



CLIMATE *Friendly* PARKS

Pinnacles National Monument Action Plan

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PINNACLES NATIONAL MONUMENT BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Pinnacles National Monument 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, beginning the adaptation scenario planning process, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, Pinnacles National Monument provides a model for climate friendly behavior within the Park Service.

Pinnacles National Monument, as a member of the Pacific West Region, is involved in the first regional effort in the National Park Service 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 be a member of the Climate Friendly Parks Program by 2010.

This Action Plan identifies steps that Pinnacles National Monument can undertake to reduce greenhouse gas (GHG) emissions and adapt to current and future impacts of climate change. The plan presents the Park's emission reduction goals, and associated reduction actions and adaptation strategies to achieve the Park's goals. Strategies and action plan items were developed by working groups at the San Francisco Bay Area Network Climate Friendly Parks Workshop.¹ While the plan provides a framework needed to meet the Park's emission reduction and adaptation goals, it is not intended to provide detailed instructions on how to implement each of the proposed measures. The Park's Environmental Management System will describe priorities and details to implement these actions, integrating emission reduction strategies into regular park operations and activities.

Pinnacles National Monument aims to reduce park operations:

- Energy use emissions to 45 percent below 2007 levels by 2016.
- Transportation emissions to 35 percent below 2007 levels by 2016.
- Waste emissions to 40 percent below 2007 levels by 2016 through waste diversion and reduction.

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 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

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service and specifically to Pinnacles National Monument. 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 Pinnacles National Monument and are available upon request.

Air quality is a defining feature at Pinnacles National Monument and an important resource. Pinnacles National Monument is designated as a Class I Area under The Clean Air Act. It is federally mandated that the plants, animals, water quality, historic and cultural resources, visibility, and other resources must be protected from air pollution impacts.

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.

At Pinnacles National Monument, increasing temperatures, and changing precipitation patterns may alter park ecosystems, changing vegetation communities, habitats available for species, and the experience of park visitors. A relatively modest increase in temperature would affect precipitation, fire regime and organism habitats in the local ecosystems. Increasing temperature and changing precipitation patterns could potentially result in a shift of specific habitat to higher elevations, local flora and fauna with specific needs and limited mobility could be locally extirpated, resulting in a possible decline of species diversity.

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 PINNACLES NATIONAL MONUMENT

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 transportation and energy (e.g., boilers, 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). At Pinnacles National Monument, the main sources of energy for park operations are propane and purchased electricity.

In 2007, GHG emissions within Pinnacles National Monument totaled 540 metric tons of carbon dioxide equivalent (MTCO₂E). 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 12 MTCO₂ per year.³ Thus, the combined emissions from park and concessioner operations and visitor activities within the Park are roughly equivalent to the emissions from the energy use of 46 households each year.

The largest emission sector for Pinnacles National Monument is transportation, totaling 370 MTCO₂E (Fig 1 and Table 1). Visitor vehicles driving within park boundaries generate about 70 percent of the transportation emissions.

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

FIGURE 1

Pinnacles National Monument 2007 Total Greenhouse Gas Emissions by Sector

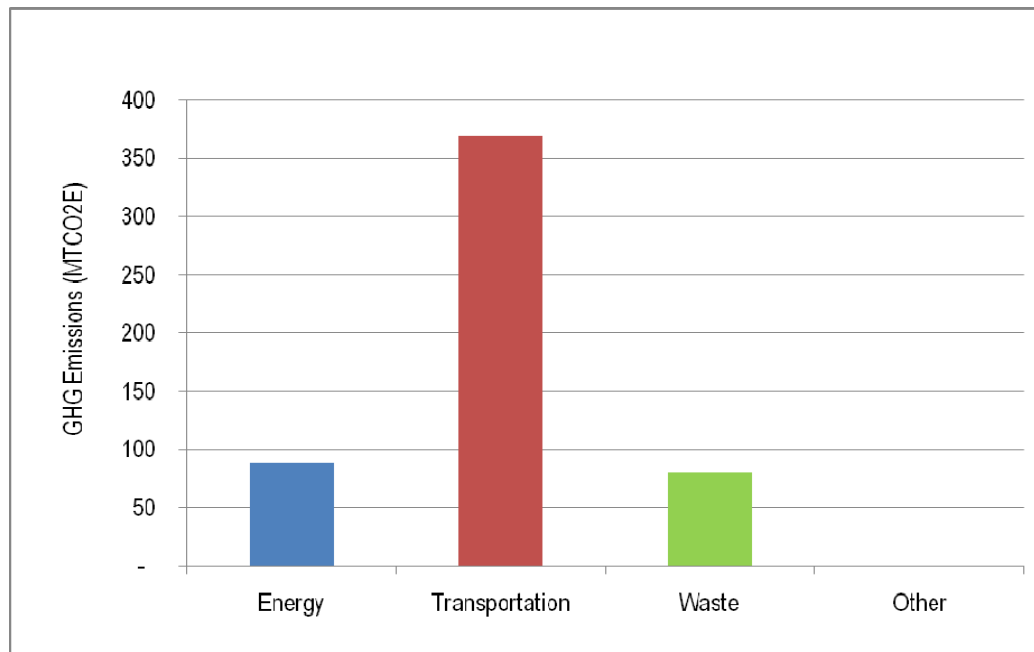


TABLE 1

Pinnacles National Monument 2007 Total Greenhouse Gas Emissions by Sector and Source

	MTCO2E
Energy	89
Stationary Combustion	34
Purchased Electricity	55
Transportation	370
Mobile Combustion	370
Waste	81
Landfilled Waste	81
Wastewater	-
Other	-
Total	540

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

FIGURE 2

Pinnacles National Monument 2007 Park Operations Emissions by Sector

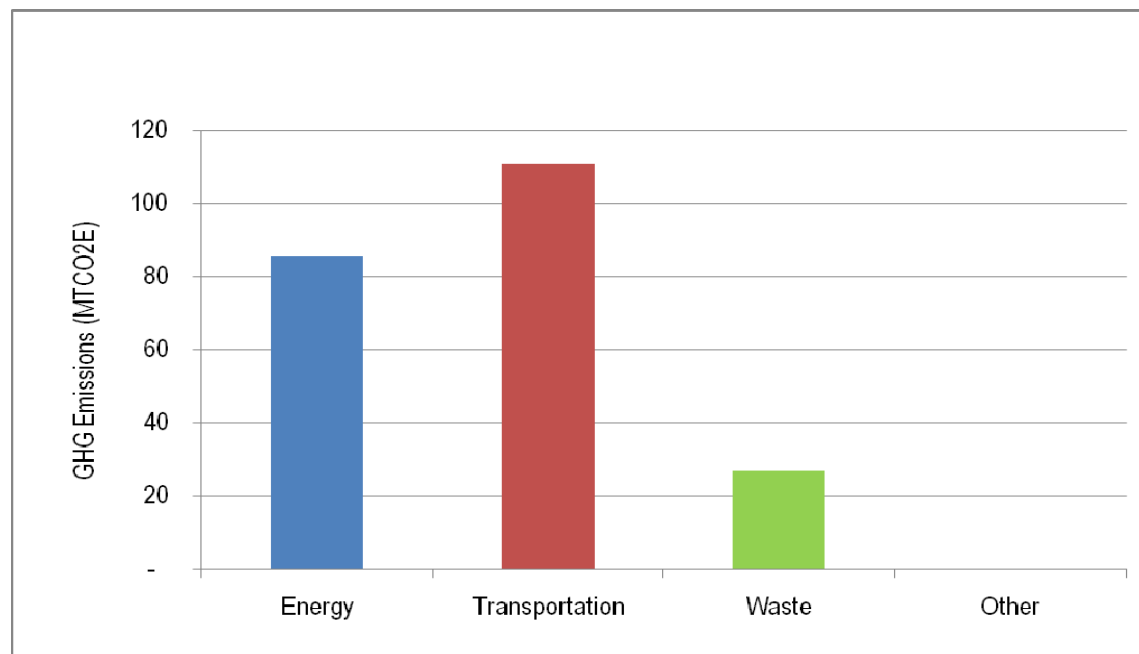


TABLE 2

Pinnacles National Monument 2007 Park Operations Emissions by Sector

	MTCO2E
Energy	86
Stationary Combustion	30
Purchased Electricity	55
Transportation	111
Mobile Combustion	111
Waste	27
Landfilled Waste	27
Wastewater	-
Other	-
Total	223

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

Pinnacles National Monument Responds to Climate Change

The following actions were developed during the CFP workshop hosted by San Francisco Maritime National Historical Park on October 27th and 28th, 2009, in order to meet the Park's climate change mitigation goals.

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

Pinnacles National Monument 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 Pinnacles National Monument 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 45 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. Emissions inventory results indicate that 39 percent of the Park's GHG emissions from Park Operations are from energy consumption. Consequently, Pinnacles National Monument 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

- Increased photovoltaic panels on park buildings, parking lots, and open areas.
 - Positioned panels to decrease building energy use by reducing solar heat gain.
 - Explored options for tying into the municipal grid for utility company buy-back.
- Set all computers' power management settings follow current ENERGY STAR recommendations.
 - Set computers to enter system standby or hibernation mode after 30 minutes of inactivity and monitors to enter sleep mode after 15 minutes of inactivity.
- Adjusted janitorial schedules.
 - Reduced energy used to keep buildings open later by conducting janitorial services earlier in the day.
- Incorporated energy efficiency criteria into new contracts for park and concessioner construction.
 - Requiring concessioners to replace refrigerators and freezers in store with energy efficient units and size appropriately.



- Replaced electrical wiring in visitor center and administrative building for best management of electrical use (server, lighting, etc.).
- Installed lighting controls.
 - Used motion sensors and made sure that a recommissioning schedule is in place to ensure appropriate use.
 - Installed photo sensors in housing units with interior and exterior controls.
 - Repaired existing controls and configured to maximum efficiency setting.
- Reviewed and implemented the DOI Sustainable Buildings Implementation Plan.

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.
 - Increase energy efficiency in all park buildings and housing by encouraging conservation and efficiency behaviors.
 - Identify “vampire energy users”.
 - Add conservation to closedown checkout process.
- Develop a mandatory energy-saving training program.
 - Instruct staff how to turn off equipment when it is not in use and enable energy-saving settings for computers and monitors.
 - Incorporate conservation into training and tailgate sessions.
 - Incorporate an energy performance reward system.
- Establish an Operations and Maintenance (O&M) schedule that evaluates energy use across the entire park.
 - Conduct an energy audit of all maintenance activities.
 - Plan projects and purchasing to reduce VMT, specifically the number of trips out of the monument.
- Adjust manual thermostats in park buildings.
 - Monitor manual thermostats and incorporate messaging in the Nature Center to remind staff to adjust for conservation.
- Incorporate alternative work schedules for operational efficiencies.
 - Adapt schedules for visitor center/entrance station.
 - Operate entrance station only during peak season weekends.
 - Utilize Maxiflex, 5/4/9 schedules, first 40, etc.

2 Upgrade lighting options

- Upgrade all light fixtures and bulbs in park to energy efficient bulbs.
 - Use high intensity discharge (HID) lamps and/or fluorescent lights (T-8's or T5's with electronic ballasts) in all fixtures used for more than 3 hours a day.
 - Replace incandescent light bulbs with Compact Fluorescent Light bulbs (CFLs) where appropriate.
- Increase day lighting with conventional glazing, light shelves, skylights, and clerestory windows.
 - Incorporate sky lighting in roof renovations at the Visitor Center and Store.
- Install energy efficient exit signs, street lighting, and traffic signals.
 - Install OSHA compliant glowing exit signs in buildings.

3 Improve building HVAC systems

- Replace heating and air conditioning units with more efficient HVAC technology.
- Develop HVAC maintenance schedule.
 - Implement HVAC inspection and maintenance schedule for coils, filters, dampers, and fans and maintenance schedule that ensures timely replacement and cleaning (recommended monthly).
- Recalibrate thermostats.
 - Regulate space temperature more accurately. In systems with pneumatic controls, the thermostats periodically require recalibration (typically, every 6 to 12 months) in order to regulate space temperature more accurately.
- Upgrade air distribution systems.
 - Convert air distribution systems from Constant Volume (CV) systems to Variable Air Volume (VAV) systems.
 - Install in Building14 for network server. Look at reconfiguration of telecom room and passive type of ventilation.

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.
 - Ensure that all new electronic/office equipment is ENERGY STAR qualified. Rather than purchasing individual copy, fax, print, and scanning equipment, consider a multi-function device.
- Default all computers to print double-sided.
- Install smart powerstrips.
- Purchase only energy efficient electronics.

- Refer to the Federal Energy Management Program guidelines for purchasing energy efficient appliances in accordance with federal procurement procedures.
- Replace park's existing boiler or furnace with an energy-efficient model.
- Install energy efficient water heaters.

5 Improve building structures and envelopes

- Weatherize park buildings by adding R-values to improve insulation effectiveness.
- Replace old windows with new windows.
 - Look for spectrally selective glass, double-glazed, low-e systems, gas filled windows, and electrochromic windows that provide better insulation and solar selectivity.
- Add window films.
 - Install window films where applicable. Window films can be retrofitted to existing windows to reduce heat gain due to solar radiation and provide a low-cost cooling load reduction.
- Install window shading.
 - Implement window shading to reduce the solar heating load imposed by windows.
- Evaluate building roofs and replace existing roofs with a "cool roof" made of highly reflective material.
 - Incorporate a reflective, cool roof material for future renovation projects at the Visitor Center and Store.

6 Utilize alternative energy sources

- Install solar thermal hot water heaters.

7 Measure energy use throughout the Park

- Conduct an energy audit for all park buildings.
 - Partner with local utilities to conduct the audit.
 - As part of energy audit, have recommendations made for appropriate lighting solutions for each space.
- Install building-level utility meters in existing buildings and in new major construction and renovation projects to track and continuously optimize performance.
 - Transfer all metered building data directly in web-based system and drop data directly in ENERGY STAR Portfolio Manager and Visible Energy.
- Review and implement the DOI Sustainable Buildings Implementation Plan.

8 Other

- Partner with local universities on energy efficiency studies and building audits.

- Leverage local resources beyond utility companies.
- Review and modify concessionaire contractual language to include sustainable practice requirements where needed.
 - Promote use of low energy lighting, such as LED lighting installed at comfort stations with motion sensors.
- Install energy meters to measure energy use and monitor big consumers.
- Network printers and other office equipment.
- Configure work station and exhibit lighting to maximize efficiency.
 - Optimize task lighting. Relocate desks to utilize natural day light and/or existing lighting fixture locations.
 - Consider LED lighting for visitor exhibits versus full room lighting.
- Install clothes lines for residential areas.
- Upgrade water treatment and distribution systems.
 - Implement phase II of campground water distribution system to eliminate multiple pumping stations.

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 Pinnacles National Monument's emissions. As the inventory results indicate, GHG emissions from transportation comprise 50 percent of park operations emissions and 69 percent of the Park's overall emissions (including visitors, and concessioners). Accordingly, in addition to the park operations emissions reduction goal, Pinnacles National Monument set a goal to reduce overall transportation emissions by 20 percent below 2007 levels by 2016. 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

- Currently using an alternative fuel vehicle (AFV), an electric vehicle for transporting park employees.
- Developed and continuously maintain a fleet maintenance schedule.
 - Continue to keep vehicles in top mechanical condition: rotate tires every 5,000-miles, check tire pressure, don't top off tank, and get regular tune-ups.



Transportation Management – Planned Actions

1 Transportation-related behavioral change

- Reduce visitor vehicle idling.
 - Post signs and information with park idling rules.
- Encourage staff carpooling.
 - Develop carpooling information and support services for staff.
- Reduce staff idling.
 - Prohibit staff vehicle idling unless required for vehicle maintenance.
 - Create dashboard idling guidelines and post in vehicles.
- Encourage employees to bike to work. .
 - Establish bike rack/parking areas/infrastructure at all major park locations.
- Establish an alternative fuel employee shuttle system.
 - Consider alternative fuel vehicles GSA can supply, such as shuttles powered by natural gas.
 - Encourage the use alternative modes of staff transport e.g. bicycles.
- Reduce meeting travel.
- Use webinars/conference calls to avoid excessive travel, both within and outside of the Park.
 - Purchase necessary equipment for teleconferencing and videoconferencing.

2 Reduce fuel consumed by visitor vehicles

- Provide alternative modes of visitor travel.
 - Increase the use of alternative fuel buses to areas of heavy use and traffic, i.e. popular destinations in the Park.
- Incentivize visitor use of high efficiency and AFVs and hybrids.
 - Recognize those who are driving high efficiency (>40 mpg) or AFVs with “climate friendly visitor” bumper stickers.
- Promote accessible, front country trails for alternative means of travel including hiking, biking, and walking.
 - Expand user-friendly trail network to allow visitors to enjoy the scenic sights of the Park outside their vehicles.
 - Explore potential for bike lanes.
- Encourage visitors to carpool and provide carpool parking areas

- Encourage campers to utilize shuttle buses from campground versus driving to trailheads.
- Improve tracking of visitor transit data.
 - Explore opportunities to collect data on visitor transportation patterns, vehicle occupancy, and ridership.

3 Reduce NPS vehicle and equipment fuel consumption

- Exceed federal fleet performance requirements set by Energy Policy Act (EPA), Executive Order 13423, and the Energy Independence and Security Act (EISA).
- Analyze fleet fuel-consumption patterns for efficiency improvements.
 - Use FAST to track fuel use and analyze fleet needs with efficiency improvements.
- Promote efficient driving.
 - Conduct driver training that emphasizes fuel efficiency and trip planning.
 - Eliminate redundant travel.
- Convert from diesel to biodiesel park-wide.
 - Run cars, trucks, non-road equipment on biodiesel. Use B20 biodiesel (20% biodiesel) in diesel fuel applications, and if possible move up to using B50 biodiesel (50%) and B100 biodiesel (100%).
- Identify areas to reduce or eliminate mowing.
 - Incorporate xeriscaping and increase the use of native vegetation throughout landscaped areas.
- Replace two-stroke engines.
 - Look for opportunities to substitute two-stroke with more efficient four-stroke engines; including the remaining lawnmower and generator.

4 Replace NPS vehicles and equipment

- Increase average fleet miles per gallon (mpg).
 - Benchmark existing fleet-wide mile per gallon average and raise the average through vehicle replacement to exceed California's fuel economy standards.
 - Conduct a fleet management study and implement recommendations.
- Right size the vehicle fleet by the number and type.
 - Use a Vehicle Allocation Methodology (VAM) to achieve a fleet that is the right size and type.
- Develop a vehicle replacement plan.
 - Evaluate AFV options: Hybrid electric vehicles (HEVs), electric vehicles, compressed natural gas (CNG), and biodiesel.
 - As older vehicles come up for replacement, order AFVs.

- Incorporate alternative fuel guidelines into fleet specifications.
 - Work with GSA to catalogue available AFVs and set minimum AFV goals.
- Replace 4-wheel with 2-wheel drive vehicles.
 - Evaluate the need for 4-wheel drive vehicles and replace with 2-wheel drive vehicles on appropriate replacement schedule.
- Use biodiesel in diesel fuel vehicles.
 - Select a biodiesel blend that can substitute 100% diesel.
- Use AFVs in demonstration projects.
 - Acquire a showcase vehicle to demonstrate park alternative fuel efforts. This vehicle should be highly visible to visitors, for example: Fee Collection, Operations, Maintenance, Condor Programs, etc.

5 Vehicle maintenance

- Use biobased lubricants and greases.
 - Move to biobased lubricants in Bobcat, and other equipment.
- Operate all fleet vehicles using re-refined engine oil.
 - Use re-refined oil with a minimum 25% post consumer content.
- Retread Tires.
 - Purchase retreads on park-owned vehicles. When leasing a vehicle, work with GSA to get retreads.

6 Transportation infrastructure

- Improve parking lot designs to incorporate local vegetation.
 - Plant trees and local grasses/shrubs in unused parking lots to sequester carbon.
 - Focus on campground areas.
- Use reclaimed materials for new roads and paving.
 - Designs should maximize permeable area and minimize runoff. Reuse on-site materials. Use pervious paving. Use low VOC, water-based road striping paint. Pulverize existing pavement for aggregate base, cold in-place recycling of existing pavement, use hot mix asphalt with recycled content (asphalt, glass, rubber tires). Specify road base aggregate from recycled concrete, asphalt, and brick.

7 Other

- Encourage staff to use alternative modes of transportation.
 - Make it easier for staff to use alternative modes of staff transport, e.g. bicycle.
- Reduce equipment use.

- Use brooms to sweep leaves rather than leaf blowers.

Waste Management

Emission Reduction Goal: Reduce park operations waste emissions to 40 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. Waste from Pinnacles National Monument facilities is transported to a landfill roughly 35 miles away on a regular basis for eastside Park Operations, and westside park operations waste is compacted and transported to the landfill once every 6 months. 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.

Pinnacles National Monument's park operation activities emitted 27 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.

Progress to Date

- Engaged staff to reduce and manage waste at work.
 - Encouraged park staff to be responsible at work by making it easy to recycle and compost waste. Made sure containers fit environment (e.g., animal-proof, rust-proof/salt air -resistant/moisture resistant, and proper size).
 - Made ceramic plates, bowls, mugs, and silverware available for employee use in lieu of disposable products.
 - Instituted paperless office practices. Established standards for double-sided printing and copying, office supply reuse, electronic correspondence procedures, electronic file storage, elimination of colored paper, etc.
 - Reviewed packaging needs when purchasing, printing, and reduce office waste in general.
- Trained maintenance staff on waste reduction initiatives.
 - Continually inform maintenance crews about recycling and composting policies at the Park; conduct periodic trainings.
- Enforced Construction Waste Management/Plan and job site recycling.
 - Required that construction contractors reuse or recycle materials used during building renovations and new site construction/remodeling projects.
- Continuously manage solid waste with an Integrated Solid Waste Alternatives Plan (ISWAP).
 - Incorporated the investigation of large scale composting opportunities into the ISWAP.
- Communicated park waste management policies (ISWAP) to staff and concessionaires.
- Included information on park sustainability, green procurement, and recycling policies in new employee orientations.

- Created a materials exchange program.
- Installed easy-to-use recycling containers throughout park facilities.
 - Purchased containers with recycled content. Placed trash and recycling containers next to each other.
 - Evaluated signage; added graphics.
- Recycled or donated used computers and electronics.
 - Donated old equipment to schools, senior centers, and community centers. Recycled unusable computers and electronics. Continually practice cradle-to-grave recycling to ensure toxic components are properly managed.
- Sent used florescent bulbs to reclaim/recycle service center.
- Evaluated current purchases and reduced redundant products.
- Coordinated procurement practices so that surplus materials in one unit may be used by another unit.
 - Repurposed rather than discarded surplus materials.
 - Established an exchange process so different departments can source surplus materials internally.
- Developed a schedule for replacing existing materials.
 - Replaced equipment with recycled equipment or new equipment that will enhance reuse and recycling, (e.g., copiers that can make two-sided copies).
 - Continuously consider environmental impacts across each product's entire life cycle.
- Used post-consumer recycled paper in all park publications.
 - Used 100% post-consumer (PC) content, processed chlorine-free (PCF) copy paper. Considered alternative fibers (i.e., non-wood) and water-based or vegetable-based ink. Targeted paper reduction.
- Reduced amount of packaging used in products sold and used in the Park.
 - Let vendors know the Park's packaging preferences.
- Used low/no-VOC insulation, carpets, paints, and adhesives.
- Used carpet with high recycled-content for any building projects.
- Inventoried and substituted all cleaning supplies with non-toxic products.
 - Conducted an inventory and review of all cleaning supplies. Substituted products containing hazardous/toxic chemicals with non-toxic products.
 - Looked for Green Seal Certified products and other green attributes when procuring cleaning and maintenance equipment.
- Promoted the use of recycled content products and materials procurement within the NPS.
- Managed non-point source wastewater.

- Continuously prevent pollution and use green products, keeping storm drains clean, and cleaning up spills (but do not hose into streets).
- Disposed of pesticides and tank rinsate (the solution remaining after rinsing the tank) properly. Checked state and local requirements.

Waste Management – Planned Actions

1 Decrease waste through behavioral change

- Train park staff and contractors on waste reduction responsibilities.
 - Ensure that staff and contractors are aware of their roles and responsibilities to reduce waste. Conduct periodic trainings to inform maintenance crews about recycling and composting policies at the Park.
 - Require an annual training on waste reduction and green procurement.
 - Make reusable and recyclable materials available for staff to use (e.g. plates, cups, silverware, etc.).
 - Integrate metrics on waste reduction responsibilities into performance evaluations.
- Train custodial staff in most efficient use of cleaning products.
 - Incorporate green janitorial supplies and products.

2 Establish new plans and policies that promote waste reduction.

- Incorporate waste reduction into green office practices.
 - Reduce purchases where possible and avoid duplicate purchases.
 - Purchase comprehensive procurement guidelines (CPG) office supplies with maximum recycled content; avoid polyvinyl chloride (PVC) supplies.
 - Purchase durable, reusable supplies, always print double sided, reuse office supplies when possible.
- Reduce waste generated at meetings and employee functions.
 - Establish guidelines for waste minimization: use durable, reusable utensils and mugs, buy in bulk, use items with reduced packaging, and provide recycling receptacles.
- Reduce purchasing through reuse.
 - Specify materials recovery (reuse and recycling of materials and components) in both building-removal bidding and in property-redevelopment process.
- Measure baseline solid waste generation (tons).
 - Record waste management data in an EMS or a spreadsheet tracking system.
- Measure, track, and report waste stream data (include landfill waste and recycled waste) to monitor reductions and success in diverting waste from the landfill.

- Record waste management data in an EMS or a spreadsheet tracking system.
- Manage solid waste with an ISWAP.
- Incorporate the investigation of large scale composting opportunities into the ISWAP.
- Choose hand dryers over paper towels.
 - Install energy efficient hand dryers throughout park facilities where practical.

3 Implement recycling and composting practices

- Continually increase the amount of waste material that can be recycled.
 - Recycle cardboard, aluminum, scrap metal, glass, white paper, and no. 1 PET and 2 HDPE plastics.
 - Add mixed paper, tin, other plastics (including film), and pallets.
 - Find reuse opportunity or donate unwanted items. Look into cooperative waste disposal or recycling to increase volume and reduce costs/traffic.
- Partner with vendors to reuse and recycle park waste.
 - Choose non-rigid recycled-content or compostable food packaging. Engage with vendors to take-back e-waste. Pursue trade-in when replacing. Return pallets and packaging.
- Start a comprehensive recycling outreach campaign aimed at park visitors.
 - Include waste prevention/recycling messages in park talks.
 - Provide recycling messages in brochures, trail guides, maps, and posters.
 - Use recycling messaging at waysides, campground display boards, and kiosks.
- Appoint a permanent employee as the Climate Friendly Coordinator for Pinnacles National Monument.
 - Primary responsibility of the Park recycling leader/manager will be to assess and continually improve the Park's recycling activities.
- Implement a Construction Waste Management/Plan and Job Site Recycling Policy.
 - Require a Construction Waste Management or Recycling Plan; track quantities of recyclables.
 - Make sure contract language addresses waste plan/recycling. Check on "take-back" policies (e.g., ceiling tiles, cardboard, carpet, and drywall).
 - Reuse construction waste on-site, reuse elsewhere, or sell for recycling materials of value including lumber/wood, drywall, metal, rubble, cardboard, fixtures, hardware, and wiring.
 - Require drywall contractors to recycle waste.
 - Work with haulers to prevent contamination of waste sorting. Ensure no illegal dumping occurs off job site.
- Practice Environmentally Responsible Deconstruction.

- Old building materials will be reduced, reused, and salvaged, in that order.
- Inefficient materials or components will not be salvaged; ensure that the reuse of vintage items represents an environmental gain.
- Use recycled oil and recycled coolant and other fluids.
- Recycle old asphalt pavement for use in ongoing road projects.
- Retread tires when replacing tires.
 - Purchase retreads on park-owned vehicles. When leasing a vehicle, work with GSA to get retreads.
- Institute alkaline, lithium battery recycling locations in every office building.

4 Reduce waste through green procurement

- Work with contractors to practice green procurement practices.
 - Incorporate environmental considerations into all aspects of a solicitation package: construction waste recycling, sustainable products, and energy/water efficiency standards. Specify green products in specs. Require all bid documents to be printed on double-sided, recycled-content paper.
- Purchase locally-produced products and materials whenever possible.
 - Work with concessionaires and procurement departments to find local vendors and food producers.
- Train staff on green procurement practices.
 - Encourage procurement staff to take Office of the Federal Environmental Executive's (OFEE) online green purchasing training.
- Adhere to Federal, NPS, and PWR Guidance for Procurement.
- Develop a Green Procurement Plan.
- Implement petroleum product substitution program.
- Increase the use of biobased products.
 - Audit the biobased products in use and look for opportunities to incorporate new products.
- Continually increase the recycled content of purchased materials.
 - Focus on office supplies, gift shop concessionaires, building supplies, furniture and maintenance equipment: hoses, mulch, edging, timbers, posts, and compost with recycled content.
- Develop an e-catalogue of local suppliers of sustainable products for park purchases.
 - Develop a preferred list of green and locally sourced products for purchase card holders and provide the list to park employees.
 - Include web links to Pacific West Region and Washington Office Green Procurement information.

- Locate e-catalogue on intrapark shared drive in the same location as requisition logs.
- The catalogue of green products should include information on the amount of recycled content and other environmental attributes.
- Adapt a list of pre-purchase questions for the Park.
 - Is it really needed? Can the existing item be fixed? Can it be donated? Are renewable resources used in its production? Is it compostable? Biobased? Durable/reusable? Is it non-toxic? Does it have simple maintenance? Is it recyclable? Is it made from recycled content? Is it a CPG item? Is the product produced and sold locally?
- Manage waste associated with Computers and FAX/Printers.
 - Purchase remanufactured toner cartridges.
 - Purchase liquid crystal display (LCD) monitors instead of cathode ray tube (CRT), which use less toxic substances.
 - Reduce the printer-to-employee ratio by maximizing shared network printers.

5 Reduce and reuse wastewater

- Install low-flow faucets.
- Replace toilets with low-flow models.
 - Install water efficient technology, e.g. composting toilets and waterless urinals.
 - Look at installing composting toilets at park comfort stations.
- Conserve water used in Grounds Maintenance.
 - Use drought-tolerant grass and native plantings.
 - Mow less grass and grasscycle (leave mowed clippings in place to fertilize).
 - Do not overwater.
 - Avoid watering during the hottest time of day and do not use fine spray sprinklers. Maximize permeability of surfaces to allow site to absorb water.
- Monitor and reduce point source wastewater.
 - Inventory maintenance wastewater sources and discharge routes.
- Reduce storm and groundwater runoff.
 - Lay out surface parking lots to allow for sheet-like drainage to infiltration and bioremediation strips/swales - minimize changes to topography.
 - Use permeable paving where possible.
 - Conduct a stormwater analysis/plan and quantify pollutants. Revegetate areas to capture run-off and sedimentation to existing creeks.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. Pinnacles National Monument 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. Pinnacles National Monument 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 Pinnacles National Monument takes to address climate change serve as opportunities for increasing the public's awareness of climate change. 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

- Integrated the science and impacts of climate change into park education tools.
 - Incorporated sessions on climate change into seasonal staff training.
 - Tailored seasonal staff handbook to include Climate Friendly Parks information.
 - Included Climate Friendly Parks language in kiosks and other educational materials.
- Created demonstration projects and exhibits to convey park sustainability message to visitors.
- Disseminated information about climate friendly actions the Park is taking at conferences and regional workshops.
- Connected with community and park partners on Climate Friendly Park efforts.
 - Built relationships with park concessionaires, Friends Groups, local environmental groups, representatives from the local tourism/community business board, representatives from the state environment/energy departments, teachers, representatives from the regional transportation authority, and local university partners.
- Currently displaying a climate change exhibit in the Pinnacles Visitor Center.
- Listed recyclable materials on receptacle bins and posted recycling information on the Park's website.
- Created distance learning events for multiple educational topics for schools and others to participate in without having to travel to Pinnacles National Monument to appreciate and understand park significance.

Park Staff

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

Developing a climate change education program for the Park's 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, Pinnacles National Monument 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. The Park has developed a number of actions to raise awareness among staff. These actions include:

- Create a park Climate Change Policy Memorandum specific to Pinnacles National Monument.



- Hold internal Climate Friendly Park discussions and workshops.
 - Devise new strategies to continually reduce greenhouse gas (GHG) emissions.
 - Distribute resources and tools to staff, and acknowledge success of current strategies, including giving awards to climate leaders.
- Keep staff members that are part of the Green Team/Environmental Management Team informed about climate-related issues.
 - Use materials, publications, and tools available from the U.S. Environmental Protection Agency (EPA) and other agencies and organizations to mentor fellow staff about climate change.
- Develop intranet pages to inform staff about climate friendly actions.
 - Use internal information technology to encourage staff to achieve GHG emissions reductions at work, and advise them on new ways to reduce personal emissions.
- Incorporate climate change issues into the employee handbook.
 - Include climate materials in employee orientation packets.
- Incorporate sessions on climate change into new staff training.
 - Focus on climate change issues into our Spring RRM and interpretation training.
- 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.
 - Hold periodic, informal talks on topics related to climate change: e.g. energy technology, green design, sequestration, etc.
- Create visual reminders for park employees with climate change information and tips on how employees can help reduce emissions.
- Create personal incentives for staff to reduce GHG emissions in park and at home.
- Develop and leverage relationship with other agencies and entities to create opportunities for workshops on climate friendly activities.
- Disseminate information about climate friendly actions the Park is taking at conferences, meetings, and regional workshops.

Visitor Outreach

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



Pinnacles National Monument 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 actions to reach these various audiences effectively. These actions include:

- Educate visitors about climate change.
 - Link climate change and preservation with actions like using mass transit and alternative forms of transportation.
- Create and distribute previously produced information on climate change and its effects on national parks in general and on Pinnacles National Monument in particular.
 - Continue distribution of the service-wide climate change brochure.
- Integrate climate change themes into interpretive programs.
 - Integrate Climate Friendly Parks program with school programs using educational kits, wayside exhibits, posters, etc.
- Create signs promoting the Park’s efforts to curb emissions.
 - Develop consistent messaging for recycling, idling, and emission reduction posters.
- Host distance learning events on climate change.
- Incorporate climate change information into existing park brochures.
 - Create/utilize bilingual brochures that talk about the success of the CFP program in terms of resource and economic savings where appropriate. Include information and illustrations on Do Your Part!
- Incorporate climate friendly information into interpreter programs and talks.
 - Recycling and shuttle use are currently mainstays of numerous interpretive programs.
- Educate visitors about their recycling options at the Park and at home.
 - Create visitor ads about the Park’s recycling activities
- Communicate with local communities, park visitors, and local media about actions they can take to reduce GHG emissions.
 - Encourage internal and external stakeholders to reduce their carbon footprints using tools like Do Your Part!
- Develop and distribute Do Your Part! materials.
- Develop a Do Your Part kiosk in the visitor’s center.
- Develop a “Do Your Part” program for online visitors.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Pinnacles National Monument 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:

- Communicate with local community groups, park visitors, and local media about actions they can take to reduce GHG emissions.
 - Encourage internal and external stakeholders to reduce their carbon footprints using tools like Do Your Part!
- Consider the local economy in procurement and other areas.
- Include community members in climate change discussions.
- Host climate change education workshops.
 - Focus presentations on climate change priorities and talk about success stories.
- Educate local community about what the Park is doing to manage waste.
- Plan a community event for Earth Day.
- Set up a Do Your Part! table at local events.

STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Pinnacles National Monument 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, Pinnacles National Monument 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

Pinnacles National Monument has a unique opportunity to serve as a model for over 150,000 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, Pinnacles National Monument 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, Pinnacles National Monument will reduce its contribution to the problem while setting an example for its visitors. The strategies presented in this Action Plan present an aggressive first step towards moving Pinnacles National Monument to the forefront of Climate Friendly Parks.

⁴ Pinnacles National Monument: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>

APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

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