



CLIMATE *Friendly* PARKS

Harpers Ferry National Historical Park Climate Action Plan

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Introduction

Approximately 250,000 visitors stroll through the streets of Harpers Ferry National Historical Park annually to discover the natural and cultural treasures preserved by the park's dedicated staff. This park's historic buildings, living history presentations, museums, and exhibits recreate the stories of Harpers Ferry's robust and influential past, while guided tours and hiking trails offer visitors a chance to see the sights and a picturesque view of the Potomac and Shenandoah Rivers and the area's mountainous terrain.

Harpers Ferry National Historical Park developed greenhouse gas (GHG) reduction strategies and actions during the park's CFP action planning workshop held February 9-10, 2011 at the Mather Training Center. The park's emissions reduction strategies focus on: energy consumption, transportation, waste generation, and climate change education efforts.

As the steward of the nation's most valued public lands, the National Park Service (NPS) has an obligation and an opportunity to be a leader in protecting the environment. As a participant in the Climate Friendly Parks (CFP) Program, Harpers Ferry National Historical Park belongs to a network of parks that are putting climate change at the forefront of sustainability planning in National Parks. This park is leading by example by developing an emission inventory, setting an emission reduction target, developing this climate action plan, and committing to educate park staff, visitors, and community members about climate change and the actions Harpers Ferry National Historical Park is taking to mitigate their impacts. In so doing, the park commits to the following actions with the overall goal of reducing GHG emissions from park operations by 15% below 2009 levels by 2019:

1. Reduce energy, fuel and water consumption throughout all park operations.
2. Conduct a feasibility study on renewable energy opportunities at the park.
3. Create policies and programs that encourage behavioral changes.
4. Create a "No vehicle Idling" policy for park operations and visitors.
5. Continually improve the park's current internal recycling program and communicate the program to staff.
6. Incorporate strategies to improve solid waste programs and reduce sources of solid waste in the park.
7. With leadership from the park Contracting Specialist, develop a green purchasing system for general supplies such as office paper and maintenance supplies and materials.
8. Improve Green Team-to-park employees communication regarding the park's sustainability initiatives.
9. Engage local communities and other stakeholders in park sustainability initiatives.
10. Improve tracking of park energy, fuel, and water usage data.

Harpers Ferry National Historical Park's climate action plan serves to support and enhance existing initiatives such as the park's Environmental Management System (EMS) and the National Capital Region's (NCR) EMS. An EMS is a management tool and organizational means to apply continuous improvement principles and strategic planning methods that reduce environmental impacts and achieve sustainability goals. The park's EMS addresses all environmental programs at the park, and provides the context for actions related to reducing park emissions, including this Climate Action Plan. The Region's EMS includes energy and GHG reduction goals as outlined in Executive Orders 13423 and 13514 that extend to the park level. It should be noted that the purpose of this climate action plan is to reduce park GHG emissions and it is not intended to address park adaptation due to climate change.



The Challenge of Climate Change

Earth's atmosphere has a natural supply of gases that trap heat and keep the planet's temperature warm enough for life to survive. Such gases are known as greenhouse gases, or GHGs. However, the release of certain GHGs, including carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), through industrial processes has disturbed this balance. These gases—which can stay in the atmosphere for at least fifty years and up to centuries—are accumulating in the atmosphere faster than natural processes are able to remove them, in effect, creating an extra-thick heat blanket around the Earth. The increase in GHGs is causing an overall warming of the planet, commonly referred to as global warming. The term climate change describes the variable consequences of global warming over time.

According to the Intergovernmental Panel on Climate Change (IPCC), the leading international organization for the assessment of climate change, “Continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century.”¹ Rising global temperatures will further raise sea-level and affect all aspects of the water cycle, including episodic and intense precipitation events, water temperature, ocean currents and upwelling, salinity levels of inland coastal waters, snow cover. Climate change is also expected to affect human health, alter crop production, animal habitats, and many other features of our natural and managed environments. Climate change presents significant risks and challenges to the National Park Service. At Harpers Ferry National Historical Park, increased temperatures will alter the natural landscape which will affect the park's structures and open space, and change both natural habitats and resources available for park visitor recreation.

HARPERS FERRY NATIONAL HISTORICAL PARK AND CLIMATE CHANGE

Based on the information above, climate change may affect the cultural and historical resources entrusted to Harpers Ferry National Historical Park. The following potential climate change impacts were considered while the park staff developed this climate action plan:

- Sea level rise could impact the appearance of Lower Town and the surrounding landscape.
- Effect of temperature change on the preservation of cultural resources, artifacts, historical structures.
- Shifts in tourism trends related to temperature changes.
- Changes in weather patterns

INVENTORY PROCESS

The park's GHG emissions inventory was completed using the Climate Leadership in Parks (CLIP) tool. The CLIP tool was developed by the CFP program in association with the U.S. Environmental Protection Agency (EPA) to account for GHG emissions specific to national parks. The tool is designed to:

- Educate park employees about the emissions inventory process
- Assist with identifying strategies for each park to reduce emissions
- Enable park personnel to track current and future progress towards emissions reduction goals.

Harpers Ferry National Historical Park staff gathered annual usage data (e.g. gallons of fuel used in a year) related to park operations and visitor travel within park boundaries for the baseline inventory year, fiscal year (FY) 2009 because 2009 was the most recent representative year of the park's emissions. Since EO 13423 stipulates 2008 as the agency baseline year, it should be noted that HAFE's emissions in FY 2009 are representative of emission from

¹ Intergovernmental Panel on Climate Change, Climate Change: 2007: Synthesis Report, page 45, www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

2008. Data categories include stationary combustion, mobile combustion, purchased electricity, waste, fertilizer, refrigeration and wastewater.

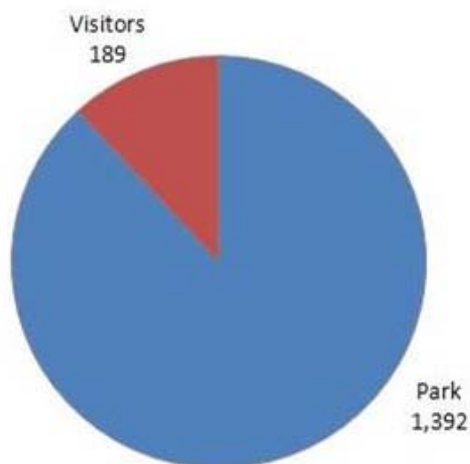
The CLIP tool automatically converts the park's data into "metric tons of carbon dioxide equivalent" (MTCO₂e), a single unit that normalizes CO₂, N₂O and CH₄². The output of the CLIP tool is the park's emissions profile, which was used to prioritize GHG emission reduction strategies.

Harpers Ferry National Historical Park's Emissions Profile

Harpers Ferry National Historical Park's GHG inventory includes emissions from park operations and visitor transportation within park boundaries. Some buildings that are owned by the park are not included in the Harpers Ferry National Historical Park's inventory because those buildings are occupied by other National Park Service entities and partners. These partners pay for the utilities in these park buildings, so the associated GHGs are not captured within the Harpers Ferry National Historical Park's GHG inventory. To ensure completeness, these buildings may be included in future GHG inventories.

Total GHG emissions for FY2009 equated to 1,581 MTCO₂e, of which 1,392 MTCO₂e (88%) are attributed to park operations and 189 MTCO₂e (12%) are attributed to visitor transportation. Figure 1 illustrates this distribution.

FIGURE 1. HARPERS FERRY NATIONAL HISTORICAL PARK TOTAL GREENHOUSE GAS EMISSIONS – 1,581 MTCO₂E



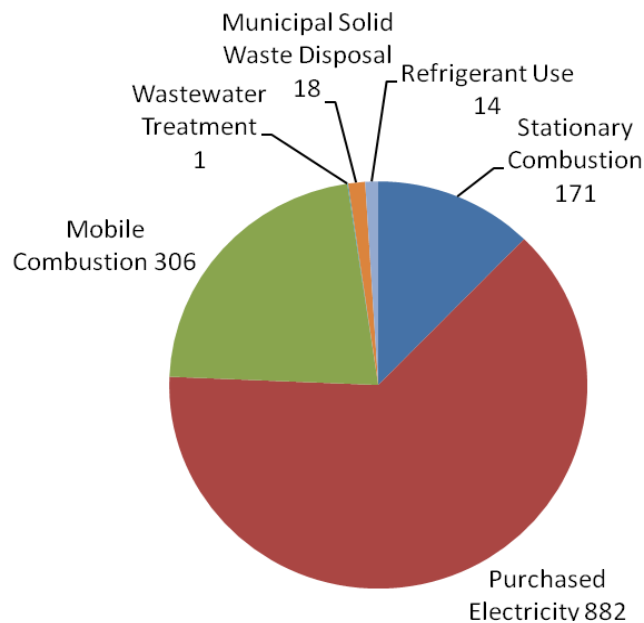
In order to develop appropriate and effective emissions reductions efforts, the park assessed emissions from park operations by source. Purchased electricity represents the largest source of GHG emissions from park operations with 882 MTCO₂e, or 63%. The second largest source of emissions from park operations is mobile combustion with 306 MTCO₂e (23%). The third largest source is stationary combustion with 171 MTCO₂e (12%). Only 1% of GHG emissions from park operations were generated from solid waste disposal and refrigerants. Emissions from wastewater treatment (1 MTCO₂e) and fertilizer application (0 MTCO₂e) were relatively very small.

² The conversion of a GHG to MTCO₂e is based on the potential of that GHG to contribute to the greenhouse effect, or its global warming potential (GWP), relative to the potential of CO₂ which is given the GWP of 1. CH₄'s GWP is 21 and N₂O's GWP is 310, meaning that an equivalent amount of CH₄ has 21 times the potential of CO₂ and N₂O has 310 times the potential of CO₂ to contribute to global warming.

The 189 MTCO₂e attributed to visitors come from visitor transportation in private or non-park vehicles traveling within park boundaries. Park staff provide shuttle buses to transport visitors between Upper and Lower Town Harper's Ferry, helping to limit visitor traffic on the roads between these two park units and therefore reduce the need for visitor travel in private vehicles. Emissions from park-owned vehicles, such as the shuttles, are included in the mobile combustion estimate for park operations.

Figure 2 illustrates the breakdown of the GHG emissions sources from park operations.

FIGURE 2. HARPERS FERRY NATIONAL HISTORICAL PARK GHG EMISSIONS FROM PARK OPERATIONS BY SOURCE - 1,392 MTCO₂E



Strategies for Reducing Emissions

Harpers Ferry National Historical Park's strategies to reduce emissions are depicted in the diagram below and prioritized based on emission reduction potential, cost-effectiveness, feasibility, co-benefits, regional impact, and ability to rapidly implement.



STRATEGY 1: REDUCE GHG EMISSIONS FROM PARK ENERGY USE BY 15 PERCENT BELOW 2009 LEVELS BY 2019

By far the most significant amount of GHG emissions are generated from purchased electricity and stationary combustion, which account for 75% of emissions from park operations. Therefore, Harpers Ferry National Historical Park will focus reduction actions on energy conservation measures and, more specifically, on reducing electricity use. In addition to reducing GHG emissions, reducing energy use will provide the park with financial savings from reduced energy costs.

PROGRESS TO DATE:

- Replaced 70 percent of lighting fixtures and ballasts to more energy efficient models.
- Changed canister lights to a track lighting system.
- Upgraded 18 HVAC units throughout the park and retrofitted six buildings.

HARPERS FERRY NATIONAL HISTORICAL PARK COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK ENERGY USE:

- 1 Reduce energy consumption throughout all park operations.
 - Weather strip windows and doors to improve insulation.
 - Maximize efficiency with currently installed heating and cooling technologies. For example: activate zoning features, reduce heating and cooling intensity when the buildings are not occupied (i.e., nights, weekends).
 - Ensure exhibits are turned off at night.
 - Increase temperatures in historical spaces to reduce energy consumption and to improve historical accuracy.
 - Continue upgrading water heating systems with tankless water heating technology.
 - Optimize building space. Consolidate office spaces to reduce heating and cooling requirements. Create a storage space for all park artifacts, period clothing, and other items not on exhibit.
 - Install light sensors in office spaces and common areas.
 - Install exterior light sensors on historic buildings in Lower Town.
 - Continue retrofit of the remaining heating, ventilation, and air conditioning (HVAC) systems in the park.
 - Add floor vents to buildings spaces to channel heat more efficiently into occupied spaces.
 - Replace old and inefficient computers with newer, faster models.
 - Continue installing additional meters and participate in the NPS metering program.
- 2 Conduct a feasibility study on renewable energy opportunities at the park.
 - Determine whether solar power is feasible at the visitor center and non-historic structures.
 - Conduct a feasibility study for wind power in different areas of the park. Identify locations where the viewscape will remain intact.
 - Conduct a feasibility study for reestablishing the small hydroelectric plant owned by the park.

- Talk to the local utility providers about tying into the system and funding opportunities for renewable energy projects from the federal government.

3 Create policies and programs that encourage behavioral changes.

- Set up protocols for maintaining thermostats within a specific range of temperatures that is appropriate for the season.
- Develop an orientation for new employees about ongoing sustainability policies, goals, and practices at the park.
- Institute a “last person out” policy to make sure all lights and electronic devices in offices spaces are turned off.
- Sponsor a metering competition between buildings or departments. Have each team compare the percent reduction in energy use.



STRATEGY 2: REDUCE GHG EMISSIONS FROM TRANSPORTATION BY 15 PERCENT BELOW 2009 LEVELS BY 2019.

Transportation is Harpers Ferry National Historical Park’s second largest source of GHG emissions. Therefore, reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce the park’s emissions.

PROGRESS TO DATE:

- New fleet of shuttle buses that use B-5 alternative fuel.
- Buses contain bike racks and standard bike racks are located throughout the park.
- Eliminated 12 vehicles from park fleet and continuing to right-size the fleet.
- A transportation study underway in 2011.
- Onsite showers are available for staff use to facilitate non-vehicular commuting.

HARPERS FERRY NATIONAL HISTORICAL PARK COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM TRANSPORTATION:

1 Reduce mobile emissions from staff and visitor activities.

- Create a “No vehicle Idling” policy for park visitors and staff.³
- Put up signs in visitor and charter bus parking areas prohibiting drivers from idling.
- Schedule time into meetings to allow staff to walk from one park area to the other. Reduce the use of cars.
- Provide a flexible work schedule to staff who do not need to be onsite every day or who commute long distances.
- Promote staff carpooling by creating a forum where staff can identify other individuals who might want to carpool.

³ Law enforcement rangers may be an exception; however, opportunities to reduce idling time will be researched.

- 2 Increase use of bio-fuels and bio-lubricants in park operations.
 - Research and test bio-lubricants in maintenance activities.
 - Increase bio-fuel for bus operations from B-5 to B-20.
 - Create a centralized bio-fuel station for local government fleets.
- 3 Replace current 17-passenger bus fleet with hybrid alternatives.
 - Consider upgrading the bus fleet to a hybrid bus system that runs on gasoline and electric to reduce idling time between shuttle runs.
 - Incorporate a diesel-hybrid engine when rebuilding the old bus.



STRATEGY 3: REDUCE GHG EMISSIONS FROM WASTE BY 15 PERCENT BELOW 2009 LEVELS BY 2019.

Waste management—in the form of source and solid waste reduction—can dramatically reduce GHG emissions. 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. Purchasing and wise use of products is closely tied to reducing waste generation. The less the park and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

PROGRESS TO DATE:

- Recycling bins are available in office areas for paper, plastic, cardboard, plastics, and cans.
- Comprehensive internal recycling program is in place.
- All bus tires with competent sidewalls are recapped at least once over their service life.
- Purchase only recycled content paper.
- Installed an internal water filtering system to reduce the use of bottled water by park staff.
- Implemented a public recycling program.
- Implemented a composting program for organic waste that provides mulch for use on park property.

HARPERS FERRY NATIONAL HISTORICAL PARK COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM WASTE GENERATION:

- 1 Improve current internal recycling program and communications about the program.
 - Publicize internal recycling efforts:
 - Resend the iPark email;
 - Provide monthly statistics on recycling to park staff;
 - Put information on the webpage in the “do you know” section; and
 - Post signage on buses.

- Promote the park-wide system for battery recycling.
 - Conduct feasibility study to create a joint recycling station with nearby federal agencies.
 - Improve communication about recycling accomplishments and goals to the entire staff. Expand communication channels beyond email and include information on:
 - What can be recycled;
 - Where should recycling be taken; and
 - Benefits of recycling.
 - Provide guidance on trash and recycling to groups that come into the park at all events. Include this in the orientation material for the rafting companies.
- 2** Incorporate strategies to improve the solid waste program and reduce sources of solid waste in the park.
- Reduce the number of plastic trash bags used in internal park operations, use appropriately-sized garbage cans and bags, and make sure plastic bags are filled before being disposed.
 - Publicize location of filtered water for staff and encourage staff to use reusable water bottles.
 - Aim to eliminate internal use of Styrofoam.
 - Work with merchants association and other commercial services to suggest packaging alternatives to reduce trash thrown away by visitors.
 - Consider eliminating solid waste collection in the outlying areas of the park.
 - Talk with IT department about reduction possibilities including:
 - Default duplex printing on all printers;
 - Reducing the number of printers in work spaces; phase out desktop printers where possible; and
 - Getting combination printer/copier/scanners to encourage scanning over printing to reduce paper waste.
- 3** With leadership from the park Contracting Specialist, develop a Green Purchasing System for general supplies such as office paper and maintenance operations supplies and materials.



STRATEGY 4: INCREASE CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS REDUCTION EDUCATION AND OUTREACH

Harpers Ferry National Historical Park is visited by 250,000 people from around the world annually and has an enormous opportunity to educate the public about climate change and GHG emissions reductions. There are also opportunities to educate park staff and members of the surrounding community.

PROGRESS TO DATE:

- The Education branch is in the final stages of installing the student heritage garden near Public Way. This outside exhibit will provide students K-12 with a variety of 21st century environmental challenges and initiatives.
- “Bridging the Watershed,” “Wonders of the Wetlands” and “Hiking” programs include



environmental education components on the effects of global warming.

- Education branch assisted the Grounds branch in selecting Park trash and recycle containers as well as appropriate container locations and discuss the benefits of recycling in visitor programs.
- Language is currently being developed to update the Park's transportation rider message and School Groups bus guide that will educate users and drivers to the No Idling policy and bio-fuels use.
- All interpretive programs and tours have a green or environmental component (e.g., energy and water conservation).

HARPERS FERRY NATIONAL HISTORICAL PARK COMMITS TO THE FOLLOWING ACTIONS TO INCREASE CLIMATE CHANGE EDUCATION WITH PARK STAFF, VISITORS AND THE LOCAL COMMUNITY.

1 Improve communication to public about the park's sustainability initiatives.

- Use social media as a tool to encourage environmental leadership, especially in younger people.
- Develop a community newsletter about the sustainability programs at the park.
- Promote the park's use of bio-diesel in shuttle buses, heavy equipment, mowers, and other equipment through signage on each vehicle or piece of equipment and at bus stops.
- Put up signage around park promoting recycling and the park's "no idling" policies.
- Post real-time data around the park such as temperature history in the area and how it has changed over time.
- Create a green brochure that highlights historically greener practices and current green practices.
- Interpret the park culture in light of "a more carbon friendly time."
- Discuss climate change on trail hikes with local school groups.
- Provide information on the audio message on the shuttle bus on the trip from Lower Town to the Visitor Center.
- Incorporate climate change into the new 90-minute interpretive hike from the Visitor Center to Lower Town.

2 Engage the community and stakeholders in park sustainability initiatives.

- Identify opportunities to connect with the community and raise awareness. Talk about issues that affect the community and the park alike (e.g., releases from sewage facility into the Shenandoah River).
- Hold an open house and behind-the-scenes tour for the local community to educate the public about park operations.
- Use annual park employee service day and Bring Your Child to Work Day to establish partnerships with community members.
- Implement a green partner award similar to the current "Volunteer of the Month" award. Recognize the partners in the local newspaper.
- Conduct more off-season events to draw people to the park. Hold a green lifestyle fair or farmer's market.
- Put short environmental films on the local cable channel or on YouTube. The films could be one-minute clips on environmental issues such as the park's recycling program.





STRATEGY 5: EVALUATE PROGRESS THROUGH IMPROVED DATA ACCURACY

In order to reach GHG reduction goals, the park recognizes the importance of reliable and accurate data. As part of its reduction strategy, the park will implement procedures that improve data collection and monitoring.

Harpers Ferry National Historical Park commits to the following actions to monitor progress and data related to purchased electricity, employee commuting, and visitor emissions.

HARPERS FERRY NATIONAL HISTORICAL PARK COMMITS TO THE FOLLOW ACTIONS TO IMPROVE DATA COLLECTION PROCESSES AND ACCURACY.

- 1 Improve tracking of park energy and water usage data.
 - Track monthly energy and water bills to better understand park energy and water consumption trends.
- 2 Improve solid waste data collection.
 - Improve waste stream tracking to improve solid waste data collection and help increase solid waste diversion.

Conclusion

Harpers Ferry National Historical Park has the opportunity to educate and to set an example for thousands of visitors each year. This report summarizes the actions by which the park commits to in reducing its GHG emissions. By addressing GHG emissions from the largest sources, the park will tackle emissions reductions in an effective way. Additionally, by sharing these strategies with visitors and partners, Harpers Ferry National Historical Park can promote an awareness of climate change and encourage stakeholders to engage in activities that will help reduce GHG emissions on a broader scale.