# Reflections in Contemporary Conservation

# The George Wright Forum

and Nature at 150

The GWS Journal of Parks, Protected Areas & Cultural Sites volume 32 number 3 • 2015



#### Mission

The George Wright Society promotes protected area stewardship by bringing practitioners together to share their expertise.

#### Our Goal

The Society strives to be the premier organization connecting people, places, knowledge, and ideas to foster excellence in natural and cultural resource management, research, protection, and interpretation in parks and equivalent reserves.

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# The George Wright Forum

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**On the cover:** Views of Woodstock, Vermont, from Mount Tom: from the 19th century, and more recently. Photos courtesy of Woodstock Historical Society and Ed Sharron.

## SOCIETY NEWS, NOTES & MAIL

#### GWS2017 set for Norfolk, Virginia

The next installment of the George Wright Society Conference on Parks, Protected Areas, and Cultural Sites—the 19th in the series!—will be held in Virginia for the first time. We will be meeting April 3–7, 2017, at the Norfolk Waterside Marriott, less than a block from the inner harbor of this city at the mouth of Chesapeake Bay. Norfolk hosts the largest Navy base in the world and has an exceptionally rich maritime history. Some nearby parks and cultural sites include Fort Monroe National Monument, Colonial National Historical Park, Great Dismal Swamp National Wildlife Refuge, and Colonial Williamsburg. A Call for Proposals will be issued in June 2016; all GWS members will receive it automatically.

#### Letter to the Editor: Franchising national parks

Dear Editor:

Since 2007, *The George Wright Forum* has been running a series of National Park Service Centennial Essays reflecting varying perspectives on the future of agency. The most recent piece by Holly Fretwell, a research fellow at the Property and Environment Research Center (PERC) in Bozeman, Montana, offers a different viewpoint on how to address the agency's difficult financial situation and the public's desire for more national parks (vol. 32, no. 2, 2015). Her proposal in a nutshell: what if NPS were to franchise the NPS brand and offer it to entrepreneurs to run new park sites that were deemed to be of national significance? Then these new units could privately run at little or no cost to taxpayers, but would be given "national park" stature.

As the centennial approaches all things should be on the table. Fretwell's suggestion is to re-imagine the NPS brand as a franchising opportunity. This is not a new idea. The Smithsonian has been doing this for years with their Affiliates program. And going all the way, the once-nonprofit National Geographic Society just sold their magazine, books, maps, and other media to a consortium headed by 21st Century Fox, the Rupert Murdoch-controlled company that owns the Fox television network and Fox news, for \$725 million. In Fretwell's plan, NPS as franchisor would license the use of the brand and provide general support. The agency would set the parameters for management and approve a business plan. This approach would ensure that new parks would have strong grassroots support. The new areas would be locally governed, enjoy the benefit of a partnership with park professionals, and enjoy the leverage of the NPS brand. Voilà! An NPS experience at substantially reduced cost to the taxpayer!

As I read the elements of Fretwell's franchise model, I was assailed by a sense of creeping familiarity—an approach that offers a way to get under the NPS umbrella, but is not managed by NPS; one that is launched by strong local support and commitment, that must follow NPS standards and requires a business plan, but recognizes that one size does not fit all. Wait a minute—don't we already have something similar in the NPS portfolio? We do, there are 49 of them, and they are called national heritage areas (NHAs).

The irony is that institutionalizing the NHA idea is stalled in a stand-off between the Obama administration (actually multiple administrations going back to 2001) and the very congressional committees who are calling for a more market-based approach. Although NHAs incorporate most of the efficiencies touted in Fretwell's article and have a 30-year track record, legislation that would officially formalize the NHA program has been held up by claims of federal overreach and fears of a federal land grab when nothing could be further from the truth!

So I ask those who, like PERC, are proposing that NPS rethink how they leverage the national park brand to follow their own dictums. Let's not create something new and shiny. Instead, why not polish up the national heritage areas model and make it work even better for the next one hundred years?

Brenda Barrett

[Ed. note: The writer was formerly the NPS coordinator for NHAs, and now edits *Living Landscape Observer*, an online newsletter providing commentary on landscape-scale conservation, historic preservation, and sustainable communities.]

#### Mitchell, Sharp retain seats on Board

Each year we schedule an election to contest two seats on the Board of Directors. We call for potential candidates in the pages of *The George Wright Forum*, and then compile a ballot. Occasionally, the number of candidates who come forward does not exceed the number of seats available. In such cases, the Board can declare that the sense of the membership is that the two candidates be re-elected by acclamation. That is what happened this year. Two incumbents, Jerry Mitchell and Ryan Sharp, announced that they were running for a second term. No other candidates came forward by the deadline. The Board subsequently exercised its prerogative to cancel the election and declare Mitchell and Sharp to be elected. They will each serve a term running from January 1, 2016 through December, 31, 2018.

## 1916 ESSAY SERIES 2016

## **Holding Course**

#### Michael Soukup

#### Introduction

As a RETIREE ONE IS USUALLY, OR PERHAPS SHOULD BE, CONTENT TO SIT IN THE BLEACHERS AND cheer on those still playing on the field. But what if your team appears confused about what the goal-line looks like, or is debating whether to change the rules because they're behind and the clock is running out? It just might be worth calling time and running out on the field with a message to focus on fundamentals, and perhaps some pages from the old playbook.

So when asked to contribute to the Centennial Essay Series I couldn't resist. Several of the most recent essays reflect deep concern over the future of the national park system and its direction in an era of rapid environmental change. Nate Stephenson (2014) reflected on his career as a scientist in a large western park. He wrote partly to dispel the gloom and discouragement he and others feel about losing the Leopold Report's "vignettes of primitive America" as a guiding principle for managing national parks (Leopold et al. 1963). My intent is similar, although my perspective and frame of reference are different.

Similarly, when William Tweed declares in his centennial essay that "the heart of the national park promise, the 'best idea America ever had,' no longer works," and asks, "Can national parks evolve successfully in a world where nearly all of their founding assumptions have been proven wrong?" (Tweed 2010: 13), it seems a good time to offer another perspective.

While coining new terms, re-defining old terms, or changing goals can exert great appeal in times of challenge, I am convinced that both the Organic Act and its evolving interpreta-

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tion as found in the National Park Service (NPS) Management Policies are sound navigation tools for an era of rapid environmental change.

It's inescapable that the National Park Service faces an enormous challenge in navigating the future—as does society at large. My message is that NPS—if it prepares well—can seize powerful opportunities to serve and significantly influence society in new ways that sustain our nation's quality of life.

Career employees have always weathered political and philosophical challenges to the national park system and its values. While neither politics nor tradition should be reasons to avoid evaluation of the performance of NPS in meeting its mission, I find myself concerned that, unless things have changed in Washington since I retired, many vested interests covet the idea that the national park system is based on myths, wrong assumptions, or impossible ideals. There have always been strong pressures for abandoning the implications of the Organic Act in favor of managing (perhaps "gardening"?) national park resources for the immediate benefits that would accrue to constituencies that favor use and consumption of park resources. The attempt to redefine the Management Policies in 2005 intended to achieve that end.

Amid the current trend to question the relevance or attainability of conservation ideals (Brower 2014), the centennial represents a chance to celebrate the achievements of one of the world's most robust efforts to conserve a nation's natural and cultural heritage, but more importantly to fortify its position for the coming age of rapid environmental change. In that light I offer some reactions to questions about the continued relevance of NPS and its mission in an era of human domination of the planet.

I can understand the angst that Nate Stephenson writes about regarding the need to move away from the Leopold Report's image of national parks as "vignettes of primitive America." Yet I think for many of us that image was abandoned as a serious goal some while back. It is important to recognize that NPS as an organization has not been "living under a rock" in the last few decades, missing out on the advances in ecology regarding the dynamic nature of natural systems. An analysis of the evolution of the Management Policies suggests that the static vignette idea was scrapped in the 1980s in favor of "allowing the natural variation of complex natural systems" and understanding those systems well enough to detect changes of techno-human origin that bring unacceptable impacts (Dennis 1999).

My field perspective was shaped on the East Coast, largely within park units inherited "with issues." Perhaps the diversification of the national park system to include a range of units beyond traditional big western parks has yielded unexpected dividends in the diversity of national park employee resilience and their comfort in dealing with human-induced change. Managing in Everglades National Park, George Washington Memorial Parkway, Fire Island National Seashore, and Gateway National Recreation Area—and the range of park designations in the West as well—has taught that all units can be managed toward the goal of unimpairment notwithstanding whether it is possible to fully get there. For me, the real magic of the national park idea has not rested primarily in the pursuit of Leopold's primitive vignettes but in the language and implications of the Organic Act. The journey of each park unit to preserve the nation's heritage under NPS management reveals the compelling power and practicality of the Organic Act's intent, and its potential for even greater value in the future.

As an extreme example, NPS has taken on Gateway not with the expectation of a vignette of primitive America, but with the goal of conserving nature (or the "wild") that remains, and working relentlessly over generations to maximize its preservation, restoration, and lessons to those who must learn to coexist with nature on the grand scale. While not a mission for the faint-hearted, learning how to protect as well as use, and restore when feasible, are lessons that future generations will value.

Are not Rock Creek Park, Padre Island National Seashore, and Shenandoah National Park—as well as Yellowstone National Park for that matter—healthier under NPS management policies that implement the Organic Act? These and other protected, restored, and evolving natural systems can be inspirations and effective case studies for the coming years.

Unimpairment has meant to me nature operating unfettered to the extent possible—a clear and valuable goal for every site in the national park system. That includes protecting systems by maximizing their ecological integrity, their resilience, and their species diversity on a landscape scale—i.e., species may come and go but at their own speed, via unrestricted paths, responding to their own needs. That vision is more complicated than Leopold's "primitive vignettes," which can still wonderfully echo in America's large western parks. However, the *Revisiting Leopold* report (Colwell et al. 2012) has provided a modern scientific framework that reinforces the Management Policies (NPS 2006) in guiding our transition into accepting change in the modern landscape where some level of techno-human impact will always be a factor.

#### Evolution of natural resource policy

While analyses of turning points in the history of NPS natural resource management rightfully fall to the next generation of historians, it seems useful to add to Stephenson's perspective. Stephenson offers three distinct eras: The era of spectacles, the Leopold Report era, and the post-Leopold modern era. These seem reasonable, but my experience suggests other possible delineation points for consideration when the next history is written.

Stephenson makes a case for the early years as an era of spectacles, when firefalls, bear feeding, and buffalo stampedes were held in early parks to build a constituency—parks as "rustic fun farms," in the words of former regional director Bob Barbee.

The need for spectacles seems to persist today in the recurrent call for parks to actively entice succeeding generations away from other recreational pursuits. Tweed cites the need for "ecosystem museums" as one way to attract the visitors of tomorrow. I would posit that, if NPS stays true to its mission, parks will have a strong constituency that grows across all segments of society (including younger age groups) in the coming era of nearly inescapable human dominance of the landscape.

I would rather characterize this early era, with the remarkable exception of the George Wright years, as the "naïve era"—one when the field of ecology and NPS were both coming of age. In contrast to Stephenson, I'd also argue that this era lasted well past the publication of the Leopold Report.

The Leopold Report's image of parks as primitive vignettes brought focus, order, and comfort to a fledgling agency with little understanding of the complexity of its mission—and which was reeling from mounting resource management controversies for which it had no answers. Yet the Leopold Report didn't effectively challenge or change the agency as much as would the passage of the National Environmental Policy Act (NEPA) in 1969.

#### The modern era of external influences

For me, the passage of NEPA was the beginning of the end of NPS's "naïve era." Until then NPS could still maintain that defending the boundary with generalist skills, and the experience and intuition of superintendents, would suffice in protecting national parks. With NEPA came the era of "Show me" and, sometimes, "Prove it!" Full disclosure required NPS, like all other federal agencies, to marshal site-specific information and present it to the public in advance of management actions.

The requirement for documenting benefits and impacts of proposed management actions exposed the general dearth of information NPS could command. It unraveled the assumption that being the environmental good guys meant you didn't really need to know much about park resources. Not only did NEPA take much of the absolute authority away from park managers, it eventually led NPS to the world of systems ecology.

Both the Leopold (1963) and the Robbins (1963) reports made important recommendations that NPS could ignore. NEPA, with its force of law, left no options. NEPA forced NPS into the public arena and into courtrooms, venues that demanded grounding in sound science. NEPA began to wrest NPS away from its default mode of focusing only on visitor services, and quickly exposed outdated concepts like managing parks as "vignettes" of static scenery.

I would offer to tomorrow's historians yet another benchmark for delineating resource management eras in NPS. The Naïve Era may well be argued to have ended not with the Leopold Report but with the *State of the Parks Report* in 1980. That rather straightforward effort asked parks to identify their major threats. The response documented for the first time the degree to which external forces were likely to determine future success in protecting park resources. That report placed mastering park operations and even optimizing resource protection within parks in their proper perspective.

All this notwithstanding, the naïve notion that park operations within the boundary alone will ensure NPS success is still reflected in National Leadership Council meetings and NPS budget priorities, and in congressional interest and allocations—a self-reinforcing loop that does not address the realities of managing 84 million acres of complex systems in the modern era. The *Call to Action* (2011) reinforces the need for parks to "scale up" their work outside their boundaries, and the agency must retool to make this a reality in the modern era.

#### Transitioning to the post-modern era

Nearly everyone can agree that we now face environmental changes in scale and speed that is something entirely new. Thanks to technology, humans are increasingly responsible for change on a global scale. Technology has provided the fulcrum, and the expanding human population provides the lever, which are now moving the earth. Climate change is perhaps the most pervasive example. In the midst of this uncontrolled experiment stands the Organic Act's requirement that park resources remain unimpaired. All this means we have now entered a third era of national park science and resource management: the post-modern era.

#### What's a small agency to do?

Rather than seek comfort in redefining "conservation," or "wilderness," or "unimpairment," or the NPS responsibility to steadfastly oppose and limit human-caused impacts in national parks to the very utmost extent, NPS must simply up its game. On its 100th anniversary, I contend that NPS has the foundation to proceed confidently and decisively into its next century, with one important proviso: it must invest in becoming what it has to be to carry out its mission successfully.

Important discussions on how NPS could position itself to face the uncertain future occurred at the turn of the millennium. Those discussions led to the Natural Resource Challenge. The Challenge programs were developed with parks and supported by the entire senior leadership as steps towards becoming a competent natural heritage steward in a landand seascape fraught with human-induced impact.

Future success starts with in-depth knowledge. If we don't understand park systems, then there is little basis for discussing ecosystem integrity, health, stability, multiple stressors, resilience, or resistance—much less active management options—in an era of rapid environmental change. There is no substitute for long-term observation in national parks if we are to understand them. Without a gradually accumulating data base, constant analysis, modeling, and testing, it is foolish to think that managers can lead and act decisively when facing tomorrow's challenges.

*Revisiting Leopold* reiterates the need for greater knowledge. With complex systems, long-term observations and data sets have inestimable value. Perhaps it is here that we should applaud Nate Stephenson's career-long devotion to research in a national park.

In parks that have had a continuous science presence, there is a foundation for prudent management. Such foundations have been laid by those NPS, US Geological Survey (USGS), and academic scientists who have devoted their careers, often over decades, to work within a single park. I believe historians will note a remarkable record of national park leadership in natural system science (in fire ecology, air quality modeling, predator–prey interactions and predator restoration, serial depletions of marine species and marine reserve design, barrier island dynamics, mine reclamation, All Taxa Biodiversity Inventories, and more) from such a small budget and band of scientists.

The fidelity of an individual scientist to a single park, an important element in understanding the complex systems of national parks, is all too rare. My favorite examples of those with tenacious site fidelity are Bill Robertson and Bob Johnson at Everglades National Park, Jan van Wagtendonk at Yosemite National Park, Gary Davis at Channel Islands National Park, Herb Meyer at Florissant Fossil Beds National Monument, and John Portnoy at Cape Cod National Seashore. All knew their park's resources intimately, and enabled NPS to be authoritative and prudent stewards. With the loss of park-based scientists to the National Biological Survey (and thence to USGS) there isn't a new generation to take their place unless NPS moves to restore in-park expertise. While the Inventory and Monitoring Program has added scientists at the network level (i.e., vital "scale up" capacity), parks need resident scientists that integrate information and work with resource managers to develop the authoritative local knowledge necessary for navigating the uncertain future.

#### Get help from friends

As the *State of the Parks Report* foretold, the mission is too vast for NPS alone. NPS needs to seek, value, and live up to strong partnerships. With a few changes in mindset, there are strong alliances that can help.

Critics of NPS believe it suffers from a siege mentality; if that has been true, the siege can best be broken from within. The siege can be broken by building programs that both invite partners in (Research Learning Centers, Cooperative Ecosystem Studies Units, Sabbaticals-in-the Park, Park Flight, Canon Scholars, etc.) and those that sally forth (programs such as Rivers, Trails, and Conservation Assistance, Wild and Scenic Rivers, National Natural Landmarks, Man and the Biosphere, etc.) to effectively share the 100 years of NPS experience in balancing use while minimizing impacts and preventing heritage impairment.

There's so much more that can be gained by welcoming academe into the best system of natural laboratories in the world. There are many academics who love the national park idea and having their research applied for direct public good. Examples can be seen among the recipients of the annual NPS Natural Resource Awards for Research, which acknowledge the contributions of this extended (and expandable) national park science family. Some spend their entire careers studying a park or parks, and directing students towards the study of the resources, ideals, and practices of national parks. There are untold numbers of students waiting to imprint on the mission and challenges of park science. Encouragement is all that is needed.

The Research Learning Center (RLC) network was conceived to point the way. One way to lift the siege is for every park (or at least where adaptively reusable facilities permit) to develop a highly functioning RLC. RLCs position parks as leaders in spreading, on a park, regional, and eventually national scale, a conservation ethic compatible with nature, biodiversity, and heritage protection.

By providing direct access for the public to science and scientists in parks, traditional park interpretation will offer a more fulfilling menu than often available from superficially trained temporary employees. RLCs can deepen inch-deep citizen support (and appreciation for natural and social science) through contact with scientists and hands-on engagement in citizen science.

RLCs that function with strong park support are proving that new leadership roles which enhance long-term protection of national parks at larger scales are possible. RLCs can forge alliances with state and federal and professional educators, and with CESU member universities (including Native American, Historically Black, and Predominantly Hispanic colleges and universities) that can benefit from inexpensive field stations. At a time of great societal need for STEM (science, technology, engineering, and mathematics) education and renewed interest in nature, RLCs can reach children and even influence local and state education programs (e.g., the Appalachian Highlands Science Learning Center's impact on North Carolina state curricula standards; see NPS 2013). If a majority of national parks develop RLCs, there can be a new dimension to NPS outreach for public good. Yet, symptomatically, some of the original 12 Challenge-funded RLC education and science coordinator positions have disappeared or remain unfilled.

NPS must not let the multi-agency Cooperative Ecosystem Studies Unit Network falter through failing to fill CESU coordinator positions on host campuses. Nor should it give up on the original CESU vision of multiple federal agencies working together on CESU university host campuses to forge coordinated science projects and a common vision of a landscape that works for all.

The Natural Resource Challenge programs were but a basic platform on which to build and should not be allowed to lapse and wither. RLC positions must be filled if they are to build new constituencies on a regional scale; CESU coordinator positions must be filled and duty stationed on the host campus if they are to attract academic interest and resources into national park science, education, and technical support—and consequently scale up park protection.

#### Get help from sister agencies

Protection of the significant portion of our nation's natural and cultural heritage found in national parks should not be asked of NPS alone. Presidents ought to direct their cabinet agencies to contribute towards the larger goal of protecting national heritage as a working corollary to their specific missions. It may take many presidents and many executive orders to overcome traditional stove-pipe and territorial tendencies, but the stakes are becoming high enough to make that happen.

Since federal lands constitute 70% of the West, better coordination and shared responsibility for national natural and cultural heritage stewardship could provide a broad range of plausible management options. Movement of many species is a less serious issue if we are managing at the landscape scale and not for static "primitive vignettes" within fixed boundaries. Fungible or cooperative boundaries among federal properties are an entirely reasonable solution if national heritage is as valuable as we think it is.

#### Ally with private landowners

There is an untapped reservoir of support and good will residing in the private landowner.

The Second Century Commission's Natural Resource Committee recommended drafting a new law that mimics the National Historic Preservation Act of 1966 (NPCA 2009). The act has changed the face of historic preservation in America by giving NPS a "servant leadership" role in providing standards, skills training, and incentives for historic preservation activities and projects on nonfederal lands (Jerry Rogers, pers. comm.). A comparable combination of incentives and technical assistance for landowners wanting to conserve nature on their land can have similarly game-changing benefits in providing functional corridors for park species that move routinely, seasonally, and in response to global warming and other long-term changes. Introducing such a bill in 2016 can have elements that appeal to both sides of the aisle in Congress as a way to protect the nation's heritage without relying on federal land ownership. Filing during the centennial and offering the concept for incorporation into campaign platforms would be valuable.

#### Mark a new era with 2016

The 2016 centennial celebrates 100 years of visionary contribution to America; it can also be a turning point of substance. The year 2016 can be both a time of satisfaction in how far NPS has traveled and re-dedication to positioning itself to address the future. On its 100th anniversary the National Park Service now benefits from the realization that much of its business is systems ecology, and it will be judged on how it incorporates that realization into its management priorities.

The best preparation for the future of our system of national parks is to power up programs that improve mission-critical performance in an era of change. Building an authoritative understanding of park resources, their stressors, and thresholds must eclipse priorities that will not be factors in future success in stewardship of the nation's heritage.

Essentially the best preparation for the coming era is for NPS to ensure its current mission is fully executed. That's where active management must begin—ensuring that park resources are understood and in the very best condition to meet future change. In short, it must first execute the current playbook by building on its experience, relevant programs, partnerships, and institutional passion. If this can be done, the best is yet to come.

To paraphrase Old Testament wisdom: If the trumpet sounds uncertain, who will answer? Confusion over goals and terminology does not make for a certain trumpet. Because national parks are a commitment between and across generations, discussions of changing goals and mission in the coming era of increasing human-induced global impact must be approached carefully—and with evolution, not revolution, in mind.

Climate change is amplifying the uncertainty and angst among heritage managers. Yet the traditional role of NPS is pre-adapted to be of value in this coming age of challenge. Experience with protecting, managing for unimpairment and compatible use, restoring ecosystem elements and condition—and thereby integrity and resilience—positions national parks as unparalleled sentinels and beacons in a time of rapid change.

Perfecting environmental stewardship in national parks is a matter of building on strengths, building new areas of strength, and harnessing the goodwill and resources of the many others who will want to help meet the ideals of the Organic Act. National parks can be central in understanding what is at risk and being lost, to minimizing biodiversity loss, and to galvanizing a new generation of advocates—not only for park integrity but for the general benefit to humankind. The National Park Service must hold to a true course in an uncertain era.

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### Find Your System

BY THE TIME THIS COLUMN COMES OUT, the commemoration of the establishment of the US National Park Service (NPS) in 1916 will have officially begun. This centennial celebration has been long planned with the National Park Foundation (NPF), philanthropic partner of NPS, playing a central role in the public rollout. The NPS/NPF "Find Your Park" campaign has been well underway for almost a year on social and mainstream media, in partnerships with the campaign's corporate sponsors, and with the foundation's Find Your Park logo liberally displayed in visitor centers and on park interpretive materials. This was the case at Sleeping Bear Dunes National Lakeshore, which I recently visited. Though the park staff I spoke with at the lakeshore were certainly aware of the centennial, they appeared to be a little vague about the its overarching objectives and confessed to being "out of the loop."<sup>1</sup>

So I have decided to use this twelfth Letter from Woodstock to take a closer look at the centennial campaign just as 2016 begins. This letter will also serve as the third of three essays on what it means today to be part of a system of parks and protected areas. In part one of this series I explored the inherent advantages of the system derived from its broad mission and diverse components, its capacity for cooperation and leverage, and the reservoir of public affection associated with a recognized and trusted brand. Part two of the series looked at the many ways the system benefits from continued growth and change, including the vital linkage with contemporary relevancy and greater inclusiveness.

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Philip A. Hart Visitor Center, Sleeping Bear Dunes National Lakeshore. Author's photograph.

As a first step, I thought it might be useful to take a look at how a sister federal agency, the US Forest Service, marked its own centennial in 2005. That commemoration largely focused on how the mission and culture of the Forest Service had changed over the years. There was a capstone national conference, "Celebrating a Collective Commitment to Conservation," and a really good three-part documentary film, "The Greatest Good," created by filmmakers Steve Dunsky and Ann Dunsky. I remember the film for the unusually candid assessments by former USFS chiefs on major Forest Service policy reversals in the 1980s and 1990s.

Unlike the Forest Service centennial, the NPS version appears to have less interest in retrospection. For that matter, despite all the challenges the national park system faces today, many of which I have addressed in previous Letters, there appear to be no events planned for 2016 that probe the system's future. A good friend and former colleague was perplexed by the apparent absence of this kind of high-profile dialogue, particularly given the prodigious work being done by the various committees of the National Park System Advisory Board<sup>2</sup> on many key issues. I'll have more to say about the Advisory Board a bit later on.

Along the same lines another friend expressed some skepticism that the Find Your Park campaign is actually raising public awareness of NPS's lesser-known (though congressionally authorized) non-park functions, such as, for example, the Rivers, Trails, and Conservation Assistance and National Historic Landmarks programs. Despite the campaign's promise to "kick off a second century of stewardship of America's national parks and engaging communities through recreation, conservation, and historic preservation programs," rangers behind the visitor desks still stumble when asked about the larger NPS mission. It remains to be seen if Find Your Park's high-profile focus on personal park experiences may come at the expense of greater public awareness about the richness and breadth of the system as a whole. Word that the *National Park System Map and Guide*—NPS's only publication for the general public that depicts the system as a whole—is out of print, and now only distributed online,<sup>3</sup> has further exacerbated this unease. For the record, the downloadable map file is unreadable on a smartphone and way too big to print at home. Given these obvious limitations, it strains the imagination that, on the cusp of the centennial, such a administrative decision would be allowed to stand, but the momentum towards e-government appears as unstoppable as ever.

These legitimate concerns and potential weaknesses notwithstanding, it is not my intent to pick apart the centennial just as it is finally gaining traction. I actually think the centennial's overarching strategy—to reach out and connect with a much younger and much more diverse segment of the population—makes a great deal of sense. It may not be an issue- or policy-focused agenda that some people might have embraced; neither does it try to learn from the National Park Service's complex and contested history. However, the centennial, particularly the NPS/NPF signature Find Your Park campaign, by largely focusing on one objective above all others, can still have a significant impact.

Pursuing this strategy, NPS is appealing primarily to a younger generation with much less identification or affiliation with the national park system rather than reaching out to a more familiar older, whiter, traditionally loyal park constituency. It would have no doubt been easier to appeal to friends who share similar values and narratives, and celebrate with the same handful of iconic national parks. Find Your Park untethers itself from convention and cuts a wide swath through the national park system inclusive of many smaller parks and urban areas (as well as the icons), interpreting a variety of park experiences through the eyes of enthusiastic Millennials.<sup>4</sup> As the trade publication *Adweek* reported:

The campaign urges visitors to think beyond postcard landscapes when considering the country's 407 national parks. Visitors are encouraged to see Alcatraz in print ads that use abandoned jail block space with the reminder, 'Parks aren't just about the history of geology. They're also about the history of confinement.' For the iconic civil rights location Little Rock [Central] High School, the ads urge visitors to remember, 'Parks aren't just about respecting nature's diversity. They're also about respect for all people.<sup>55</sup>

Much of what is on the Find Your Park webpage is pitched to what at first glance may seem to be a self-absorbed age demographic having a really good time in the parks. But it works, and its youthful energy is refreshing—the activities make being in the parks look like a lot of fun and there is nothing wrong with that.

Of course, the actual centennial year has yet to begin and some surprises could be in store. Granted, what I have seen may only be the tip of the iceberg and my interpretation could be wide of the mark, but I think the broad contours of the Find Your Park campaign are becoming increasingly clear. Make no mistake about it: this is a skillfully crafted campaign, conceived with the help of Grey New York, a remarkably capable and intuitive advertising agency hired by NPF. As the foundation describes it:

Find Your Park includes a stream of programs, exhibits, events, promotions and public activities throughout 2015 and 2016 that will encourage everyone to find their park. As a holistic marketing campaign, Find Your Park includes broadcast, print, digital, outdoor and radio creative [content] featuring arresting visuals of the national parks, as well as public relations, influencer and social media efforts.<sup>6</sup>

But dig a little deeper and the message gets more specific. As Grey says in its own words, the national park system must be "accessible to all ... every day ... a source of personal self-worth and pride for every single American." The Find Your Park campaign intends "to



Another example of the "Find Your Park" campaign. Image courtesy of the National Park Foundation.

re-introduce the National Park Service to a new generation of Americans ... in a changed America ... with a message that creates emotional connections, penetrates culture and will motivate people to action.<sup>77</sup> It is hard to argue with that.

In his dedication of Pullman National Monument, President Obama said, "No matter who you are, no matter where you live, our parks and our monuments, our lands and our waters, these places are the birthright of all Americans." The president reminded his audience that places like Pullman, representative of our collective history, are "as undeniable and worth protecting as the Grand Canyon or the Great Smoky Mountains," and that "places that look ordinary are nothing but extraordinary. The places you live are extraordinary, which means you can be extraordinary. You can make something happen."

This message of equal access, environmental justice, and individual and community empowerment resonates as well through the centennial effort. Building on this spirit of social mobilization, Find Your Park has recruited a select group of celebrity "influencers" with vast legions of followers on social media platforms such as YouTube, Instagram, and Snapchat. To their credit, these personable "Celebrity Ambassadors," as they are called, promote their adopted parks with full-throated, if theatrical, enthusiasm. There is a refreshing diversity within this group—and the diversity of national parks they are championing is equally refreshing. Not only do you have "Ambassador" TV personality Terrence I. marching in the footsteps of the Buffalo Soldiers through Yosemite Valley, but actress Roselyn Sanchez is doing her morning yoga near Fort Point, TV star Bella Thorne is romping through the Santa Monica Mountains, singer/songwriter and LGBT advocate Mary Lambert is reading her poetry in Faneuil Hall, and peripatetic Bill Nye, "the science guy," is in a taxi careening around Manhattan sharing facts and trivia about Grant's Tomb, Castle Clinton, the Statue of Liberty, and the African Burial Ground. This cheerleading cohort may not have "found" their entire national park system vet, but they certainly seem to be making progress. Even some of the "premier" corporate sponsors of Find Your Park, such as American Express, seem to have gotten the message as well, showing off more of the national park system in their online videos than you might have expected.

While Find Your Park with its ambitious and tightly targeted objective provides an appealing national face to the centennial, other activities are rather modest, apart from President Obama's signature "Every Kid in a Park" initiative. There is an NPS-themed Rose Bowl parade (with Ken Burns as grand marshal), an IMAX film, and various National Geographic special offerings, but it appears largely left to individual parks to fill in much of the centennial's substance with locally inspired and organized program content. However you may feel about the absence of more direct involvement by national leadership, it is not inconsistent with Director Jon Jarvis' approach to designing his *Call to Action*. In both the *Call to Action* and the NPS centennial you can detect the influence of advisor Meg Wheatley on Jarvis' theory of change. Wheatley, a member of the National Park Service Advisory Board and a former member of National Parks Second Century Commission, has long advocated, "supporting positive actions," mostly emerging from the field, "that can be replicated and broadly supported."<sup>8</sup>

However, with the exception of Yellowstone's NPS centennial celebration planned around the revitalization of its Roosevelt Arch/Gardiner entrance, at first glance, early parkbased centennial events on the Find Your Park webpage calendar are not particularly inspiring. Many events appear to be regularly offered programs rebranded for the centennial. However, digging down a bit, several distinctive events caught my eye. Little Rock Central High School National Historic Site is sponsoring what it is calling a "social conscience gathering" in commemoration of the end of Civil War, enactment of civil rights legislation, and the establishment of the National Park Service. This gathering is intended to "identify barriers to social change, cultivating empathy for other people and cultures, and forging new paths toward global equality." This follows closely on the heels of Vicksburg and Shiloh national military parks co-sponsoring a related symposium at Mississippi State University, titled "The Fifteenth Amendment: From U.S. Grant to Lyndon B. Johnson's Voting Rights Act." Hopefully, more thought provoking centennial events like these will follow.

Perhaps the centennial's greatest test is the degree in which progress enabled by the NPS director's *Call to Action*, exemplified by the "Civil War to Civil Rights" network, Climate Change Action Plan, "Every Kid in a Park" initiative, "Healthy Parks/Healthy People" programs, and the NPS "Urban Agenda,"<sup>9</sup> can be institutionalized and embedded within the agency. This test is particularly applicable to many of the National Park System Advisory Board's accomplishments and its wide-ranging recommendations on the future of the national park system including educational partnerships, relevancy and community relationships, science and climate challenges, innovation and leadership development, philanthropy and economic valuation, and other 21st-century NPS priorities.

With so much at stake, this question takes on special urgency as the 2016 centennial coincides with a national election. Given the unraveling of historical bipartisanship on environmental and park-related issues and the election's uncertain outcome, it is not entirely inconceivable that both the executive branch and congress might be controlled by people antagonistic toward public lands and predisposed to reversing more than a century of landmark environmental legislation, from the Antiquities Act to the Endangered Species Act. In such an environment, the continuation of the national park system as we know it today cannot be taken for granted; what has been authorized can always be deauthorized. Ultimately, the system's durability and long-term support depends on a broad social compact with the American people, a compact that requires constant engagement and renewal. Let us hope that a highly successful NPS centennial can dramatically expand that compact to the extent that there is enough political momentum coming out of the celebratory year to sustain and build upon the progress that has been made. At the very least the centennial can lay the foundations for deepening public engagement and establishing ever-more-meaningful connections between the national park system and the individuals and communities across the country that it serves. This includes more people of color, urban dwellers, new Americans, and younger generations of park users.

A progress report from the *Call to Action* may have gotten it half right when it stated in reference to the centennial, "To us, it's not about cakes and candles—it's about being an or-

ganization ready to take on the challenges of our second century." But it is also about people "finding their national park system"—a park system that they perceive as increasingly relevant and useful to their lives in a rapidly changing world.

#### Endnotes

- 1. In fairness to the wonderful staff at Sleeping Bear Dunes, I've encountered this dearth of information about the centennial at several other recently visited parks.
- 2. Learn more about the National Park System Advisory Board's work at www.nps.gov/ resources/advisoryboard.htm.
- 3. The *National Park System Map and Guide* is available through the NPS Harpers Ferry Center online at www.nps.gov/hfc/cfm/carto-detail.cfm?Alpha=NPS.
- 4. Do check out http://findyourpark.com/.
- Noreen O'Leary, "In Centennial Campaign, Grey N.Y. Offers New View of America's National Parks: It's Not Just about Geysers and Canyons," *Adweek*, April 1, 2015.
- National Park Foundation, "National Park Service and National Park Foundation Launch Find Your Park Virtual View Tour, Connecting People with Parks across the Country," NPF News, April 2, 2015.
- Ken Dowling, "Overview of Grey's Approach to the NPS Centennial Campaign," February 2013.
- 8. National Park Service, Report to the National Park System Advisory Board, "Developing Leadership and Nurturing Innovation," November 4–5, 2015.
- 9. See Letter from Woodstock, "An Urban Parks Agenda for Everyone?" *The George Wright Forum*, vol. 31, no. 2 (2014); online at www.georgewright.org/312diamant.pdf.

Comments on "Letter from Woodstock" are always welcome. Write to LFW@georgewright.org.

## 🛯 The Heart of the Matter

New essential reading on parks, protected areas, and cultural sites

*Protected Area Governance and Management*, edited by Graeme L. Worboys, Michael Lockwood, Ashish Kothari, Sue Feary, and Ian Pulsford. Canberra: Australian National University Press, 2015.

#### **Reviewed by David Harmon**

The purpose of "The Heart of the Matter" is to call the attention of *George Wright Forum* readers to books that we think are important additions to the professional literature. You'll have noticed that the tagline of the feature goes further than that, and we are aware that a certain level of presumption goes along with giving yourself permission to declare something "essential." In the case of *Protected Area Governance and Management*, the presumption is, I think, completely justified. A truly comprehensive guide to the full range of issues, both conceptual and practical, that protected areas managers in today's world are facing, this is a book that really ought to be on the desk of every senior-level park manager (and of anyone who aspires to be).

Why? Because it gives one an unmatched look at all the major issues facing protected natural areas around the world, and as we move forward into a new era of changed climate and tightly interconnected economics and politics, no manager can afford to ignore the global context of his or her work. A product of the International Union for Conservation of Nature's World Commission on Protected Areas, *Protected Area Governance and Management* builds on previous substantive work. Several of the co-editors have been involved in precursor editions dating back to the pioneering 2001 volume *Protected Area Management: Principles and Practice*, the first attempt to place the subject on a global footing. A second edition followed in 2005, and then in 2006 came a successor book, *Managing Protected Areas: A Global Guide*, which introduced a broader cast of expert chapter authors, expanding the perspectives being presented. That was a significant advance, but even so most of the authors still came from a relatively small number of English-speaking countries. The authors responsible for the 29 chapters of *Protected Area Governance and Management* represent a far wider reach, and this is reflected in the diversity of examples and perspectives, which come from all parts of the world.

The George Wright Forum, vol. 32, no. 3, pp. 221–222 (2015). © 2015 The George Wright Society. All rights reserved. (No copyright is claimed for previously published material reprinted herein.) ISSN 0732-4715. Please direct all permissions requests to info@georgewright.org. The book opens with useful overviews of basic protected area concepts (including the IUCN definition, and its system of protected area categories), natural and cultural heritage as they relate to protected areas, social and economic influences, and values and benefits. Nutsand-bolts chapters cover planning, interacting with the media, overseeing cultural uses and features, and managing visitor use, operations, incidents, and resource threats. Context-setting chapters cover topics such as governance types, benefitting from complexity thinking, and geoconservation. Sectorial chapters treat freshwater/estuarine and marine protected areas, and strategic chapters tackle climate change, biodiversity and ecosystem function, leadership development, public engagement, connectivity conservation, and evaluating management effectiveness. And there's more.

The editors do a good job of harmonizing the various authorial voices while still preserving the unique flavor of the different contributions. As one might guess, it's not really a book meant to be read straight through; at 35 pages shy of a thousand, it would take an exceptionally doughty reader to manage it. My suggestion is to skim it from front to back, noting areas of special interest to you. Then read the introductory chapters in full to get aligned to the rest of the book, and afterwards dip in and out as your inclinations dictate, knowing that you can return to other sections later as references. This reading plan is aided by the book's design. Generously illustrated with full-color photographs, maps, tables, and graphics, it is accessible to professionals and upper-level students alike. Each chapter has its own reference list (yay! it's so much easier that way than having to flip to the back all the time), and, crucially for a book like this, there is an excellent index.

When taking a global perspective, inevitably the subjects have to be dealt with at a level less specific than that taken in specialist texts. The challenge—probably the biggest one editors of a single-volume overview like this have to meet—is to find the sweet spot between superficiality and suffocating detail. Nearly all the chapters of *Protected Area Governance and Management* hit that target. If you want to understand what is going on in the wide world of protected areas, this is simply a book not to be missed.

It can be ordered in hard copy from the publisher, but is also available at no charge as a PDF or fixed-layout e-publication; go to http://press.anu.edu.au/titles/protected-area-governance-and-management-2/ for all three options.

## Man and Nature at 150: Reflections in Contemporary Conservation

#### Brent A. Mitchell, guest editor

### Preface

MAN AND NATURE; OR, PHYSICAL GEOGRAPHY AS MODIFIED BY HUMAN ACTION heralded the beginning of the conservation movement in the United States. It marks the turning point in perception of a planet divinely ordained to be controlled by man to a dawning recognition that human use is veering out of control. Variously described as "epoch making" and "the beginning of land wisdom in this country," it establishes Marsh as both "pioneer" and "prophet of conservation."

For its impact and insights, *Man and Nature*, and its author, George Perkins Marsh, ought to be at least as well known as Rachel Carson and *Silent Spring*, and Aldo Leopold with *A Sand County Almanac*. Alas, it and he are not. This issue represents one small effort at remedy by exploring ways in which Marsh's treatise is still relevant today, 150 years after it was first published.

#### Why care about Marsh?

Why should we care about G.P. Marsh? Isn't he just another "dead white male"? In presenting these reflections on his writings, are we not perpetuating the "great man" approach to history, now discredited in some circles? Perhaps, but our modern norms and cultural views should not discount the achievements of a man in his time. Certainly, it would have been difficult or impossible for Rachel Carson to have achieved similar fame had she been born in 1807 rather than 1907, and we should celebrate today's progress towards equal opportunity of gender, race, and religion while we strive to achieve it fully. But that does not disclaim the importance of Marsh nor negate the value in studying *Man and Nature* and how it came about.

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Marsh's biographer, David Lowenthal, points out that "Marsh himself stressed that humble and unsung lives were as deserving of memory as those of the great, and collectively of far more consequence for both human and earth history. Yet for the insights he signally added to our world view Marsh's own life is unusually worth study."

We study and remember Marsh not because he earned our attention, but rather because he still has much to teach us. Quoting Lowenthal again, from the preface to his biography, *George Perkins Marsh: Prophet of Conservation*, "It would be an error to enlist Marsh in support of any current environmental credo. He was a man of his time, his perceptions like his concerns may yet inspire us, but they are bound to be anachronistic.... Yet Marsh's resonance remains potent; he faced human dilemmas that strike us as both familiar and novel."

It may be particularly appropriate to celebrate George Perkins Marsh in these pages. He was a multilingual student of the natural world who, entirely through his own initiative, researched and wrote a publication that would change the course of conservation for succeeding generations. Thus Marsh's story holds a few parallels with that of another George born a century later: George Melendez Wright.

Lastly, we often understand history best when it is told through the personalities that lived it. In every human endeavor we hold up heroes, if for no better reason than to put a singular face on complicated events despite awareness that they involved many different people. For those of us working in conservation as we know it today, Marsh was the first of those heroes.

#### How the pieces tie together

A distinguished group of authors contributed to this issue: historians, writers, scientists and conservation practitioners. All are highly accomplished, but I have to acknowledge that here Professor David Lowenthal is the first among equals. No one has studied Marsh in more detail and with greater scholarship. Marsh's obituary from the American Academy of Arts and Sciences includes the line, "We look with desire for a full account of his life from some hand competent to the grateful task." Seventy years later, Lowenthal took up the challenge, and succeeded brilliantly.

Without Professor Lowenthal's work the story of Marsh's contributions might have been largely lost to us. All the authors are indebted to Lowenthal's most authoritative biography, *George Perkins Marsh: Prophet of Conservation*, and other writings. Among those writings he has kindly added the centerpiece to this issue.

Rolf Diamant describes how Marsh's insights still redound today through the writings and lectures of Lowenthal. Diamant recalls an exchange to Italy with the biographer, a book tour and roving conversation about contemporary stewardship organized by the US Embassy in Rome. My own essay stresses the need for more such international, professional exchange. Marsh built most of his arguments for conservation on observations abroad as an ambassador; I build on that to argue for expanded application of our federal conservation partners as a form of soft diplomacy.

Unlike Lowenthal's biography, Marsh's original writings are not an easy read. The very title *Man and Nature* may be mildly offensive to some today with its seeming gender bias.

John Elder gives guidance on how to read Marsh, how to navigate the dense language and a writing style now out of fashion, giving encouragement that reading the original text will reward the reader's effort.

Not out of fashion is Marsh's strong belief that conservation and environment should not be left to experts. He considered himself an amateur—most of his scholarly interests (of which there were many) were pursued as pastime, not profession. As described in the article by Nora Mitchell and Rolf Diamant, he "preached the necessity of informed public participation ... as well as the necessity of stewardship."

That public can be inspired by the same landscape that shaped Marsh's relationship to the natural world. Christina Marts writes from Marsh-Billings-Rockefeller National Historical Park to describe how the National Park Service is encouraging new generations of stewards.

In writing *Man and Nature*, Marsh was primarily responding to the greatest environmental threat of his day, rapine deforestation. Nicholas Fisichelli, Gregor Schuurman and Edmund Sharron are three among many responding to the greatest threat of our time, climate change. Though Marsh could not have anticipated the mechanisms and scale, he would have discerned its root causes.

#### Our time in history

In our decimal accounting of time, we take centennials and sesquicentennials as opportunities to reflect on the past and consider the future. It has been just over 150 years since George Perkins Marsh's *Man and Nature* was published. This is also the 150th anniversary of Frederick Law Olmsted's landmark report on Yosemite, which declared the establishment of parks and reservations as a duty of republican government. And, of course, we will soon mark 100 years since the National Park Service was formed under director Stephen Mather. Marsh turned the conception of our relationship with nature on its head. Olmsted championed park-making and a profession of landscape architecture. Mather melded an ad hoc collection of parks into a system, albeit an inchoate one. All were bold in their visions. They not only broke new ground, they reset the playing field. In today's parlance, they were game changers.

What can we learn from these origin stories? How can our generation spark a new age of environmentalism?

As Lowenthal points out, discussing the impacts of Marsh's first edition in 1864 and the second in 1874, "Radically changed was not this 1874 revision, however, but how somberly Americans were by then reassessing their environmental prospects." In short, a fundamental shift had occurred in that decade. Are we fully alert to major shifts in thinking that are occurring, or need to occur to meet modern challenges? How do we turn threat into opportunity? Again, Lowenthal: "Central to Marsh's alarms and reform agendas was his view that ecological and societal problems and solutions were entwined and must be tackled in tandem." Have we bridged the nature/culture divide? Can we assure that conservation is not something that is set apart but centrally relevant to modern life? Do we fully affirm that [hu-]Man and Nature are one?

#### Purpose

This theme issue has been produced with the assistance of Marsh-Billings-Rockefeller National Park and under the auspices of the National Park Service Stewardship Institute. We are grateful to each of two publications, *Forest History Today* and *Northern Woodlands*, for permission to reprint an article for this issue; to the Billings Farm & Museum/Woodstock Foundation for assistance with photographs; and to the Woodstock Historical Society for the historical photos used on the cover and in several of the articles.

Our purpose in compiling this theme issue is not unlike that of Marsh himself, as expressed in his preface:

...[in writing *Man and Nature*] I address myself not to professed physicists, but to the general intelligence of educated, observing, and thinking men; and that my purpose is rather to make practical suggestions than to indulge in theoretical speculations.... In these pages, as in all I have ever written or propose to write, it is my aim to stimulate, not to satisfy, curiosity, and it is not my part to save my readers the labor of observation or of thought.

Brent A. Mitchell, NPS Stewardship Institute (partner) and Quebec-Labrador Foundation, Atlantic Center for the Environment, 55 South Main Street, Ipswich, MA 01951 USA; brentmitchell@qlf.org

### Marsh's Man and Nature at 150

#### David Lowenthal

RIGHTLY TERMED "THE FOUNTAINHEAD OF THE CONSERVATION MOVEMENT,"<sup>1</sup> Man and Nature was arguably the most influential work of its time. It was the first book to recognize the environmental perils of human agency, the first to assess the damage done, and the first to set forth a program of reform. Darwin's On the Origin of Species transformed notions of natural change; Marx's Kapital shown new light on economic and social change; Marsh's Man and Nature exposed their profound and menacing interactions. Before Marsh, human impacts were largely thought benign improvements in line with God's command to subdue the Earth and make it fruitful. Marsh praised the benefits, but deplored their adverse side effects, some intended and deliberate, others heedless and unsought, most increasingly damaging as technology magnified human impacts.

*Man and Nature* changed minds by marshalling a huge range of historical and scientific evidence, and its apocalyptic immediacy spurred worldwide reform. "Man has too long forgotten that the world was given to him for usufruct alone, not for consumption, still less for profligate waste," thundered Marsh. For our own and for posterity's sake we must mend our prodigal ways, "thus fulfilling the command of religion and of practical wisdom, to use this world as not abusing it" [1 Corinthians 7.31]. He summarized the impact of two millennia of misuse in the Old World:

[In] parts of Asia Minor, of Northern Africa, of Greece, and even of Alpine Europe, causes set in action by man have brought the face of the earth to a desolation almost as complete as that of the moon. The earth is fast becoming an unfit home for its noblest inhabitant, and another era of equal human crime and human improvidence would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even extinction of the species.<sup>2</sup>

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And ongoing resource rapine in the New World, American and antipodean alike, more than mirrored Old World follies.

In country after country—the United States, Italy, France, Switzerland, India, New Zealand, South Africa—leaders inspired by *Man and Nature* legislated to protect natural resources. Deforestation, soil erosion, flooding, and desertification were the following century's conservation reform targets. New and more daunting threats later emerged: chemical and nuclear contamination, species and ecosystem extinction, global warming. And as humanity's destructions intensified, *Man and Nature*'s message became ever more relevant.

At first glance, Marsh (1801–1882) seems an unlikely conservation pioneer. He was a Vermont-born lawyer and legislator, a long-serving, gifted diplomat, esteemed as a philologist, historian, and littérateur. During three terms in Congress, Marsh helped shape the nascent Smithsonian Institution. As the American envoy to the Ottoman Empire in the 1850s, he got the United States to import camels to the arid Southwest as hardy beasts of burden. As ambassador for a record-breaking 21-plus years to newly unified Italy, he championed its political and religious freedom. Adept in 20 languages, he produced the first Icelandic grammar in English and inaugurated Scandinavian scholarship in America. Lecturing at Columbia in New York, he published two classic texts on English language and literature. He regretfully turned down a history professorship at Harvard. He bred sheep, ran a woolen mill, chartered a bank, quarried marble, crafted surveying tools, redesigned the Washington Monument, was America's foremost authority on and collector of prints and engravings. He spearheaded New World archaeological salvage, international boundary conventions, deaf-mute teaching, and women's' rights.

Hailed today as "the last individually omniscient person in environmental matters,"<sup>3</sup> Marsh termed himself a mere dabbler in natural history. Insisting that *Man and Nature* "makes no scientific pretensions and will have no value for scientific men," he sought to interest "people who are willing to look upon nature with unlearned eyes."<sup>4</sup> He traced his own nature tutelage to his Vermont childhood "on the edge of an interminable forest" then being logged for timber, fuel, potash, and sheep pasture.<sup>5</sup> Marsh recalled "sitting on a little stool between my father's knees" at the age of four or five, jolting along ridge-top roads in a two-wheeled chaise:

To my mind the whole earth lay spread out before me. [Father] called my attention to the general configuration of the surface; pointed out the direction of the different ranges of hills; told me how the water gathered on them and ran down their sides. What struck me, perhaps, most of all—he stopped his horse on the top of a steep hill, bade me notice how the water there flowed in different directions, and told me that such a point was called a *water-shed*. I never forgot that word, nor any part of my father's talk that day.<sup>6</sup>

Marsh's watershed memory was rekindled seventy years later, when he arbitrated a boundary conflict between Italy and Switzerland north of Milan, riding on mule-back over an Alpine mountain pass in a driving downpour. The records of local administrative and land ownership history reluctantly compelled Marsh to award the disputed area to Italy. As he stressed in his written decision, Swiss possession would have been far preferable: it would have unified control of the currently fragmented Cravairola watershed ("watershed" now denoting not a ridgetop separating drainage areas, but the whole gathering ground of a river system).<sup>7</sup> For the contested area lay within a branch valley of the Swiss Val Maggia, long devastated by torrential erosion aggravated by deforestation, log flotation, and sluice-building for timber transport. "The steeply inclined soil, some 2500 acres, including the [Swiss] village of Campo, began to slide downwards in a body," wrecking and damaging houses, reported Marsh in a subsequent edition of Man and Nature. The soil was now "so insecure that meadow and pasture grounds, which, if safe, would be worth a hundred dollars per acre, cannot now be sold for ten."8 Marsh deeply regretted being denied an outcome that would have enhanced land management, promoted conservation, and benefited both claimants. The watershed was physically Swiss; it ought to be politically Swiss.<sup>9</sup> Although bizarrely chided by a later Italian jurist for his "Freudian" fixation on watersheds, Marsh's summary of watershed boundary desiderata is commonly relied on in international law today for the environmental benefits he cited.<sup>10</sup>

For all its ultimate fame, *Man and Nature* was not at first widely appreciated. So little did Marsh fancy its prospects that he donated his copyright to a Civil War charity; friends and supporters bought it back as the first printing quickly sold out. Even so, only the appearance ten years later of a second edition, renamed *The Earth as Modified by Human Action*, made it highly influential.<sup>11</sup>

Radically changed was not this 1874 revision, however, but how somberly Americans were by then reassessing their environmental prospects. "Marsh's work is not a new one," wrote a reviewer, but "it comes almost as new, to the American public."

Twelve years ago, the matters Marsh treats were only of curious interest to us. Our woods: Were they not exhaustless? Irrigation: What need had we to bring lands under cultivation by artificial and expensive agencies, when the unsurveyed public domain amounted to fifteen hundred million acres, assumed to be all of the same exuberant fertility with the prairies of Illinois and Iowa? We have been brought very sharply to realizing our natural limitations. 'The axe of the pioneer' has ceased to be the emblem of our civilization. We have seen the rapid extension of railways stripping the eastern half of the continent of its tree-covering, at a rate which threatens vast mischief to the nation. But sharper still has been the experience of the last twelve years in the settlement of that mighty West, toward which the star of empire was believed to be moving. We have seen population labor painfully up the incline from the Missouri westward. And we have learned, with dismay, that the unoccupied public domain is very far from being of the same high quality as the Genesee valley or [Ohio], Illinois, and [Iowa]. Stories of barren plains hundreds of miles in extent, of lava-overflows, sterile and forbidding, of regions swept by tornadoes, and devastated by winter torrents, of tracts in which naught but sagebrush or chaparral grows, and where nature is wilder than the Scottish Highlands-have now become familiar. We no longer look to 'the West' as an exhaustless resource. Already the available lands remaining are computed by millions of acres, not hundreds of millions. Already we attribute most unwelcome changes of temperature and humidity to our reckless disturbance of the equilibrium of nature. Thus aroused by the necessity of husbanding resources, and of protecting their heritage from abuse and waste, a treatise so learned and popular as this can not fail to command wide attention.<sup>12</sup>

Another transformative factor was public awareness of the West's awe-inspiring scenery, whose splendors launched the bellwether of the national parks system at Yellowstone in 1872, foreshadowed by Yosemite as a state reservation in 1864. Famed by the passionate advocacy of John Muir, these seemingly pristine landscapes reversed American perceptions of wilderness, from loathsome impediment against glorious progress to sacred sanctuary against crass despoliation.

Two contrasting depictions of American landscape exemplify the reversal of wilderness taste. In 1837, America's most popular historian, George Bancroft, compared the howling wilderness of the Hudson River Valley before European settlement with the cultivated scene of his own day. In 1607, Henry Hudson had seen "vegetable life and death mingled hideously together."

The horrors of corruption frowned on the fruitless fertility of uncultivated nature. Reptiles sported in the stagnant pools, or crawled over mouldering trees; decaying vegetation fed seeds of pestilence. [But now, in 1837,] the earth glows with civilization; the banks of the streams are enamelled with the richest grasses; woodlands and cultivated fields are harmoniously blended. The thorn has given way to the rosebush; the cultivated vine clambers where serpents used to nestle; while industry smiles at the changes she has wrought, and inhales the bland air which now has health on its wings. And man is still in harmony with nature, which he has subdued, cultivated, and adorned.<sup>13</sup>

To Bancroft, deforestation, the railroad, mining, and commerce spelled aesthetic progress and spiritual regeneration.

Seventy years later, the novelist John Fox's bestseller *Trail of the Lonesome Pine* drew the opposite conclusion. By then Bancroft's symbols of triumphant conquest had become emblems of horrendous desecration. The logger's ax and the hewn stump no longer signified civilized progress; they now bespoke the sullying of virgin nature. Despoiled by soulless loggers, Cumberland Gap's once crystal-clear stream was laden with sawdust and "black as soot." The novel's protagonist, a mining engineer turned nature lover, vows to restore Lonesome Cove:

'I'll tear down those mining shacks, ... stock the river with bass again. And I'll plant young poplars to cover the sight of every bit of uptorn earth. I'll bury every bottle and tin can in the Cove. I'll take away every sign of civilization.'

'And leave old Mother Nature to cover up the scars,' says his fiancée, June.

'So that Lonesome Cove will be just as it was.' 'Just as it was in the beginning,' echoes June. 'And shall be to the end.'<sup>14</sup>

Biblically ordained restoration redeems all: corporate greed vanquished, industrial poisons excised, nature left to heal herself, Edenic plenitude in eternal tranquility. In this new climate of romantic primitivism, part Thoreau, part Muir, Marsh's pragmatic concerns were relegated to a humdrum realm of utilitarian practicality—"wise use."

Man and Nature's subsequent influence exemplifies our fluctuating crisis-driven conservation needs. Influential among fin-de-siècle foresters fearful of looming timber shortages, it regained prominence among soil conservationists in the dust-bowl 1930s. It resurfaced



Portrait photo of Marsh, 1861, by Matthew Brady. Brady-Handy Photograph Collection, Library of Congress.

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again in the 1960s with Rachel Carson's pesticide pollution texts, the catastrophic oil spill off the coast of Santa Barbara, and the polluted Cuyahoga River burning its way down to Lake Erie. The symposium *Man's Role in Changing the Face of the Earth* (1955) and my 1965 reissue of *Man and Nature* made Marsh available to the Earth Day movement and the environmental reformers of the 1970s. Climate change and its perils today again foreground Marsh's insights.<sup>15</sup>

Central to Marsh's alarms and reform agendas was his view that ecological and societal problems and solutions were entwined and must be tackled in tandem. Here I discuss the salience of both for today's world.

Marsh's understanding of ecology, before the word itself was even known, was remarkably comprehensive. He realized that all organic and inorganic nature continually interacted. He stressed processual duration, noting that minute and seemingly insignificant changes, wrought by obscure infinitesimal creatures over many millennia, had laid down geological strata thousands of feet thick over vast areas. We ought not assume "a force to be insignificant because its measure is unknown, or even because no physical effect can now be traced to it."<sup>16</sup> He recognized that the complexity of natural processes, operating at diverse paces of change, made it impossible to predict the outcome even of familiar commonplace phenomena.

Most importantly, Marsh explained why human impacts differed both in kind and intensity from all other living beings. Unlike other creatures, human foresight and agency aimed at often temporally remote and tangential purposes: "the backwoodsman and the beaver alike

Villa Arrivabene, George Perkins Marsh's residence in Florence, as it appears today. © 2015 Brent A. Mitchell.



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fell trees," the beaver to eat their bark and build his den, the man to plant an olive grove for his descendants.<sup>17</sup> And exponentially mounting technological might multiplied human impacts at hitherto unimaginable scale and speed.

A critical outcome of human agency was its disruptive impact on nature. Other organic and inorganic processes were in large measure either cyclical or repetitive and, earthquakes and volcanic eruptions aside, generally slow-paced, reverting to more or less stable conditions. By contrast, human impacts were long-lasting and often irreversibly transformative. Marsh instanced species extinction; soil exhaustion and erosion; the damming of water courses; the transfer of flora and fauna, diets and diseases, between the Old World and the New; revolutionary changes in Mediterranean oceanography wrought by the Suez canal. Moreover, industrial mankind's population growth displaced other species and converted largely wild and untenanted areas into intensively used and urbanized spaces.

Not only were such changes massive and rapid, their outcomes were ever harder to gauge, their unforeseen consequences jeopardizing both nature and humanity. This made active stewardship all the more essential. Once transformed by human action, a locale required continual oversight. "In lands laid waste by human improvidence or malice, [man must] become a co-worker with nature in the reconstruction of the damaged fabric."<sup>18</sup>

To be a co-worker called for more than professional expertise. It demanded an informed citizenry who valued resource stewardship as both a personal and a collective good. Such citizens should be broadly skilled amatenurs like those of Marsh's native and climatically demanding Vermont. The Green Mountain State's largely rural inhabitants were of necessity omnicompetent pragmatists, alike self-reliant and cooperative. "Encyclopedic training" was needed by all, because "every man is a dabbler in every knowledge. Every man is a divine, a statesman, a physician, and a lawyer to himself."<sup>19</sup>

Alongside familiarity with nature and neighborly commitment, Marsh's co-workers should ideally share attachments formed by long-term residence. He deplored "the restless love of change, which makes us [Americans] almost a nomad rather than a sedentary people."

Incessant flitting is unfavorable for permanent improvements. It requires a very generous spirit in a landholder to plant a wood on a farm he expects to sell. But having begun a plantation would attach the proprietor more strongly to the soil, and have a greater value in the eyes of a succeeding generation, if thus improved and beautified, [serving as] a moral check against a too frequent change of owners. [Land] remain[ing] long enough in one family to admit of gradual improvements would increase its value both to the possessor and to the state.<sup>20</sup>

Moreover, gratitude for ancestral legacies ought to generate like-minded regard for heirs. Land stewardship, like Edmund Burke's institutional partnership between the living, the dead, and those yet to be born, had to be a multigenerational effort.<sup>21</sup> Listing the environmental "duties this age owes to those that are to come after it," Marsh termed Americans especially beholden for the "toils and sacrifices of [our] immediate predecessors. We can repay our debt to our noble forefathers only by a like magnanimity, a like self-forgetting care for our own posterity."<sup>22</sup>

Those who worked the land should share equitably in both the benefits and the burdens of the resources they harvested and husbanded. Conservation was unworkable in a society marked by gross extremes of wealth and poverty: all alike must be stakeholders in woods and fields, soils and waters. Marsh's harshest critiques were leveled at malefactors of great wealth, whose rapacious greed for private gain against the public good was gutting the nation's natural resources even before the Civil War.

Companies have no souls; their managers no consciences. More than one American state is literally governed by unprincipled corporations, which not only defy the legislative power, but corrupt the administration of justice. Corporations become most dangerous enemies to rational liberty, to the moral interests of the commonwealth, to the purity of legislation and of judicial action, and to sacred private rights. The [lack] of all higher than pecuniary obligations is [due] more to banks and manufacturing and railway companies than to any other cause of demoralization.<sup>23</sup>

Marsh termed it the duty of government to steward the public interest against corporate avarice. "The popular apprehension of being over-governed, and more emphatically the fear of being over-taxed, has [led to] the general abandonment of certain governmental duties," notably transport, communications, and banking. "No doubt these institutions by government are liable to great abuse. But the corruption thus engendered, foul as it is, does not strike so deep as the rottenness of private corporations." Greedy plutocrats were savaged on the same page of *Man and Nature* as short-sighted wastrels who were "breaking up the floor and wainscotings and doors and window frames of our dwelling, for fuel to warm our bodies and to see the our pottage." Economic avarice and environmental waste were alike immoral and calamitous.

Yet Americans went on valuing land mainly as commodity, if not solely in terms of monetary profit. Distressed by the tawdry 1920s workaday scene, the legal scholar Austin Tappan Wright envisioned an alternative utopian "Islandia" that fused occupancy and utility with beauty and ethics. On an Islandian farm, Wright's American visitor is stunned by its "suave serene beauty in the massing of a grove, a house, a field. Nowhere in the whole farm was there a place without charm." Discussing whether to cut down some birch trees,

what interested the [owners] was the effect upon a certain view, rather than the value of the wood. They looked upon their whole farm as a great living canvas, to which they as artists made only little changes from time to time; for the larger picture was painted mostly by nature and by generations before them. No farmer merely farms but is an artist in landscape architecture as well.

They considered not only where crops grew best, but "how the field will look when they first come up through the earth, and when they are full grown, and when they are dead and when they are stubble. The art was neither agriculture nor architecture but a combination of both."<sup>24</sup> Wright's *Islandia* became a cult classic for ruralist visionaries from Aldo Leopold to Louis Bromfield, Scott Nearing, and Carl Sandburg.
Marsh would have applauded Wright's aim and imagery, if not his starry-eyed unworldliness. But the largely rural America that Marsh had inhabited and that Wright fantasized in memory is now irretrievably gone. Ever fewer of us dwell even on land that we farm, and are ever less likely to be its owners. The landscapes we mainly love are precisely the wildernesses where no one, or hardly anyone, lives at all, and to which we come not as natives but aliens. So desirable is such wilderness that since the passage of the Wilderness Act in 1964 we have restored ever more of it, turning terrain formerly farmed or grazed back to the untrammeled nature it has not been for centuries or, given Native American presence, even for millennia.

Attachment to wilderness has many virtues: it refreshes body and soul; it reminds us of a living plenitude whose loss we regret; it offers lessons in fortitude and self-reliance. But these benefits are necessarily scarce. Wilderness visits cannot be many or frequent; were they common the wilderness would be loved to death. Nor does the rare wilderness experience compensate for our neglect of, if not contempt for, the pervasive landscapes we fashion for lucre and shelter, traffic and transport. These are where we perforce pass much of our lives: on the freeway and in the mall, alongside the detritus of industry and extraction, in the urban jungle. So indifferent, if not obnoxious, had the everyday American scene come to seem by the mid-20th century that the interstate highway system was famously built to let people drive from coast to coast without seeing any of it.<sup>25</sup>

To achieve Marsh's and Wright's ecological and social visions, affection for our national parks and wildernesses must expand to embrace the everyday places we would better cherish were they made—and hence felt to be—worth cherishing. To prize only the rare and the remote is an unhappy legacy of the Book of Genesis, which saw the earthly paradise as the Garden of Eden. From Eden humanity was exiled into the desolate wilderness that was all the rest of the world. As Eden itself was inaccessible, substitutes were sought in delectable gardens for the sacred and the select. It is time to give up these exclusive Edens, along with the Rubaiyat myth that "wilderness is paradise enow."<sup>26</sup> To deify the isolated wilderness sojourn denigrates the everyday realms that ought to enrich and enliven our quotidian lives. As social beings we should reclaim our inherited landscape from humdrum neglect, and rejuvenate the ravaged world as a global garden.

[Ed. note: Watch for a video of David Lowenthal discussing George Perkins Marsh and *Man and Nature* at Marsh-Billings-Rockefeller National Historical Park on http://nps.gov/mabi.]

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### Marsh and Mayors: With David Lowenthal in Italy

#### Rolf Diamant

ABOUT 15 YEARS AGO, Nora Mitchell, then the director of the National Park Service's Conservation Study Institute, was teaching at the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) in Rome when she received an invitation to lunch at the American Embassy with the deputy chief of mission and the minister of the Council for Economic Affairs. The embassy officials had recently heard about the newly established Marsh-Billings-Rockefeller National Historical Park, where Mitchell's organization was based and where I was superintendent, and wanted to learn more about park and institute programs.

The new national park and the imposing US embassy on the Via Veneto share an important connection—the great conservationist George Perkins Marsh. The park interprets the life and work of Marsh, known around the world for his landmark 1864 publication *Man and Nature*. The book was written while Marsh was in Italy, after being appointed by President Abraham Lincoln in 1861 as the first ambassador to that emergent republic. Marsh would remain in Italy as ambassador until he died in 1882, a remarkable 21-year tenure serving six consecutive US presidents.

Upon learning from Mitchell that the preeminent geographer, historian, and Marsh scholar, David Lowenthal, was releasing a revised edition of his standard biography,<sup>1</sup> the embassy proposed a book/lecture tour in Italy for him. Lowenthal would speak on the legacy of Marsh and the relevance of his vision of stewardship to contemporary Italy at a series of roundtable discussions with invited historians, conservationists, and public officials. Mitchell and I, as institute director and park superintendent, respectively, were asked to join Lowenthal to describe the emerging role of our new national park and institute, and help lay the groundwork for a US State Department exchange program between the US National Park Service and Italian protected area professionals, established in honor of Marsh.

Our lecture tour took us to various cities; however, our visit to Naples was particularly memorable. We arrived to find the meeting room at the US Consulate filled with representatives from national parks and other protected areas, local mayors and regional government

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officials, foundations, nongovernmental organizations, and universities. After lunch and introductions we gathered around a large table where Lowenthal, in his customary fashion, began the program recounting Marsh's impact on the nascent 19th-century Italian conservation movement and the creation of the Italian republic.

In his introduction to *Man and Nature*, Lowenthal has written: "As amateur citizens, all of us need to care enough for our environment to become capable of shaping and ready to promote the reforms essential to its sustenance."<sup>2</sup> In Naples, Lowenthal elaborated on Marsh's belief in the crucial role of the citizen environmentalist in a democratic society. Marsh did not trust leaving key decisions in the hands of experts only. Rather, he believed that every citizen in a democracy had to be knowledgeable enough about the issues of the day to participate in the decision-making process and not become over-reliant on specialists.<sup>3</sup>

In his foreword to John Elder's *Pilgrimage To Vallombrosa: From Vermont to Italy in the Footsteps of George Perkins Marsh*, Lowenthal had also written, "History like ecology humbles Earth's stewards.... Conservation is the crux of Marsh's partnership between the living, the dead, and those who are to be born. It is the duty we owe our descendants on behalf of our ancestors."<sup>4</sup> That afternoon Lowenthal described Ambassador Marsh's belief in progress, his faith in reform, and how conservation is inherently inseparable from heritage.

Attendees at previous tour venues would usually at this point in the program join in with questions and observations. But the Naples participants still wanted to hear more. So he continued, pointing out that many of the numerous obstacles to conservation in Marsh's day still exist in today's world, and are not unique to Italy—we encounter them on both sides of the Atlantic. "Immediate urgent crises, restless mobility, faceless corporate irresponsibility, the fraying of community ties, the democratic process itself," Lowenthal wrote in his biography of Marsh, "all impose a tyranny of the present that threatens to throttle stewardship."<sup>5</sup> In an article that he would write some years later for the National Park Service's *CRM Journal*, he would warn "that resource stewardship of nature and culture and of both together cannot be only an occasional, one-off activity; it must be embedded in everyday behavior towards land … [and] the places we live in as well as those we visit and dream about." Marsh, he said,

had long ago recognized "widespread popular support is essential to sustain heritage stewardship over the long term."<sup>6</sup>

Lowenthal concluded his remarks that afternoon in Naples with the observation that Marsh was also a realist and cer-

Roundtable discussion in Naples. Photo courtesy of the author.



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tainly understood the obstacles "amateur citizens" would face in trying to be good stewards of the land and heritage. Those barriers could only be surmounted by a well-grounded sense of place and of heritage, and a growing sense of local, regional, and national obligation.

As he put his notes down, the group appeared to take a collective breath and then the room exploded with everyone talking at once. The conversation at first centered on the lack of respect for public lands in the region around Naples and an unchecked epidemic of "ecocrime." Most egregious, in the opinion of many in the room, was the illegal tipping or dumping of hazardous industrial wastes on public lands, including national parks and protected areas, most of it facilitated by organized criminal gangs. One person after another lamented that too many people in Italy view this kind of environmental crime as only a crime against the state rather than a crime against all humanity and all living creatures. This situation is further exacerbated by the weakness of Italy's central government and its environmental statutes. In response, environmental organizations initiated thousands of civil actions against illegal dumping.

Everyone in the room agreed, however, that what was really needed was a fundamental shift in public thinking and behavior. Local officials spoke about steps they were taking to strengthen the credibility and accountability of regional and central governments. They were also working to broaden public engagement and participation in civic institutions, and to establish confidence in the basic rule of law—all elements essential for a functional modern democracy. This is why Lowenthal's remarks about inclusiveness, civic behavior, and stewardship had resonated so powerfully that afternoon.

As Lowenthal, Mitchell, and I watched this dialogue unfold it became clearer that this was no ordinary book tour. Our tour had served a larger agenda as a catalyst for dialogue on the pressing environmental issues facing Italy at that moment in time. The tour organizers understood well William Faulkner's maxim that "The past is not dead. It's not even past." In the same spirit as Ambassador Marsh's mission to encourage Italy's *risorgimento* and the new nation-state that was then taking shape, in a small way, Lowenthal's book tour, 135 years later, was also aimed at strengthening Italy's democratic governance and civic institutions.

My other epiphany was all about David Lowenthal. Like a skilled musician, with near-perfect pitch and timing, I had seen him deftly transition a lecture on George Perkins Marsh to a larger conversation about civic environmentalism and contemporary stewardship—a performance I will not forget.

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# Bushwhacking to the Source: The Most Influential Nature Book You've Never Read

#### John Elder

MAN AND NATURE, PUBLISHED BY GEORGE PERKINS MARSH IN 1864, has long been acknowledged as a monument of environmental literature. In 1931 Lewis Mumford memorably called it "the fountainhead of the environmental movement," while in 2003 William Cronon stated that it "stands right next to *Silent Spring* and *A Sand County Almanac* by any measure of significance." But it also appears to be the case, as Editor Dave Mance remarked after a recent *Northern Woodlands* conference, that many more people acknowledge Marsh's importance than have managed to finish reading his book.

The book's difficulties are easy enough to identify. It's a densely argued tome of 465 pages and 656 footnotes, synthesizing historical and scientific references from numerous languages into a daunting account of ecological destruction and a stern call for social and economic reform. It is not, and never has been, light reading. Furthermore, as Marsh's biographer and editor David Lowenthal writes, "*Man and Nature* is a stylistic mélange, at once pedantic and lively, solemn and witty, turgid and incisive, objective and impassioned. A casual glance may discourage: one sees long sentences, interminable paragraphs, Latinate words, circumlocutory phrases, thickets of commas." Marsh's exposition is rarely elevated by the lyrical language or propelled by the narrative structure that make those other environmental classics by Rachel Carson and Aldo Leopold so engaging.

Not surprisingly, the passage of a century and a half makes certain aspects of *Man and Nature* feel dated. The title itself puts some readers off, and many of Marsh's references in the text and in footnotes are to scientists, controversies, and political figures that, while prominent in their own day, are now generally forgotten. The topical and contemporary texture that made his arguments so compelling to readers in his own day—inspiring the founding of national parks and national forests in the United States and around the world—can make perus-

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ing certain sections of his book today feel like turning the pages of yellowing newspapers. For historical or literary scholars such an archival experience can, of course, be intriguing, but that's not always so for other readers.

Nevertheless, there are several ways in which present-day readers may enjoy Marsh's chewy style and, in doing so, also experience the power and timeliness of his vision. I was a teacher of English and Environmental Studies for 37 years at Middlebury College. And it sometimes happened, in a class including readings from Basho, Wordsworth, or Oliver, for example, that a student would come up after the first or second meeting to confide that he or she just didn't like reading poems. My response was always "Not yet!" Poetry, like classical music or jazz (or wine or coffee, for that matter) will for some need to be a cultivated taste. Attributes or flavors that initially seem strange or off-putting gradually become prized through their association with other, more appealing, elements. In the same way, a reader who spends enough time with *Man and Nature* will come to see that the robustness of its prose is essential to the power and vividness of its arguments. As Lowenthal notes, "direct and evocative passages abound. The striking metaphor, the scathing denunciation, the barbed precept, the polished rhetorical summation—in these devices Marsh excelled, and they infuse the work with life."

Here's a passage from Marsh's Chapter I, "Introductory," that is in fact a single extremely complex sentence. It exemplifies Lowenthal's reference to a "thicket of commas"! At the same time, it conveys the stern, prophetic voice that gives the book its enduring power: "The earth is fast becoming an unfit home for its noblest inhabitant, and another era of equal human crime and human improvidence, and of like duration with that through which traces of that crime and that improvidence extend, would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even extinction of the species." The starkness of this assertion is reinforced both by the lofty parallelism of Marsh's language and by the profuse details of the preceding discussion. Within the half-dozen prior pages Marsh ponders the extinction of mammals and birds by human beings, changes to the climate caused by deforestation, and instances in which "parts of Asia Minor, of Northern Africa, of Greece, and even of Alpine Europe" have become lunar desolations because of human action. The same few pages include an extraordinarily lengthy and detailed footnote comparing 19th-century wastefulness with the more balanced and sustainable lives of pre-agricultural and pre-industrial peoples.

Many passages, including the one cited just above, are most effective when read aloud (which is, of course, also true of poetry). Reading the footnotes aloud, as well, helps passages that might have appeared ponderous or slow on the page to shine with Marsh's excitement, energy, indignation, and eagerly shared examples. Once one begins to encounter his prose in this way, it becomes clear that the long sentences and many asides express not an impulse for formal and authoritative control so much as an almost ungovernable sense of urgency. He wants to share the broad, potentially restorative picture of ecological and social health to which he himself has come after arduous studies criss-crossing disciplinary, national, and linguistic boundaries. Marsh reminds me of a certain type of magisterial, old-school college lecturer—not always so good, perhaps, at give-and-take or at bearing his audience in mind, yet capable of holding forth rivetingly on a topic about which he is deeply learned and with which he is totally obsessed.

To appreciate Marsh's writing, then, one must learn to do so in part because of, rather than despite, his extravagant and crowded style. Making our way through his prose may sometimes feel like bushwhacking up an overgrown slope. Distinctive pleasures can arise from such an off-trail outing. The trees through which we struggle can suddenly open out around mysterious stone walls and cellar holes; the tangled syntax of such woods may be punctuated by glacial erratics and italicized by rusty choker chains. Details that may never have been noticed by travelers on a smoother path now thicken our sense of the surrounding forest's voice and story. After such laborious progress, we may be more ready to appreciate the immense vistas glimpsed from ledges above the tree-line.

Elm Lot, Marsh-Billings-Rockefeller National Historical Park, Woodstock, Vermont. Photo courtesy of Rolf Diamant.



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Another lesson I learned while teaching at a liberal arts college was that practically any topic benefits from being considered in historical terms. Marsh's intricate style and his undergrowth of footnotes may both be harmonized with the broader thematic, scientific, and political contours of his book within the context of his day. For this reason I'd like to propose that any reader coming to Man and Nature for the first time simultaneously plunge into Lowenthal's magnificent biography, *George Perkins Marsh: Prophet of Conservation.* Appreciative readers of the recent, acclaimed biographies of Adams, Hamilton, Jackson, and Lincoln will be equally fascinated by this account of Marsh's eventful and admirable life, in America and abroad.

One especially gripping aspect of the biography was Marsh's revulsion at the Gilded Age that followed the Civil War and the collapse of Reconstruction. Having been an ardent supporter of abolitionism and the Union, Marsh nonetheless chose to remain in Europe during the final two decades of his life because of a sense that America had become, in Lowenthal's words, "a morass of materialist greed." His objection to these developments reflects a conviction that the essential duty of a democratic government is to promote social unity and ecological health. He may have been deeply disdainful of Southern claims before the Civil War and the subsequent excesses of Gilded Age plutocrats and their tame politicians, but he was never cynical about the potential benefit of rigorous analysis and dialogue. His book is a strenuous attempt to focus civic conversation on the urgent necessity for certain changes. The parallel between the Gilded Age and the widening income disparity and unseemly political influence of tycoons now further reinforces Marsh's pertinence to a reader in our day.

In many other ways, too, Marsh's writings on environmental degradation remain as resonant as they were in 1864. A vivid example appears in a section of Chapter III, "The Woods," that is entitled "General Consequences of the Destruction of the Forest": "The face of the earth is no longer a sponge, but a dust heap, and the floods which the waters of the sky pour over it hurry swiftly along its slopes, carrying in suspension vast quantities of earthy particles which increase the abrading power and mechanical force of the current.... Gradually it becomes altogether barren ... and thus the earth is rendered no longer fit for the habitation of man." The combination of such specificity with the dire future Marsh foretells was arresting for his contemporaries. No one had made such predictions before or related them to such a wide range of observations, research, and historical evidence. They were, in the words of Wallace Stegner, "the rudest kick in the face that American initiative, optimism, and carelessness had yet received."

Marsh's jeremiads against deforestation can often be incorporated directly into today's ongoing dialogue about climate change. Unrestrained cutting at a local level and wide reliance on fossil fuels can both lead to urgent problems on a global scale. If Marsh's tendency towards heavy documentation sometimes slows down the flow of his work, it also conveys qualities of integrity and transparency that make his arguments hard to refute. In a country where partisan think tanks and corporate-funded ad campaigns willfully blur the dangers of climate change by making ungrounded assertions or simply fabricating their own facts, we could use more footnotes in our environmental dialogue. One of his most important attributes as a writer comes in such encouragement to get serious about the problems we face rather than trivializing them as merely political issues.

Mumford called the book "conservation's fountainhead" in order to claim it as an enduring *source* for environmental stewardship. Not only is Marsh a stern and exacting ancestor for those concerned about the health of our planet today, he also proposes specific, hopeful alternatives to the destructive habits he decries. In both these ways, he has contributed to an indispensable stream of thought. As Robert Frost advises his readers in "Directive," with its own account of a New England pilgrimage through challenging terrain, "Your destination and your destiny's/A brook that was the water of the house,/Cold as a spring as yet so near the source...."

While *Man and Nature* is from start to finish a trove of arresting insights and examples, one more recommendation I would offer for those coming to this masterpiece on their own would be to concentrate initially on just two of Marsh's six chapters—Chapters I, "Introductory," and III, "The Woods." In addition to containing some of Marsh's sharpest denunciations of deforestation, they return again and again to the possibility of ecological and cultural renewal. What people have damaged they may also, acting together and guided by science, begin to repair. As he says in Chapter I, "In reclaiming and reoccupying lands laid waste by human improvidence or malice … the task … is to become a co-worker with nature in the reconstruction of the damaged fabric which the negligence or the wantonness of former lodgers has rendered untenantable." Just as awareness of Marsh's historical context helps align his proliferating examples with his broader concern for political reform, so too does this pairing of danger and opportunity focus and unify *Man and Nature*.

"The Woods" is the longest chapter in Marsh's book, the most fully documented, and the most central to his own life story. One reason this topic was so important to Marsh is that he was born in Woodstock, Vermont, in 1801, as an era of relentless deforestation was beginning. While growing up, he saw the slopes of nearby Mount Tom logged off, burnt, and eroded, the nearby streams clogged and their fisheries destroyed. Many years later, when he was an American diplomat in the Mediterranean (first in Turkey and then in Italy), his linguistic skills and archaeological interests led him to investigate the sites of ancient civilizations that had been destroyed as a direct result of their own deforestation. Across the millennia, he describes these episodes of ancient carelessness and waste as warnings about the ecological and cultural damage in his own day. All of his scientific documentation stems from this sense of prophetic urgency: unless governmental policies and economic practices are changed, collapse will surely follow.

Just as Marsh's condemnation of "depravation," "barbarism," and "extinction" in his own era's practices resounds through "The Woods," this chapter also contains an equally powerful prescription for how they might change: "We have now felled forest enough everywhere, in many districts far too much. Let us restore this one element of material life to its normal proportions, and devise means for maintaining the permanence of its relations to the fields, the meadows, and the pastures, to the rain and the dews of heaven, to the springs and rivulets with which it waters the earth." How might we find the strength of mind and steadiness of action to undertake such a change? Marsh believed that for Americans of his own day one key was to cultivate a less restless relation to the landscape. As he states in the same section of "The Woods" from which the previous quotation came, "The face of physical nature in the United States shares this incessant fluctuation, and the landscape is as variable as the habits of the population. It is time for some abatement in the restless love of change which characterizes us...." Settling down could foster a greater capacity for attention to the natural world and a deeper affiliation with our surroundings.

Such an emphasis circles back to the concreteness and particularity of Marsh's style. Little things in nature count and are easier to register if we can curtail our incessant mobility. Within this context, Marsh's book can be seen as an act of gathering. Through the attentiveness it exemplifies, we may be able to escape from ignorant destruction based in the oblivious selfishness of "crass materialism." Today, we are faced with cataclysmic changes deeply rooted in our hyper-mobile and consumerist society. It has thus far proven extremely difficult to make the required changes in most Americans' way of life. But both in his own analysis and in the remarkable influence he had on a world-wide conservation movement, Marsh encourages us to try harder. In reading *Man and Nature* we are not only returning to an environmental landmark. We are reminded of the virtues of humility, balance, and restraint, which will be needed as we go forward. With such a profound reorientation we could recover the source of health and meaning and, as Robert Frost writes at the end of "Directive," "Drink and be whole again, beyond confusion."

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# Conservation and Soft Diplomacy: Engagement Abroad Brings Benefits at Home

#### Brent A. Mitchell

I AM WRITING FROM FLORENCE, ITALY, having just returned from a visit to Villa Arrivabene, the home of George Perkins Marsh. Marsh served as US ambassador<sup>1</sup> to Italy for 21 years until his death in 1882. Turin was the capital when the Kingdom of Italy was unified in 1861, but four years later the capital was moved to Florence. It was here that Marsh extensively revised his first edition of *Man and Nature*, expanding it in response to unexpected popularity.

My journey to Italy is a pilgrimage of sorts, an opportunity that fell into my lap at just the right time. I had been invited to Europe on several projects just as my wife, Jessica Brown, was teaching a course in Rome for ICCROM, the International Centre for the Study of the Preservation and Restoration of Cultural Property. Much earlier, I had volunteered to edit this issue of *The George Wright Forum*, celebrating the seminal conservation work of a man who spent much of his long career as a statesman and diplomat. The visit to Italy provided an opportunity for research and also a bookend to my long partnership with the National Park Service. I have frequented Marsh's childhood home in Woodstock, Vermont, ever since it was established as a national park in 1992. The park is home to the Stewardship Institute, created by the National Park Service to enhance leadership in conservation, and in which my organization is a founding partner. I have often stood at Marsh's boyhood home, and so it was very meaningful for me to step into the building where he lived his last days, 4,000 miles away from Vermont.

#### Conservation benefits—at home and abroad

George Perkins Marsh was not the first to speak out about forest practices in the US, but he was the first on record to go beyond utilitarian concerns and make ecological connections, several years before the term *ecology* was coined in Germany. Marsh's disquiet about defor-

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Left: George Perkins Marsh seated in his library at the Villa Forini (a.k.a. Villa Arrivabene) in Florence, Italy, photographed by Schemboche, 1875. Courtesy of Billings Family Archives. Right: Villa Arrivabene today, with a photo of George Perkins Marsh in the same room when it was his residence. © 2015 Brent A. Mitchell.

estation, erosion, and destructive human land uses did not start abroad but at home. Many mark the beginning of the modern American conservation movement with his 1847 speech to the Agricultural Society of Rutland County, Vermont, long before he ever left the country.<sup>2</sup> Thus the seeds of Marsh's ideas were homegrown, but germinated on foreign soils. *Man and Nature* was compelling because Marsh catalogued centuries of land abuse around the Mediterranean, and drew a line to the then-current practices in land clearing he had been witnessing in New England.

In this, his experience is somewhat akin to Charles Darwin, his contemporary. In contrast to the popular image, Darwin did not sail to the Galapagos, look at the finches and declare, "Eureka, they have evolved!" Darwin knew about evolution before he ever boarded the *Beagle* in 1831. Even his grandfather, Erasmus Darwin, had written about evolution or, as it was called at the time, transmutation of species. What was missing was the mechanism, the process, and Darwin spent the next 28 years gathering evidence. It is the weight of evidence gathered around the world that made *On the Origin of Species* so difficult to refute. Darwin almost missed his chance to sail on the *HMS Beagle*, and I often wonder how delayed science might have been had he stayed at home.

Marsh's first boat was a sailing packet en route to Constantinople, via France. Like Darwin, he was seasick the whole voyage. He had sought an appointment in the foreign service, expecting to be posted in northern or central Europe, owing to his skills in Scandinavian and Germanic languages. Instead, he was appointed minister to the Ottoman Empire. He spent five months crossing Europe to arrive in the Ottoman capital. Already in financial trouble from investments at home, he hoped his fortunes would improve abroad. But rents at his new post were exorbitant, and thus, partly to save money, he spent many months traveling throughout the empire, which then stretched from Tunis, across Egypt, most of the Middle East, all of present-day Turkey, and the Balkan peninsula of Europe (except Greece and Montenegro).

#### Power of place

One could argue that it is no longer necessary to travel, as Marsh did, to engage internationally. Technology makes it easier than ever before to communicate with and understand the wider world. Video allows us to travel virtually, even in real time. With the click of a button we can share everything from scholarly work and case studies to quick questions and quicker opinions.

But there is also great power in being in a place, to seeing landscapes with one's own eyes, to talking directly with those most familiar with issues. And understanding deepens with time in a place and its society.

One should not visit Florence without seeing Michelangelo's statue of David. The sight is powerful. We have all seen many images of the statue, from fairly accurate photos, to countless replicas. But only in seeing the real thing could I appreciate it— absolute perfection, fashioned out of solid stone. As the great art biographer Vasari described it, "After seeing this no one need wish to look at any other sculpture or the work of any other artist."<sup>3</sup> We spent a long time with the *David* and, after a time, began to observe other people in the room. The Galleria dell'Accademia was crowded, as expected, even in late October. A few people were taking long looks at the statue, clearly in awe. But the attention of most was not on the marble but on their mobile device, being photographed in front of the masterpiece, either by others

Four-hundred-year-old fresco from Villa Arrivabene showing a "skirmish" between Christian and Turkish forces along the Danube. © 2015 Brent A. Mitchell.



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or by their own hand. After they had put themselves in the picture, or otherwise bagged the trophy, they moved on.

Of course, people were unobservant long before selfie sticks. Even in Marsh's time: "We live in a day of expedients, of short-hand processes and labor-saving contrivances."<sup>4</sup> Keen observation was perhaps Marsh's greatest talent, and one he valued highly in himself and others. "Sight is a faculty, seeing is an art. To the natural philosopher, the descriptive poet, the painter, the sculptor, and indeed every earnest observer, the power most important to cultivate, and at the same time hardest to acquire, is that of seeing what is before him."

Marsh distilled insights from copious reading, observation, and discourse. As Lowenthal states, Marsh had "remarkable talent in fusing myriad aspects of landscape into descriptive unity—a talent rare among those trained in narrow specialties, that would become rarer still as what was called natural history gave way to increasingly narrow disciplines."<sup>5</sup> What Marsh achieved required talent, but also time. Obviously, Marsh's travel speeds were limited to the transportation of his day, but he was also further slowed by illness, sometimes his own but often of his family's; and this offered more time for observation and contemplation.

We shall not cease from exploration, and the end of all our exploring will be to arrive where we started and know the place for the first time.

— T. S. Eliot

#### Value to soft diplomacy

Back in Villa Arrivabene, Marsh's home in Florence, I immediately recognize from a photograph the room that once served as his salon. (That photograph now hangs above the fireplace in the very room it depicts.) The villa, restored in the 1980s, is now a municipal office for District 2, called *Campo di Marte*, and the former salon is now equipped as a conference room. Though all of Marsh's books which lined the room are gone (Frederick Billings purchased Marsh's library and repatriated the books as a gift to the University of Vermont), the original 17th-century frescos depicting military scenes still line the upper walls. The 13th-century building had been transformed into a "palazzo" in 1615 by the Bourbon del Monte family, who had had a long military history connected to the Florentine Republic and Medici family. Thus, the US ambassador was surrounded by reminders of Machiavellian times. (*The Prince* was published in 1513.) The many scenes depicting battles and naval warfare against the Turks might have particularly interested Marsh, given his service as minister to the Ottoman Empire from 1849 to 1853.

Marsh's library "is described as containing twelve thousand volumes, some miscellaneous and modern, 'many rare, valuable, ancient, and curious.'"<sup>6</sup> It seems an odd counterpoint to have images of war decorating the library of a consummate bibliophile (Marsh's reading habits led to temporary blindness as a child). However, Marsh was not a dove. A fervent republican and unionist, he advocated for military action against the forces of rebellion and slave aristocracy in the Civil War; on a few occasions he counseled a show of force abroad; and he himself traveled to many of his assignments on warships. But as the longest-serving chief of mission in US history, Marsh was practiced in all kinds of diplomacy. Marsh did all the things an ambassador does: represented American interests with foreign governments, defended individual Americans abroad, assessed political situations in reports to Washington, arbitrated and adjudicated disputes, entertained visiting dignitaries. But he also engaged in "softer" forms of diplomacy, providing suggestions and materials that were not directly related to his mandate as the president's man in Rome or Constantinople. Given his strong interest in forestry, he regularly consulted on the topic. In a practice we would no longer condone, he gave seeds and plantings of American species for introduction abroad. He maintained regular correspondence with diplomats of and in other countries on questions of philology and linguistics, and collected many specimens for the new Smithsonian Institution, of which he had been a regent. All of these activities contributed to mutual understanding between the US and the countries where he served.

Soft diplomacy continues to this day. The book tour/conservation dialogue described elsewhere in this publication, hosted by the US delegation in Italy, is a specific example. Many embassies have a cultural attaché on staff, host programs, and even support cultural centers. The US Bureau of Educational and Cultural Affairs promotes mutual understanding by sending Americans to conduct research abroad, and *vice versa*, through Fulbright scholarships and other programs. Over 200,000 Americans have served their country [*sic*] through the Peace Corps over the past 50 years. My own five-year Peace Corps experience gave me insights and skills that have proved invaluable throughout my career.

Marsh was closely connected to the Forest Institute of Vallombrosa, the only one of its kind in Italy. He died there in 1882. Below: Active forestry in Paneveggio Nature Park in the Dolomites. © 2015 Brent A. Mitchell.



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Our US conservation and land management agencies all have international programs of one kind or another, and all at different scales. The US Fish and Wildlife Service has clear authority to act internationally by virtue of a variety of species conservation acts and international conventions to which the US is a signatory. The US Forest Service is quite active internationally, and is a well-recognized partner, particularly in the Americas. The National Park Service also has a number of international programs, but lacks clear authority to cooperate internationally. None of these programs emphasize long-term, professional development, and none are sufficiently funded.

Such engagement is seen in terms of one-way US aid to other countries—a common problem in garnering budget support for our federal agencies to work internationally. The prevailing conception is that while the US may have skills and experience needed in other countries, the same resources are needed at home, therefore funding international work is a drain on US resources. "Why should we spend money in other countries, when our parks at home have a maintenance backlog?" (or variations thereof) is a common refrain.

But the story of how *Man and Nature* came to be tells us that we have as much to gain as to give in any equation of international conservation commerce. For example, as the area, number and variety of protected areas has grown exponentially around the world, various countries have devised new solutions to their conservation. Thus, the world has become a rich laboratory for protected areas innovation, for integrating conservation and development, for shared governance of resources, and for sophisticated cultural expressions of stewardship. We see community conserved areas in Africa and India, for example; privately protected areas across Latin America; restoration of indigenous management of resources around the world. The US stands to benefit from learning from these many laboratories of management practice outside our borders. As National Park Service Director Jon Jarvis has said on many occasions, "We originated the national park idea, it went around the world, and it came back different." We can learn a great deal from those differences, but to gain full advantage we have to be deeply engaged with these new takes on the national park idea. Rather like visitors viewing Michelangelo's *David*, we have to take the time needed to truly *see* what we are looking at—to use, as Marsh said, our faculty of sight as an art unto itself.

Every year we send hundreds of thousands of Americans in uniform overseas. Deployments to combat zones naturally dominate the headlines, but most service men and women are in permanent stations in more than 150 countries, or 75% of the world's nations. The scale and cost for maintaining such military presence overseas is unprecedented in the history of the world. The wisdom of our military posture is beyond the scope of this article, but it should be noted that often our armed services provide humanitarian services: disaster relief, infrastructure development and maintenance, etc. So, with so much investment in sending American men and women in uniform overseas, why shouldn't a few of those uniforms be those worn by National Park Service, Fish and Wildlife Service, and Forest Service professionals? Why shouldn't more of those services be in conservation, potentially reducing future disasters? Why do we not exploit the inherent value of conservation assistance as a profitable exchange of intellectual capital and a means to achieve our foreign policy ends?

#### Stewardship in the national interest

Over the past decades, international travel and exchange programs for federal agency conservation professionals have been regarded as extravagant and irrelevant and have been progressively cut. (This is true not only of international engagement, but also of cognate domestic activities, including even professional conferences, where the benefits to skills development and information exchange should be obvious.) More troubling, our agencies have become self-limiting, increasingly concerned about the "optics" of foreign engagement or international projects. But if we view such intercourse as a foreign policy imperative rather than a burden on domestic programs, the true value comes into sharper focus.

Furthermore, conservation as diplomacy isn't necessarily "soft." Military personnel are advising counterparts in countries all over the world. Meanwhile, the Pentagon recently reported that climate change is an "urgent and growing threat to our national security" and blames it for "increased natural disasters" that will require more American troops designated to combat it.<sup>7</sup> Why shouldn't we send experts from other areas of our government—our conservation agencies—to "combat" these threats as long-term advisors in our national interest?

One of our earliest conservation documents, Frederick Law Olmsted's Yosemite Report of 1865,<sup>8</sup> makes a comparison to national defense and high public purpose:

It is the will of the nation as embodied in the act of Congress that this scenery shall never be private property, but that like certain defensive points upon our coast it shall be held solely for public purposes.

This "will of the nation," articulated in 1864—the same year Marsh published *Man and Nature* and in the midst of civil war—has resulted in a system of national parks that not only protects but projects our best ideals. What we choose to preserve, and the stories we choose to tell, say a great deal about who we are as a nation. They are a reflection of our national identity and public memory. Some of this memory is the struggle for human rights in places like the former internment camps at Manzanar, Minidoka and Honouliuli; at Harriet Tubman Underground Railroad, Brown v. Board of Education, and Trail of Tears; and, most recently, Pullman and César E. Chávez—all now part of the national park system.

Opportunities for the National Park Service to engage abroad may be particularly wide in scope given the agency's near-unique mandate among its global counterparts in care for both natural and cultural resources. Here is just one example of an opportunity:

Angry mourners recently forced Serbian Prime Minister Aleksandar Vučić to flee commemorations in Srebenica marking the passage of 20 years since thousands of Muslim men and boys were slain there during the Bosnian war. The US National Park Service has made great strides in learning how to interpret difficult history and manage sites of conscience. What a service it would be to help the region with reconciliation through designating and developing sites of memory addressing the war and its causes. For the US, this would be both a learning exercise and an insurance payment: the US (rightly) invested heavily in the military response that ended the Balkan Wars. Effective interpretation is a cost-efficient hedge against future conflict. Final resting place of George Perkins Marsh in Rome, Italy. © 2015 Brent A. Mitchell.

#### Worlds away

Shortly before traveling to Europe I was in Rio de Janeiro, Brazil (5,000 miles from Vermont), staring at a painting in the Museum of Fine Arts. The painting showed a romantic scene of a forest and stream, not unlike the Hudson River School paintings that now hang in residence at Marsh-Billings-Rockefeller National Park. A striking difference is that the nature view in



the Brazil painting covers only half the canvass. The other reveals a scene of devastation of the Atlantic Forest, with men chopping the few remaining trees. I was struck by the title of the painting, *Vista de um mato virgem que se está reduzindo a carvão (View of a Virgin Forest Being Reduced to Charcoal)*, and especially the date, 1843. I found the painting significant for two reasons. First, it is dated four years before Marsh's first speech about forest practices in New England. (I am starting to learn about Brazilian debates on forest clearing that appear to predate similar attention in the US, but do not yet know if they offered ecological insights similar to Marsh's.)<sup>9</sup> Second, and more to the point of this essay, the painting was by Félix Émile Taunay, a Frenchman who moved to Brazil at the age of 21. Thus he had the perspective of a foreigner.

George Perkins Marsh is buried in the Non-Catholic Cemetery for Foreigners in Rome, also the final resting place of John Keats, Percy Shelley, William Wetmore Story, and many other artists and notable figures. Now near the center of modern, expanded Rome, the graveyard was outside the city walls when burials began in the early 1700s. Catholic law dictated that Protestants (mostly foreigners) be buried separately from consecrated ground, and often at night. Beyond the walls, out of sight. As talk again turns to building walls around the United States, literally and figuratively, George Perkins Marsh and his *Man and Nature* remind us—especially those of us in conservation—of the importance of direct, in-depth engagement with the wider world.

#### Endnotes

- Technically, Marsh's title was that of "Envoy Extraordinary and Minister Plenipotentiary." The US Government began to upgrade heads of diplomatic missions to "Ambassador" five years after he died.
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# The Necessity of Stewardship: George Perkins Marsh and the Nature of Conservation

#### Nora J. Mitchell and Rolf Diamant

THE FEAR THAT GEORGE PERKINS MARSH (1801–1882) FELT FOR THE FUTURE compelled him to write *Man and Nature*, which remains one of the central texts of American environmental thought. Although he believed in the application of science to problem-solving, his observations of the impact humans were having on their environment—particularly through deforestation—led him to urge immediate action while scientific inquiry proceeded. As David Lowenthal, Marsh's pre-eminent biographer, notes:

After Marsh's 1864 book, the conclusion was clear. Humans depend on soil, water, plants, and animals. But exploiting them deranges and may devastate the whole supporting fabric of nature. To forestall such damage we need to learn how nature works and how we affect it. And we must then act in concert to retrieve a more viable world.... *Man and Nature* was written to expose the menace, to explain its causes, and to prescribe antidotes. The human capacity to wreck must instead be used to replenish nature.<sup>1</sup>

Marsh's landscape observations were drawn from his Vermont childhood, his experience as his native state's representative to Congress, and his travels in Turkey and Italy as a diplomat. His scholarship was also impressive. He spoke twenty languages, allowing him to read the relevant literature from many different countries. Drawing upon this vast global and historical knowledge, he began work on *Man and Nature*, referring to his ambitious undertaking as "a little volume." In it he would refute prevailing thought that "the earth made man," arguing instead that "man made the earth."<sup>2</sup>

In his book, Marsh described the destruction resulting from human exploitation across the globe and made adroit comparisons to the fall of ancient civilizations. Environmental

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View of Mount Tom, Woodstock, Vermont, before 1869. Photo courtesy of Woodstock Historical Society.

historian William Cronon has described Marsh's vision as "apocalyptic"; however, he also noted that "Marsh ... combined this dark prophecy with a deeply optimistic faith that disaster could be averted if only people responded in time."<sup>3</sup>

Published in the mid-nineteenth century, a period described by Lowenthal as "the peak of Western resource optimism," Marsh's seminal work "refuted the myths of limitless plenty and spelled out the need for conservation."<sup>4</sup> He assembled convincing evidence of "human's unique potency" and the dramatic extent and unpredictable human influence on the environment.<sup>5</sup> Because "Man is everywhere a disturbing agent," Marsh argued, "wherever he plants his foot, the harmonies of nature are turned to discord."<sup>6</sup> An example was his warning that "felling of the woods has been attended with momentous consequences to the drainage of the soil … indigenous vegetable and animal species are extirpated … we are even now breaking up the floor and wainscoting and doors and window frames of our dwelling."<sup>7</sup>

To reinforce his argument, Marsh, the practical Vermonter, "ransacked libraries and landscapes alike in search of evidence."<sup>8</sup> But he also presented practical solutions gathered from his foreign travels. As we would say today, he was documenting and sharing "best practices," particularly focusing on a handful of good land management examples from Europe: "on narrow theatres, new forests have been planted, inundations of flowing streams restrained ... [and these efforts were] more glorious than the proudest triumphs of war," providing "faint hope" that restoration was possible.<sup>9</sup> Though not as widespread as he hoped, Marsh lauded



French Lot, Marsh-Billings-Rockefeller National Historical Park, Woodstock, Vermont. Photo courtesy of Ed Sharron/National Park Service.

the importance of seeking these "practical lessons learned by the common observation of unschooled men." He could not resist adding that on these practical topics, "philosophy has scarcely yet spoken." To insure the success of landscape restoration, he asserted that humanity must learn to be a "co-worker with nature in the reconstruction of damaged fabric."<sup>10</sup>

Marsh's "little volume" had a big impact. Cronon has argued that "it is no exaggeration to say that that *Man and Nature* launched the modern conservation movement ... [and was] endlessly cited and quoted in the decades following its initial publication."<sup>11</sup> According to Lowenthal, the book's primary impact was on the practice of forestry, quoting the former chief of the US Division of Forestry, Nathaniel Egleston, who declared in 1896 that *Man and Nature* had awakened Americans "to our destructive treatment of the forests, and the necessity of adopting a different course."<sup>12</sup> For Marsh, forest stewardship and watershed protection went hand in hand. He saw great potential in the nascent profession of forestry in Europe and its new schools of study. In his chapter, "The Woods," he included many silvicultural details otherwise not readily available to "English speaking countries." Consequently this chapter is one-third of the entire book.

*Man and Nature* inspired forest stewardship efforts in America and was widely referenced in a successful petition to Congress in 1873 to create a national forestry commission.<sup>13</sup> This document helped lay the groundwork for the 1891 Forest Reserve Act, which in turn led to the creation of the national forest system as we know it today in 1905. *Man and Na*- *ture*'s influence also extended far beyond the United States, in particular to Italy, and its national forest acts of 1877 and 1888, and to Australia, South Africa, Japan, and other countries struggling to control unregulated exploitation of natural resources.<sup>14</sup>

Marsh wrote to influence scientists or politicians, and, more important, to appeal to "the general intelligence of educated, observing, and thinking men" whom he encouraged to become involved in environmental issues as a right and responsibility of citizenship. As Marsh explains in his introduction (quoted below), he wanted to address poets and painters, as well as to "the common observer" and "every traveler." He implored them all to refine their art of observing. With his book, he hoped to "excite an interest" to "stimulate, not to satisfy curiosity."<sup>15</sup>

With obvious pride, Marsh considered himself an "amateur" in the literal sense of the word. According to Lowenthal, Marsh "preached the civic necessity of informed public participation ... as well as the necessity of stewardship."<sup>16</sup> However, Marsh was realistic about the obstacles these "amateur citizens" would face in trying to be good stewards of the land. Lowenthal described these barriers as: "immediate urgent crises, restless mobility, faceless corporate irresponsibility, the fraying of community ties, the democratic process itself—all impose a tyranny of the present that threatens to throttle stewardship."<sup>17</sup> In response to these hindrances, Marsh called for educators to broaden their commitment to stewardship and to ensure passing this torch from one generation to the next. Throughout *Man and Nature*, Marsh urged caring for our world today with a sense of the future—what today we call sustainability.

Given his admiration of forests and foresters, his sudden death during an 1882 visit to the mountain-top forestry school at Vallombrosa, near Florence, is particularly poignant. His body, wrapped in an American flag, was carried down the mountain by an honor guard of forestry students. The leadership of the diplomatic community gathered at the local train station to accompany the casket back to Rome along with an escort of Italian dragoons. Marsh was laid to rest in Rome's Protestant Cemetery. In an 1884 posthumous edition of *Man and Nature*, his publisher wrote that Marsh's "conviction of the vital importance to the future of our race of a wiser economy ... in the use of Nature's gifts [had animated Marsh] to the last day of his life."<sup>18</sup>

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#### Excerpts from George Perkins Marsh, Man and Nature; or, Physical Geography as Modified by Human Action<sup>19</sup>

#### From the Preface

The object of this present volume is: to indicate the character and, approximately, the extent of the changes produced by human action in the physical conditions of the globe we inhabit; to point out the dangers of imprudence and the necessity of caution in all operations which, on a large scale, interfere with the spontaneous arrangements of the organic or the inorganic world; to suggest the possibility and the importance of the restoration of disturbed harmonies and the material improvement of waste and exhausted regions; and, incidentally, to illustrate the doctrine, that man is, in both kind an degree, a power of a higher order than any of the others forms of animated life, which, like him, are nourished at the table of bounteous nature....

The extension of agricultural and pastoral industry involves an enlargement of the sphere of man's domain, by encroachment upon the forests which once covered the greater part of the earth's surface otherwise adapted to his occupation. The felling of the woods has been attended with momentous consequences to the drainage of the soil, to the external configuration of its surface, and probably, also, to local climate; and the importance of human life as a transforming power is, perhaps, more clearly demonstrable in the influence man has thus exerted upon superficial geography than in any other result of his material effort....

I have only to add what, indeed, sufficiently appears upon every page of the volume, that I address myself not to professed physicists, but to the general intelligence of educated, observing, and thinking men; and that my purpose is rather to make practical suggestions than to indulge in theoretical speculations properly suited to a different class that to which those for whom I write belong.

#### From Chapter I, Introductory

**Reaction of Man on Nature.** But, as we have seen, man has reacted upon organized and inorganic nature, and thereby modified, if not determined, the material structure of his earthly home.... But though the subject has been incidentally touched upon by man geographers ... it has not, as a whole, so far as I know, been made matter of special observation, or of historical research by any scientific inquirer.

It is still too early to attempt scientific method in discussing this problem, nor is our present store of the necessary facts by any means complete enough to warrant me in promising any approach to fullness of statement respecting them.... At present, then, all that I can hope is to excite an interest in a topic of much economic importance, by pointing out the directions and illustrating the modes in which human action has been or may be most injurious or most beneficial in its influence upon the physical conditions of the earth we inhabit.

**Observation of Nature.** In these pages, as in all I have ever written or propose to write, it is my aim to stimulate, not to satisfy, curiosity, and it is not part my object to save my readers the labor of observation or of thought. For labor is life, and Death lives, where power lives unused....<sup>20</sup>

To the natural philosopher, the descriptive poet, the painter, and the sculptor, as well as to the common observer, the power most important to cultivate, and, at the same time, the hardest to acquire, is that of seeing what is before him. Sight is a faculty; seeing, an art...

The pursuit of physical geography, embracing actual observation of terrestrial surface, affords to the eye the best general training that is accessible to all.... It may be profitably pursued by all; and every traveler, every lover of rural scenery, every agriculturist, who will wisely use the gift of sight, may add valuable contributions to the common stock of knowledge on a subject which, as I hope to convince my readers, though long neglected, and now inartificially presented, is not only a very important, but a very interesting field of inquiry.

**Restoration of Disturbed Harmonies.** In reclaiming and reoccupying lands laid waste by human improvidence or malice, and abandoned by man, or occupied only by a nomad[ic] or thinly scattered population, the task of the pioneer settler is of a very different character. He is to become a co-worker with nature in the reconstruction of the damaged fabric which the negligence or the wantonness of former lodgers has rendered untenantable. He must aid her in reclothing the mountain slopes with forests and vegetable mould, thereby restoring the fountains which she provided to water them; in checking the devastating fury of torrents, and bringing back the surface drainage to its primitive narrow channels; and in drying deadly morasses by opening the natural sluices which have been choked up, and cutting new canals for drawing off their stagnant waters....

**Destructiveness of Man.** Man has too long forgotten that the earth was given to him for usufruct<sup>21</sup> alone, not for consumption, still less for profligate waste....But [nature] has left it within the power of man irreparably to derange the combinations of inorganic matter and of organic life, which through the night of æons she had been proportioning and balancing, to prepare the earth for his habitation....

Apart from the hostile influence of man, the organic and the inorganic world are, as I have remarked, bound together by such mutual relations and adaptations as secure, if not the absolute permanence and equilibrium of both, a long continuance of the established conditions of each at any given time and place, or a least a very slow and gradual succession of changes in those conditions. But man is everywhere a disturbing agent. Wherever he plants his foot, the harmonies of nature are turned to discords. The proportions and accommodations which insured the stability of existing arrangements are overthrown. Indigenous vegetable and animal species are extirpated, and supplanted by others of foreign origin, spontaneous production is forbidden or restricted, and the face of the earth is either laid bare or covered with a new and reluctant growth of vegetable forms, and with alien tribes of animal life. These intentional changes and substitutions constitute, indeed, great revolutions; but vast as is their magnitude and importance, they are, as we shall see, insignificant in comparison with the contingent and unsought results which have flowed from them....

**Physical Improvement.** True, there is a partial reverse to this picture. On narrow theatres, new forests have been planted, inundations of flowing streams restrained.... These achievements are more glorious than the proudest triumphs of war, but, thus far, they give but faint hope that we shall yet make full atonement for our spendthrift waste of the bounties of nature.

**Physical Decay of New Countries.** The geological, hydrographical, and topographical surveys, which almost every general and even local government of the civilized world is carrying on, are making yet more important contributions to our stock of geographical and general physical knowledge, and, within a comparatively short space, there will be an accumulation of well established constant and historical facts, from which we can safely reason upon all the relations of action and reaction between man and external nature.

But we are, even now, breaking up the floor and wainscoting and doors and window frames of our dwelling, for fuel to warm our bodies and seethe our pottage, and the world cannot afford to wait till the slow and sure progress of exact science has taught it a better economy. Many practical lessons have been learned by the common observation of unschooled men; and the teaching of simple experience, on topics where natural philosophy has scarcely yet spoken, are not to be despised.

In these humble pages, which do not in the least aspire to rank among scientific expositions of the laws of nature, I shall attempt to give the most important practical conclusions suggested by the history of man's efforts to replenish the earth and subdue it; and I shall aim to support these conclusions by such facts and illustrations only, as address themselves to the understanding of every intelligent reader, and as are to be found recorded in works capable of profitable perusal, or at least consultation, by persons who have not enjoyed a special scientific training.

#### From Chapter III, The Woods

**Sylviculture.** The art, or, as the Continental foresters call it, the science of sylviculture has been so little pursued in England and America, that its nomenclature has not been introduced into the English vocabulary, and I shall not be able to describe its processes with technical propriety of language, without occasionally borrowing a word from the forest literature of France and Germany. A full discussion of the methods of sylviculture would, indeed, be out of place in a work like the present, but the almost total want of conveniently accessible means of information on the subject, in English-speaking countries, will justify me in presenting it with somewhat more detail than would otherwise be pertinent.

The growth of arboreal vegetation is so slow that, though he who buries an acorn may hope to see it shoot up to a miniature resemblance of the majestic tree which shall shade his remote descendants, yet the longest life hardly embraces the seedtime and the harvest of a forest. The planter of a wood must be actually motivated by higher motives than those of an investment the profits of which consist in direct pecuniary gain to himself or even to his posterity.... But when we consider ... the terrible evils necessarily resulting from the destruction of the forest, both the preservation of existing woods, and the far more costly extension of them where they have been unduly reduced, are among the most obvious of the duties which this age owes to those that are to come after it.

**Instability of American Life.** We have now felled forest enough everywhere, in many districts far too much. Let us restore this one element of material life to its normal proportions, and devise means for maintaining the permanence of its relations to the fields, the meadows, and the pastures, to the rain and the dews of heaven, to the springs and rivulets with which it watered the earth....[This] would involve a certain persistence of character in all the branches of industry, all the occupations and habits of life ... and would thus help us to become, more emphatically, a well-ordered and stable commonwealth, and not less conspicuously, a people of progress.

[Authors' note: We are deeply indebted to Professor Lowenthal for his lifelong work on Marsh, as it his through his eyes that many of us have discovered Marsh and his relevance to conservation today.]

[Ed. note: This article is reprinted with permission from the Forest History Society, Durham,

North Carolina (www.foresthistory.org). It was originally published in *Forest History Today* (Spring/Fall 2005).]

#### Endnotes

- 1. Lowenthal, introduction to George Perkins Marsh, *Man and Nature; Or, Physical Geography as Modified by Human Action*, ed. by David Lowenthal, (1864; Seattle: University of Washington Press, 2003), xv.
- George Perkins Marsh to Spencer F. Baird, 21 May 1860, cited in David Lowenthal, George Perkins Marsh, Prophet of Conservation (Seattle: University of Washington Press, 2000), 267n1. Marsh was referring to the contemporary work of geographers who were focused on the "inquiry of how far external physical conditions ... have influenced the social life and social progress of man." Also see Marsh, Man and Nature, 13.
- 3. William Cronon, foreword to David Lowenthal, *George Perkins Marsh, Prophet of Conservation* (Seattle: University of Washington Press, 2000), xiii.
- 4. Lowenthal, introduction to *Man and Nature*, xvi; see also from Lowenthal, *George Perkins Marsh*, x: "At a time when the United States was moving at breakneck speed to industrialize and develop the national economy by exploiting its wealth of natural resources to the fullest, Marsh's was a lonely voice cautioning against the risks of careless growth."
- 5. Lowenthal, *George Perkins Marsh*, 295, and Lowenthal, introduction to *Man and Nature*, xxvi.
- 6. Marsh, Man and Nature, 36.
- 7. Marsh, Man and Nature, 3, 36, 52.
- 8. William Cronon, foreword to Man and Nature, ed. Lowenthal, xii.
- 9. Marsh, Man and Nature, 43-44.
- 10. Marsh, Man and Nature, 35.
- 11. Cronon, foreword to Man and Nature, x. In Lowenthal's introduction to the 2003 edition of Man and Nature, on page xvi, he cites several observations of the impact of Marsh's work: Lewis Mumford said Man and Nature was "the fountainhead of the conservation movement," in The Brown Decades: A Study of Arts in America, 1865–1895, rev. ed. (1931, New York: Dover, 1955), 78; Stewart L. Udall, in The Quiet Crisis (New York: Holt, Rinehart & Winston, 1963), 69–82, called it "the beginning of land wisdom in the country"; and Wallace Stegner, in "It All Began with Conservation," Smithsonian (April 1990): 38, declared it "the rudest kick in the face that American initiative, optimism and carelessness had yet received." While Gifford Pinchot's reference to Man and Nature as "epoch-making" is often cited, his biographer Char Miller notes that Pinchot disputed its impact by asserting that only a handful of Americans had ever read it. Even so, Pinchot's copy of Marsh's book (1882 edition), which he had received on his twenty-first birthday in 1886, remains at Grey Towers National Historic Landmark (Char Miller, Gifford Pinchot and the Making of Modern Environmentalism [Washington, DC: Island Press, 2001], 55, 56, 362.)

- 12. N.H. Egleston, cited in Marsh, *Man and Nature*, xvi. See also Lowenthal, *George Perkins Marsh*, 302–305.
- 13. Another who was heavily influenced by Marsh's ideas was Franklin B. Hough, a member of the American Association for the Advancement of Science, and who later became the first head of forestry in the federal agency established in 1876, the US Division of Forestry (predecessor to the US Forest Service).
- 14. Lowenthal, introduction to *Man and Nature*, xvii: "Beyond America, Marsh's precepts were also early espoused.... Italian foresters and engineers found Marsh's advice invaluable in framing national forest acts of 1877 and 1888. *Man and Nature* inspired British officials seeking to curb deforestation in India, Burma and the Himalayas, was cited as gospel to halt the 'barbarous improvidence' of tree felling in New Zealand, and spurred early conservation reform in Australia, South Africa, and Japan."
- 15. Marsh, Man and Nature, 15.
- 16. Lowenthal, introduction to *Man and Nature*, xxxv. In *George Perkins Marsh*, Lowenthal writes of "the necessity of stewardship" (427–428).
- 17. Lowenthal, George Perkins Marsh, 428.
- Lowenthal, George Perkins Marsh, xxiii. See footnote #33, Publisher's note in Marsh, The Earth as Modified by Human Action: A Last Revision of "Man and Nature" (New York, 1884), v.
- 19. See endnote 1 for bibliographic information.
- 20. G.C. to Sir Walter Raleigh, quoted in Man and Nature, 15n11.
- 21. According to Lowenthal, *George Perkins Marsh*, 282: "The notion of *usufruct*—the view that each generation had rights only to current use, not perpetual title, which would forbid both hoarding and waste—had been advanced several years previously by Thomas Jefferson, fearful lest his Virginia fellow-planters squander finite resources. Marsh elaborated Jefferson's warning that individual entrepreneurs could not be trusted with long-range commitments. Only by assuming public responsibility could Marsh's countrymen curtail private profligacy."
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## The View from Mount Tom: Perspectives from the Childhood Landscape of George Perkins Marsh

#### **Christina Marts**

As I WRITE, THE HILLS OUTSIDE OF MY OFFICE IN WOODSTOCK, VERMONT, are covered in their autumnal glory—the great wash of greens have given way to shades of crimson, golds, and blaze orange. Marsh-Billings-Rockefeller National Historical Park (NHP) sits outside the Woodstock village on a slight rise overlooking the fertile farm land that is now the Billings Farm & Museum and the hills and valleys surrounding the Ottaquechee River. Aptly named the "Green Mountain State," today, approximately 80% of the land in Vermont is forested. The interplay and co-dependence of forests, agricultural fields, and small villages are the hallmark of the Vermont landscape and core to the identity and foundational ethics of Vermont communities, and have been for over 200 years.

This was the boyhood home of George Perkins Marsh, born in 1801. However, the landscape that Marsh experienced over two centuries ago was very different than the one we know today. In his boyhood years, the land was cleared to make way for agricultural fields and to supply potash and timber for the growing settlements of early Vermont. Fires were frequent, and early in Marsh's life a large fire devastated most of Mount Tom, the prominent summit behind the Marsh estate with panoramic views overlooking the Woodstock village and Ottaquechee Valley.

From an early age, Marsh was an exuberant learner. So much so, in fact, that by the age of about seven or eight Marsh nearly went blind from the strain of excessive reading under poor light and for nearly four years he could not read at all (Lowenthal 2000a). Without his books for learning, Marsh took to the woods where he turned his keen mind and passion for observation and discovery to nature. These were impressionable years for young Marsh, and in those woodland journeys he cultivated a love for the natural world that would continue with him throughout his adult life. He would later describe himself as "forest-borne;" and for him "the bubbling brook, the trees, the flowers, the wild animals were to me persons, not

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19th-century view from Mount Tom over Woodstock, Vermont. Photo courtesy of Woodstock Historical Society.

things" (Marsh 1864). He learned to identify all of the species of trees on Mount Tom. His father taught him the concept of "watershed" and directed his attention to the interplay of water and soils. From his perch at the summit of Mount Tom, Marsh could scan the entire intervale and took note of the interrelations of the village to the river, fields and forests, and the changes in the landscape from human use and misuse (Lowenthal 2000a).

Marsh would go on to complete his formal schooling in nearby Dartmouth College in Hanover, New Hampshire, and later move to Burlington, Vermont, to pursue law. He also tried his hand at various business adventures, unsuccessfully, before taking up the call as a public servant that would eventually lead him overseas as US ambassador to the Ottoman Empire and Italy (Lowenthal 2000a). However, during his time in Vermont he would return to his family home in Woodstock frequently and continued to observe, with great concern, the growing devastation of the landscape of his childhood.

In the short time of Marsh's early years, the Vermont landscape underwent drastic change. From the early clearing for potash and timber, the forest of Vermont continued to fall at an increasing rate, spurred by the rise in the wool industry. By the 1840s there were six sheep for every one person in Vermont (Albers 2000), and by the 1850s only about 35% of Vermont's forest remained (MacCleery 2011). In addition to the effects of land clearing and overgrazing, development and damming along the rivers were also rampant. Flooding, massive soil erosion, and the destruction of fisheries ensued.

The disastrous effects of the rapid, massive deforestation of Vermont and greater New England that Marsh experienced would later be acknowledged as one of the first environmental catastrophes in the country's early history. And Marsh was one of the first to take note (1847):

The changes ... wrought in the physical geography of Vermont, within a single generation, are too striking to have escaped the attention of any observing person, and every middle-aged man who revisits his birth-place after a few years of absence, looks upon another landscape.

He would later reflect in a letter to botanist Asa Gray (1849):

I spent my early life almost literally in the woods; a large portion of the territory of Vermont was, within my recollection, covered with natural forests; and having been personally engaged to a considerable extent in clearing lands, and manufacturing, and dealing in lumber, I have had occasion both to observe and to feel the effects resulting from an injudicious system of managing woodlands and the products of the forest.

The firsthand lessons of the destructive power of wide-scale human manipulation of the natural world would stay with Marsh through his later journeys in life. These experiences, together with his observations of environmental destruction from his travels in the Old World as US ambassador, would serve as the genesis of *Man and Nature*.

In its first printing, *Man and Nature* did not have wide readership, but it did garner the attention of several influential actors of the day. Among them was the first chief of the US Forest Service, Gifford Pinchot, who received a copy of *Man and Nature* for his 21st birthday from his brother, and later credited it as "epoch making." A well-worn edition of the book can still be found at the library of Pinchot's Pennsylvania home, Grey Towers. Another first-edition copy with notes in the margins and evidence of thoughtful use is found in the library of the Marsh-Billings-Rockefeller mansion. This copy belonged to Frederick Billings, who also grew up in Woodstock and returned to purchase the Marsh place in 1869. In *Man and Nature* Marsh extols:

We have now felled forest enough everywhere, in many districts far too much. Let us restore this one element of material life to its normal proportions, and devise means for maintaining the permanence of its relations to the fields, the meadows and the pastures, to the rain and the dews of heaven, to the springs and rivulets with which it waters down the earth.

Inspired by Marsh's call to action, Frederick Billings responded by planting trees by the thousands to re-establish the Mount Tom forest, building a progressive forestry and farming program that could serve as a model for others to learn from. As Billings' wife, Julia, writes:

He would plant trees in the spring of the year, determining to cover the hills with forests.... He was led to consider forestry by reading the writings of Geo. P. Marsh

regarding climactic changes induced by devastation of the forests; and he thought the farmers should be taught to see the importance of preserving their woodlands.

Billings shared Marsh's philosophy that human agency had the potential to be a positive as well as destructive force, and that nature could be improved through intervention. Marsh advocated that what humans had destroyed, so could they mend: "In reclaiming or reoccupying lands laid waste by human improvidence or malice.... He is to become a co-worker with nature in the reconstruction of the damaged fabric..." (Marsh 1864).

Today, if you were to travel in the footsteps of George Perkins Marsh on the trails that crisscross Mount Tom, you would witness a landscape of recovery. The worn-out hills have largely been restored by the planting efforts begun by Frederick Billings, continued by his daughters, and aided by the insistence of natural regeneration. Norway spruce and white pine tower over the Marsh-Billings house, and hemlock and beech shade the mountain stream. The patchwork of forest stands reflects a 150-year evolution in forestry practices, and a committed land ethic shared across generations. Deep in some of these old stands, the most astute observer can still find the gnarly 200-plus-year-old open-grown sugar maples that would have dotted the worn-out pastures during Marsh's lifetime.

This is the landscape of Marsh-Billings-Rockefeller National Historical Park. The park was established in 1992 when Mary French Rockefeller, granddaughter of Frederick Billings, and her husband, Laurance Rockefeller, donated the property to the National Park Service (NPS). The park, which opened to the public in 1998, interprets the history of conservation in the United States and continues the legacies of Marsh's teachings and Billings' practices in managing the Mount Tom forest as a demonstration of stewardship in action.

As others in this issue of *The George Wright Forum* argue, *Man and Nature* was a book of its time and cannot be read by the modern reader without placing it within the historical context of its development. Nevertheless, there are fundamental lessons found in Marsh's life and writing that are as powerful today as they were 150 years ago, and continue to inform the park's approach to stewardship (in no small part due to the continual re-examination of Marsh's role in the history of conservation by historians and scholars, first among them Dr. David Lowenthal).

Today, the park is one of the oldest continuously managed forests in the United States developed from scientifically informed practices. The park continues the tradition of forest management on Mount Tom as a demonstration of progressive forest stewardship. In its approach, the park strives to recognize the interdependence and balance between trees, water, wildlife, and community, as Marsh advocated in his pleas for reform. The work, by necessity, requires a long view; a demand to think beyond single generations. "The improvement of forest trees is the work of centuries. So much more the reason for beginning now" (Marsh 1879). Elsewhere in this *Forum* issue, you can read about the park's approach to managing the forest for climate change, an equally critical long-term view in response to the ecological crises of our time.

While not a scientist himself, Marsh was an advocate for scientifically informed management. In his 1860 report on the "Study of Nature," Marsh argued that only by understanding the environment might we learn how to repair it (cited in Lowenthal 2000a). In the stewardship of the Mount Tom forest, the use of scientifically informed monitoring and decision-making is at the core of the management approach. Over the 550 acres, nearly 120 long-term forest monitoring plots provide detailed tracking of forest stand dynamics that inform forestry decisions; and the National Park Service Northeast Temperate Inventory and Monitoring network provides additional monitoring of water quality, breeding birds, land use change, and other key baseline ecological conditions. However, data alone are not sufficient for examining impacts, as Marsh later advised, recognizing that even with such diligence we will never know the full effects of our actions. Science must be equally matched with the ability to take a broader view, working between disciplinary boundaries and striving for a pace of change that respects the speed of trees.

Marsh also cautioned against the supremacy of scientific specialists or a new class of scientific elite. Rather, he argued that science had to be grounded in the realities and complexities of everyday life, and advocated for the role of the amateur and democratization of scientific knowledge (Lowenthal 2000b). We echo similar calls for inclusivity and civic engagement as we work to engage new audiences in contributing to park stewardship through citizen science. Programs on woodland management for landowners, phenology monitoring with volunteers, and annual bioblitz events all aim to invite the public, regardless of their professional training, to contribute new knowledge and observations and forge personal connections to learning about the ecology of the park and their own communities.



Students at Woodstock Union High School conduct mercury monitoring studies at the park. Photo courtesy of National Park Service.

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Sixth-grade students from local elementary schools look out across the landscape from the summit of Mount Tom as part of their curriculum inspired by George Perkins Marsh's quote "Sight is a faculty; seeing, an art." Photo courtesy of National Park Service.

Education is a key theme in many of Marsh's writings (although later in life he will lament that education alone is not enough) (Lowenthal 2000a, 2014); however, perhaps the most valuable lesson Marsh's story offers in this regard is the example of Marsh himself as a student of nature. Research now validates what Marsh's boyhood experience exemplified: children in their elementary years are at a unique developmental stage in their learning where they are beginning to understand how the world around them works, yet are curious about new ideas and are beginning to forge affinities and habits that will stay with them throughout their lifetime (Wells 2012, 2013). Not unlike Marsh's over-addiction to books in his youth, there is a growing concern that youth today are spending a harmful amount of time in front of computer screens to the detriment of their health and development (Louv 2005; Rideout 2010).

The national "Every Kid in a Park" program recognizes this crisis with the aim to provide free access to parks and public lands to all 4th-graders and their families. Over the last decade, Marsh-Billings-Rockefeller NHP has worked with teachers and schools to develop robust programs in place-based education that get children outdoors and using the park and community resources to enhance the educational curriculum and inspire life-long learning. Teachers who have participated in "A Forest for Every Classroom" have crafted new curricula that use the Mount Tom forest as a learning laboratory, just as Marsh did informally in his boyhood adventures. Along the trails that Marsh walked, today's students are learning about ecosystems, climate change, stewardship, water quality and mercury pollution, creative writing, social history, and so much more. For example, teachers of 6th-grade classes in area schools have taken to heart Marsh's words, "Sight is a faculty; seeing, an art," (Marsh 1864) and crafted a curriculum that encourages their students to hone their observational skills by exploring Mount Tom and their place in the world through different lenses—from the microscopic to the telescopic. This model of teacher professional development that fosters partnerships between public lands, teachers, and schools is now being offered in other parks and public lands throughout the country as programs such as "A Park for Every Classroom," "A Trail for Every Classroom," "Iditarod Trail to Every Classroom," and "A Watershed for Every Classroom."

Marsh's call for reform was as much a social one as it was an ecological one. He felt that the only way to achieve stewardship was to develop a commitment to the future with a sense of duty to both the memory of our ancestors and the care and concerns of our descendants (Lowenthal 2014). This, above all, summarizes the philosophical approach to the work at Marsh-Billings-Rockefeller NHP. It recognizes that stewardship is equally about community as it is about ecology, and that it is only in developing an understanding, appreciation, and commitment to the co-dependence of society and the environment that we can advance a land ethic for our time. The park aims to illustrate the spectrum of ways communities throughout the country are forging new relationships in the landscapes they call home. In Marsh's boyhood landscape, the park works closely with its own community of Woodstock to test new ideas for community-based conservation that strive toward sustainability of people on the land. The large-landscape conservation initiative for the Prosper Valley, the area north of the park defined by the convergence of four towns in one watershed, recognizes the values of contiguous wildlife corridors and protecting forests from fragmentation as much as it does maintaining working farms and forests in the valley to support community traditions and local economies.

As we mark the 150th anniversary of *Man and Nature*, there is recognition that there is still much work to do to address the imbalances of humans and nature. As the park was being established, its early advocates recognized that the call for stewardship should not remain locked within our history books or the Woodstock experience. The NPS Stewardship Institute was co-created with the park to continue to advance stewardship practices by working with a broad network of diverse, committed practitioners from throughout the NPS and our conservation partners. It recognizes that the challenges we face today are even more complex, potent, and urgent than in Marsh's time, and that only by tapping the collective wisdom of practitioners working across a diversity of parks, programs, and professional disciplines can we craft new approaches for stewardship needed for our times.

The institute works across broad geographies—from urban to large rural landscapes—to bring together leading-edge thinkers from all levels of the agency and the conservation community. The collaborative process has fueled the development of the NPS Urban Agenda, which is now working with 10 model cities throughout the country to pilot and learn from new partnership models among NPS, other government agencies, and community groups in the urban context. In support of large-landscape conservation, the institute works to share best practices and examples from throughout the field that exemplify the diverse ways that agencies, communities, and non-profit partners are working together to protect and steward landscape-scale connectivity in support of both natural and cultural values. Marsh also recognized the spectrum of values in landscapes, and the need for landscape-scale thinking and management. In arguing for the protection of the Adirondacks, Marsh equally acknowledged the value of wilderness, the importance of watersheds, and the connection to local commerce (Marsh 1864):

Some large and easily accessible region of American soil should remain, as far as possible, in its primitive condition, at once a museum for the instruction of the student, a garden for the recreation of the lover of nature, and an asylum where indigenous tree, and humble plant that loves the shade, and fish and fowl and four-footed beast, may dwell and perpetuate their kind.... [T]he forest alone, economically managed, would, without injury, and even with benefit to its permanence and growth, soon yield a regular income larger than the present value of the fee.... The collateral advantages of the preservation of these forest would be far greater.... The rivers which rise in it, flow with diminished currents in dry season, and with augmented volumes of water after heavy rains. They bring down much larger quantities of sediment, and the increasing obstructions to the navigation of the Hudson ... [and] give good grounds for the fear of serious injury to the commerce of the important towns on the upper waters of that river....

Visitors to Marsh-Billings-Rockefeller NHP walk the carriage roads and trails that crisscross through the landscape that George Perkins Marsh explored in his youth. Photo courtesy of Jim Higgins.



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In all of this work, there is the recognition that our strategies suffer from a fundamental flaw-the need for greater inclusivity in shaping a national social and ecological stewardship ethic. In Marsh's time the issues of slavery and women's suffrage drove deep divides throughout the country. Marsh was a supporter of women's rights and an abolitionist, yet his arguments for reform were tempered by his Victorian sensibilities. In November 2014, a symposium was held at the park with the institute and Center for Whole Communities to celebrate the 150th anniversary of Man and Nature and explore the relevancy of Marsh's work to the conservation today. In those discussions, there was a clear calling for the need to address issues of inequality and inclusivity in order to craft a more robust stewardship narrative where all cultures and all voices are equally represented and contributing. The park and institute are working together to embrace greater diversity and inclusion in its stewardship approach in all aspects of our work, including piloting partnership-based cultural competency training models that are now serving as a regional pilot; evaluating best practices in building connections between parks and diverse communities; and championing the need to broaden the conservation narrative to include issues of environmental justice, social inequality, and the value of local knowledge.

Motivated by a shared commitment to advance a stewardship legacy needed for our times, the park, institute and its many partners work together to promote the balance and interdependence between communities and the land. In the words of Laurance Rockefeller, "The true importance of Marsh, Billings, and those who follow in their footsteps goes beyond simple stewardship. Their work transcends maintenance. It involves new thought and new action to enhance and enrich ... the past.... We cannot rest on the achievements of the past. Rather, each generation must not only be stewards, but activists, innovators and enrichers" (Rockefeller 1993).

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## Climate Change: Responding to the Crisis Portended by George Perkins Marsh

Nicholas A. Fisichelli, Gregor W. Schuurman, and Edmund Sharron

## Introduction

Climate change is the challenge of our age. It is here and now, it is pervasive, and it is unfortunately—our future. George Perkins Marsh clearly recognized the major environmental crises of his time in the mid-1800s, when most still saw the taming and subjugation of nature as imperative improvements to the planet (Lowenthal 2009). He perceived the impacts of unsustainable logging, overfishing, overgrazing, and non-native species, as well as the floods, erosion, and desertification that followed unwise land conversion. And, he pushed to reverse these changes and restore landscapes to their previous conditions. Our climate change challenge today is immense and complex, and interacts synergistically with many of the human-caused stressors Marsh observed. A whole body of science, which Marsh anticipated with his prescient concerns about human impacts to climate, establishes that the planet is already committed to substantial climate change (Wigley 2005; Hansen et al. 2013). Thus, we must both adapt to ongoing changes and minimize future impacts. The future will not look like the past, and the disconcerting reality is that by exposing Earth's climate to significant and ongoing human influence, we have now committed ourselves to the immense stewardship challenge of determining desired future conditions within protected areas.

## Past change

George Perkins Marsh's Woodstock, Vermont, birthplace—now home to Marsh-Billings-Rockefeller National Historical Park (NHP)—provides a useful backdrop and context for understanding past, ongoing, and future changes. Marsh (1801–1882) witnessed tremendous environmental changes. He was born near the beginning of rampant deforestation that

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reduced forest cover in the state by more than half, from about 80% to around 30% during the century (Foster 2006). Short-sighted land use and poor land clearing practices caused highly visible erosion and tremendous loss of topsoil from previously forested areas. These same areas, now lacking the shade of a forest overstory and devoid of a thick organic soil layer, were also more prone to the effects of drought. "Too general felling of the woods [is] the most destructive among the many causes of the physical deterioration of the earth" noted Marsh in *Man and Nature* (1864). Marsh lamented that the Vermont landscape was under such rapid transformation that areas were unrecognizable to the traveler after only a short number of years. Unsustainable fishing was also an unacknowledged issue Marsh recognized as requiring management attention.

In addition to land use impacts, Marsh was startlingly prescient about human impacts to the Earth's climate. In a speech in 1847 to the Agricultural Society of Rutland County, Vermont, Marsh articulated multiple ways in which humans influence local and regional climate, such as through changes in landscape albedo, desertification, urban heat islands, and heat, energy, and moisture held in the atmosphere:

Man cannot at his pleasure command the rain and the sunshine, the wind and frost and snow, yet it is certain that climate itself has in many instances been gradually changed and ameliorated or deteriorated by human action. The draining of swamps and the clearing of forests perceptibly affect the evaporation from the earth, and of course the mean quantity of moisture suspended in the air. The same causes modify the electrical condition of the atmosphere and the power of the surface to reflect, absorb and radiate the rays of the sun, and consequently influence the distribution of light and heat, and the force and direction of the winds. Within narrow limits too, domestic fires and artificial structures create and diffuse increased warmth, to an extent that may effect vegetation. The mean temperature of London is a degree or two higher than that of the surrounding country, and Pallas believed, that the climate of even so thinly a peopled country as Russia was sensibly modified by similar causes.

Marsh died in 1882 and therefore lived before the earnest beginnings of the fossil fuel-driven industrial revolution. Thus, his observations and amazing insights were based primarily on land-use changes rather than on the tremendous increases in greenhouse gas emissions that have occurred in the interim. Since Marsh's day, atmospheric concentrations of carbon dioxide have climbed from roughly 290 to recently over 400 parts per million (NOAA 2015), an unwelcome milestone and the highest concentration in well over 800,000 years (IPCC 2013). Although Marsh did not witness this change, he did appreciate that incrementally small actions (such as daily emissions of greenhouse gases) could accumulate and ultimately cause immense impacts (Lowenthal 2009).

## Ongoing climate change

The signs and symptoms of anthropogenic climate change are clearly evident today. The above-mentioned greenhouse gas emissions are driving increasing atmospheric temperatures,

sea-level rise, and acidification of the world's oceans (IPCC 2013). Air temperatures in recent decades are significantly warmer than the longer-term record; for example, the past 30 years likely represent the warmest period of the past 1,400 years, on average, in the northern hemisphere (IPCC 2013). Within the US national park system, recent conditions (past 10–30 years) in over 80% (235) of the 289 parks with significant natural resources have been warmer than 95% of the historical record (1901–2012) (Figure 1; Monahan and Fisichelli 2014). Thus, even many of those long-tenured park managers who have worked at the same park for several decades have spent their entire careers under relatively anomalous conditions.

Marsh-Billings-Rockefeller NHP is experiencing both extreme warm and extreme wet conditions (Figure 2). Annual temperature, summer temperatures, and winter temperatures of the past 10–30 years are, on average, warmer than 95% of historical conditions going back to 1901. Long-term temperature records from the region suggest—unsurprisingly—that recent years are much warmer when compared with the time Marsh spent there. This warming pattern has been fairly consistent, with annual mean temperatures of the past 10, 20, and 30 years each being warmer than all other periods of equal length since 1901. Rainfall

**Figure 1.** Recent (past 10–30 years) mean temperature relative to the historical range of variability (1901–2012) in 289 US national parks (park plus surrounding landscape—30-km buffer). Park temperature is considered "extreme" if one or more of seven temperature variables examined is <5th percentile ("Cold") or >95th percentile ("Warm") of the historical distribution (adapted from Monahan and Fisichelli 2014).



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**Figure 2.** Recent temperature and precipitation percentiles at Marsh-Billings-Rockefeller National Historical Park (including areas within 30 km [18.6 mi] of the park's boundary). Black dots indicate average recent percentiles across the 10-, 20-, and 30-year intervals. Variables are considered "extreme" if the average percentiles are <5th percentile or >95th percentile (i.e., the gray zones, where recent climate is pushing the limits of all observed climates since 1901). Black bars indicate the range of recent percentiles across 10-, 20-, and 30-year moving windows (adapted from Monahan and Fisichelli 2014).

events are becoming more intense across the Northeast (Melillo et al. 2014), and seasonal rainfall totals are also extremely high in the park.

We need not only look to future "potential" changes; climate change is happening now in parks and is having impacts to park resources, infrastructure, and operations. Across the continent, resource responses to ongoing climate change include changes in glaciers, birds, insects, mammals, and vegetation (Carrara and McGimsey 1981; Moritz et al. 2008; Tingley et al. 2009; Dolanc et al. 2013; Giersch et al. 2015). Climate change is also accelerating weathering, deterioration, and loss of cultural resources (Colette 2007; Sabbioni et al. 2010), exacerbating maintenance backlogs, challenging park operations, and impacting visitor use and experience (Buckley and Foushee 2012; Fisichelli et al. 2015).

At Marsh-Billings-Rockefeller, carriage roads are experiencing greater erosion and requiring more maintenance than in the early years of the park, due to increased heavy-rain events (Figure 3). Projects are underway to increase the size of culverts along the carriage road system to handle the increased amount of runoff generated during these more frequent and heavy summer rainstorms. Warming spring temperatures may be linked to increases in visitor use and demand for more interpretive programs earlier in the spring.

#### Future climate change

Climate change is multifaceted, and future climate will likely differ significantly from even the



**Figure 3.** Recent heavy rainfalls have overwhelmed culverts and caused substantial erosion and damage to historic carriage roads in Marsh-Billings-Rockefeller National Historical Park. Park managers are adjusting culvert size to adapt to current and projected future changes in rainfall intensity.

recent past (IPCC 2013; Melillo et al. 2014). For example, future combinations of temperature and precipitation in many areas may have no current analogues on the planet (Williams et al. 2007). Climate change also includes changes in climate variability and extreme events, such as potential increases in the frequency, duration, and intensity of droughts, heat waves, and storms (Melillo et al. 2014). Additionally, many uncertainties and as-yet-unknown surprises will influence the rate and direction of future change. It is beyond the scope of this essay to delve into details, and many authoritative references, such as those cited above, provide comprehensive future projections. Importantly, climate change will interact with other stressors (Fisichelli et al. 2014a), such as those noted by Marsh in the 1800s.

One of the greatest challenges of climate change is that it is a directional and unrelenting change. Much work in disturbance ecology has focused on understanding responses to press and pulse disturbances (Bender et al. 1984). Press disturbances are sustained changes and pulse disturbances are short-term, distinct events. Both involve a limited period of change followed by a return to stable original conditions (pulse) or new conditions (press), such that in theory the ecosystem ultimately attains equilibrium (Bender et al. 1984). It is easiest to understand ecosystem responses to either of these two types of disturbance when examined in isolation. For example, examining forest regeneration after a fire (pulse), or studying a river system under a new, higher sedimentation regime (press). Climate change is neither simply a

press nor a pulse disturbance; it is ongoing and accelerating directional change, a disturbance without an endpoint (Lake 2000) or stable "new normal."

To add to the complexity, climate change also influences and interacts with familiar press and pulse disturbances. It is difficult and often erroneous to attribute individual hurricanes, storms, or other pulse-disturbance weather events to climate change (in the same way that it is difficult to attribute any single outcome of a roll of loaded dice to the fact that they have been subtly manipulated), but what is clear is that these pulse events and their impacts occur on top of directional climate change (Trenberth et al. 2015). For example, Hurricane Sandy in 2012 occurred atop 20 cm of climate change-induced sea-level rise (since 1880) that caused the storm to flood an additional ~70 km<sup>2</sup> in New York and New Jersey (Miller et al. 2013). Did the storm happen because of climate change? Unknowable. Was it made worse because of it? Most assuredly. Disturbance impacts such as tree mortality from pests, droughts, and wildfires may also be magnified by ongoing climate change (van Mantgem et al. 2013; Allen et al. 2015; Anderegg et al. 2015).

Climate change, it must be stressed, is directional. When examined over multi-decadal scales—as by climate's own definition—this change is continuous and has no foreseeable equilibrium (Hansen et al. 2013). Thus, we cannot assume that restoration to a pre-existing state will be achievable. The past climate is just that, and as a key component of that pre-existing ecological state, already does not exist or will soon cease to exist.

#### **Responding to change**

The response to climate change must be broad, deep, and persistent, and involve both mitigation and adaptation. Mitigation in a climate change context is the reduction in greenhouse gases through reduced emissions and enhanced sequestration. Adaptation is, in simple terms, adjustment to changing conditions. It is, more formally, adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively reduces negative effects or capitalizes on opportunities (see Executive Order no. 13653, 2013). Adaptation and mitigation are inextricably linked. Early responses to climate change focused on mitigation, but climate change impacts and the need to adapt to them soon became obvious. Furthermore, the long residence time of greenhouse gases in the atmosphere, lag times in the climate system, and our current greenhouse gas emissions trajectory suggest that climate change will continue for centuries (Hansen et al. 2013). Mitigation is now vital to ensure that ongoing adaptation efforts are successful-much of our efforts at adapting to change may only be effective in the near term and under moderate amounts of climate change (Bierbaum et al. 2014). Failure to mitigate will have cascading impacts that may overwhelm adaptation actions. The focus below is on adaptation; mitigation efforts at local, national, and global scales are integral to the climate change response (NPS 2012; Executive Office of the President 2013; IPCC 2014).

Climate change and other global change stressors not only challenge land managers' abilities to protect natural areas but also demand that we re-think conservation concepts, goals, and objectives in a continuously changing world (Hobbs et al. 2010; NPSAB 2012). Adapting to climate change means either resisting effects or facilitating change (Millar et al.

2007; Stein et al. 2014). Ongoing and future climate change will likely affect all aspects of protected area management, including natural and cultural resource protection, operations and infrastructure, and visitor use and experience. To structure adaptation thinking for protected area management, a spectrum of adaptation strategies can be described as spanning persistence, autonomous change, and directed change (Figure 4; Fisichelli et al., in review). Persistence strategies aim to resist change and maintain current or past conditions. Directed change actively manages a target (resource, asset, or process) towards specific new desired conditions. With autonomous change, the target responds to climate change and management may support its capacity to do so but does not aim to steer the target back towards past conditions or move it towards a strictly defined desired future state. There is no single adaptation option that is appropriate in all situations; rather, the appropriate strategy will vary across resources, space, and time. For example, many persistence strategies are suitable in the near term but are likely to become increasingly risky and costly as time goes on (Millar et al. 2007). The stewardship response to climate change therefore needs to be continuous, and continually reassessed. This paradigm shift in management is nascent and will take many decades to fully form, but we are beginning to take the first tentative steps and develop the forward momentum to achieve critical mass (Stephenson 2014).

The past has been a tremendous stewardship guide and past conditions have been a widely agreed-upon goal for conservation across protected areas. Past ecosystem states, in essence, made the decisions regarding stewardship and guided management interventions to preserve the structure, composition, and function of landscapes. This one-size-fits-all approach worked across landscapes, jurisdictions, and ecosystem types. Certainly, variability in ecosystems states was understood; however, this was seen as variability around a static baseline, or at least within familiar bounds. Climate change challenges these ideas and strongly points to a future that will not resemble the recent past. The past, therefore, cannot be the sole guide for the future; this is a core challenge of climate change. Human influence over the landscape, in the form of climate change and other broad-scale global change stressors, obscures even the idea of the natural condition of protected areas (NPS 2006; Cole and Yung 2010). There is no one-size-fits-all approach in climate change adaptation (Bierbaum et al. 2014). Decisions will vary tremendously across space, time, and resources. Managers and stakeholders need to have open conversations about desired future conditions, what is



**Figure 4.** Climate change adaptation is about managing change and includes a spectrum of strategies. Persistence strategies resist climate change. Directed change actively manages towards specific new desired conditions. With autonomous change, the target responds to climate change and management may support its capacity to do so, but without steering the target towards a specific future state. Appropriate strategies will vary across resources, space, and time. achievable, what the major tradeoffs are, and how to proceed. These are difficult decisions and the "wisdom" of past natural conditions cannot be used as the sole goal for stewardship. This does not mean that management need be capricious and change course with every record warm year or disturbance event. It also does not mean that intense management intervention is necessary everywhere and at all times. Restraint is always needed, is an important tool in the manager's toolbox, and given limited management resources, is often a forced norm (Stephenson 2014).

Climate change does mean that decisions need to be made, often with limited information and under major irreducible and high-impact uncertainties. Furthermore, these decisions will need to examine multiple tradeoffs, such as fostering a free-flowing river and its erosion and deposition dynamics or protecting cultural resources from these erosional forces. Decisionsupport approaches such as scenario planning and structured decision-making can guide and inform the process, especially in elucidating uncertainties and tradeoffs (Gregory et al. 2012; Moss et al. 2014). The science and decision support approaches, however, do not define conservation goals. An iterative process of co-learning and knowledge co-production of achievable future landscape conditions is needed to shape conservation goals (Dilling and Lemos 2011; Nel et al. 2015).

Although climate change adaptation is a relatively new aspect of conservation, the tools of adaptation, in most instances, are the same ones managers are already using. The fundamental change is in understanding the impacts of climate change and then using conventional tools to ameliorate these impacts (NFWPCAP 2012; Stein et al. 2014). Invasive species management is already a recurring action in many protected areas and climate-informed decision-making can lead to both more effective treatments and accomplishment of multiple climate adaptation goals. Examples include: promoting native species persistence within potential climate refugia by controlling invasive species; fostering transitions (directed change) among native natural communities by managing non-native invasions within areas likely to experience major climate-mediated changes; selecting non-native pest and disease targets within a park unit based on host species future habitat suitability; and examining which invasive species and areas within parks may require greater management in the future and—as importantly—which invasives may decline in identified areas under a changing climate.

Marsh-Billings-Rockefeller NHP is typical of most national park areas in that it has both significant natural and cultural resources and that many of the significant cultural resources are composed of natural resources. The forest at Marsh-Billings-Rockefeller is the oldest surviving example of planned and managed reforestation in the country (Figure 5). It is a living history of the evolution of forest stewardship in the United States. It tells the story of bringing state-of-the-art European silvicultural practices to the US in the late 1800s and of modern sustainable forest practices. These forests are now also telling the story of global change impacts and adaptation. Managers at the park and forest scientists are incorporating climate change vulnerability information into management plans and developing strategies to encourage the establishment and growth of a broad suite of present native tree species adapted to emerging and future climatic conditions (Figure 6; Fisichelli et al. 2014b).



**Figure 5.** Active forest management is a core component of the cultural landscape at Marsh-Billings-Rockefeller National Historical Park, and managers are currently adapting practices to promote native species adapted to a changing climate.

Changes to management include minor shifts in silvicultural practices that will encourage future climate-adapted tree species such as oak, cherry, and pine.

This adaptation is a subtle but important change in management that seeks to bring about the desired future condition of an intact, healthy forest in the park. Historical (and historic) reforestation efforts at this site were a deliberate and conscious effort at improved stewardship and were some of the first-in-the-country efforts to restore working forests. The methods were untested in the US and these pioneering stewards faced multiple uncertainties analogous to climate change adaptation challenges today. What tree species would do well here? What would the next 100 years look like? Presently, managers are adding to this rich history and the cultural significance of the park through ongoing stewardship and climate change adaptation.

Marsh's writings, especially *Man and Nature* (1864), did catalyze change in forest stewardship and fish management. These stewardship changes often occurred incrementally and took multiple decades to manifest. Similarly, our willingness and ability to adapt to climate change is evolving and improving. Coming on the heels of the 150-year anniversary of *Man and Nature* is the centennial of NPS (1916–2016). This is an opportunity to reflect on the past 100 years of management, recognize how much it has changed, and begin to envision how much and in what ways management must change for the next 100 years of park stewardship.



**Figure 6.** Projected changes in potential habitat suitability for three common tree species in the Marsh-Billings-Rockefeller National Historical Park area. "Least change" and "major change" projections (black dots) are for three future periods, compared with late 20th century habitat. Y-axis is the ratio of future to late-20th-century habitat suitability (e.g., 2.0 = doubling of suitable habitat; 0.5 = 50% reduction in habitat). Data from Fisichelli et al. (2014b).

Conservation goals are reflections of human values, and human values evolve and change (Riley et al. 2002). Decisions made during one era of management may have been appropriate and the right decision at the time, but the "right" decision changes with time along with our values. Feeding bears in national parks was integral to the visitor experience during the early days of NPS. Managers understood the detrimental effects caused by feeding wild animals, but at that time and perhaps for a fledgling organization attempting to establish itself, visitor experience and expectations trumped early wildlife concerns. Over time, through increased scientific understanding and evolving public perceptions and park stewardship values, management changed. Park managers reassessed goals and objectives and brought them in line with evolving conservation values. We may well be making decisions today that will seem like poor choices in the future; it is hubris to assume otherwise. But what is vital is that we continually reassess our actions and our goals and tailor them to changing ecological and social conditions.

Changes in Marsh's day provide both warnings and some encouragement that global society can respond to and mitigate climate change. As mentioned above, the rate of deforestation in New England during the 1800s was phenomenal. Surprisingly, the rate of reforestation during the 1900s was almost as rapid. It is hard to imagine anyone in the late 1800s looking at the deforestation trend of that century and positing that the next century would see reforestation of much of these areas. This massive transformation from forest to pasture and agricultural fields and then back to forest illustrates the types of changes that can occur as a result of human choice. A major driver of this change was economic forces reducing demand for potash and sheep and new agricultural opportunities opening up in the West. Thus, although this reforestation, in large part, cannot be attributed to conservation efforts, it nevertheless illustrates the magnitude of human behavioral changes that can be directed through economic forces, and suggests the types of measures that are needed to foment broad-scale change.

Climate change is a disconcerting reality. It is also an opportunity for improving stewardship of protected areas. It is an opportunity to recognize, appreciate, and work with

the dynamism of nature. It is an opportunity to move beyond assumptions of a single past condition or reference state (Pickett and Parker 1994). It is an opportunity to recognize the emerging relevance of protected areas for adaptation. It is an opportunity to work across jurisdictions, at broad regional spatial scales, and over multi-decadal time scales (Zavaleta and Chapin 2010). It is an opportunity to value, rather than discount, the future; we have the ability to forecast future climate better than any generation in history (Lemos and Rood 2010) and are obligated to respond.

Protected area networks did not exist during Marsh's time. National parks, national forests, wildlife refuges, and other protected lands were specifically established to conserve natural resources and safeguard them from the types of impacts Marsh observed and brought to the attention of society. One of the greatest contributions of today's global network of protected areas is providing the space and time for species to adapt to ongoing change, although this was not the original intent. Thus, the insights and efforts of Marsh 150 years ago are still relevant and, in fact, are contributing to today's climate change response.

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# The Alaska Lands Controversy: A Fight Bigger than the Last Frontier

## **Chance Finegan**

"LOVERS OF CONGRESSIONAL DRAMA WILL BE GLAD TO KNOW THAT WE ARE BEGINNING TODAY the revival of that great old off-Broadway production known as the 'Great Alaskan Lands Bill.' Some other titles have been suggested: 'The Great Lockup,' 'The Dig, Dam, Rape, and Plunder Bill,' and others."

With these words, Representative Morris Udall opened a 1979 hearing regarding the Alaska National Interest Lands Conservation Act (ANILCA). After nine years of debate and only after provocation by President Jimmy Carter—Congress passed the legislation in its 1980 lame-duck session. The bruising battle over ANILCA can best be understood in the context of the broader fight to define "conservation" during the 1960s and 1970s. This paper considers ANILCA's roots in Alaska's statehood and the Alaska Native Claims Settlement Act of 1971 (ANCSA) as well as the intersection of the fights over conservation and to codify subsistence rights of Alaska Natives.

Political scientist R. McGreggor Cawley (1993: 17) argues forcefully that the meaning of "conservation" changed during the 1960s. Cawley writes of Gifford Pinchot's articulation of three principles of conservation: development, prevention of waste, and use for the benefit of many. "New" conservation, according to Cawley, is the product of the preservation movement, which successfully appropriated the term "conservation."

Indeed, as Stewart Udall argued in 1962, "Each generation has to redefine it [conservation] because it has new meaning" (quoted in Cawley 1993: 24). As Udall later wrote in *The Quiet Crisis* (1963):

Today, the conservation movement finds itself turning back to ancient Indian land ideas, to the Indian understanding that we are not outside of nature, but of it. From

The George Wright Forum, vol. 32, no. 3, pp. 290-298 (2015). © 2015 The George Wright Society. All rights reserved. (No copyright is claimed for previously published material reprinted herein.) ISSN 0732-4715. Please direct all permissions requests to info@georgewright.org. this wisdom, we can learn how to conserve the best parts of our continent.... [T]he task must begin immediately and be completed within the next three decades.

Udall's comments clearly indicate his desire—and that of his allies—to redefine conservation and shift its meaning to reflect a preservationist perspective.

The conflict in the 1960s and 1970s over the definition of conservation pitted traditional, extractive users against preservationists and recreational users. Traditional users benefited from "old" conservation and disagreed with Udall's claim that conservation needed redefining. New conservationists, John Muir's intellectual children, instead articulated a vision of conservation as the protection of the resource, not its use.

Unlike the later Sagebrush Rebellion, ANILCA was more than an old-versus-new conservation fight, for Alaska Natives were drawn into the controversy as well. Many non-Natives viewed Alaska Natives as interlopers on the land; the most extreme of the new conservationists wished to see Alaska preserved as an untrammeled wilderness free from human influence, excluding Alaska Natives and non-Natives alike (Norris 2002: 76).

Fortunately, rather than quarrel over their differences Alaska Natives and new conservationists generally recognized that they both stood to benefit from ANILCA and worked together to secure its passage. As one Alaska Native wrote in a 1969 letter, "We Eskimos would like to join the Sierra Club. We have no money but lots of thoughts and collective action" (quoted in Catton 1997: 194–195). Luci Beach, executive director of the Gwich'in Steering Committee, put it even more bluntly, saying, "We've been accused of being puppets of the environmentalists, but this is our fight too. It's about saving ourselves, our way of life" (Sherwonit 2004). As we shall see, new conservationists welcomed Alaska Natives with open arms.

The relationship between old conservationists and Alaska Natives was another matter entirely. Old conservationists, particularly sportsmen, were demanding access to Alaska's fish and game resources—demands that threatened to "overwhelm" subsistence users and leave nothing for Alaska Natives (Norris 2002: 67).

The conflict between old conservationists and Alaska Natives has its roots in Alaska's statehood. When Alaska was granted statehood in 1958, Congress gave the new state the ability to "select" lands from federal holdings within it. As Morris Udall noted in *The Congressional Digest* in 1978, Alaska's land grant was on a magnitude dwarfing anything in the Lower 48:

The United States gave Alaska the largest, richest statehood land grant in history ... a whole California—104 million acres. Alaska got it right off the top, with priority selection to the best, richest lands, to mine them, to log them, to do anything they wanted with them. In contrast, my home state, Arizona, received only 10 million acres at statehood.

But the state quickly ran into conflict with Alaska Natives, for the statehood act had summarily extinguished their land claims.

Compounding Alaska Natives' displeasure with the statehood process was that many of the withdrawals included lands used by Alaska Natives for subsistence activities. Alaska Natives refused to accept these withdrawals, perceiving them as a naked land grab; in 1961 alone, Alaska Natives formally contested state selection of 75,000,000 acres (Williss 1985).

United States Senator Ernest Gruening only exacerbated their concerns when speaking of a proposed dam, saying the impact would be minimal, flooding "only a vast swamp, uninhabited except for seven small Indian villages" (quoted in Williss 1985). Gruening later told the *Tundra Times* that the dam "would flood an area about as worthless from the standpoint of human habitation as any that can be found on Earth" (quoted in Daley and James 2004: 128). Local Athabascans were indignant. One individual excoriated Gruening in the *Tundra Times* a few months later, imploring readers not to "let [him] convince you the land is worthless. It may be to him but not to Natives. He never stops long enough in the villages ... to discuss with them their land problems" (quoted in Daley and James 1994: 129).

Led by the rabidly pro-development Gruening, the state, in the view of most Alaska Natives, was selecting all the best lands for itself and was forcing Natives off Native-owned land. Out of this conflict rose ANSCA, which created various Native corporations that would hold title to native lands across the state. Together the corporations' grants totaled 40,000,000 acres of land and a \$925,500,000 settlement payment (Williss 1985). The corporations would manage the land to provide for the economic well-being of Alaska Natives. One commentator wrote at the time that the settlement amounted to "the great, final, and retributive payment for all of American history's Native claims ... not only principal, but interest as well on more than twenty decades of national guilt" (quoted in Williss 1985). Rather than force Alaska Natives onto reservations, Congress opted for a more progressive approach in creating the Native corporations.

ANSCA is not without criticism or problems. It is often attacked as cultural imperialism, for it forced Western institutions on Native communities. Indeed, placing ownership of Native land in the hands of corporations is not without significant risk, as Native corporations, like any others, are subject to taxation, default, takeovers, and other negative events that could cause the land to pass out of Native ownership (Zellen 2008).

Further, ANSCA did not explicitly protect Native subsistence rights. The conference committee convened in 1971 to reconcile the House and Senate versions of ANSCA provides the only positive affirmation of the subsistence protection Congress intended ANSCA to provide. While the committee's report unambiguously states that, "the conference committee expects both the Secretary [of the Interior] and the state to take any action necessary to protect the subsistence needs of the Natives," this expectation was not written into the law. Because it was not in the law proper, it was easy for officials to overlook. The failure of both Department of the Interior and Alaskan state officials to adequately protect subsistence rights ensured that Alaska Natives would agitate for changes to ANSCA.

ANCSA did, however, contain a small section with potentially enormous consequences. Section 17d(2) authorized the secretary of the interior to withdraw up to 80,000,000 acres of unreserved public lands for study as possible additions to the national conservation system. The secretary then had two years to make any recommendations regarding these lands to Congress, which had five years thereafter to act on the recommendations. Afterwards, any lands not added to the national conservation system would revert back to "unreserved" status, able to be selected by the state or by Native corporations. It is against this timeline that old and new conservationists, along with Alaska Natives, debated ANILCA.

The ANILCA debate featured everything needed for political drama—protests, raucous hearings, politicians hanged in effigy, and arson. It was a legislative battle on a massive scale, with most non-Native Alaskans joining forces to defend old-conservation values against outsiders sympathetic to a new definition of conservation.

In a 1972 comment in the Anchorage newspaper, one Alaskan likened the fight over ANILCA to Pearl Harbor, saying "I feel the same way I did on December 8, 1941.... [W]e're in for an awful battle and there'll be a lot of blood-letting." In the same issue, another Alaskan simply called early ANILCA proposals "premeditated assaults on Alaska's sovereign rights." Senator Gruening wrote in the *New York Times* (January 14, 1974) that outsiders sought to "convert Alaska into a combination of wilderness and zoo." In southeast Alaska, a National Park Service (NPS) ranger wrote to his supervisor that "a threat against our [park staff's] lives drew applause" (quoted in Allen 2010: 176). Later, an NPS airplane was set on fire as it sat at the local airstrip.

These comments and tactics are reminiscent of those made in another of the great fights between old and new conservation—the Sagebrush Rebellion of the late 1970s and early 1980s, in which Westerners clamored for federal lands in the West to be conveyed to the states. The rhetoric, protests, and other tactics used by the Sagebrush Rebels—representative of old conservation—mirror those used by Alaskans opposed to ANILCA.

ANILCA was frequently touted by new conservationists as "America's final opportunity to get it right the first time" with respect to land conservation; during the ANILCA debate, the Sierra Club titled one of its statements before Congress "Alaska: The Last Great First Chance" (Wayburn 1977). President Carter (1980) alluded to this sentiment at ANILCA's signing ceremony, saying, "We Americans have a history of viewing the environment as wilderness ... that must be conquered."

This language underscores how the meaning of conservation was changing. Surely Pinchot would have taken issue with the implicit statement that America did not "get it right the first time" by establishing the US Forest Service. President Theodore Roosevelt would undoubtedly have been equally put out—arguing that he "got it right the first time" by promoting a multiple-use agenda.

Although the language used in the ANILCA debate is similar to that seen in other land management conflicts, ANILCA's alliance between new conservationists and Alaska Natives, along with its stunning magnitude, set it apart from other conservation battles. Overnight, the national park system and the national wildlife refuge system would more than double in size. The national wild and scenic river system would swell to almost twice its size, with twenty-five additions. The national wilderness preservation system would triple in acreage with a stroke of President Carter's pen. In all, ANILCA permanently protected well over 100,000,000 acres—almost the size of Italy and Greece combined. Old conservationists simply could not afford to lose this battle. It was too big, too important, too all-encompassing.

Just two days before the d(2) land withdrawals were due to Congress, Interior Secretary Rogers C.B. Morton submitted them, withdrawing the maximum acreage allowed. Howls of

rage came swiftly. The *Anchorage Daily Times* editorialized (March 16, 1972) that, "Alaskans of the future may just be a collective glob of zoo-keepers. And the Sierra Club will cheer." A resident of the Wrangell-St. Elias Mountains similarly protested that "[t]he real Alaskan and real American will never use this place" (Defenderfer and Walkinshaw 1981: 60).

The comment about "the real Alaskan" never using this place demonstrates how old conservation as applied in Alaska largely ignored the needs of Alaska Natives. Alaska Natives—the original "real Alaskans"—had been using Alaska's resources in a sustainably consumptive, subsistence manner for generations. ANILCA would codify such use on the federal level and provide for its protection in perpetuity. For the first time, Alaska Natives would have guaranteed rights to access public lands and use them just as they had for generations.

New conservationists staunchly defended subsistence rights, for various reasons. Some environmentalists viewed subsistence hunting as a natural part of the ecosystem. Others viewed support for subsistence as a political tool to further the cause of creating new parklands in Alaska, arguing that "giving ground on subsistence hunting ... gave greater moral authority to take a firm stand against sport hunting" (Catton 1997: 209–210). For its part, the Wilderness Society, in a statement before Congress, made new conservation nearly indistinguishable from the Native position when the society's Alaska representative pointedly said, "We are going to the wall on this question. It is extremely important that it [subsistence] be protected" (Catton 1997: 210). Native Americans played little-to-no role in the Sagebrush Rebellion, but in the ANILCA controversy, Native rights were front-and-center.

After considering the subsistence rights proposal in 1979, the Senate Committee on Energy and Natural Resources lent its support to the idea and emphasized what its House counterpart had written the year before, when it stated in a report that:

The committee is convinced that developments since 1971 have combined to create a new situation requiring positive Congressional action to protect both renewable resources of the public lands in Alaska and the well-being of Alaska Natives and other persons who depend upon subsistence uses on such lands (p. 183).

Reflective of Congress' frustration with the efforts of the secretary of the interior and Alaska to protect subsistence rights under ANSCA, this statement goes beyond mere disapproval. Congress' inclusion of subsistence rights and linkage of those rights to "protecting renewable resources" has far-reaching implications. Not only does new conservation preempt the Pinchot-era idea of sustainable resource extraction, it goes so far in the opposite direction as to designate certain people (here, Alaska Natives and "rural residents") as deserving special protection.

Native Alaskans therefore represent another part of the new meaning of conservation the idea that sustainably consumptive, subsistence use of a resource is acceptable and takes precedence over other uses (e.g., sport hunting). This is vastly different than the system of conservation Roosevelt and Pinchot envisioned and is not a matter of interpretation; rather, such a priority is written into ANILCA itself, which reads, in part, that "it is necessary for the Congress ... to protect and provide the opportunity for continued subsistence uses on the public lands by Native and non-Native rural residents." Congress thus established a priority order for public land use in Alaska. If managers must restrict the harvest of fish or game, ANILCA compels the restriction of all consumptive, non-subsistence uses before restricting subsistence use. ANILCA allows restriction of subsistence use only if it is absolutely necessary to protect a specific population and only after all other uses have been eliminated, establishing what is widely known as "the subsistence priority."

It is not difficult to see the threat that this represents to old conservation, which postulates that everyone, and consequently all uses, should be accommodated as much as possible. As Representative Wayne Aspinall said in the early 1960s, conservation means "developing them [natural resources] for the best use of the people as a whole" (quoted in Cawley 1991: 25). The subsistence priority is certainly not concerned with "the people as a whole." Rather, the subsistence priority is concerned with protecting natural resources first for a select group of people.

Ironically, it was not until after ANILCA's passage that old conservationists realized the full impact of the "unholy" subsistence priority (Sherwonit 2004), which has been litigated for decades. Tribal scholar and Bureau of Indian Affairs official Karen Atkinson (1987) writes:

Many do not understand why fifteen percent of Alaska's population has exclusive access to a disproportionate share of ... wildlife resources. Many non-Natives question the validity of such a priority. They question whether a subsistence priority is necessary.

Literally dozens of lawsuits, reaching to both the Alaska and United States supreme courts, have been heard by the courts since ANILCA; the legal wrangling over it continues to this day.

ANILCA, therefore, represents a defining moment in the conflict between those who sought to maintain conservation's old definition, which as Aspinall put it, "means we do not waste; however, it does not mean we save merely for the sake of saving," and those who sought to reshape the meaning of conservation into something more resembling Muir's vision of resource preservation (Cawley 1993: 25). The rhetoric employed by individuals aligned on both sides of the policy debate over ANILCA reflects the debate over the proper definition of conservation; it is strikingly similar to that of the Sagebrush Rebellion. Further, ANILCA's subsistence priority is a frontal assault on the traditional definition of conservation, as it is exclusionary rather than inclusionary in nature.

While Congress dithered over ANILCA's details, time was running out, for ANSCA dictated a strict timeline for congressional action. When, in 1978, it looked like old conservationists had succeeded in delaying ANILCA to death, President Carter sent a bolt of lightning down Pennsylvania Avenue to Capitol Hill by using his authority under the Antiquities Act of 1906 to proclaim a whole set of national monuments that, when combined, covered *one-third* of Alaska's landmass.

Alaska was beside itself. The tundra crackled with hostility towards Washington, presaging the 1979 Sagebrush Rebellion and giving perfect voice to the strident chorus of those who were resisting the redefinition of conservation. Consider this city council resolution from Eagle, Alaska (Allen 2010: 129):

The city council of the City of Eagle, Alaska does not advocate violence, but we can no more be responsible for the actions of an individual citizen than we can be for any animal when it is cornered.

Tim Jacobsen, a miner who worked inside of the newly proclaimed Wrangell-St. Elias National Monument, spoke for many Alaskans when he said:

Christ, they [the Park Service] have 400 years to drive you out and they'll keep their same salary as they fine you and delay you and permit you to death. They have total power—they can keep you in court forever. If they want to close you down, they'll do it. The Park Service is anti-mining and I look at them as an adversary (Defenderfer and Walkinshaw 1981: 30).

The language used here is instructive. "Anti-mining" certainly would never be used to describe old conservation and "adversary" clearly points to the ongoing conflict over conservation's definition.

Large, well-publicized, organized acts of civil disobedience took place across the state. In the waning months of 1979, the Real Alaska Coalition telegrammed Washington, D.C. with a simple message: the coalition was sponsoring an illegal sheep hunt in the Wrangell Mountains; if the NPS wanted to stop them, they would be happy to provide the agency with directions to the hunting camp for a showdown (Bleakley 2002: 125). NPS more or less gave up on law enforcement for the 1979 season, with a spokesperson simply telling the Fairbanks *Daily News-Miner*, "We're just not out there hiding behind every rock waiting to catch someone doing something illegal" (Lewis 1979). For the time being, new conservation had yet to take hold in Alaska.

The situation in Glennallen, a gateway community to the new Wrangell-St. Elias National Monument, was no better. When NPS officials arrived, it was made apparent that they "were not welcome," in the words of Robert Teich, a local business owner (Matthews 1979). Another business owner put it even more bluntly, saying, "I hope they leave peacefully, because what they are representing is not accepted.... [I]f they take it personal, it's their misinterpretation."

This sort of "misinterpretation" must have happened quite frequently in Glennallen the first summer after the proclamations. Park rangers received bomb threats, were evicted from their hotel rooms, and attended meetings where threats against their lives were followed with applause (Allen 2010). In the small village of McCarthy, wholly surrounded by the new monument, it was even more difficult to "misinterpret" the local populace's feelings about the matter, for someone took a bulldozer to a hillside and carved "SIERRA CLUB GO TO HELL" on a mountainside (Allen 2010: 160).

Meanwhile, accusations of "Vietnam-style tactics" on the part of the Park Service began to fly in the national media. Hank Rust, who owned an air-taxi service in the area, told the *Wall Street Journal* that "They [park rangers] use helicopters in assault-type tactics and come into camps wearing flak jackets and packing riot guns.... [T]hey are about as un-American as you can get" (James 1980). Indeed, the Park Service did use helicopters; an Interior Department helicopter was "turned away from a camp at gun-point" during the summer after the proclamations (Allen 2010: 149). Everything came to a head in the fall of 1979, when "an individual [in Glennallen] known to be friendly to rangers" was assaulted, and the Park Service's airplane was set ablaze as it set on the tarmac in an apparent arson attack (Williss 1985). Elsewhere in the state, President Carter was burned in effigy (Egan 2000).

The controversy that engulfed Alaska mirrored the national debate over the meaning of conservation. Advocates of old conservation, namely local residents accustomed to generally unrestricted access to public lands, abhorred attempts by organizations such as the Sierra Club to redefine conservation. ANILCA can be interpreted much the same—as part of the larger fight during the 1960s and 1970s over the meaning of conservation.

Where ANILCA differs from other incidents in this fight is its gargantuan scale and inclusion of Alaska Natives. ANILCA placed 100,000,000 acres into the national conservation system and provided federal protection of subsistence rights for rural Alaskans. Indeed, ANILCA did more than simply redefine old conservation for a large portion of Alaska—it repudiated it. Conservation, as articulated by Aspinall, is the management of resources for everyone's benefit. ANILCA turned this on its head: it established priority rights for rural Alaskans and created a system through which those individuals are the congressionally designated primary beneficiaries of Alaska's fish and game resources.

The protests in Alaska encapsulate the overarching debate of the 1960s and 1970s regarding the meaning of conservation. Further, the rhetoric used by individuals aligned on both sides of the battle as well as the tactics presaged the next great showdown between old and new conservation—the Sagebrush Rebellion.

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# Visitor Perceptions of Roadside Bear Viewing and Management in Yellowstone National Park

## Leslie Richardson, Kerry Gunther, Tatjana Rosen, and Chuck Schwartz

VIEWING BOTH GRIZZLY BEARS (Ursus arctos) and American black bears (Ursus americanus) along roadside habitats has long been a popular recreation activity enjoyed by visitors to Yellowstone National Park (YNP). Both the nature of this activity, as well as the management of bears using park road corridors, have evolved significantly over the last century. For instance, while it was common by the 1920s for black bears to beg for human food on the roadsides (Schullery 1992), large numbers of visitors observing and interacting with human-habituated and food-conditioned bears led to a high incidence of human injuries and property damage from bears through the 1960s (Haroldson and Gunther 2013). This led to an evolution in bear management within YNP, which started somewhat informally from the park's creation in 1872 through the 1950s, with overly troublesome bears removed as necessary on a case-bycase basis (Gunther 1994). By 1960, a more formal National Park Service bear management program was implemented, aimed at reducing bear-caused human injuries and property damage, and re-establishing bears in a more natural state (National Park Service 1960; Gunther 1994). In 1970 a new, more intensive bear management program was initiated (Leopold et al. 1969). The number of bear-human conflicts within YNP declined significantly in the following years, with a large portion of the decline coming from reduced black bear-caused injuries on roadsides (Gunther 1994). While this outcome was due in part to changes in policies and regulations, it required a monumental shift in visitor attitudes and habits, altering the way visitors perceived bears and their role in Yellowstone (Wondrak Biel 2006).

Today, rather than relocating or hazing habituated bears along park roadways, YNP management focuses on managing people viewing roadside bears. This informal adaptive management strategy began in the early 1990s in an effort to reduce the number of bears being removed along park roads, as well as to allow the bears to continue using high-quality roadside habitat (Gunther and Biel 1999). Under this current management strategy, visitors

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have the opportunity to view bears foraging on naturally occurring foods along roadways (Haroldson and Gunther 2013). Indeed, the number of traffic jams on YNP's roads due to drivers stopping to view bears, referred to as "bear jams," has grown exponentially over the last few decades (Gunther and Wyman 2008) and is expected to remain at current levels or increase in the future (Haroldson and Gunther 2013). While existing data collected by YNP can be used to show trends in bear jams and other impacts of the current management policy, little is known about how visitors perceive roadside bear management policy in YNP. To better understand visitors' behavior and perceptions regarding the recreational activity of bear viewing and various aspects of bear management within YNP, a visitor survey was conducted in the summer of 2009. The remainder of this article discusses survey design and data collection, and presents the results.

## Survey design and data collection

A visitor survey was developed in the summer of 2008 as a collaborative effort between a team of interdisciplinary scientists at the Yale School of Forestry and Environmental Studies, the National Park Service, and the US Geological Survey. The survey was designed to capture a wide range of information on visitor behavior and opinions related to bear viewing in YNP. The survey instrument was split into seven sections, each with a different focus, and survey questions were developed based on discussions with scientists at YNP's Bear Management Office, the US Geological Survey's Interagency Grizzly Bear Study Team, and the US Geological Survey's Fort Collins Science Center.

In collaboration with park staff, four types of visitor intercept locations that reflected the variety of visitor types to YNP were identified. These included visitor centers, restaurants, trailheads, and road pullouts. Specific intercept sites included Canyon Visitor Center, the "old" Old Faithful Visitor Center, Tower Fall general store and restaurant, Albright Visitor Center at Mammoth, Hayden Valley road pullouts and trailheads, Fishing Bridge road pullouts and trailheads, and Lamar Valley road pullouts and trailheads. To capture YNP's primary bear viewing season, surveys were administered from May through September of 2009. Sampling occurred over 12 weekdays, balanced across the days of the week, and eight weekend days. At each survey location, every third visitor, 18 years and older, was intercepted while exiting. A mail-back survey method was used; visitors who agreed to participate in the study were asked their name and contact information and were given a cover letter, the survey packet, and a postage-paid return envelope. In sum, 70 visitors refused to take the survey, 978 visitors agreed to take the survey, and 663 visitors mailed the survey back, for an overall response rate of 63.3% when taking the initial refusals into account, and a response rate of 67.8% to the mailed survey. This is a high response rate considering the length of the survey (eight pages) and the lack of an incentive to complete it. Various demographic statistics for survey respondents are shown in Table 1.

## The role of bear viewing in visitation

Visitors coming to YNP in the summer months participate in a wide variety of activities. Survey respondents were presented with a list of activities and asked to identify all that they

Table 1. Demographics of survey respondents.					
Demographic Statistic	Demographic         Percentage of         Demographic           Statistic         Respondents         Statistic		Percentage of Respondents		
Gender (n=658)		Education (n=659)			
Male	51%	Some high school	1%		
Female	49%	High school diploma/GED	4%		
Age (n=660)		Some college	30%		
18-20 years	2%	Bachelor's degree	30%		
21-35 years	20%	Graduate degree	35%		
36-50 years	31%	Household income (n=645)			
51–65 years	35%	Less than \$25,000	7%		
65 years and above	12%	\$25,000-\$49,999	16%		
Employment Status (n=657)		\$50,000-\$99,999	29%		
Employed (full-time or part-time)	77%	\$100,000-\$149,999	28%		
Retired	20%	\$150,000 or greater	20%		
Unemployed	3%				
Residence (n=660)					
United States	97%				
Other	3%				

participated in on their most recent trip to YNP. The results of this question reveal that a majority of all respondents participated in geyser viewing (97%); sightseeing (88%); viewing of any wildlife, including bears (81%); and bear viewing specifically (55%) (Figure 1).

To gather additional information about the importance of various activities and natural resources in visitors' decisions to take trips to YNP throughout the year, survey respondents were asked to rate each activity from Figure 1 on a four-point scale ranging from "Not at all important" to "Very important." Regarding bear viewing, 62% of respondents indicated that viewing bears is very important in their decision to take trips to YNP throughout the year, while 24% reported that it is moderately important, and 13% reported that it is somewhat important. Respondents were then presented with a list of 21 different mammals and birds and asked to select the top five that they would most like to see on their trips to YNP. Bears ranked the highest, with 81% of respondents listing them as one of the top five they would most like to see.

Respondents were also asked to indicate their preference regarding the type of bear-viewing experience they would prefer in terms of distance from the animal and number of other viewers (Figure 2). Nearly half (46%) of all respondents indicated that the habituation or wariness of a bear does not matter when they see a bear. Around 16% of respondents indi-



Figure 1. Activities participated in during respondents' most recent trip to YNP.



Figure 2. Survey respondents' preferences toward a specific type of bear-viewing experience.

cated that they would prefer to see a habituated bear up close involved in natural activities surrounded by a large number of people, whereas 19% indicated that they would prefer to see a wary bear far away with a spotting scope with fewer other people watching, and 19% had no opinion.

When presented with the option to see either a black or grizzly bear, 35% of all respondents indicated that they would prefer to see a grizzly bear, 5% would prefer to see a black bear, and 60% had no preference between the two. When asked about their experiences seeing bears, 68% of people reported that they had previously observed a bear in YNP and 67% saw a bear on their most recent trip to YNP.

## Perceptions towards management practices and bear viewing

To better understand the acceptability of different management practices for roadside bear viewing in YNP, survey respondents were first informed of the park's historical and current policies regarding roadside bears, as well as some of the issues associated with this policy. A portion of this text follows:

Yellowstone National Park policy is now "to manage human behavior" when "bear jams" develop and not to remove bears from roadside habitat (a "bear jam" is an expression used to describe traffic jams that occur "when the parked vehicles of people watching bears obstruct traffic"). Currently there are more "bear jams" than park rangers to manage them. This is a concern for visitor safety and a strain on existing park personnel.

Respondents were presented with several possible management techniques and asked to indicate the level at which each of the methods is acceptable to them (Table 2). The majority of survey respondents believe that YNP's current policy of allowing bears to occupy roadside habitats is either generally acceptable or very acceptable. The more extreme management options, such as trapping bears for the purpose of removing them from the population, are not acceptable to the majority of respondents.

Respondents were then presented with a chart asking them to indicate "Yes," "No," or "No opinion" to a series of questions related to bear viewing in YNP (Table 3). Results show that over half of all respondents (59%) do not think that radio collars or other tagging detracts from their bear-viewing experience, and over half (63%) agreed that knowing about the benefits of radio collars and tagging makes these practices more acceptable to them. Though 51% of respondents did not agree that YNP needs more staff to manage roadside bear viewing, a substantial percentage (44%) did agree with that statement. In addition, 51% of respondents

Management Option	Not acceptable	Somewhat acceptable	Generally acceptable	Very acceptable	No opinion	N*
Acceptability of allowing bears to occupy roadside habitat	2.9%	9.8%	30.6%	56.0%	0.8%	663
Acceptability of discouraging bears from using roadside habitat by means of aversive conditioning (give a pain stimulus to the bear so that the bear associates the location with pain)	67.1%	15.2%	13.5%	3.2%	1.1%	653
Acceptability of discouraging bears from using roadside habitat by means of trapping and relocating (with low success)	42.0%	49.7%	6.3%	2.0%	0.0%	650
Acceptability of discouraging bears from using roadside habitat by means of trapping for purposes of removing the bear from the population (euthanizing)	99.1%	0.0%	0.6%	0.3%	0.0%	654

 Table 2. Acceptability of alternative roadside bear-viewing management practices in Yellowstone

 National Park.

\*Not all respondents provided responses for each management option

Question	Yes	No	No opinion	N*
Do radio collars or other tagging on the bear detract from your viewing experience?	18%	59%	23%	660
Radio-collaring and tagging bears is critical to acquiring information on bears' health, needs and movement patterns: does knowing about the benefits of radio collars and tagging make them acceptable to you?	63%	28%	9%	661
Do you think YNP needs more staff to manage roadside bear viewing?	44%	51%	4%	663
Do you feel unsafe when watching bears on roadsides?	20%	74%	6%	663
Do you think park rangers should provide more information on roadside locations where sightings of bears may be more common?	51%	36%	13%	651
Are glimpses of wary bears running across a meadow for tree cover as satisfying as watching a habituated bear forage next to a road?	74%	23%	3%	663
Do you value bears more because of roadside bear viewing opportunities?	52%	43%	5%	663
Does roadside bear viewing inspire you to accept bear conservation?	37%	59%	4%	662
Does roadside bear viewing inspire you to accept habitat protection?	66%	15%	19%	649
Does roadside bear viewing inspire you to accept some limits on development and recreation to protect bears?	62%	31%	7%	644

\*Not all respondents provided responses for each question

 Table 3. Perceptions of various bear-viewing scenarios in Yellowstone National Park.

think that YNP rangers should provide more information on roadside locations where sightings of bears may be more common. Slightly more than half (52%) of all respondents reported that they value bears more because of roadside viewing opportunities, 66% feel that roadside bear viewing inspires them to accept habitat protection, and 62% feel that roadside bear viewing inspires them to accept some limits on development and recreation to protect bears.

## The influence of roadside bear viewing on intended visitation

Rather than relying only on professional judgment to determine how visitation might change with a management decision, survey instruments can be used to directly ask visitors how they would respond. This approach, referred to as contingent visitation or contingent behavior, allows agencies to augment professional judgment about potential changes in visitation with responses of the visitors themselves (Loomis and Caughlan 2004b). This technique has been used in past park surveys to estimate the percentage of YNP visitation attributable to wolves (Duffield et al. 2006), as well as to estimate changes in visitation associated with various elk and bison management strategies in Grand Teton National Park (Loomis and Caughlan 2004a, 2004b). In our 2009 visitor survey, respondents were first asked to report the number of trips made to YNP in the last year, and were then presented with the following question: Would your decision to visit Yellowstone National Park change if bears were no longer allowed to stay along roadside habitats?

Respondents who answered "Yes" to this question were then asked to report the number of additional or fewer annual trips they would take. Results show that 2% of respondents would take more trips throughout the year, while 10% reported that they would take fewer trips throughout the year. Additional information regarding the economic impacts of changes in visitation based on these results can be found in Richardson et al. (2014). To examine the characteristics of those respondents who reported that they would take fewer trips to YNP throughout the year if bears were no longer allowed to stay along roadside habitats, a logistic regression model was used, with a binary dependent variable taking on a value of 1 if the respondent reported that they would take fewer trips, and 0 otherwise. The results of two models, Model 1, which includes all independent variables hypothesized to influence the dependent variable, and Model 2, which includes only those variables that had a statistically significant effect on the probability that an individual would take fewer trips throughout the year, are shown in Table 4. All variables refer to the respondents' most recent trip to YNP unless otherwise stated.

The model results from Table 3 demonstrate that respondents who participated in viewing of wildlife other than bears on their most recent trip to YNP are more likely to report that they would take fewer trips to YNP throughout the year if bears were no longer allowed to stay along roadside habitats, all else constant, and this variable is significant at the 1% level. The number of trips taken to YNP in the last year also has a positive and statistically significant effect on the probability that a respondent would take fewer trips to YNP throughout the year. Individuals who saw a bear on their most recent trip to YNP were more likely to report that they would take fewer annual trips to YNP, and finally, as the income of a respondent

	Model 1		Model 2	
Variable	Coefficient	Std. Error	Coefficient	Std. Erro
Participated in viewing wildlife other than bears (1 if yes, 0 if no)	1.226***	0.377	1.247***	0.374
Number of trips to YNP in last 12 months	0.131*	0.070	0.135**	0.070
Ever observed a bear in YNP (1 if yes, 0 if no)	0.433	0.321		
Saw a bear on this trip to YNP (1 if yes, 0 if no)	0.587*	0.335	0.590*	0.330
Gender (1 if male, 0 if female)	-0.071	0.285		
Age	0.008	0.011		
Education	0.041	0.068		
Currently employed (1 if full or part time, 0 if retired or unemployed)	0.346	0.238		
Live in the United States (1 if yes, 0 if no)	-0.131	0.781		
Income	0.000005***	0.000	0.000006***	0.000
Constant	-5.375***	1.190	-4.431***	0.534
	N = 634		0.590* 0.000006*** -4.431*** N = 644 LR chi2 (4) = 27	
	LR chi2 (10) = 30.72		LR chi2 (4) = 27.51	
	Prob > chi2 = 0.0007 Prob > chi2 = 0.0		.0000	

 
 Table 4. Logistic regression of the decision to take fewer annual trips to YNP if bears were no longer allowed to stay along roadside habitats.

\*: p<0.10, \*\*: p<0.05, \*\*\*: p<0.01

increases, so does the likelihood that they would take fewer trips to YNP if bears were no longer allowed to occupy roadside habitats.

## Discussion

The recreational activity and experience of roadside bear viewing in YNP has changed significantly over the last century. Conducting periodic visitor surveys can help managers better understand the demand for various recreational activities within national parks, and help them systematically identify the range of visitor perceptions and opinions associated with different management practices. Surveys can also help to inform visitors about park policies, and the opportunities and challenges associated with them. Results of this 2009 visitor survey demonstrate that wildlife viewing in general and bear viewing in particular are popular recreation activities in YNP. Park visitors place a high economic value on bear-viewing opportunities (Richardson et al. 2014). The majority of survey respondents believe that YNP's current policy of allowing bears to occupy roadside habitats is either generally acceptable or very acceptable, while the more extreme management options, such as euthanizing roadside bears, are not acceptable to the majority of respondents. Responses to a contingent visitation question indicate that some visitors would change the number of trips taken to YNP throughout the year if bears were no longer allowed to stay along roadside habitats. Future surveys can be used to better understand the role of roadside bears in YNP and continue to help managers obtain feedback from visitors on various aspects of park management and policy.

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## The Role of Universities in Protected Area Management: Considerations for the Future

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## Introduction

IN NOVEMBER 2014, the International Union for the Conservation of Nature (IUCN) convened the sixth-ever World Parks Congress, a global forum about conservation, management, and development of protected areas around the planet. As an event which occurs only once every 10 years, it is a considered a seminal occasion that brings together thousands of individuals from all types of institutions (e.g., government, nongovernmental organization [NGO], private sector), roles (e.g., ministry official, NGO director, herder, fisherman) and areas around the globe to engage in discourse and learning about local actions that address pressing global issues affecting protected areas. It is a pivotal forum in which information and lessons learned over the past decade, typically at a local or regional scale, can feed into a bigger picture of conservation.

In the United States, 2015 represents the 125th anniversary of the Morrill Act, the second of two bills of that name passed in the late 1800s which gave grounding and support to establish land grant and agricultural academic institutions. These institutions were mandated to integrate agriculture and mechanic arts in their teaching and research, and, from that, other land-focused disciplines emerged within the same institutions over time (e.g., natural resources management). In the 1890 Morrill Act, the United States Congress extended funding for development of additional land grant institutions focused primarily in the southern part of the country. Today, land grant universities, some more than 200 years old, are institutions in which teaching, research, and service related to protected areas is arguably most relevant in higher education in the United States.

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In 2016, the United States will commemorate the centennial anniversary of its National Park Service (NPS), the second-ever such agency in the world situated at a national level of government (Parks Canada, founded in 1911, was the first). The National Park Service manages over 400 units across the country for a variety of cultural, historical, and ecological values, and many are recognized around the globe—Yellowstone, Grand Canyon, and Yosemite national parks, for example. Of all the responsibilities of the federal government, management of national parks is arguably among the most cherished by residents of the United States.

Thus, the United States is preparing for the 100th anniversary of the National Park Service in the year following the 150th anniversary of legislation that established land grant institutions that are imperative to the training of protected area managers and research. And, shortly before thousands of people from around the world convened in Sydney to discuss bigger-picture issues around protected area management, we convened a group of individuals from universities and protected areas to address how universities can continue to support protected areas effectively into the future.

Levitt's (2014) *Conservation Catalysts: The Academy as Nature's Agent* highlights how universities and colleges have aided in large landscape-scale conservation. The purpose of this paper is to keep this conversation going and look for ways to improve how and what we are doing as national parks enter their second century. We ask: What have we learned about how universities and protected areas can support one another with their respective missions? What might that support look like into the future, given today's challenges, including bio-diversity loss and climate change, which create tremendous uncertainty for protected area managers?

We began this discussion in Sydney at the World Parks Congress with approximately 50 international participants, and also reviewed relevant literature about the topic, and continued to deliberate about it months afterward. Subsequently, we facilitated a second conversation at the George Wright Society Conference in April 2015 with approximately 25 land managers and academics (largely US-based), examining specific opportunities for improving the role of universities and potential barriers to enabling the fruition of these concepts. The George Wright Society Conference convenes over 700 managers and scientists from parks and protected areas alongside researchers from academic institutions to facilitate an interdisciplinary forum to discuss the status of protected area research and management.

#### Principles and suggestions for good partnerships

Based on the results of comparative, thematic content analysis (Creswell 2007) on the discussion data from the World Parks Congress and George Wright Society Conference, and through a study of prior literature, we have compiled principles and suggestions for the role of universities in protected area management now and for the future. Furthermore, we searched for and researched examples that illustrate each of these principles, highlighting the types of roles universities have and can have with protected areas. Many of these principles have been at the heart of university protected area work already, and their inclusion here represents the endurance of those principles over time, as we believe they will continue to be important into the future. Other principles are more recent, demonstrating how universities can support protected areas, which we hope will stimulate additional discussion and brainstorming.

## Universities can provide diverse research expertise that informs decision-making

Universities are uniquely resourced in that they have disciplinary experts and future land stewards (i.e., students) who can lead inquiry to provide scientific approaches and knowledge needed to untangle complex socioecological challenges. Universities have biologists, sociologists, ecologists, anthropologists, historians, and dozens more experts, typically sharing the same physical campus where they have the opportunity to collaborate to address the research needs and management challenges in protected areas. The refrain that our natural resource issues, including those in protected areas, need interdisciplinary approaches is widely accepted. University researchers must remember this unique opportunity they have, take advantage of it to address our natural resource challenges, and leverage the capacity of students to help address these issues.

Cooperative Ecosystem Studies Units (CESUs; http://www.cesu.psu.edu) are consortiums of federal and local government agencies, NGOs, and academic institutions that facilitate and provide a mechanism for collaborative problem-solving. CESUs help facilitate research-based partnerships between protected areas and universities, as well as provide resources for university partners to collaboratively explore and inform current challenges, and train the next generation of scientists and leaders.

For example, recently, a 10-year CESU-affiliated collaboration between the NPS Natural Sounds and Night Sky Program and the Park Studies Unit at Penn State University was given the National Network Award by the CESU Network. At the university, protected areas researchers created the Natural Sounds Working Group, comprising experts from the College of Engineering, College of Health and Human Development, College of Arts and Architecture, and College of Liberal Arts. This group facilitated experts from medicine, psychology, physics/acoustics, recreation and park management, philosophy, ecology, and bio-behavioral health to conduct studies examining the interaction between acoustic energy and humans, with the focus on national park soundscapes. This partnership, and collaborative teams like it, can help NPS think through complex issues and provide data to managers in the field making tough decisions.

#### Universities can anchor long-term ecological research for protected areas

Universities can serve as a steady source for consistent and ongoing long-term research at protected areas. The Long Term Ecological Research (LTER) Network, started by the National Science Foundation in 1980, is one such example of universities collaborating with protected areas to conduct multi-decade research and monitoring.

For example, in the United States, the Harvard Forest (a parcel of land as well as a team of experts hosted at Harvard University since 1907 and supported by the LTER Network) is home to a team of researchers from universities across New England who pursue social–ecological research in conjunction with undergraduate and graduate students participating in summer internships, master's degrees, and PhD programs. One of their most innovative initiatives is the Wildlands and Woodlands Vision, a program aimed at conserving 70% of New England's forests from development, with an emphasis on long-term monitoring of the conserved protected areas. This model of research and outreach has proven particularly relevant in a region where much of the land is privately owned, requiring protected area managers, land trusts, and universities to collaborate with landowners to integrate science and management to appropriately monitor land change over multiple generations (Foster et al. 2014).

A similar model of collaborative research has been adopted by the James Hutton Institute and Cairngorms National Park in Scotland (Blackstock et al. 2011), where researchers specifically work with the park and associated stakeholders to provide meaningful, cooperative results. Furthermore, new partnerships between the University of the Highlands and Islands in Scotland, the United Kingdom Environmental Change Network, Centre for Ecology and Hydrology, the James Hutton Institute, and Scottish Natural Heritage recently resulted in a memorandum of understanding, creating the first long-term social–ecological research platform (LTSER) in the United Kingdom, through Cairngorms National Park. This initiative will foster holistic, interdisciplinary research approaches that can better inform park management and regional conservation efforts.

## Universities can be objective third-party thought leaders for protected areas

Universities have a unique opportunity to challenge the status quo by providing an objective critique regarding socioecological health. Parks and protected area managers make decisions in a politically charged environment whether they are confronting issues of wildfire or climate change. Decisions can be swayed by science but also by political pressures in cases where agencies seek funding from a legislative body with a political agenda. Universities should have (and protect) academic freedom, and therefore they have the opportunity to play a role in objective data gathering and analysis, and help in decisions where controversy can be fueled by perceptions of the public or by political leaders with differing views. Furthermore, universities should provide a policy-related curriculum that enables future scholars and land managers to develop research that can objectively inform policy (Clark 2001).

Government officials in Florida were recently in the US national news for allegedly banning the use of terms such as "climate change," "global warming," and "sea-level rise" to limit associated political controversies (Korten 2015). In response, long-time climate researchers at the University of Miami's Department of Geologic Sciences and their colleagues, with extensive research relationships with NPS and other federal agencies, were willing to speak out publicly against the abolition of such terms. It is imperative that academics with this level of expertise in a given area, such as climate change science, be willing to stand behind sound research, to provide guidance without being swayed by political pressures.

Another example of proactive use of resources and research around this controversial topic is the recent publication addressing climate change resilience, collaboratively developed by academic units at Wageningen University in the Netherlands, the IUCN Regional Office of West Asia, and various other regional partners. The toolkit discusses the challenges associated with, and suggested strategies for, mitigating climate change through practical plans and policies that can be adopted across local and national levels (IUCN 2014). Collaborative

publications such as this extend beyond the controversies surrounding climate change, by providing practical, scientifically driven suggestions for mitigating associated impacts.

## Universities should prepare managers to address contemporary challenges

To address contemporary protected area challenges, universities should prepare future protected area managers with the necessary suite of skills and knowledge, including traditional biological and ecological sciences as well as disciplines related to communication, conflict, planning, and leadership. Many, if not all, of the biological and ecological challenges in protected areas have a social aspect to them, whether it be part of the greater context of the issue, the cause of the issue, or a combination of both. Consequently, preparing students to address challenges and issues in protected areas requires more than biological and ecological competencies. They must know how to facilitate processes with stakeholders, communicate science to non-science audiences, and understand the social–ecological map of an issue. They must have the skills to mobilize people to do something different, and translate a bigger vision of ideal conditions into day-to-day activities.

As a result, universities should train students to be equipped to communicate and collaborate across disciplines and across cultures. Students should be well versed in other languages and cultural norms, and should evaluate case studies from both local and global perspectives. Universities should provide opportunities for testing new methodologies, technologies, and adaptive management strategies that incorporate systems-wide inclusivity. Finally, universities must foster teaching, associated research, and outreach that applies these tested best-practice adaptive monitoring and management tools.

In addition, many universities with conservation programs are geographically and strategically situated to implement field-based experiential approaches for teaching the diverse skills needed for effective protected area management. Some institutions even have their own protected areas, and others are located in close proximity to areas with natural, cultural, and/ or historic significance. Universities should take these opportunities to integrate nearby protected areas in instruction.

At Colorado State University, the Conservation Leadership through Learning (CLTL) master's program teaches students about conservation and protected area management through the lenses of economics, political science, anthropology, sociology, and conservation biology. Students complete coursework in collaborative conservation, systems thinking, leadership, and policy, in addition to that in biological diversity and ecosystem sciences. Students put their coursework into action, with weeklong intensive projects centered on a current issue, as well field components consisting of four-to-six-month immersive partnerships with protected areas, conservation NGOs, and stakeholders.

For more than a decade, faculty members at California State University–Channel Islands have worked collaboratively with Santa Monica Mountains National Recreation Area, which closely borders the campus, as well as nearby Channel Islands National Park to facilitate mutually beneficial partnerships. Since the creation of the university, the institution and Channel Islands National Park has strived to create a "park–university learning community," where shared spaces (e.g., NPS offices on campus, and student research stations on federal land) foster a united vision for teaching and learning about protected areas. For example, the university offers an interdisciplinary undergraduate course, "The National Park," where curriculum is jointly taught by the superintendent of the park and by faculty in environmental science, resources management, and political science. The course includes student projects focused on engaging peers in the park experience, as well as a four-day experiential trip to Yosemite National Park. Finally, the university and NPS have established the Santa Rosa Island Research Station, a living-learning laboratory on the island, where students aid the park by conducting inventory and monitoring research while simultaneously expanding their understanding of the unique natural and cultural resources of the area.

## Universities can facilitate citizen science

Protected area managers rely more on citizen science, and thus universities can facilitate research and evaluation about viable and successful models of it, and help build practitioners' professional development in this contemporary option for data collection. Citizen science, or engagement of nonprofessional volunteer scientists in research, is a methodological strategy that allows for local or global-scale ongoing ecological-based data collection. This form of data collection and engaged research will be increasingly vital to monitor socioecological health locally and globally. However, currently the validity of these data is frequently questioned because of the means in which they were collected. To address this, universities can and should facilitate the development of legitimate citizen science strategies. Universities can enlighten the professional scientific community by edifying non-expert scientist-students to develop solid methodological approaches (i.e., those that are rigorous, ethical, replicable) through engaged learning opportunities.

For example, scientists at Colorado State University's Natural Resource Ecology Lab developed the CitSci.org platform to create a standardized method that any protected area can adapt and implement to establish a citizen science data collection program that can result in usable and trustworthy data. Through CitSci.org, practitioners can create their own customized citizen science webpage, engage volunteers in all stages of research from project design and data collection to result analysis, recording and collating data, receiving support from other researchers, and coordinating projects. To date, over 150 projects have been contributed with over 30,000 observations on subjects as diverse as wildlife monitoring, air and water quality, and energy use.

## Universities should help develop communication strategies for informing policy

Universities are uniquely situated to positively influence public understanding and acceptance of science, and they are often perceived by the public and many (though hardly all) policy-makers as trusted sources of scientific information. Effectively communicating science to non-scientists can be tricky, yet it has important implications for influencing public policy and what the public demands from its policy-makers. The public encompasses a high diversity of demographics, values and attitudes toward nature, prior experiences, and belief systems. Universities can help protected areas understand their specific target audiences, and how important, valuable scientific findings and outcomes can be communicated to, and understood by, critical audiences. This can ultimately help shape human attitudes, behaviors, and policies that support the conservation of protected areas.

The Northern Climate Network (NCN) at Northern Michigan University, on the south shore of Lake Superior in Marquette, Michigan, is a campus–community collaborative brain trust sponsored by the university's provost and vice president of academic affairs. The NCN has more than 100 members, including faculty, staff, and students; local government offices and elected officials; representatives from nearby US Forest Service, US Fish and Wildlife Service, NPS, and state natural resource management offices; and several NGOs, including The Nature Conservancy and a regionally recognized organization, the Superior Watershed Partnership. The NCN is a catalyst for numerous collaborative and applied research projects related to climate change adaptation and community climate literacy in the region. A dozen members serve as representatives to Marquette County's Climate Adaptation Task Force, which is developing a public information campaign about the local impacts of climate change on the county's natural resources. Ultimately, the NCN has linked dozens of academics with practitioners, and elected officials with scientists, in order to enhance public literacy about climate change and, ultimately, better inform local natural resource policy.

#### Universities should provide accessible professional development

Universities should leverage their online learning platforms to provide protected area professionals with accessible professional development and trainings about contemporary issues, skills, and techniques. Nearly every university now has an online platform from which to deliver instruction. This is an opportunity to reach students beyond the confines of the physical campus, and expand the reach of people who can learn from academic experts, to communities in which higher education and professional development was previously inaccessible. Many protected areas are in remote locations, perhaps hundreds of miles from the nearest university. Online education brings the classroom to them, a classroom that, in close partnership and ongoing discussion with protected area personnel, can address the skills and competencies needed to address contemporary protected area issues (Dawson 2007).

For example, the Eppley Institute, an outreach program within Indiana University, demonstrates how a university can provide practical distance education opportunities to protected area professionals at local, regional, and national organizations. The institute has collaborated with NPS, other agencies, and even professional organizations such as the Society for Wilderness Stewardship to developed tailored online courses for employees regarding natural asset management, interpretation and visitor engagement, philanthropy, administration, and safety. In partnership with the Arthur Carhart National Wilderness Training Center, the Eppley Institute has developed online training courses for federal employees on topics such as climate change, wilderness management, and cultural stewardship. Many courses are accredited through continuing education credits, and all are evaluated for learner satisfaction, transfer of knowledge, and performance improvement.

## Conclusion

Protected area management has reached and celebrated many milestones. The World Parks

Congress is a once-a-decade example of such a milestone, and the mere fact that we have such an event represents the importance and stature of protected areas in contemporary society. In addition, universities have evolved to foster the development of land managers, and informed scientific monitoring practices within these invaluable places for more than 125 years. During this time, policies and management strategies have changed, as have university curricula and methodological approaches. The World Parks Congress in 2014 and the recent George Wright Society Conference in 2015 not only commemorated the past but also demonstrated the exciting future of protected areas management. This future lies to a large degree within the hands of universities and the education, service, and research they provide. The principles, and the associated examples we have offered in this paper, highlight some of the current roles universities play in protected area management, as well as suggestions that should be considered for the future. We are optimistic about the future, and welcome the challenges ahead. Yet we realize that universities must continue to evolve to adequately inform management despite unforeseen social and ecological changes and challenges. To close, we hope this paper stimulates contemplation of your role, as an academic, land manager, stakeholder, or other related constituent, to continue allowing universities to work as the conduit through which our actions aid in the future preservation of our protected areas.

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