Protecting Resources

Just as uniformed park staff all take part in protecting people visiting and working in Yellowstone, so do they share responsibility for protecting cultural and natural features from whatever inadvertent or deliberate damage may be done to them as a result of human activity. These obligations are carried out by:

- monitoring resources to determine visitor impacts and effective means of minimizing them;
- providing trails, campgrounds, and other facilities in areas most often used by visitors;
- educating visitors about how they can help protect the park resources; and
- enforcing applicable laws and park regulations.

Enforcing the Rules

The protection of park resources from injury or harm is one or the oldest and most traditional of all ranger duties. In 1998, Yellowstone rangers issued 222 violations for illegal camping, 110 for illegal fishing, 27 for poaching, and 51 related to the use of firearms in the park. Rangers and investigators also respond to a variety of other visitor infractions against park resources.

Harvesting park wildlife. Although permitted outside the park, wildlife hunting and antler collecting are illegal in the park. In the fall, when hunters use backcountry areas immediately adjacent to the park, some slip across the 291-mile boundary accidentally or deliberately, and hunt elk, sheep, grizzly bears, moose, deer, and other wildlife. Each year from September through November, park rangers patrol the rugged boundary by horseback and on foot with the help of officers from state game and fish departments and the U.S. Fish and Wildlife Service. Steep terrain, deep snow, and inclement weather often hinder efforts to protect the park during this critical period when hunting is legal outside park borders.

In the spring, when elk, deer, and moose drop their antlers, "horn hunters" are tempted to prowl the sparsely patrolled park. High black-market prices for wild animal parts have necessitated major undercover investigations of wildlife poaching and trafficking. Prices for bighorn sheep have ranged from $2,000 to $10,000, and bear gall bladders are sometimes sold for up to $150 per ounce in the illegal market. Even the apparently innocuous "horn hunting" deprives small mammals of calcium and other benefits they might gain were not the horns removed from the park to bring upward of $12 per pound to poachers.

An Unfortunate Tradition

From Yellowstone's earliest days, the park's wildlife have been the target of illegal hunters. In the 1890s, bison heads were worth $100 to $300, which was serious money at the time; today a large bison skull may be worth $5,000 or more. While patrolling Pelican Valley on snowshoes in March 1894, Felix Burgess, a park scout, and Sergeant Troike of the U.S. Cavalry, caught Ed Howell poaching bison. Howell and a partner had settled in a winter camp on Astringent Creek, intending to kill all the bison there.

Nearly a century later, in 1984, Yellowstone rangers and other federal agents completed a successful undercover "sting" operation, nabbing local poachers on felony charges that led to the imprisonment of several offenders. In 1991, park rangers caught two notorious poachers, Donald Lewis and Arthur Sims, who for eight years had used Yellowstone as a personal hunting ground and the filming location for a "how-to" hunting video, which showed 12 trophy elk bulls being shot by bow and arrow.

Fishing limits. Although fishing is permitted in many park waters, it is subject to specific regulations regarding species, season, size limits, and type of bait and tackle used. All anglers over age 15 are required to purchase a permit. While most visitors comply with creel and size limits, others violate the regulations, such as one family that was found harvesting and canning Yellowstone's fish for sale out of their trailer in a park campground.

Damaging rocks and artifacts. Whether for fun, profit, or sheer possessiveness, park visitors have vandalized some archeological sites and removed cultural artifacts removed from the context in which they should be studied. Archeologists doing survey work in 1997 found evidence of illegal collecting at their study sites. Informal surveys of the Obsidian Cliff area in 1996 suggested that approximately 32 percent of the people visiting the site removed rock specimens. Because current funding only supports intermittent patrols in the area, visitor access to the Obsidian Cliff face has had to be restricted in order to protect this important area.

Straying out of bounds. Yellowstone provides thousands of sites for visitors to camp or to park and enjoy a walk or picnic. But off-road parking and illegal fires and campsites damage the soil and vegetation, and may promote the spread of non-native plants.

Rangers use a combination of visitor education, use restrictions, and enforcement of the rules in an effort to minimize these impacts.

Feeding the animals. Wild animals that learn to depend on human foods are deprived of their natural balanced diet, and may become less able to survive on their own or cause injury to visitors in their pursuit of human food. Although park rules forbid leaving food unattended or deliberately providing it to wildlife, many visitors cannot resist the temptation to offer handouts. Rangers use persuasion, and penalty if necessary, to keep visitors from risking an animal's and their own well-being.

Protecting and Managing the Park's Resources

Yellowstone has endeavored to maintain the NPS tradition of "resource rangering," keeping employees in all divisions and job specialties involved in protecting the park's resources. All uniformed staff are encouraged to participate in visitor education, especially as it relates to resource protection. Visitors enthralled by the sight of wildlife along park roads provide a "captive audience" to which a patrolling ranger can explain an animal's ecology and population status. While talking with anglers, rangers check for compliance with park regulations, promote minimum-impact fishing, and discuss the threat posed by the introduction of exotic species such as lake trout. Rangers on foot or horse-patrols through popular developed areas take opportunities to inform visitors about cultural resources and geologic hazards.

But the realities of park operations and the resulting specialization mean that maintenance workers must devote primary attention to building and road repair, and ranger-naturalists' schedules are filled with walks, talks, and time at visitor center desks. Similarly, most of the average patrol ranger's time is taken by response to accidents, building alarms, and other requests for visitor service or law enforcement.

To strengthen the connection between resource protection and management, Yellowstone initiated a resource operations program in the late 1980s. In addition to resource specialists assigned to the Yellowstone Center for Resources, who are responsible for monitoring the condition of the park's cultural and natural features and determining what needs to be done to protect or restore them, five full-time resource management coordinators and typically up to 15 seasonal employees are assigned to the Division of Resource Operations and Visitor Protection.

Resource operations staff assist in preparing resource plans and carrying out the resulting management programs in the field. With assistance from patrol rangers, landscape architects, interpreters, and maintenance workers (as their time permits), these specialists assess the condition of backcountry campsites, restore features that have been

The Restitution Fund

A fund was established in 1994 to provide some restitution to the park when its natural or cultural resources are abused. Although courts have ordered those convicted of violations to pay $37,500 to the fund since its inception, only $22,500 had been collected as of mid-1999. Still, this has paid for improved crime-fighting equipment and for ranger training to increase apprehension of lawbreakers.

The fund also provides a source of reward money, an inducement that has helped solve most of the park's known poaching cases. In one incident in Elk Park in 1993, a frequently photographed and well-known trophy bull elk was poached in the height of the autumn rutting season. With the assistance of professional photographers, the elk's killer was apprehended, tried, and convicted with penalties of $10,000 restitution to the park and eight months' jail time. In this way, the fight to protect Yellowstone is supported by payments from those who have sought to violate it.

disturbed by human use, take daily weather readings, and sample wildlife carcasses for disease. The responsibility to protect cultural resources, historic buildings and trails and archeological sites must receive equal emphasis. Resource coordinators serve as liaisons between field staff and subject-matter specialists and researchers, providing resource education for other field staff by holding workshops, maintaining resource libraries, and sponsoring informal seminars. They also provide vital scientific information through inventory and monitoring programs. (See "Inventory and Monitoring," page 5–9.)

Controlling exotic invaders. Botanists have identified more than 170 species of exotic plants in the park, including most of the weeds listed as "noxious" in the states of Montana, Idaho, and Wyoming. Yellowstone's native plant communities are at risk from these invaders, and resource operations staff lead the effort to prevent, monitor, and control their spread. Working with the Greater Yellowstone Weed Coordinating Committee and vegetation specialists who help prioritize the threat posed by various non-native plants, field staff identify and map infestations, prevent spread associated with construction and other ground-disturbing activities, and take action to

eradicate or contain the most serious threats. In 1998, resource operations staff spent $190,000 in efforts to control 33 non-native plant species using approved herbicides on 1,300 acres, manual control on 500 acres, and an experimental burn on 200 acres (see page 2-24). However, the program has been limited by its irregular funding, as well as competition for money from more charismatic species and resource issues.

In addition to plants, exotic terrestrial and aquatic animals can invade the park. Gypsy moths (*Lymantria dispar)* have done extensive damage to deciduous trees since their arrival in the United States in 1869. While Yellowstone has remained relatively free of gypsy moths so far, district resource specialists have worked with entomologists from Animal and Plant Health Inspection Service (APHIS) and the U.S. Forest Service to install about 80 traps each year to detect gypsy moth presence and trends.

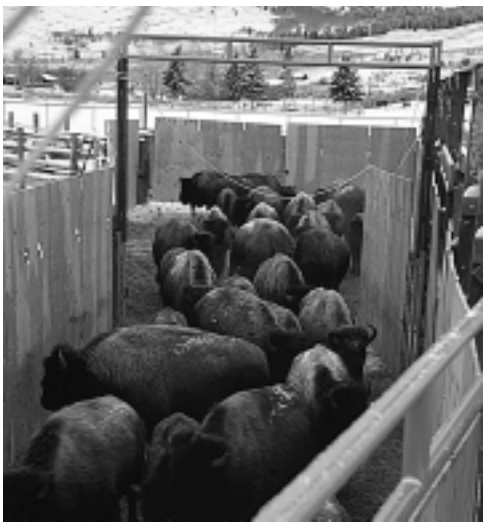
Managing hazard trees. Although the park's hazard tree crew ceased being funded in 1986, trees likely to topple continue to be a problem in developed areas, campgrounds, and along roadsides (see "Vegetation," page 2–23). Resource operations staff work with other park and concessioner staff to identify and remove trees that threaten to fall on unsuspecting visitors and employees. After tree removal in developed areas and campgrounds, planting of new seedlings is done by resource operations, maintenance, or concessions staff and volunteers.

Managing habituated wildlife and pests.
Coyotes and bears that lose their fear of humans may injure a visitor if they become "habituated" to people and their food. Unwary visitors have been gored by bison, bitten by coyotes, kicked by elk, or they have lost their picnic food to scavenging ravens. In park lodging and employee housing, rodents, wasps, hornets, and bats prove to be annoying. When trash removal, special warning signs, or educating and fining visitors fail to keep wildlife from becoming habituated and creating a risk to human health and safety, resource rangers must resort to more extreme remedies. Rodents and insects are exterminated; bats and other wildlife are trapped and relocated if feasible, otherwise they must be killed.

Protecting thermal features.
Yellowstone spends enormous effort and thousands of dollars on signs and interpretive displays to educate visitors about the fragile nature of geothermal features. Still, thoughtless visitors or vandals sometimes break off pieces of sinter or travertine out of curiosity or to take as souvenirs, carve graffiti into the formations, or clog geysers and hot springs by using them as

wishing wells or trash bins. In 1996, resource operations staff monitored 81 thermal features in the Upper, Middle, and Lower geyser basins for vandalism. More than 3,000 coins and countless cigarette butts, nails, rocks, and pieces of boardwalk were removed from hot pools during the course of that one summer.

Plugging the narrow vents impedes the flow of water from below and can alter a feature's eruptive pattern or lower its temperature, influencing the algal growth that produces the beautiful coloration in many hot springs. Rangers have helped the park geologist pump water out of the famous Morning Glory Pool, trying to reach and extract material plugging the hot spring's vent, or to induce an eruption in which the feature would clean itself. Although this technique worked once, the last attempt at a major cleanout failed, probably because too much junk had been thrown in the water.



Herding bison. While managers from the park and other agencies debate what to do about bison that cross the park boundaries (see "Bison," page 3–16), the rangers have kept track of the animals' daily movements, temporarily hazed them back into the park, and operated a capture and shipping facility near Gardiner, Montana, since its construction in 1996. During the winter of 1996–97, rangers staffed the capture facility almost daily, capturing and testing bison for brucellosis; 461 were sent to slaughter, and another 107 that tested negative for brucellosis were held for the winter and hazed back into Yellowstone during spring greenup. These difficult chores were greatly reduced during the next two winters, which brought milder weather and less bison migration out of the park.

Increasing resource knowledge. In 1986 the Division of Resource Management Operations and Visitor Protection initiated a resource management training session that has become an annual parkwide event. Focussing on different themes each year, the workshop brings together staff from across the park, from neighboring agencies, and from academia. This training, which is mandatory for park rangers, has been accomplished with only a small budget for guest speakers' travel and expenses.

Caring for natural and cultural sites. In 1998, special funds provided under the Archeological Resources Protection Act (ARPA) helped pay a portion of the salary of a seasonal ranger whose responsibility included monitoring and protecting cultural features.

Program Needs

• ADDITIONAL STAFF. Currently, only one ranger district has an assistant resource operations coordinator to ensure an effective, professional program; additional permanent resource specialists and seasonal staff are needed for vegetation, bison management, and other resource operations. Cultural resource sites need to be regularly patrolled by trained officers. (See "Cultural Resources," page 4-1.)

• TRAINING. Resource rangers need additional funds to attend professional meetings and training courses outside the park to keep abreast of changing developments in the fields of cultural and natural resource management.

• EQUIPMENT. The few vehicles assigned to the resource operations staff are old and in disrepair; to save money, the rangers have had to use surplus vehicles from the Department of Defense and other government agencies. Other basic equipment and supplies needed include computers, GIS software, GPS units, safety gear, and equipment to carry out monitoring programs, weed control, and backcountry work assignments.

Resource Protection

Stewardship Goals

Professionally trained resource specialists participate in planning and implementing field-level inventories, monitoring programs, and resource management actions to protect cultural and natural resources.

Rangers and other park staff assist in resource operations-oriented programs, education, and visitor contacts, trained and guided by resource specialists.

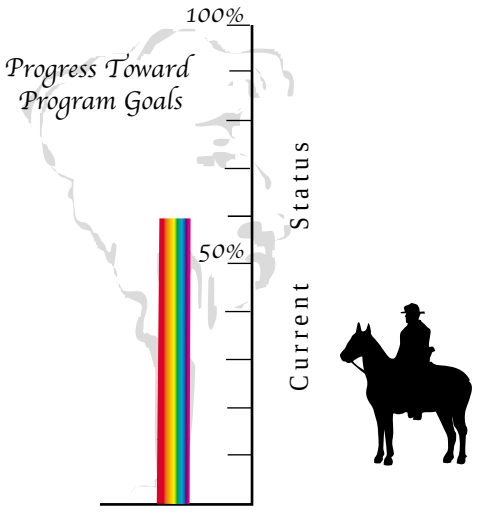
Field projects are accomplished safely, efficiently, and cost effectively.

Current State of Resources/Programs

Existing specialists have accomplished a number of inventories, monitoring, and mitigation actions, but equipment, training, and staff remain limited.

Interdisciplinary "resource rangering" receives continued emphasis, but time and funding for field-level resource operations fall short.

Despite renewed emphasis on safety, resource operations staff lack adequate equipment, reliable vehicles, and the training needed to perform their varied responsibilities.



1998 Funding and Staff

Recurring Funds	
Yellowstone N.P. Base Budget	$ 331,200
Cost Recovery/Special Use Fees	199,336
Non Recurring Funds	
One-time Projects	$107,300
Staff	15.6 FTE

The human resources and funding necessary to professionally and effectively manage the park to stewardship levels will be identified in the park business plan.