
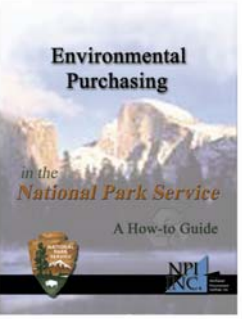






Pacific West Region's 100+ Best Management Practices

Defining What a Green Park Looks Like





ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
GREEN PROCUREMENT (GENERAL)		
Federal, NPS, and PWR Guidance	EO 13101 <i>Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition</i> , 1998; Section 6002 of the <i>Resource Conservation and Recovery Act</i> , 1976. <i>Environmental Purchasing in the National Park Service: A How-to Guide</i> May 2006.	
Green Procurement Plan	Develop a Green Procurement Plan or Affirmative Procurement Plan using the PWR or WASO model plan addressing preference for purchasing CPG and biobased products.	Encourage employees to take OFEE's online green purchasing training.
Before You Make a Purchase, Ask:	Is it really needed? Can the existing item be fixed? Can it be donated? Are renewable resources used in its production? Is it biodegradable? 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?
CPG – Comprehensive Procurement Guideline	Know the CPG* categories. When making a purchase, check to see if recycled content is available. Use RMAN (Recommended Materials Advisory Notice) for the % recovered content required. * federal purchasing requirements	Use values higher than RMAN.
Biobased Products	Farm Security and Rural Investment Act of 2002 (Farm Bill of 2002) creates a procurement program that will require federal agencies to purchase biobased products, unless those products are not reasonably available; fail to meet performance standards; or are available only at an unreasonable price.	
FAR	Become familiar with FAR part 23 "Environmental Requirements." Specifically, see part 1.101 through 1.102-4, part 23.4 "Use of Recovered Materials," part 23.7 "Contracting for Environmentally Preferable and Energy-Efficient Products and Services," part 23.8 "Ozone-Depleting Substances," and part 52.223-9 "Certification of Percentage of Recovered Material Content for EPA Designated Items Used in Performance of the Contract."	
Contract Language	Incorporate environmental considerations into all aspects of 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.	Set up local standards to meet your goals. Use electronic solicitation for bids.
Paper Purchasing (CPG Item)	30% PC content for printing and writing paper (mandatory).	100% post-consumer (PC) content, processed chlorine-free (PCF) copy paper.
Packaging (Styrofoam is under Waste Reduction)	Avoid products with excess or wasteful packaging. Is the packaging made of post-consumer (PC) recycled content? Is it recyclable? Reduced? DO NOT shrink wrap publications.	Is it reusable/refillable?
Computers and FAX/Printers	Must be Energy Star qualified. Purchase remanufactured toner cartridges. Purchase LCD monitors instead of CRT, which use less toxic substances.	Consider less toxic materials/components, recycled content, and recyclability.

(BMP) MORE ADVANCED	* REFERENCE	SUCCESS	✓ DATE
	PWR Solid Waste Coordinator: sonya_capek@nps.gov		
	PWR Directive 51 – Environmentally Preferable Purchasing Policy WASO Environmental Purchasing Handbook: http://pfmd1.nps.gov/EMP/hazmat/EMP_LIB/library_EPP.cfm		
Develop a preferred list of green products for purchase card holders.	PWR Environmental Purchasing Handbook: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3 OFEE's Online Green Purchasing Training for the Federal Community – www.usalearning.gov - "What is Green Purchasing, Anyway?" EPA's Buying Green with a Government Credit Card: www.epa.gov/oppt/epp/tools/creditcard.htm www.fedcenter.gov	Cabrillo NM, Lassen Volcanic NP, & Lava Beds NM created Green Purchasing Plans. Cape Cod NS developed an "Authorized List" of products with environmental attributes.	
Adapt a list of pre-purchase questions for your park.			
Go beyond recycled content as an environmental attribute. Other attributes may be more important (such as zero VOC paint for interiors, or certified wood over plastic lumber).	40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials www.epa.gov/cpg		
	www.biobased.oce.usda.gov		
	www.arnet.gov/far		
	PWRO Team Lead, Contracting: jamie_sherrill@nps.gov		
Processed-Chlorine Free paper. Consider alternative fibers (i.e., non-wood) and water-based or vegetable-based ink. Target paper reduction.	New Life DP (Cascade Fine Paper): 80% PC Aspen 100 (Boise-Cascade): 100% PC Harbor 100 (Grays Harbor): 100% PC Federal Network for Sustainability Paper Initiative: www.federalsustainability.org/initiatives/gfcp.htm	PWRO Oakland & Seattle offices use Boise Cascade Aspen 100 paper.	
Let vendors know your packaging preference.			
Reduce the printer-to-employee ratio by maximizing shared network printers.	www.energystar.gov www.epa.gov/oppt/epp/pubs/copiers/copiers.htm		

ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
SUSTAINABLE DESIGN/SPECIFICATIONS		
Resources	Purchase the <i>Green Spec Binder</i> . Review the manual <i>Greening Federal Facilities</i> (May 2001), GSA Green Lease Standards, Whole Building Design Guide specifications, and Alameda County Waste Management Authority Green Building Guides and Remodeler's Checklist.	Implement PWR Directive PW-048 <i>Sustainable Design and Construction Practices</i> .
Energy Efficiency Standards	Energy Policy Act of 2005 requires new Federal buildings to be designed 30% below ASHRAE standards. In addition, sustainable design principles are to be applied to new and replacement buildings. See ASHRAE publication "Advanced Energy Design Guide for Small Office Buildings."	
Lifecycle Assessment	Consider the cost of a product over its entire life, which includes the environmental impacts of resource extraction, processing, manufacturing, use, disposal, and transportation.	
Job Site	Protect native vegetation during construction. Minimize runoff, use mulches, and minimize heat island effect. Build on previously disturbed sites only. Do not bury construction debris.	
Building Sizing	Design efficient floor plans that maximize daylighting, energy efficiency, and effective site orientation.	
Structural Systems and Framing	If wood, optimize dimensions to match standard lumber sizes. Design on 2' modules to reduce waste. Place window and door openings on framing module. Less is more: use advanced framing (optimal value engineering, e.g., use 24" OC framing module, 2x sandwich headers instead of solid 4x or 6x beams, more insulation, and open corners and T-walls). Use shallow frost-protected footings. Use metal trusses, finger-jointed wood trusses, or I-joists for floors and roofs. Use engineered lumber products or steel for beams or headers. Use finger-jointed studs or engineered stud materials. Use recycled-content underlayment (50%), sheathing, or OSB. Use gypsum board made from recycled paper, or recycled cellulose fiber. Use structural insulated panel (SIP) walls or roof. Use insulated concrete form (ICF) walls or roof, or solid foam block system.	Utilize central cutting area to reduce waste and use smaller lengths. Install vapor-permeable house wrap. 
LEED - Leadership in Energy and Environmental Design	Incorporate feasible LEED standards into design. DAB projects must be assessed using LEED criteria.	Meet Certified or Silver LEED standards.
SUSTAINABLE BUILDING MATERIALS		
Product Selection	Buy locally produced materials (to save energy and reduce emissions from transportation). Choose products that are durable and can be reused or recycled. Avoid products with PVC, radon, molds, pesticides, HCFC foam insulation, and off-gassing. Choose materials that conserve resources (e.g., use by-products of other manufacturing processes; use smaller, faster-growing species of wood), and are energy efficient. Use salvaged timbers and decking. Use FSC certified wood.	
Low-Embodied Energy (Relative Energy Intensity of Materials by Weight)	Use products that last longer and require less maintenance. Consider products with low-embodied energy values: Lumber 1, brick 2, cement 2, glass 3, fiberglass 7, steel 8, plastic 30, aluminum 80.	Use concrete containing fly ash. Use concrete that uses soybean oil.
Composite/Plastic Lumber	Determine best product for application (e.g., docks, picnic tables, benches, boardwalks, decks, signs). Some options are ChoiceDek (wood fiber/plastic PET), Trimax (fiberglass/plastic PET), Durawood (plastic PET), Nexwood (plastic/rice hulls).	Consider certified wood products or reclaimed lumber over plastic lumber where appropriate (aesthetic concerns/structural needs).



(BMP) MORE ADVANCED	REFERENCE	SUCCESS	✓ DATE
	Environmental Building News Archives and Green Spec Directory: www.BuildingGreen.com http://inside.nps.gov/regions/custommenu.cfm?lv=1&rgn=PWR&id=661 -PWR Directive 48 www.stopwaste.org/fsbuild.html www.wbdg.org www.doi.gov/greening/buildings/qrbuid.html		
	www1.eere.energy.gov/femp/program/newconstruction.html www1.eere.energy.gov/femp/about/legislation_epact_05.html www.ashrae.com		
Use tools such as BEES to evaluate lifecycle costs.	Building for Environmental & Economic Sustainability lifecycle assessment tool: www.bfrl.nist.gov/oa/software/bees.html Athena Institute (LCA tool) http://athenaSMI.ca	Parks' use of plastic lumber requires less long-term maintenance.	
		Point Reyes Restroom was built on existing foundation.	
Make efficient framing part of a waste management plan for large construction projects.	www.toolbase.org www.buildinggreen.com	Rocky Mountains	
Meet Gold or Platinum LEED standards.	www.usgbc.org	Mount Rainier Visitor Center (Silver) Zion Visitor Center (Silver)	
	Environmental Building News & Green Spec binder: www.BuildingGreen.com http://athenaSMI.ca		
		Assateague Island, The Presidio, Rocky Mountains, Yosemite, Zion	
	www.unitedsoybean.org		
	ChoiceDek: www.choicedek.com Trimax: www.trimax-products.com Nexwood: www.nexwood.com	Fort Vancouver, Haleakala, Lake Mead, Lake Roosevelt, Mount Rainier, Olympic, Redwood, Whitman Mission	




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Certified Wood Products (CWP)	Specify CWP certified by the Forest Stewardship Council (FSC). Use FSC standards when selecting wood products.	Choose formaldehyde-free products.
Engineered Wood Products	Choose gluelam, OSB, wood I-joists, laminated-veneer lumber, parallel strand lumber, and laminated strand lumber. Use OSB with lower or non-formaldehyde adhesives to replace plywood for subfloors. Binders: urea releases the most formaldehyde; pheno is less and PMDI none, but PMDI is toxic at the point of manufacture. Particleboard: no more than 0.2 ppm formaldehyde, and plywood: no more than 0.3 ppm.	
Old Growth Wood Products	DON'T USE. Is clear, narrow-grained cedar or redwood siding really needed? Use laminated wood timbers instead of old growth. Don't buy tropical hardwoods unless reliably documented that the wood is from well-managed forests.	Use reclaimed wood.
Pressure-Treated Wood	Don't use wood with hazardous chemicals, particularly arsenic (CCA, ACC, ACA, CZC, ACZA). Most pressure-treated woods are restricted by environmental concerns. Prevent soil contact and rot. Protect workers from handling, don't cut or clean over water, and NEVER burn scraps.	Use environmentally safer treatment (i.e., arsenic- and chromium-free, such as ACQ, copper naphthenate or copper boron azole), or plastic lumber instead.
Paint (CPG Item)	<ol style="list-style-type: none"> Latex – Exteriors: Use minimum 20% PC recycled content or low-VOC (under 100 g/L flat, 200 g/L non-flat) Latex – Interiors: use no- or low-odor, non-toxic, low-VOC (under 50 g/L flat, 100 g/L non-flat) Oil-based: use ONLY where essential (e.g., ships). Keep looking for alternatives. Avoid paint containing heavy metals and toxic organic substances listed in the Green Seal standards. Ventilate while painting and air out before occupying.	For recycled content, look for a higher PC content and the lowest VOC emission available. For latex, look for no VOC's. Use light colors indoors to increase light reflection and reduce the amount of light that must be produced for the space.
Exterior Wall Finish	Use locally produced block or brick. Use recycled-content fascia, soffit or trim, OSB, or w.p. gypsum board. Use engineered wood sub-fascia, soffit or trim, or OSB. Use recycled-content siding or fiber cement siding material.	
Doors and Windows	Use recycled-content doors with the least toxic binders. Use Energy Star-qualified windows and doors. Exterior doors and windows should have an NFRC U-Factor of 0.35 or lower, and Solar Heat Gain Coefficient of 0.45 or lower. Windows should be low-e (emittance). Use exterior shading devices and interior window treatments.	
Roofing	Choose and Energy Star qualified roof – Use reflective roofing or light colors to reduce cooling needs. Use recycled content roofing when applicable and a minimum 30-year lifespan. Use roofing material weighing less than 350 lbs./100 sq. ft. to reduce roof mass. Use recyclable roofing materials (e.g., metal, or wood fiber and concrete, or plastic).	Consider integrating roofing insulation, cooling load avoidance, and moisture-control detailing for all jobs. Specify non-halogenated and reflective roof membranes, recyclable roofing (TPO), and non-ozone-depleting roof insulation.
Insulation (CPG Item)	Use insulation with the high R-values appropriate for the location (see Energy Star link to the right). Use insulation with a minimum CPG recycled content for each material. Consider cellulose insulation with UL-rated fire retardant. Use CFC- and HCFC-free rigid foam or spray plastic foam insulation.	Take CFC-based foam insulation to a recycler who can capture CFC's.
Cabinetry and Trim	Use formaldehyde-free adhesives in cabinetry and trim. Make sure exposed particleboard containing formaldehyde is sealed with water-based blocking finish. Cabinet finishes should have 50 g/L or fewer VOC's. Use finger-jointed or engineered wood trim. Any tropical hardwood trim or casework should be FSC.	Use alternative materials (e.g., biobased), recycled wood, medium density fiberboard, domestic wood.
Floor Coverings: Non-Carpet (CPG Item)	Use natural linoleum with low-toxic adhesive or backing, ceramic tile with low-toxic mastic and grout, rubber with high recycled content, finished concrete (colored, stained, textured, scored), or cork or FSC bamboo, depending on level of use.	Use adhesives specifically formulated for each material.


(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	www.certifiedwood.org – database of certified wood SmartWood www.smartwood.com	North Cascades- Hozomeen The Presidio	
	Green Seal Report: <i>Particleboard and Medium-Density Fiberboard</i> , Oct. 2001 www.greenseal.org	The Presidio	
	www.ecotimber.com	The Presidio	
	ACQ Preserve products: www.treatedwood.com/products/preserve www.healthybuilding.net	The Presidio created a policy banning the use of CCA.	
	Kelly Moore E-Cote Paint www.kellymoore.com AFM Safecoat www.afmsafecoat.com Miller Paint www.millerpaint.com NPS <i>Environmentally Responsible Paint Options</i> , Nov 2002 http://pfmd1.nps.gov/EMP/hazmat Green Seal Report: <i>Architectural Paints</i> , Dec. 1999. Green Seal sets green labeling standards for paints (GS-11) and anticorrosive paints (GS-03) www.greenseal.org	Fort Vancouver, North Cascades, The Presidio, Yosemite Channel Islands uses a non-toxic bottom paint for their boats.	
	www.energystar.gov		
	Specify recycling of old roofing (e.g., Armstrong Tiles). Integrate rainwater harvesting into roof design. Consider a green roof. Consider using the roof for photovoltaics.	"Low-Slope Roofing: Prospects Looking Up," <i>Environmental Building News</i> , Vol. 7, No. 10, November 1998. www.BuildingGreen.com Energy Star Roofing Products www.energystar.gov	
	Energy Star Recommended Levels of Insulation . See www.epa.gov/cpg for Recommended Recycled Content % for various insulation materials.		
	Neil Kelly Signature Cabinets: www.neilkelly.com/cabinets www.certifiedwood.org – database of certified wood www.unitedsoybean.org www.BuildingGreen.com www.ecotimber.com		
	See NPS <i>Sustainable Flooring Options</i> , March 2003 www.earthwisefloors.com www.built-e.com www.stratica.com	Joshua Tree uses TerraGreen tiles. The Presidio uses reclaimed wood, bamboo, and finished concrete.	




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Floor Coverings: Carpet (CPG Item)	Residential – Consider recycled PET. Commercial – Use nylon face fiber with some PC content and reclaimed backing, or no backing (Mohawk). Use carpet tiles for some applications. Let carpet air out before and after installation. Use recycled-content carpet pad. Look for PVC-free backing. Look for Carpet & Rug Institute's IAQ "Green Label." Regularly clean and maintain. Use mats at entrances.	Recycle existing carpet. Select products with binders and adhesives with no-/low-VOC emissions. Look for 100% recycled content cushion or backing. Look for biobased adhesives using polyurethane or polyol derived from soybean oil.
Finishes and Adhesives/Indoor Air Quality (IAQ)	Control moisture and leaks to avoid molds and mildew. Keep the building dry. Interior paints, finishes, sealants, and adhesives should contain no more than 20 g/L VOC. Use only low-toxic mastics, sealants, and solvent-free adhesives. Use adhesives and sealants with no formaldehyde or heavy metals. Use water-based urethane finishes on floors and water-based lacquer finishes on woodwork. Use carpeting and pad tacked or taped, not glued, or use water-based adhesives. Avoid products that offgass such as particleboard, carpet, paint, and adhesives. If use is necessary, air out before occupancy.	Reduce unplanned air flows. Provide exhaust ventilation for stationary pollution (copiers, printers, restrooms, etc.). Educate designers, builders, and building occupants. Use soy-based adhesives.
Furnishings	Use salvaged or reconditioned furnishings. If new, choose high recycled content, no/low VOC's, and/or certified wood. Allow daylight to penetrate space. Modular units come in reclaimed units, composite woods, natural fibers, and low-VOC levels.	Choose those that have future adaptability.
WASTE REDUCTION: WASTE PREVENTION, RECYCLING, COMPOSTING		
Construction Waste Management/Plan and Job Site Recycling	First practice source reduction. Then reuse 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. Test for lead and asbestos where needed. Don't reuse old fixtures, windows, toilets, etc. that are not energy efficient, unless there is historic value. 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. Make sure contract language addresses waste plan/recycling. Check on "take-back" policies (e.g., ceiling tiles, cardboard, carpet, drywall).
Deconstruction	Building materials should be reduced, reused, and salvaged in that order. Don't salvage inefficient materials or components. Make sure reuse of vintage items represents an environmental gain.	Specify materials recovery (reuse and recycling of materials and components) in both building-removal bidding and in property-redevelopment process.
ISWAP-Integrated Solid Waste Alternatives Plan	Develop a written recycling plan for employees and visitors. Look at the <i>Servicewide Solid Waste Management Handbook</i> to see whether you need an ISWAP. Submit for funds under the Environmental Management Program budget call.	
Correspondence, Paper Use, File Management	Establish standards for double-sided printing and copying, office supply reuse, electronic correspondence procedures, electronic file storage, elimination of colored paper, etc.	Incorporate source reduction into every practice. Eliminate reading and central files.
Computers and Electronics	Donate old equipment to schools, senior centers, etc. Recycle unusable computers and electronics. Do not landfill.	Reduce the overall number of printers and faxes – maximize network printers.
Waste Materials: General	Recycle cardboard, aluminum, scrap metal, glass, white paper, and no. 1 PET and 2 HDPE plastics. Monitor to prevent contamination (small amounts of one plastic can damage equipment used to recycle other plastics).	Add mixed paper, tin, other plastics (including film), and pallets, if local market permits. Find reuse opportunity or donate unwanted items.
Waste Materials: Beverage Containers	Oregon, California, and Hawaii have bottle bills in the PWR – Consider collecting bottles with deposits to get the deposit refund.	Sell only beverage containers that can be recycled locally. Work with concessionaire.



(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
Use a flooring material other than carpet! (e.g., linoleum, recycled-content rubber, and wood products)	See NPS <i>Environmentally Responsible Carpet Choices</i> , Oct. 2005. EPA <i>Greening Your Purchase of Carpet</i> , 2006: www.epa.gov/oppt/epp/pubs/carpet/carpets2.htm Green Seal Standards www.greenseal.org www.carpet-rug.com www.interfaceflooring.com Cool Carpet Program	Lake Roosevelt, Lassen Volcanic, North Cascades, Olympic, The Presidio, USS Arizona	
	<i>Building Air Quality: A Guide for Building Owners and Facility Managers</i> , EPA 402-F-91-102, www.epa.gov/iaq ASHRAE Standards 62-1989 and 55-94 for ventilation, temperature, and humidity. www.ashrae.org www.unitedsoybean.org www.healthybuilding.net		
	Ecowork by Studio eg: www.studioeg.com www.greenatworkmag.com		
	PWR Solid Waste Coordinator: sonya_capek@nps.gov		
Grind drywall (use as soil amendment), wood (chips for erosion control), concrete, and masonry on-site for reuse. Make efficient framing part of a construction waste management plan.	www.metrokc.gov/procure/green/wastemgt.htm www.epa.gov/epaoswer/non-hw/debris-new www.ciwmb.ca.gov/ConDemo www.stopwaste.org Construction Waste Management Database: http://test.wbdg.org/tools/cwm.php?u=5 PWR Construction Waste Specifications: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3	Mount Rainier, The Presidio, Rocky Mountains, Yosemite	
Provide a time benefit to offset time or cost penalty to deconstruct. Design for deconstruction: reuse, recycling, and reprocessing of components.	"Deconstruction: Back to the Future for Buildings?" <i>Environmental Building News</i> , Vol. 9, No. 5, May 2000. www.BuildingGreen.com Building Materials Inventory Form www.nahbrc.org Used Building Materials Association www.ubma.org	The Presidio, Rocky Mountains, Yosemite	
	<i>Servicewide Solid Waste Management Handbook</i> , 1996. PWR Environmental Management Program: http://inside.nps.gov/regions/region.cfm?rgn=566&lv=3	Intermountain Parks Pacific West Parks	
Institute paperless office practices.	<i>PWR Green Office Practices Guide</i> , May 2003: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3		
Practice cradle-to-grave recycling to ensure toxic components are properly managed. Purchase electronics with less toxic components.	Computers for Learning www.computers.fed.gov NPS/Dell Take-Back Agreement: www.nps.gov/propertymanagement PWR Electronics Disposal Guidance: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3	Yosemite, Joshua Tree, Lake Roosevelt, and North Cascades have recycled electronics through Dell.	
Look into cooperative waste disposal or recycling to increase volume and reduce costs/traffic. Investigate composting to increase diversion rate.		All PWR parks recycle at least one material. Yellowstone partners with cooperative county recycling. NOCA composts plant and tree waste, food scraps.	
	www.bottlebill.org		




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Styrofoam/Food Serviceware	Eliminate use of styrofoam. Use biodegradable cornstarch utensils (Earthshell) and biodegradable foam "peanuts." Some styrofoam can be taken in for reuse at UPS Stores, or local businesses who ship items.	
Green Hotel Standards	Develop waste reduction standards for hotels. Ensure that all lodges use water savings information cards about washing sheets and towels. Choose non-rigid recycled-content or biodegradable food packaging.	Provide staff training.
Hand Dryers	Choose air hand dryers over paper towels.	
"Special" Wastes	Look for a place to recycle pallets, scrap metals, tires, etc.	
Composting	Establish simple green yard waste recycling. Provide small-scale worm bins for residential food waste. 	Investigate food composting with residents or concessionaire.
Trash and Recycling Containers	Purchase containers with recycled content. Place trash and recycling containers next to each other. Evaluate your signage; use graphics. Make sure containers fit environment (e.g., animal-proof, rust-proof/salt air -resistant/moisture resistant, and proper size).	Centralize containers (remove from individual sites). Determine if you need multi-lingual signs.
Education Programs	Develop a Junior Ranger program for recycling and habitat preservation. Include waste prevention messages in talks. Provide recycling messages in brochures, trail guides, maps, and posters. Use at waysides, campground display boards, and kiosks. For concessions, include waste reduction tips with hotel reservation forms. Use soy-based or water-based inks. Describe environmental successes on your home page.	Work with local businesses, schools, and community to prevent waste before it enters park, and to reduce litter.
LIGHTING AND ENERGY CONSERVATION		
Light Pollution Sources: NPS, Concession, Visitor, External	Develop plans to minimize or eliminate light pollution in the Statement of Park Management, the GMP, and RMP. Eliminate unnecessary lights. Carefully match outdoor lighting levels with application. Educate staff and visitors/partners to change practices causing light pollution. Sensitize them to the benefits of dark night skies. 	Enforce light limits. Shield light sources with directional devices to prevent light pollution. Add controls to turn lights off/on with motion sensors.
Building Siting	Orient buildings to maximize passive solar energy and natural ventilation. Use north wall design that minimizes heat loss.	Use LEED standards.

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	EPA <i>Greening Your Purchase of Food Serviceware</i> , Dec. 2001. www.epa.gov/oppt/epp www.earthshell.com www.theupsstore.com	Statue of Liberty concessions sort, clean, and recycle styrofoam.	
	Green Seal Report: <i>Rigid Quick Serve Food Packaging</i> , May-June 1999. The Chinnet Company www.us.huhtamaki.com EarthShell Corp www.earthshell.com Insulair Inc. www.insulair.com www.greenhotels.com	Grand Tetons, Mount Rainier, Olympic, Yellowstone. Yosemite's Concessioner created "The Green Path."	
	Xlerator Dryer uses 80% less energy than other hand dryers www.exceldryer.com	Craters of the Moon, Point Reyes, Olympic	
Investigate biosolid or septage composting.	Earth Tub: www.gmt-organic.com www.mastercomposter.com www.magicworms.com www.compostingcouncil.org	Lake Mead composts fish waste with local utility. Yellowstone composts through a cooperative county operation. North Cascades composts horse manure and plant waste. PWRO Seattle composts food waste in a worm bin.	
Institute pack-in/pack-out trash policy.	McClintock www.mcclintockmetal.com		
		City of Rocks created a Traveling Trunk on waste. Lake Mead has community outreach on littering. North Cascades and Olympic created children's recycling guides and weatherproof bulletin board messages.	
	EO 13123 <i>Greening the Government Through Efficient Energy Management</i> , 1999. PWR Directive 47 – Energy Management and Water Conservation PWR Energy Coordinator: steve_butterworth@nps.gov		
Work with those who generate light pollution outside park boundaries to modify/re-engineer intrusive light sources. Help develop local ordinances to control intrusive light pollution impacting parks and visitors.	<i>Lighting Retrofit Workbook</i> : http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3 PWR Dark Night Sky Program: http://inside.nps.gov/regions/region.cfm?rgn=310&lv=3 International Dark Sky Association: www.darksky.org Yellowstone Lighting Guidelines: http://inside.nps.gov/regions/region.cfm?rgn=310&lv=3	New Mexico Parks helped develop state regulations regarding dark night skies. Pinnacles and Ebey's Landing have local light ordinances. Sequoia Kings Canyon, Grand Canyon use shielded lighting.	
	www.usgbc.org Low-energy building design workshops: www.sbcouncil.org		





ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Building Design/Solar Energy	Use light-colored roofs and pavement to minimize heat island effect. Maximize insulation and minimize infiltration of building envelope. Use appropriate window glazing. Choose glazing with low solar heat gain in southern climates. Use wall shading. Seal and insulate ductwork. Incorporate natural cooling in design.	Use air movement techniques and desiccant dehumidification (latent heat removal is preferred). Use active solar system (e.g., water heating and photovoltaic power). When reroofing, switch to a protected-membrane system.
Daylighting	Use natural daylight strategies to reduce lighting energy use and cooling requirements. Use dimming electronic ballasts and control banks of luminaires along window walls that are separate from interior lights.	Bring daylight in high, bounce off surfaces, filter with vegetation and architectural components, and integrate with electric lighting and HVAC systems.
Fixtures: Lighting	Install LED EXIT signs. 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 lightbulbs with Compact Fluorescent Lightbulbs (CFLs) where appropriate. (Do not use CFL in outdoor cold areas.) Install occupancy sensors. Promptly replace fluorescent lamps that strobe or have blackened ends. Buy low-mercury products. Always transport and store fluorescent lamps horizontally.	Lower the ratio to one watt/square foot or less in general office space. A combination of motion and heat-detecting sensors may work best. 
Fixtures: Heating and Cooling	Use ceiling fans. Set thermostats at reasonable temperatures. Install programmable electronic thermostats and timers.	Consider paddle fans in high ceilings.
Woodstoves and Fireplaces	Replace old stoves with new ones meeting EPA New Source Performance Standards (NSPS); must have catalytic converters.	
Electric Motors and Heating/Cooling Systems	Check loads, install electronic motor controls. Ensure HVAC systems are in "setback" mode during unoccupied periods. Check for moisture or indoor air quality problems. Install heat pumps, and heat recovery and tankless water heaters. Insulate hot water pipes to R-4 or better. Provide proper maintenance!	Downsize HVAC equipment as a result of reduced heating or cooling loads. Optimize for part-load conditions. Replace systems with photovoltaic-battery system. Ventilate according to ASHRAE Std. 62. Consider rooftop solar water-heating when re-roofing, and heat-recovery (e.g., ventilators) when rehabilitating. Replace with more efficient, ozone-safe systems.
Appliances	Reduce hot water temperature to 120° F (reducing below 120° F may allow bacteria to grow inside hot water tanks). Buy an Energy Star-qualified front-loading clothes washer. Choose electronic ignition for gas dryer and range. Choose an appropriately-sized Energy Star-qualified refrigerator and dishwasher.	Replace conventional garbage disposals with pulpers. Install an on-demand water heater or a 4-6 gallon heater for facilities without the need for large water heaters.
Office Equipment	Must be Energy Star qualified. Laptops use less energy. Activate energy management features. Screen savers DO NOT save energy (Activate sleep/hibernate settings or manually turn off). Turn-off equipment when not in use. Use LCD monitors instead of CRTs.	Ink-jet and bubble-jet printers use less energy than laser. Use direct computer faxing or e-mail (copiers use more energy than any other office equipment).
Financing	Inquire about Energy Savings Performance Contracts, Utility Incentive Programs, and Green Power Purchasing through the Regional Energy Program Coordinator, Steve Butterworth.	


(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
Heat and cool by non-fossil fuel sources (100% renewable power). Use photovoltaic or hydrogen-source fuel cells. Consider removing power lines and substations.	www.ornl.gov/roofs+walls www.energystar.gov http://ateam.lbl.gov/publications.html BPA's NPS Solar Power Metering Website: www.bpa.gov/energy/n/tech/EEMeteringData/Federal/Federal.cfm?Group=Federal_NPS www.eere.energy.gov/RE/solar.html	PV Systems: Channel Islands, Joshua Tree, Point Reyes, Santa Monica Mountains, Redwood, Yosemite, Whitman Mission, Mount Rainier, San Juan Island, Whiskeytown, John Day Fossil Beds, Cabrillo. See BPA Website.	
Assess light pipes, light shelves, fiber optics, tracking daylight apertures, and other advanced techniques.	www.nrel.gov/buildings_thermal www.daylighting.org www.pge.com/pec/daylight	 Whiskeytown	
Upgrade lighting system when HVAC is upgraded. 	Green Seal Reports: <i>Compact Fluorescent Lighting</i> , Nov.-Dec. 1998. <i>Occupancy Sensors</i> , Feb. 1997. www.greenseal.org www.energystar.gov www.eere.energy.gov Residential Lighting Guide and Lighting Retrofit Workbook: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3		
	EO 12902 <i>Energy Efficiency and Water Conservation at Federal Facilities</i> , 1994. Green Seal Report: <i>Room Air Conditioning</i> , Summer 1999. www.greenseal.org	Whitman Mission uses a blend (B20) of biodiesel and heating oil to heat the park's maintenance shop and warehouse.	
	EPA's New Source Performance Standards: www.epa.gov/Region7/programs/artd/air/nsps/nsps.htm	Yosemite	
Consider air over evaporative water tower cooling systems for air conditioning systems. Use recycling systems if cooling towers used. Replace systems with fuel cell or biomass-fired (boilers). Use ground source heating systems.	www.eere.energy.gov/femp www.esource.com www.ashrae.org www.energystar.gov Energy Efficient Products Model Contract Language: www.eere.energy.gov/femp/procurement/eeep_model_lang.cfm	Joshua Tree Cottonwood Zion visitor center	
	www.energystar.gov www.eere.energy.gov/consumer/tips Energy Efficient Products Model Contract Language: www.eere.energy.gov/femp/procurement/eeep_model_lang.cfm	Olympic installed "Instant-Flow" on-demand water heaters and replaced 40 gallon water heaters with 6 gallon water heaters.	
Reduce the number of printers at each desk – Maximize the use of network/shared printers and fax machines.	EPA <i>Greening Your Purchase of Electronics</i> , Dec. 2001, and EPA <i>Greening Your Purchase of Copiers</i> , Dec. 2001. www.epa.gov/oppt/epp www.energystar.gov		
	Check with: steve_butterworth@nps.gov www.epa.gov/greenpower www.eere.energy.gov/femp	Lewis & Clark, John Day Fossil Beds	




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Education on Simple Practices	Educate employees on turning off lights; closing windows and doors; weather stripping; turning off computers, etc.; washing and drying full loads of laundry; and using soaps that perform at lower temperatures.	Assess employee transportation patterns; encourage carpooling or provide incentives.
EQUIPMENT AND GENERATOR USE		
Noise Sources: NPS/Concessions -Maintenance equipment & practices -Leaf blowers, hedge trimmers, weed whackers -Lawnmowers -Chainsaws, etc. -Vehicles (cars, trucks, buses, snowmobiles, aircraft, watercraft, motorcycles) -Air conditioners, heaters -Loudspeakers (music or voice) -Sirens -Generators	Minimize noise. Turn off motors when not using; no idling. Shield sources with noise attenuation devices. Review maintenance plans.  4-stroke engine	Assess practices, equipment, and times and seasons of use to see where noise can be eliminated. Educate park staff/concessionaires to change behavior or practices causing noise. Sensitize them to natural sounds.
Noise Sources: Visitor -Vehicles -Generators -Radios/Music -Loud voices, etc.	Educate visitors to change behavior and/or practices causing noise. Sensitize them to natural sounds.	Move noise generation or affected resources/people geographically.
Noise Sources: External Operations -Aircraft overflights -Traffic -Other urban noises -Mining/landfill operations -Land development	Educate external partners to change their behavior and/or practices causing noise.	Work with those who generate noise to modify or re-engineer the intrusive noise source to reduce decibel levels and impacts on park resources and visitors.
Equipment	Convert gasoline-powered lawnmowers, hedge trimmers, leaf blowers, weed whackers, etc., to electric. Use push mowers and hand tools on small projects. Convert 2-stroke engines to 4-stroke.	Use biobased lubricants and fluids.
WATER QUALITY AND CONSERVATION		
General	Conduct a water audit. Educate employees on simple water-conserving practices. Set up a leak reporting system. Wash vehicles at commercial location; if can't, set up recycling wash stations in the park to recycle the water and reduce pollution.	Perform annual leak detection surveys.
Grounds Maintenance (see also Grounds and Landscaping)	Use drought-tolerant grass and native plantings. Grasscycle (leave mowed clippings in place to fertilize). Don't water during the hottest time of day. Don't use fine spray sprinklers. Don't overwater. 	Mow less grass. Maximize permeability of surfaces to allow site to absorb water. Use rain catchment techniques.

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	www.fedcenter.gov	Lake Mead	
	PWR Air/Noise Coordinator: judy_roccio@nps.gov		
Develop plans to minimize or eliminate noise generation in the Statement of Park Management, and in the GMP and RMP. Generate permit requirements to prevent/limit/regulate noise-generating activities under 36CFR1.6.	DO-47 <i>Soundscape Preservation and Noise Management</i> www.naturesounds.org 36CFR 1.6 "Regulation on Permit Requirements" 36CFR Ch.1, Sec. 2.5.1 "Snowmobiles" 36CFR Ch.1, Sec. 3.7 "Boats" Green Seal Report: <i>Lawn Care Equipment</i> , June-July 1998. www.greenseal.org 	Joshua Tree replaced generators with PV systems – at Cottonwood, Lost Horse Ranger Station, the amphitheater, the water pump, etc.) Lake Mead uses quiet planes. Yellowstone converted their snowmobiles to 4-stroke. Olympic replaced the generator at Staircase with a micro-hydro unit. Mojave replaced two generators at Hole-in-the-Wall and Zzyzx with PV. Mt Rainier replaced White River's generator with PV.	
Enforce noise limits of 36 CFR 2.12 or other relevant NPS noise regulations. Generate closures under 36 CFR 1.5.	DO-47 <i>Soundscape Preservation and Noise Management</i> 36 CFR Ch.1, Sec. 2.12 "Audio disturbances" 36 CFR Ch.1, Sec. 2.5.1 "Snowmobiles" 36 CFR Ch.1, Sec.3.7 "Boats" 36 CFR 1.5 "Closures and public use limits"	Zion reduced visitor vehicle traffic by providing propane-powered shuttle buses.	
Help to develop local ordinances to control intrusive noise generation impacting parks.	DO-47 <i>Soundscape Preservation and Noise Management</i> Check local noise ordinances.	Grand Canyon Aircraft Overflights Rule. Rocky Mountain Air Tour Overflights Ban.	
Design and maintain natural plantings/vegetation that do not need pruning, etc.	California Air Resources Board www.arb.ca.gov www.unitedsoybean.org www.bioblend.com www.greenpluslubes.com www.biobased.oce.usda.gov www.soybiobased.org/bestpractices	PWR policy to convert from 2-stroke to 4-stroke engines as equipment is replaced.	
	PWR Water Conservation Coordinator: steve_butterworth@nps.gov PWR EMP Coordinator: steve_mitchell@nps.gov		
Install leak detection devices.	www.h2ouse.org www.awwa.org/waterwiser www.epa.gov/region9/water/recycling		
Xeriscape: Install native and/or drought-tolerant plants that require no watering other than what occurs naturally.	www.epa.gov/greenacres/wild.html http://plants.usda.gov www.ciwmb.ca.gov/organics/Xeriscaping www.baileyseed.com – Water Warden Drought-Tolerant Grass Seed	Fort Vancouver, The Presidio 	




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Plumbing/Fixtures	Maximum flow rates: 1.6 gal flush for toilets, 2.0 gal/minute for lavatories and showers. Buy water-conserving showerheads (1-2.5 gpm), faucets, faucet aerators, toilets, and urinals. Insulate piping. Fix leaks! Adjust the flush valves in gravity toilets and install refill diverters. Use dual-flush adapters. Choose waterless urinals, but first check sewer system flow needs.	Install individual facility water meters. Install electronic controls for faucets, toilets, and urinals. Choose self-contained drinking fountains and adjust the temperature to 70° F vs. 65° F. Consider composting toilets.
Point Source Wastewater	Inventory maintenance wastewater sources and discharge routes. Practice good housekeeping! Use non-chlorinated chemicals, bleach-free, non-phosphate, non-toxic, and biodegradable dishwashing and laundry detergent and cleaners. Never discharge unknown liquids down the drain (e.g., low/high pH, oily and solvent wastes, fuels, antifreeze). Plug floor drains. Label all storm drains and catch basins. Check state requirements.	Clean vehicles and equipment off-site where appropriate. If on-site, pre wipe components, use closed-loop systems. Recycle and reuse water through vehicle wash systems.
Non-Point Wastewater	Prevent pollution and use green products. Keep storm drains clean. Clean up spills but do not hose into streets. Dispose of pesticides and tank rinsate properly. Check state and local requirements.	Use watershed approach: EPA Index of Watershed Indicators to rate water quality.
Storm and Groundwater Management	Lay out surface parking lots to allow for sheet-like drainage to infiltration and bioremediation strips/swales. Minimize changes to topography. Provide warning labels on drains and catch basins. Maintain and clean grease traps and oil and water separators. Use permeable paving materials and permeable vegetated materials for roads and walks, curbless design, and porous gutters. Drain surface runoff into soil.	Use bioengineering for treatment of runoff and sediment control. Comply with National Pollutant Discharge Elimination System. Use permeable paving.
GROUNDS AND LANDSCAPING		
Groundcovers and Plantings (Mulch is CPG Item)	Choose a groundcover/grass that uses less water and mowing. Grasscycle (leave clippings in place). Use less fertilizer and pesticide. Use non-toxic termite treatments. Plant trees on east and west sides of building to reduce cooling loads. Hedgerows, windrows, and shrubbery can block winter winds, channel cool summer breezes into buildings, and lessen microclimatic impact of solar radiation absorption of dark surfaces. Use mulches and drip irrigation.	Xeriscape: Install native and/or drought-tolerant plants that require no watering other than what occurs naturally. Compost green waste. Use organic fertilizers. Use integrated pest management (IPM) techniques.
Materials (CPG Items)	Use hoses, mulch, edging, timbers, posts, and compost with recycled content.	
HAZARDOUS WASTE/POLLUTION PREVENTION		
Ozone-Depleting Substances (ODS) and PCB's	Eliminate the use of products that use CFC's and HCFC's as blowing agents, and HVAC systems that use CFC's and HCFC's as heat transfer agents. Check with state on ODS requirements.	Ensure appropriate handling, servicing, and tracking of equipment containing such substances. Look for non-halon fire suppression systems.

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	EO 12902 <i>Energy Efficiency and Water Conservation at Federal Facilities</i> , 1994. www.epa.gov/owm/water-efficiency/ Waterless Company www.waterless.com www.compostingtoilet.com www.falconwaterfree.com www.kohler.com Solar Powered Sensor Faucet www.sloanvalve.com www.eere.energy.gov/femp/technologies/water_efficiency.cfm	Channel Islands, Joshua Tree, Craters of the Moon, Olympic, Whitman Mission use waterless urinals. Kaloko-Honokohau, Redwood, Yosemite use composting toilets. Sequoia Kings Canyon uses low-flow toilets.	
Where legal, separate and reuse graywater (water from bath sinks, showers, tubs, and laundry) for irrigation. Make sure filters are cleaned and system properly maintained. Harvest rainwater for irrigation but do not connect roof drains, downspouts, or patio runoff to graywater system. Collect roof runoff for other uses. Treat blackwater with on-site system.	National Pollution Discharge Elimination System (NPDES) permitting program: www.dwr.water.ca.gov	Haleakala reuses wastewater for non-potable toilet flushing.	
	<i>Clean Water Act</i> , Section 319 EPA Index of Watershed Indicators www.epa.gov/iwi www.epa.gov/owow/nps http://cfpub1.epa.gov/npdes		
Conduct a stormwater analysis/plan and quantify pollutants. Consider green (vegetated) roofs. 	www.greenroofs.com www.forester.net/sw_0203_green.html 	Assateague Island uses a crushed shell parking surface. Joshua Tree uses a non-toxic trail soil stabilizer called "Stabilizer Solutions."	
	Executive Memorandum: "Environmentally and Economically Beneficial Practices on Federal Landscaped Ground," 1994.		
Conduct water audits. Make all surfaces permeable for rainwater absorption. Restore habitat on site.	www.asla.org Contact your local Agricultural Extension Office. Contact your IPM Coordinator. www1.nrintra.nps.gov/brmd/invasivespecies/ipm www.epa.gov/greenacres/wild.html http://plants.usda.gov www.ciwmb.ca.gov/organics/Xeriscaping www.baileyseed.com – Water Warden Drought-Tolerant Grass Seed www.epa.gov/cpg		
	PWR HazMat Coordinator: steve_mitchell@nps.gov Regional Model P2 Plan.	The Presidio	
Verify contractors' and concessions' appropriate management. Develop capital equipment plans to eliminate ODS.	EO 12843 <i>Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances</i> , 1993. www.ari.org		




ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Oil and Coolant (see also Vehicles)	Use laundering service for oil rags. Use plastic spill containment pallets for storage of oil product containers. Use buckets at diesel receiving station to prevent drips and leaks during unloading from fuel trucks. Properly label and store. Recycle all used oil. Check state requirements.	Recycled used oil and purchase re-refined oil in a closed loop system.
Solvents (see also Air Quality)	Practice source reduction first! Avoid solvent-based finishes, adhesives, particleboard, carpet, and other VOC-releasing products. Seek out non-toxic, water-based products (e.g., non-solvent, citric-based products). DO NOT use halogenated solvents. Characterize spent solvents and wastewater. Provide proper storage, labeling, and containers. Check state requirements.	Reduce, reuse, recycle, substitute, or eliminate solvent use. Provide add-on controls such as ventilation, covers, and refrigeration freeboard coils to existing vapor degreasers.
Paints (see also Paints in Sustainable Building Materials)	Store paints and solvents in airtight containers. Use paintbrushes rather than sprayers. Do not buy aerosol paints. Do not use oil-based paint unless essential (e.g., some boats). Characterize paint waste before disposal. Buy only what is needed, but recycle leftover paint. Choose low-VOC paint.	Lighter-colored paints tend to have lower VOC content. Avoid paint containing heavy metals and toxic organic substances listed in the Green Seal standards.
Fluorescent/HID Bulbs and PCB Ballasts	Manage all mercury-containing lamps as universal waste. Mail in pre-purchased packages for recycling.	Use lights with lower levels of mercury and which are less hazardous (T8 or T5).
Batteries	Manage Ni-Cads and small, sealed lead-acid as universal waste. Dispose of alkaline batteries in one's and two's in the trash. Store in dry, moderate temperature. Do not stockpile. Switch off battery-powered equipment when not in use. Determine state and local regulatory requirements.	Recycle all battery types. Use rechargeable batteries, preferably solar powered.
Disposal	Find ways to reduce your use of hazardous materials. Do not mix hazardous waste with used oil. Seek out recycling over disposal.	
FLEET MANAGEMENT AND ROADS		
Park and Concessionaire Vehicle and Fleet Use	Reduce vehicle miles traveled (VMT) by encouraging carpooling, walking, or bicycling. Promote telecommuting. Match vehicle <i>size</i> to needs and use (e.g., do you really need an SUV?) Convert 2-stroke to 4-stroke engines for boats and snowmobiles. Institute a no idling policy.	Purchase alternative-fueled (natural gas, EPS), electric, or hybrid vehicles, or vehicles with the best fuel economy. Conduct a fleet study in the park to identify ways to downsize fleet.
Visitor and Tour Operator Vehicle Use	Reduce vehicle miles traveled (VMT) by encouraging carpooling, walking, or bicycling. Investigate and encourage the use of alternative-fueled vehicles for tour operators.	Provide shuttle buses. Provide incentives for use of alternative-fueled vehicles, like reduced entrance fees.
Off-Road Vehicle Use	Reduce particulate matter using dust control (e.g., water) and speed limits.	When purchasing new, buy low emission equipment. Use biobased and synthetic lubricants.
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.
Retread Tires (CPG Item)	Purchase retreads on park-owned vehicles. When leasing a vehicle, work with GSA to get retreads.	
Fleet Maintenance	Keep vehicles in top mechanical condition: rotate tires every 5000-miles, check tire pressure, don't top off tank, get regular tune-ups.	

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	www.safety-kleen.com www.ac-rerefined.com	Yosemite	
	Solvent Alternatives Guide http://clean.rti.org www.metrokc.gov/procure/green/bul77.htm www.envicareusa.com		
	www.greenseal.org www.wbdg.org PWR Environmental Paint Choices Report – EMP Library http://pfmd1.nps.gov/EMP/hazmat		
	Ballast disposal info. www.energystar.gov Association Of Lighting and Mercury Recyclers: www.almr.org	Redwood	
	Radio Shack, Wal-Mart, Target and other retail stores have collection sites for batteries. Rechargeable Battery Recycling Corporation: 800-822-8837 www.rbr.org (recycle Ni-Cads) www.epa.gov/epaoswer/non-hw/muncpl/battery.htm www.fedcenter.gov	Redwood	
	EO 13149 <i>Greening the Government Through Federal Fleet and Transportation Efficiency</i> , April 21, 2000.		
Convert 75% of fleet to alternative-fueled vehicles (AFV). Offer bicycles for employees for short in-park trips.	EO 12844 <i>Federal Use of Alternative Fueled Vehicles</i> , 1993. EO 13031 <i>Federal Alternative Fueled Vehicle Leadership</i> , 1996. www.eere.energy.gov/cleancities	Sequoia Kings Canyon, & Olympic successfully downsized their fleet. Point Reyes, North Cascades, Hagerman Fossil Beds purchased hybrids. Hawaii Volcanoes has bikes for staff.	
Work with local transit to provide regional transit alternatives to the park, and provide park shuttle buses.	Transportation & Sustainable Communities: http://scitech.dot.gov/partech/sustran/sustran.html	Grand Canyon, Yosemite, Zion, Santa Monica Mountains, Point Reyes have park shuttles.	
Replace 2-stroke engines with 4-stroke.			
	Asphalt Recycling & Reclaiming Association: www.ara.org Green Roads www.forester.net/sw_0203_green.html www.pca.state.mn.us/waste/listedmetals.html www.enispaint.com www.uscoldpatch.com	Assateague Island uses indigenous crushed shells for road base & parking. Mount Rainier, Yellowstone, Olympic uses water-based road striping paint. Yosemite uses recycled asphalt product (US Cold Patch).	
		Cape Cod	

ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Antifreeze/Coolant (CPG Item)	Use reclaimed (recycled) engine coolant and recycle used coolant. Determine state hazardous waste requirements. Switch to polyethylene glycol but evaluate hazardous waste characteristics. See if available reclaimed.	Explore potential for recycling on-site.
Engine Oil (CPG Item) (see also Hazardous Waste)	Use re-refined oil with a minimum 25% PC content. Recycle used oil. Consider a closed loop system to recycled and purchase rerefined oil in the same contract.	Look for oil with 100% non-virgin stock. Consider soy-based motor oil. Explore the need for an oil filter crusher.
Biodiesel	Use B20 biodiesel (20% biodiesel) in diesel fuel applications.	Use B50 biodiesel. (50%)
Biobased Lubricants and Greases	Use biobased lubricants and greases (hydraulic fluid, total loss, metalworking, crankcase oil, chainsaw oil, etc.) Recycle used oil.	Use biobased without added petroleum synthetics.
JANITORIAL PRACTICES		
Inventory and Substitution	Eliminate use of hazardous chemicals (carcinogenic and other hazardous chemicals are listed at www.westp2net.org/Janitorial/jp4.htm) Conduct an inventory and review of all cleaning supplies. Substitute products containing hazardous/toxic chemicals with non-toxic products. Select from PWR <i>Green Janitorial Products and Practices Guide</i> , June 2003. Some products available from JWOD.	Evaluate cleaning practices to reduce and consolidate the number of products used. Use antibacterial or disinfectant only where necessary.
Paper Products (CPG Item)	Buy chlorine-free toilet paper and paper towels with high post-consumer recycled content.	Buy chlorine-free or unbleached products.
Plastic Bags (CPG Item)	Purchase bags with recycled content.	Purchase bags with 100% recycled content.
BURN ACTIVITIES (AIR QUALITY)		
Prescribed Burning	Notify public to reduce human exposure.	Notify public and limit amount of fuel consumed.
Campfires	Prohibit collection of wood in the park and provide clean, dry wood through concessions.	Limit number of campfires per campground and/or designate campfire-free campgrounds.
ADMINISTRATION AND OPERATIONS		
Concessions Contracts	Include waste, water, and energy reduction in contract performance evaluation.	Concessionaires must develop EMP's for new contracts.
Employee Performance Standards	Establish a sustainability, energy, and/or recycling coordinator. Identify and include employee environmental standards in biannual performance appraisals.	Do the same for the Superintendent. Add environmental or sustainability language into park GPRA goals.
Green Office Practices (CPG Item)	Reduce purchases where possible. Avoid duplicate purchases. Purchase CPG office supplies with maximum recycled content. Avoid PVC supplies. Purchase durable, reusable supplies. Always print double sided.	Reuse office supplies when possible.
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.	Provide in-house education, e.g., brown bag lunches on environmental topics.

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	Sierra www.sierraantifreeze.com Safety-Kleen www.safety-kleen.com National Automotive Repair Compliance Assistance Center www.ccar-greenlink.org	Redwood uses Sierra antifreeze.	
Test motor oil before changing to determine if service is required. Do not use oil additives. Use oil filter "extenders." Hot drain used filters.	Safety Kleen www.safety-kleen.com Defense Logistics: www.dscr.dla.mil/products/pol/polcat.htm www.unitedsoybean.org		
Use B100 biodiesel. (100%)	www.biodiesel.org Biodiesel Technical Reference Guide: www.ofee.gov/whats/1205biodiesalgde.htm	Channel Islands, Hawaii Volcanoes, Mount Rainier, Yosemite, Whitman Mission use blends of biodiesel.	
	EO 13134 <i>Developing and Promoting Biobased Products and Bioenergy</i> , August 12, 1999. www.biobased.oce.usda.gov Biobased Best Products Practices Guide: www.soybiobased.org/bestpractices www.unitedsoybean.org www.greenpluslubes.com www.bioblend.com	Channel Islands, Golden Gate, Mount Rainier, Olympic, Yosemite use biobased lubricants.	
	PWR <i>Green Janitorial Products and Practices Guide</i> , June 2003. EPA <i>Greening Your Purchase of Cleaning Products</i> : www.epa.gov/oppt/epp/pubs/clean/cleaning.htm Green Seal Report: <i>Industrial and Institutional Cleaners</i> , Sept.-Oct. 1999. www.greenseal.org www.unitedsoybean.org www.westp2net.org/Janitorial/jp4.htm	Fort Vancouver, Redwood, Olympic, Mount Rainier 	
	Green Seal Report: <i>Paper Towels</i> , Feb. 1998. www.greenseal.org www.chlorinefreeproducts.org		
Purchase biodegradable cornstarch bags.	www.dynapak.com Biodegradable Bags www.BiocorpUSA.com www.qsaadvantage.gov		
	PWR Air Quality Coordinator: judy_rocchio@nps.gov		
Evaluate preventative fuel removal methods and choose the one with the least environmental impact.	Title 17 <i>California Smoke Management Plan</i> : www.arb.ca.gov	Yosemite	
Restrict campfires when air quality conditions are bad.	Park Resource Management Plan, "Air Resources" section.	Yosemite	
Implement BMPs for Operations & Maintenance Plans.	Environmental Programs Manager, NPS Concessions: wendy_berhman@nps.gov http://concessions.nps.gov/program3.cfm	Acadia, Crater Lake, Yosemite	
	PWR Green Office Practices Guide, 2003: http://inside.nps.gov/regions/region.cfm?rgn=319&lv=3		
	EPA <i>Greening Your Meetings and Conferences</i> : www.epa.gov/oppt/epp/pubs/meet/greenmeetings.htm www.bluegreenmeetings.org		

ACTIVITY	BEST MANAGEMENT PRACTICE	
	SIMPLE	ADVANCED
Employee and Park Recognition	Recognize employees for initiative, creativity, and achievement in sustainable practices. Encourage suggestions on how to institute new ideas.	Prepare nominations for the NPS and DOI Environmental Achievement Award, DOE awards, and the White House Closing the Circle Award.
Training	Include information on park sustainability, green procurement, energy conservation, and recycling policy in new employee orientations.	Incorporate sustainability into all training opportunities.
General Planning Documents	Incorporate greening strategies into GMP's, EA's, etc. Include community neighbors in regional planning.	Look at transportation issues.
Environmental Plans	Assess the need for these plans, surveys, or inventories: <ul style="list-style-type: none"> a. Air Emissions Inventory b. Pollution Prevention Plan c. Hazardous Waste Analysis d. HAZCOM Plan e. PCB Inventory f. ODS Inventory g. Asbestos Operations/Plan h. Radon Survey i. Emergency Response j. SPCC Plan k. Solid Waste (ISWAP) l. Alternative Energy 	
Environmental Management Systems (EMS)	Ensure you have a working, functional EMS in place. Once fully established, expand it to incorporate more challenging goals, specific communication strategies, training programs	
Project Review	Add an environmental or sustainability component on the same level as Section 106, ADA, and NEPA.	
Funding Sources	Learn about potential funding sources under DOE, NPS EMP Funding, EPA, state grants, etc.	
Permits for Group Events	Incorporate waste reduction or litter message.	Require clean-up fees to be returned if area left clean.
Education:		
Event Celebration	Plan activities for environmental events: Earth Day (April 22), America Recycles Day (November 15).	Use PWR's Sustainability Tip of the Month to promote sustainable practices.
News Sharing	Contribute to the PWR <i>Green Voice</i> newsletter, and the Servicewide newsletter, <i>Sustainability News</i> .	Contribute to external publications. Present innovative park projects at conferences.
Park Web Page, Park Brochure, and Newsletter	Add information about what and where to recycle, and any successes in sustainable projects. Print on recycled-content paper.	Use PCF, and soy- or water-based ink.
Park and Individual Responsibility	Develop your own park BMP list and environmental leadership goals. Become a CEI park (Center of Innovation). Practice environmental stewardship at home. Teach your kids.	Let your kids teach you. Seek out training opportunities.

(BMP) MORE ADVANCED	REFERENCE	SUCCESS	DATE
	Closing the Circle Award: www.ofee.gov NPS Environmental Achievement Awards: http://pfmd1.nps.gov/EMP/ea	Channel Islands, The Presidio, Yosemite, Joshua Tree	
	Invite specialists to present to all employee meetings. Send employees to NPS and external training.		
	Promote regional ecotourism.	Assateague Island created a Sustainable Design Flow Chart. Denali, Grand Canyon, Zion, North Cascades incorporated sustainability standards in their GMP.	
	EO 13148 <i>Greening the Government Through Leadership in Environmental Management</i> , April 21, 2000. PW-051 <i>Environmentally Preferable Purchasing Policy</i> . PW-048 <i>Sustainable Design and Construction Practices</i> . Contact the Regional Program Coordinator for each environmental plan.		
	PWR EMS Website: http://inside.nps.gov/regions/region.cfm?rgn=438&lv=3		
	Create base-funded support.	Whiskeytown was awarded a Unilever Plastic Lumber grant.	
	PWR Sustainability Tip of the Month: http://inside.nps.gov/regions/region.cfm?rgn=PWR&lv=1 www.ofee.gov www.earthday.net www.americarecyclesday.org www.unitedsoybean.org Editor, <i>Sustainability News</i> : diane_liggett@nps.gov Green Voice Newsletter: http://inside.nps.gov/regions/region.cfm?rgn=200&lv=3		
	Become an environmental advocate.	Joshua Tree, Point Reyes, Santa Monica Mountains. Channel Islands has goal to become petroleum-free. Lake Mead created the War On Litter campaign.	

* The product references provided in this document are not intended to endorse one product over another, and represent only a limited selection of available products.

100+ Best Management Practices



Defining What a Green Park Looks Like



Printed on post-consumer recycled-content paper.

May 2006