THE FIVE STEPS OF RESOURCE MANAGEMENT

RESEARCH

Scientists inventory the resources, determine ecological relationships, document impacts and provide information on how undesirable changes can be prevented.

IMPLEMENTATION

Facts provided by researchers are used to evaluate options and to determine what action should be taken. Then, the results are monitored.

EDUCATION

To gain understanding and support, rangers explain resource problems and possible solutions to the public. While the primary objective of the walks and talks we present is to encourage everyone to fully experience and appreciate Craters of the Moon, these activities also explain how the cumulative actions of park visitors and neighbors may have long-term consequences.

PROTECTION

Park rangers enforce regulations established to protect natural features. Their goal is to maintain the monument's natural environment in as pristine condition as possible, while still providing for visitor enjoyment.

PUBLIC INVOLVEMENT

Because these are your lands entrusted to our care, we seek citizen input before any significant actions are taken.

At Craters of the Moon, the resource management process is initiated whenever serious impacts affecting the environment are identified.

Other Resource Management Concerns

INFERNO CONE

Inferno Cone, another of the monument's volcanic formations, is also showing signs of heavy visitor use. The boots of one hiker after another have gradually compacted the cinders and turned a narrow trail into a broad scar that mars Inferno Cone from bottom to top. Currently, none of our attempts to eliminate or slow this damage has been successful.

There is always the chance that we will discover a new technique or idea that will lead us to a solution, but it could also be there is no perfect answer. This type of problem is not uncommon in our national parks and is a good example of how difficult it can be to resolve the conflict between visitor use and the preservation of resources.

EXOTIC PLANTS

The gradual encroachment of exotic plant species such as mullein, thistle and knapweed is also considered a major threat to the monument's environment. The seeds of these undesirable plants are carried into the monument by animals or are dropped from vehicles traveling the highway that transects the monument. With no natural enemies to control them, these aliens often displace native plants.

AIR QUALITY

Air quality is another concern. Over the last few years, visibility has decreased and pollutants are beginning to affect the plant life. Several monitoring systems are now measuring the toxic materials found in the air.

LAVA TUBES

The lava tubes (caves) are extremely delicate environments that require special management. Lava tube beetles, bats and other animals that live exclusively in these places, as well as delicate rock and mineral formations, are especially sensitive to human contact. A cave management plan that will guide the use of these unusual formations has recently been completed.

DISAPPEARANCE OF ANIMALS

The disappearance of animals once common at Craters of the Moon also disturbs us. Grizzly bears, bighorn sheep and bison that were at one time indigenous to this area eventually succumbed to the expanding influence of humans.

The managerial philosophy of the National Park Service in the 1920s and 1930s also may have been largely responsible for the demise of the porcupine. In 1927, monument personnel, acting to protect the limber pine from possible damage, recommended, "....the porcupine be declared to be a predatory animal and that the custodian of the monument kill these animals on sight." We are currently investigating the possibility of reintroducing the porcupine into the monument.

Other studies and monitoring programs are planned for the future. This research will undoubtedly uncover new problems, but it also will further our knowledge of the monument's resources and continue to bring new solutions to light.

What You Can Do

There are many ways to support the preservation and protection of your national parks. At home, you can get involved in park issues. When there is a call for public comments, learn about the issues and express your opinion. If possible, volunteer your time to help the parks in accomplishing their resource management goals. You can collect seeds, count birds, computerize data or help with dozens of other tasks.

Take your children along when you visit the parks. Attend ranger-led walks and talks, encourage them to explore the trails, and let them experience the park for themselves. Let them know why you value these places.

Set an example for others. Eliminate some of the world's air pollution and the rapid depletion of resources by reducing the amount of energy and materials you consume.

Reduce— Reuse—Recycle—Rethink!

When you visit a park, hike the trails, photograph the scenery, canoe the rivers; but try to keep your impact on the natural features to an absolute minimum. **Try not to leave "footprints" that need to be erased.**

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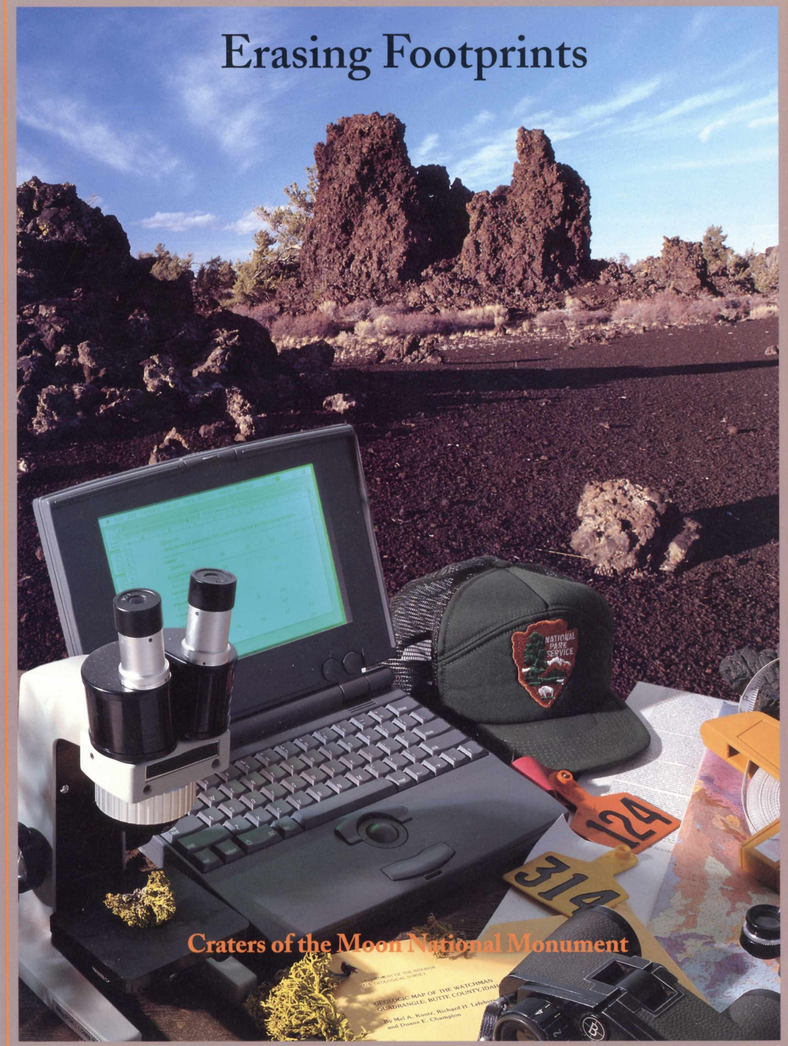
Erasing Footprints



Resource Management: The Job of Erasing Footprints

Walk off the trail and the tracks you leave in the cinders will be there for many years. Pick a wildflower to savor its beauty and a thousand seeds never sprout. Drive around the loop road and your vehicle's exhaust spews poisonous fumes into the air. You cannot visit Craters of the Moon without changing it in some way.

It is our job as the managers of Craters of the Moon to encourage visitors to enjoy themselves. At the same time, we have a responsibility to identify which visitor impacts have serious consequences.

With 250,000 people visiting the monument each year, it is difficult to keep people from taking home a souvenir rock or feeding a saltine cracker to a chipmunk. Our task becomes even more perplexing when we try to protect the natural features from activities that take place outside the monument.

To meet these challenges, the National Park Service brings together many different specialists. It is their job to identify the problems, collect information, and take action. Collectively, we call this process ***resource management****. Ultimately, the goal of resource management is to minimize human impacts: to erase the "footprints" that significantly affect the resource or the visitor experience.*

Protecting the Spatter Cones

As symbolic as Yellowstone's Old Faithful, the spatter cone chain located along the monument's loop drive represents the very essence of Craters of the Moon—volcanism. These "mini-volcanoes" were formed when blobs of molten lava were thrown a few feet into the air during the last gasp of an eruption. The hot clots of lava fell on top of one another and became welded together to form small cones around a central vent.

Ironically, as rugged as the spatter cones look, they are very fragile. Although erosion is a natural process, the accelerated destruction of these cones began when the very first visitor climbed to the top to "take a look inside." It wasn't long before the effect of thousands of footprints became evident.

Faced with this problem, the resource management process was put into operation.

RESEARCH—When we compared photographs taken in the 1920s to present conditions, the problem was easy to recognize. On some of the cones, more than two feet of rock had been eroded off the top rim. On others, entire sections of crater wall had collapsed. Worn into the flanks of every spatter cone were numerous trails.

We contacted Sunset Crater National Monument and other parks with volcanic landscapes to ask if they had similar problems. Most managers reported they also had experienced difficulty preventing people from hiking across the steep slopes of the cones. As deep ruts began to appear on the cones, most of these managers solved their problem by closing sensitive areas to visitor travel and allowing certain volcanic formations to be viewed only from a distance.

IMPLEMENTATION—Our first priority at the spatter cones was to repair past damage. We removed old cement stairways, asphalt trails, and pipe railings. We covered the scars with rock collected at the base of the cones.

Our second priority was to prevent further damage.

Several options were considered:

- Do nothing and accept the deterioration.
- Close the area to all visitor use.
- Construct a viewing platform.
- Allow limited access.

We chose limited access. We now encourage visitors to look inside a cone adjoining the parking area, but have enacted stringent controls to limit access to the other cones.

With a course of action determined, our maintenance crew removed unneeded trails and improved access to areas where use is encouraged. They stabilized trails with buried timbers. Railings and retaining walls were built for safety purposes and to prevent the trails from widening.

With little experience to guide us, we made some mistakes. The safety railings around Snow Cone had to be rebuilt three times. The first railing, constructed of metal pipe and wire mesh fencing, looked like a plumber's nightmare. We then installed a wooden pole railing. Upon completion, it resembled a corral for very small horses. Finally, we built an enclosure of lava rock pilings with cable strung between them. This was the only barrier that was not a major visual intrusion.

EDUCATION—On-site exhibits that discuss the delicate nature of these rock features were installed. We included articles in the park newspaper and folder explaining how walking over the fragile lava or cinders can result in long-lasting damage. Everyone entering the monument receives one of these free publications.

PROTECTION—We established a regulation prohibiting off-trail travel and began routine patrols of the area to inform visitors how to enjoy themselves without impacting these features.

PUBLIC INVOLVEMENT—Before starting the spatter cone rehabilitation project, we prepared a proposal that was made available to the public for review and comment. After considering all input, a plan to restore the cones was devised.

Local school administrators helped in the selection of young people to work in our Youth Conservation Corps program. This group assisted our maintenance crew in the construction of trails, retaining walls and railings.

Since completion of this project, the deterioration of the spatter cones has greatly slowed. Visitors have shown their support with positive comments and a willingness to stay on established trails.

Counting Mule Deer

In the late 1970s, we became increasingly concerned about the large number of mule deer living within the boundaries of Craters of the Moon. The herd seemed to be expanding and we had no way of knowing if this trend would eventually cause undesirable changes to occur within the monument's ecosystem.

We knew that managing the deer herd would involve more than just allowing "nature to take its course." We needed to know the number of predators—mountain lions, bobcats, and coyotes—that were utilizing the deer as a food source. We were interested in the effect the routine suppression of wildfires had on various habitats. We especially wanted to know how the actions of people, both inside and outside the boundary of the monument, were influencing the deer herd.

We also needed data on how many deer were here, where they were located and what impact they were having on the habitat. To answer these questions, we initiated the resource management process.

RESEARCH—The first thing we had to do was capture 100 mule deer. We conducted grid searches in the brush to locate the hiding places of well-camouflaged fawns. We tranquilized deer with darts and tracked them until the immobilizing drug took effect. And we enticed deer into rope mesh traps baited with blocks of salt.

Every deer caught was marked with a set of ear tags and brightly colored streamers that allowed us to identify individual animals. We also attached radio collars around the necks of twenty deer. This permitted us to follow their day-to-day movement.

Over the next three years, we recorded 2,381 sightings of marked deer. These observations allowed us to compile a life history on each animal. This information, along with deer census counts conducted over the next several years, showed that the deer herd varied in size from 350 to 500 animals. The data also showed that most deer fatalities were not caused by predators. Instead, most deer died because of severe winter conditions, hunting activity outside the monument's boundary, or when struck by vehicles while crossing the highway.

The research also revealed an exceptionally high birth rate of twins and triplets and a relatively high percentage of young deer (one- and two- year old animals) within the herd. This data indicated that this mule deer herd was one of the most productive ever studied in the western United States.

Biologists also discovered that as the size of the herd increased, an estimated 25% of all yearling deer eventually moved into the areas surrounding the monument. Based on this figure and information gathered on the health of the habitat, we were able to predict that a population explosion was not likely to occur in the near future and that, even at maximum population levels, the deer were not a threat to their environment.

At the completion of the study, our biologists recommended monitoring the herd to determine population trends, working to control the size of the deer population by adjusting hunting pressure on adjacent lands, and removing the lawns around the visitor center and housing area. This would prevent deer from crossing the highway during dry periods in late summer in search of the unnatural concentration of food and water the grassy areas provide.

The biologists also suggested that we consider intentionally burning the forested areas in the northern section of the monument. Burning these groves of trees would promote the growth of the plants deer use for food and shelter and reduce the chance of a large scale fire due to the buildup of fuels.

IMPLEMENTATION—We have acted on some of these recommendations and are still evaluating the others.

Each spring and fall, we conduct census counts to calculate the total population of mule deer, to determine fawn survival rate, and to establish an age profile of the deer herd. We also work with the Bureau of Land Management and the Idaho Department of Fish and Game to manipulate regulations and set hunting seasons that would help to maintain a dynamic population of mule deer in the monument while ensuring the well-being of the habitat.

We are now revegetating around the visitor center with native plants that require less water than lawns. By reducing the amount of water used in this area, fewer deer will be enticed into crossing the highway.

We have not determined if we should intentionally burn the quaking aspen stands and Douglas fir forest to promote the growth of good forage plants like antelope bitterbrush. Although we now realize the important role that lightning-caused fires play in maintaining natural ecosystems, we are still cautious about using prescribed burning to make up for years of fire suppression. The impact of fire on all living things, not just mule deer, must be considered. The potential risk of controlled burns escaping onto neighboring lands and the need to ensure visitor safety are other primary concerns.

EDUCATION—Our brochures and the park newspaper have incorporated recent findings about the life cycle of mule deer within the monument. As part of our evening programs and guided hikes, we frequently discuss resource management issues on such subjects as deer migration, herd dynamics and the impacts of management actions.

PROTECTION—Because hunting is not permitted within the monument, we must ensure that deer and other animals are not taken illegally by poachers. Restrictions on use of the north unit of the monument have been enacted to protect the mule deer and critical habitat.

PUBLIC INVOLVEMENT—During the mule deer study, we asked the public to report sightings of tagged deer. These reports helped to locate the destinations of migrating deer leaving the monument in the fall. Hunters also provided valuable information about the age and sex of deer taken on land adjacent to the monument.

Recently, local high school students began raising native plants such as rubber rabbitbrush, sagebrush and scorpionweed in a greenhouse. These students will set up test plots to determine which of these plants will survive on disturbed sites. This information will aid us in selecting the most vigorous species for replacement of the lawns at the visitor center.

Sometime in the future, we will develop a fire management plan that will be made available for public review and comment.

Mule Deer in the Future

In some National Parks, human alteration of the environment has made it difficult to control populations of animals like deer and elk. At Craters of the Moon, we anticipate that research and continued monitoring will make it possible to detect potential problems long before they occur. For now, we feel that a combination of natural controls and human activity outside the monument is sustaining the mule deer population at a desirable level.