



CLIMATE *Friendly* PARKS

Grand Canyon-Parashant National Monument Action Plan

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GRAND CANYON-PARASHANT NATIONAL MONUMENT BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Grand Canyon-Parashant National Monument belongs to a network of parks nationwide that are putting climate friendly actions at the forefront of sustainability planning. By conducting an emissions inventory, setting an emissions reduction goal, developing this Action Plan, and committing to educate park staff, visitors, and community members about natural climate variability, climate sensitivity and climate change, Grand Canyon-Parashant National Monument demonstrates its commitment to climate friendly, sustainable and energy efficient, and green operations.

Grand Canyon-Parashant National Monument, as a member of the Pacific West Region, is involved in the first regional effort in the National Park Service to become carbon neutral. The Region has developed a vision of having its park operations be carbon neutral and of having all of its parks be a member of the Climate Friendly Parks Program by 2010.

This Action Plan identifies steps that Grand Canyon-Parashant National Monument can undertake to reduce Greenhouse Gas Emissions (GHG) emissions and mitigate its impact on actual and potential climate change. The plan presents the Monument's emissions reduction goals and associated reduction actions. Strategies and action plan items were developed by working groups at the Mojave Desert and Mediterranean Coast Climate Friendly Parks Workshop.¹ While the plan provides a framework needed to meet the Monument's emissions reduction, it is not intended to provide detailed instructions on how to implement each of the proposed measures. The actions described in this Climate Friendly Action Plan relate to the priorities found in the Monument's Environmental Management System.

Grand Canyon-Parashant National Monument is co-managed by the National Park Service and the Bureau of Land Management (BLM). Grand Canyon-Parashant's natural splendor provides a sense of solitude to those who venture into its isolated domain. Located on the edge of one of the most beautiful places on earth, the Grand Canyon, the Monument's expansive landscape encompasses a chronicle of natural and cultural history. Conservation of these values and resources, as well as natural and social processes from which they spring, can be effected by climate change. The National Park Service and Bureau of Land Management strive to manage these resources for the long-term, using science to inform management decisions. The National Park Service and Bureau of Land Management have integrated their staff and programs to enhance communication regarding resource values and potential impacts to these resources from climate change.

The Bureau of Land Management has a climate adaptation planning program for climate related work. Combining the National Park Service Climate Friendly Park's program with the Bureau of Land Management's climate program will enable the two agencies to collaborate on current conservation, sustainability, alternative energy and related ecologic and social issues facing both the land management agencies and the public. These actions would be integrated into achieving land health conditions identified in management plans

Currently, the Bureau of Land Management (BLM) and National Park Service (NPS) are initiating an effort to address fire, fuels, and vegetation management on 356,820 acres of the Shivwits Plateau of the Grand Canyon - Parashant National Monument. The completed plan will develop specific actions to achieve land health conditions and goals identified in the Grand Canyon - Parashant National Monument Resource Management Plan/General Management Plan completed in 2008. This planning process is expected to take 2-3 years to complete. The goal is to achieve healthy land conditions based on a number of natural conditions including addressing the impacts of climate change or natural climate variability on the ecosystem.

¹ Original notes from these workshops, including detailed action items not presented in the final plan have been archived by Grand Canyon-Parashant National Monument and are available upon request.

To meet these goals, the Monument will implement strategies proposed in this plan that relate to the Monument's current and future emission inventories. Specifically, the plan recommends three strategies:

Strategy 1: Identify and implement mitigation actions that the Monument can independently take to reduce GHG emissions resulting from activities within and by the Monument

Strategy 2: Increase education and outreach efforts surrounding climate change, energy and resource conservation, alternative energy, and recycling

Strategy 3: Monitor progress with respect to reducing emissions and identify areas for improvement

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents risks and challenges to the National Park Service and specifically to Grand Canyon-Parashant National Monument. Scientists cannot predict with certainty the general severity of climate change, natural climate variability nor its impacts. Average global temperatures on the Earth's surface have increased about 1.1°F since the late 19th century, and the 10 warmest years since 1900 have all occurred in the past 15 years. The single leading cause of this warming may be the buildup of Greenhouse Gas Emissions (GHGs) in the atmosphere—primarily carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)—which trap heat that otherwise would be released into space.

The continued addition of CO₂ and other GHGs to the atmosphere may raise the Earth's average temperature more rapidly in the next 100 years; a global average warming of 4-7°F by the year 2100 is considered possible.² Rising global temperatures may further raise sea levels and may affect all aspects of the water cycle, including snow cover, mountain glaciers, spring runoff, water temperature, and aquatic life. Climate change may also affect human health, crop production, animal and plant habitats, and many other features of our natural and managed environments.

At Grand Canyon-Parashant National Monument, climate variability, which may include increasing temperatures and changing precipitation patterns, may alter Monument ecosystems, change vegetation communities, habitats available for species, and the experience of Monument visitors. The Monument is involved in the Mojave Desert Initiative which is a multi-agency effort to address climate change impacts to Mojave Desert resources and ecological processes. Climate variability has already led to changes to vegetation communities in terms of conversions to non-native species dominance and changes in fuel loading and fire regime. These changes are documented via research and being tracked through scientific monitoring. The Mojave Desert Initiative is sponsoring this work and using the information to being devising adaptive management strategies to protect resources and manage for long-term conservation.

² IPCC 2007. Climate Change 2007: The Physical Science Basis. Intergovernmental Panel on Climate Change, Geneva Switzerland. Available online at < <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>>

GREENHOUSE GAS EMISSION INVENTORY AT GRAND CANYON-PARASHANT NATIONAL MONUMENT

Naturally occurring GHGs include CO₂, CH₄, N₂O, and water vapor. Human activities (e.g., fuel combustion and waste generation) generally lead to increased concentrations of these gases (except water vapor) in the atmosphere.

Greenhouse Gas Emissions

GHG emissions result from the combustion of fossil fuels for transportation and energy (e.g., boilers, electricity generation), the decomposition of waste and other organic matter, and the volatilization or release of gases from various other sources (e.g., fertilizers and refrigerants).

Grand Canyon-Parashant National Monument completed a GHG emission inventory using the Climate Leadership in Parks (CLIP) Tool provided by the Climate Friendly Parks program. The CLIP Tool uses data on the activities that occur within the Monument that produce GHG emissions (i.e., emission sources) and methods established by the Intergovernmental Panel on Climate Change (IPCC) to estimate GHG emissions. Emission sources included in the GHG inventory include stationary and mobile fossil fuel combustion, electricity purchases, solid waste disposal, wastewater treatment, and refrigeration and air conditioning use. For the purposes of preparing an action plan, these sources are grouped into four sectors – Energy, Transportation, Waste, and Other. Grand Canyon-Parashant National Monument completed emission estimates for these sources from its own facilities, vehicles, equipment, etc. (i.e., Monument Operations) as well as from the activities of visitors inside the Monument.

In 2008, GHG emissions within Grand Canyon-Parashant National Monument totaled 41 metric tons of carbon dioxide equivalents (MTCO₂E). This includes emissions from Monument and visitor activities, including vehicle use within the Monument. For perspective, a typical single family home in the U.S. produces approximately 12 MTCO₂ per year.³ Thus, the combined emissions from Monument and visitor activities within the Monument are roughly equivalent to the emissions from the energy use of 3 households each year.

As Figure 1 and Table 1 demonstrate, the largest emissions sector for Grand Canyon-Parashant National Monument was transportation, which totaled 39 MTCO₂E. This estimate includes emissions from visitor travel within the Monument's boundaries as well as those from local tour vehicles operating within the Monument. Figure 2 and Table 2 show the total emissions resulting from just NPS operations within the Monument's boundaries, which are estimated to be 30 MTCO₂E. Here again it is evident that the majority of the operational emissions are the result of transportation within the Monument.

³ U.S. EPA, Greenhouse Gases Equivalencies Calculators – Calculations and References, Retrieved , Website: <http://www.epa.gov/RDEE/energy-resources/calculator.html>

FIGURE 1

Grand Canyon- Parashant National Monument 2008 Total Greenhouse Gas Emissions by Sector

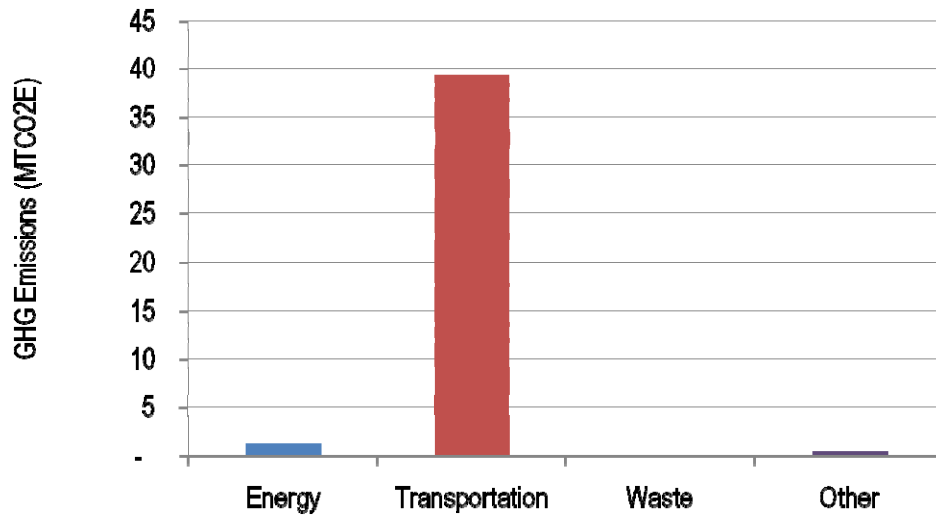


TABLE 1

Grand Canyon-Parashant National Monument 2008 Total Greenhouse Gas Emissions by Sector and Source

	MTCO2E
Energy	1
Stationary Combustion	1
Purchased Electricity	-
Transportation	28
Mobile Combustion	28
Waste	0
Landfilled Waste	0
Wastewater	-
Other	1
Refrigeration and Air Conditioning	1
Fertilizer Application	-
Petroleum and Natural Gas Activities	-
Other	-
Total	30

Note - Totals may not sum due to rounding
Not applicable data sources represented by "-"

FIGURE 2

Grand Canyon-Parashant National Monument 2008 Park Operations Emissions by Sector

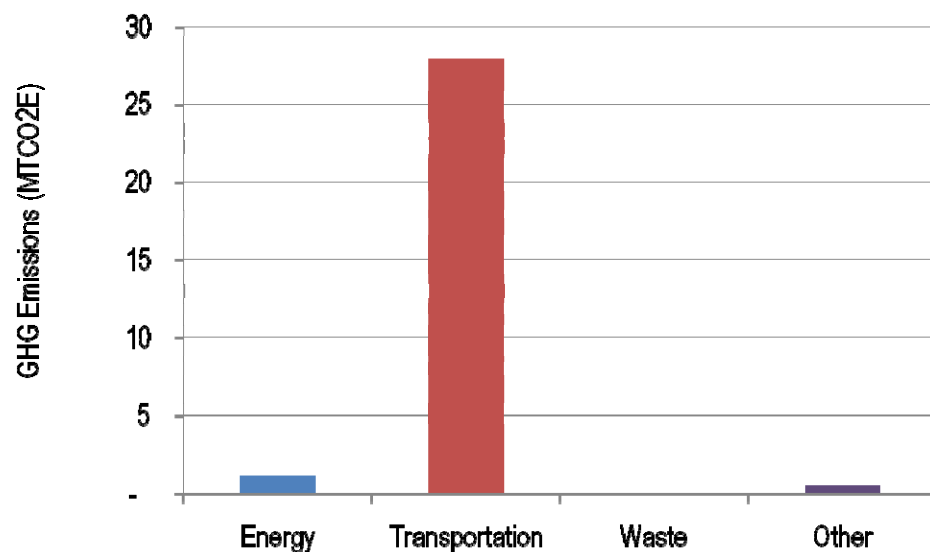


TABLE 2

Grand Canyon-Parashant National Monument 2008 Park Operations Emissions by Sector

	MTCO2E
Energy	1
Stationary Combustion	1
Purchased Electricity	-
Transportation	39
Mobile Combustion	39
Waste	0
Landfilled Waste	0
Wastewater	-
Other	1
Refrigeration and Air Conditioning	1
Total	41

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

Grand Canyon-Parashant National Monument Responds to Climate Change

The following actions were developed during the Mojave Desert and Mediterranean Coast Climate Friendly Parks Workshop on December 1-2, 2009, in order to meet the Monument's climate change mitigation goals.

STRATEGY 1: REDUCE GHG EMISSIONS RESULTING FROM ACTIVITIES WITHIN AND BY THE MONUMENT

Grand Canyon-Parashant National Monument has developed a set of actions that the Monument is committed to taking in order to reduce emissions from activities within and by the Monument. These strategies have been prioritized based on a qualitative assessment of a set of criteria including: emission reduction potential, cost-effectiveness, feasibility, co-benefits, regional impact, and ability to rapidly implement. Actions that Grand Canyon-Parashant National Monument will take have been presented below in order from highest to lowest priority within each sub-category.

Energy Use Management

Emissions Reduction Goal: Reduce Monument operations' energy use emissions by 10 percent below 2008 levels by 2015.

Improving energy efficiency and implementing alternative energy sources reduces the Monument's -base fuel use, lowers GHG emissions, decreases electricity consumption, and offers monetary benefits for the Monument by reducing operational costs.. Emissions inventory results indicate that three percent of the Monument's GHG emissions from Park Operations are from energy consumption. Consequently, Grand Canyon-Parashant National Monument has identified actions it will take to reduce energy-related emissions. Presented below are the actions that are currently under way and which comprise the Monument's progress to date, as well as those actions the Monument will pursue.

Progress to Date

- Developed and implementing a HVAC maintenance schedule to ensure timely inspection of coils, filters, dampers, and fans. Replaced all of the Monument's high intensity discharge lamps with energy efficient compact fluorescent bulbs at the Dellenbaugh Administrative Site
- Installed a 1.8 kW photovoltaic power system at the Dellenbaugh Administrative Site.
- Including the installation of solar in the plans and designs for new buildings.
- Installing energy efficient water heaters upon replacement of existing heaters.
- Incorporating best practices regarding energy efficient building sitting into plans and designs for new buildings.
- Reducing lighting energy use by integrating daylighting into the plans and designs for new buildings.
- Compressing work week of field crews and other staff to reduce number of trips into the field and into the office.
- Replacing older HVAC units with more efficient units on an ongoing basis when needed.
- Carpooling to meetings.
- Utilizing shuttle to Las Vegas, Nevada from St. George, Utah and other types of shuttle services.
- Recycling in the office, battery collections, promoting more efficient printing methods – minimizing paper waste.

Energy Use Management – Planned Actions

1 Promote energy efficiency and energy conservation in the Monument through behavioral change

- Engage staff and visiting researchers to unplug appliances including small electronics and battery chargers when not in use at Dellenbaugh Administrative Site.

2 Upgrade lighting options

- Replace compact fluorescent light bulbs with light emitting diodes (LED). Replace outdated fluorescent light fixtures and bulbs with higher efficiency models.
- Implement daylighting by installing skylights in both housing units (cabins) at Dellenbaugh Administrative Site in Fiscal Year 2011.

3 Switch to more efficient electronics and devices

- Establish and implement a green procurement policy that sets minimum energy performance standards for all electronic equipment.
 - Ensure that all new electronic and office equipment is ENERGY STAR qualified, and rather than purchasing individual copy, fax, print, and scanning equipment, consider a multi-function device.
- Replace existing water heaters at the Dellenbaugh Administrative Site with high efficiency model (propane) when funding becomes available (20% savings in propane usage).
- Replace current furnaces (90% AFUE) at the Dellenbaugh Administrative Site with a higher efficiency model (95 % AFUE) when replacement required.

4 Improve building structures and envelopes

- Install additional insulation in housing units in Fiscal Year 2011.

Transportation Management

Emission Reduction Goal: Reduce Monument operations transportation emissions by 10 percent below 2008 levels by 2018

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Grand Canyon-Parashant National Monument's transportation related emissions. As the inventory results indicate, GHG emissions from transportation comprise 96 percent of Monument's operational emissions and 93 percent of the Monument's overall emissions (including visitors). Accordingly, in addition to the Monument operations emissions reduction goal, Grand Canyon-Parashant National Monument set a goal to reduce overall transportation emissions by 10 percent below 2008 levels by 2018. Presented below are the actions that are currently under way and which comprise the Monument's progress to date, as well as those actions that the Monument will pursue.

Progress to Date

- Performing monthly vehicle inspections and update maintenance documents each month.
- Engaging staff to bike to work.
- Installing 11 new Trafx brand vehicle counters in 2010..The installation of an advanced traffic counting systems will allow for more accurate monitoring and documenting of daily, monthly and annual activity patterns of both park operations and recreational users. The data collected will allow a more accurate determination of the total Visitor Miles Traveled (VMT) within the Monument and assist in monitoring the levels of GHG emissions produced by Monument visitors and Monument operations.

Transportation Management – Planned Actions

1 Transportation-related behavioral changes

- Query staff about feasibility to carpool based on residence location.
 - If possible develop carpooling information and support services for staff.
- Develop parking and storage area for bicycles to make commuting by bike easier.
- Further encourage the use of the satellite link and teleconferencing equipment already in place for teleconferencing and video conferencing. This equipment is in place at both the Monument office building and the Bureau of Land Management District office building in St George, Utah. A single office building for both operations is planned by 2013.

2 Reduce visitor vehicle fuel consumption

- Encourage visitors to drive more fuel efficient vehicles

3 Reduce NPS vehicle and equipment fuel consumption

- Compress work week of field crews and other staff to reduce number of trips into the field and into the office.

4 Replace NPS vehicles and equipment

- Acquire hybrid vehicle to utilize for commuting to trainings and meetings.

Waste Management

Emission Reduction Goal: Reduce Monument operations waste emissions by 10 percent below 2008 levels by 2018 through waste diversion and reduction.

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source and solid waste reduction—can dramatically reduce GHG emissions. Landfills are the largest human-generated source of CH₄ emissions in the United States. Reducing the amount of waste sent to landfills reduces CH₄ emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. The less the Monument and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

Grand Canyon-Parashant National Monument's operational activities emitted less than 1 MTCO₂E from waste management in 2008. Diverting or reducing the Monument's waste stream through increased recycling efforts and waste management will reduce the amount of waste sent to landfills and resulting emissions. Presented below are the actions that are currently under way and which comprise the Monument's progress to date as well as those actions that the Monument will pursue.

Progress to Date

- Recycling cardboard, aluminum; scrap metal, glass, white paper, colored paper and no. 1 polyethylene terephthalate (PET) and no. 2 high density polyethylene (HDPE) plastics, batteries, fluorescent lights and bi-metal cans at both the Monument office and the Dellenbaugh Administrative Site.
- Using local vendors for specialty wood pole fencing materials.
- Installed recycling containers at the office building in St. George, Utah and Dellenbaugh site.
- Purchased and use green office and cleaning products.
- Used recycled paper for printing and copying in the office.
- Installed dual flush adapters in toilets to reduce water use at the Dellenbaugh Administrative Site during fiscal year 2010.
- Installed low flow showerheads and aerators at the Dellenbaugh Administrative Sites.
- Implemented a program to ship used florescent light bulbs to a recycling center.
- Advertising surplus materials and equipment as available to other Monument staff through email.
- Instituted alkaline and lithium battery recycling program through Batteries Plus, which is a local vendor.
- Used liquid crystal (LCD) displays, remanufactured or generic toner cartridges and shared network printers to decrease waste materials and electricity.

Waste Management – Planned Actions

1 Establish new plans and policies that promote waste reduction.

- Implement double sided printing as the default mode for all Monument computers.
- Reduce number of copies handed out to staff at meetings and ensure that all copies are double sided and all unused handouts of documents are recycled.
 - Use PowerPoint presentations in lieu of paper handouts when possible.
 - Ensure that documents presented at meetings are posted on network drives, placed on SharePoint site, or provided via email to reduce the number of hard copies produced.
- Institute and implement a policy that purchases only products with minimal packaging and packaging made of post-consumer (PC) recycled content, recyclable and/or reusable/refillable.

2 Implement recycling and composting practices

- Continually increase the recycling rate at all facilities throughout the Monument.
 - Add mixed paper, tin, other plastics (including film), and pallets.
 - Find reuse opportunity or donate unwanted items. Look into cooperative waste disposal or recycling to increase volume and reduce costs/traffic.

3 Reduce waste through green procurement

- Purchase locally-produced materials whenever possible.
- Continually increase the amount of recycled content of purchased materials and seek to minimize impact of cleaning supplies.
- Use post-consumer recycled paper in all Monument publications.
 - Use 100% post-consumer (PC) content, processed chlorine-free (PCF) copy paper. Consider alternative fibers (i.e., non-wood) and water-based or vegetable-based ink. Target paper reduction.
- Assign all staff to complete on-line green training
- Inventory and substitute all cleaning supplies with non-toxic products.

4 Reduce and reuse wastewater

- Research methods to collect rainwater to be utilized for flush toilets.
- Continue to replace toilets with low-flow models.
 - Install water efficient technology, e.g. composting toilets and waterless urinals.
- Install low flow showerheads and aerators

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change and natural climate variability are complex and easily misunderstood issues. Grand Canyon-Parashant National Monument can play an integral role in communicating about climate variability to a vast audience. A better understanding of the challenges and benefits of conservation, sustainability, energy efficiency in reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. Grand Canyon-Parashant National Monument recognizes that the greatest potential impact the Monument can have on mitigating climate change is through public education. Thus, the Monument sees public education as an end goal of any climate initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions Grand Canyon-Parashant National Monument takes to address climate change serve as opportunities for increasing the public's awareness of natural climate variability and climate change. Presented below are the actions which comprise the Monument's progress to date, and those actions that the Monument will pursue.

Monument Staff

Incorporate climate change into Monument staff training, events, and performance plans

Developing a climate change education program for Monument staff is vital to increasing awareness about climate change and natural climate variability among Monument visitors and fostering a sense of collective responsibility among staff to help reduce Monument emissions. By incorporating conservation, recycling, sustainability, and climate change education into staff development programs, Grand Canyon-Parashant National Monument will enable its staff to demonstrate their commitment through leading by example, and providing visitors with the tools and resources they need to reduce GHG emissions in the Monument and in their own communities. Potential actions include:

- Incorporate sustainability and conservation messages into displays in Interagency Visitor Center and also add climate change and natural climate variability information to the Monument's websites and include a link to the Climate Friendly Parks website.
- Encourage cooperating agencies and institutes to incorporate sustainability and conservation education into education materials, curricula, and demonstrate the same in their operations in support of the Monument's interpretation and visitor education offerings.
- Join with local City, County and State agencies to promote energy conservation and sustainable design, land use planning and other actions which reduce greenhouse gas emissions and promote resource conservation. For example: Washington County Water Conservancy District, Envision Utah, Envision Dixie and Dixie Recycling Coalition.
- Working with the Bureau of Land Management to develop a Monument -specific climate change policy memorandum that establishes and promotes the Monument's position on climate change, and empowers Monument staff to engage the public about the issue and the Monuments' response.
- Working with the Bureau of Land Management, print and post appropriate brochures and posters with climate change information at the Monument office building, inter-agency visitor center and the Dellenbaugh (NPS) and Nixon (BLM) Administrative Sites.
 - Create, distribute, and post informational materials about how to reduce GHG emissions.
- Create intranet pages about climate change that are linked to both the National Park Service and Bureau of Land Management intranet, as well as DOI Climate Change Workgroup web pages.

- Incorporate climate change section into the Monument brochure upon next revision. Utilize National Park Service Climate Change brochures as platform to educate public in visitor center contacts.
- Add a climate change topic to existing Bureau of Land Management brown bag program at Interagency Visitor Center in St George, Utah.

Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Grand Canyon-Parashant National Monument realizes that it has a unique opportunity to educate the public in a setting free from many of the distractions of daily life. By using existing materials, developing Monument-specific materials, highlighting what the Monument is currently doing to conserve resources, provide for facility sustainability and cost efficiency, and encouraging visitors to conserve resources and thereby reduce emissions, Grand Canyon-Parashant National Monument can play an important role in educating the public about conservation and climate change.

Grand Canyon-Parashant National Monument staff recognize the many different audiences that visit the Monument including recreational and non-recreational visitors, “virtual visitors” who visit the Monument online, school-aged visitors, local and out of town visitors, local tribes, and external audiences. Reaching these various audiences with conservation and climate change information and engaging them in the Monument’s efforts requires appropriately focused messaging. The Monument has developed a number of actions to reach these various audiences effectively. These actions include:

- Distributing currently available brochures on climate change in the visitor center.
- Providing visitor center personnel from all agencies with current conservation, green energy and climate change information.
- Promoting recycling options at home and in the community.
- Expanding interpretive school outreach programs to include conservation, alternative energy, recycling and climate change information. Utilize the recycling exercise in Junior Ranger Handbook, with school groups and other children’s programs to relate home recycling to broader community resource conservation and protection goals.
- Creating exhibits like the Dellenbaugh Administrative Site’s photovoltaic system that showcase sustainable projects being utilized in the Monument.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Grand Canyon-Parashant National Monument can play a significant role in supporting the Monument’s conservation and climate change mitigation goals. As such, when appropriate, Monument staff will assist local communities with incorporating conservation and climate change messages into community events and find partners to promote conservation and climate change education at those events, and engage with surrounding agencies to coordinate effective outreach and education efforts. Potential actions include:

- Promoting educating the public about conservation, alternative energy and climate change and how it affects the local community.
- Planning an interagency Earth Day celebration in St George, Utah.
- Developing plans for event waste management, incorporate into event planning, recycling at events, minimize waste of hand-outs, reusable bags, etc. for all special events (such as a St. George Junior Ranger Day),

STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Grand Canyon-Parashant National Monument plans to reduce its emissions to the specified goals. Achieving these goals will require an ongoing commitment by the Monument, which may include subsequent emission inventories, additional mitigation actions, and reevaluation of goals. As part of this strategy, Grand Canyon-Parashant National Monument will:

- Monitor progress with respect to reducing emissions. This will include subsequent emission inventories to evaluate progress toward goals stated in this action plan.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Periodically review and update this plan.
- Track climate friendly actions through the Monument's environmental management system.

CONCLUSION

Grand Canyon-Parashant National Monument has an opportunity to serve as a model for over 40,000 recreational visitors annually.⁴ This report summarizes the operational actions the Monument commits to undertake to increase its resource sustainability and conservation. Specifically, the Monument realizes its ability to educate the public and serve as a valuable model for citizens. By addressing conservation, energy efficiency and sustainability that lower GHG emissions within the Monument and sharing its successes with visitors, Grand Canyon-Parashant National Monument will help mitigate climate change far beyond the Monument's boundaries.

Natural and cultural resources found on National Park Service and Bureau of Land management lands face an uncertain future due to the possible effects of climate variability and climate change. However, by addressing potential climate change impacts, embracing new technologies that make efficient use of resources and thereby reducing emissions, Grand Canyon-Parashant National Monument will reduce its contribution to the problem while setting an example for its visitors and local communities. The strategies presented in this Action Plan present a first step in the Grand Canyon-Parashant National Monument Climate Friendly Parks Program.

⁴ Grand Canyon-Parashant National Monument: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>

APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

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