A Mission for Sustainability amidst a Changing Climate

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In 1916, President Woodrow Wilson signed an act to create the United States National Park Service (NPS) for an inherently *sustainable* reason: "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (National Park Service Act, 1916). It was through this Organic Act that 35 of our nation's parks and monuments would henceforth be protected and managed by this new agency of the US Department of the Interior (DOI). However, the NPS Organic Act merely set the foundation for the agency. In fact, nearly 100 years later, the national park system has grown into a network of over 400 federally managed sites across the country that protect natural and cultural resources for the enjoyment of the American people and other visitors.

Today, however, NPS faces unprecedented challenges as managers begin to better understand the implications of a changing climate on park resources. After nearly a century of both active and hands-off management, NPS has released several directives, guidance documents, and initiatives to ensure that resources are protected in perpetuity—even in the presence of climate change. These documents include the *Climate Change Response Strategy*, *Climate Action Plan, A Call to Action*, and *Green Parks Plan*. Through these strategic plans and vision documents, NPS strives to meet the challenges of climate change through innovation; forward-thinking, "boots-on-the-ground" action; and, most importantly, a sustainable approach to resource management and agency operations.

Taking Action: Sustaining our sustainability mission

Climate Change Response Strategy. In 2010, NPS Director Jon Jarvis acknowledged the realities of climate science and the importance of taking action. "I believe climate change is fundamentally the greatest threat to the integrity of our national parks that we have ever experienced.… This is a high-priority issue for the current Administration, including the De-

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partment of the Interior and its individual bureaus," Jarvis stated, and so the *Climate Change Response Strategy* was born (NPS 2010: 1).

As the first agencywide climate change guidance document, the response strategy spearheaded the issue for the NPS. It outlines a framework for addressing climate change within the context of four distinct yet integrated activities: science, adaptation, mitigation, and communication. It was through the release of this strategy that NPS began to discuss and address the issues related to climate change in a systematic and comprehensive way—and with the support of a proactive and forward-thinking director. This strategy also supports several executive and secretarial orders, including Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance"; Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management"; and Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources."

The response strategy was deployed as a collaborative response, and it engaged partners and stakeholders at all levels to implement the strategy following a collective approach. As success stories and lessons learned began to emerge from the actions this strategy initiated, NPS also acknowledged the importance of ensuring that climate change response be a part of its next-century stewardship mission, as articulated in the director's *A Call to Action*.

Climate Change Action Plan. Released in 2012, the *Climate Change Action Plan* builds on the response strategy to include current and future high-priority climate change response actions for NPS. Divided into three sections, the plan calls for several federal and NPS-specific initiatives to support climate change response at all levels—from national offices to individual park units. Most importantly, the plan acknowledges the continually changing social and environmental conditions of today's world and, as such, emphasizes the importance of "new thinking and new approaches" as the agency continues its response. This plan represents yet another milestone in the stewardship of America's finest treasures and ensures that NPS managers move forward in a flexible and coordinated manner when managing for a changing climate.

A Call to Action. On August 25, 2011—the 95th anniversary of the NPS—Director Jarvis took another step in a sustainable direction when he released *A Call to Action*. This visionary document describes specific goals and measurable actions that chart a new direction for NPS as it enters its second century. It also draws on three major national reports and initiatives: *The Future of America's National Parks* (2007), a report to the president from the secretary of the interior; *Advancing the National Park Idea* (2009), a report of the National Parks Second Century Commission; and "America's Great Outdoors: A Promise to Future Generations" (2011), an Obama administration effort to develop new national conservation and recreation agenda.

A Call to Action is aimed at charting "a path toward that second century vision by asking our [NPS] employees and partners to commit to concrete actions that advance the mission of the Service" (National Park Service 2011: 6). Within this charge, the NPS director identifies 39 actions; action number 23 is "Go Green" to "reduce the NPS carbon footprint … and widely showcase the value of renewable energy." To meet this goal, NPS will, according to this action, "foster sustainability in our parks and with our partners by reducing greenhouse

gas emissions by 20 percent" (National Park Service 2011: 18). It is in response to and support of this plan that NPS developed *the Green Parks Plan.*

Green Parks Plan. At the end of fiscal year 2013, NPS operated and managed over 75,000 structures–which included 46 million square feet of building space, 5 million acres of maintained landscapes and 3,600 utility systems. From lighting walkways to heating and cooling buildings, NPS consumes energy every day. In fact, the production of energy to operate buildings (including those that NPS manages) is one of the largest contributors to greenhouse gas (GHG) emissions in this country: it consumes nearly 70% of all energy produced in the United States. The *Green Parks Plan* was created to address this reality.

On Earth Day 2012, NPS released the plan, which defines a collective vision and long-term strategic plan for sustainable management of agency operations (National Park Service 2012: 3). The goals outlined in this plan, such as "Be Energy Smart," foster a management approach focused on sustaining resources and improving energy performance. Similar to *A Call to Action,* this plan is flexible yet recognizes that the agency's success hinges on adopting sustainability as "a guiding value" and embedding it in servicewide operations on a daily basis" (National Park Service 2012: 15).

The plan not only supports the charge to "go green" in *A Call to Action,* but it also moves NPS to the next level of climate change mitigation originally initiated by the *Climate Change Response Strategy.* While the mitigation component of the response strategy shares broad goals, such as "[s]ubstantially reduce the National Park System's carbon footprint from 2008 levels by 2016 through aggressive commitment to environmentally preferable options," the *Green Parks Plan* pushes on to define reduction goals for scope 1, 2, and 3 GHG emissions, as well as reduction goals for such sectors as energy intensity, petroleum use, and water consumption (National Park Service 2010: 19).

The *Green Parks Plan* is framed around nine strategic goals that "focus on the impact of facilities on the environment and human welfare" and are supported by several performance objectives (see Figure 1) (National Park Service 2012: 5).

Within these goals, objectives are identified to help move NPS toward greater sustainability. Specifically, the plan identifies an NPS sustainability target, which includes reducing:

Figure 1. Strategic goals of the *Green Parks Plan.*

- Scope 1 and 2 GHG emissions 35% from the 2008 baseline by 2020;
- Scope 3 GHG emissions 10% from the 2008 baseline by 2020;
- Servicewide building energy intensity 35% from the 2003 baseline by 2016;
- Potable water use intensity 30% from the 2007 baseline by 2020; and
- Fossil fuel consumption 20% from the 2005 baseline by 2015.

Through the sustainability vision this plan outlines, parks and programs gain the vision, support, and tools to not only meet the charge of *A Call to Action* and the *Climate Change Response Strategy,* but to also address the mitigation and sustainability components of the *2012–2014 Climate Action Plan,* released as a follow-up to the *Climate Change Response Strategy*.

Taking action: Climate Friendly Parks

Through partnerships, stakeholder engagement, and servicewide sustainability and climate change response programs, the service is actively working toward reducing its carbon footprint at the national, regional and park levels.

The Climate Friendly Parks program was established in 2002. Today, over 100 national park system units participate to reach park-based sustainability goals. The program responds to climate change and mitigates GHG emissions by encouraging sustainable management of park resources and operations. The program supports parks by sharing climate change science, helping staff assess climate change implications and prepare action plans on climate change issues, and encouraging and advancing a culture of sustainability within and beyond park boundaries.

Originally established as a partnership with the US Environmental Protection Agency (EPA), this program, now fully operated by NPS, retains its interdisciplinary roots. Staff from the Sustainable Operations & Climate Change (SOCC) branch of the Park Facility Management Division (PFMD) and from the Air Resources Division collaborate with park and regional representatives to address key sustainability and climate change challenges through educational workshops and facilitated discussions. The goals of the Climate Friendly Parks program are to (1) measure park-based greenhouse gas emissions and understand their sources; (2) educate park staff and the public about climate change and demonstrate ways individuals and groups can take action to lessen their carbon footprint; and (3) aid parks in developing strategies and actions to address sustainability challenges, reduce GHG emissions, and respond to a changing climate.

Climate Friendly Kids: A case study in climate change education

National parks across the country share a multitude of stories about our nation's diverse history, cultural heritage. and natural resources. Through Climate Friendly Parks, park rangers and educators also share the story of a changing climate with visitors. At the three national monuments in the area around Flagstaff, Arizona—Sunset Crater, Walnut Canyon, and Wupatki—park staff engage in climate change and sustainability education through a partnership with nearby Willow Bend Environmental Education Center.

As recipients of a 2013 National Park Foundation "America's Best Idea" grant, staff from the three monument parks and the environmental education center collaborated to develop

Climate Friendly Kids, a sustainability-focused educational program for underserved youth in the Flagstaff area (Feldt 2014: 12). Through in-class lessons, field trips to each of the three parks, and participation in service learning projects, the program aims to teach participants about sustainable practices and how to incorporate sustainable actions into their daily lives (Figure 2). The inaugural class of Climate Friendly Kids, which graduated in December 2013, included students from three third- and fourth-grade classes from Flagstaff area schools.

By sharing their sustainability mission, the Flagstaff-area national monuments hope to inspire students to incorporate sustainable practices into their lives so that they might better protect the parks and local resources as future stewards.

Engaging NPS staff in the sustainability conversation through My Green Parks

Begun in 2012, the My Green Parks website (internal to NPS) provides an interactive, online tool for NPS staff to learn more about sustainability and GHG emissions. In developing the site, the goal was, and continues to be, to provide a "one-stop shop" for servicewide sustainability needs regardless of position, region, program, or park unit (Figure 3). To accomplish this, site features were created on a servicewide level. The site is arranged by several categories:

- **Take Action.** "Take Action" scenes feature GHG reduction actions related to energy savings, transportation, green purchasing, waste reduction, and water conservation, which NPS staff can "pledge" to take in several duty areas (e.g., offices, maintenance

Figure 2. In 2013, 4th-grade students from schools in Flagstaff, Arizona, participated in the Climate Friendly Kids program. Participants used reusable bags during their field trip to Walnut Canyon National Monument. Sara Feldt/NPS photo.

Figure 3. By taking action on My Green Parks, NPS staff pledge to reduce federal costs, conserve valuable natural resources, and reduce servicewide greenhouse gas emissions. Source: NPS.

facilities, fleet/travel management), as well as when traveling to and from their duty location. When users select specific actions, the site provides key information on how to complete the action and why the action is important.

- **View Savings**. Once an action is taken, environmental and monetary benefits are calculated for the selected behaviors (e.g., commute by bicycle, use natural lighting). The "View Savings" page provides staff with key information on individual and aggregated projected carbon emissions, electricity, waste, and dollar savings.
- **Challenges**. "Challenges" range from submitting best practices to participating in sustainability-related quizzes. This feature promotes the importance of recognizing and sharing sustainability achievements throughout the agency and provides opportunities for staff to participate in friendly competitions while assessing their sustainability "know-how."
- **Resources**. The site also hosts and updates educational "Resources" on topics ranging from climate change to energy management. The site's "Bulletin Board" feature also shares servicewide greening efforts, success stories, and best management practices, and showcases green leaders.

My Green Parks takes a three-pronged approach to promoting a sustainable work ethic: providing educational material on sustainability issues; suggesting actions staff can take to reduce GHG emissions while illustrating the associated tangible benefits of those actions; and tracking and monitoring the potential cumulative environmental benefits and cost savings for each park unit and office.

Partnerships to promote sustainability

In 2010, NPS began the Clean Cities National Parks Initiative, a partnership with the Department of Energy, National Renewable Energy Laboratories, and local Clean Cities Coalitions to support the development and use of renewable and alternative fuels throughout the agency. This partnership supports the *Green Parks Plan* goals to "Green Our Ride," "Be Climate Friendly," and "Foster Sustainability beyond our Boundaries." It is helping NPS use more environmentally friendly transportation methods at parks, ultimately aiding in reducing agency dependence on petroleum-based fuels for transportation while increasing energy savings and the use of sustainable transportation methods across the country.

This interagency agreement has proven quite successful with 13 participating parks, such as San Antonio Missions National Historical Park (Figure 4), Grand Teton National Park and Yellowstone National Park, receiving over $2.8 million in funding for fleet-focused projects. Through this partnership, parks showcase NPS sustainability initiatives by replac-

Figure 4. San Antonio Missions National Historical Park participates in the Clean Cities National Park Initiative. The park's fleet now features propane mowers and electric vehicles such as this Mitsubishi MiEV. David Vekasy/NPS photo.

ing outdated, gasoline-powered vehicles with alternatively fueled vehicles, installing charging stations for electric vehicles, and providing educational opportunities for the public to learn about cutting carbon emissions. A full list of participating parks and projects is available on the Clean Cities National Parks Initiative website.

Since its kickoff, this partnership has provided funding to increase sustainability efforts. It has helped parks reduce fleet size and transition to more sustainable transportation methods. As 2014 continues, new members will join the cadre of parks participating in this initiative, continuing the servicewide efforts to reduce fossil fuel consumption while increasing use of alternative transportation.

Showcasing our achievements: Sustainable buildings

The *Green Parks Plan* challenges NPS to adopt best practices through the "integration of sustainability in planning [and] compliance" with the federal government's "Guiding Principles for High Performance and Sustainable Buildings" (National Institute of Building Sciences 2006). Whenever federal building design and construction work occurs, whether for new construction or major renovation, buildings must fully comply with all federal laws for accessibility and safety. For sustainability and efficiency measures, NPS must comply with the guiding principles, which focus on the government's commitment to "designing, locat-

ing, constructing, maintaining and operating facilities in an energy efficient and sustainable manner" (National Institute of Building Sciences 2006).

Across NPS, 65 buildings meet the standards outlined in the guiding principles, and among those, 55 have achieved recognition under the Leadership in Energy and Environmental Design (LEED) certification program. Although meeting LEED standards is not a requirement for NPS buildings, it is a valuable program that can aid planners in addressing entire building life cycles. As of June 2013, of the 55 LEED-certified buildings servicewide, 24 are recognized at the LEED Platinum level, 24 at the LEED Gold level, 4 at the LEED Silver level, and 3 at the LEED basic level.

In 2011, Grand Canyon National Park completed construction of the LEED Platinum-certified Paiute Apartments—a complex of 64 apartment units (Figure 5). Developed to address the park's housing shortage, the project also met both servicewide and park-specific goals for sustainability.

Project manager Greg MacGregor emphasized that the park went above and beyond minimum requirements to ensure that the project met (and exceeded) accessibility, safety, and sustainability measures. He explains that plan analysis for the complex was based on the international building code, the Americans with Disabilities Act, the Architectural Barriers Act, and uniform federal accessibility standards.

To reach the LEED Platinum level, the Paiute Apartments achieved 84 points in LEED for Homes certification in several categories, including innovation and design process, loca-

Figure 5. Grand Canyon National Park's Paiute Apartments received a LEED Platinum rating for their sustainability features. NPS photo.

tion and linkages, sustainable sites, water efficiency, energy and atmosphere, materials and resources ,and indoor environmental quality. The buildings' sustainable and energy efficiency features include the following:

- **Building site.** To avoid new impacts to cultural and historic sites and to use space efficiently, the apartments stand on a previously disturbed 5.5-acre lot.
- **Landscaping.** As the primary means for surface water management, native, drought-tolerant species were planted to help keep soil intact. If irrigation is needed, reclaimed water from its municipal water system is used.
- **Building materials**. Walls, floors, and the roof are constructed of Forest Stewardship Council-certified wood.
- **Energy-efficiency features**. The building features high-efficiency water fixtures and fittings for bathroom faucets, toilets, and showers.
- **Renewable energy and other sustainability features**. Photovoltaic systems were installed for each apartment building, dark sky-compliant light fixtures were installed in parking areas, and bike racks were strategically placed to encourage zero-emissions commuting.

Grand Canyon National Park's new facilities—along with the other innovative and sustainable buildings across national park system—are a testament to forward thinking and a dedication to sustainability. NPS continues to meet sustainability goals outlined in the *Green Park Plan,* as well as the soon-to-be released *Sustainable Buildings Implementation Plan* through buildings such as the Paiute Apartments as well as new visitor centers and rehabilitated historic structures.

Next steps

Since the release of the *Green Parks Plan* on Earth Day 2012 (Figure 6), NPS has carried out

Figure 6. In 2012 NPS Director Jon Jarvis announced the release of the Green Parks Plan at an Earth Day press conference at the Lincoln Memorial. Anthony DeYoung/NPS photo.

a systematic approach to sustainability. The nine goal categories of the *Green Parks Plan* have given NPS a new lens for viewing sustainability across the service.

Sustainability is at the core of the NPS mission and, in the face of a changing climate, sustainable management of the very resources the agency was founded to protect is its only option. The sustainability vision supports climate change response and sustainability initiatives at all levels and it will continue to move NPS forward into its second century.

Through national and park-based efforts, NPS will continue to move in a sustainable direction. In fact, several offices, including the Climate Change Response Program and the SOCC branch of the PFMD, are spearheading this collaborative effort—working with other NPS offices and federal agencies, as well as partners, stakeholders, and the public. From park managers and field staff to national and regional offices, this agency embraces innovation in the technologies we use and the management practices we employ. By doing so, we will continue to protect, *sustainably,* some of America's most valued places and resources, and the stories they share, for generations to come.

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