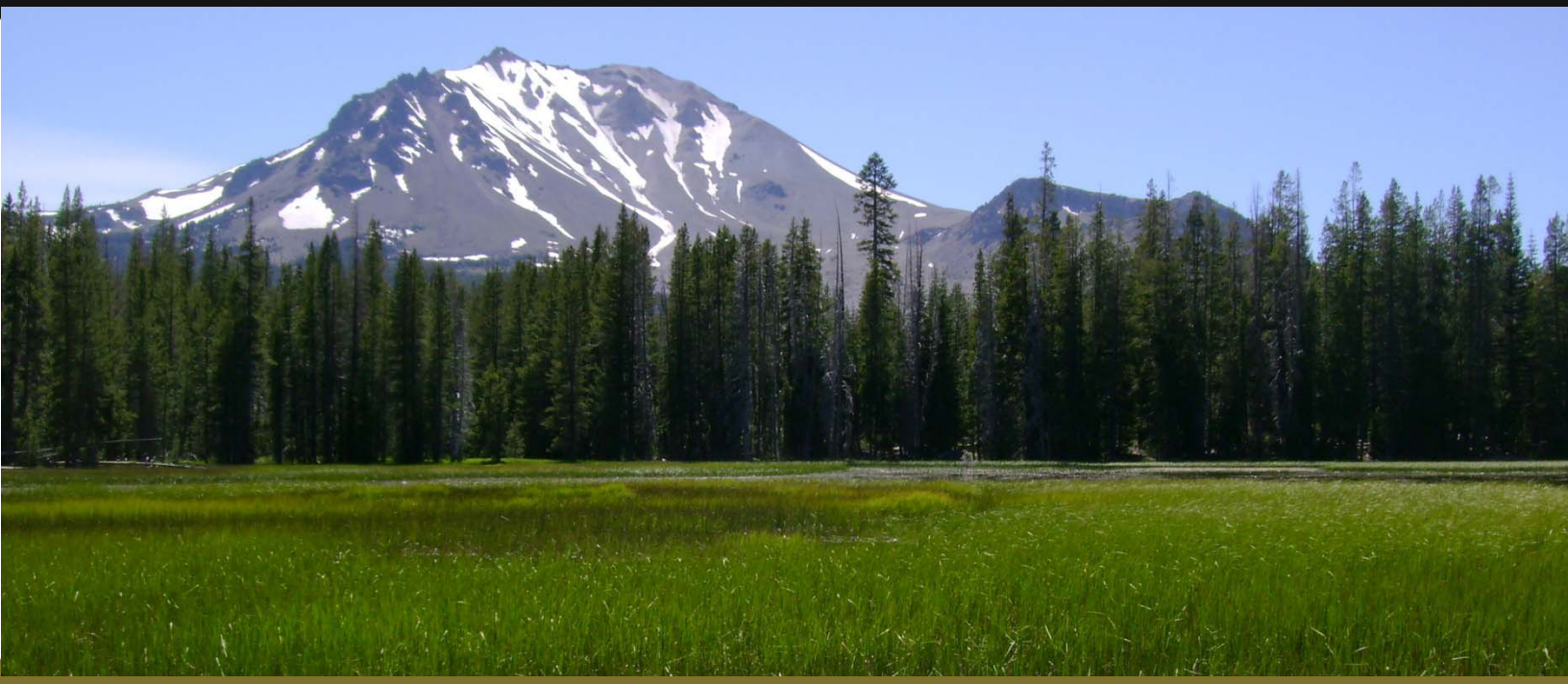
National Park Service
U.S. Department of the Interior



CLIMATE*Friendly* PARKS

Lassen Volcanic National Park Action Plan

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LASSEN VOLCANIC NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Lassen Volcanic National Park belongs to a network of parks nationwide that are putting climate friendly behavior at the forefront of sustainability planning. By developing this Action Plan, conducting a greenhouse gas (GHG) emission inventory, setting emission reduction goals which will be incorporated into all aspects of park management and operations, and committing to the education of park staff, visitors, and community members about climate change, Lassen Volcanic National Park will be a model for climate friendly behavior within the park service.

This Action Plan identifies steps that Lassen Volcanic National Park (LVNP) will undertake to reduce GHG emissions 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 Klamath Climate Friendly Parks Workshop.[1] Specifically, this plan recommends three strategies:

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

Strategy 2: Increase climate change education and outreach efforts.

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

While this 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. The park's 2009 Strategic Management Plan, Green Team Annual Workplan, and Environmental Management System describe priorities and details to implement these actions.

Lassen Volcanic National Park intends to:

- Reduce 2007 energy GHG emissions from park operations by 20 percent by 2016.
- Reduce 2007 transportation GHG emissions from park operations by 20 percent by 2016.
- Reduce 2007 waste GHG emissions from park operations by 10 percent by 2016.
- Reduce total 2007 park GHG emissions, including visitors and concessioners, by 10 percent by 2016.

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service and specifically to Lassen Volcanic National 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 (CO_2), methane (CH_4) and nitrous oxide (N_2O)—which trap heat that otherwise would be released into space.

The continued addition of CO_2 and other GHGs to the atmosphere will raise the Earth's average temperature more rapidly in the next century; a global average warming of 4-7°F by the year 2100 is considered likely.[2] Rising global temperatures will

[1] Original notes from these workshops, including detailed action items not presented in the final plan have been archived by Lassen Volcanic National Park and are available upon request.
[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>

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.

While the exact role of climate change upon LVNP ecosystems is unknown, several specific issues are of concern to the park's resource managers. These issues include potential changes in the timing, type, and duration of precipitation and associated changes in wildland fire regimes, habitat types and species distributions. Shifting patterns of precipitation, such as a reduction in the park's deep winter snowpack, would significantly alter habitats and ecosystem processes within the park. Long-term monitoring is underway to gather more information in a variety of areas, from physical processes such as climate and weather patterns, to the distribution and abundance of temperature sensitive species such as the American pika (*Ochotona princeps)*.

GREENHOUSE GAS EMISSION INVENTORY AT LASSEN VOLCANIC NATIONAL PARK

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

Greenhouse Gas Emissions

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

In 2007, GHG emissions within Lassen Volcanic National Park equaled 2,806 metric tons of carbon dioxide equivalents ($MTCO_2E$). This includes emissions from park and concessioner operations and visitor activities, including vehicle use within the park. For perspective, a typical single family home in the U.S. produces approximately 11 $MTCO_2$ per year.[3] Thus, the combined emissions from park and concessioner operations, along with visitor activities within the park, are roughly equivalent to the emissions from the electricity use of 255 households each year.

The largest emission sector for Lassen Volcanic National Park is transportation, totaling 2,357 $MTCO_2E$ (see Figure 1 and Table 1) or 84% of the park's overall emissions. LVNP's transportation emissions are largely a result of four primary factors:

1) The park is a 'drive-through' park for a majority of visitors: the main park road is an extension of the north-south Highway 89 corridor, which comprises a portion of the Volcanic Legacy Scenic Byway/All American Road.
2) Access to three popular backcountry developed areas (Butte Lake, Juniper Lake and Warner Valley) requires a significant amount of driving for both visitors and staff. For example, maintenance employees servicing these areas drive between 0.5 and 1.5 hours from their duty stations to reach these backcountry sites.
3) The majority of park staff is stationed at the Park Headquarters in Mineral, California, which is located 9 miles from the nearest park entrance (Southwest Entrance) and many staff drive much further along the Lassen Park Road to access work sites during the summer months.
4) The park uses heavy equipment between roughly April and June of each year to conduct the Spring Road Opening of the main park road.

When concessionaire and park visitor emission contributions are removed from total emission figures, park operations alone generate 638 $MTCO_2E$ per year. The transportation sector is still the largest contributor of GHG emissions at 54% of the total park operations' emissions. Emissions generated from the generation of electricity used by the park are the second largest contributor, at 42% of emissions from park operations (Table 2 and Figure 2).

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

FIGURE 1

Lassen Volcanic National Park 2007 Total Greenhouse Gas Emissions by Sector

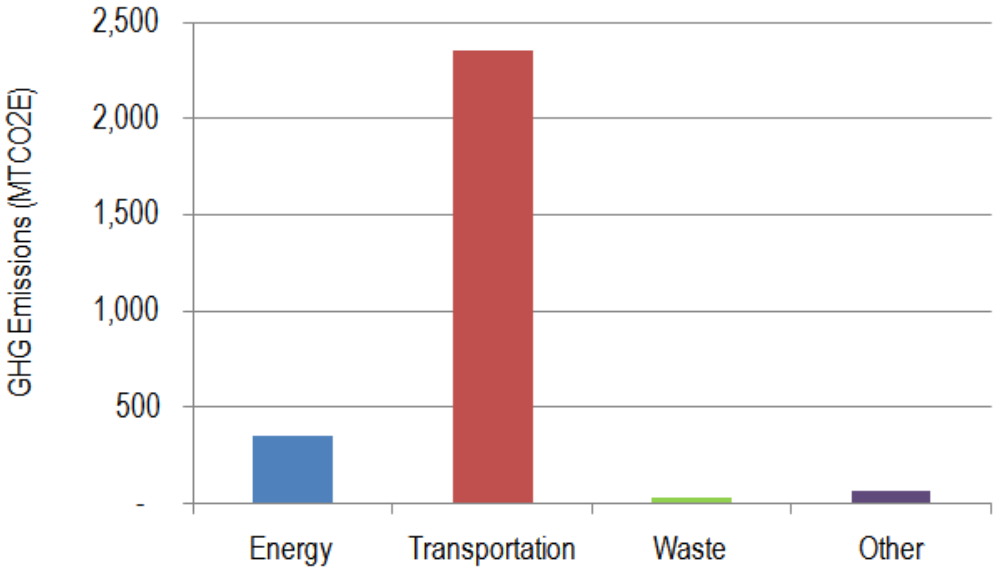

TABLE 1

Lassen Volcanic National Park 2007 Total Greenhouse Gas Emissions by Sector and Source

	MTCO2E
Energy	349
Stationary Combustion	245
Purchased Electricity	104
Transportation	2,357
Mobile Combustion	2,357
Waste	31
Landfilled Waste	31
Other	69
Refrigeration and Air Conditioning	69
Total	2,806

Note - Totals may not sum due to rounding

FIGURE 2

Lassen Volcanic National Park 2007 Park Operations Emissions by Sector

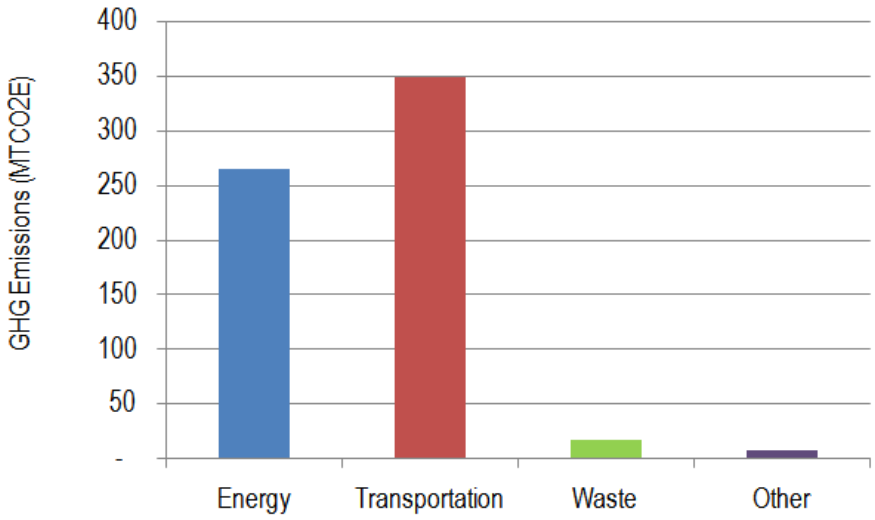

TABLE 2

Lassen Volcanic National Park 2007Park Operations Emissions by Sector

	MTCO2E
Energy	265
Stationary Combustion	167
Purchased Electricity	98
Transportation	348
Mobile Combustion	348
Waste	18
Landfilled Waste	18
Other	7
Refrigeration and Air Conditioning	7
Total	638

Note - Totals may not sum due to rounding

Lassen Volcanic National Park Responds to Climate Change

The following actions were developed during the Klamath Climate Friendly Parks Workshop on April 14th and 15th, 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

Lassen Volcanic National Park has developed a set of actions that the park is committed to taking 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 Lassen Volcanic National Park will take have been presented below in order from highest to lowest priority within each sub-category.

Energy Use Management

Emission Reduction Goal: Reduce 2007 energy GHG emissions from park operations by 20 percent 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. Emissions inventory results indicate that 42 percent of the park's GHG emissions from park operations are from energy consumption. Consequently, Lassen Volcanic National 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

Behavioral Changes

- Installed programmable thermostats (electronic thermostats and set appropriate settings) in Mineral Headquarters (HQ) area and Kohm Yah-mah-nee Visitor Center (KYVC)

Lighting

- The south-facing orientation of the KYVC was selected to maximize natural light in the construction of the building.
- Daylight is used to light the KYVC and Loomis Museum to conserve electricity use.
- Motion sensor lighting has been installed on buildings throughout the Mineral HQ area and at Manzanita Campground restroom facilities.
- Solar powered outdoor lighting was installed at the Discovery Center.
- Solar panels installed on the Manzanita Lake Campground restrooms provide all the power needed for the facility.
- Compact Florescent Light bulbs (CFL's) have been installed at Mineral HQ, KYVC, and Southwest entrance.

Heating, Ventilation, and Air-Conditioning (HVAC)

- Established Superintendent's Order number 46 (SO #46), Green Procurement, which implements procurement policy concerning the purchase of energy efficient electronics/office equipment for the park.

- APC/UPS back-up batteries and surge protectors were installed for park computers, and these are turned off daily to reduce 'vampire energy' losses. Park staffs are periodically reminded of this through the Dacite, the all employee electronic newsletter.
- The park's only boiler has been replaced with and energy efficient model at the KYVC.
- Installed energy efficient water heaters in the housing located at Manzanita Lake.

Improving Building Envelope

- Installed double pane windows at KYVC.
- Rehabilitated seven CCC-era and three Mission-66 era buildings in Mineral and floors in three structures at Manzanita Lake to improve insulation and reduce air leaks.
- Conducted an energy audit for all park buildings in 2010

Alternative Energy

- Installed solar panels at Manzanita Lake Fire Station (2.2 kW) and on the Mineral auto shop (35 kW) and annex (35 kW). These three buildings are powered by solar energy and remainder is given to PGE.
- Purchased green electricity (2005-2008) credits from Bonneville Dam, and in turn, traded them with PGE (local provider) to provide the park with renewable energy. In 2009, due to staff change and some complications in this agreement the park weren't able to continue this agreement. However, the park will pursue again when correct staff member is brought on in the future.

Other Energy Management Actions

- Incorporated energy efficiency LEED criteria at the KYVC.

Energy Use Management – Planned Actions

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

- Encourage energy conservation in all park activities.
  - Educate employees to turn off computer, monitors, printers, backup battery units, interior and exterior lights, and other electronic devices at the end of the workday. Establish "know your energy use" program – friendly competition between offices/divisions.
- Develop a mandatory energy-saving training program.
  - Develop employee energy conservation education program implemented through Dacite entries (e-newsletter), staff meetings and in-park trainings.
- Adjust thermostats.

- Establish temperature settings for buildings park-wide.
- Identify person(s) for reviewing thermostat setting for holidays, all-employee training days, etc. (i.e.) when buildings are vacated).

- Set computer management settings.
  - Aid all park staff in setting computer management settings to: a) hibernate within a specific timeframe, b) switch to screen saver mode, c) print double-sided, d) use an eco-font, and e) set default margins for Word documents.

- Establish a flex schedule.
  - Develop maxi-flex work option which includes work at home options to reduce commuting, reduce energy use in office.

2 Upgrade lighting options

- Upgrade all light fixtures and bulbs in park to energy efficient bulbs.
  - Install CFL bulbs at Manzanita Lake housing and North District building.

- Install lighting controls.
  - Install motion sensor lighting controls on the exterior of the Mineral Fire building to reduce the amount of energy used.

- Install energy efficient outdoor lighting.
  - Improve energy efficiency of Mineral Headquarters area as part of the 2012 Mineral Utilities Project. One component of the project involves reducing the number of streetlights within the HQ area and replacing them with energy efficient and 'night-sky friendly' models.

- Use daylighting.
  - Use daylighting construction design for new Southwest Campground bathroom. Include daylighting specifications for all new construction/reconstruction projects.

3 Heating, Ventilation, Air-Conditioning (HVAC)

- Develop an HVAC maintenance schedule.
  - Continue monthly inspections of the KYVC HVAC system and expand these inspections to all of the park's facilities.

- Recalibrate thermostats.
  - Recalibrate all thermostats throughout the park facilities within five years.

- Ensure efficient use of building automation systems (BAS).
  - Conduct an energy audit to confirm efficient operations.

4 Switch to more efficient electronics and devices

- Default all computers to print double-sided.
  - Ask park IT specialist to set up double-sided printing specifications on new print network. IT specialist will assist Manzanita Lake staff to establish settings on their non-networked printers.
  - The park IT specialist is evaluating opportunities to reduce/consolidate the number of individual printers used in office buildings. New printers will be energy efficient models.
- Install Smart Strip power strips.
  - Purchase and implement use of smart power strips for the park's electronic equipment.
- Install energy-efficient water heaters.
  - Inventory and replace inefficient water heaters within Mineral and Manzanita Lake buildings. Investigate the feasibility of installing propane on demand water heaters.

5 Improve building structures and envelopes

- Weatherize park buildings by adding R-values to improve insulation effectiveness.
  - Continue to rehabilitate CCC and Mission 66-era structures to improve insulation and reduce air leaks.
- Replace old windows with new windows.
  - Replace windows in historic buildings and Mission 66 structures with double pane windows with similar appearance. Ensure air-tight fit. Consult with park cultural resource specialist.
  - Investigate using double casement windows.

6 Utilize alternative energy sources

- Install photovoltaic panels on park buildings, parking lots, open areas, etc.
  - Obtain approval to develop an alternative energy source to power the Manzanita Lake maintenance area.
  - Design and install an 80 kW system in Mineral HQ that will provide enough power to cover Mineral's energy requirements (compliance will be undertaken for this as part of the planning for the 2010 Mineral Utilities project).
- Investigate other potential alternative sources including hydropower.
  - Investigate use of micro hydroelectric power (Pelton wheel) at Manzanita Creek.

7 Measure energy use throughout the park

- Incorporate energy efficiency criteria into new contracts for park and concessioner construction.
  - Incorporate energy efficient considerations into new bathroom at Southwest Campground and for new Mineral conference room/fitness facility.
  - Use 2010 energy audit information to improve efficiency of existing structures.

Transportation Management

Emission Reduction Goal: Reduce 2007 transportation GHG emissions from park operations by 20 percent by 2016.

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Lassen Volcanic National Park's emissions. As the inventory results indicate, GHG emissions from transportation comprise 54 percent of the park operation emiss ons. Accordingly, in addition to the park operations emissions reduction goal, Lassen Volcanic National Park will begin planning targets for reducing overall transportation emissions (including those generated by the public and the concessionaire) in 2011. Presented below are the actions that are currently underway and which comprise the park's progress to date, as well as those actions that the park will pursue.

Progress to Date

Behavioral Changes

- Because of the significant distance between the north (Manzanita Lake) and south (Mineral) administrative areas, staffs are encouraged to use teleconferencing in lieu of driving to attend monthly meetings, such as Lassen Operations Team (LOT) meetings.
- Interpretation purchased carbon offsets in 2009 for a training that was attended.
- In 2009, the park began, and will continue, a fuel-use education reduction program which has included utilizing SCA interns to develop educational bullets, and making presentation at all employee meetings.
- Employees frequently carpool from their homes to work, and from their duty stations to meetings.

Visitor Vehicle Travel

- "Premium" parking spaces are dedicated for alternative fuel vehicles at KYVC.
- Discounts are offered for entry to the park by foot and/or bike visitors.

Vehicle and Equipment Fuel Consumption

- The Protection Divisions' 2-stroke engine snowmobiles have been replaced with more efficient 4-stroke models.
- The park adopted an Idling Standard Operating Procedure (SOP) in 2010, which applies to park employees and will be incorporated into agreements and contracts by the Contracting Officer.

Vehicle and Equipment Replacement

- Several efforts have been made to acquire more fuel efficient GSA and seasonal rental vehicles by different divisions. For example, compact sedans are requested in lieu of trucks, and hybrid/alternative fuel vehicles have been obtained from GSA and via rental agreement.
- Resources Management decreased the size of their GSA fleet by 25% in 2009.

- Manzanita Lake Maintenance staff uses electric vehicles/mini-trucks on the north side of the park. There was an attempt to use them in the Mineral, but snow and cold weather created complications.

Vehicle Maintenance

- The park keeps the entire fleet in top mechanical shape to ensure the vehicles are operating at peak performance.
- The park has been using re-refined oil when it has been available in the area.

Transportation Infrastructure

- Crushed and reclaimed asphalt during the Federal Highways repaving project and other park projects.
- Planted native vegetation at KYVC and around new (non-historic) structure to reduce the amount of mowing and fuel used by the park
- The green team purchased four mountain bikes and two three-wheel 'basket' bikes, helmets and locks for use between offices/ buildings at Manzanita Lake and Mineral in 2010.
- The park wrote a Job Safety Analysis (JSA) for using the bikes and employees are given the combination to the bike locks after reading and signing the JSA.

Transportation Management – Planned Actions

1 Transportation-related behavioral changes

- Discourage visitor vehicle idling.
  - Establish signage/education for visitors that encourage no idling in general and especially when queuing at construction zones and at park entrance.
- Encourage staff carpooling and encourage non-motorized travel.
  - Alter maintenance staff work hours to coincide with interpretive staffs so they can carpool together to KYVC.
  - Encourage more carpooling to worksites and from home, set a target of one 'carpooling day' per week for employees.
  - Give incentive for employees who bike to work when possible.
- Reduce meeting travel.
  - The park is in the process of purchasing videoconferencing equipment for new conference room.
- Continue the employee fuel-use reduction education program created in 2009.

2 Reduce visitor vehicle fuel consumption

- Use alternative fuel shuttle buses.
    - Work with concessionaire (in 2014 or later when the Manzanita Lake Connector Trail is completed), to establish a shuttle system between Manzanita Lake and the Lassen Peak parking lot. Ideally, the shuttle route will include the KYVC as one of the stops).
    - Improve tracking of visitor transit data. Generate ideas for collecting information on the amount of vehicle travel in the park, to track trends and come up with alternatives for travel.

3 Reduce NPS vehicle and equipment fuel consumption

- Promote efficient driving through the fuel use education program.
    - Include elements that focus on behaviors such as driving the speed limit and not idling.
- Identify areas to reduce or eliminate mowing.
    - Purchase and maintain rotary and/or electric mowers for the residents and for the Mineral ball field area.

4 Replace NPS vehicles and equipment

- Increase fleet fuel efficiency through replacement.
    - Look into setting a benchmark for miles per gallon for fleet vehicles through the Fleet Management Plan.
    - Create a fleet of 'right sized' vehicles fleet through analysis under the Fleet Management Plan.
    - Create a replacement plan to replace lower miles per gallon vehicles with higher miles per gallon hybrids, biodiesel, and electric vehicles through the Fleet Management Plan.
    - Superintendent stated the park's "2020 goal" should be to switch to gas/electric hybrids vehicles (rather than biodiesel which has availability and performance (in cold weather) issues, which are primarily powered by solar energy produced in Mineral and/or Manzanita Lake.
    - Acquire an electric vehicle charging station for the Mineral Headquarters area and the Summit Lake Campground area (would need to be solar-powered) to encourage the use of electric/hybrid vehicle use by park staff and visitors.

5 Improve transportation infrastructure

- Use reclaimed materials for new roads and paving.
    - The park will continue to use the best environmental practices concerning the paving of roads with in the park boundaries.

Waste Management

Emission Reduction Goal: Reduce 2007 waste GHG emissions from park operations by 10 percent by 2016.

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 CH_4 emissions in the United States. Reducing the amount of waste sent to landfills reduces CH_4 emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. The less the park and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

Lassen Volcanic National Park's park operation activities emitted 31 $MTCO_2E$ from waste management in 2007. The amount of waste sent to landfills and resulting emissions will be reduced by diverting or reducing the park's waste stream through increased recycling efforts and waste management. 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

Behavioral Changes

- The park Contracting Officer has conducted training, under SOP #46, on the Office of the Federal Environmental Executive's online green purchasing training.
- The park's Green Team conducts training on waste reduction and recycling at the annual park-wide seasonal employee orientation.
- The park tracks all green purchases on its DI log if the product purchased meets one or more of the following criteria: has recycled content, is sustainable, and/or was repaired instead of replaced.

Waste Prevention

- In 2006 the Green Team received a grant for $148,000 from the State of California, Division of Recycling, to install recycling bins, adjacent to all trash receptacles throughout the park, and to initiate a public education campaign and improve motivational signage. The educational work initiated under the grant continues annually and includes incorporating a recycling message into interpretive programs (particularly youth programs) in the park.
- Redesigned the park's fax cover sheet to eliminate the black band at the top that wasted printer ink.
- Installed hand dryers in restroom facilities throughout the park between 2008 and 2010.
- Recycling receptacles are always offered at employee events, if event involves an outdoor lunch then discounts are offered to workers who bring their own utensils and plates.
- The park provides zero-waste lunch information for school and group tours.
- Purchased plates, silverware, cups, and a dishwasher for the new conference room facilities to reduce the waste associated with plastic eating utensils.
- Styrofoam packing peanuts are collected in the Mineral recycling shed and taken to "Mailboxes Etc." in Red Bluff or Redding.

- Concessioners use corn and/or paper products instead of plastics.
- Existing materials that need to be replaced are replaced with recycled equipment or energy efficient new models.
- Property officer offers materials up for excess internally before transferring or disposing out of park. Board of Survey also offers useful 'Lost and Found" items to divisions before excessing (i.e., GPS units, walking sticks, cameras). Maintenance provides excess building materials to a local chapter of Habit for Humanity.
- The park maintains water fountains for the public to fill their personal water bottles. Aluminum water bottles can be purchased from the concessioners and Lassen Association.

Waste Diversion (Recycling and Composting)

- In 2010, the KYVC was awarded LEED Platinum status by the US Green Building Council. In preparation for the new visitor center, the old Chalet previously located at the visitor center site was deconstructed instead of demolished. Deconstruction was done in the most environmentally responsible way possible and the bulk of the Chalet materials were recycled or reused.
- In 2010, the Environmental Management System Council was merged within the park's Green Team . The Green Team coordinates all recycling projects within the park and tracks information on the amount and type of material recycled annually.
- The Green Team set new targets for recycling and Universal Waste collection each year, in its annual work plan.
- Through its Universal Waste Collection process, the park Maintenance Division recycles florescent bulbs (CFL's), alkaline batteries, empty propane fuel canisters, and e-waste (e-waste disposal is done by the Property Officer), The Maintenance Division tracks waste management data using the Environmental Management Systems to identify trends which may signal the need for specific waste reduction actions.
- In 2010, the park located a service that shreds and recycles CDs, as well as paper.
- Recycled oil and coolant are used by auto shop employees.
- The park uses a composting lawnmower to reduce the amount of waste generated by disposing of grass clippings.
- The park improved its system for collecting and tracking ink and toner cartridge recycling in Mineral HQ. Cartridges are collected, inventoried and dropped off at Office Max for purchase credit.

Green Procurement

- For construction projects, locally produced lumber, rock and road materials are purchased. In addition, VOC-free paint is used and, if carpet needs to be installed, only recycled-content carpet materials are purchased.
- Post-consumer recycled content paper is used for office printing and all publications, including the park newspaper.
- The park purchases many recycled content materials including paper towels, trash bags, office paper, paint, carpets, etc.

- Forest Stewardship Council (FSC) certified wood was purchased for the Visitor Center.

Reduce Wastewater

- Low flow toilets have been installed in several buildings throughout the park.
- Motion sensor faucets have been installed at the Visitor Center.
- Timers have been installed on the Mineral Administration Building sprinkler system (which is part of an historic landscape) to avoid watering during the middle of the day to reduce the amount of water evaporating.
- Native plants are used in all new landscaping projects because they require no watering.

Waste Management – Planned Actions

1 Decrease waste through behavior change

- Continue to have the Green Team educate park staff on waste reduction responsibilities.
  - The Green Team will continue to identify new areas to target for waste reduction education and action during the development of their annual workplan.
  - Waste reduction education efforts should be included on park's website.
- The Green Team will work with Interpretation to continue visitor education efforts regarding recycling and waste reduction. The Team is interested in recruiting an intern to develop an outreach plan.
  - Add zero waste/leave no trace information to park website and park newspaper.
  - Establish drop boxes at entrances so visitors can recycle maps and park newspapers.

2 Increase waste prevention efforts.

- Add recycling collection/sorting bins to seasonal housing/offices.
  - The Green Team will purchase recycling bins for seasonal housing and offices to encourage the sorting and recycling materials (the Team is trying to encourage sorting over commingling recyclables).
- Promote expanded waste reduction efforts into Green Office Practices.
  - Encourage staff to bring personal hand drying towels for the office bathrooms. Maintenance will install towel racks or hand dryers in office bathrooms, and the Green Team will add educational signage, to encourage staff to help reduce the amount of paper towels used by the park.
  - Develop guidelines for green meetings (i.e., place agenda on dry erase board instead of handling out individual copies, etc.)

3 Enhance recycling and implement composting practices

- Expand the Green Team's recycling and waste diversion efforts..

- Utilize information from the 2002 LVNP Integrated Solid Waste Management Plan (ISWAP) to identify priority areas for waste diversion.
- Investigate ways to increase the efficiency of collecting and transporting commingled material from Manzanita Lake.
- Emphasize/improve Universal Waste collection site at the Mineral HQ area.

- Compost yard waste and/or food waste.
  - Investigate the possibility and implementation of composting both yard waste (grass clippings, branches and invasive) and food waste within the Mineral Headquarters Area.
  - The park will investigate the use of an Earth Drum at Drakesbad Guest Ranch.

- Practice Environmentally Responsible Deconstruction.
  - Continue to deconstruct (dismantle, salvage/reuse and recycle materials) from any older buildings/infrastructure (i.e., roads) that are removed from the park. This practice should be standard and will be done during the replacement of the Southwest parking lot 'comfort station.'

- Improve waste collection and transportation efficiency.
  - Work with Maintenance to reduce the number of time waste is collected in offices. Also we will set up food waste receptacles to eliminate potential mouse problems associated with this.

4 Reduce waste through green procurement

- Continue to train staff on green procurement practices, such as researching and purchasing products with recycled content, or those made of non-toxic materials.
  - The Contracting Officer will be responsible for conducting this training or requesting a trainer from the Pacific West Regional Office.
  - The Contracting Officer will investigate opportunities to include green procurement/waste reduction requirement for contractors.

- Regularly inventory commonly used products to evaluate their 'greenness,' and research possible green substitutions.

- Continue the Maintenance Division's practices of purchasing environmentally-friendly materials for constructions, such as Forest Stewardship Council (FSC)-certified wood, VOC-free paints and adhesives, recycled content carpets, etc.
  - Verify whether FSC wood is being used for new conference room and building rehab and if not then look into doing so.

5 Reduce and reuse wastewater

- Install low-flow faucets.
  - Install low-flow faucets when an older model faucet needs replacing.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. Lassen Volcanic National Park 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. Lassen Volcanic National Park recognizes that the greatest potential impact the park can have on mitigating climate change is through public education. Thus, the park sees public education as an end goal of any climate initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions Lassen Volcanic National Park takes to address climate change serve as opportunities for increasing the public's awareness of climate change. Presented below are actions currently under way within LVNP, and additional actions that the park is planning to pursue.

Progress to Date

Behavioral Changes

- Some purchases are made through local vendors, such as VIP t-shirts and Green Team awards. The Green Team awards purchased in 2010 are customized reusable shopping bags made from post-consumer recycled plastic.
- Local vendors are utilized for many services, including painting, copying and recycling .

Sustainability Education

- The Interpretation Division developed the first Green Junior Ranger program in the NPS and began recruiting Green Junior Rangers during the summer of 2010.
- Interpretation staffs have worked with the Klamath Inventory and Monitoring (I&M) Network staff to develop and disseminate park-specific climate change information, which can be accessed through the NPS Nature and Science website.
- Lassen Volcanic National Park hosted an NPS climate change traveling exhibit at the Loomis Museum and Visitor Center in 2009.
- The Green Team adopted a logo which is incorporated into signs and flyers, and displayed on recycling bins, to convey a consistent recycling message throughout the park (staff and visitor outreach).
- Interpretation and Green Team employees participate at local community events highlighting park accomplishments (i.e., parades, Endangered Species Fair, Watershed Festival, etc.).
- Created displays for use at park education center which school tours see.
- The KYVC was a cooperative effort between all divisions and greatly increased staff and public awareness of the Park's efforts towards sustainability. The Park has continued to incorporate these practices into other structures being planned, like the new SW restrooms and Mineral Conference Room.

Climate Friendly Partnerships

- Partnered with local organizations and friends groups, during the 2009 Strategic Plan development, to look for opportunities to lower GHG emissions and educated the public about climate change.

- The Resource Management Division has begun meeting biannually with staff from the surrounding Lassen National Forest to hold educational forums regarding climate change and discuss potential joint research and monitoring projects. The USFWS and local non-profit groups have been invited to participate.

Other Education and Outreach Actions

- Distributes NPS "Climate Change in National Parks" and "Climate Change in Western National Parks" brochures.

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, Lassen Volcanic National Park 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:

- Hold internal Climate Friendly Park discussions and workshops.
  - Green Team members will advise division staff on CFP/CLIP emission updates and strategies to implement GHG reductions.
  - Green Team will make presentation at all employee meetings and seasonal orientations.
  - The Green Team will continue to post regular 'greening' announcements in Dacite, the park's all employee electronic newsletter. However, the Team will begin to develop a list of climate change related Dacite entries to augment the current recycling and waste reduction messages normally posted.
- Include the science and impacts of climate change into park education tools.
  - The Interpretation and Resources Management Divisions will work with the Green Team to develop climate change outreach message/action goals for park staff.
- Incorporate sessions on climate change into new staff training.
  - Develop a climate change talking point's sheet for park staff (Resource Management staffs).
  - Begin training new and existing staff on minimizing the use of cleaning products and, in particular, disposable cleaning supplies (Maintenance Division staffs).
  - Incorporate climate change education into seasonal staff training (Interpretation Division staffs).
- Develop a brown bag series for park staff including concessioners, partners, and occasionally visitors to educate about current climate change science, the park's efforts, and what they can do.
  - Green Team will initiate brown bag lunch series of timely climate related topics.
- Create personal incentives for staff to reduce GHG emissions in park and at home.

- The Green Team will create and energy savings competition between office buildings.

- Disseminate information about climate friendly actions the park is taking at conferences, meetings, and regional workshops.
  - Continue to contribute to the Pacific West Regions Green Voice publications.

Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Lassen Volcanic National Park realizes that it has a unique opportunity to educate the public in a setting free from many of the distractions of daily life. By using existing materials, developing park-specific materials, highlighting what the park is currently doing about climate change, and encouraging visitors to reduce emissions, Lassen Volcanic National Park can play an important role in educating the public about climate change.

Lassen Volcanic National Park staff recognize the many different audiences that visit the park, including recreational and non-recreational park visitors, "virtual visitors" who visit the park online, 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:

- Educate visitors about climate change.
  - Interpretation Staff will work with the Upper Columbia Basin I&M Network to disseminate climate change information developed through the "Pikas in Peril" Project.
  - Resource Management and Interpretation staff will post links to park-specific climate change information on the park's website and work to expand and update that information annually.
  - The park Media Specialist will establish a link on the park's website to educate visitors about the park's 'no idling' policy. Link idling practices with potential impacts to air quality, scenic vistas, and climate change and discuss how a visitor's no idling efforts will benefit park resources and their visitor experience.
  - The Interpretation Division will obtain additional exhibits on climate change as the opportunities arise.
  - New exhibits scheduled for the Lassen Peak trail will incorporate climate change-related themes.

- Incorporate climate friendly information into interpreter programs and talks.
  - Integrate climate change themes into a certain percentage of interpretive programs. The Interpretation Division will set targets for this goal in 2011.
  - Incorporate climate change education components into all school programs.

- Educate visitors about their recycling options at the park and at home.
  - The Superintendent's Secretary is developing an interactive children's exhibit area for the KYVC which will focus on climate change and eco-friendly behaviors to adopt at home
  - The new Green Team Junior Ranger Program incorporates climate friendly activities, such as recycling, that can be done at home.
  - The Green Team will recruit youth interns to develop ideas about ways to communicate sustainability and climate change messages in 'fresh' ways to the park's diverse audiences.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Lassen Volcanic National Park 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. Potential actions include:

- Consider the local economy in procurement and other areas.
  - Increase the park's emphasis on purchasing from local manufacturers/vendors whenever possible.
- Plan a community event for Earth Day.
  - The Green Team will begin organizing an in-park Earth Day celebration and National Park Week celebration.

STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Lassen Volcanic National 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 actions, and revaluation of goals. As part of this strategy, Lassen Volcanic National Park 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

Lassen Volcanic National Park has a unique opportunity to serve as a model for over 350,000 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, Lassen Volcanic National Park will help mitigate climate change far beyond the park's boundaries.

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

[4] Lassen Volcanic National Park: Park Statistics. Available online at: http://www.nature.nps.gov/stats/viewReport.cfm

APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

Mike Lafkas, Water Treatment Operator
Nancy Nordensten, Biologist
Kara Roll, Superintendent's Secretary
Steve Zachary, Interpretive Specialist

With assistance from additional LVNP Green Team members:
Janet Coles, Plant Ecologist
Nathan Goodson, Maintenance Worker
David Harry, Facility Operations Specialist
Merita Kimball, Water Treatment Operations
Kim McCrary, Park Ranger (Protection)
Dan Ostmann, Fuels Crew Supervisor
Liz Roberts, Human Resources Officer