



Winter Use

Winter presents challenges to both visitors and park managers. With snow piled six feet high along the road, it can be disconcerting to round a bend in an open snowmobile and find a belligerent half-ton animal who does not want to yield the right-of-way. But if it is an unsettling experience for the visitor, it is even more so for the moose or bison, whose bolting may waste precious calories needed to sustain the animal until spring.

When Yellowstone was established no one foresaw that a frigid, snow-covered landscape would one day be enticing to visitors. While the road from the park's North Entrance was plowed at least as far as the Lamar Valley for visitors in the 1930s, deep snow and cold temperatures kept all but the most intrepid travelers out of the park's interior from November through March. In 1949, snowplane tours escorted 35 visitors into the park, and in 1955, the first snowcoaches brought 507 people to enjoy the winter wonderland. The first private snowmobiles—all six of them—joined the snowcoach riders in 1963, traveling on ungroomed roads. At that time, Yellowstone in winter had fewer than 1,000 visitors and no hotels or restaurants, gas stations, or warming huts.

By the late 1960s, under increasing pressure from the surrounding states and communities to plow park roads, Yellowstone chose instead to encourage winter visitation by grooming interior roads for more comfortable travel by snowmobile and snowcoach. In this way, technological improvements have made the park a wonderful place for a broader range of visitors to enjoy winter scenery and wildlife. Sub-zero temperatures make steam from hot springs appear much more dramatic, and animals are easily spotted against the

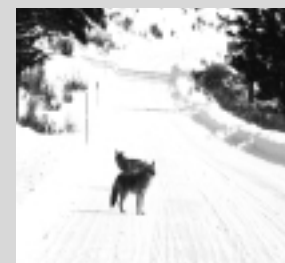
snowy backdrop, often congregating at thermal areas. The unfrozen waters enable ducks, geese, and other birds to spend the entire winter in the park.

National park policy permits snowmobile use only on designated routes and when it is consistent with the park's resource values and safety considerations. In light of such concerns, snowmobiles were prohibited at Yosemite, Sequoia-Kings Canyon, and Lassen Volcanic national parks after an initial period of limited use. Glacier National Park has never

ADAPTATIONS TO WINTER LIFE

The park's residents—both wild and human—have adapted to the rigors of Yellowstone's winters in a variety of ways over the years. Army scouts built the first "snowshoe cabins" in the 1890s for shelter during patrols into the park interior. Into the 1970s, nearly all rangers and their families moved from summer duty stations at Yellowstone Lake, Old Faithful, and Canyon to park headquarters in the lower, more moderate climate of Mammoth, where there has been a primary school since Army days. Today about 235 NPS and concession employees spend the winter in the park's snowbound interior, stocking in four months' worth of supplies. Their access to the outside world depends on satellite-transmitted television, mail that arrives twice a week on a snowmobile from Mammoth, and increasingly via email and the world wide web. While some employees transfer to less isolated locations when their children reach school age, others "home school" or commute the children by snowmobile to school. Most permanent employees find owning a snowmobile to be a necessity for occasional trips "out," but few seasonals can afford to buy one on six months' pay.

Many of the wild animals leave the park in winter: mule deer and five of the park's seven elk herds move to lower elevation ranges; army cutworm moths fly from the tops of the Absarokas to agricultural lands on the plains of Wyoming; many birds migrate to distant, even tropical habitat for the winter. Of those animals that stay, the long sleepers include ground squirrels, yellow-bellied marmots, and grizzly bears, who hibernate for four to six months. Others like pikas and beavers retreat from sight, seldom seen under snow or ice, but awake, living on food stored up during summer and fall.





Waiting to Inhale

During peak winter use periods, more than 500 snowmobiles may pass through Yellowstone's West Entrance in a single hour. This causes not only a great deal of noise and congestion, but foul air: snowmobiles are significantly more polluting than a modern automobile. Concerns about employee health led to the installation of a carbon monoxide monitoring station at West Yellowstone in October 1998. Subsequent monitoring has found carbon monoxide levels near the limits set by federal standards and the State of Montana. Other studies are researching snowmobile emissions and pollution deposits in the snowpack.

allowed snowmobiles on Going-to-the Sun Road. At Voyageurs National Park, snowmobiling is a popular but controversial winter recreation.

GROOM IT AND THEY WILL COME

Yellowstone's response to increasing winter use has been incremental and piecemeal, starting with more road grooming. Shelter for snowmobilers was provided by hauling in trailers to use as warming huts. More employees and volunteers were added to the winter staff, but they had to be housed in trailers or cabins that had been built for summer use. The demand for overnight visitor lodging was met by converting an employee dormitory to provide more rooms at Old Faithful (see page 6–44).

By the time the first formal analysis of oversnow use was done in 1990, annual winter visitation was passing 100,000. With interest in snowmobiles growing, the number of winter visitors continued to rise dramatically, reaching a record 143,000 in the winter of 1993–94. Visitation declined somewhat in the following years, dropping to 113,504 in 1996–97, perhaps because of negative publicity about crowding, a hike in the snowmobile entrance fee from \$4 to \$15, or unusually good snow conditions in lower elevations outside the park. By the winter of 1998–99, the visitor count was back up to about 120,000.

THE PROBLEMS OF PLENTY

The cost of services. While winter visitors still comprise less than 4 percent of the park's total annual visitation,



Yellowstone has been unable to absorb the rapid growth without strains to its facilities and staff as well as stress to park resources. Winter operations are especially expensive because of the logistics of servicing remote areas and over-snow transportation. For example, maintenance crews now plow 70 miles of asphalt, groom 184 miles of snow-covered roads for snowmobiles, and shovel walkways in developed areas and trails. Additional base funding has not

been provided to add staff or address any of the maintenance, equipment, law enforcement, visitor protection, and utility costs that have resulted from the growth in winter visitation. Consequently, to the extent that Yellowstone has allocated funding to provide some increases in winter staffing and improvements in facilities such as warming huts and employee winter housing, it's been at the expense of summer operations. Since 1991, just the cost of maintaining park roads, buildings, and oversnow vehicles has grown 42 percent to nearly \$1.2 million annually (see "Infrastructure" page 7-2).

A hazy shade of winter. Although Yellowstone is designated a Class I airshed under the Clear Air Act—meaning that its air quality should not be degraded—snowmobile exhaust creates clouds of smoke at park entrances and other congested areas that are far more polluting than the emissions from modern cars, which are subject to federal regulation. The effect of carbon monoxide, a major portion of the exhaust, on unacclimated visitors is intensified at higher altitudes.

Risk management. Expanding use not only means increased likelihood of conflict between users, but increased safety concerns. The number of snowmobile accidents in the park has been ranging from 25 to 42 each winter, some of which result in human fatalities. When the weather is mild and nighttime temperatures do not fall below freezing, groomed road surfaces rapidly deteriorate the next day. Even 400 snowmobiles can cause road conditions to decrease from good to deplorable by late afternoon, and some days up to 2,000 machines enter the park. Medical transports are difficult and slow; it can take four hours to travel the 30 miles from Old Faithful to West Yellowstone when road conditions are poor. To reduce the number of accidents and prevent use by children, all snowmobile operators in the park are required to have a valid driver's license.

Behind the scenes. All gasoline sold in Yellowstone during the winter must be brought into the park in the fall and stored. Winter gasoline sales to visitors doubled since 1985 and an additional station opened at Fishing Bridge in 1993. If gasoline needs continue to grow, storage capacity will soon be inadequate, despite a significant



increase in tank capacity at Canyon in the early 1990s. Storage capacity is also inadequate for the park's snowmobiles and grooming equipment, and for providing heating fuel. The demand for diesel fuel exceeded the supply at Canyon and Grant Village in 1994 and 1995, and propane storage was insufficient for the Lake district in 1992 and 1994.

Substantial solid waste is generated in the park interior during the winter by both resident employees and park visitors. Until the roads reopen in the spring, most solid waste in the interior is stored in 75-foot compactor trailers, creating wildlife attractants and potential health risks. These trailers are being used to their maximum capacity, and alternatives will require a major capital investment.

Many of the park's water and sewage systems were installed more than 25 years ago and were not designed for winter use, as the lines are too close to the ground surface or in thermal ground that accelerates their deterioration. At Old Faithful and Madison, sewage discharge systems are working at their capacity and cannot withstand any substantial increase in use. (See "Infrastructure," page 7-31.)

Yellowstone has made major strides in the last decade to purchase and maintain snowmobiles for park staff to carry out their work; one-third of the fleet is now replaced each year. Park mechanics have gained skills in fixing the temperamental machines, which are built for recreational use rather than the high-mileage work use by Yellowstone's snowbound staff.

CONFLICTING PRIORITIES



What visitors want. Eight surveys have been conducted in recent years to help the park learn more about winter visitors and their preferences. In the winter of 1996-97, about 64 percent of the season's visitors entered by snowmobile and 9 percent by concessioner snow-coach; the other 25 percent entered the park on its only plowed road, between Gardiner and Cooke City, Montana. Many of these visitors parked at trailheads to cross-country ski.

According to a visitor survey conducted in February 1995, the most common activities were viewing wildlife (91 percent), viewing scenery (90 percent) and snowmobiling (74 percent). "Trails and roads need grooming" was most often mentioned as what visitors liked least about their visit to Yellowstone, but noise and pollution from snowmobiles came in second. Such surveys expose the conflict: winter visitors want better traveling conditions, but the current level of motorized use is already damaging the quality of their experience.

While many snowmobilers may expect a "social" atmosphere, other winter visitors want quiet and solitude. Cross-country skiers have objected that on calm days they can hear snowmobiles even when five



miles from the nearest road. Some snowmobilers criticize the unsafe driving of other snowmobilers, and many visitors complain about the crowded parking areas, roads, warming huts, food services, and restrooms.

What wildlife need. Although visitors crowding around wildlife to get a closer look can be hard on animals at any

time of year, in winter, when many animals survive on stored fat supplies, the extra energy they expend when frightened can mean the difference between life and death. While most of the park's deer, bighorn sheep, and pronghorns migrate out of the park in search of milder weather, many bison, elk, and moose remain in the park where the temperature routinely drops to 40° below zero and mountain meadows are buried under snow. Many animals travel on park roads, at least until they encounter traffic. They may appear especially docile and tolerant of human proximity because they are moving slowly or not at all, but research has shown that their heart rates increase when a snowmobile passes, indicating that they are stressed even if they do not move away. Any energy loss affects the animals' ability to survive the winter. The very quietness of a cross-country skier who suddenly comes upon a bison or elk herd without advance warning can also cause stress. New studies underway may help managers better understand the relationship between winter recreation and wildlife.

What local communities seek. Many communities surrounding the park see their own survival at stake in the winter use controversy. Although residents do not agree about what they expect from public land use, many depend on the associated tourist industry; some areas have little or no other economic base during the winter. The neighboring communities have spent millions to attract more winter tourists, who are believed to spend twice as much per capita as their summer counterparts.



With the support of the Wyoming congressional delegation, federal funding was provided to construct the 320-mile Continental Divide Snowmobile Trail, which starts near Pinedale, Wyoming, and goes through Grand Teton National Park, ending in the John D. Rockefeller Jr., Memorial Parkway, at which point snowmobilers can pick up the trail system into Yellowstone. West Yellowstone, Montana, has billed itself as “the snowmobile capital of the world,” and Cody officials wanting to attract more winter tourists have pressed for more development and winter accommodations on the east side of the park.

What the park needs to provide. While the new Snow Lodge at Old Faithful represents a quality experience that Yellowstone would like to be available to all winter visitors, few other visitor facilities in the park were designed for winter use. The winter lodging available at Mammoth Hot Springs is in buildings that were designed for summer use only, in some cases as seasonal employee housing. Warming huts are small and interpretive exhibits are few. Insulation, heating and plumbing systems, museum displays, and even the types of seating in visitor center auditoriums are not conducive to providing for visitors' comfort and enjoyment. Restroom facilities are often inadequate in number, size, and warmth.

Tending to public safety and park resources becomes more time-consuming, more costly, and riskier in winter, requiring additional staff training and equipment. Prevention and control of fires in historic buildings, guest lodgings, and employee residences are more difficult in snowed-in areas at sub-zero temperatures, as is cleaning up hazardous materials spills and herding bison.

WHAT HAS BEEN ACCOMPLISHED

Interagency coordination. In 1994, a committee representing Yellowstone and Grand Teton national parks, the John D. Rockefeller, Jr., Memorial Parkway, and the surrounding national forests was formed to develop a coordinated approach to winter use issues and obtain public input on possible solutions. The committee advocated that a full range of winter use experiences be distributed across greater Yellowstone. The goal is to make information available so that visitors can choose the appropriate setting for their desired activity and enjoy it without risking their own safety or damaging the resources. Each national park and forest is responsible for determining appropriate management within that framework.

Concession contracts. Five snowcoach and 21 snowmobile tour operators are authorized to bring visitors into the park. Before 1995, such concessioners paid a flat fee of \$300 a year. Under their current four-year contracts, they are required to put 4 percent of their gross annual receipts into an account that will be used to pay for improvements in warming huts, restrooms, and other facilities needed for winter operations. In the winter of 1998–99, these fees provided \$31,397 toward such improvements.



New winter lodge. The Snow Lodge at Old Faithful, which was originally constructed as an employee dormitory and laundry, became the only winter lodging in the park's interior in 1971. A new lodge for both summer and winter visitors was completed in 1999, funded from revenues generated under the park's contract with Amfac. The new 100-room Snow Lodge provides better accommodations for about the same number of visitors as the prior building, and consolidates fast food, dining room service, and a ski shop into one building.

New Winter Use Plan. In response to a lawsuit filed by the Fund for Animals and several other parties concerned because the NPS had not prepared an environmental impact statement (EIS) on the effects of winter recreation and road grooming on wildlife and other park resources in greater Yellowstone, the NPS agreed in May 1997 to prepare a new winter use plan and EIS for Yellowstone and Grand Teton national parks and the John D. Rockefeller Parkway. In addition to input from the general public, five counties, three states, and the U.S. Forest Service have agreed to participate in the winter use EIS process. The draft winter use plan and EIS was made available for public review in August 1999 with alternatives that include both continuation of the current mix of uses and changes in permitted uses. In January 1999, the U.S. Environmental Protection Agency announced plans to regulate snowmobile emissions, but this is unlikely to have any impact on Yellowstone in the near term.



Program Needs

- **ASSESS CAPACITY AND SET LIMITS.** Each oversnow and motorized road segment in the park should be evaluated for the quality of the visitor experience, resource threats, visitor safety, the possible effects of displacing a large number of winter users to adjacent land, facility capacity, and budget limitations. Unless limits are imposed that hold use at or below current levels (120,000 to 140,000 visitors per season), additional steps must be taken to ensure that quality winter experiences and park resources are maintained.

- **RANGER STAFF.** Increasing the ranger staff would enable each major area in the park to increase road, snowmobile, and ski patrol; extend entrance stations staffing for longer hours; provide 24-hour emergency response; and take care of necessary resource monitoring and management activities.

Additional interpretive rangers are needed so that visitor centers and warming huts can be kept open for longer hours, seven days each week, and provide more interpretive programs and specially designed winter activities for children.

- **MAINTENANCE CREWS.** Additional employees are needed to adequately handle these responsibilities and to permit:

- ⇒ adequate building maintenance, including clearance of up to six feet of snow from roofs to protect structural integrity and human safety;
- ⇒ daily grooming of oversnow routes, which when they become choppy are uncomfortable and, at worst, capable of throwing people from snowmobiles;
- ⇒ plowing of roads as often as may be needed to ensure safe travel; and
- ⇒ adequate maintenance of frontcountry trails and boardwalks at Canyon and Old Faithful, which become treacherous when laden with ice and snow.



- **WINTER GEAR.** Rangers need more double-track snowmobiles for emergency response and snow-course monitoring; helmets with radio and hearing protection; and caches located throughout the park interior with gear such as skis, snowshoes, avalanche probes and beacons, cargo sleds, and other search-and-rescue equipment. To improve structural fire protection, the park needs to enclose appropriate fire hydrants and purchase more oversnow fire-fighting vehicles with pumps and water tanks for use in developed areas. To keep roads, boardwalks, and trails to popular viewpoints reasonably accessible in winter, the maintenance staff needs more snowblowers to clear selected walking paths; additional snowmobiles, including double-tracks for towing loads in the interior; and additional groomers to remove the persistent moguls from snow-covered roadways.

- **INFRASTRUCTURE.** Utility systems and facilities require major funding for their redesign or replacement to ensure the health and safety of park visitors and staff during the winter. Appropriate winterized housing is required at each remote area with sufficient storage space for food so that trips to town can be kept to a minimum. Because there are few garages, personal and government vehicles, including snowmobiles that must be kept at entrances and in the park interior, have to be shoveled out and won't start due to temperatures that reach 40° below zero.

- **WARMING HUTS AND VISITOR CONTACT STATIONS.** Warming huts at Canyon and Madison need to better accommodate visitors, and the concessioner-provided food service needs to be upgraded. Hut improvements are also needed at Norris, Fishing Bridge, and West Thumb. The Old Faithful Visitor Center should be replaced with a more appropriately designed year-round facility (see "Interpretation" page 6-8). Suitable exhibits and other interpretive media are needed to meet the park's goals for visitor safety and education and resource protection.

- **RESEARCH.** Previous winter-related research has focussed on visitor use, air quality, and wildlife species such as elk and bison. More needs to be learned about how winter visitation affects other species such bald eagles and trumpeter swans, as well as small mammals living under the snow and vegetation, especially in thermal areas. Research is also needed on the contaminants that are deposited in the snowpack as a result of snowmobile use and may eventually migrate to lakes and streams, on the effects of oversnow vehicles on air quality and noise levels, and how snowmachines can be made quieter and less polluting.





WINTER USE

STEWARDSHIP GOALS



Through sound decision-making, managers implement strategies to determine and maintain appropriate levels and types of winter use.



A full complement of trained staff develops proactive programs to protect, interpret, and maintain resources and facilities to serve needs of winter visitors and protect the park environment.



Researchers assess effects of winter use on migrating wildlife, air and water quality, noise levels, vegetation, cultural resources, and other issues to provide park managers with information needed to help meet long-term goals.



The safety of visitors and staff is emphasized in Yellowstone's severe and life-threatening winter environment; programs are in place to orient and educate winter users of the park.

CURRENT STATE OF RESOURCES/PROGRAMS



Burgeoning winter use has out-paced the ability of park staff and facilities to provide high-quality visitor services in balance with resource protection objectives.



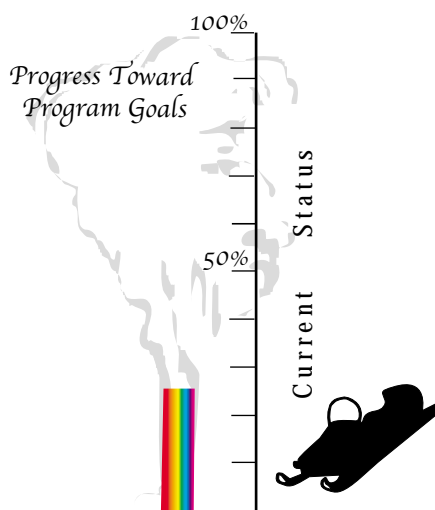
Park operations have not made a good transition from a mostly summer-season operation to addressing busy shoulder and winter seasons. Protection, interpretive, and maintenance efforts are mostly reactive. Despite a new winter lodge, warming huts, food services, and medical facilities are inadequate in winter.



Controversy surrounding issues of noise, air quality, wildlife, and human use levels complicates management of winter use and requires major research efforts, which are only partially funded.



Park newspapers, interpretive programs, ranger patrols, and snowmobile road-grooming efforts contribute to winter safety, but weather conditions, roads and terrain, and geographic isolation continue to make winter trips a challenging and distinctive experience.



1998 FUNDING AND STAFF

Recurring Funds	
Yellowstone N.P. Base Budget	\$ 60,000
Non Recurring Funds	
Fee Demonstration Program Projects	\$ 143,999

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