National Park Service
U.S. Department of the Interior

CLIMATE*Friendly* PARKS

Marsh-Billings-Rockefeller National Historical Park Action Plan

TABLE OF CONTENTS

MARSH-BILLINGS-ROCKEFELLER NATIONAL HISTORICAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Marsh-Billings-Rockefeller National Historical Park belongs to a network of parks that are putting climate friendly behavior at the forefront of sustainability planning in national parks. By conducting an emission inventory, setting an emission reduction target, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, Marsh-Billings-Rockefeller National Historical Park is serving as a model for climate friendly behavior within the park service.

Marsh-Billings-Rockefeller National Historical Park has committed to reducing greenhouse gas (GHG) emissions from its Park Operations by 30% below 2006 levels by 2011. This Action Plan lays out the measures the park will take to meet this goal. In addition to implementing these measures, Marsh-Billings-Rockefeller National Historical Park will:

- Perform subsequent emission inventories to monitor progress
- Identify additional actions to reduce GHG emissions and inform the public on climate change
- Include additional actions, and strengthen existing actions, to reduce GHG emissions in future Action Plans

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service. At Marsh-Billings-Rockefeller National Historical Park, increased temperatures may alter the natural ecosystems present, and change both the habitats available for species and resources available for park visitor recreation.

Scientists cannot predict with certainty the general severity of climate change nor its impacts. However, the current warming trend suggests that the problem is real and should be taken seriously. 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.

[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>

GOALS AND OBJECTIVES

The objective of this Action Plan is to identify actions that Marsh-Billings-Rockefeller National Historical Park can undertake to reduce GHG emissions and thus address climate change. This plan presents the park's emission reduction targets and associated reduction strategies designed to achieve the park's emission reduction goals.

While the plan does not provide detailed instructions on how to carry out each of the proposed measures, it provides the essential framework needed to meet Marsh-Billings-Rockefeller National Historical Park's emission reduction targets. The plan presents an opportunity for the park to devote resources for climate action through a mandate from the park's superintendent. This mandate gives park staff the resources and authority to pursue the mitigation strategies contained in this plan.

Marsh-Billings-Rockefeller National Historical Park aims to:

Reduce GHG emissions from Park Operations to 30% below 2006 levels by the year 2011 by implementing emission mitigation actions identified by the park.

In order to meet or surpass this goal, the park will implement strategies proposed in this plan that build from the park's current and future emission inventories. Specifically, the plan recommends three main strategies:

Strategy 1: Reduce emissions from park facilities and operations by identifying and implementing emission mitigation actions.

Strategy 2: Increase climate change outreach and education efforts.

Strategy 3: Evaluate progress and identify areas for improvement.

GREENHOUSE GAS EMISSION INVENTORY AT MARSH-BILLINGS-ROCKEFELLER NATIONAL HISTORICAL PARK

Naturally occurring greenhouse gases 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 energy (e.g., boilers, electricity generation) and transportation purposes, the decomposition of waste and other organic matter, and the volatilization or release of various other sources (e.g., fertilizers and refrigerants).

In 2006, Marsh-Billings-Rockefeller National Historical Park's GHG emissions totaled 78 metric tons of carbon equivalent (MTCE). This total includes emissions calculated for the park's operations. As Figure 1 and Table 1 demonstrate, the largest emission sector for Marsh-Billings-Rockefeller National Historical Park is Energy - totaling 68 MTCE. The majority of these emissions result from the stationary combustion of heating oil and propane for park operations – totaling 44 MTCE.

FIGURE 1

Marsh-Billings-Rockefeller National Historical Park's 2006 GHG Emissions from Park Operations by Sector

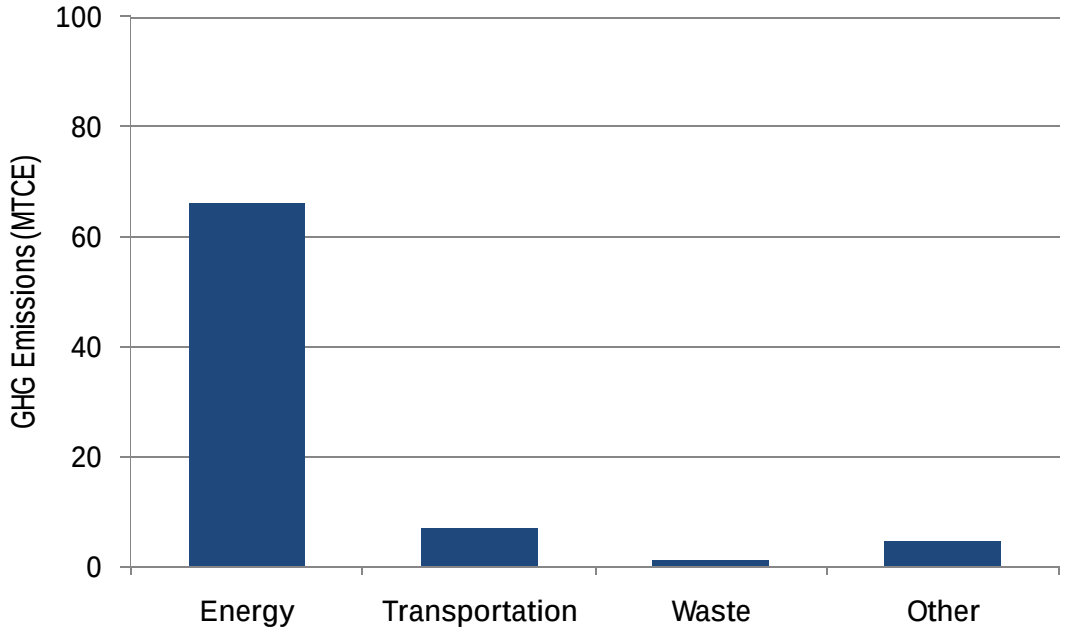

TABLE 1

Marsh-Billings-Rockefeller National Historical Park's 2006 GHG Emissions from Park Operations by Sector and Source

	Emissions (MTCE)	% of Total
Energy	66	84%
Stationary Combustion	44	
Purchased Electricity	22	
Transportation	7	9%
Vehicles and Equipment	7	
Waste	1	1%
Landfilled Solid Waste	1	
Other Emission Sources	5	6%
Refrigeration and Air Conditioning	2	
Other	2	
Total Emissions	78	

Totals may not sum due to rounding

How Marsh-Billings-Rockefeller National Historical Park is Responding to Climate Change

The following actions were developed by staff at Marsh-Billings-Rockefeller National Historical Park to meet the park's climate change mitigation goals.

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

Energy Use Management

Emission Reduction Goal: Reduce Park Operations energy use emissions to 32% below 2006 levels by 2011.

Improving energy efficiency and implementing alternative energy sources reduces park-based fuel use, lowers GHG emissions, decreases electricity consumption, and offers monetary benefits for the park. As the inventory results indicate, 84 percent of the park's GHG emissions from Park Operations result from energy consumption. The following strategies were developed to meet the park's energy use emission reduction goal:

1 Install more efficient boilers, furnaces, and water heaters

- Continue to upgrade to energy efficient boilers.
- Continue to upgrade to energy efficient water heaters.
- Install solar hot water heaters.
- Continue to upgrade to energy efficient furnaces.

2 Replace an existing device with a biotic-fueled device or fuel an existing device with biodiesel/biomass

- Fire existing device (e.g., generator) with biodiesel instead of diesel. Augment Carriage Barn, the Mansion, and the Belvedere heating system with wood-fired boilers.

3 Promote energy efficiency and energy conservation in NPS-owned facilities

- Complete an energy audit of all structures in park and use information to implement energy efficiency measures.
- Continue to upgrade to energy-efficient lighting in park buildings.
- Install room occupancy sensors and automatic lighting.
- Continue to develop an efficient light fixture and light bulb procurement approach.
- Use natural lighting in park buildings as much as possible.
- Run office equipment, appliances, etc, on energy-saving mode.
- Supply office equipment, etc. with power through single power strip. Turn off when not in use.
- Install free software that powers down computer monitors when not in use.
- Replace inefficient office equipment with energy efficient office equipment according to replacement schedule. Evaluate and commit to energy saving projects through the park(s) utility service.

- Replace Halogen bulbs with LED lighting in exhibit spaces.
- Perform energy-efficiency retrofits including improving building insulation and sealing the building's envelope.

4 Produce clean energy or purchase electricity from a renewable energy provider

- Analyze opportunities for installing photovoltaic panels on park buildings, parking lots, open areas, etc.
- Continue to purchase green energy from a renewable energy provider (e.g., CVPS's Cow Power program).
- Install fuel cells.

5 Retrofit old and historical buildings to be energy efficient

- Incorporate energy efficiency criteria into new building and building retrofitting contracts.
- Collaborate with historical preservation representatives to achieve maximum energy efficiency in historic buildings.
- Use the Leadership in Energy and Environmental Design (LEED) Green Building principles where possible with consideration of historic preservation management policies and guidelines.

6 Other

- Increase the thermostat by 2 degrees during warm weather and decrease the thermostat by 2 degrees during colder weather.
- Individually sub-meter all buildings in the park.
- Incorporate energy-efficiency criteria into new contracts for park construction.
- Incorporate energy efficient measures (e.g., monitoring) to improve efficiency of HVAC systems.
- Purchase carbon offsets.
- Develop and implement checklist for environmental review of new projects.
- Conduct proof of concept analysis for intelligent micro-grid opportunities.
- Identify opportunities to promote all energy actions through interpretation.

Transportation Management

Emission Reduction Goal: Reduce Park Operations transportation emissions to 30 % below 2006 levels by 2011.

Reducing vehicle miles traveled, improving vehicle efficiency and using alternative fuels can significantly reduce Marsh-Billings-Rockefeller National Historical Park's emissions. As the inventory results indicate, 9 percent of the park's GHG emissions from Park Operations are a result of mobile combustion. The following strategies were developed to meet the park's transportation emission reduction goal:

1 Reduce fuel consumption by NPS, concession, and visitor vehicles

- Provide access to the park through a regional alternative-fuel shuttle in partnership with the town of Woodstock.
- Consider an incentive program for visitors who travel to the park via an alternative fuel vehicle (including the shuttle).
- Establish preferential parking for alternative fuel vehicles.
- Encourage staff carpooling and bike-to-work/walk-to-work initiatives.
- Expand e-conferencing capabilities (e.g., webinars) to reduce business travel.
- Undertake a fleet study to determine how to decrease petroleum consumption and increase the use of alternative fuels in its fleet.

2 Use alternative fuels and oils in vehicles and equipment

- Run non-road equipment on biodiesel.

3 Increase use of hybrid or alternative fuel vehicles by NPS staff, concessioners, and visitors

- Replace gasoline truck with hybrid.
- Continue to replace aging fleet vehicles with alternative fuel or hybrid vehicles.
- Incorporate alternative fuel guidelines into fleet specifications.
- Obtain high-profile alternative fuel or hybrid vehicle to emphasize commitment.

4 Other

- Replace two-stroke engines with more efficient engines where applicable (chainsaws, leaf blowers, lawn mowers, etc.).

Waste Management

Emission Reduction Goal: Reduce Park Operations waste emissions to 5% below 2006 levels by 2011 through waste diversion and reduction.

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source reduction and solid waste reduction—can dramatically reduce GHG emissions. The less we consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted. Additionally, reducing the amount of waste sent to landfills reduces CH_4 emissions caused by decomposition.

Diverting or reducing the park's waste stream through increased recycling efforts and waste management procedures will reduce the amount of waste sent to landfills, which are the largest human-generated source of CH_4 emissions in the United States. Marsh-Billings-Rockefeller National Historical Park's Park Operation activities emitted 1 MTCE from waste management in 2006. The following strategies were developed to meet the park's waste emission reduction goal:

1 Manage waste through source reduction, composting, recycling, and combustion

- Create a materials exchange program whereby end-of-life materials are made available for reuse at other units and for other applications (e.g., used brick, wood waste).
- Evaluate Recycling Program for potential improvement opportunities.
- Continue to reuse or recycle material used during building and grounds remodeling.
- Continue to work with vendors to create partnerships that ensure the park's waste can be beneficially reused and recycled (e.g., mixed paper recycling, plastics recycling).
- Continue to reclaim/recycle used florescent bulbs.
- Continue to use alkaline, lithium battery recycling locations in every office building.
- Continue to track and report recycling data (e.g., quantity and type of material).
- Manage solid waste through the implementation of an Integrated Solid Waste Alternative Program (ISWAP) plan.
- Track and report landfill data to track reduction in disposal.
- Continue to salvage tree snags, boulders, topsoil, etc. as appropriate at construction sites.

2 Increase and coordinate staff efforts towards recycling

- Continue to include managing recycling in at least one full time person's job responsibilities.
- Continue to interface with maintenance regarding green operation responsibilities.
- Train park staff and concessionaires in new waste management practices (e.g., prepare an orientation packet and provide information on policies and practices on recycling).
- Continue to educate park employees about recycling and composting opportunities.

3 Develop and implement Green Purchasing policy

- Manage new procurement by requiring purchase of products made of recycled materials or with reduced packaging and other "green" practices.
- Purchase locally-produced materials when possible.
- Develop a list of park accepted sustainable products for purchasing and provide the list to park employees.
- Continue to use low/no-VOC insulation, carpets, paints, adhesives, etc.

- Evaluate current purchases and reduce redundant products.
- Continue to use non-toxic/Green Seal certified cleaning and other products.
- Develop a schedule for replacing existing materials over time and consider replacing equipment with recycled equipment or new equipment that will enhance reuse and recycling (e.g., copiers that can make two-sided copies).
- Continue to use post-consumer recycled paper in all park publications.
- Continue to use non-toxic chemicals that reduce bulk waste and result in best value for custodial operations.
- Encourage contractors to implement petroleum product replacement program and use bio-based lubricants throughout park fleet, chainsaws etc.
- Train staff on green procurement practices.
- Continue to reduce purchasing through reuse.

4 Reduce wastewater sent to treatment facilities

- Continue to replace toilets with low-flow models.
- Install low-flow faucets.

5 Other

- Continue to make ceramic plates, bowls, mugs, and silverware available for employee use in lieu of disposables.
- Continue sustainable practices database reporting.
- Identify baseline for solid waste generation.
- Encourage electronic transmission of information to reduce employees' paper consumption.
- Conduct an Integrated Solid Waste Alternatives Program Plan (ISWAP) (COMPLETED).
- Inventory hazardous wastes.
- Eliminate current inventory of hazardous wastes.

Other Management Activities

Emission Reduction Goal: Reduce other Park Operations emissions to 5% below 2006 levels by 2011.

There are several additional sources of GHG emissions at national parks in addition to those included in the Energy, Transportation, and Waste sectors. These include emissions from land management, refrigeration and air conditioning use, and fertilizer application, among others.

Marsh-Billings-Rockefeller National Historical Park's Park Operation activities emitted 6 MTCE from other emission sources in 2006. The following strategies were developed to reduce emissions from these sources:

1 Reduce fertilizer use on lands

- Continue to reduce fertilizer use where possible.
- Continue to use compost as an alternative to chemical fertilizers.
- Continue to minimize excess applied nitrogen fertilizer.

2 Continually improve land use practices

- Manage forestland in an eco-responsible manner by continued participation in the FSC certification program.
- Consider re-vegetation and exotic plant control funding as line items in any construction project.
- Confine all construction activities to pre-designated areas.

3 Other

- Place HEPA filters in buildings and HVAC systems to filter indoor air of fine particle pollution.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex issue that the park can help communicate to the public. A better understanding of the problem and the benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. Marsh-Billings-Rockefeller National Historical Park recognizes that the greatest potential impact the park can have on mitigating climate change is through public education. Thus, the park sees public education as an end goal of any climate initiative. From increasing the efficiency of park operations to developing climate specific interpretive programs, the actions Marsh-Billings-Rockefeller National Historical Park takes to address climate change serve as opportunities for increasing the public's awareness of climate change.

Park Staff

Developing a climate change education program for park staff is vital to increasing awareness about climate change among park visitors. By incorporating climate change education into staff-development programs and creating new opportunities for staff to learn about climate change, Marsh-Billings-Rockefeller National Historical Park will reduce park emissions and provide visitors with the tools and resources they need to reduce GHG emissions at home and in their own communities.

Incorporate climate change into park staff training and performance plans

In an effort to provide Marsh-Billings-Rockefeller National Historical Park staff with the knowledge and tools to educate visitors, the park will:

- Create a Park Climate Change Policy Memo specific to the park.

- Provide the Environmental Management Team with materials, publications, and tools available from the U.S. Environmental Protection Agency (EPA) and other agencies and organizations to mentor fellow staff about climate change.
- Hold internal discussions and workshops to devise new strategies to continually reduce greenhouse gas (GHG) emissions, distribute resources and tools to staff, and acknowledge success of current strategies.
- Develop intranet pages to inform staff about climate friendly actions being taken throughout the park, encourage them to continue to strive towards more greenhouse gas emissions reductions, and advise them on new ways to reduce GHG emissions.
- Incorporate education on the science and impacts of climate change into education tools (e.g., seasonal staff handbook) used during seasonal staff orientation.
- Continue to incorporate sessions on climate change into seasonal staff training.
- Continue to incorporate climate-friendly information into Interpreter programs and talks.
- Create personal incentives for staff to reduce GHG emissions in park and at home.
- Create visual reminders for park employee regarding climate change and how employees can help reduce emissions.

Visitors

Understanding climate change and its consequences is essential to initiating individual behavioral change. Marsh-Billings-Rockefeller National Historical Park 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 park-specific materials, highlighting what the park is currently doing about climate change, and encouraging visitors to reduce emissions, Marsh-Billings-Rockefeller National Historical Park can play an important role in educating the public about climate change.

Incorporate climate change awareness into visitor education

Park interpretive staff have the opportunity to introduce the issue of climate change to many visitors. Marsh-Billings-Rockefeller National Historical Park encourages staff to include messages about climate change in their interpretive programs. The park will:

- Continue to incorporate climate change information into existing park brochures and create/utilize bilingual brochures.
- Continue to educate visitors about climate change and how public transportation can help reduce emissions.
- Continue to create and/or distribute current monitoring data on climate change and its effects on national parks in general and on Marsh-Billings-Rockefeller.

Highlight what the park is doing to address climate change

Marsh-Billings-Rockefeller National Historical Park has already taken many climate friendly actions. In an effort to lead by example and demonstrate climate friendly behavior for the public, the park will increase education and outreach efforts related to sharing the successes it has already achieved. The park will:

- Create signs promoting park's efforts to curb emissions.
- Develop a plan for interpretation on the new, alternative fueled regional bus.

- Continue to build partnerships and work other institutions (e.g., schools) to promote climate change education and support GHG reduction programs regionally.
- Continue to disseminate information about climate friendly actions the park is taking at conferences and regional workshops.

Encourage visitors to reduce GHG emissions

Perhaps the greatest potential for Marsh-Billings-Rockefeller National Historical Park to help reduce GHGs is to increase visitors' awareness of how they can reduce their personal GHG emissions. The park will:

- Develop a Do Your Part kiosk in visitor's center where visitors can sign up for the program and get involved.
- Table at local events such as farmers markets and other community gatherings and speak to people about Do Your Part!

DO YOUR PART FOR CLIMATE *Friendly* PARKS

The Do Your Part! program provides easy actions people can take every month to reduce emissions in their everyday lives.

Local Community

The communities within and surrounding Marsh-Billings-Rockefeller National Historical Park are key partners in achieving GHG reduction goals. As such, Marsh-Billings-Rockefeller National Historical Park staff continue to explore partnership opportunities with local community entities to promote climate change awareness. Park staff will use their knowledge of climate change resources to help local communities engage in climate friendly actions.

Encourage climate change awareness among the communities within both the park and region

Marsh-Billings-Rockefeller National Historical Park realizes that the communities within the park and the region are one of the greatest assets in addressing climate change. The park will:

- Continue to work with the surrounding community to develop regional climate adaptation strategies, including landscape scale conservation and connectivity efforts.
- Support community-based GHG reduction programs.
- Use the park's forest management as a demonstration on adaptive management and climate change monitoring.
- Involve citizens in assisting with climate change monitoring programs (e.g., phenology, eBrids).
- Share programs with other parks in the Northeast Temperate Inventory and Monitoring Network and NPS science community.
- Contact possible park partners, such as environmental groups, representatives from the local tourism/community business board, representatives from the state environment/energy departments, teachers, representatives from the regional transportation authority, and local university partners.
- Consider local economy in procurement and other areas.
- Continue to communicate with local communities, park visitors, and local media about actions they can take to reduce GHG emissions.
- Work with local organizations to set climate change priorities and host climate change education workshops.
- Share information with local community about efforts to manage waste.

- Develop and leverage relationships with other agencies and entities to create opportunities for workshops on climate friendly activities etc.

STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Marsh-Billings-Rockefeller National Historical Park plans to reduce it's emissions to the specified goal. Achieving this goal will require an ongoing commitment by the park, which may include subsequent emission inventories, additional mitigation actions, and revaluation of goals.

- Perform subsequent emission inventories to evaluate progress toward goals stated in this action plan.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Form a committee to meet periodically to review progress on this plan.

CONCLUSION

Marsh-Billings-Rockefeller National Historical Park has a unique opportunity to serve as a model for approximately 30,000 visitors annually.[2] This report summarizes the operational actions the park commits to undertake to address climate change. Specifically, the park realizes its ability to educate the public and serve as a valuable model for citizens. By seriously addressing GHG emissions within the park and sharing its successes with visitors, Marsh-Billings-Rockefeller National Historical Park will help mitigate climate change far beyond the park's boundaries.

This Action Plan also serves as an important enhancement mechanism for the Park's Environmental Management System (EMS). Realistic environmental commitments created by Marsh-Billings-Rockefeller National Historical Park staff and approved by the park's superintendent will significantly reduce the park's GHG emissions in the coming years. The mitigation actions included in this plan have been developed in order to be directly transferable to the park's EMS Marsh-Billings-Rockefeller National Historical Park's Action Plan thus provides an effective way to meet EMS goals.

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, Marsh-Billings-Rockefeller National Historical Park 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 Marsh-Billings-Rockefeller National Historical Park to the forefront of Climate Friendly Parks.

[2]Marsh-Billings-Rockefeller National Historical Park: Park Statistics. Available online at: http://www.nature.nps.gov/stats/viewReport.cfm.