



Canyonlands

The official newspaper
of Canyonlands National Park

From Dust to Crust

DUST STORMS HAVE LONG BEEN ASSOCIATED WITH EROSION OF TOPSOIL, poor air quality and other harmful effects. In March of this year, a dust storm from the Gobi Desert in northwest China cast much of southeast Asia in a pallid gloom as airports canceled flights and health officials warned people to carry umbrellas and wash thoroughly when they returned home. Residents of Utah faced similar storms in April. But dust isn't all bad: scientists working in Canyonlands have discovered that airborne dust can be extremely beneficial to the area in which it falls.

Any local gardener will agree that it's a miracle anything grows in Canyonlands without the advantage of compost, manure and daily irrigation. Despite natural obstacles like extreme temperatures and lack of water, native plants endure, even surprising visitors with their abundance. Airborne dust may be one reason for this success.

As much as 30% of the soil in Canyonlands arrived as airborne dust. Dust can be distinguished from other sediments because it differs in mineral and chemical composition from nearby bedrock, the only other source of soil-building material in many areas. According to lab results, dust both introduces new elements and enriches many others consumed by plants. For example, dust doubles the amount of phosphorous and manganese, triples the amount of sodium, and more than quadruples the amount of magnesium in the soil. Imagine food falling from the sky, filling your fridge and three others just like it. It's a virtual feast for the plant community.

Examining new elements helps identify potential dust sources, though naming exact origins remains impossible. Given the right conditions, dust can travel halfway around the world, and frequently does. A Gobi Desert storm last year crossed the Pacific and sprinkled tons of Asian dust from California to Florida. It was the largest storm ever recorded, and noticeably affected visibility in Canyonlands as it passed.

Most dust destined for Canyonlands probably originates in the American Southwest. The Mojave, Great Basin and Sonoran deserts are all upwind of the park, and recent satellite images have recorded dust plumes traveling from the Mojave to the Canyonlands area. Soil profiles in Canyonlands indicate a change in sources during the past several decades, so it's possible that human modifications like farming, grazing, military testing, urban development and water diversions have made the Mojave more prone to erosion. Not surprisingly, the Gobi has witnessed many of the same activities.

Soil loss can be devastating to the ecosystem in which it occurs, and the newly airborne nutrients only benefit soils that can retain them. In Canyonlands, this job falls to cryptobiotic soil crust, a living groundcover and efficient dust trap found throughout the park. The lumpy, irregular surface of healthy crusts combs dust particles from the air and shelters them. When it rains, bacteria living in the crust actually bind the dust particles to existing soils in a sticky, fibrous web.



Recipe for dust collection: one bundt cake pan filled with marbles; elevate six feet; empty every four months or as needed. Dust is collected at five different locations in Canyonlands.



Crust close-up: the rugged topography, caused by frost heaving in winter, traps seeds as well as dust, creating an ideal environment for germination.



Extreme close-up: through the lens of an electron microscope (950x), the fibers holding the crust together are clearly visible.

While it can withstand wind, the flattening impact of feet or wheels crushes crust back into dust, which may float away on the next breeze. More importantly, the formation of healthy soil crust requires up to half a century. Protecting park soils is a small but significant step every visitor can take. Stay on roads and trails, and hike on rock or in sandy washes during any off-trail explorations. And don't forget, the soil under your shoes may have traveled all the way from China.

Taking Inventory

Much like a physician monitors a patient's heartbeat and blood pressure for diagnostic purposes, National Park Service officials need accurate information about the resources in their care. Specifically, they need to know how and why natural systems change over time, and what amount of change is normal, in order to make sound management decisions.

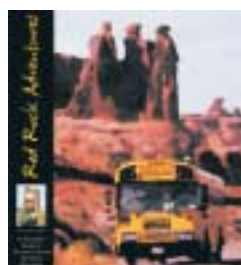
In 1998, Congress authorized and funded a new initiative designed to build a stronger scientific foundation for the management and protection of natural resources in parks and monuments across the country. As part of **The Natural Resource Challenge**, Canyonlands joins sixteen other parks on the Colorado Plateau where scientists are designing an integrated inventory and monitoring program. The first goal of the program is to verify records of what plants and animals exist in the parks. To accomplish this, teams of scientists and park biologists are conducting inventories of plants, mammals, reptiles, amphibians and birds.

The second phase of the program is the development of vital signs monitoring. Vital signs are measurable, early warning signals that indicate changes which could affect the long-term health of natural systems. Canyonlands, along with other network parks, is planning a program to monitor biological and physical resources like air quality, water quality, exotic species, soils, and threatened and endangered species.

To guide inventory efforts, plant and animal species lists are available at all visitor centers. Many species suspected to occur in Canyonlands remain undocumented. Visitors are invited to make observations, take photographs and report sightings of these species to park staff. Sightings of rare or endangered species are also appreciated.



Thanks to you, improvements are being made throughout the park. See back page for details.



TEACHERS!

Red Rock Adventures: A Teacher's Guide to Canyon Country Outdoor Education contains over 100 science activities for grades one through six. Topics are taken directly from the Utah State Science Core Curriculum guidelines and are correlated to the National Science Standards. See field trip descriptions and download copies of the award-winning curriculum at: <http://www.nps.gov/seug/ccoe>.

CLOSED FOR RENOVATIONS

Island in the Sky: Willow Flat Campground and Green River Overlook closed during August, September and October of 2002.

Needles: Scenic drive to Big Spring Overlook closed beyond the campground turnoff during June, July and August of 2002.



National Park Service
U.S. Department of the Interior

Canyonlands Park News

Published By

Canyonlands Natural History Association (CNHA), a nonprofit organization that assists the National Park Service in its educational, interpretive and scientific programs. CNHA's goals include enhancing every visitor's understanding and appreciation of public lands by providing a selection of quality, educational materials for sale at the park visitor centers. For more information, contact CNHA at (435)259-6003, or visit them online at www.cnha.org.

Editor

Neal Herbert

Contributors

Angie Evenden, Catherine Bland, Dan Greenblatt, Mary Moran, Paul Henderson

Park Mailing Address

Canyonlands National Park
2282 SW Resource Blvd.
Moab, UT 84532

Phone

(435) 719-2313

Email

canyinfo@nps.gov

Website

www.nps.gov/cany

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Searching for Treasure

BY DAN GREENBLATT

THE VIEW FROM GRAND VIEW POINT AT THE Island in the Sky contains an incredible collection of canyons, spires, pinnacles and mesas. The view also contains many stories: stories of sedimentation and erosion; stories of mountains and rivers. A series of roads, one distinct but most nearly obscured by vegetation, reveal a human story: that of uranium miners exploring unfamiliar country with the hopes of becoming rich.

Uranium is a critical component of atomic weapons. In the 1950s, the United States government sought to stockpile it. Southeast Utah's canyon country was thought to contain a considerable amount of uranium. However, finding it was not simple. The uranium was in unknown locations scattered throughout inaccessible terrain. A wide-scale exploration of the canyon country would be necessary.

To accomplish this, the government, through the Atomic Energy Commission (AEC), recruited an army of prospectors to comb the area for uranium. Potential miners were offered the chance to make a fortune while fulfilling their duty to national security. In addition, the AEC offered a number of incentives, including bonuses and inflated prices for uranium finds, as well as information and instruction to beginners. These were strong drawing cards, enticing men from all over the country to leave their jobs and families behind to join one of America's last great mining booms.

The search for uranium altered canyon country forever. To provide miners access to prospecting areas, the AEC built almost 1,000 miles of road in southeast Utah, many of them in what would become Canyonlands National Park. The roads

were constructed by hard physical labor, often by lonely miners working with bulldozers, picks and shovels. One can imagine the difficulty of building and traveling these roads, which remain as a testament to the tremendous amount of work undertaken by the miners to prospect the area.

Though substantial amounts of uranium were found in the region, very little was found in what is now Canyonlands. However, the newly created roads led to other discoveries. Prior to the mining boom, canyon country was an inaccessible region. Only a handful of people, mostly cowboys, shepherders and miners, knew it at all. Traffic slowly increased as more people began touring the area simply to see the sights.

Soon Bates Wilson, Superintendent of what was then Arches National Monument,

other National Park Service employees from the area, and members of the local community began working to establish a national park. Wilson led jeep tours for government officials which featured lengthy discussions over campfires and Dutch oven dinners amid the canyons. In 1964, Congress established Canyonlands National Park to preserve the scenery and recreational opportunities of the area.

So, when you enjoy the view from Grand View Point, or any of the overlooks at the Island in the Sky, remember the story of hard-working miners toiling with hopes of making a fortune. While many of them did not make the money they envisioned, their labor led to an important treasure. By opening canyon country to travel, the miners blazed the trail for the establishment of Canyonlands National Park.



The "C" Group uranium claim was near Airport Tower at the Island. This photo was taken by District Ranger Ed Rothfuss in January of 1965, four months after the park was established.



Mountain biking on the White Rim Road



Hiking the Grand View Point Trail

Exploring Island in the Sky

Basics

- Visitor center is open 8 a.m. - 6 p.m. from April to late October, 8 a.m. - 4:30 p.m. the rest of the year. Features exhibits, book and map sales, audio-visual programs, backcountry permits, general information, and park rangers on duty.
- There are no free water sources at the Island. Water is sold in the visitor center at the front desk and at a vending machine outside.
- Orientation video: *Wilderness of Rock* is shown on request at the visitor center (15 minutes).
- Vault toilets are located at the visitor center, Grand View Point, White Rim Overlook, Upheaval Dome and Willow Flat Campground. The visitor center toilets are wheelchair accessible.
- Campground at Willow Flat has 12 sites available on a first-come, first-served basis. No water or hookups provided. Fee is \$5 /site/night.
Note: Willow Flat Campground and Green River Overlook will be closed for renovations during August, September & October of 2002.

Scenic drive

A 34-mile (round-trip) scenic drive allows visitors to tour the entire mesa top. The *Road Guide to Canyonlands - Island in the Sky District* offers an insightful narrative for the trip and is sold at the visitor center. Wheelchair accessible overlooks include Grand View Point and Buck Canyon Overlook. There are picnic areas at White Rim Overlook, Grand View Point and Upheaval Dome.

Interpretive activities

- Interpretive trails (with printed guides) include Mesa Arch, Neck Spring and Upheaval Dome Overlook.
- Ranger programs: Geology talks (20 minutes) are presented daily at 10:30 & 11:30 a.m. at Grand View Point (April to late October). Campfire programs are presented several nights a week at Willow Flat Campground (April - September). Check at the visitor center or campground for topics, times and special programs.

For kids

Free Junior Ranger booklets are available at the visitor center. Kids age 6 to 12 can earn a Junior Ranger badge by completing five or more activities in the book. For hiking, kids enjoy peeking through Mesa Arch and climbing the back of the whale at Whale Rock. Use caution as there are unfenced overlooks on both of these trails.

What to do with your day

First, stop at the visitor center for current information on trails, roads, interpretive programs, weather, or to watch the park orientation video.

If you have 2 hours:

Drive to Grand View Point or Green River Overlook. Hike to Mesa Arch.

If you have 4 hours:

Drive to Grand View Point, Green River Overlook and Upheaval Dome. Hike the Grand View Point, Mesa Arch, and Upheaval Dome Overlook trails.

If you have 8 hours:

Visit every overlook. Hike several mesa top trails or one of the more strenuous trails descending to the White Rim. Enjoy lunch on the trail or at White Rim Overlook or Upheaval Dome picnic areas.

If you are interested in geology:

View the exhibits at the visitor center and pick up a geology handout. Visit Grand View Point to see the rock layers. Visit Upheaval Dome and hike to the first overlook. There you can learn two theories about how the crater might have been formed.

If you are interested in natural history:

View the visitor center exhibits and pick up a free natural history handout. As you pass through Gray's Pasture, keep an eye out for mule deer or bighorn sheep. Walk the Mesa Arch or Neck Spring trails and learn about native plants.

If you are interested in human history:

View the visitor center exhibits and pick up a free handout. Hike the Aztec Butte Trail to see ancestral Puebloan ruins. Visit Buck Canyon Overlook and see the exhibit about ranching. Old fences and corrals are visible along the scenic drive and Murphy Point Road. Also, old mining roads are visible from most overlooks.

If you are interested in watching sunrise/sunset:

Find out sunrise and sunset times at the visitor center. Visit Mesa Arch at dawn. Visit Green River Overlook at dusk for incomparable views of sunset over the canyons. Hike to the top of Aztec Butte for a spectacular view of the Island in the Sky and surrounding countryside.

Have You Seen Our Galaxy?

BY CATHERINE BLAND

FOR THOUSANDS OF YEARS, OBSERVING THE night sky has been fundamental to human life and survival. The sky was a major symbol in the natural world of order and cyclic repetition. Studying the skies brought a sense of normalcy to people's lives. Movement of the planets and stars helped farmers determine when to plant and harvest crops and guided ritual and religious observances. Interpretations of the celestial bodies varied widely among cultures, but often the sky was considered the abode of gods, a place humans could never touch. How do we know that sky watching was important to people of the past? Folk stories, myths, elaborate rituals and festivals, dance and costumes, and complex and symbolic architecture survive today.

Astronomers today ask the same questions posed millennia ago by people sitting around a campfire at night. Those people wondered about the meaning of the flickering but eternal stars overhead and the fragile transient life around them. Today we sometimes take the vast wealth of information on the night sky for granted or are

amazed by the accomplishments of ancient astronomers. Our complacency or amazement results from our own night blindness, a symptom caused by our brightly lit and building-enclosed world.

Even though we no longer need to track celestial events for our daily survival, we still enjoy gazing at the sky's majestic beauty. Yet this simple pleasure is denied to 90 percent of the world's population. Not only is light pollution an aesthetic problem but it also affects our sense of perspective. Most of the world's population can no longer ponder earth's place in the universe because light pollution of the night sky shrinks the visible universe down from millions of light years to a few miles. One of our most ancient and universal cultural values is threatened and may become extinct.

Fortunately, in Canyonlands National Park, we can reenact that thousand-year-old campfire scene. Campers and backpackers settling in for the night watch the unfolding drama of our galaxy as stars uncloak one by one. Soon the night sky is filled with thou-

sands of glittering jewels, too many to count. Occasionally, a meteor blazes across the sky. The final act is one that may only be viewed by ten percent of the world's inhabitants and is the most majestic and breathtaking of scenes. Spanning the sky like a cloud of light is a region known as the Milky Way. Earthlings peering into this "band of mist" are looking at the center of our galaxy.

Yet light pollution from nearby towns has become evident even here in the last few years. As these towns grow, so grows the amount of light that encroaches on the dark skies of

Canyonlands National Park. Advertising and display lighting, building illumination, upward floodlighting and domestic and industrial security lights vanquish the dark into shadowy corners. How do we protect the beauty of our night skies? Should we turn off street lamps

and exterior building lights in favor of dark skies and forego private and public safety and security? Does this starry wilderness deserve the same protection afforded to other resources of this national park? To date there is no federal legislation mandating preservation of the night sky. What is the solution? Do we need another federal regulation?

Fortunately, with some modifications of lighting sources and forethought about the

placement of lighting, the needs of safety and security and dark skies can all be accommodated. Light pollution is mostly the product of public lighting that goes to waste. In the United States alone, billions of dollars a year in energy costs could be saved by replacing high wattage, unshielded street lamps and exterior lights with well-directed, lower wattage, shielded lights. Shields would allow the same amount of light to be delivered to the ground where it is needed for safety and security. Additionally, less carbon dioxide and other pollutants would be introduced into the atmosphere because power plants would be



The lights of North America as seen from space
Photo courtesy the International Dark-Sky Association and W.T. Sullivan



To celebrate Astronomy Day (April 20th), Interpretive Ranger Catherine Bland (above right) gave visitors a chance to gaze at sunspots and a rare alignment of five planets: Mars, Mercury, Jupiter, Saturn and Venus.



producing less energy for lighting. Meanwhile, night-sky watching in Canyonlands remains a democratic joy, available to all and open every night from dusk to dawn. Turn out the lights and look to the dark sky for a great and cosmic show.

LEARN MORE

To learn more about light pollution and how to return the night sky wilderness to your city or town, visit the International Dark-Sky Association at www.darksky.org.

Exploring The Needles

Basics

- Visitor center is open 8:00 a.m. - 5:00 p.m. from April to late October, and 8:00 a.m. - 4:30 p.m. the rest of the year. Features exhibits, book and map sales, audio-visual programs, backcountry permits, general information, and park rangers on duty.
- Water is available year-round at the visitor center and at the Squaw Flat Campground.
- Orientation video: *Wilderness of Rock* is shown on request at the visitor center (15 minutes).
- Restrooms are available at the visitor center and Squaw Flat Campground (wheelchair accessible). There are also vault toilets at Elephant Hill.
- Squaw Flat Campground has 26 sites available first-come, first-served. No hookups. \$10 /site/night.

Scenic drive

The scenic drive continues 7 miles past the visitor center, ending at Big Spring Canyon Overlook. Along the way are several pullouts for short hiking trails, viewpoints and a picnic area. Graded dirt roads lead to Cave Spring, where there is an interpretive trail, and to the Elephant Hill trailhead, where there is a second picnic area. The Elephant Hill access road provides excellent views of the Needles from a car (about one mile from the pavement). **Note:** The scenic drive to Big Spring Overlook will be closed beyond the campground turnoff June through August 2002.

Interpretive activities

- Interpretive trails (with printed guides) include Cave Spring, Pothole Point, Roadside Ruin & Slickrock.
- Campfire programs are presented five nights a week at Squaw Flat Campground (April - October). Check at the visitor center or campground for topics and times.

For kids

Free Junior Ranger booklets are available at the visitor center. Kids age 6 to 12 can earn a Junior Ranger badge by completing five or more activities. The Cave Spring Trail, featuring a cowboy camp and prehistoric pictographs, is always a hit with kids. Pothole Point is another popular hike, especially if the potholes are full of water. Before you set out, borrow a kids' discovery pack from the visitor center. Packs include a naturalist guide, binoculars, hand lens and more (small fee and deposit required).

What to do with your day

First, stop at the visitor center for current information on trails, roads, interpretive programs, weather, or to watch the park orientation video.

If you have 2 hours:

Drive to Big Spring Canyon Overlook and hike the Pothole Point trail along the way. Drive to a view of the Needles on the Elephant Hill access road.

If you have 4 hours:

Explore the scenic drive and graded dirt roads. Hike the Cave Spring, Pothole Point and Roadside Ruin trails or the longer Slickrock trail.

If you have 8 hours:

After exploring the scenic drive, hike to Chesler Park or around the Big Spring-Squaw Canyon loop. Enjoy lunch on the trail or at a picnic area.

If you are interested in geology:

View the exhibits at the visitor center and pick up a free geology hand-out. Every Needles trail provides unique views of rock formations, and marine fossils are visible in the canyon below Big Spring Canyon Overlook (follow the Confluence Trail).

If you are interested in natural history:

View the visitor center exhibits and pick up a free natural history hand-out. Bighorn sheep are seen most frequently from overlooks along the Slickrock Trail. Squaw, Lost and Salt Creek canyons are great for early-morning birding.

If you are interested in human history:

View the visitor center exhibits and pick up the free human history hand-out. Hike the Roadside Ruin and Cave Spring trails. If time permits, visit the Peekaboo rock art panel in Salt Creek Canyon.

If you are interested in watching sunrise/sunset:

Find out sunrise and sunset times at the visitor center. Sunrise is spectacular from the campground area, especially along the short trail over the butte between Loops A and B. Visit Pothole Point or Wooden Shoe Arch Overlook as the glow of sunset washes over the Needles.



Pothole Point



Evening Program at Squaw Flat Campground



Chesler Park



A raft plunges through a rapid on its way through Cataract Canyon.

Backcountry Areas

Much of the land in Canyonlands is undeveloped, a fact evident at any of the overlooks along the Island in the Sky scenic drive. The park's primitive character has made it a popular destination for backcountry travel. In every district, rugged roads, trails and rivers provide paths into remote corners of the park.

The White Rim Road, a 100-mile loop below the Island in the Sky mesa, is a favorite of mountain bikers and four-wheel drivers. The Needles provides ideal itineraries for backpackers in search of solitude. The Maze offers opportunities for lengthy exploration by foot and vehicle. Due to its remoteness and the difficulty of roads and trails, travel to the Maze requires more time, as well as a greater degree of self-sufficiency.

Yet another way to see the park is on the rivers. Boaters can float down the flatwater sections of the Colorado and Green rivers to the Confluence, or continue downstream to face 14 miles of rapids as the river tumbles through Cataract Canyon.

Rock art enthusiasts should be sure to visit Horseshoe Canyon, a detached unit of Canyonlands northwest of the Maze. A moderately strenuous hike leads to a series of pictograph panels created by hunter-gatherers over 2,000 years ago.

If you're interested in planning a trip to any of these areas, request a copy of the *Canyonlands Trip Planner*, or visit our website at www.nps.gov/cany.

Thanks to You

CANYONLANDS ENCHANTS VISITORS WITH ITS BEAUTY. HUNDREDS OF THOUSANDS OF OUTDOOR enthusiasts are drawn here each year. This popularity creates a challenge - to assist and protect visitors, while preserving the natural and cultural treasures they come to see. With your fees and continued support, we can meet this challenge together.

In 1996, Congress authorized the Recreational Fee Demonstration Program to improve the scope and quality of federal facilities and address natural and cultural resource issues. Prior to this program, fee money was returned to the general fund of the federal government and parks were only reimbursed for their collection costs. Now, the park keeps 80 percent of camping, entrance and permit fees. During the last five years, over 2.3 million dollars in retained fee revenue has been put to work at Canyonlands.

The park has a trail crew for the first time in nearly 20 years. Major trail reconstruction projects have been undertaken at Grand View Point, Mesa Arch and Roadside Ruin. All of the paved roads at Canyonlands have received preventative maintenance that extends their life and makes travel safer. Visitor centers have received fresh paint and new carpets. A sprinkler system was added to the Island in the Sky Visitor Center. A Backcountry Information Office was constructed at Needles. An additional restroom was installed at Upheaval Dome. Campsites are being rehabilitated both in the frontcountry and along the White Rim Road. Finally, if you are headed into the backcountry, your fee dollars fund the permit system, including staffing the reservation office.

Many other projects are in progress. Throughout the park, informational signs are being replaced, power-generating systems are being upgraded, and critical research programs are being initiated. This summer, significant improvements will be made to the Green River Overlook at the Island, making the overlook handicap accessible and adding a restroom. Other less-visible projects, such as repairing park water and sewer systems, are crucial for guarding health and safety.

National Park Service employees strive to protect the natural and cultural resources of Canyonlands. Now you're a partner in this important work. Thanks to you, improvements are being made to park facilities and programs that will ensure future visitors are able to experience this national treasure.



Bridge restoration on the Murphy Trail



Shade structures in the Needles District



WATCH YOUR STEP! Cryptobiotic soil crust is a living groundcover that forms the foundation of high desert plant life in Canyonlands and the surrounding area. This knobby, black crust is dominated by cyanobacteria, but also includes lichens, mosses, green algae, microfungi and bacteria.

Protect Your Park

- Avoid trampling cryptobiotic soil crusts by walking on trails, slickrock or in sandy wash bottoms.
- Pets are not allowed on hiking trails or four-wheel-drive roads, even in a vehicle. Pets may accompany groups at overlooks and in the campground, but must be leashed if outside a vehicle.
- Protect water sources. Do not swim or bathe in potholes or intermittent streams.
- Preserve your heritage. Do not enter, alter or deface archeological sites. Leave artifacts undisturbed.
- It is illegal to remove natural or cultural features including plants, rocks, artifacts, driftwood, or antlers.
- Vehicles and bicycles must travel on designated roads.
- ATVs are not permitted.

Protect Yourself

- Drink at least one gallon of water per day, more if involved in strenuous activity.
- Always carry a map, adequate clothing, and flashlight in the backcountry.
- Remain in one place if you become lost or separated from a group.
- Never cross a canyon that is flooding.
- During a lightning storm, avoid lone trees and high ridges. Return to your vehicle if possible.
- Be careful near cliff edges, especially when rock surfaces are wet or icy.

Sustainable Living at the Maze

FOR MANY VISITORS TO THE MAZE DISTRICT OF Canyonlands, isolation is both risk and reward. Few places are farther from the bright lights and big cities of urban America. For park employees living at Hans Flat, the Maze District headquarters, isolation is a fact of life. With the nearest groceries at least two hours away, it's a long trip to town for a loaf of bread, a container of milk and a stick of butter.

This isolation also affects park management. The nearest power transformer is 45 miles away. There is no potable ground water. For years, diesel generators supplied power to the small community of eight residences, maintenance shop, ranger station and laundry. At considerable expense, tanker trucks delivered fuel and water. High operating costs meant that facilities were closed and the rangers furloughed every winter. The need to conserve resources has always been a priority.

The residents of Hans Flat have responded to this challenge with remarkable thrift and restraint. They began a recycling program to reduce waste in the 1980s, long before there were even "local" drop off points. In the early 1990s, employees began composting and established organic gardens which now produce mixed greens and vegetables year-round. Their measures to

conserve power and water are extreme: when is the last time you flushed the toilet with water saved as your shower warmed up?

"It's called a Navy shower and should take about two minutes. Turn the water on and get wet. Turn it off and soap up. Turn it on again, rinse and you're done. I started saving the start-up water in a bucket because it seemed wasteful to let it go down the drain."

Bill Foreman offers these instructions for showering at Hans Flat to all new employees. As part of his district orientation tour, the maintenance foreman and conservation guru also explains how to brush your teeth, shave, wash the dishes, and when to flush the toilet. Forget about cheating: Bill watches the utility meters and posts monthly use statistics for each household. At Hans Flat, it's a matter of pride to stay at the bottom of these lists.



Bill Foreman and the Hans Flat Solar Array.

This discipline is encouraged because water still has to be trucked to the Maze, and each 5,800 gallon load costs the park around \$700, or 12 cents per gallon. There is no car washing. The gardens are watered with captured rainfall and used dishwater stored in barrels. Utah residents use 269 to 325 gallons of water per day (the national average is 179). People at Hans Flat use less than 20. Even compared to the other districts of Canyonlands, water conservation saves Hans Flat over \$10,000 a year, almost enough to cover the salary of a seasonal ranger.

Power is another important commodity, though it no longer arrives by truck. Hans Flat now draws electricity from a state of the art solar array that has completely changed life at Hans Flat. Installed in 1995, solar power has reduced the use of the diesel generators by 95%. This not only



Hillary Hudson picking greens from the organic garden.

offsets fuel costs, but eliminates the noise and exhaust pollution typical of these machines.

However, living on a solar array requires an uncanny awareness of power consumption. Turning off lights in unoccupied rooms, using compact fluorescent fixtures - these mainstream concepts of conservation are mandatory at Hans Flat. But the real struggle of solar living is eliminating phantom loads. Phantom loads include the infamous blinking display on a VCR, surge protectors, even doorbell buttons. These devices, and many others, use electricity constantly if they are plugged in, usually for a small display or light. Enough small (hence phantom) loads create a significant drain on a power supply limited by daylight. Unplugging everything can be enough to prevent the Hans Flat generators, which now serve as a backup system, from running at all.

Aside from the administrative details, Bill's orientation tour is unlike any other in Canyonlands, and perhaps the entire park service. The habits he's developed over the years not only save money, but promote a lifestyle that is a model of sustainability. In a world of dwindling resources, this sort of restraint may become increasingly necessary in households across the country.