



CLIMATE *Friendly* PARKS

# Joshua Tree National Park Action Plan

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# JOSHUA TREE NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

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

Joshua Tree National Park, as a member of the Pacific West Region, is involved in the first regional effort in the National Park Service (NPS) to become carbon neutral. The Region has developed a vision of having its Park operations be carbon neutral and established a goal of having all of its parks become a member of the Climate Friendly Parks Program by 2010.

This Action Plan identifies steps that Joshua Tree National Park can undertake to reduce Greenhouse Gas (GHG) emissions and mitigate its impact on climate change. The plan presents the Park's emission reduction goals, and associated reduction actions to achieve the Park's goals. Strategies and action plan items were developed by working groups at the Mojave Desert and Mediterranean Coast Climate Friendly Parks Workshop. While the plan provides a framework needed to meet the Park's emission reduction goals, it is not intended to provide detailed instructions on how to implement each of the proposed measures. Climate Friendly Parks Green Team will work closely with the Environmental Management System (EMS) Team to implement and monitor the actions identified in this plan. The Park's EMS Team will document progress.

Joshua Tree National Park aims to:

*Reduce energy use GHG emissions to 50% below 2008 levels by 2016.*

*Reduce Park operation transportation-related emissions to 20% below 2008 levels by 2016, and overall transportation emissions including visitor vehicle emissions to 5% below 2008 levels by 2016.*

*Reduce waste-related emissions to 10% below 2008 levels by 2016.*

*Continue to work with Park staff, visitors, and the community to effectively reach out to a wide audience about climate change and about reducing resources use.*

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 Joshua Tree 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 19<sup>th</sup> century, and the 10 warmest years of the 20<sup>th</sup> 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<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O)—which trap heat that otherwise would be released into space.

The continued addition of CO<sub>2</sub> 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.<sup>1</sup> 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 Joshua Tree National Park, increasing temperatures and changing precipitation patterns will alter Park ecosystems, changing vegetation communities, habitats available for species, and the experience of Park visitors. Ecological models indicate that Joshua trees could be lost from the Park in the future. Staff is working with researchers to determine the level of impacts to and to understand effects on the Park. Recent research topics include impacts to reptiles and plants.

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<sup>1</sup> 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 JOSHUA TREE NATIONAL PARK

Naturally occurring GHGs include CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, 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).

In 2008, GHG emissions within Joshua Tree National Park totaled 6,507 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E). This includes emissions from Park and visitor activities, including vehicle use within the Park. For perspective, a typical single family home in the U.S. produces approximately 12 MTCO<sub>2</sub> per year.<sup>2</sup> Thus, the combined emissions from Park operations and visitor activities within the Park are roughly equivalent to the emissions from the energy use of 553 households each year.

The largest emission sector for Joshua Tree National Park is transportation, totaling 6,198 MTCO<sub>2</sub>E (Fig 1 and Table 1). A large percentage of the transportation, 94 percent, is from private vehicle use. This private transportation alone accounts for 89 percent of the total Park emissions. Joshua Tree National Park roads are oriented from west to south and from north to south. This is the route that a large percentage of visitors also travel – on a one-way route which includes, at the greatest length, 50 miles from the West Entrance to the southern Cottonwood Entrance.

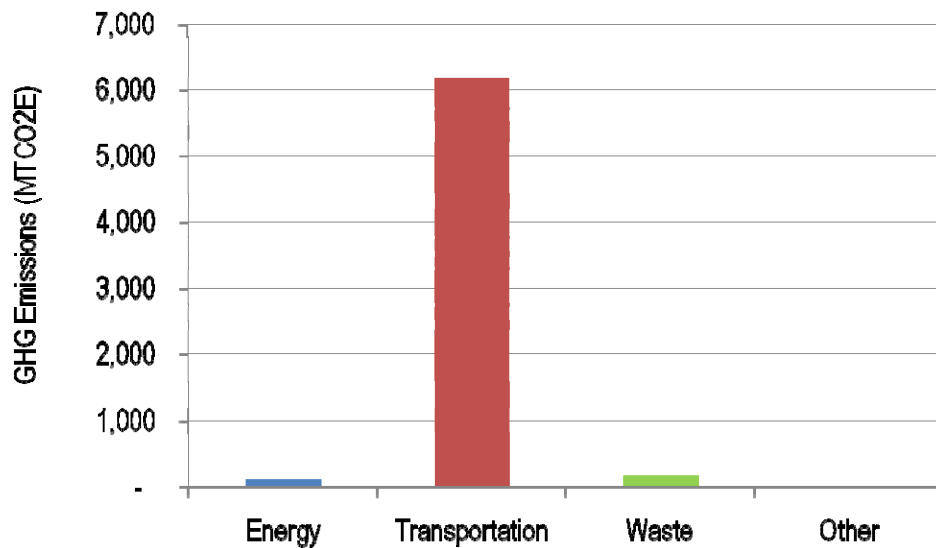
Moreover, Park staff is primarily based out of Twentynine Palms, near the North Entrance. Work in the Park involves transporting personnel and/or equipment substantial distances throughout the Park (e.g., trash/recycling, law enforcement, interpretation programs, campground services).

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<sup>2</sup> U.S. EPA, Greenhouse Gases Equivalencies Calculators – Calculations and References, Retrieved , Website: <http://www.epa.gov/RDEE/energy-resources/calculator.html>

## FIGURE 1

*Joshua Tree National Park 2008 Total Greenhouse Gas Emissions by Sector*



## TABLE 1

*Joshua Tree National Park 2008 Total Greenhouse Gas Emissions by Sector and Source*

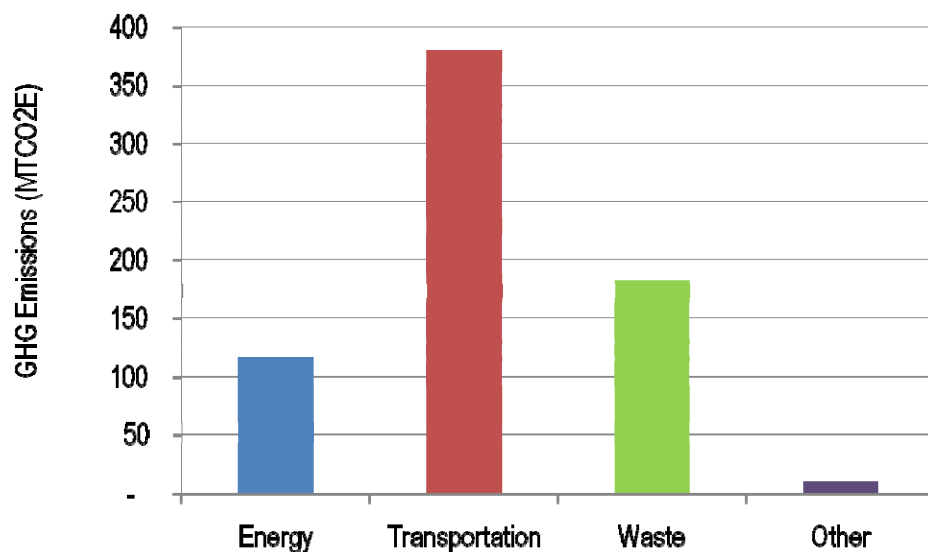
	MTCO2E
<b>Energy</b>	<b>116</b>
Stationary Combustion	59
Purchased Electricity	57
<b>Transportation</b>	<b>6,198</b>
Mobile Combustion	6,198
<b>Waste</b>	<b>182</b>
Landfilled Waste	182
Wastewater	-
<b>Other</b>	<b>11</b>
Refrigeration and Air Conditioning	11
<b>Total</b>	<b>6,507</b>

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

## FIGURE 2

### *Joshua Tree National Park 2008 Park Operations Emissions by Sector*



## TABLE 2

### *Joshua Tree National Park 2008 Park Operations Emissions by Sector*

	MTCO2E
<b>Energy</b>	<b>116</b>
Stationary Combustion	59
Purchased Electricity	57
<b>Transportation</b>	<b>380</b>
Mobile Combustion	380
<b>Waste</b>	<b>182</b>
Landfilled Waste	182
Wastewater	-
<b>Other</b>	<b>11</b>
Refrigeration and Air Conditioning	11
<b>Total</b>	<b>689</b>

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

# Joshua Tree National Park Responds to Climate Change

*The following actions were developed during the Mojave Desert and Mediterranean Coast Climate Friendly Parks Workshop on December 1-2, 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

Joshua Tree National Park has developed a set of actions to implement 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 Joshua Tree 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 Park operations' energy use emissions to 50 percent below 2008 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 17 percent of the Park's GHG emissions from Park operations are from energy consumption. Consequently, Joshua Tree National Park identified actions it will take to reduce energy-related emissions (assuming staffing levels are similar to those of 2008). Presented below are the actions that are currently under way and which comprise the Park's progress to date, and future actions the Park will pursue.

Like other parts of California, Joshua Tree National Park experiences poor air quality and is threatened with power shortages and increasing costs for electricity. But unlike much of the rest of the state, Joshua Tree National Park began relying on alternative energy sources before the situation became a crisis and costs skyrocketed. The Park replaced fossil-fuel generators in the 1990s with stand-alone photovoltaic (PV) systems to harness the abundant solar energy available in the desert. The Park has continued to reduce its carbon footprint and our energy costs by installing grid-tied PV systems that produce clean electrical power. Joshua Tree National Park has become the "flagship" for renewable energy generation throughout federal land management agencies.

### Progress to Date

- Joshua Tree National Park has 12 stand-alone photovoltaic systems that are not connected to the power grid.
  - Cottonwood Maintenance Yard—This 20-kilowatt (kW) system provides power to a visitor center, two restrooms, three offices, five NPS residences, and a maintenance shop. A contract to upgrade this system was completed in 2009.
  - Campground Amphitheaters—4-kW systems at Indian Cove, Jumbo Rocks, and Cottonwood campground amphitheaters provide power for building lighting, audio-visual equipment, electric overhead door openers, and walkway lighting.
  - Lost Horse Complex—A 5-kW system generates power for a ranger station and residence, and runs two evaporative coolers (swamp coolers).
  - Cottonwood Well—An 8-kW system powers a three-phase, 5 horsepower submersible pump, to bring water to the Cottonwood area.
  - Cottonwood Lift Station—A 4-kW photovoltaic system works behind the scenes to operate a single phase 2-horsepower submersible pump.

- Air Quality and Seismic monitoring stations—Solar energy powers five monitoring stations around the Park, including a 4-kW air-quality monitoring station in Cottonwood Canyon.
- Currently Joshua Tree National Park has two grid-tied PV systems generating electricity. During Fiscal Year (FY) 2009, the 64-kW system at the Park headquarters generated about 94,827 kW-hours of electricity, and the 2.5-kW system at the North Entrance station generated about 3,593 kW-hours of electricity. The electricity from these two installations is released back into the power grid, providing electricity credits to the Park for a savings of approximately \$20,000 per year. In the past, the Park has had problems with the headquarters solar panels delaminating in the extreme, desert heat. Joshua Tree National Park developed a relationship with the manufacturer of the panels, Sanyo Corporation. Sanyo installed a “test bank” comprised of a variety of experimental, newer-technology, high-temperature panels at Park headquarters. The performance of these panels was monitored remotely by Sanyo engineers in Japan. This research and development project has led to the production of new panels that are suitable for extreme desert environments. In March, 2009 Sanyo replaced all 382 panels on the headquarters system with their newest high-temperature product at no cost to the Park. Sanyo continues to test the latest innovations in extreme-environment PV technology at Joshua Tree National Park. As a result, the Park continues to reap the benefits of the electricity generated from the test-bank grid-tied research and development system.
- A 7-kW photovoltaic system was installed at the Black Rock maintenance office in fall, 2008. It is expected to come on-line in Fiscal Year 2010 when the net metering agreement has been confirmed by Southern California Edison. A 14.4-kW grid-tied PV system was also installed on the new resources building at Park headquarters. Both systems are expected to be generating electricity as soon as the utility agreements are signed by the WASO contracting office.
- In 2005, NPS Maintenance staff replaced and retrofitted 139 lighting fixtures at 15 locations Park-wide, including 74 new fluorescent light fixtures, 12 solar motion sensor lights, and 9 low-voltage walkway lights. Forty-four electronic ballasts were replaced and 214 fluorescent T8 bulbs were replaced and recycled. In 2008, the Park participated in the Federal Direct Install Initiative, a community partnership program with Southern California Edison. Through this effort, 562 lighting fixtures Park-wide were replaced, for a net savings of 65,840 kW/h. In 2009, NPS staff replaced an additional 300 incandescent bulbs with compact fluorescent light bulbs on interior and exterior fixtures. They also installed 122 exterior “night sky friendly” fixtures at over 30 locations Park-wide.
- Two old refrigerators were replaced with Energy Star compliant appliances at the end of FY 2009.
- In 2008, high efficiency heating, ventilation and air conditioning (HVAC) units were installed at the West Entrance station, and Pinto Wye Maintenance offices. In 2009, high efficiency HVAC units were installed in the Black Rock Bureau of Land Management office, and a computer server closet at Park headquarters. In addition, two condensers were replaced at the headquarters Protection building. All HVAC units at Park headquarters have been replaced in the last five years except those in a temporary office trailer.

## Energy Use Management – Planned Actions

### 1 Promote energy efficiency and energy conservation in the Park through behavioral change

- Identify priority conservation measures through audits and educate staff about specific energy use per building and measures to reduce use. For example, place signs or develop reminder system for different energy conservation measures such as “turn off lights.”
- Develop and distribute an annual memorandum describing energy conservation measures (including link to Climate Friendly Parks Web page).

- Ensure that this memorandum is issued to new staff during orientation.
- Teach staff how to set power management controls on all computers and monitors and recommend 3-5 minutes before monitor shuts down (Green Team to determine), with flexibility included for staff to manage their own settings.
  - Reiterate the importance of turning off computers and monitors at the end of the day.
- Any stand alone foot heater must have a certain energy rating. Recommend bringing a blanket for your feet.
- Explore the use of individual fans to assist cooling rooms relative to decreasing the temperature of entire buildings.

## 2 Upgrade lighting options

- Retrofit remaining light fixtures to high efficiency lights (95% completed). Include on-going assessments for best technology and health considerations.
- Evaluate every room for motion sensor control.
  - Repair broken ones promptly.
  - Don't allow snap-back (replacing with old technology).
  - Check timers on a monthly basis.
- Retrofit all outdoor lighting ensuring compliance with night-sky requirements and considering safety needs.
  - Evaluate lower wattage requirements at Entrance Stations.
- Have employees identify indoor areas that are too dark and evaluate daylighting options.

## 3 Heating, Ventilation, and Air Conditioning (HVAC)

- Ensure that an HVAC maintenance schedule is in place by July 2010.
- Install 7-day programmable thermostats throughout the Park by July 2011.
- Ensure that all new installed HVAC systems are rated at the highest available seasonal energy efficiency ratio (SEER) rating.
- Install heating zoning systems where feasible to decrease unnecessary heating.

## 4 Switch to more efficient electronics and devices

- Exceed regional guidelines for purchasing energy efficient electronics, appliances, and devices.
- Purchase printers capable of printing double-sided and educate Park staff about how to use double-sided printing function (set as default).
- During routine powerstrip replacements, ensure that all new powerstrips are smart powerstrips.

- Place smart powerstrips on all network printers where feasible.
- Exceed regional guidelines for purchasing energy efficient electronics.
- Set a minimum water heater efficiency rating and replace all non-compliant water heaters by a set date.
  - Only replace minimum capacity needed.
- Replace all old refrigerators with Energy Star compliant appliances by the end of 2010.

## 5 Improve building structures and envelopes

- Superinsulate all buildings, ceilings and walls, where feasible.
- Evaluate door entries for energy conservation needs.
  - Adjust, repair, or replace where needed.
- Assess and complete work orders for all window replacements and improvements (e.g., window shades).
- All new construction will consider the environment in which it is built (e.g., directions of doors, windows).
- Encourage removal or replacement of energy-consuming buildings, especially those that are temporary.

## 6 Utilize alternative energy sources

- Incorporate solar panels placed on covered parking areas into plans for new parking areas.

## 7 Measure energy use throughout the Park

- Complete an energy audit of all structures in the Park by the end of 2011.
- By 2015 and where feasible, convert all equipment that uses natural gas or propane to electric.
- Install building-level metering by the end of 2011.

## Transportation Management

*Emission Reduction Goal: Reduce Park operations transportation emissions to 20 percent below 2008 levels by 2016.*

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Joshua Tree National Park's emissions. As the inventory results indicate, GHG emissions from transportation comprise 55 percent of Park operations emissions and 95 percent of the Park's overall emissions (including visitors). Accordingly, in addition to the Park operations emissions reduction goal, Joshua Tree National Park set a goal to reduce overall transportation emissions by 5 percent below 2008 levels by 2016 (assuming visitation numbers are similar to those of 2008). Presented below are the actions that are currently under way and which comprise the Park's progress to date, and future actions that the Park will pursue. The planned actions include off-site goals, which will not necessarily result in a reduction in the Park's calculated GHG emission numbers, but which are identified as important to reduce emissions on a broader scale outside of the Park boundaries, and can serve as examples to the broader public for ways to reduce emissions.

## Progress to Date

- Benchmarked existing fleet performance and potential options for vehicle replacement.
- Continue to develop and maintain a fleet management plan.

## Transportation Management – Planned Actions

### 1 Transportation-related behavioral changes

- Limit bus idling by adding this requirement to their permits. Post signs about idling in high use areas.
- Conduct audit of travel between Cottonwood Visitor Center, Black Rock, fee booths, and Oasis of Mara.
  - Minimize number of vehicles and number of trips for NPS and Joshua Tree National Park Association staff.
- Arrange duty schedules and housing assignments to minimize in-park travel (e.g., meetings with supervisors).
- Give incentives for Park staff to carpool to work.
- Evaluate possibilities for private vendor to provide employee shuttle from Yucca Valley to Twentynine Palms.
- Evaluate and establish a no-idling vehicle policy for Park staff.
- Encourage staff carpooling to meetings and conferences.
- Ensure that the most fuel-efficient vehicles are used for long-distance travel.
- Facilitate long distance meetings through video teleconferencing, conference calls, and internet conferencing (e.g., Skype).
- Facilitate cross-division ordering to reduce the number of shipments into the Park (e.g., common office supplies).

### 2 Reduce visitor vehicle fuel consumption

- Continue to develop front-country opportunities for hiking, biking, and walking.

### 3 Reduce NPS vehicle and equipment fuel consumption

- Expand safe and efficient-driver program (i.e., good driving habits, driving the speed limit) currently in the maintenance program to Park-wide.
- Complete fleet management plan (i.e., with NPS contractor).
  - Reduce fuel used through more efficient travel planning and through conversion of vehicles to hybrids and electric vehicles.
- Document trips and evaluate if “one occupant” trips can be reduced.

### 4 Replace NPS vehicles and equipment



- Evaluate work-related needs for driving vehicles home - use the right vehicle in the right place for the job.
- Develop a vehicle replacement plan based on the results of the fleet management plan.
- Work with GSA to ensure Park needs for hybrids and other fuel efficient models are met.
- Use alternative/hybrid vehicle as an education opportunity to encourage use to the public.
- Replace 4-wheel with 2-wheel drive vehicles based on results of fleet management plan.

## 5 Transportation Infrastructure

- Recycle chipped asphalt as road base where appropriate.

## 6 Other

- Explore possibilities with other public partners (e.g., Marine base) to enhance employee transportation opportunities.

## Waste Management

*Emission Reduction Goal: Reduce Park operations waste emissions to 10 percent below 2008 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 methane (CH<sub>4</sub>) emissions in the United States. Reducing the amount of waste sent to landfills reduces CH<sub>4</sub> 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.

Joshua Tree National Park's operation activities emitted 182 MTCO<sub>2</sub>E from waste management in 2008. 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 associated resulting emissions. Presented below are the actions that are currently under way and which comprise the Park's progress to date, and future actions that the Park will pursue.

### Progress to Date

- Veterans of Foreign Wars (VFW) veterans started operating the Joshua Tree National Park recycling program in 1996. A few dedicated volunteers managed the entire Park recycling program until the end of 2008. DesertArc, a work training center that offers opportunities to individuals with disabilities, took over the program and continues to recycle glass, aluminum, plastic, paper and cardboard. The recycling program helps to meet the Park's commitment to sustainable operations as outlined in the Integrated Solid Waste Alternatives Program (ISWAP). From the start of the program in 1996 through the end of FY2009, 208 tons of material has been recycled.
- Continue to recycle materials as the local market permits.
- Ensured that low-flow/waterless toilets are incorporated into the design of the new Visitor Center.
- Co-locate waste and recycling bins with clear signage to reduce mixing of waste and recycling. All dumpsters have new signage for trash. Recycling bins will receive new signage for stronger identification of recycling.

- Locate waste bins (e.g., dumpsters) and recycling bins by vault toilets where possible. This has been implemented in campgrounds and includes on-going evaluation of effectiveness and location. Relocation of bins has been implemented as needed.
- Continue annual staff training on cleaning products and practices, and waste reduction practices.
- Developing a propane cylinder recycling program.

## Waste Management – Planned Actions

### 1 Decrease waste through behavior change

- Incentivize responsible waste management by visitors.
  - Work with school and youth groups (e.g., scouts) coming to the Park to encourage them to take their trash home.
- Educate Park staff about the Environmental Management System (EMS) and Integrated Source Water Assessment and Protection (ISWAP) programs, and make them available to Park staff on the Park intranet site.
- Train all Park staff on opportunities to reduce waste.
  - Cover Climate Friendly Park initiatives at quarterly all-staff meetings.
  - Purchase refillable devices such as mechanical pencils, ink pens.

### 2 Establish new plans and policies that promote waste reduction.

- Continue to evaluate ways to minimize paper towel use in staff restrooms (e.g., powerful hand dryers).
  - Establish baseline paper towel use and set goal for reducing paper towel use in a 5-year time frame.
- Evaluate alternative options for plastic bags.
- Work with the network to develop intranet program to exchange supplies and equipment.
- Document annual waste reduction and diversion, including re-evaluating the local market for recyclables.
- Complete solid waste generation baseline.
- Review annual waste reports.
  - If no reduction occurs one year, superintendent will work with management team to take steps to mitigate.
- Eliminate the sale of disposable water bottles in the Visitor Centers by 2013.
  - Develop a display on environmental impacts from disposable water bottles to be placed by the drinking fountain at the Visitor Centers by 2011.
  - Encourage staff to use refillable water bottles, rather than purchased water bottles.

- Prohibit the purchase of disposable water bottles by Park staff by 2010.

### 3 Implement recycling and composting practices

- Educate Park staff regularly about the Park's recycling and composting programs, incorporating changes into the educational programs as they occur.

### 4 Reduce waste through green procurement

- Orient Park staff to the national Green Procurement Plan and post on Park intranet site.
- Continue to review recycled products to meet or exceed minimum requirements for purchasing recycled paper (e.g., bleach-free, 100% recycled) and other products in the consumer packaged goods (CPG).
  - Train anyone who purchases, including the management team.

### 5 Reduce and reuse wastewater

- Continue to replace faucets and toilets with low-flow models as needed.
- Plant xeriscape and low-water use plants.



## STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. Joshua Tree 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. Joshua Tree 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 essential element of any climate initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions Joshua Tree National Park 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 future actions that the Park will pursue.

### Progress to Date

- Continue to connect with community and Park partners on Climate Friendly Park efforts.
  - Strengthen relationships with Park association, friends groups, local environmental groups, representatives from the local tourism and community business board, representatives from the state environment and energy departments, teachers, representatives from the regional transportation authority, and local university partners.

### 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, Joshua Tree 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:

- Include climate friendly principles in orientation for new employees and all employee meetings.
- Include climate friendly training in annual interpretive training by inviting climate change experts as speakers in the training.

### Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. Joshua Tree 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 and consider alternatives, Joshua Tree National Park can play an important role in educating the public about climate change.

Joshua Tree 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 actions to reach these various audiences effectively. These actions include:

- During program evaluations, audits, and coaching, encourage the incorporation of climate friendly information into interpreter programs and talks.
- Educate visitors about their recycling options in the Park and at home.
- Educate visitors about reducing transportation-related emissions.
- Consider the development of a Do Your Part! program for online visitors.
- Develop and strategically distribute (so as not to increase waste) Do Your Part! Be Desert Smart! materials.
- Incorporate climate change stories and information into the 2010 Joshua Tree Guide, and consider adding a “climate change and its effects on Joshua Tree National Park” special edition to the Park’s newspaper.
- When replacing vehicles in fleet, replace with hybrid vehicles whenever feasible and best fuel economy when hybrid is not feasible so that staff is sending a message about being climate friendly with actions as well as with words.
- Develop and produce a Mojave Desert version of the “Arrange for Change” climate change exhibit for the Joshua Tree Visitor Center. Make exhibit production files available to other desert network parks for their own use.
- Explore the creation of a climate change interpretive trail for the Park. If feasible, seek funding for development.
- Add climate change books and other related interpretive products to the cooperating association’s Scope of Sales. Explore development of a Park ‘carbon offset’ coupon for visitors to purchase.

## Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Joshua Tree 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:

- Work with school groups, participate in speaking engagements, and work with the Desert Institute to address climate change in surrounding communities. The Desert Institute provides educational programs through the Joshua Tree National Park Association.
- Add climate friendly information to public service announcements in 2010.
- Consider having a local workshop for staff, partners, and local community that inform the public, so the Park is seen as a leader in this arena.
- Contact possible Park partners, such as Park concessioners, tribes, friends groups, local environmental groups, representatives from the local tourism and community business board, representatives from the state environment and energy departments, teachers, and local university partners to discuss climate change initiatives.

## STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in Strategies 1 and 2 above, Joshua Tree 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 reevaluation of goals. As part of this strategy, Joshua Tree 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

Joshua Tree National Park has a unique opportunity to serve as a model for over 1,300,000 recreational visitors annually.<sup>3</sup> 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, Joshua Tree National Park will help mitigate climate change far beyond the Park's boundaries.

Joshua Tree National Park ecosystems face an uncertain future due to the possible effects of climate change. However, by seriously addressing climate change impacts and reducing emissions, Joshua Tree 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 towards moving Joshua Tree National Park to the forefront of Climate Friendly Parks.

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<sup>3</sup> Joshua Tree National Park: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>

## APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

### Joshua Tree National Park

Dave Carney	Supervisory Interpretive Ranger
Andrea Compton	Chief of Resources
Andy Garvin	Maintenance Mechanic
Michelle Harrison	Contracting Officer
Rick Holt, Jr.	Engineering Equipment Operator
Elena Juarez	Campgrounds Foreman
Marilyn Lutz	Facility Management Systems Specialist
Roberta Pilcher	Program Assistant
Jimmy Pritchett	Protection Ranger
Curt Sauer	Superintendent
Vic Scott	Maintenance Management Assistant
John Slaughter	Chief of Maintenance
Scott Tremblay	Buildings and Utilities Foreman
Susan Usher	Visitor Use Assistant
Michael Vamstad	Wildlife Ecologist
Joe Zarki	Chief of Interpretation