



CLIMATE *Friendly* PARKS

Fort Vancouver National Historic Site Action Plan

This document reports the accomplishments of Fort Vancouver National Historic Site staff who participated in the joint NPS and EPA Climate Friendly Parks (CFP) Workshop on February 9th and 10th, 2010. In conjunction with its Environmental Management System (EMS) planning, Fort Vancouver National Historic Site developed the following commitments to reduce greenhouse gases and criteria air pollutants through the climate-friendly management of park operations and increased outreach and education efforts.

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FORT VANCOUVER NATIONAL HISTORIC SITE BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Fort Vancouver National Historic Site belongs to a network of parks nationwide that are putting climate-friendly behavior at the forefront of sustainability planning. By conducting an emission inventory, setting an emission reduction goal, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, Fort Vancouver National Historic Site provides a model for climate-friendly behavior within the National Park Service.

As part of the National Park Service's Pacific West Region, Fort Vancouver National Historic Site is involved in the regional effort within the NPS to become carbon neutral. The Region has developed a vision of having its park operations be carbon neutral, and of having all of its parks become Climate Friendly Parks Member Parks by 2010. Within the context of this larger vision, Fort Vancouver National Historic Site developed the emission reduction and adaptation goals described in this plan.

Fort Vancouver National Historic Site has committed to reducing greenhouse gas (GHG) emissions from its park operations by 24% below 2007 levels by 2016. Park operations refers to the facilities, vehicles, equipment, etc. that are under the operational control of the park.

This Action Plan describes steps that Fort Vancouver National Historic Site can undertake to reduce GHG emissions and 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. Strategies and action plan items were developed by working groups at the North Coast & Cascade and Upper Columbia Basin Climate Friendly Parks Workshop.¹ While the plan provides a framework needed to meet the park's emission reduction goals, it is not intended to provide detailed instructions on how to implement each of the proposed measures.

Fort Vancouver National Historic Site will make every effort to reduce GHG emissions from its park operations and will be able to make this effort on the existing operation. In the fall of 2011, Fort Vancouver National Historic Site will be adding the South & East Vancouver Barracks to their building inventory. This area includes 27 structures. Many of these structures have not been updated with modern insulation or infrastructure, and most of these structures have not been upgraded for the last 40 years. Once this property is on the park's inventory and the park is responsible for energy costs, percentages will increase and this may reflect on the park's efforts to reach its goals.

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service. At Fort Vancouver National Historic Site, increasing temperatures, and changing precipitation patterns may alter park ecosystems, and change both the habitats available for species and resources available for visitors to enjoy the park.

Scientists cannot predict with certainty the general severity of climate change nor its impacts. Average global temperatures on the Earth's surface have increased about 1.1°F since the late 19th century, and the 10 warmest years of the 20th century all occurred in the last 15 years. The single leading cause of this warming is the buildup of GHGs in the atmosphere—primarily carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)—which trap heat that otherwise would be released into space.

¹ Original notes from these workshops, including detailed action items not presented in the final plan have been archived by Fort Vancouver National Historic Site and are available upon request.

The continued addition of CO₂ 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.² 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.

Goals and Objectives

The objective of this Action Plan is to identify actions that Fort Vancouver National Historic Site can undertake to reduce GHG emissions and to adapt to current and future impacts of climate change. This plan presents the park's emission reduction goals, associated reduction actions, and adaptation strategies designed to achieve the park's goals. In addition to the GHG reduction actions identified in this plan, Fort Vancouver National Historic Site has already implemented several actions park wide.

The plan does not provide detailed instructions on how to carry out each of the proposed measures; rather, it provides the framework needed to meet Fort Vancouver National Historic Site's emission reduction and adaptation goals. 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 actions contained in this plan.

Fort Vancouver National Historic Site aims to:

- Reduce GHG emissions from Park Operations to 24% below levels by the year 2016 by implementing emission mitigation actions identified by the park.
- Preserve to the highest degree possible the park's natural and cultural resources and infrastructure from the impacts of climate change.

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 actions to reduce GHG emissions and preserve natural and cultural resources and infrastructure and implement actions that the park can independently take to reduce GHG emissions resulting from activities within and by the park.

Strategy 2: Monitor progress with respect to reducing emissions and preserving natural and cultural resources and infrastructure.

Strategy 3: Revise and update this Action Plan to strengthen existing actions and include additional actions.

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

GREENHOUSE GAS EMISSION INVENTORY AT FORT VANCOUVER NATIONAL HISTORIC SITE

Naturally occurring GHGs include CO₂, CH₄, N₂O, 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., electricity generation) and transportation purposes, the decomposition of waste and other organic matter, and the volatilization or release of gases from various other sources (e.g., fertilizers and refrigerants).

In 2007, GHG emissions within Fort Vancouver National Historic Site totaled 565 metric tons of carbon dioxide equivalent (MTCO₂E). This total includes emissions calculated from park operations and visitors including vehicle use within the park. For perspective, a typical single family home in the U.S. produces approximately 12 MTCO₂ per year.³ Thus, the combined emissions from park operations and visitor activities within the park are roughly equivalent to the emissions from the electricity use of 48 households each year.

The largest emission sector for Fort Vancouver National Historic Site is Energy, totaling 488 MTCO₂E (Fig 1 and Table 1).

The park purchased a total of 324,715 Kilowatt Hours (kWh) from Clark County Public Utility District (PUD) and Portland General Electric (PGE). 315,393 kWh were purchased from Clark PUD and they obtain power from two sources: half is from the BPA and the other half is from the River Road Generation Plant. 9,322 kWh were purchased from Portland General Electric for the properties in Oregon City, OR, and they produce their own energy from a number of different sources.

The park will be building a new Leadership in Energy and Environmental Design (LEED) certified Visitor Center that will replace the current Mission 66 Visitor Center. The addition of the new visitor center will greatly help the park reduce the electricity consumptions.

Pearson Air Museum used a total of 173,440 kWh of electricity during the fiscal year of 2007. The building is owned by the NPS but run by the City of Vancouver and the emissions are not attributed to the total park operations.

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

FIGURE 1

Fort Vancouver National Historic Site 2007 Total Greenhouse Gas Emissions by Sector

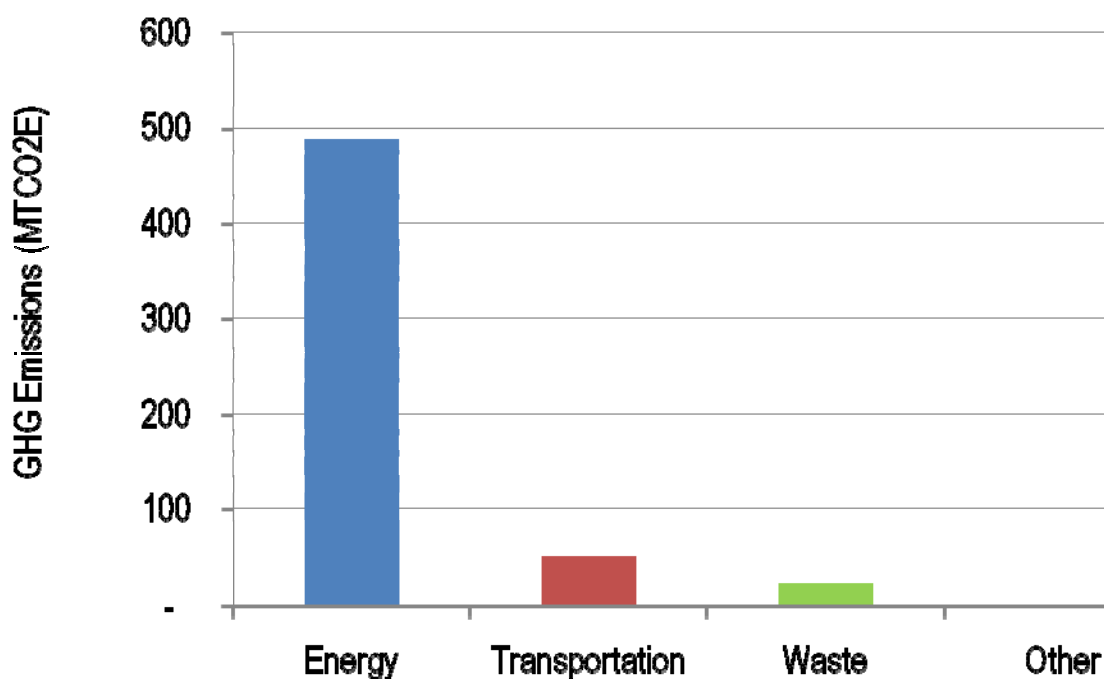


TABLE 1

Fort Vancouver National Historic Site 2007 Total Greenhouse Gas Emissions by Sector and Source

Total Park GHG Inventory Results (MTCO2E)

	MTCO2E
Energy	488
Stationary Combustion	39
Purchased Electricity	449
Transportation	52
Mobile Combustion	52
Waste	24
Landfilled Waste	23
Wastewater	1
Other	1
Refrigeration and Air Conditioning	1
Total	565

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

FIGURE 2

Fort Vancouver National Historic Site 2007 Park Operations Emissions by Sector

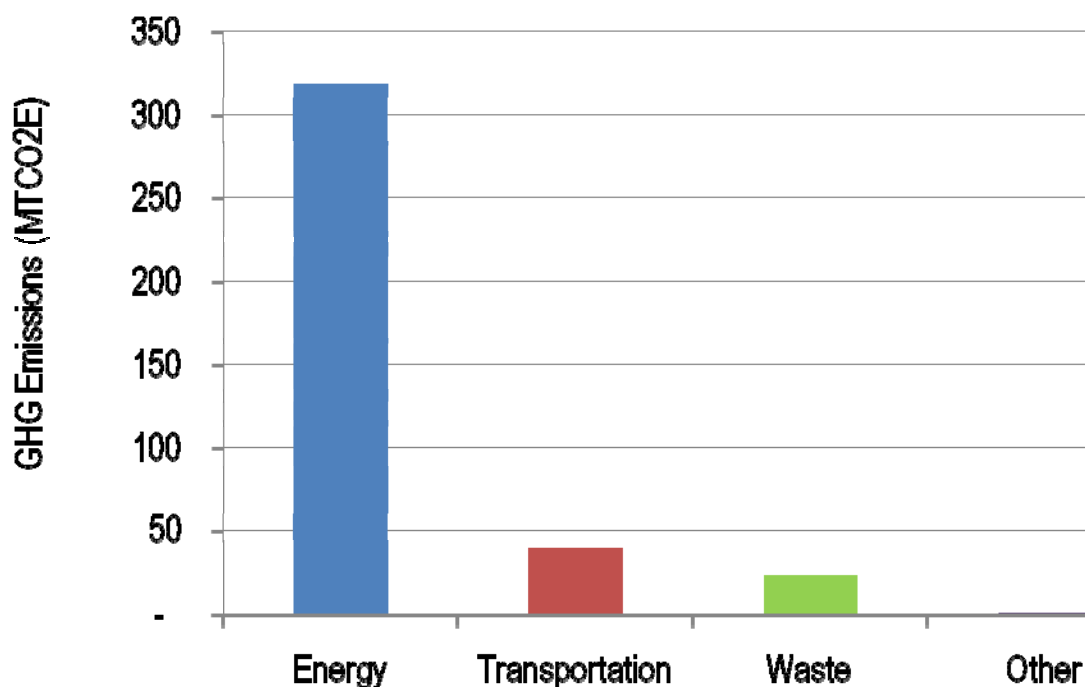


TABLE 2

Fort Vancouver National Historic Site 2007 Park Operations Emissions by Sector

Park Operations GHG Inventory Results (MTCO2E)

	MTCO2E
Energy	319
Stationary Combustion	27
Purchased Electricity	292
Transportation	39
Mobile Combustion	39
Waste	23
Landfilled Waste	23
Wastewater	0
Other	1
Refrigeration and Air Conditioning	1
Total	382

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

Fort Vancouver National Historic Site Responds to Climate Change

The following actions were developed during the North Coast & Cascade and Upper Columbia Basin Climate Friendly Parks Workshop on February 9th and 10th, 2010, in order to meet the park's climate change mitigation goals.

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

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

Energy Use Management

Emission Reduction Goal: Reduce park operations' energy use emissions to 35 percent below 2007 levels by 2016.

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 (319 MTCO₂E) of the park's GHG emissions from park operations are from energy consumption. Consequently, Fort Vancouver National Historic Site 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.

As identified above, Fort Vancouver National Historic Site will make every effort to reduce GHG emissions from its park operations and will be able to make this effort on the existing operation. In the fall of 2011, Fort Vancouver National Historic Site will be adding the South & East Vancouver Barracks to their inventory. This area includes 27 structures. Many of these structures have not been updated with modern insulation or infrastructure. Most of these structures have not been upgraded for the last 40 years. Once this property is on the park's inventory and the park is responsible for energy costs, percentages will increase and this may reflect on the park's efforts to reach its goals.

Energy Use Management – Planned Actions

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

- Reduce vehicle use. Utilize park bicycles.
 - Target a 20% reduction from 2007 mileage use by carpooling to work locations, taking breaks on job sites and utilizing park bicycles during the good weather days to travel from office to office within the park. The Oregon site, the McLoughlin House is located 30 miles south of Portland Oregon. The grounds maintenance crew travels to this site to maintain the grounds twice a week. There currently is no other solution.
- Encourage energy conservation in all park activities.
 - Encourage conservation in all park activities by shutting off lights, using natural lighting and turning off electronics.
- Establish an Operations and Maintenance (O&M) schedule that evaluates energy use across the entire park.

- Establish best maintenance and operations practice in order to improve energy and water efficiency.
- Adjust thermostats.
 - Ensure that thermostat settings will be set at; 68 degrees in the winter and no less than 78 degrees in the summer.
- Ensure all computers' power management settings follow current ENERGY STAR recommendations.
 - Develop a computer policy to ensure computers and monitors will be shut down at the end of a day. Policy will be distributed to all employees.

2 Upgrade lighting options

- Upgrade all light fixtures and bulbs in park to energy efficient bulbs.
 - Replace incandescent lighting throughout the entire park with energy efficient florescent lighting.
- Install lighting controls.
 - Install motion light sensors in all buildings. Sensors will be noted on maintenance building inspections to ensure they are in working condition.
- Install energy efficient outdoor lighting.
 - Research alternative lighting options for Visitor Center parking lot following night-sky guidelines.
 - During the design phase of the new Visitor Center, incorporate alternative outdoor lighting.
- Use day lighting.
 - Encourage staff to utilize sunlight as opposed to artificial light for work functions through the summer months.
 - Research the possibility of sky-lights in office area buildings.

3 Heating, Ventilation, and Air Conditioning (HVAC)

- Develop an HVAC maintenance schedule.
 - Continue to perform HVAC maintenance according to the seasonal maintenance schedule.
- Recalibrate thermostats.
 - Maintenance will work with the HVAC company to ensure thermostats are calibrated for most efficient, effective temperature and energy savings.
- Upgrade air distribution systems.
 - Consult with the Regional Energy Lead to request an energy audit.

4 Switch to more efficient electronics and devices

- Establish and implement a green procurement policy that sets minimum energy performance standards for all electronic equipment.
 - Assign to park employee the task of monitoring procurements to ensure that “green” products are being considered and purchased prior to making purchases.
- Default all computers to print double-sided.
 - Send a notice to all employees to set all printers in their offices on duplex as a default.
- Install Smart Strip power strips.
 - Research, purchase, and install Smart Power strips throughout the park.
- Develop an energy efficient hot water heating and delivery system.
 - Review the efficiency of park hot water heaters and submit a Project Management Information System (PMIS) (house funding) funding request for those models in need of efficiency upgrades. Specify preference for solar, on-demand and/or tankless models.
- Replace park's existing boiler or furnace with an energy-efficient model.
 - Review the efficiency of park boilers and furnaces and submit a PMIS (house funding) funding request for those models in need of efficiency upgrades.

5 Improve building structures and envelopes

- Weatherize park buildings by adding R-values to improve insulation effectiveness.
 - Inventory R-values of insulation in all occupied, heated, cooled buildings. Based on funding, replace/upgrade insulation.
- Replace/upgrade old windows.
 - Contact the Regional Energy Lead to identify inefficiency windows and where window weather stripping or replacement is appropriate. Specifically in historic reconstructions and Mission 66 buildings.
 - Ensure that windows in the new Visitor Center will be energy efficient.
 - Apply window film to south facing windows, where applicable, to prevent cooling loss.

6 Utilize alternative energy sources

- Purchase electricity from a renewable energy provider.
 - Research the possibility of purchasing renewable energy. Contact the Regional Energy Lead for recommendations of the various types of renewable energy available.
- Install photovoltaic panels on park buildings, parking lots, open areas, etc.

- Research the possibility of installing photovoltaic panels in the park.

7 Measure energy use throughout the park

- Partner with local universities on energy efficiency studies, audits and buildings audits.
 - Contact the Regional Energy Lead for information on existing agreements with local universities, etc. which the park may utilize for audits.
- Incorporate energy efficiency criteria into new contracts for park and concessioner construction.
 - The park will ensure that all contracts awarded by contracting officers have in the scope of work requirements for energy efficiency and sustainability. During the design phase of the new Visitor Center, ensure that all plans include energy efficient and sustainability is taken into account.
- Conduct an energy audit for all park buildings. Partner with local utilities to conduct the audit.
 - Contact Clark County PUD and Portland General Electric to request an energy audit of utilities used. With this information build a building portfolio to maintain the most efficient use of energy.
- Review and implement the Department of Interior (DOI) Sustainable Buildings Implementation Plan.
 - The park will review the DOI Sustainable Building Implementation Plan and be familiar with the guidance in this plan for improvements in existing buildings and the construction of new buildings.
- Install building-level utility meters in existing buildings and in new major construction and renovation projects to track and continuously optimize performance.
 - Contact Clark County PUD to perform an audit to determine if our meters are efficient.

Transportation Management

Emission Reduction Goal: Reduce park operations transportation emissions to 35 percent below 2007 levels by 2016.

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Fort Vancouver National Historic Site's emissions. As the inventory results indicate, GHG emissions from transportation comprise 10 percent of park operations emissions and 9 percent of the park's overall emissions (including visitors, and concessioners). Accordingly, in addition to the park operations emissions reduction goal, Fort Vancouver National Historic Site set a goal to reduce overall transportation emissions by 50 percent below 2007 levels by 2016.

Transportation Management – Planned Actions

1 Transportation-related behavioral changes

- Prohibit visitor vehicle idling.
 - Post signage on visitor bulletin boards asking visitors not to idle their vehicles in the park.
- Reduce staff idling.
 - Inform employees that warming up park vehicles (as well as personal vehicles) is not necessary with modern engines, warm up unnecessary.
- Encourage staff carpooling.
 - Provide information to staff on bus routes throughout the Vancouver/Portland area and information on transportation reimbursement for alternative travel.
- Reduce meeting travel.
 - Reduce travel to meeting by using more webinars and conference calls for meeting.

2 Reduce visitor vehicle fuel consumption

- Promote accessible front-country trails.
 - Post maps with routes of trails throughout the park on visitor bulletin boards.
 - Investigate the possibilities of adding information on trails and the amount of greenhouse gas emissions reduced by using the existing trail system to existing publications and information available in the Visitor Center.

3 Reduce NPS vehicle and equipment fuel consumption

- Promote efficient driving.
 - Use all-employee meetings to discuss the carbon impacts of driving throughout the park vs. taking park bicycles or walking.

- Identify areas to reduce or eliminate mowing.
 - Conduct a grounds management study of the new grounds surrounding the Vancouver Barracks and implement best/most efficient management practices (include the McLoughlin house unit).
- Analyze fleet fuel-consumption patterns for efficiency improvements.
 - Research vehicle fuel consumption and use patterns to determine if there is room for improvement.

4 Replace NPS vehicles and equipment

- Increase fleet fuel efficiency through replacement.
 - Study the effectiveness of fuel usage in the current fleet to determine if alternate vehicles or trade-out of vehicles is needed or possible.
- Right size the vehicle fleet by the number and type.
 - Determine if the park has the right combination of fleet types for use.
- Use alternative fuel vehicles or hybrids.
 - Determine if funding will allow the park to either purchase or lease alternative fuel vehicles from GSA in order to replace current fleet with the best/most efficient technology available.
- Replace 4-wheel drive with 2-wheel drive vehicles where appropriate.
 - Discuss the necessity of having 4-wheel drive vehicles in the park's fleet.

5 Vehicle maintenance

- Develop and maintain a maintenance schedule.
 - Initiate a preventative maintenance schedule for park owned vehicles and maintain a binder or log sheet to record the history of repairs. This will help the park determine if the vehicle is energy efficient or if the vehicle should be replaced.
- Use bio-based lubricants and greases.
 - Research and create a sustainable procurement log sheet where items can easily be ordered.
- Operate all fleet vehicles using re-refined oil.
 - Create a vendor log of locations where the park may take vehicles and be assured the products being used are environmentally safe.
- Retread tires.
 - Replace all tires with retreads when appropriate.

6 Transportation infrastructure

- Use reclaimed materials for new roads and paving.
 - Research the various alternative road material products when a road project is funded.

Waste Management

Emission Reduction Goal: Reduce park operations waste emissions to 35 percent below 2007 levels by 2016 through waste diversion and reduction.

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

Fort Vancouver National Historic Site's park operation activities emitted 24 MTCO₂E from waste management in 2007. Diverting or reducing the park's waste stream through increased recycling efforts and waste management will reduce the amount of waste sent to landfills and resulting emissions. Presented below are the actions that are currently under way and which comprise the park's progress to date as well as those actions that the park will pursue.

Waste Management – Planned Actions

1 Decrease waste through behavior change

- Train staff on green procurement practices.
 - Provide the Pacific west Region's best practices to all employees.
- Train park staff on source reduction, waste prevention, recycling, and composting initiatives.
 - Review and update the park's recycling and composting policies. Issue the new updated policy to new employees at orientation and review periodically at all employees meetings.

2 Establish new plans and policies that promote waste reduction.

- Incorporate waste reduction into Green Office Practices.
 - Post a list of "green" office products, purchased by office, in all offices to reduce duplicate purchases. Also include information on disposal, printing standards, electronic alternative for communications etc.
- Start a comprehensive waste reduction and recycling outreach campaign aimed at park visitors.
 - Create a "Trash Talk" type information pamphlet and posters to inform visitors on the parks recycling policy.
- Choose hand dryers over paper towels.
 - Replace paper towel dispensers with "quiet" hand dryers. Create a PMIS to address replacement of hand dryers throughout park (FOVA, MCHO and Pearson).
 - During the design phase of the new Visitor Center, write in the need to eliminate paper towel dispensers.

- Reduce waste generated at meetings and employee functions.
 - Use ceramic cups and eliminate the use of paper products at special events and all employee meetings.
- Pack-in and pack-out.
 - Update the park poster for the picnic shelter to encourage the “Pack-In and Pack-out” policy.
- Purchase products that minimize packaging.
 - Request that vendors use post-consumer/recycled packaging materials when the park purchases items that must be shipped.
- Eliminate non-recyclable styrofoam/food serviceware.
 - Eliminate the use of packaging materials made of Styrofoam.
 - Research (administration) biodegradable packaging material.
- Create a materials exchange program.
 - Establish a section of the park’s intranet site dedicated a materials and equipment exchange so park areas can source surplus materials internally.
- Reduce plastic water bottle use.
 - Explore the possibility of installing a water refilling station for visitors to refill water bottles.

3 Implement recycling and composting practices

- Continually increase the amount of waste material at the park that can be recycled.
 - Establish a system, in addition to the park’s CFP and EMP, for monitoring amount of waste produced in the park.
 - Research the possibility of purchasing composting bins for food products which can be placed at each work site. Train staff in the daily operations of this new composting bin.
 - Educate the public in the amount of composting materials they are contributing by placing their waste in the proper receptacle.
- Compost yard waste.
 - Chip downed and dead wood and transport to garden compost pile.
- Recycle or donate old computers and electronics.
 - Donate old computers and other electronics according to the NPS disposal policy.
- Practice environmentally responsible deconstruction.
 - Develop a waste management plan for all materials used in construction/destruction projects.
 - Develop a plan for disposing of old appliances or other “out of the ordinary” products.

- Use recycled oil and recycled coolant and other fluids in the auto shop.
 - Research and list vendors who are using recycled vehicle maintenance products.
- Send used florescent bulbs to reclaim/recycle service center.
 - Dispose of all florescent bulbs at the proper reclaim/recycle service center.
- Institute alkaline, lithium battery recycling locations in every office building.
 - Identify a central location in the park to take batteries and inform park staff of its location.
- Measure the baseline solid waste generation at the park.
 - Continue to measure waste and track waste generation through dumpster pick-ups.
- Co-locate trash and recycling bins.
 - Purchase solar composting trash bins for the park.
- Assign at least one full time person to act as a park recycling leader/manager.
 - Assign (if staffing permits) an employee to track the park's recycling program.
- Recycle grass.
 - Research the possibility of catching grass clippings for some of the smaller green spaces and hauling to the park's compost bins.

4 Reduce waste through green procurement

- Purchase locally produced materials whenever possible.
 - Encourage the procurement of "locally produced" materials, taking into consideration the amount of energy used to order and ship from outside Washington State or Oregon.
- Encourage contractors to practice green procurement practices.
 - Encourage contractors to include environmental considerations in their purchasing by ensuring that contracts adhere to Federal Acquisitions Regulation for environmental purchasing.
- Use post-consumer recycled paper in all park publications.
 - Request to Government Printing Office (GPO) that all park publications are printed on 100% post-consumer (PC) content, processed chlorine-free (PCF) copy paper.
- Train staff on green procurement practices.
 - Send an email out to employees suggesting they take the Office of the Federal Environmental Executive's online green purchasing training.
- Adapt a list of pre-purchase questions for the park.
 - Develop a frequently asked questions sheet for items to be purchased.

- Develop a Green Procurement Plan.
 - Provide new employees with the Pacific West Region's green procurement guidance.
- Inventory and Substitute all cleaning supplies with non-toxic products.
 - Establish a vendor list, through GSA, for all cleaning supplies eliminating use of hazardous chemicals from cleaning supplies.
 - Substitute products containing hazardous/toxic chemicals with non-toxic products.
 - Look for Green Seal Certified products and other green attributes when purchasing cleaning and maintenance equipment.
- Use low/no-VOC insulation, carpets, paints, and adhesives.
 - Establish a vendor list, through GSA, for items such as carpets, paints, adhesives, etc. which contain high recycled content, including other environmental requirements including zero volatile organic compounds (VOC) emissions paint, adhesives, and carpets.

5 Reduce and reuse wastewater

- Install low-flow faucets.
 - Inventory faucets throughout the park and install faucet aerators.
 - Ensure that during the design/building stage of the rehabilitated Visitor Center, all faucets installed will be low-flow and include aerators.
- Replace toilets with low-flow models.
 - Inventory toilets and replace with low-flow models.
 - Ensure that during the design/building stage of the rehabilitated visitor center, low-flow toilets are considered.
- Conserve water used in ground maintenance.
 - Remove any non-native species in park planters and replace with native species.
 - Analyze water usage to determine if further changes can be made to reduce the amount of water used.
 - Plant native species at the rehabilitated Visitor Center.

6 Other

- Manage solid waste and recycling by developing an ISWAP (Integrated Solid Waste Alternatives Plan).
 - Develop an ISWAP plan for the park.
- Implement and enforce a construction waste management plan and job site recycling policy.

- Develop and implement a Construction Waste Management Plan that includes source reduction as the priority practice. Other important components should include:
 - Reuse of construction waste on-site, reuse elsewhere, or selling recycling materials of value (lumber/wood, drywall, metal, rubble, cardboard, fixtures, hardware, and wiring).
 - Requirements that drywall and other construction contractors recycle waste.
 - Testing for lead and asbestos where needed.
 - Evaluation of the reuse of old fixtures, windows, toilets, etc. that are not energy efficient, unless there is historic value.
 - Requirements for waste haulers to prevent contamination of waste sorting.
 - Documentation to ensure no illegal dumping occurs off job site.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. Fort Vancouver National Historic Site can play an integral role in communicating about climate change to a vast audience. A better understanding of the challenges and benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. Fort Vancouver National Historic Site 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 public transportation to developing a green purchasing program, the actions Fort Vancouver National Historic Site takes to address climate change serve as opportunities for increasing the public's awareness of climate change.

Park Staff

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

Developing a climate change education program for park staff is vital to increasing awareness about climate change among park visitors and fostering a sense of collective responsibility among staff to help reduce park emissions. By incorporating climate change education into staff development programs, Fort Vancouver National Historic Site will enable its staff to demonstrate their commitment through leading by example, and providing visitors with the tools and resources they need to reduce GHG emissions in the park and in their own communities. Potential actions include:

- Create a park Climate Change Policy Memo specific to Fort Vancouver National Historic Site.
 - Develop an environmental statement from the Superintendent that will be included in all new employee orientation packets and made available to supervisors.
- Hold internal Climate Friendly Park discussions and workshops.
 - Utilize all email, newsletters and all employee meetings to disseminate climate change information.
- Develop intranet pages to inform staff about climate-friendly actions.
 - Place the park's climate Action Plan on the share-drive.
- Incorporate climate change issues into the employee handbook.
 - Include park specific climate change information in new employee orientation packets.
- Include the science and impacts of climate change into park education tools.
 - Include pack-in & pack-out policy and climate change lessons/activities in teacher packets.
- Advise staff on monthly webinars hosted by the climate change steering committee.
 - Assign responsibility to a staff member to stay aware of all Climate Change Steering Committee webinars and send out emails with information on how to join in.
- Incorporate sessions on climate change into new staff training.
 - Incorporate park specific climate change information into staff orientation and orientation packets.
 - Provide climate change training for new interpreters and other park staff who make visitor contacts.

- Contribute park success stories to green voice biannual publication.
 - Identify a staff member to collect success stories throughout the park and also be the main contact between the park and Green Voice/Climate Friendly Parks.
- Train custodial staff in most efficient use of cleaning products and waste reduction practices.
 - Train custodial staff in the most efficient use of cleaning products and waste reduction best practices.
- Communicate the park's waste policy or ISWAP to staff and concessioners.
 - Distribute copies on the park's ISWAP (when completed) to each division along with additional information such as green procurement lists and "cheat sheets" for waste reduction and recycling.

Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Fort Vancouver National Historic Site 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, Fort Vancouver National Historic Site can play an important role in educating the public about climate change.

Fort Vancouver National Historic Site staff recognize the many different audiences that visit the park, including recreational and non-recreational park visitors, "virtual visitors" who visit the park's website, face book site and pod-casts available to school-aged visitors, local and out of town visitors, local 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. These strategies include:

- Create and distribute previously produced information on climate change and its effects on national parks in general and on your park in particular.
 - Develop a climate specific web page on the park's website and link to the Climate Friendly Parks and Do You Part! websites.
- Integrate climate change themes into interpretive programs.
 - Develop posters for the picnic shelter and restrooms informing visitors of the park's CFP goals.
- Create signs promoting the park's efforts to curb emissions.
 - Include appropriate signage in visitation areas informing the public of the park's environmental policies and goals as well as what they can do to reduce their greenhouse gas emissions while at the park.
- Consider hosting a climate change traveling exhibit.
 - Check-out the traveling NPS climate change exhibit.
 - Create interpretive panels explaining the sustainable features of the Visitor Center renovation including reuse and recycling of materials.
- Incorporate climate-friendly information into interpreter programs and talks.

- Develop two climate change interpretive programs/talks – one targeted for students and the other for adults.
- Incorporate climate change information into interpretation at archaeological digs.
- Include climate change messaging in Junior Ranger Program.
 - Create worksheets/coloring sheets related to climate change topics as hand-outs to visitors.
- Educate visitors about their recycling options at the park and at home.
 - Information will be taken from the EPA website and made available to visitors during the time the Climate Change exhibit is at the park.
- Communicate with local communities, park visitors, and local media about actions they can take to reduce GHG emissions.
 - Contact the local newspaper to let them know that the park is becoming a Climate Friendly Park and what that means.
- Create demonstration projects and exhibits to convey park sustainability message to visitors.
 - Develop signage for the new solar compacting trash cans that explains the technology's process and benefits.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Fort Vancouver National Historic Site can play a significant role in supporting the park's climate change mitigation goals. As such, when appropriate, park staff will assist local communities with incorporating climate change messages into community events and find partners to promote climate change education at those events, and engage with surrounding agencies to coordinate effective outreach and education efforts.

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

Fort Vancouver National Historic Site realizes that the communities within the park and the region are one of the greatest assets in addressing climate change at Fort Vancouver. The park will:

- Consider the local economy in procurement and other areas.
 - Create a list of local vendors.
- Plan a community event for Earth Day.
 - Work with partners to plan activities for the community on earth Day in conjunction with park activities.
- Set up a Do Your Part! table at local events.
 - Set up a table with climate friendly posters, pamphlets, and information at appropriate local events.

STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Fort Vancouver National Historic Site 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 actions, and reevaluation of goals. As part of this strategy, Fort Vancouver National Historic Site will:

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

CONCLUSION

Fort Vancouver National Historic Site has a unique opportunity to serve as a model for over one million recreational visitors annually.⁴ 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, Fort Vancouver National Historic Site 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 Fort Vancouver National Historic Site staff and approved by the park's superintendent will significantly reduce the park's GHG emissions in the coming years. The mitigation and adaptation actions included in this plan have been developed in order to be directly transferable to the park's EMS. Fort Vancouver National Historic Site'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, Fort Vancouver National Historic Site 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 toward moving Fort Vancouver National Historic Site to the forefront of Climate Friendly Parks.

⁴ Fort Vancouver Historic Site: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm-2007>

APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

TRACY A. FORTMANN	SUPERINTENDENT
GREG SHINE	SUPERVISORY PARK RANGER
ELAINE HUFF	ADMINISTRATIVE OFFICER
ALEX PATTERSON	CHIEF OF MAINTENANCE
THERESA LANGFORD	CURATOR
ROBERT CROMWELL	ARCHAEOLOGIST
KIMM FOX-MIDDLETON	SUPERVISORY PARK RANGER