



CLIMATE *Friendly* PARKS

# Cuyahoga Valley National Park

## Climate Action Plan

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## THE CHALLENGE OF CLIMATE CHANGE

The effects of climate change are already impacting the physical and natural systems that sustain the American people. These changes present significant challenges to the National Park Service (NPS) and specifically Cuyahoga Valley National Park. Climate change threatens the natural and cultural systems that the park is known for and established. National Park Service Director Jarvis testified before Congress in 2009, stating "Climate change is fundamentally the greatest threat to the integrity of our national parks that we have ever experienced."

Evidence of climate changes abounds, from a number of sources including but not limited to coral, tree rings, cave deposits, ice, and monitoring equipment. Average global temperatures on the Earth's surface have already increased about 1.5°F since the late 19th century, and the 10 warmest years of the 20th century all occurred in the last 15 years. <sup>1</sup> However, climate change is more than just temperature increase, there are a variety of effects including potentially more intense and frequent storms. <sup>2</sup>

These changes are caused by the buildup of greenhouse gases (GHGs) in the atmosphere which trap heat that otherwise would be released into space. The Greenhouse effect is a natural one, making earth warm enough to be livable. However, human emissions of GHGs are increasing and accelerating the warming beyond natural levels.

With the rate of GHG emissions still increasing, average global temperature continues to rise. It is hard to predict the total magnitude of the expected change but the climate trends that are already emerging are expected to continue and to intensify as GHGs continue to be emitted. The Intergovernmental Panel on Climate Change has estimated that a global average warming of 5-10°F by the year 2100 is considered likely.<sup>3</sup>

The projected temperature increase would change the length and character of the seasons so that spring arrives earlier and summer lasts longer and is generally hotter, both in terms of its average and peak temperatures. Rising global temperatures would change weather patterns and result in more extreme events ranging from extreme hot days to more intense and frequent storm events (see figure at right).<sup>4</sup> These changes will affect all aspects of the water cycle, including snow cover, mountain glaciers, spring runoff, water temperature, and sea level.

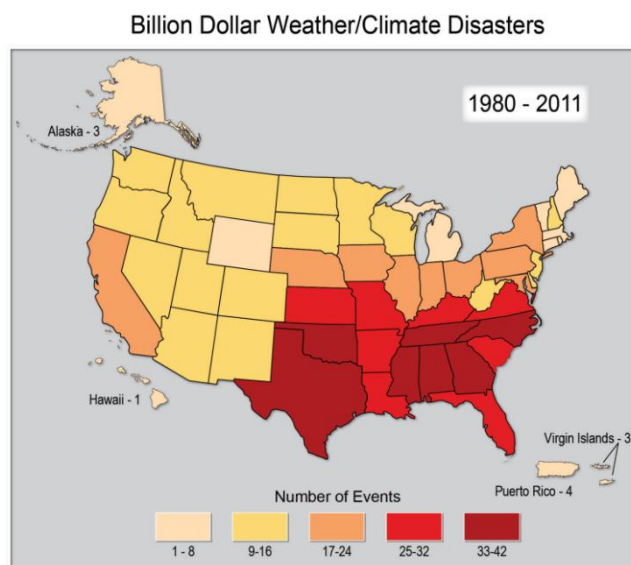


Figure 1: Billion Dollar Weather/Climate Disasters 1980-2011

In addition, heat waves and warm spells will likely be more frequent, more intense, and longer (IPCC 2012), potentially changing plant and animal habitats. Climate change is also expected to affect human health, infrastructure, water resources, agriculture, energy, and many other features of our natural and managed environments. These impacts can already be seen both on an international and local scale.

<sup>1</sup> Federal Advisory Committee. "Draft Climate Assessment Report Released for Public Review." Draft Climate Assessment Report Released for Public Review. U.S. Global Change Research Program, 14 Jan. 2013. Web. 18 Feb. 2013. <http://ncadac.globalchange.gov/>

<sup>2</sup> <http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap17-southeast.pdf>

<sup>3</sup> IPCC 2007. Climate Change 2007: The Physical Science Basis. Intergovernmental Panel on Climate Change, Geneva, Switzerland. Available online at [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_wg1\\_report\\_the\\_physical\\_science\\_basis.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm)

<sup>4</sup> <http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap17-southeast.pdf>



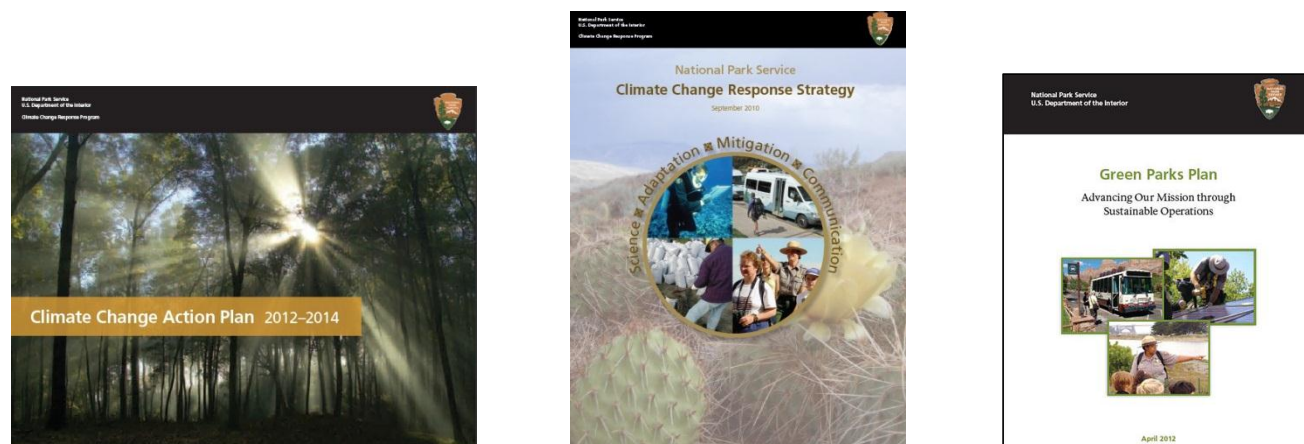
Though the general global climate effects might be the same, climate change is expected to impact different bioregions in different ways. At Cuyahoga Valley National Park, projections indicate that increasing temperatures and changing precipitation patterns will alter park ecosystems, changing vegetation communities, habitats available for species, and the experience of park visitors. Historic structures and built infrastructure are also at risk due to potential increased flooding, riverbank failures, shifting foundations, etc. The past is no longer an indicator for the future; climate events that were once rare or unusual will be common. In the last 10 years, the park has suffered numerous flooding events that, while they cannot be attributed to climate change, have been frequent and severe enough to fit the modeled impacts from a changing climate.

## CONTEXT FOR ACTION

Sustainability is at the cornerstone of the National Park Service (NPS). In fact, the 1916 NPS Organic Act outlines our foundational objective “...to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” Additionally, the Wilderness Act of 1964 established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as wilderness areas, to be administered in such a manner that will leave them *unimpaired* for future use and enjoyment as wilderness.

The National Park Service acknowledges that climate change may threaten the very cultural and natural resources we strive to preserve. Our response to a changing climate must include the many federal and NPS-specific directives and guidelines that have been developed to encourage action around adaptation and mitigation to climate change. These directives and guidelines include the Federal Executive Orders 13423 (Strengthening Federal Environmental, Energy, and Transportation Management) and 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) and the Department of the Interior (DOI) and NPS policies, plans, and strategies such as the 2012-2014 Climate Change Action Plan, Green Parks Plan and Climate Change Response Strategy. The guidance from these documents has been integrated into this Climate Action Plan. The schematic in Figure 1 illustrates some of the NPS documents influence the Cuyahoga Valley NP Climate Action Plan.

Figure 1. NPS Climate Change Response Program Planning documents.



Executive Order (EO) 13423 sets broad agency requirements for strengthens the sustainable practices of previous EOs. Specific elements of this Executive Order include:

- Reduce petroleum consumption in fleet by 2% annually through 2015 using a FY 2005 baseline
- Increase alternative fuel consumption by 10% annually
- Reduce energy intensity in buildings by 30% by 2015 using a FY 2003 baseline
- Have at least 50% of required renewable energy come from new renewable sources
- Reduce water consumption 16% by FY 2015 using a FY 2007 baseline
- Construct or renovate buildings in accordance with sustainability strategies, including resource conservation, reduction, and use; siting; and indoor environmental quality
- Expand green procurement & electronic management
- Reduce the use of chemicals and toxic materials and find alternatives

Executive Order 13514 further expanded on the prior Executive Order and set sustainability goals for Federal agencies, focusing on improvements to environmental, energy, and economic performance. Key elements of Executive Order 13514 include:

- GHG Emissions: Develop and implement a FY 2020 percentage reduction target for GHG emissions relative to a FY 2008 baseline.
- Fleet consumption of petroleum: Reduce use by 2% annually through FY 2020 relative to a FY 2005 baseline, 30% total (exempts those with <20 vehicles).
- Water Use, Potable: Reduce use by 2% annually through FY 2020 or by 26% relative to a FY 2007 baseline.
- Water Use, Non-Potable: Reduce use by 2% annually through FY 2020 or by 20% relative to a FY 2010 baseline.
- Solid Waste: Divert 50% of the waste stream from landfills through FY 2015 relative to the FY 2005 baseline.

The Green Parks Plan (GPP<sup>5</sup>) is a strategic sustainability plan in response to EO13514. The GPP is intended to synthesize implementation objectives under multiple mandates into a single point of focus. The plan includes nine strategic goals and over 34 performance objectives addressing a range of topics in the key categories of sustainability and climate change to address climate change from a facilities standpoint. This includes:

- Continuously Improve Environmental Performance: The NPS will meet and exceed the requirements of all applicable environmental laws.
- Be Climate Friendly and Climate Ready: The NPS will reduce GHG emissions and adapt facilities at risk from climate change.
- Be Energy Smart: The NPS will improve facility energy performance and increase reliance on renewable energy.
- Be Water Wise: The NPS will improve facility water use efficiency.
- Green Our Rides: The NPS will transform our fleet and adopt greener transportation methods.
- Buy Green and Reduce, Reuse, and Recycle: The NPS will purchase environmentally friendly products and increase waste diversion and recycling.
- Preserve Outdoor Values: The NPS will minimize the impact of facility operations on the external environment.
- Adopt Best Practices: The NPS will adopt sustainable best practices in all facility operations.

<sup>5</sup> <http://www.nps.gov/greenparksplan>

- Foster Sustainability Beyond Our Boundaries: The NPS will engage visitors about sustainability and invite their participation.

NPS Climate Change Action Plan (2012-2014<sup>6</sup>) outlines the high-priority, no-regrets actions NPS will undertake to address climate change. This document is intended to serve as a guidance to help prioritize decisions so that actions are focused and integrated across NPS.

- Near Term Priorities
  - Enhance Workforce Climate Literacy
  - Engage Youth & Their Families
  - Develop Effective Planning Frameworks & Guidance
  - Provide Climate Change Science to Parks
  - Implement the Green Parks Plan
  - Foster Robust Partnerships
  - Apply Appropriate Adaptation Tools & Options
  - Strengthen Communication
- Preparing for New Challenges and Opportunities
  - Incorporate New Technology and Climate Science

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<sup>6</sup> [http://www.nps.gov/orgs/ccrp/upload/NPS\\_CCActionPlan.pdf](http://www.nps.gov/orgs/ccrp/upload/NPS_CCActionPlan.pdf)

## OVERVIEW OF THE PARK

The 33,000 acre Cuyahoga Valley National Park encompasses 22 miles of the Cuyahoga River between Cleveland and Akron, Ohio. It not only offers a surprising and rich natural diversity that results from the valley's unique geography and geologic history, but it also has some of the largest remaining tracts of forest in northeast Ohio. Nearly half of Ohio's native plant species are found in the Park. The Park has wetland and riparian habitats and other aquatic resources, as well as numerous plant and animal species, including rare, threatened, and endangered species which depend on a variety of habitats for protection and survival.

On average, the Park has 2.5 million visitors annually. By influencing and educating these visitors, the Parks' actions on sustainability and climate change have the potential to extend beyond the borders of the park to help preserve natural and cultural resources now and into the future.

## CUYAHOGA VALLEY NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Cuyahoga Valley National Park belongs to a network of parks nationwide that are putting climate friendly behavior at the forefront of planning. As part of this program, the Park has conducted a GHG emission inventory, held a workshop, and set a GHG emission reduction goal. These efforts have led to the development of this Climate Action Plan that includes, among other items, actions to be taken to mitigate and adapt to climate change. Through this Action Plan and a commitment to educate Park staff, visitors, and community members about climate change, the Park provides a model for climate friendly behavior within the National Park Service.<sup>7</sup>



NPS staff, partners, and sustainability/climate change experts gathered to hold a Climate Friendly Parks Workshop from April 23-25, 2013 to better understand and discuss overall sustainability concepts, the implications of climate change for the Park, and to start implementing new actions. Strategies and action plan items were developed by working groups at the Climate Friendly Parks Workshop.<sup>8</sup>

This Climate Action Plan incorporates the strategies that were brainstormed at the workshop and identifies steps that the Park is taking to reduce GHG emissions to mitigate its impact on climate change. The plan presents the Park's emission reduction goals, and associated reduction actions to achieve the Park's goals. To the extent possible, the Park created goals that are Specific, Measurable, Attainable, Realistic, and Timely (SMART). Having structured SMART goals will ensure that the Park can iteratively monitor progress against the emission reduction goals and identify areas for improvement.

While the plan provides a framework needed to meet the Park's emission reduction, it is not intended to provide detailed instructions on how to implement each of the proposed measures. These actions will be primarily carried out by the Park's green team and documented in the Environmental Management System (EMS). The EMS will further describe priorities and details to implement these actions.

<sup>7</sup> More information about the Climate Friendly Park program <http://www.nps.gov/climatefriendlyparks/>

<sup>8</sup> Original notes from these workshops, including detailed action items not presented in the final plan have been archived by Park and are available upon request.

Cuyahoga Valley National Park as identified the following goals to reduce its greenhouse gas emissions produced by Park operations as follows

- Energy use consumption emissions to **30%** below 2008 levels by 2020
- Waste emissions to **50%** below 2008 levels by 2020
- Transportation emission to **20%** below 2008 levels by 2020
- Cumulatively, this will result in a GHG reduction of **30%** below 2008 levels by 2020 in GHG emissions for the park.

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

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

**Strategy 2:** Increase climate change education and outreach efforts.

**Strategy 3:** Carbon storage through reforestation efforts.

**Strategy 4:** Actions to anticipate and adapt to a changing climate.

As part of this, the Park will continue to monitor progress with respect to reducing emissions and identify areas for improvement.

## GREENHOUSE GAS EMISSION INVENTORY

Cuyahoga Valley National Park completed the GHG emissions inventory by gathering data from appropriate Park staff and reports concerning Park operations, and entering the data into the Climate Leadership in Parks (CLIP) tool. The CLIP tool was initially developed by the NPS Climate Friendly Program in association with the U.S. Environmental Protection Agency to account for GHG emissions specific to national parks. The tool is designed to:

- Convert energy and resource use data into metric tons of carbon dioxide (CO<sub>2</sub>) equivalent (MTCO<sub>2</sub>E). In order which is a single unit that standardizes carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>).
- Educate park employees about the sources of GHGs, and the emissions inventory process through data gathering.
- Assist with identifying strategies for each park to reduce emissions.
- Enable park personnel to track current and future progress toward emissions reduction goals.

Activities such as fuel and electricity use, refrigeration, and sending solid waste to the landfill for treatment all produce different types of GHGs. Since not all GHGs affect climate change to the same degree, it is necessary to convert each GHG to a common unit in order to compare them to the park inventory. The CLIP tool automatically converts the Park's data into MTCO<sub>2</sub>E. The conversion to MTCO<sub>2</sub>E is based on the potential of a specific GHG to contribute to the greenhouse effect, or its global warming potential (GWP), relative to the potential of CO<sub>2</sub>, which is given the GWP of 1. The GWP of CH<sub>4</sub> is 21, meaning that an equivalent amount of CH<sub>4</sub> has 21 times the potential of CO<sub>2</sub> to cause global warming. The output of the CLIP tool is the Park's emissions profile, which was used to prioritize GHG emission reduction strategies.



## Greenhouse Gas Emissions

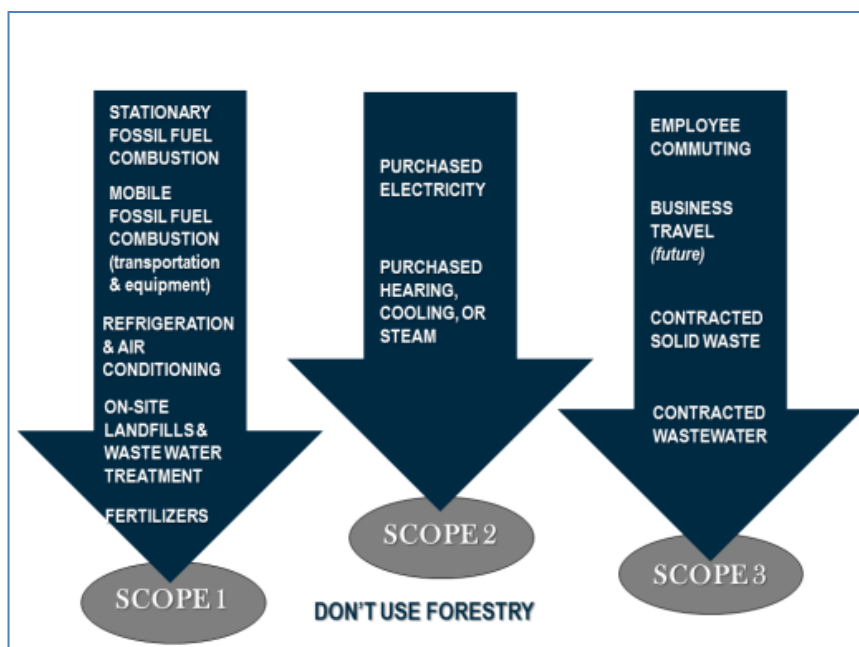
GHG emissions result from the combustion of fossil fuels for transportation and energy (e.g., boilers, electricity generation), the decomposition of waste and other organic matter, and the release of gases from various other sources (e.g., fertilizers and refrigerants). Cuyahoga Valley National Park conducted a GHG emission inventory for the year 2008 and calculated the following emissions (emissions in Metric Tons Carbon Dioxide Equivalents (MTCO<sub>2</sub>E). Numbers are rounded:

Emission sector	Emissions in MTCO <sub>2</sub> E
Stationary combustion	172
Purchased electricity	771
Mobile sources from park operations and visitors	6,126
Waste	136
Wastewater Treatment	65
Refrigeration	36
Fertilizer	1
Park Employee Commuting to work	208
<b>Total Park Only Emissions</b>	<b>1,635</b>
<b>Total emissions including visitors</b>	<b>7,516</b>

In 2008, GHG emissions from Park Operations only totaled 1,635 MTCO<sub>2</sub>E. Carbon dioxide equivalent takes into account that some gases have a greater potential to warm the earth's atmosphere than others. For comparison, a typical single family home in the U.S. produces 12 MTCO<sub>2</sub>E per year according to the U.S. Environmental Protection Agency (EPA 2011), so Park operations alone are equivalent to about 136 homes. If both Park activities and visitor emissions are counted, then the total emissions were calculated to be 7,516 MTCO<sub>2</sub>E, or about 626 homes.

To help with analyzing the GHG inventory, the table above presents total GHG emissions associated with the Park and visitors. GHG reporting is often categorized into "scope" and the adjacent graphic shows which emissions make up scope 1, 2, or 3. For the purposes of this report, only the emissions descriptors will be used as in the above table. These distinctions help inform the park's strategy and help to inform how actions should be targeted.

If both park and visitor vehicles are included, the largest emission sector in this inventory is mobile combustion emissions, totaling 6,126 MTCO<sub>2</sub>E. This represents 81% of the total calculated emissions for the Park. This is not uncommon for many national parks; we invite visitors!

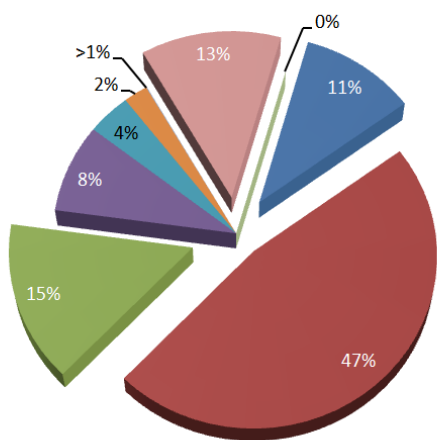


Looking only at the emissions from Park operations, the largest sector of GHG emissions is from purchased electricity, at 771 MTCO<sub>2</sub>E (about 47% of park-only emissions). The next highest park operation sector is stationary combustion, which emitted 172 MTCO<sub>2</sub>E (about 11% of park-only emissions) in 2008. This inventory serves to show the park where emissions are highest, and where efforts to reduce emissions might be most effective.

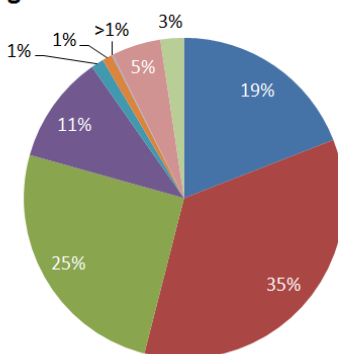
## FIGURE 1

Total Greenhouse Gas Emissions by Sector for 2008

### Cuyahoga Valley NP



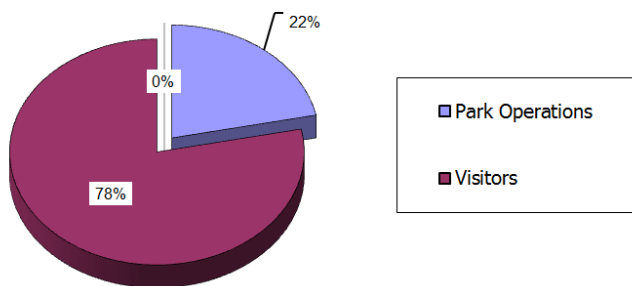
### Avg CFP Park



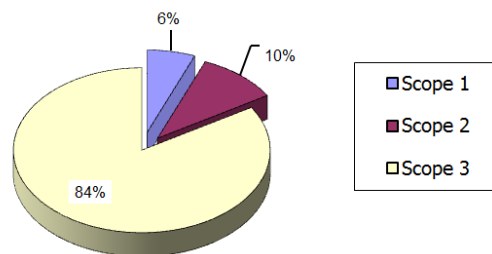
- Stationary Combustion
- Purchased Electricity
- Mobile Combustion
- Waste
- Wastewater Treatment
- Refrigeration
- Fertilizer Application
- Park Employee Commuting
- Other GHG Sources

## FIGURE 2

2008 GHG Emissions (MTCO<sub>2</sub>E) by Park Unit for Cuyahoga Valley National Park

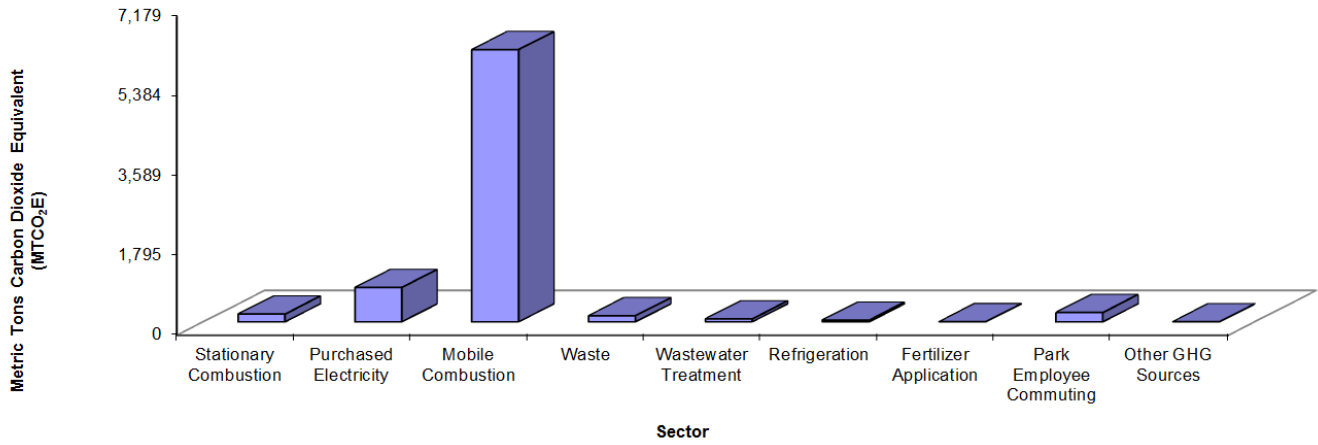


2008 GHG Emissions (MTCO<sub>2</sub>E) by Scope for Cuyahoga Valley National Park



# FIGURE 3

### 2008 GHG Emissions (MTCO<sub>2</sub>E) by Sector for Cuyahoga Valley National Park





# Cuyahoga Valley National Park Responds to Climate Change

*The following actions were developed during the Climate Friendly Parks Workshop on April 23-25, 2013 in order to meet the park's climate change mitigation and adaptation goals.*

## STRATEGY 1: Reduce GHG Emissions Resulting From Activities By Park Operations

Cuyahoga Valley National Park is committed to reducing emissions from activities within and by the Park. 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 the Park will take have been presented below in order from highest to lowest priority within each sub-category. A cross-cutting strategy for evaluating progress and identifying areas for improvement is outlined.

### Energy Use Management

*Emission Reduction Goal: Reduce Park operations' energy use emissions to 30 percent below 2008 levels by 2020.*

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. Emissions inventory results indicate that 73 percent (metric tons) of the Park's GHG emissions from Park operations are from energy consumption. Consequently, the Park identified actions it will take to reduce energy-related emissions. Presented below are the actions that are currently under way and which comprise the Park's progress to date, as well as those actions the Park will pursue.

### Progress to Date

- ✓ Virginia Kendall Maintenance Area conversion to low emitting diode (LED) lights completed; purchased LED bulbs for full park conversion.
- ✓ Programmable thermostats installed in 70% of Park operated buildings.
- ✓ Experimented w/ alternative fuel technologies (cell and wind turbine).
- ✓ Utilized small scale solar power (comfort stations).
- ✓ Occupancy sensors purchased for buildings.
- ✓ Happy Days Lodge: more efficient hand dryers purchased.

### Energy Use Management – Planned Actions

**1 Promote energy efficiency and energy conservation in the Park.** Increase energy efficiency in all Park buildings and housing by encouraging conservation and efficiency behaviors.

- Create an incentive program to foster the most energy saving behaviors (“Get Caught being Green”).
- Encourage use of natural lighting for office, and during the summer, utilize blinds to minimize solar heating and keep the office cooler.
- Adjust personal comfort (e.g. clothing) and set thermostats to reduce energy consumption.



- Change behaviors to reduce office electric use:
  - Turn off lights, use motion sensors, and use task lighting instead of overhead lights.
  - Turn off computer monitors when not in use and unplug unused chargers, power strips and other sources of phantom energy consumption.
  - Adopt other sustainability measures (recycling, composting, etc.).

## 2 Upgrade lighting service.

- Upgrade all light fixtures and bulbs in the Park to energy-efficient bulbs.
  - Where possible, reduce the number of lighting fixtures.
  - Complete fixture and bulb installations by 2015.
- Install lighting controls.
  - In common areas and offices install motion sensors, provide appropriate guidance and standard operating procedures (SOPs) to ensure targeted energy reductions are achieved.
  - Install dimmable lighting systems to enable occupant-selected lighting coverage to further reduce lighting energy needs.

## 3 Improve building performance.

- Conduct whole building energy audits.
  - Secure a representative number of whole building energy audits (donation of services, contract for audits, or purchase equipment and train staff to complete audits, etc.).
  - To the greatest extent practical and as early as possible, implement energy conservation measures recommended as a result of energy audits.
  - Actively pursue cyclic maintenance funding for ongoing window and door maintenance (caulking, sealing, etc.).
  - Develop an effective strategy to maximize energy conservation while protecting historic resources.
- Make HVAC System Improvements.
  - Install programmable thermostats and implement effective zone controls. Monitor for successful reduction in energy use.
  - Explore air circulation systems for reduced air layering in multiple level buildings with open stair wells.
- Reduce solar heating of buildings during summer.
  - Explore plantings and use of awnings, where appropriate, to reduce the amount of solar radiation and heating during summer months.

#### 4 Utilize alternative energy sources.

- Install photovoltaic panels on Park buildings, parking lots, etc.
  - Identify appropriate lighting and other electric service items and appropriate locations for solar power generation. Develop a plan for funding and installing solar energy production.
- Continue to utilize, where appropriate, geothermal systems.

#### 5 Reduce energy consumption of IT equipment and systems.

- Replace older servers with more efficient models (Coonrad Ranger Station priority).
- Facilitate most efficient use of needed equipment.
  - As appropriate, set power settings to achieve the most efficient energy use.
  - Purchase computers, printers, servers, and other equipment with high efficiency ratings.
  - Where possible, consolidate individual printers, scanners, etc. into centralized, multi-function units with high efficiency ratings.

#### 6 Measure energy use throughout the Park.

- Monitor and analyze energy use to track results of energy saving initiatives and to identify potential equipment problems.
- Investigate potential benefit of installing and utilizing smart meters.

## Transportation Management

*Emission Reduction Goal: Reduce Park operations transportation emissions to 20 percent below 2008 levels by 2020.*

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce the Park's emissions. As the inventory results indicate, GHG emissions from transportation comprise **24** percent of the Park's overall emissions (not including visitors, and partners). Accordingly, in addition to the Park operations emissions reduction goal, the Park set a goal to reduce overall transportation emissions from Park operations by 20 percent below 2008 levels by 2020. Presented below are the actions that are currently under way or which comprise the Park's progress to date, as well as those actions that the Park will pursue.

### Progress to Date

- ✓ Fifty-three (53) of Park's 82 vehicles are alternatively fueled.
- ✓ Park staff/partner/volunteer No Idle Policy in place.
- ✓ Reduced fleet size by 15% from 2008 to 2012.

- ✓ Currently working on a Department of Energy Clean Cities Program proposal to convert grounds equipment and gas powered vehicles to propane or other alternative fuel (October 2013 submission).
- ✓ Transportation Scholar intern currently completing assessment of alternate transportation feasibility.

## Transportation Management – Planned Actions

### 1 Promote transportation-related behavioral changes.

- Encourage and educate staff on choosing the best vehicle for the trip/job.
- Encourage staff to combine trips.
- Encourage carpooling.
- Educate staff on “eco-driving” habits (e.g. no quick acceleration, properly inflated tires).

### 2 Reduce visitor emissions.

- Maximize train service by promoting Bike Aboard!, Hike Aboard!, and other, similar train programs.
- Facilitate with local governments the improvement of bike infrastructure in the Park, (e.g. bike lanes).
- Explore option of bike share or additional bike rental opportunities along Towpath Trail.
- Implement key trail plan provisions that focus on connection of Park trails to regional trail systems and provide transportation interface nodes and critical locations.
- Explore possibility of additional RTA-Metro bus stops connecting the Park to local and major population centers.

### 3 Reduce NPS vehicle and equipment fuel consumption.

- Update the Park’s Fleet Management Plan to ensure the fleet is right sized and as energy efficient as possible.

### 4 Replace NPS vehicles and equipment.

- Investigate option of converting non-diesel vehicles to alternative fuel such as propane.
- Investigate the opportunity to use more efficient, off-road vehicles in remote Park locations.
- Convert or replace mowers to propane and/or other alternative fuel options.

## Waste Management

*Emission Reduction Goal: Reduce waste emissions from Park operations to 50 percent below 2008 levels by 2020 through waste diversion and reduction.*

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source and solid waste reduction—can dramatically reduce the Park’s GHG emissions. Landfills are one of the largest human-generated sources of methane (CH<sub>4</sub>) emissions in the United States. Methane is a greenhouse gas that while shorter-lived and less prevalent than carbon dioxide is 20 times more potent. Its reduction is a critical part of addressing climate change. Reducing the amount of waste sent to landfills reduces methane emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. The less the Park and its visitors consume in terms of products and packaging, and the more they reuse and recycle, the less energy will be used and fewer GHGs emitted.

In 2008, Park operations emitted 136 MTCO<sub>2</sub>E from waste management. Diverting or reducing the Park’s waste stream through increased recycling efforts and waste management reduces the amount of waste sent to landfills and resulting emissions.

Presented below are the actions that are currently under way and which comprise the Park’s progress to date as well as those actions that the Park will pursue.

### Progress to Date

- ✓ Trash audit completed.
- ✓ Park’s Integrated Solid Waste Alternative Plan (ISWAP) completed.
- ✓ Right sizing of commercial waste containers and reduced pick up schedule.
- ✓ Visitor recycling implemented.
- ✓ Composting at Environmental Education Center implemented.
- ✓ Trash free areas of the Park established.
- ✓ All demolition/construction/rehabilitation projects diverted the most waste possible (85% of waste in 2011).
- ✓ Robust metal recycling active with proceeds funding other sustainability measures.
- ✓ Staff recycling program developed and implemented.
- ✓ Green Procurement Plan signed, implemented, and staff training completed.
- ✓ Green Procurement list of commonly purchased items being developed for staff.
- ✓ Weekly “green” message sent to staff via email “Post” with emphasis on waste diversion.

### Waste Management – Planned Actions

#### 1 Strive to be Zero Waste – Decrease waste through behavior change.

- Make recycling convenient and easy.
- Encourage paper use reduction through double sided printing, on-line viewing (use of pdfs), etc.
- Educate staff on waste that is generated from printing emails, etc. Develop a culture of thinking before printing.

## **2** Establish new initiatives that promote reduced consumption and waste reduction.

- Investigate feasibility of removing all paper towels and replacing with hand dryers.
- Reduce Park's paper consumption by 5%.
- Evaluate current Park-wide printing practices (Schedule of Events, etc.); identify ways to reduce quantities.

## **3** Implement recycling and composting practices.

- Investigate feasibility of staff composting program.
- Expand / improve metal recycling and sorting to maximize waste diversion and revenue generation.



## STRATEGY 2: Carbon Storage Through Tree Planting on Disturbed Sites

### Removal of atmospheric Carbon through Reforestation

#### Forest Management

*Carbon Storage Goal: Reduce the Park's overall net impact on GHG emissions by replanting forests to store carbon.*

While not typical for Climate Action Plans at most parks, the history of disturbance at Cuyahoga Valley National Park presents the unusual but enormous potential for long-term removal of large quantities of atmospheric carbon (as greenhouse gases) through active reforestation. Not only will the storage of carbon at reforested sites contribute to the overall efforts of the Park in reducing greenhouse gases, but planting native trees will help to make the Park more resilient in the face of a changing climate.

**Table 1: Carbon Stocks by Age Class for Ohio**

Age Class	Mean volume	Live tree	Dead tree	Under story	Down dead wood	Forest floor	Soil	Total non soil
years	m <sup>3</sup> /hectare	tonnes carbon/hectare						
0	0	0	0	0	8.56	8.05	65.35	16.61
5	1.32	0.74	0.02	2.23	6.73	7.11	65.35	16.84
10	7.9	4.46	0.11	3.53	5.53	6.87	65.35	20.5
15	20.24	11.39	0.29	3.46	4.9	7.04	65.35	27.09
20	36.75	20.64	0.54	3.27	4.69	7.47	65.35	36.61
25	55.54	31.13	0.84	3.11	4.77	8.03	65.35	47.88
30	74.98	41.94	1.15	2.98	5.03	8.67	65.35	59.77
35	93.89	52.44	1.46	2.89	5.38	9.32	65.35	71.49
40	111.54	62.2	1.77	2.82	5.77	9.98	65.35	82.53
50	141.67	78.79	2.31	2.72	6.54	11.23	65.35	101.59
60	164.6	91.25	2.74	2.66	7.10	12.26	65.35	116.2

Figure 2: Excerpt from Generated COLE Report for Ohio - Oct 2013

While the NPS is now just beginning to study the potential for carbon storage through ecosystem management<sup>9</sup>, trees store vast quantities of carbon and Cuyahoga Valley National Park will take advantage of reforestation opportunities to sequester carbon and improve resilience of habitat to climate change.

Based on the information available from the U.S. Forest Service Carbon Online Estimator (COLE) for Ohio forests<sup>10</sup>, 10 years after planting, reforested sites at CVNP could store up to 4.8 metric tons of carbon per acre<sup>11</sup> (see Table 1). Using the Forest Service information and information on the condition of disturbed lands in the Park, revegetating and reforesting of 100 acres could store up to 480 metric tons (mT) of carbon within 10 years.

To help convey the magnitude of the benefit from reforestation, the Park used an online US EPA conversion calculator, which indicated the carbon storage for 480 mT would be equivalent to removing 366 passenger vehicles from the road<sup>12</sup>. Another useful comparison is that of 'how many incandescent light bulbs would one need to replace with LED bulbs to get the same amount of benefit as the 480 mT of carbon storage?'

<sup>9</sup> <http://www2.nature.nps.gov/ParkScience/index.cfm?ArticleID=626>

<sup>10</sup> US Forest Service COLE <http://www.ncasi2.org/GCOLE/qcole.shtml>

<sup>11</sup> COLE Report for Ohio: Calculated using 'Live tree, Dead Tree, Understory and Forest Floor; conversion from hectare to acre = hectare x .4, and adjusted for disturbed lands vs. cleared forested lands

<sup>12</sup> <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

By converting the mT of carbon to CO<sub>2</sub> (carbon mT x 3.667) and using an online calculator for LED light bulb conversion,<sup>13</sup> the park calculates the accumulated CO<sub>2</sub> reduction from reforesting 100 acres of disturbed land over 10 years would be roughly equivalent to that of replacing 1,300 incandescent light bulbs with LED bulbs for a year. After 50 years, as the storage capacity of the reforested lands grows, they are expected to accumulate and store enough carbon (4,064 mT) to be equivalent to removing about 3,100 passenger vehicles from the road or replacing nearly 11,000 incandescent lights with LED bulbs for a year!

Similarly, restoring hundreds of acres of the Park's fallow fields from non-native pasture grasses to native warm season grasses and forbs can also have a large impact on carbon storage. Although comparative data for the soils and species at the Park are not available, native prairie vegetation has been shown to store as much as 4 times more carbon in the soil than non-native pasture.<sup>14</sup>

With more than 2,000 acres suitable for reforestation and/or restoration to native grasses, the Park has enormous potential to store carbon while simultaneously creating habitat more resilient to climate change.

Presented below are the actions that are currently under way and which comprise the Park's progress to date, as well as those actions that the Park will pursue.

### Progress to Date

- ✓ In the past two years, Cuyahoga Valley National Park has reforested 28 acres of upland and riparian forest adjacent to existing forested land.
- ✓ In 2010, Cuyahoga Valley National Park constructed its native plant nursery and began active restoration of forestland in 2009. The nursery has the capacity to produce over 10,000 plants per year, which will continue to be used to restore native vegetation at disturbed sites.
- ✓ Staff and volunteers have worked together to collect more than 200 pounds of native-plant seed within recent years. This seed material is being used to restore diverse native plant communities at disturbed sites, creating habitats that are more resistant to invasive species and resilient to climate change that were formerly dominated by non-native vegetation.

### **1** Revegetate and restore previously disturbed lands, including sites dominated by invasive, non-native vegetation.

- Prepare a plan that identifies potential restoration sites and implementation methods, including a plan for reforestation and conversion of non-native grasslands to native meadow.
- Identify and apply for funding to implement reforestation and restoration efforts at the Park with a goal of restoring native vegetation to at least 10 acres of habitat each year.
- Continue to revegetate old fields and disturbed lands at Cuyahoga Valley National Park to store carbon and promote successful succession of habitats to hardwood forest and/or native meadow.

<sup>13</sup> <http://imcled.com/html/product/Carbon-Footprint-Calculator/>, assumes conversion of 75 watt incandescent bulbs to 13 watt LED bulbs operating for 8 hours per day.

<sup>14</sup> (Purakayastha, T.J., Huggins, D.R., Smith, J.L., 2008. Carbon sequestration in native prairie, perennial grass, no-till and cultivated Palouse silt loam. Soil Sci. Soc. Am. J. 72,534–540)

## STRATEGY 3: Increase Climate Change Education and Outreach

Climate change is a complex and interconnected issue that is already impacting everything from cultural and natural resources to Park infrastructure and to the visitors themselves. The Park can play a vital role in communicating about climate change to visitors and the wider community.

A better understanding of the challenges and benefits of reducing GHG emissions and adapting to climate change can further motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. The Park recognizes that the greatest potential impact it can have on mitigating climate change is through public education, and considers this part of the end goal of any climate change initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions the Park takes to address climate change serve as opportunities to increase the public's awareness. The Park and partner operations present many opportunities to be "Sustainability Labs" by testing the technical and practical feasibility of sustainability measures and showcasing openness to trying new approaches.

Presented below are the actions that are currently under way and which comprise the Park's progress to date, and those actions that the Park will pursue.

### Progress to Date

- ✓ Cuyahoga Valley Environmental Education Center has developed a Climate Action Program.
- ✓ Participated with the City of Cleveland in their climate change response and sustainability efforts.

### Staff Education

Developing a climate change education program for Park staff is vital to increasing awareness about climate change and fostering a sense of collective responsibility among staff to help reduce Park emissions. By incorporating climate change education into staff development programs, the Park will enable staff to demonstrate their commitment through leading by example, and showing visitors the tools, resources and inspiration needed to help reduce GHG emissions in the Park and in their own lives and communities.

Potential actions include:

- Utilize Park internal communications tools to broadcast climate change messages and news (Messenger, Post, etc.).

### Visitor Awareness

Understanding climate change and its consequences is essential to initiating individual behavioral change. The Park realizes that it has a unique opportunity to educate the public about climate change. Resources available include using existing materials, developing Park-specific materials, highlighting what the Park is currently doing about climate change, identifying the ongoing impacts of climate change on natural and cultural resources, and encouraging visitors to reduce emissions.

The Park can play an important role in educating the public about climate change. Park staff recognizes the many different audiences that visit the Park, including recreational and non-recreational visitors, "virtual visitors" who visit the Park online, school-aged visitors, local and out-of-town visitors, tribes, and external audiences. Reaching these various audiences with

climate change information and engaging them in the Park's efforts requires appropriately focused messaging. The Park has developed a number of strategies to reach these various audiences effectively. Focused messaging strategies include:

- Use social media to post messages and images of Park improvements.
- Involve the public in ongoing plant and animal life cycle event studies to see how these are influenced by seasonal and annual variations in climate, as well as habitat factors (e.g. early blooming of trees, late departures of fall migrants, etc.).
- Interpret sustainability efforts that the Park is undertaking.
- Develop climate change and sustainability waysides.

## Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding the Park can play a significant role in supporting the Park's climate change mitigation goals. When appropriate, Park staff will assist local communities with incorporating climate change messages into community events, find partners to promote climate change education at those events, and engage with surrounding agencies to coordinate effective outreach and education efforts. In addition, Cuyahoga Valley National Park will work with these communities to help ensure that visitors are aware of the impacts of climate change. Potential actions include:

- Support local communities in their sustainability and climate change response efforts.
- Include climate change programming in any public lecture series.
- Utilize Facebook and Park website for additional messaging.

## STRATEGY 4: Actions For Adapting To A Changing Climate

Climate change threatens the Park's unique cultural and natural resources and infrastructure critical for Park operations, and impacts visitor's experiences. In the context of climate change, adaptation is an adjustment in natural or human systems that moderates the harm and/or seeks out beneficial opportunities in response to the anticipated change.

Adaptation may include a variety of physical, social, economic, or ecological responses, such as adapting the location, structure, or function of Park facilities in anticipation of climate change. Research has shown that larger, more diverse and connected ecosystems are more likely to resist the changes induced by climate change and return to their natural state.<sup>15</sup> The best way to mitigate the impacts of climate change on degraded habitats is to restore biodiversity, reduce fragmentation, control invasive species, and ensure connectivity between habitats.

Given the potential impact from climate change, it is important to establish baseline information on, and closely monitor, cultural and natural resources and Park infrastructure to identify those that are most at risk. From this identification, the Park can then work towards addressing the most vulnerable resources and reducing the greatest risks.

Presented below are the actions that are currently under way and which comprise the Park's progress to date, and those actions that the Park will pursue.

### Progress to Date

- ✓ To mitigate the impacts of climate change, Cuyahoga Valley National Park is restoring native habitats with an emphasis on invasive species removal, re-vegetation with a diverse mix of native species, and targeting efforts that maintain forest continuity.
- ✓ Altered the use of basements and making alterations to basements to anticipate flooding.
- ✓ Hardened support systems under and immediately adjacent to historic structures and Park infrastructure adjacent to areas prone to repeated flooding (such as Towpath Trail, railroad bridge abutments, etc.).
- ✓ Rockside Boarding Site improvements included porous pavement, additional egress, and creation of vernal pools to help mitigate flooding.
- ✓ See also progress under Section 2: Carbon Sequestration.

### Adaptation

#### 1 Vulnerability Assessment and Change Monitoring.

- Complete a vulnerability assessment for cultural and natural resources and Park infrastructure.
- Begin monitoring phenology (temporal) and geographic shifts in species distribution and viability.

<sup>15</sup> Thompson, I., Mackey, B., McNulty, S., Mosseler, A. (2009). Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems. Secretariat of the Convention on Biological Diversity, Montreal



- Evaluate existing data and identify gaps.
- Seek funding for establishing a program.
- Join a phenology network to track wetland data.
- Work with area metro parks to facilitate citizen science support.

## **2 Incorporate climate adaptation into all levels of NPS planning and development.**

- Address likelihood of more frequent and severe flooding events.
  - Tap funding opportunities in upcoming water authority program to address at risk resources/infrastructure.
  - Investigate the feasibility to implement storm water controls within Park boundary (such as wetland creation, storm water detention, rain gardens, etc.).
- Incorporate climate change forecasts into all relevant planning and development efforts to increase the adaptive capability of Park resources and facilities.

## **3 Restoration of degraded habitats**

- Incorporate re-vegetation with a wide variety of native species.
- Source plant materials regionally that maintain a high degree of genetic diversity.
- Focus on creating continuous blocks of habitat.

## EVALUATE PROGRESS & IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in the goals above, the Park plans to reduce its emissions to the specified goals. Achieving these goals will require an ongoing commitment by the Park, which may include subsequent emission inventories, additional mitigation and adaptation actions, and reevaluation of goals.

Presented below are the actions that are currently under way and which comprise the Park's progress to date as well as those actions that the Park will pursue.

### Monitoring – Planned Actions

#### **1** Monitor progress with respect to reducing emissions and use this to drive continual performance.

- Conduct annual emission inventories to evaluate progress toward goals stated in this action plan.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Annually review and update this plan.
- Track progress on climate friendly actions through the environmental management system.

## CONCLUSION

The Park has a unique opportunity to serve as a model for over 2.5 million recreational visitors annually.<sup>16</sup> This report summarized the actions the Park commits to undertake to address climate change. In particular, 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, the Park will help mitigate climate change far beyond the Park's boundaries.

The National Park Service as a whole faces an uncertain future due to the possible effects of climate change. However, by adapting to climate change impacts and reducing emissions, Cuyahoga Valley National Park will preserve Park resources; reduce its contribution to the problem, while setting an example for its visitors. The strategies presented in this Climate Action Plan present an aggressive first step towards moving the Park to the forefront of Climate Friendly Parks.

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<sup>16</sup> Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>

## APPENDIX A: LIST OF WORKSHOP PARTICIPANTS

Stan Austin - *Superintendent, Cuyahoga Valley NP*  
Paul Stoehr - *Deputy Superintendent, Cuyahoga Valley NP*

Deb Yandala – *CEO, Conservancy for Cuyahoga Valley NP*  
Craig Tallman – *President, Cuyahoga Valley Scenic Railroad*  
Darwin Kelsey – *Executive Director, Countryside Conservancy*

### Workshop Coordinators

Julie Thomas McNamee – *National Climate Friendly Parks Program Coordinator - Air Resources Liaison*  
Ryan Scavo - *Natural Resource Specialist, Washington Office*  
Dennis Hamm - *Park Coordinator / Land Resources Specialist (Green Team)*  
Veronica Dickerson - *Inventory Contact / Management Assistant (Green Team)*

### Workshop Leads

Dee Strickland – *Facility Management Specialist*  
Lead: Waste Management  
Dave Mekker – *Electrician (Green Team)*  
Lead: Energy Management  
Mike Hodgkinson – *Utilities Work Leader*  
Lead: Water Management  
Rich Vitello – *Property Tech (Green Team)*  
Lead: Transportation – Fleet  
Lynn Garrity – *Trail Planner*  
Lead: Transportation – Transportation System Planning  
Pam Barnes – *Education Specialist*  
Lead: Education and Interpretation  
Darlene Kelbach – *Landscape Architect (Green Team)*  
Lead: Cultural Resource Management /  
Andrew Bishop – *Bio Science Tech (Green Team)*  
Lead: Natural Resource Management /

### Guest Participants

Bob Krumenaker - *Superintendent, Apostle Islands NL*  
Mike Johnson, *Metroparks, Serving Summit County*  
Nancy Hughes, *Cleveland Metroparks Zoo*

### Staff Participants

Jennie Vasarhelyi - *Chief, Division of Interpretation*  
Mary Pat Doorley – *Interpretative Operations Supervisor*  
Lynette Sprague-Falk – *Interpretive Assistant (Green Team)*  
Heather Berenson – *Educational Technician (Green Team)*  
Eric Semple - *Chief of Maintenance*  
Tom Toledo - *Facility Operations Supervisor*  
Bill Zimmer – *Supervisor, Grounds and Trails*  
Lisa Petit - *Chief, Division of Resource Management*  
Kim Norley – *Landscape Architect (Green Team)*  
Meg Plona - *Wildlife Biologist*  
Paulette Cossel - *Architect*  
Chris Davis – *Plant Ecologist*  
Janet Popielski - *Civil Engineer*  
Sonia Bingham - *Wetland Biotech (Green Team)*  
Carl Dyer - *Acting Chief Ranger*  
Jeff Treubig – *Dispatcher (Green Team)*  
Bryan Muroski - *Seasonal Park Ranger (LE)*  
Shelby Lewis – *Conservancy for CVNP – Volunteer Coordinator (Green Team)*  
Katie Myers-Griffith – *Countryside Conservancy – Farmland Programs Coordinator (Green Team)*  
Tracy Emrick - *Countryside Conservancy*  
Ray Kammer - *CVSR*  
Michele Hofer – *SHRO – Human Resources Technician*  
Joyce Jordan - *Safety Officer*  
Stacy Heffernen - *Director, CV Environmental Education Center*  
Paul Clarke - *Computer Technician*

# APPENDIX B: WORKSHOP AGENDA

*Please bring your  
own coffee mug &  
name tag*

## Cuyahoga Valley National Park CLIMATE FRIENDLY PARKS WORKSHOP

April 23<sup>rd</sup>-25<sup>th</sup>, 2013

Happy Days Lodge: 501 W. Streetsboro Road, Peninsula, OH

*"Managing a National Park means making difficult choices. All things we do affect the natural ecosystems we are pledged to protect, some more than others. Individually, our actions may seem to have little impact, but added together, they may mean the difference between a viable ecosystem and a damaged one."-- J. B. Harkin, First Parks Commissioner, Parks Canada*

### DAY ONE – TUESDAY APRIL 23, 2013

8:00 – 8:30	<b>Meet &amp; Greet</b> – Register and enjoy coffee and light food	
8:30 – 8:45	<b>Welcome &amp; Introduction</b> – Agenda & Workshop Goals	<b>Stan Austin, Superintendent</b> Cuyahoga Valley National Park
8:45 – 9:05	<b>Session 1: Overview of the Climate Friendly Parks Program</b> Introduction to the Climate Friendly Parks Program mission and goals	<b>Julie Thomas McNamee, Air Resources Liaison</b> , Air Resources Division (WASO)
9:05 – 10:10	<b>Session 2: Climate Change in the Midwest/Great Lakes Region</b> Climate Change in the National Parks, a case study of Apostle Islands National Lakeshore and anticipated local impacts from climate change on natural and cultural resources, infrastructure, etc.	<b>Bob Krumenaker, Superintendent</b> Apostle Islands National Lakeshore
10:10 – 10:30	<b>BREAK</b>	
10:30 – 12:30	<b>Session 3: Sustainability Initiatives &amp; Success Stories Across Borders</b>  Short presentations on, sustainability accomplishments, barriers and adaptation strategies. Presentations by Cuyahoga Valley NP and partners, the City of Cleveland, Green City Blue Lake, and The Oberlin Project followed by an audience discussion on motivating behavioral shifts and exploring opportunities for collaboration.	<b>Stan Austin, Superintendent</b> , Cuyahoga Valley National Park  <b>Deb Yandala, CEO</b> , Conservancy for Cuyahoga Valley National Park  <b>Craig Tallman, President</b> , Cuyahoga Valley Scenic Railroad  <b>Darwin Kelsey, Executive Dir.</b> ,

		Countryside Conservancy
		<b>David Beach</b> , <i>Director</i> , GreenCityBlueLake Institute
		<b>Matt Gray</b> , <i>Director</i> , City of Cleveland Office of Sustainability
		<b>Bryan Stubbs</b> , <i>Managing Director</i> , The Oberlin Project
12:30 – 1:30	<b>LUNCH</b> ( <i>bring your own</i> )	
1:30 – 2:30	<b>Session 4: Greenhouse Gas Emissions 101 &amp; Park/Partner Inventories</b> Overview, explanations and comparisons of CLIP Tool inventories for CUVA and partners	<b>Ryan Scavo</b> , <i>Natural Resource Specialist</i> , WASO  <b>Julie Thomas McNamee</b> , <i>Air Resources Liaison</i> , Air Resources Division (WASO)  <b>Veronica Dickerson</b> , <i>Administrative Assistant</i> , Cuyahoga Valley NP
2:30 – 2:45	<b>BREAK</b>	
2:45 – 3:30	<b>Session 5: Lessons Learned from Apostle Islands National Lakeshore &amp; their Sustainability Efforts</b>  Apostle Islands has been at the leading edge of sustainability in the NPS. Learn about their efforts – both breadth and substance – along with the management philosophies that have led to their success.	<b>Bob Krumenaker</b> , <i>Superintendent</i> Apostle Islands National Lakeshore
3:30 – 4:15	<b>Session 6: Sustainability, Climate Change and Historic Building Preservation</b>  How to maximize energy efficiency while preserving historic material	<b>Stephen Spaulding</b> , <i>Historic Preservation Specialist</i> , NER (by phone)
4:15 – 4:30	<b>Closing Thoughts &amp; Wrap-Up</b>	

## DAY TWO – WEDNESDAY APRIL 24, 2013

Please bring your own coffee mug & name tag

8:00 – 8:30	<b>Welcome Back</b> – Recap day one and share goals for the second day	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison, Air Resources Division, Washington Office (WASO)</i>
8:30 – 9:15	<b>Session 1: Education &amp; Outreach Opportunities Panel Discussion</b> A panel discussion on education and outreach opportunities and initiatives at Cuyahoga Valley and across the National Park Service.	<b>Ryan Scavo</b> , <i>National Resource Specialist, Sustainable Operations and Climate Change Branch (WASO)</i>  <b>Pam Barnes</b> , <i>Interpretation and Education, Cuyahoga Valley National Park</i>  <b>Elisabeth Cohen</b> , <i>Education &amp; Training Specialist, NPS Climate Change Response Program</i>
9:15 – 9:45	<b>Session 2: Funding Sustainability Initiatives</b> 1. Federal Energy Management Program (FEMP) 2. NPS Opportunities	<b>Dan Collinge</b> , <i>Program Analyst, Department of the Interior Energy Management Program (by phone)</i>  <b>Shawn Norton</b> , <i>Branch Chief, Sustainable Operations &amp; Climate Change (WASO) (by phone)</i>
9:45 – 10:00	<b>BREAK</b>	
10:00 – 10:15	<b>Session 3: Introduction to CFP Action Planning</b> Overview, instructions, and picking groups	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison, Air Resources Division (WASO)</i>
10:15 – 12:00	<b>Group Work: Developing Action Items...</b> * Energy Conservation & Renewables * Transportation Management - including transportation, employee commuting, & staff training)	<b>Facilitators:</b> <b>Julie Thomas McNamee</b> , <i>Air Resources Liaison, Air Resources Division (WASO)</i>  <b>Ryan Scavo</b> , <i>National</i>



	<ul style="list-style-type: none"> <li>* Education &amp; Outreach</li> <li>* Cultural &amp; Natural Resources – Climate Change Impacts</li> <li>* Inspiring Behavioral Change – Staff</li> </ul>	<i>Resource Specialist, Sustainable Operations and Climate Change Branch (WASO)</i>
12:00 – 1:00	<b>LUNCH</b> ( <i>bring your own</i> )	
1:00 – 3:00	<p><b>Continue Action Item Development...</b></p> <ul style="list-style-type: none"> <li>* Energy Conservation &amp; Renewables</li> <li>* Transportation Management - including transportation, employee commuting, &amp; staff training)</li> <li>* Education &amp; Outreach</li> <li>* Cultural &amp; Natural Resources – Climate Change Impacts</li> <li>* Inspiring Behavioral Change – Staff</li> </ul>	<p><b>Facilitators:</b>  <b>Julie Thomas McNamee</b>,  <i>Air Resources Liaison, Air Resources Division (WASO)</i></p> <p><b>Ryan Scavo</b>, <i>National Resource Specialist, Sustainable Operations and Climate Change Branch (WASO)</i></p>
3:00 – 3:15	<b>BREAK</b>	
3:15 – 4:00	<p><b>Sharing Action Items</b>  Each group will have 5 minutes to share their top 3 and most immediate sustainability action items and why. Also discuss being ready for bigger projects when opportunities arises. Each presentation will be followed by 5 minutes of Q &amp; A time.</p>	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison, Air Resources Division (WASO)</i>
4:00 – 4:15	<p><b>Next Steps</b>  Day 3 agenda &amp; integrating actions into EMS</p>	<b>Ryan Scavo</b> , <i>National Resource Specialist, Sustainable Operations and Climate Change Branch (WASO)</i>
4:15 – 4:30	<b>Closing Thoughts &amp; Wrap Up</b>	<p><b>Julie Thomas McNamee</b>, <i>Air Resources Liaison, Air Resources Division (WASO)</i></p> <p><b>Stan Austin</b>, <i>Superintendent, Cuyahoga Valley National Park</i></p>

## DAY THREE – THURSDAY APRIL 25, 2013

8:30 – 8:45	<b>Welcome Back</b> Recap day three and outline goals for the final day	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison</i> , Air Resources Division, Washington Office (WASO)
8:45 – 9:00	<b>Re-cap of Existing EMS</b> Taking a look at the Cuyahoga Valley NP existing EMS	<b>Dennis Hamm</b> , <i>Land Resources Specialist</i> , Cuyahoga Valley National Park  <b>Veronica Dickerson</b> , <i>Administrative Assistant</i> , Cuyahoga Valley National Park
9:00 – 9:15	<b>Integrating CFP &amp; EMS</b> Introduce resources and guidance documents and outlining CFP expectations/requirements	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison</i> , Air Resources Division (WASO)
9:15 – 11:30	<b>Group Work CFP Actions/EMS Integration</b> *Policy & Commitments *Long-Term Goals & Objectives/Targets *Environmental & Sustainability Efforts *Aspects Analysis *Legal & Other Requirements *Roles & Responsibilities *Communication Policy & Strategy *Yearly Work Plan	
11:45 – 12:00	<b>CFP Next Steps</b>	<b>Ryan Scavo</b> , <i>National Resource Specialist</i> , Sustainable Operations and Climate Change Branch (WASO)
12:00 – 12:15	<b>Closing Thoughts &amp; Workshop Wrap Up</b>	<b>Julie Thomas McNamee</b> , <i>Air Resources Liaison</i> , Air Resources Division (WASO)  <b>Paul Stoehr</b> , <i>Deputy Superintendent</i> , Cuyahoga Valley National Park