National Park Service
U.S. Department of the Interior

CLIMATE*Friendly* PARKS

# Scotts Bluff National Monument Action Plan

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# SCOTTS BLUFF NATIONAL MONUMENT BECOMES CLIMATE FRIENDLY

As a participant in the Climate Friendly Parks program, Scotts Bluff National Monument belongs to a network of Parks and Monuments nationwide that are putting climate friendly behavior at the forefront of sustainability planning. By conducting a Green House Gas(GHG) emission inventory, setting a GHG emission reduction goal, evaluating adaptation scenario planning processes, developing this Action Plan, and committing to educate Monument staff, visitors, and community members about climate change, Scotts Bluff National Monument provides a model for climate friendly behavior within the National Park Service.

Scotts Bluff National Monument has contributed to improving the environment through implementation of a variety of programs and projects. Sustainable operational practices implemented include the transitioning to an alternative-fuel/hybrid fleet, an extensive recycling program, "Green" purchasing, and a shuttle to reduce individual vehicle traffic to the Scotts Bluff Summit.

This Action Plan describes measures the Monument will take to further reduce its GHG emissions. In addition to implementing these measures, Scotts Bluff National Monument will:

- Utilize the Environmental Management System to measure progress with respect to reducing emissions and preserving natural and cultural resources and infrastructure.
- Identify additional actions to reduce GHG emissions and preserve natural and cultural resources and infrastructure, as necessary.
- Periodically assess and revise this Action Plan to strengthen existing actions and include additional actions.

**Scotts Bluff National Monument** intends to reduce its greenhouse gas emissions produced by Monument operations as follows:

- ***Energy use consumption emissions to 25% below 2008 levels by 2016.***
- ***Waste emissions to 20% below 2008 levels by 2016.***
- ***Transportation emission levels to 15% below 2008 levels by 2016.***

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 four 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 climate change education and outreach efforts.

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

**Strategy 4:** Develop, implement and monitor a plan to adapt to current and future impacts of climate change.

# THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service and specifically Scotts Buff National Monument. Scientists cannot predict with certainty the general severity of climate change 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 of the 20th century all occurred in the last 15 years. The single leading cause of this warming is the buildup of GHGs in the atmosphere—primarily carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) —which trap heat that otherwise would be released into space.

The continued addition of $CO_2$ and other GHGs to the atmosphere will raise the Earth's average temperature more rapidly in the next century; a global average warming of 4-7°F by the year 2100 is considered likely.[1] Rising global temperatures will further raise sea levels and affect all aspects of the water cycle, including snow cover, mountain glaciers, spring runoff, water temperature, and aquatic life. Climate change is also expected to affect human health, crop production, animal and plant habitats, and many other features of our natural and managed environments.

At Scotts Bluff National Monument, increasing temperatures and changing precipitation patterns may alter Monument ecosystems, changing vegetation communities, wildlife habitats available for species, and the experience of Monument visitors. Possible challenges associated with global climate change to Scotts Bluff ecosystems are changes in vegetation, occurrence of more frequent or intense droughts, increases in insect populations due to longer frost-free seasons, increase in frequency and intensity of wildfires and floods, and changes to water flows in the North Platte River. Challenges to cultural resources and infrastructure may occur from increased seasonal heavy storms, flooding, rockslides, and/or wildfires. Potential exists for increases to air pollution, as well as energy requirements for seasonal air conditioning. Finally, Monument operations will likely be affected through demand increases for emergency services due to threats of wildfires, and flooding.

[1] 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 MONUMENT

Naturally occurring GHGs include $CO_2$, $CH_4$, $N_2O$, and water vapor. Human activities (e.g., fuel combustion and waste generation) lead to increased concentrations of these gases (except water vapor) in the atmosphere.

## Greenhouse Gas Emissions

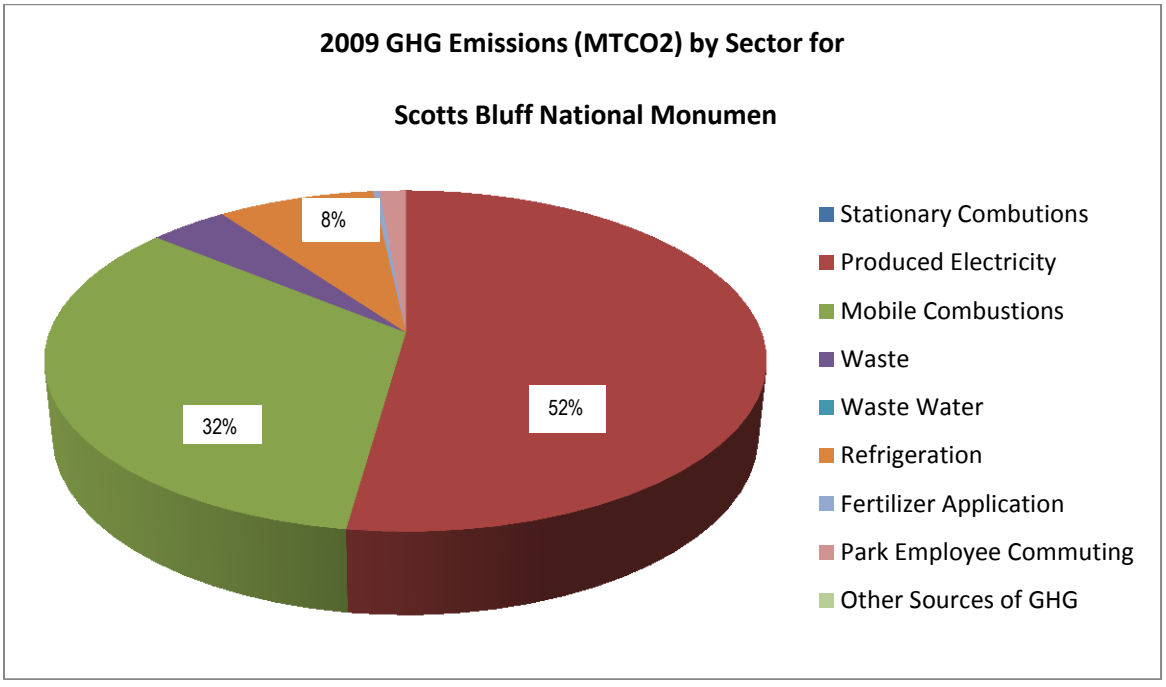
GHG emissions result from the combustion of fossil fuels for transportation and energy (e.g., boilers, electricity generation), the decomposition of waste and other organic matter, and the volatilization or release of gases from various other sources (e.g., fertilizers and refrigerants).

In 2009, GHG emissions within Scotts Bluff NM totaled **146** metric tons of carbon dioxide equivalents ($MTCO_2E$). This includes emissions from Monument operations and concessioner operations and visitor activities, including vehicle use within the Monument. For perspective, a typical single family home in the U.S. produces approximately 11 $MTCO_2$ per year.[2] Thus, the combined emissions from the Monument—and visitor activities within the Monument—are roughly equivalent to the emissions from the electricity use of 13 households each year.

The largest emission sector for Scotts Bluff NM is purchased electricity emissions, totaling **76** $MTCO_2E$ (Fig 1 and Table 1).

# FIGURE 1

***Scotts Bluff National Monument*** *2009 Total Greenhouse Gas Emissions by Sector*




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

# TABLE 1

***Scotts Bluff National Monument*** *Total Greenhouse Gas Emissions by Sector and Unit*

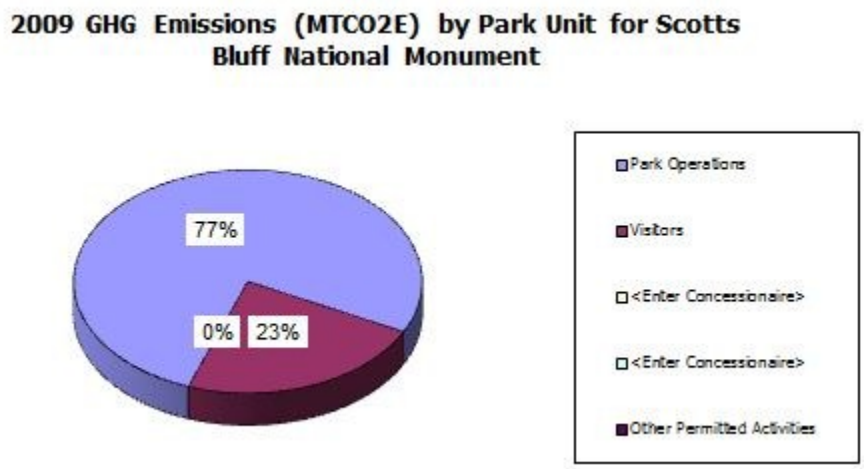
**EMISSION RESULTS BY SECTOR AND PARK UNIT**

**Metric Tons Carbon Dioxide Equivalent ($MTCO_2E$)**

| Park Unit | Stationary Combustion | Purchased Electricity | Mobile Combustion | Waste | Wastewater Treatment | Refrigeration | Fertilizer Application | Park Employee Commuting | Other GHG Sources | Total Emissions | Forestry |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Park Operations | 0 | 76 | 15 | 6 | 0 | 12 | | 2 | 0 | **112** | |
| Visitors | 0 | NA | 34 | NA | NA | 0 | NA | NA | 0 | **34** | NA |
| <Enter Concessionaire> | | | | | | | | NA | | **0** | NA |
| <Enter Concessionaire> | | | | | | | | NA | | **0** | NA |
| Other Permitted Activities | | | | | | | | NA | | **0** | NA |
| **Total Emissions** | **0** | **76** | **49** | **6** | **0** | **12** | | **2** | **0** | **146** | |

# FIGURE 2

***Scotts Bluff National Monument*** *2009 Operations Emissions by Unit*



# TABLE 2

*Scotts Bluff National Monument* 2009 Operations Emissions by Scope

**EMISSION RESULTS BY GAS AND PARK UNIT***

**Metric Tons Carbon Dioxide Equivalent ($MTCO_2E$)**

| Park Unit | $CO_2$ | $CH_4$ | $N_2O$ | HFC | Total Emissions |
|---|---|---|---|---|---|
| Park Operations | 93 | 7 | 0 | 12 | **112** |
| Visitors | 33 | 0 | 1 | 0 | **34** |
| <Enter Concessionaire> | | | | | |
| <Enter Concessionaire> | | | | | |
| Other Permitted Activities | | | | | |
| **Total Emissions** | **126** | **7** | **1** | **12** | **146** |

*Excludes Forestry

# Scotts Bluff National Monument Responds to Climate Change

*The following actions were developed during the CFP workshop hosted by Mount Rushmore National Memorial in April 2012, in order to meet the Monument's climate change mitigation and adaptation goals.*

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

**Scotts Bluff 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 **Scotts Bluff National Monument** will take have been presented below in order from highest to lowest priority within each sub-category.

## Energy Use Management

*Emission Reduction Goal: Reduce Monument operations' energy use emissions to 25 percent below 2009 levels by 2016.*

Improving energy efficiency and implementing alternative energy sources reduces Monument-based fuel use, lowers GHG emissions, decreases electricity consumption, and offers monetary benefits for the Monument. Emissions inventory results indicate that **52%** percent of the Monument's GHG emissions from Monument operations without visitor emissions are from energy consumption. Consequently, **Scotts Bluff National Monument** 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**

- ✓ Installed T-8 high efficiency florescent lighting throughout Monument—2008-2009
- ✓ Installed high efficiency HVAC units in all maintenance offices--2011
- ✓ Exterior security lights changed from HPS to LED and put on daylight sensors—2012
- ✓ Installed high efficiency light bollards along sidewalks put on timers-2012
- ✓ Installed motion activated switches in most offices—2012.

## Energy Use Management – Planned Actions

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

- Encourage energy conservation among staff through an education initiative that includes:
  - Managers working with first line supervisors to communicate to their staff energy saving practices.
  - Discussions of practices and improvement at management meetings. These will follow the operational leadership approach.
  - Develop and disseminate a list of energy saving practices for Monument staff to follow.
- Adjust thermostat settings to no more than 68 degrees in the winter and no less than 78 degrees in the summer.
- Implement green office policy that includes turning off lights and other electronics, enabling computer and monitor "hibernate" settings, using natural lighting, and reducing water use.

- Develop tips on conserving energy and include them in the Monument social media pages.
- Develop tip sheet for employees to learn how to make their homes more energy efficient.
- Develop a training program on sustainability that educates staff on energy, water, and fuel conservation.
- Ensure that language in contracts, leases, or agreements reflects green priorities in energy and material use. Include energy efficiency as a rated factor in performance standards, when appropriate.
- Provide smart power strips for appropriate facilities and workspaces. Identify opportunities to shut off all network systems (e.g., printers) when not in use. Consult with Information Technology staff to identify opportunities for further reduction of power consumption
- Incorporate energy-efficiency criteria into new contracts for Monument construction projects.
- Install building-level utility meters in existing buildings and in new major construction and renovation projects to track and continuously optimize performance.
- Review and implement the DOI Sustainable Buildings Implementation Plan.
- Develop tips on conserving energy and include them in the Monument's social media presence.

## 2 Measure energy use throughout the Monument

**Within 1-2 Years**

- Conduct energy audits for all Monument buildings Where feasible:
  - Upgrade to programmable thermostats.
  - Install insulating jackets for water heaters, explore in-line, on-demand water heaters, and establish more energy efficient temperature settings.
- Conduct water pump efficiency tests for all pumping systems.
- Evaluate pumps, blowers, and motors for upgrade to high-efficiency or variable frequency drives (VFD).

## 3 Upgrade lighting options

**Within 1-2 Years**

- Minimize use of artificial lighting by taking advantage of natural lighting in existing structures. Design or retrofit buildings to utilize natural lighting as much as possible.
- Finalize Monument Lighting Guidelines for International Dark Sky certification.
  - Assess efficiency and pollution effects of outdoor lighting
- Complete an assessment of lighting fixtures throughout the Monument, which includes replacement as needed.
  - Develop better documentation of progress.

- Assess potential for solar lighting at exterior locations.

- Set up procurement criteria to support replacement schedule.
- Install motion sensors for turning on lights where feasible throughout the Monument's buildings

**Within 5 Years**

- Install dimmable ballasts when feasible.
- Utilize natural lighting using conventional glazing, light shelves, skylights, and clerestory windows or identified efficient window in new construction and major rehabilitation projects.

## 4 Switch to more efficient electronics and devices

**Within 1-2 Years**

- Establish and implement a green procurement policy that sets minimum energy performance standards for all electronic equipment.
  - Ensure that all new electronic/office equipment is ENERGY STAR qualified at www.energystar.gov, and rather than purchasing individual copy, fax, print, and scanning equipment, consider a multi-function device.
- Assess energy efficiency of server systems during energy audit. Develop replacement schedule to increase efficiencies.
- Adequately ventilate or sunshield all electrical and mechanical equipment in warm weather.
- Provide smartstrips at all multi-appliance locations.
- Consolidate printers to reduce redundancy and unnecessary energy use.
- Educate and train procurement employees on how and why to purchase energy efficient appliances/electronics.
- Default all computers to print double-sided.
- Purchase only energy efficient electronics.
  - Refer to the Federal Energy Management Program guidelines for purchasing energy efficient appliances in accordance with federal procurement procedures.
- Install energy meters to measure energy use and monitor big consumers.
- Replace Monument's existing furnace with an energy-efficient model.
- Install energy efficient water heaters.

## 4 Improve building structures and envelopes.

**Within 1-2 Years**

- Determine efficiency of existing insulation via energy audit and develop a replacement schedule.
- Perform building infiltration assessment to determine air tightness and work towards tight building envelope during the energy audit.
- Evaluate possibilities for energy-efficiency options during energy audit.
- Evaluate solutions for improving insulation in historic structures through Section 106 compliance.
- Educate and train Monument employees to identify and target weatherization and energy efficiency during scheduled recurring comprehensive condition assessments (5-yr cycle) and annual condition assessments of monument facilities.
- Prioritize weatherization of buildings identified by assessments as inefficient.
- Develop schedule to bring existing buildings into LEED Existing Buildings Operations and Maintenance (EBOM) system when possible.
- Inventory existing windows, prioritize and describe facility needs using the Facility Management Software System, and replace all single-pane windows with energy-efficient windows appropriate to the structure throughout the Monument.
- Ensure that 100% new construction meets LEED certification standards.

**Within 10 Years**

- Phase out use of fossil fuel consumption in buildings by developing a seven-year plan to install renewable energy systems within the Monument that, on an annual basis, will offset electricity consumption through the grid and have carbon-neutral lifecycle footprints (from manufacturing through the end of useful life).

## 5 Utilize alternative energy sources

**Within 1-2 Years**

- Purchase as close to 100% renewable energy-generated electricity as possible.

**Within 5 Years**

- Install solar hot water heating systems in housing and other Monument buildings as feasible.
- Evaluate opportunities to use biomass as replacement fuel.

## 6 Measure energy use throughout the Monument

- Monitor electrical, natural gas use.

## Transportation Management

*Emission Reduction Goal: Reduce transportation-related GHG emissions from Monument operations*
*25% by 2016*

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Scotts Bluff National Monument's emissions. As the inventory results indicate, GHG emissions from transportation comprise 43% percent of Monument operations emissions and 34% percent of the Monument's overall emissions which includes visitors and employees. Scotts Bluff National Monument set a goal to reduce transportation GHG emissions from Monument operations by 25 percent by 2016. GHG emissions from visitor-related transportation (Scope 3 GHG emissions) will be addressed through evaluation of opportunities and education. Presented below are the actions that the Monument will pursue to achieve this goal.

**Progress to Date**

- ✓ Flex fuel vehicles-E85
  - LE vehicle-2013 Chevy Tahoe
  - 2012 Chevy Silverado Pickup
- ✓ Hybrid vehicles
  - 2011 Ford Escape
  - 2008 Toyota Prius

## Transportation Management – Planned Actions

### 1 Reduce NPS staff and public vehicle, and equipment fuel consumption

**Within 1-2 Years**

- Develop a Green Fleet Management Plan including policies, procedures, and protocols to "right-size" the vehicle fleet by number and type.
  - Analyze fleet fuel consumption patterns for efficiency improvements.
  - Set a benchmark for fleet-wide mile per gallon average.
  - Evaluate opportunity to replace conventional and E-85 vehicles with alternative fuel vehicles (AFVs) including hybrid electric vehicles (HEVs), electric vehicles, compressed natural gas (CNG), and biodiesel.
- Promote efficient driving through the use of employee trainings and dashboard signage.
- Use alternative fuel vehicles in demonstration projects.
- Develop idling guidelines and post in fleet vehicles (e.g., dashboard stickers for NPS vehicles). Unless required for vehicle operation, establish the Monument as a zero idling zone. Pair with an educational campaign to communicate "No Idling" messages throughout the Monument for both staff and visitors.
- Reduce business and travel through the use of webinars, scheduling joint meetings, or using video or teleconferencing during meetings.

- Formalize a policy that promotes flexiplace or flexischedule (e.g., telecommuting or carpooling). Include a plan for incrementally reducing vehicle miles traveled on an annual basis.
- Consider installation of an Electric Vehicle Charging Station for park and visitor use.
- Encourage employee use of alternative forms of transportation (e.g., bicycles or electric vehicles) to replace driving vehicles short distances. Develop guidelines to ensure appropriate vehicle use and selection.
- Continue to encourage staff carpooling. Develop an online system to help with coordination.
- Identify areas to reduce or eliminate mowing and implement the most efficient method (e.g., solar-charged electric equipment) for any mowing that cannot be eliminated. Investigate replacing lawn with low-maintenance native vegetation.

## 2 Reduce Vehicle GHG emissions from visitors

**Within 1-2 Years**

- Promote visitor use of Saddle Rock trail for alternative means of travel including accessing the summit of Scotts Bluff.
- Expand trail access points.
- Explore potential for bike lanes on Old Oregon Trail Road.
- Evaluate signage to encourage use of Bike Trails.
- Work cooperatively with partners - public and private - to evaluate local and regional alternative transportation systems for Monument access.
- Evaluate opportunities to expand current shuttle bus to top of Scotts Bluff.
- Educate visitors about benefits of Green Travel (see Education and Outreach.)
- Continue to collect data on visitor transportation patterns, vehicle occupancy, and ridership to determine needs for alternative transportation.
- Consider installation of an Electric Vehicle Charging Station for park and visitor use.

## 3 Other

**Within 1-2 Years**

- Evaluate adaptive transportation management strategies.
- Designate a “green” transportation manager charged with ensuring that transportation decisions are made in alignment with sustainability and other NPS policies.

## Waste Management

*Emission Reduction Goal: Reduce Monument operations waste emissions to 20 percent below 2009 levels by 2016 through waste diversion and reduction.*

The connection between waste and GHG emissions may not at first 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 $CH_4$ (methane) emissions in the United States. Waste from Scotts Bluff National Monument facilities routinely travels to the Gering Sanitary Landfill. Reducing the amount of waste sent to landfills reduces $CH_4$ 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.

Scotts Bluff National Monument's Monument operation activities emitted 6 $MTCO_2E$ from waste management in 2009. Diverting or reducing the Monument's waste stream through increased recycling and waste management efforts will reduce both the amount of waste sent to the Gering landfill and resulting emissions. Presented below are the actions that the Monument will pursue to achieve the stated goal.

**Progress to Date**

- ✓ Recycled-refined oil used in vehicles –2009-2012
- ✓ Recycling—use of more recycling bins throughout the Monument
- ✓ Recycling of the following for several years:
  - Cardboard
  - Newspaper
  - Office paper
  - Mixed paper-Glossy
  - Magazines
  - Plastic
  - Batteries
  - Florescent bulbs
  - Aluminum
  - Steel
  - Copper
  - Oil
  - Electronics (computers & cell phones)
  - Toner & Printer Cartridges
- ✓ Installed water bottle refilling station in VC, 2012 to minimize need for plastic water bottles use
- ✓ Installed auto-flush low-flow toilets, no water urinal, auto on and off lavatory dryers in Comfort Station 2012-2013

# Waste Management – Planned Actions

## 1 Decrease waste through behavior change

**Within 1-2 Years**

- Evaluate effectiveness of existing recycling programs. If warranted by evaluation results, institute signage throughout the Monument and weave waste reduction messaging into interpretation programs.
- Continue to require that construction contractors and maintenance reuse or recycle materials used during building renovations and new site construction/remodeling projects and monitor for compliance.
- Provide biodegradable or reusable plates, cups, and, silverware for staff to use to reduce waste, or have everyone bring their own.
- Integrate metrics on environmental responsibilities into performance evaluations.

## 2 Establish new plans and policies that promote waste and pollution reduction

**Within 1-2 Years**

- Implement a Construction Waste Management Plan and Job Site Recycling Policy.
- Continue to purchase and recycle environmentally-friendly printer cartridges.
- Promote the use of barrel composters, worm bins, and/or Earth Tubs at Monument facilities and residence.
- Designate a Monument employee who will take a leadership role in the Monument's effort to improve recycling and waste reduction, and incorporate this responsibility into his/her employee performance appraisal plan.
- Develop methodology for measuring and analyzing pesticide use in order to reduce the use of toxic and/or petroleum based pesticides in managing landscapes and outdoor spaces through the use of integrated pest management strategies and other techniques

**Within 5 Years**

- Manage solid waste using an Integrated Solid Waste Alternative Program (ISWAP).

## 3 Develop infrastructure to effectively manage waste

- Procure recycling trailer to allow storage and transfer of recycled materials to appropriate facilities.

**Within 10 Years**

- Compost food and other organic waste.
- Investigate composting opportunities to include landscape materials composting for Monument residents, and other opportunities for organic waste from Monument (e.g., food waste and landscape vegetation, etc.).

## Reduce consumption and reuse water

*Goal: reduce water consumption 25% by 2016*

Similar to Waste Management, the connection between water use and GHG emissions may not be obvious.

**Within 1-2 Years**

- Evaluate appropriate uses for reclaimed water.
- Use reclaimed water more extensively throughout the Monument.
- Conduct an assessment of leaks in water delivery system.
- Investigate harvesting rainwater and filtering for potable use and landscape use.
- Replace existing restroom faucets and toilets with energy-efficient low-flow models.
- Replace existing water-using urinals with waterless urinals (or best technology) Monument-wide.
- Reduce lawn watering on lawn and replace high maintenance Kentucky Blue Grass with low maintenance, indigenous buffalo grass.

# STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. **Scotts Bluff National Monument** can play an integral role in communicating about climate change to a vast audience. A better understanding of the challenges and benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. **Scotts Bluff 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 **Scotts Bluff National Monument** takes to address climate change serve as opportunities for increasing the public's awareness of climate change. Presented the actions that are currently under way and which comprise the Monument's progress to date, and those actions that the Monument will pursue.

## Key Messages

Implementing effective education and outreach programs requires a focused set of messages to relay to appropriate audiences. Scotts Bluff National Monument recognizes this fact and will develop several key messages about climate change to educate Monument staff, visitors, partners, and gateway communities. Strategies for communicating these messages include:

- Focusing on education about the issues and solutions without focusing on climate change itself.
- Communicating the Monument's long-term goals in increments to make them more tangible.
- Using positive framing and messaging.
- Ensuring that messaging addresses the greater Scottsbluff and Gering area, not just the Monument.

## Monument Staff

**Within 1-2 Years**

### 1 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 among Monument visitors and fostering a sense of collective responsibility among staff to help reduce Monument emissions. By incorporating climate change education into staff development programs, Scotts Bluff 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 but are not limited to:

- Create a climate change training program for staff which will increase climate change messaging into interpretive/educational/informative/communication efforts.
- Regularly integrate climate change messaging into staff meeting.

## Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Scotts Bluff 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 about climate change, and encouraging visitors to reduce emissions, Scotts Bluff National Monument can play an important role in educating the public about climate change.

**Within 1-2 Years**

### 1 Incorporate climate change awareness into visitor education

- Work with Oregon Trail Museum Association to develop and implement programs (e.g., Monuments Climate Challenge) that will educate people about climate change. Projects may include the use of re-usable water bottles with sustainability message in conjunction with water bottle filling station already installed.
- Ensure that the climate change messages are incorporated into appropriate interpretive programs and printed materials and programs (e.g., the Junior Ranger program, evening programs, and the monument website and social media presence).
- Ensure that climate change messages can reach diverse audiences by translating written and audio-visual materials.

### 2 Highlight what the Monument and its partners are doing to address climate change

- Maintain an updated list on the Monument website and social media of climate-friendly actions the Monument and partners have taken.
- Highlight demonstrations of successful climate friendly projects (e.g., buffalo grass installation, photovoltaic technology, etc.).
- Develop self-guided tours for visitors to see and learn from sustainable actions the Monument is taking.

### 3 Encourage visitors to reduce greenhouse gas emissions

- Encourage visitors to rethink, reduce, reuse, and recycle by placing appropriate signage on existing recycle and trash stations (e.g., “By recycling this aluminum can, you have saved X lbs of $CO_2$ from entering the atmosphere.”).
- Encourage visitors to participate in the Climate Friendly Parks program by providing easy actions people can take to reduce emissions in their everyday lives.

## Local Community Outreach

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

**Within 1-2 Years**

**1 Encourage climate change awareness among the communities within both the Monument and the region**

- Continue to encourage alternative transportation within the Monument community and engage the community with "things you can do" messages on website and social media.
- Develop a means for "Green Travel", a reduced carbon to carbon-neutral visit through the Monument's website.
- Develop and distribute an interactive climate change curriculum for local school visits.
- Provide volunteer opportunities to work on climate change related projects by participating in research, mitigation actions, site restoration or citizen science.
- Share climate change information such as actions, mitigations, and adaptation strategies with surrounding local and civic organizations.
- Use media and social media to advertise, celebrate, and raise awareness about climate change actions in the Monument.

# STRATEGY 3: DEVELOP AND IMPLEMENT A PLAN TO ADAPT TO CURRENT AND FUTURE IMPACTS OF CLIMATE CHANGE

While every effort must be made to curb future impacts of climate change through GHG reduction actions such as those proposed in Strategy 1, the impacts of climate change are now being seen around the globe. As such, it is important to develop and implement strategies to adapt to the effects of a changing climate in order to protect the natural, cultural, and infrastructure resources contained in our national public lands. The actions presented in this section are the first step towards developing broader adaptation strategies.

When developing strategies for adaptation, it is important to recognize that the adaptation community is in its early stages. The bodies of both scientific and planning knowledge on this subject are rapidly evolving. In general, the body of knowledge is currently coalescing around several key aspects of adaptation planning, which include: 1) establishing a measurable natural and cultural resource baseline, 2) developing key partnerships both between entities (e.g., National Park Service, U.S. Forest Service, non-governmental organizations) and between individuals (e.g., managers, policy makers, stakeholders, scientists) who will be affected by any actions taken, 3) identifying and developing adaptation strategies, 4) implementing adaptation strategies, and 5) revisiting and revising these strategies based on experience and updated science.

As discussed during the Climate Friendly Parks workshop, impacts of climate change on the Monument include increased temperatures, changes in precipitation patterns, and warmer and altered stream flow patterns. Many of these impacts are interrelated, and this makes adaptation planning a complicated task. For example, increased temperatures and changes in precipitation can impact forest regeneration, forest productivity, species distribution, and large scale disturbance patterns from fire, insect outbreaks, and direct mortality. The potential for large scale disturbances of Monument resources and infrastructure highlights the need for proper adaptation strategy

planning and implementation. The actions discussed below represent the beginning of this process for Scotts Bluff National Monument.

## Natural Resources

National Parks and Monuments contain, and have protected and preserved for decades, various ecological landscapes and representative species of the nation's biological diversity. The species that comprise these ecosystems and the landscapes they inhabit will respond to climate change. The actions below were developed in an effort to preserve and protect Scotts Bluff National Monument's natural resources to the greatest extent possible. These actions are general approaches to natural resource protection. The Monument has developed specific steps to be taken that are available on request.

**Within 1-2 Years**

### 1 Implement an approach that encourages adaptation and improves the resilience of natural resources

- Continue baseline species inventories and implement monitoring activities to inform and develop conservation strategies, particularly for those species in the communities where considerable change is expected – particularly with the ponderosa pine forests
- Work with researchers, other agencies, and the public to develop spatial and temporal adaptation strategies for aquatic and terrestrial resources on a landscape scale. Specifically work with Platte River Basin Environment, Nebraska National Forest, Nebraska Game Monuments Commission.
- Create a dialog with adjacent agencies (e.g. Platte River Basin Environments and Nebraska Game and Parks) to develop criteria or common definitions regarding "migrating species" and "invasive/exotic species."

**Within 5 Years**

- Integrate different temporal scales into adaptation strategies. Address short term (next 5 years), medium term (next 20 years) and longer term (50-100 years) strategies.
- Integrate individual research and monitoring projects as part of a broader holistic research and monitoring program. Utilize current research and monitoring to develop predictive models to inform Monument management.
- Pursue resource restoration and rehabilitation projects such as invasive species removal, restoration of rare species, or reduction of unnatural fuel loads in Monument forested areas to promote greater ecosystem resilience.

## Cultural Resources

Scotts Bluff National Monument contains significant cultural resources in the form of archeological sites, historic structures, museum collections and archives, and cultural landscapes. The integrity of these cultural resources can be affected by physical changes in the landscape due to climate change. Scotts Bluff National Monument has developed the following actions to preserve as many of the cultural resources within the Monument boundaries as possible.

**Within 1-2 Years**

### 1 Implement an approach that encourages preservation and adaptation of cultural resources

- Update, as necessary, the documentation for all significant cultural resources and review documentation for candidate cultural resources. Continue to monitor and assess documented and candidate cultural resources as well as related facilities (e.g., the Scotts Bluff visitor center curatorial vault) to identify impacts of or vulnerability to climate change, then identify effective means of mitigation.
- In consultation with National Park Service cultural resource professionals, the Advisory Council on Historic Preservation, and repositories in an energy-efficient manner suited to the environmental preservation requirements of the collections and archives.

## Infrastructure

To enable visitors to experience the Monument's resources, its physical infrastructure (that may include roads, trails, bridges, culverts, buildings, and utilities) must be maintained and serviced to prevent potential impacts from climate change. Scotts Bluff National Monument recognizes the potential for its infrastructure to be impacted and has developed the following actions to understand and plan for the impacts of climate change to better protect its physical resources.

**Within 1-2 Years**

### 1 Implement an approach that encourages adaptation of facilities (including transportation and structures)

- Re-evaluate design and location of facilities to ensure resilience from potential impacts of climate change. When possible, avoid geohazardous areas (e.g., debris cones, floodplains).
- Anticipate hazard trees and fire. Consider wildland fuel management needs as part of evaluating facility lifecycle costs; minimize risk through proper site of facilities location, design and materials.
- Incorporate landscape principles and plantings to reduce reliance on non-renewable energy for climate control (e.g., use plantings to shade structures in the summer and allow maximal solar gain in the winter).
- Incorporate landscape principles and plantings to survivability in changing climatic conditions when warranted (e.g. xeriscaping and changing to drought tolerant species, i.e. buffalograss).
- Design all new construction and reconstruction to take maximal advantage of natural, environmental conditions (e.g., orienting buildings and structures to take advantage of natural light).
- Anticipate increased heating or cooling needs and develop ways to reduce the needs or meet them without increasing non-renewable energy demand or GHG emissions.

### 2 Implement an approach that encourages adaptation of utilities

- Assess increased impacts on water sources and drain fields or leach fields by collecting, interpreting, and utilizing surface water quality monitoring data.

### 3 Engage public in adaptation planning and implementation of strategies

- Regularly communicate with the public to develop an understanding of and gain support for inevitable difficult decisions made with respect to resources and infrastructure (e.g., seasonal closures of roads and trails).

# STRATEGY 4: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Scotts Bluff 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 revaluation of goals. As part of this strategy, Scotts Bluff National Monument will:

**Within 1-2 Years**

- Monitor progress with respect to reducing emissions. This will include subsequent emission inventories to evaluate progress toward goals stated in this action plan.
- Educate visitors about climate change, and the mitigation actions that Scotts Bluff National Monument has taken to reduce electricity (i.e., educate visitors on solar PV system on visitor center.)
- Develop additional emission mitigation actions beyond those listed in this plan.
- Periodically review and update this plan.
- The Monument will track climate friendly actions through the environmental management system.

# CONCLUSION

Scotts Bluff National Monument has a unique opportunity to serve as a model for over 100,000 recreational visitors annually. This report summarizes the operational actions the Monument commits to undertake to address climate change. Specifically, the Monument realizes its ability to educate the public and serve as a valuable model for citizens. By seriously addressing GHG emissions within the Monument and sharing its successes with visitors, Scotts Bluff National Monument will help mitigate climate change far beyond the Monument's boundaries.

The National Park Service faces an uncertain future due to the possible effects of climate change. However, by seriously addressing climate change impacts and reducing emissions, Scotts Bluff National Monument will reduce its contribution to the problem while setting an example for its visitors. The strategies presented in this Action Plan present an aggressive first step towards moving Scotts Bluff National Monument to the forefront of Climate Friendly Monuments.

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# APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

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|---|---|
| Patricia Bean | Integrated Resource Management Technician |
| Lesley Gaunt | Interpretive Specialist |
| Wayne McRoberts | Maintenance Specialist |
| Kevin Haberman | Facilities Manager |
| Robert Manasek | Chief of Resources |
| Amy Stasch | Budget Technician |
| Kelly Mansfield | Administrative Officer |
| Tom Schaff | Chief Ranger |
| AJ Legault | LE Ranger |
| Ken Mabery | Superintendent |

# LETTER OF SUPPORT

Scotts Bluff National Monument is committed to reducing its carbon footprint through strategic sustainable planning and action. We strive towards a vision of carbon neutrality by continuously reducing the amount of greenhouse gases (GHG) from consumption of energy and water, use of transportation and generation of waste. Every 1 to 3 years, we will evaluate our emissions output through an inventory process which will measure the success of the mitigation actions shown in this plan. We will educate our employees, visitors, and community partners on climate change through demonstrated action and increased educational efforts. The monument will explore adaptive solutions to regional climate change issues with partners, universities, and other experts. By creating a climate of action, Scotts Bluff will meet the goal of reducing GHG emissions by a minimum of 20% in 2016 while reaching beyond the monument's boundaries to increase awareness and positively influencing our visitors.

Reviewed by:

Ryan Michelle Scavo — 5/29/2013
Natural Resource Specialist — Date
Sustainable Operations & Climate Change (PFMD)

Julie McNamee — 5-29-2013
Julie McNamee — Date
Natural Resource Specialist
Air Resources Liaison, Air Resources Division

Approved by:

Ken Mabery, — 5/15/2013
Superintendent — Date
Scotts Bluff National Monument

Written and recommended by Scotts Bluff National Monument Green Team:

Patricia Bean — 5/15/13
Patricia Bean — Date

Lesley Gaunt — 5-15-13
Lesley Gaunt — Date

Wayne McRoberts — 5/15/13
Wayne McRoberts — Date