



CLIMATE *Friendly* PARKS

Death Valley National Park Action Plan

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DEATH VALLEY NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Death Valley 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, Death Valley provides a model for climate friendly behavior within the park service.

This Action Plan identifies steps that Death Valley can undertake to reduce GHG emissions to mitigate its impact on climate change. The plan presents the Park's emission reduction goals, and associated reduction actions to achieve the Park's goals. Strategies and action plan items were developed by working groups at the Mojave Desert and Mediterranean Coast Climate Friendly Parks Workshop.¹ While the plan provides a framework needed to meet the Park's emission reduction, it is not intended to provide detailed instructions on how to implement each of the proposed measures. The Park's Environmental Management System will describe priorities and details to implement these actions.

Death Valley aims to reduce park GHG emissions by no less than 25%.

To meet this goal, 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 Death Valley. 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.

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.

¹ Original notes from these workshops, including detailed action items not presented in the final plan have been archived by ICF 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> >

Many of the plants and animals that live in Death Valley are living on the edge of survival under current conditions. An increase in temperature or a change in precipitation patterns, even slightly, has the potential to push some of these plants and animals into greater isolation, threatened status, or even to extinction. The endangered Devils Hole pupfish currently spawn their young at the limit of optimal water temperature, and elevated water temperatures could be enough to prevent successful spawning. In a small population of animals whose life span is about one year, very subtle changes could rapidly devastate that population.

Changes in precipitation patterns could lead to more frequent and/or more violent storm events. This increase in seasonal rains would benefit opportunistic invasive species of grasses and annuals that could sprout and spread quickly. These plants will add an unnatural fuel source for wild fires to what should be a sparsely populated landscape, thus leading to more devastating wildland fires during summer thunderstorm events. Native desert plants do not recover well after fires, so large burn areas would then become havens for even more exotic plant species, which, in turn, would impact native animal species dependent on native plants, a prime example of which would be the desert tortoise.

In a land of extremes, too little is known about the impacts of changes in climate. There are both significant links among the plants and animals that survive here, and harm or degradation to of any of those links could lead to major changes and/or loss of such endemic species.

GREENHOUSE GAS EMISSION INVENTORY AT DEATH VALLEY

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). In 2008, GHG emissions within Death Valley, including visitor transport, totaled 7,371 metric tons of carbon dioxide equivalents (MTCO₂E). For perspective, a typical single family home in the U.S. produces approximately 11 MTCO₂ per year.³ Thus, the combined emissions from park, concessioners, and visitor activities throughout the park are roughly equivalent to the emissions of 670 households each year.

The largest segment of GHG emissions from park operations comes from waste (see table 1 and figure 1). Death Valley currently trucks all of its solid waste garbage to Pahrump, where it is landfilled. Death Valley is committed to reducing its solid waste stream by reducing waste creation through green procurement, reuse, repurposing, and recycling. Death Valley has a strong relationship with a concession in-holding for recycling, and is taking measures to increase recycling amounts and effectiveness in order to reduce the Park's output of solid waste. In addition to solid waste, wastewater is a significant emitter of GHGs for the Park. Death Valley currently uses "traditional" sewer lagoons to treat all wastewater at Furnace Creek and Stove Pipe Wells. Death Valley is at a point at which a switch in technology will be required, primarily due to the Furnace Creek lagoons reaching their permitted capacity. The replacement wastewater treatment technology shall be vetted to ensure the lowest GHG emissions.

Energy production represents Death Valley's second largest opportunity to reduce GHG emissions. The Park has several solar photovoltaic arrays in operation, under construction, and more planned, all of which are visible efforts to offset fossil fuel energy production. However, the largest impact on GHG emissions by electric power production will come through "negawatts" (preventing electricity from being produced in the first place), which is primarily through better construction techniques and improved building envelopes, and through training and behavioral changes.

Death Valley is the largest park in the Mojave network with over 3 million acres of park land, and with so much land to cover, vehicular miles add up quickly; the GHGs produced from park vehicles, while the smallest sector of GHG emissions, still represent significant opportunities for reduction. When visitor transport is added, vehicular emissions becomes the Park's overriding largest emission factor. Thus, Death Valley must strive to make better vehicle purchases for operations, but must make particularly strong educational and outreach programs and work with potential travel providers in order to reduce the number of traveler miles driven and increase the efficiency of every visitor mile driven.

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

FIGURE 1

Death Valley 2008 Park Operations Emissions by Sector

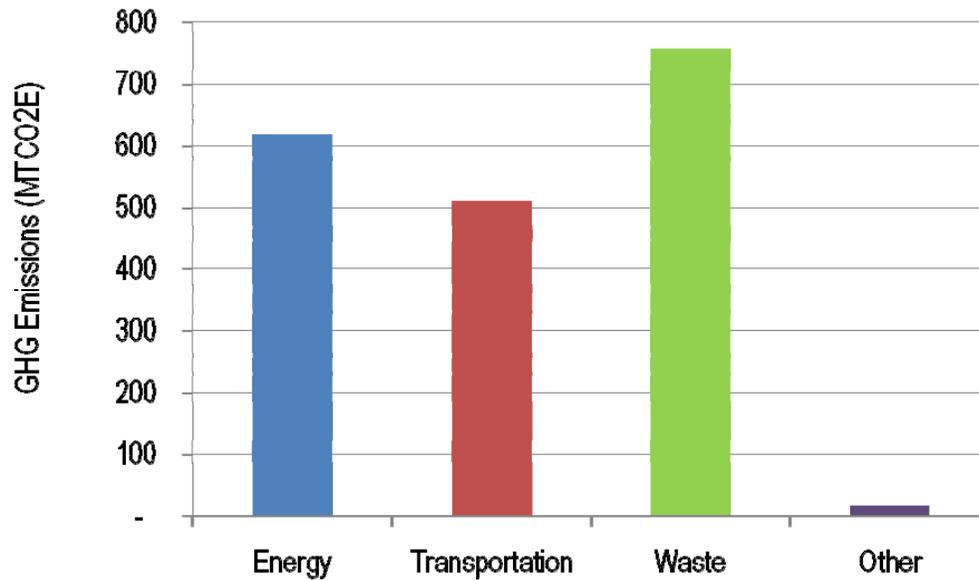


TABLE 1

Death Valley 2008 Park Operations Emissions by Sector

	MTCO2E
Energy	618
Stationary Combustion	126
Purchased Electricity	492
Transportation	511
Mobile Combustion	511
Waste	757
Landfilled Waste	609
Wastewater	148
Other	18
Refrigeration and Air Conditioning	18
Total	1,903

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

FIGURE 2

Death Valley 2008 Total Greenhouse Gas Emissions including visitor travel by Sector

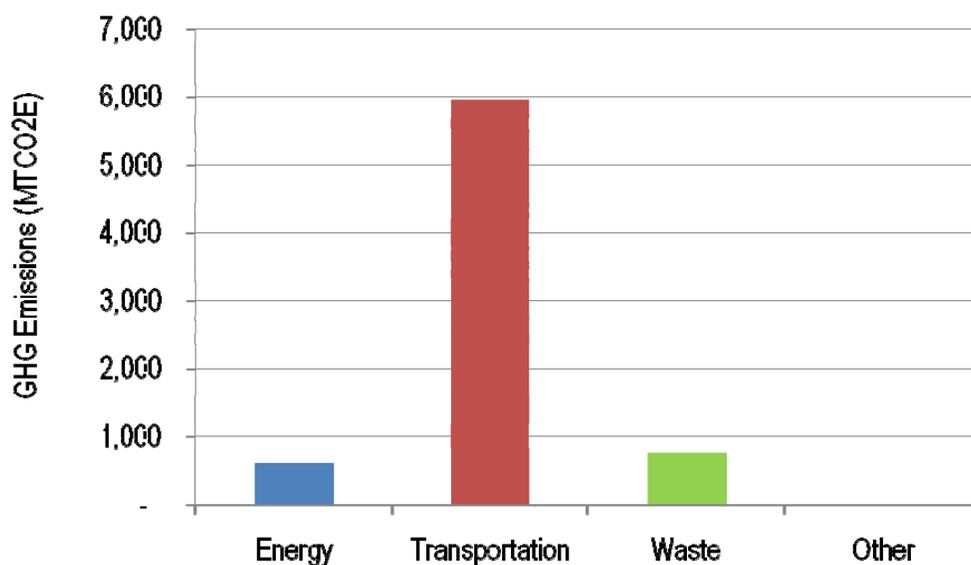


TABLE 2

Death Valley 2008 Total Greenhouse Gas Emissions by Sector & Source including visitor travel

	MTCO2E
Energy	618
Stationary Combustion	126
Purchased Electricity	492
Transportation	5,978
Mobile Combustion	5,978
Waste	757
Landfilled Waste	609
Wastewater	148
Other	18
Refrigeration and Air Conditioning	18
Total	7,371

Note - Totals may not sum due to rounding

Not applicable data sources represented by "-"

Death Valley Responds to Climate Change

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

Death Valley 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 Death Valley will take have been presented below in order from highest to lowest priority within each sub-category.

Energy Use Management

Emission Reduction Goal: Reduce park operations' energy use emissions to 35% percent below 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 42 percent of the Park's GHG emissions from Park Operations are from energy consumption. Consequently, Death Valley 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

Purchase or produce "green" energy:

- ✓ Installed several photovoltaic systems on buildings and structures throughout the park with more planned.
- ✓ Purchased energy efficient electronics.
- ✓ All residential unit appliance purchases are Energy Star models.
- ✓ All light fixtures and bulbs in park are energy efficient.
 - 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.
 - Replaced incandescent light bulbs with Compact Fluorescent Light bulbs (CFLs).
- ✓ HVAC inspection and maintenance schedule ensures timely upkeep and cleaning.
- ✓ Installed various photovoltaic systems throughout park, with more planned.
- ✓ Completed park-wide energy audit of buildings by contractor.

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.

- Provide residents with information regarding cleaning swamp cooler filters and A/C filters/condensers to promote optimum efficiency.
- Educate about energy “vampires” and how to reduce their impact.
- Develop a mandatory energy-saving training program.
 - Incorporate conservation into training and tailgate sessions.
 - Instruct staff how to turn off equipment when it is not in use and enable energy-saving settings for computers and monitors through mandatory staff training.
 - Implement reward based energy saving competition among park employees.
- Establish an Operations and Maintenance (O&M) schedule that conserves energy use across the entire park.
 - Ensure greater efficiency and productivity through implementing a 4 day flex schedule for employees, allowing some buildings to be shut down on the 5th day.
 - Adjust thermostat setting to be seasonally appropriate, as well as appropriate for the time of day.
 - Generate energy conservation through good maintenance practices.
- Ensure 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. (visit: www.Energy Star.gov/powermanagement)

2 Upgrade lighting options

- Establish policy that would require new and retrofitted buildings to maximize day-lighting options.
 - New buildings will be oriented to maximize passive solar and natural ventilation, while designing south and west walls and roof overhangs to minimize solar heat gain.
 - Use ambient light and take advantage of day lighting opportunities with the use of clerestories, light shelves, light wells, skylights, monitors, and solar tubes.
- Establish a “good neighbor” or “dark sky” outdoor lighting policy to require new and retrofitted buildings to utilize appropriately focused and shielded, high efficiency outdoor lighting fixtures with sensors and/or timers.

3 Switch to more efficient electronics and devices

- Fully implement DOI green procurement policy.
 - Ensure that all new electronic/office equipment is ENERGY STAR qualified at www.Energy Star.gov, and rather than purchasing individual copy, fax, print, and scanning equipment, consider a multi-function device.
 - Cross-check Energy Star ratings with Consumer Reports to account for lax Energy Star testing regimen, and purchase only Energy Star equipment that will truly save energy.
- Default all computers/printers to print double-sided.

- Install standby-mode energy saving power strips and surge protectors, such as Smart Strip or Bye-Bye Standby®.
- Purchase only energy efficient electronics.
 - Refer to the Federal Energy Management Program guidelines for purchasing energy efficient appliances in accordance with federal procurement procedures.
- Install energy meters to measure energy use and monitor big consumers. Display results as an educational tool.
- Replace park's existing boiler or furnace with an energy efficient model during the rehabilitation of the Visitor Center and Headquarters.
- Install energy efficient and/or solar water heaters in park housing.
- Purchase energy meters (such as Kill-A-Watt or Watts-Up) to help locate energy drains, understand energy usage, and general conservation training.
- Encourage conservation reading and research.

4 Improve building structures and envelopes

- Rehabilitate Visitor Center and Headquarters.
 - Ensure efficient use of Building Automation System to maximize energy efficiency by adjusting indoor temperature based on outdoor temperature.
 - Weatherize buildings by increasing R-values to improve insulation effectiveness.
 - Upgrade air distribution systems to a Variable Air Volume system.
 - Incorporate radiant barrier systems into the roof insulation system.
- Add window films and shading to reduce the solar heating load imposed on windows where applicable.
- Replace old windows to provide insulation and solar security where applicable.
 - Look for spectrally selective glass, double-glazed, low-e systems, gas filled windows, and electrochromic windows that provide better insulation and solar selectivity.
- Investigate the development of cool roof for applicable buildings.

Engage concessioners and partners to aid in energy use reduction.

- Modify concessioner contractual language to include sustainable practice requirement.

5 Utilize alternative energy sources

- Purchase electricity from a renewable energy provider.
 - Research renewable electricity options to reduce purchased electricity related GHG emissions.

- Install solar water heaters on seasonal apartments and investigate use for new park housing.

6 Measure energy use throughout the Park

- Incorporate energy efficiency criteria into new contracts for park and concessioner construction.
 - Ensure contract language requires concessioner activities reflect Park sustainability goals.
- Utilize a professional planner/ consultant to ensure efficient growth in compliance with Executive Order 13514.
- Review and employ the DOI Sustainable Buildings Implementation Plan.

Transportation Management

Emission Reduction Goal: Reduce park operations transportation emissions to 35 percent below 2008 levels by 2016

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce Death Valley's emissions. As the inventory results indicate, GHG emissions from transportation comprise 27 percent of park operations emissions and, including visitors, 81 percent of the Park's overall 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

- ✓ Park uses B20 biodiesel.
- ✓ Park uses the online tracking system accessible at <http://fastweb.inel.gov> to track fuel use and analyze fleet needs with efficiency improvements to report to the DOE.
- ✓ VIPs use Park iThink and GEM electric vehicles.
- ✓ Park uses a fleet maintenance schedule to keep vehicles in top mechanical condition.
- ✓ All fleet vehicles use a re-refined oil, and all oil is recycled.

Transportation Management – Planned Actions

1 Transportation-related Behavioral Changes

- Reduce visitor vehicle idling.
 - Post signs and information with Park idling rules in most popular seasonal spots.
- Encourage staff carpooling.
 - Standardize carpooling information.
 - Provide support services to increase staff participation.
- Encourage alternative modes of travel for staff.
 - Establish a employee bike-to-work program.

- Work with Caltrans to create bike paths between Furnace Creek, Cow Creek, and Stove Pipe Wells.
- Encourage alternative work opportunities for staff such as telecommuting where feasible.
- Prohibit staff vehicle idling.
 - Prohibit staff vehicle idling unless required for vehicle maintenance or is seasonally necessary.
 - Create dashboard idling guidelines and post in vehicles.
 - Tint vehicle windows with light colored low-e tinting, to the extent allowed by state law.
 - Incorporate the use of cooled work break trailers and misting fans for summer work crews.
- Reduce meeting travel through use of webinars/conference calls to avoid excessive travel, both within and outside of the park. Purchase necessary equipment for teleconferencing and videoconferencing.

2 Reduce visitor vehicle fuel consumption

- Incentivize visitor use of high efficiency and alternative fuel vehicles and hybrids.
 - Recognize those who are driving high efficiency (>40 mpg) or alternative fuel vehicles with reduced entrance fees or "climate friendly visitor" bumper stickers.

3 Reduce National Park Service vehicle and equipment fuel consumption

- Exceed federal fleet performance requirements set by Energy Policy Act (EPACT), Executive Order 13423, and the Energy Independence and Security Act (EISA).
 - Reduce transportation-related petroleum consumption by 2 percent through fiscal year 2015 relative to the fiscal year 2005 baseline.
 - Increase use of alternative fuels by 10 percent relative to the previous year.
- Analyze fleet fuel-consumption patterns for efficiency improvements.
 - Analyze fleet fuel consumption patterns for areas that FAST does not include, such as Law Enforcement.
- Require all carriers used by vendors and park facilities to be certified under EPS's Smartway Transport Partnership.
- Replace two-stroke engines to the greatest extent possible.
- Promote efficient driving.
 - Conduct driver training that emphasizes fuel efficiency and trip planning.
 - Educate workers how efficient driving not only saves gas, but is also good for the longevity of vehicles.

4 Replace National Park Service vehicles and equipment

- Develop a vehicle replacement master plan.

- Evaluate Alternative Fuel Vehicle options: Hybrid electric vehicles (HEVs), electric vehicles, compressed natural gas (CNG), biodiesel.
- Raise existing fleet-wide miles per gallon average through vehicle replacement to exceed California's fuel economy standards. Replaced retiring vehicles with more efficient, alternative fuel, or hybrid vehicles.
- Evaluate 4-wheel drive needs, and replace with 2-wheel drive vehicles when and where possible.
- Incorporate alternative fuel guidelines into fleet specifications.
 - Work with GSA to catalogue available AFVs and set minimum AFV goals.
- 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.
 - Incorporate alternative fuel guidelines into fleet specifications through GSA.

Waste Management

Emission Reduction Goal: Reduce park operations waste emissions to 40 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 CH₄ emissions in the United States. Reducing the amount of waste sent to landfills reduces CH₄ emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. The less the Park and its visitors consume in terms of products, the less energy is used and fewer GHGs are emitted.

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 will result in lower 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.

Additionally, a large percentage of the Park's wastewater is treated using open lagoons, thus emitting significant amounts of GHGs. The park needs to upgrade this system to an extended aeration activated sludge plant.

Progress to Date

- ✓ Donate and reuse disposed items.
- ✓ Recycle or donate old computers and electronics.
 - Recycle unusable computers and electronics.
 - Donate old equipment to schools, senior centers, etc.
 - Practice cradle-to-grave recycling to ensure toxic components are properly managed. Purchase electronics with less toxic components.
- ✓ Cooperative waste disposal and recycling with Xanterra.
 - Recycle cardboard, aluminum, scrap metal, glass, white paper, and no. 1 PET and 2 HDPE plastics.
- ✓ Eliminate non-recyclable Styrofoam/Food Serviceware through policy to purchase biodegradable products
 - Ensure the elimination of non-recycled Styrofoam/Food Serviceware in concessioner contract language.

- ✓ Manage solid waste with an Integrated Solid Waste Alternatives Program (ISWAP).
- ✓ Send used fluorescent bulbs to reclaim/recycle service center.
- ✓ Institute alkaline, lithium battery recycling locations in every office building.
- ✓ Adhere to Federal, NPS, and PWR Guidance for Procurement.
- ✓ Replace toilets with low-flow models.
- ✓ Install water efficient technology, e.g. composting toilets and waterless urinals.
- ✓ Use reclaimed materials for roads and paving.
 - Designs shall use low VOC, water based road striping paint, and pulverized pavement for aggregate base, cold in-place recycling of existing pavement, and use hot mix asphalt with recycled content.
 - Recycle old asphalt pavement in on going road projects.
- ✓ Boneyard materials exchange, reuse, and repurposing.
- ✓ Follow federal green procurement guidelines and adapt them to Death Valley specifics.
- ✓ Use post-consumer recycled paper in all park publications.
 - Use 30% post-consumer (PC) content, processed chlorine-free (PCF) copy paper. Consider 100% PC copy paper, alternative fibers (i.e., non-wood) and water-based or vegetable-based ink. Target paper reduction.

Waste Management – Planned Actions

1 Decrease waste through behavior change

- Promote the use of Pack-in and Pack-out program, which encourages visitors to pack out their garbage to reduce the amount of waste left in park areas.
- Engage staff to reduce and manage waste at work.
 - Encourage park staff to be responsible at work by making it easy to recycle waste; make sure containers fit environment (e.g., animal-proof, rust-proof/salt air -resistant/moisture resistant, and proper size).
 - Take into account the amount of packaging when making purchases.
- Promote the use of recycled content products and materials purchased by Death Valley. This includes materials bought for field operations, office procurement, and by charge card purchasers.
- Train park staff, concessioners, and contractors on waste reduction responsibilities.
 - Rebuild ISWAP committee to review and revamp ISWAP, provide training.
 - Ensure that staff, concessioners, and contractors are aware of their roles and responsibilities to reduce waste. Conduct periodic trainings for all park personnel about recycling policies at the Park.
- Train maintenance staff on waste reduction initiatives.
 - Continually inform maintenance crews about recycling policies at the park; conduct periodic trainings.

- Train custodial staff in most efficient use of cleaning products and use of reusable cleaning gear i.e. rags instead of paper towels.

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 CPG office supplies with maximum recycled content, avoid PVC supplies.
 - Utilize MyGreenParks website when it becomes active.
 - Purchase durable, reusable supplies, always print double sided, reuse office supplies when possible.
- Encourage the use of hand dryers over paper towels wherever possible.
- Communicate park waste policy or ISWAP to staff and concessioners.
 - Create an orientation packet and provide information on policies and practices for recycling, green procurement, and other aspects of the park's waste management policy.
 - Conduct brown bag lunches and training seminars for all park personnel on topics related to waste reduction.
 - Include information on park sustainability, green procurement, and recycling policy in new employee orientations.
- Measure baseline solid waste generation (tons).
 - Continue use and development of the Park's Resource Conservation and Recovery Act (RCRA) Sustainable Practices Report.
 - Capture green procurement and waste management data in an EMS or a spreadsheet tracking system for annual Sustainable Practices Report (RCRA).
- 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.
- Increase use of equipment, such as shredders for plastic and crushers for aluminum, to reduce volume of waste and recyclables.
 - Possibly install Big Belly solar powered trash collector/compactors, depending on trial results.
- Reduce the use of plastic bottles by encouraging alternatives.
 - No longer provide bottled water through employee association.
 - Discourage bottled water sales at concession or NHA sales venues.
 - Institute employee challenge to reduce the use of bottled water.

- Provide potable water refilling stations at various points throughout park.
- Work with concessioners to reduce packaging and material use.
- Implement and enforce a Construction Waste Management Plan and Job Site Recycling Policy of LEED value
 - Priority practice should be source reduction.
 - Reuse construction waste on-site or elsewhere or sell recycling material of value (lumber, drywall, metal, rubble, cardboard, fixtures, hardware, and wiring).
 - Require construction contractors recycle waste; ensure that no illegal dumping occurs off job site.
 - Work with haulers to prevent contamination of waste sorting; ensure no illegal dumping occurs off job site.
 - Require a Construction Waste Management or Recycling Plan; track quantities of recyclables.
 - Ensure contract language addresses waste plan/recycling. Check on "take-back" policies (e.g., ceiling tiles, cardboard, carpet, and drywall).
 - Require drywall contractors to recycle waste.
- Reduce waste generated at meetings and employee functions.
 - Institute practice of using projector instead of making copies of documents.
 - Establish guidelines for waste minimization: use durable, reusable utensils and mugs, buy in bulk, use items with reduced packaging, and encourage use of recycling receptacles.

3 Implement recycling practices

- Continually increase the amount of recyclable material at the park.
 - Add tin, other plastics (including film), and pallets.
 - Further educate visitors and staff about recycling.
- Improve differentiation of recycling containers and trash receptacles for easier separation.
 - Place containers where appropriate based on visitor use.
 - Evaluate the need for multi-lingual signs; use graphics.
 - Ensure that containers fit the environment.
- 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.
- Assign at least one person to act as a park recycling leader/manager, possibly an intern to start.

- Primary responsibility will be to assess and continually improve park's recycling activities.
- Partner with vendors and concessioners to develop waste reduction standards for hotels and food services.
 - Ensure that all lodging use water saving information cards about washing linens and towels, and that hotel housekeeping employees understand and comply with customer directed water saving practices.
- Establish a propane cylinder recycling program at campgrounds, such as a tank exchange system.
- Establish requirements for contractors to follow EPA's Comprehensive Procurement Guideline.
 - Specify the purchase of green materials.
- Create a list of pre-purchasing questions to be answered on the "greenness" of product before purchasing.
- Develop a catalog of sustainable products for purchasing department.
- Practice Environmentally Responsible Deconstruction where historically possible.
 - Inefficient materials or components will not be salvaged; ensure that the reuse of vintage items represents an environmental gain.
 - During contractor bidding, specify that reuse and recycling are a priority.
 - Old building materials are to be reduced, reused, and salvaged, in that order.

4 Reduce waste through green procurement

- Evaluate current purchases and reduce redundant products.
- Reduce amount of packaging used in products sold and used in the park.
 - Let vendors know your packaging preferences.
 - Coordinate with Park Concessioners and Xanterra.
- Train staff on green procurement practices.
 - Encourage procurement staff to take OFEE's online green purchasing training.
- Coordinate procurement practices so that surplus materials in one unit may be used by another unit.
 - Repurpose rather than discard surplus materials.
 - Establish an exchange process so different departments can source surplus materials internally.
- Continually increase the recycled content of purchased materials.
 - Focus on office supplies, gift shop concessioners, building supplies, furniture and maintenance equipment: hoses, mulch, edging, timbers, posts, and compost with recycled content.
- Develop a schedule for replacing existing materials.

- Consider replacing equipment with recycled equipment or new equipment that will enhance reuse and recycling, (e.g., copiers that can make two-sided copies).
- Consider environmental impacts across each product's entire life cycle.
- Develop a Green Procurement Plan.
- Inventory and Substitute all cleaning supplies with non-toxic products.
 - Conduct an inventory and review of all cleaning supplies. Substitute products containing hazardous/toxic chemicals with non-toxic products.
 - Look for Green Seal Certified products and other green attributes when procuring cleaning and maintenance equipment (phase out use of Simple Green).
- Implement petroleum product substitution program.
- Use low/no-VOC insulation, carpets, paints, and adhesives.
- Use flooring materials containing high recycled content for any building projects.
- Promote the use of recycled content products and materials procurement within the NPS.
- Manage waste associated with Computers and FAX/Printers.
 - Purchase remanufactured toner cartridges.
 - Purchase LCD monitors, which use less toxic substances, instead of CRT monitors.
 - Reduce the printer-to-employee ratio by maximizing shared network printers.
 - Collect used cartridges in central locations for recycling and publicize those locations.
 - Encourage employees to switch to fonts that use less ink and less paper, i.e. Times New Roman.

5 Reduce and reuse wastewater

- Install ultra low-flow faucets and showerheads.
- Look at installing composting toilets at park comfort stations.
- Make better use of RO-reject water for irrigation.
- Conserve water by planting native vegetation and drought-resistant grasses.
- Manage non-point wastewater.
 - Prevent pollution and use green products. Clean up spills properly.
 - Dispose of pesticides and tank rinsate properly. Check state and local requirements.

6 Other

- Develop a pollution prevention assessment and training program for park staff.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

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

Progress to Date

- ✓ Keep staff 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.
 - Make staff aware that bus tours are a form of ecotourism, and to thank bus tourists and bus tour operators.

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, Death Valley 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.
 - 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.
- Incorporate climate change issues into the employee handbook.
 - Include climate materials in employee orientation packets.
- Include the science and impacts of climate change in park education tools.
 - Incorporate sessions on climate change into seasonal staff training.
 - Tailor seasonal staff handbook to include Climate Friendly Park information.
- Incorporate sessions on climate change into new staff 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.

- 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 at both work and home.
- Develop and leverage relationships to create opportunities for workshops on climate friendly activities.
- Publicize at conferences, meetings, and workshops the climate friendly actions the Park is taking.

Visitor Outreach

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

Death Valley staff recognize the many different audiences that visit the Park, including recreational and non-recreational park visitors, online “virtual visitors,” school-aged visitors, local and out of town visitors, Timbisha Shoshone tribe, 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.
 - Link climate change and National Parks preservation with actions like using mass transit and alternative forms of transportation.
 - Include Climate Friendly Park language in kiosks and other educational materials.
- Create and distribute previously produced information on climate change and its effects on National Parks in general and on your park in particular.
- Integrate climate change themes into interpretive programs.
 - Integrate Climate Friendly Parks program with school programs using educational kits, wayside exhibits, posters, etc. Look for opportunities to educate with resources like the Climate Change Wildlife and Wildlands Toolkit. For more information, visit: <http://www.globalchange.gov/resources/educators/toolkit>
- Create signs promoting the Park’s efforts to curb emissions.
 - Develop consistent messaging for recycling, idling, and emission reduction posters.
- 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!
- Create interpretive programs by integrating Climate Friendly Park information with school programs, wayside exhibits, posters etc.

- Incorporate climate friendly information into interpreter programs and talks.
- 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 a Do Your Part! kiosk in the visitor's center.
- Provide a link to the Do Your Part! webpage on Death Valley's homepage, newspaper, wireless splash, and Xanterra homepage.
- Forge successful partnerships with concessioners, Friends Groups, local environment groups, local tourism/community businesses, and local schools and universities to educate the public about climate change.
- Create demonstration projects and exhibits to convey park sustainability message to visitors.
- Engage citizen scientists and local community members in phenology monitoring.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding Death Valley 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:

- Connect with community and park partners on Climate Friendly Park efforts.
 - Build relationships with park concessioners, 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. Work with the surrounding community to address climate change.
- 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, Death Valley 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, Death Valley 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

Death Valley has a unique opportunity to serve as a model for over 600,000 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, Death Valley 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, Death Valley 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 Death Valley to the forefront of Climate Friendly Parks.

⁴ Death Valley: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>