

Winter Visitor Use Planning in Yellowstone and Grand Teton National Parks

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Abstract—Winter use in Yellowstone and Grand Teton National Parks increased dramatically in the 1980s and early 1990s. That increase and the emphasis on snowmobiles as the primary mode of transportation brought into focus a host of winter-related issues, including air pollution, unwanted sound, wildlife impacts and the adequacy of agency budgets, staff and infrastructure to manage the burgeoning use. The increase has spawned several research and monitoring projects, five planning processes, two regulatory processes and, to date, two lawsuits. This paper is a case study of the ongoing planning, regulatory and legal aspects of winter use in these parks.

Winter recreation in Yellowstone and Grand Teton National Parks can be viewed from contrasting perspectives. One is the phenomenal scenery enjoyed by thousands of visitors each winter. Another is that the scenery and visitors have become a drawing card and source of economic development for communities near the parks. A third perspective is the possible impact on resources from those visitors: Visitors first began arriving in measurable numbers 40 years ago, and their impacts on a system that evolved over thousands of years with virtually no human intervention are unknown. Park staff has a different perspective, which involves managing visitor use in a natural area unlike almost any other in the lower 48 states. Another perspective questions the quality of the visitor experience and the effects on that quality of both passive and proactive management decisions. Finally, there are the planning and legal perspectives as all of these issues interact. This latter perspective includes five winter visitor use planning efforts, one petition for rule making, one promulgation of regulations and two lawsuits, so far. This paper is a case study of the last perspective and focuses on the planning and legal aspects of an ongoing land management issue (as of May 1999).

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The paper's primary focus is Yellowstone National Park, but similar issues for Grand Teton National Park and the John D. Rockefeller, Jr., Memorial Parkway are also addressed. The Parkway is a separate administrative unit of the national park system located between Yellowstone and Grand Teton and managed by Grand Teton National Park.

Winter in the National Parks

Winter in Yellowstone and Grand Teton National Parks evokes images of quiet and solitude. In contrast to the hustle of a summer day in the parks, where tens of thousands of visitors are congregating, winter is perceived by many as the quiet season, when they can be alone with nature. A summer day can see over 25,000 people in Yellowstone alone, while 2000 people may visit Yellowstone on a busy winter day. In summer as well as winter, visitors congregate at the developed destinations in Yellowstone and Grand Teton, such as Old Faithful, the Grand Canyon of the Yellowstone, Flag Ranch, Moose and West Thumb Geyser Basin. Visitors are drawn to these locations in all seasons in large part because the parks' road network and developments are typically concentrated near the features. The road network in Yellowstone was laid out at the turn of the century, courtesy of the U.S. Army, to connect many of the Park's major geological features.

Nearly 90 percent of Yellowstone National Park is proposed wilderness, and over 98 percent of the Park is undeveloped and considered backcountry. The less than two percent that is developed contains the road network, utility corridors and developed areas. Winter visitors are also like summer visitors in that the vast majority do not stray far from the road corridors and developed areas. Summer and winter visitors traveling through the parks in motorized vehicles are confined to the road corridors and developed areas. Winter visitors to the parks travel by three primary modes: snowmobile, snowcoach and automobile. About 60 percent of Yellowstone's winter visitors enter the park via snowmobile, 30 percent are in an automobile and 10 percent are riding a snowcoach. Typically, about 15% of Yellowstone's visitors cross-country ski while in the park (Littlejohn 1996). Dispersed, off-road recreation is nonmotorized in nature. This is in contrast to other public lands around the national parks, where a combination of both road-based and dispersed motorized recreation is allowed, summer and winter.

As little as 30 years ago, winter travel in the national parks was only for the hearty and rugged few. Cross country skis were heavy wooden affairs, and early snowmobiles

almost required a complete tool kit and spare parts (or a spare snowmobile) if you wanted some assurance of completing a successful trip. Road surfaces were not groomed, and there were no warming huts or gas stations. Park staff overwintering in the interior of Yellowstone were primarily winter keepers, whose role - then and now - was to help shovel snow off roofs and generally keep an eye on the buildings and resources. Visiting the parks in the winter was truly an adventure, and getting there (and back) was more than half the fun. Other papers document more completely the history of winter use (Greater Yellowstone Coordinating Committee 1999; National Park Service 1990; Paganelli 1980; Yochim 1998).

Although limited over-snow vehicular travel began shortly after World War II, regular motorized travel did not take off until the 1960s when a combination of more reliable snowmachines and a supportive park administration made over-snow travel more feasible. In the late 1940s, communities near the Park requested that Yellowstone's roads be plowed for the winter to support better winter access to the parks and economic development for the communities. These requests continued over the decades, culminating in U.S. Senate hearings in 1967 on the subject. The agency's decision was not to plow roads, but to support the existing, small-scale snowmobile travel. As a result, by December 1971, most of the basic infrastructure and facilities that are in use today were in place. The road network was groomed regularly, and the Snowlodge at Old Faithful (at that time, a converted employee dormitory) was being used for lodging (Yochim 1998). The 1971-72 winter recorded 29,248 visitors. Use more than doubled over the next decade (National Park Service 1990).

Action at the Presidential level in the early 1970s should have affected snowmobile use at Yellowstone, but did not. In February 1972, President Nixon signed Executive Order 11644 on *Use of Off-Road Vehicles on the Public Lands*. That Executive Order stated that trails may only be located in units of the National Park system when off-road vehicle use will not adversely affect their natural, aesthetic, or scenic values (Executive Order 11644 1972). Use of snowmobiles on road corridors has been defined as off-road vehicles use. As a result of this Executive Order, parks were directed to review snowmobile use. Some did, and based on the review, parks such as Glacier National Park, chose to ban snowmobile use. Yellowstone National Park apparently did not accomplish a written review (there is no evidence in the administrative records) and allowed snowmobile use to continue (Yochim 1998). Executive Order 11644 was amended and strengthened by Executive Order 11989 signed by President Carter in 1977 (Executive Order 11989 1977).

Things have changed in the past 30 years. The winter season in the parks lasts from mid-December to mid-March. Prior to mid-December, the park roads are closed to visitor traffic to allow enough snow to accumulate to support over-snow traffic. Beginning in early to mid-March, the Park closes, and roads are plowed to prepare them for the summer season. Park roads begin to reopen for wheeled vehicle traffic in mid-April, while the remainder open by late-May. In Yellowstone, the road from the Park's North Entrance to Cooke City, Montana remains open year-round for wheeled vehicle travel, as does U.S. Highway 191, which traverses the northwest corner of the park. Grand Teton National

Park plows the road from Moran Junction to Flagg Ranch throughout the winter. Snow accumulations in the parks vary from about a foot in the Mammoth area of Yellowstone to over 10 feet in the Flagg Ranch and South Entrance areas of Grand Teton and Yellowstone.

To prepare for the winter season, the NPS and concessionaires must bring in and store all large or bulky supplies before the roads close. For example, all gasoline that is available for public sale or administrative use over the course of the winter is stored in underground fuel tanks by early November each year. Similarly, most garbage generated in the interior is stored for the balance of the winter and hauled out as the roads are plowed. The public as a whole often does not understand the infrastructure limitations; they assume that park facilities operate like their communities.

Burgeoning winter use in the 1980s caused the National Park Service to question whether the agency had the fiscal resources to adequately provide for winter visitors. These questions, and a desire to upgrade winter infrastructure, led to the preparation of a winter use plan for the parks. In the 1982-83 winter, visitation stood at 71,653. In the 1989-90 winter, just before the *Winter Use Plan* was completed for Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway, visitation was 98,249 (National Park Service 1990).

Within two years, winter use in Yellowstone exceeded the 1990 plan's projection for the year 2000 of 143,000 winter visitors. National forests in the Greater Yellowstone Area also observed rapid, but less well-documented increases. For example, snowmobile visitation on the Hebgen Lake District of the Gallatin National Forest increased from 47,552 to 84,800 between 1984-85 to 1995-96 (Greater Yellowstone Coordinating Committee 1999). For most of the other forest lands, use is not systematically recorded and is based on anecdotal reports by forest staff, other agencies and users.

This measured and perceived increase in use in the late 1980s and early 1990s set in motion planning processes in the parks and forests that continue to this day. The 1990 *Winter Use Plan* said that if visitation exceeded the year 2000 projection or if the Continental Divide Snowmobile Trail became operational in Grand Teton National Park, a process called "visitor use management" would be initiated. Both of those events happened in the winter of 1992-1993. The *Winter Use Plan* defines visitor use management as a process to identify more specific visitor experience and resource protection objectives, identify key impact indicators, establish a monitoring program and identify specific actions to manage impacts within acceptable limits (National Park Service 1990).

However, the pattern of increasing visitation changed in the mid- to late-1990s. Visitation in Yellowstone National Park went down, dramatically, reaching a nadir of 113,504 in 1996/1997. Visitation has hovered around the 115,000-125,000 level since then. What happened in the 1990s to cause this reduction in use? We do not know the exact causes, but we believe a number of events influenced visitation.

The national parks experienced some poor snow years, so the parks actually closed prematurely in the spring due to lack of snow. Also, in many years, the parks experienced repeated warm days and nights, making it difficult to groom roads effectively. When this happens, the snow roads become extremely rough, with moguls up to three feet high

after as few as 300 to 400 snowmobiles pass by. Riding conditions become deplorable, if not downright unsafe. Snowfall in other parts of the country, especially the upper Midwest, was excellent in some of those years, which may have kept people recreating closer to home. Short-term weather events also contributed to the decline in use. In 1997, it was raining at Old Faithful on New Year's Day. The snow turned to slush, and Yellowstone closed. The Federal Government shut down in late-1995 and early-1996, and the parks were closed for three weeks. As part of the fee demonstration program, entrance fees increased from \$4/person to \$15/snowmobile in December 1996. In early 1994, the National Park Service began publicly expressing misgivings about increasing winter visitation. The media, some local communities and tourism agencies translated these concerns into a notion that the parks were (or were about to be) closed. We continue to get inquiries from potential visitors asking if the parks are open.

In addition, we believe the nature of how people learn about and plan their trip to the parks in the winter has influenced visitation levels. Visitor surveys tell us that many people decide and plan their trip based on previous trips and talking with other people, especially family or friends, rather than park or tourism agency sources (National Park Service 1995; Northwest Wyoming College 1999). If they, or people they know, have had (or perceive) a bad experience, they are not going to return.

Going back to the early 1990s, we need to remember that park and forest staff had experienced close to a decade of measured and perceived growth in visitation. In some years, the percentage increases were double digit. Park staff could see no impediments to increasing use in the future. The snowmobile industry, chambers of commerce, and state tourism bureaus were all promoting winter in Yellowstone and Grand Teton National Parks. The parks themselves, and concessionaires, were contributing to that promotion. Communities like West Yellowstone, which not too many years before almost shut down in the winter, had developed into a self-styled "snowmobile capital of the world." More than 1,000 rental snowmobiles were available for park and forest visitors in this one community.

Other issues associated with increased use were at the forefront for park staff. This included concerns about emissions and air quality, unwanted sound, impacts to wildlife, adequacy of agency staff and budgets, and adequate infrastructure. These concerns initially led the two parks to work together in 1993 to develop an action plan to implement the short- and long-term steps that the 1990 *Winter Use Plan* identified (National Park Service 1993). Park staff discussed these with the national forest personnel, who echoed their concerns.

The Interagency Winter Use Report

In early 1994, after a winter tour of park and forest lands, the national forest supervisors and national park superintendents who make up the Greater Yellowstone Coordinating Committee agreed to coordinate a review of winter use in the Greater Yellowstone Area. The managers requested that their agencies' staff work together to provide a report on

winter recreation. The report was to encompass winter recreation on more than 12 million acres of federal lands and cross the boundaries of three national park units and six national forests (the Targhee, Custer, Gallatin, Shoshone, Bridger-Teton and Beaverhead-Deerlodge). The forests transcend the boundaries of three U.S. Forest Service regional offices.

A team of 15 to 20 staff was formed over the course of 1994 to respond to the Greater Yellowstone Coordinating Committee's request. Individual units made staff assignments, and staff were to work on this project, in addition to their normal duties. Funding for staff salary and travel was up to the individual units, while the National Park Service paid for supplies, printing and the cost of facilitators from the NPS Denver Service Center. The group made an early decision to adopt the NPS Visitor Experience and Resource Protection process (VERP). That process was still in a testing and development phase, primarily at Arches National Park, but the forest and park staff believed that it held promise for this application. The working group requested staff from the NPS Denver Service Center, who were helping develop and test the VERP process to serve both as advisors and facilitators for the interagency team.

The National Park Service developed the VERP process in response to the 1978 National Parks and Recreation Act. That law directs the NPS to establish and implement carrying capacities for units of the national park system. VERP is founded on the "limits of acceptable change" process published by the U.S. Forest Service in 1985 and shares a common set of elements. Those include a description of the desired future conditions, identification of indicators of quality visitor experiences and resource conditions, establishment of standards that define the minimum acceptable conditions, monitoring to determine if management actions must be taken and taking management actions to ensure that indicators are maintained within specified standards. VERP is intended to be integrated into national park planning and focus on the impacts of visitor use on the visitor experiences and the park resources. These impacts are primarily attributable to visitor behavior, use levels, types of use, timing of use and location of use (National Park Service 1997a).

The assessment included using the U.S. Forest Service's landscape analysis process to look at winter recreation and ways to improve visitor experiences while protecting the environment. Managers, interest groups and the public have expressed concern about a variety of issues surrounding winter use. The assessment describes issues as being within a user group (skiers versus skiers), between user groups (skiers versus snowmobilers), with natural resources (recreationists using winter wildlife habitat), and trespass into restricted areas. The report describes multiple issues in certain areas as well.

The landscape analysis utilized the Geographic Information System (GIS) to create database layers of lands currently open to winter use, existing use areas (motorized and nonmotorized) and visitor use issues. As the project began in 1994, few unified Greater Yellowstone Area-wide GIS layers were usable. Even accurate boundaries of the different units did not exist in a consistent and usable computer format. Some units lacked GIS staffing. Therefore, developing maps was a time-consuming, labor-intensive process.

The team created other data layers using natural restrictions to winter recreational use, such as areas of low snow and difficult slopes (the team considered slopes greater than 30% inaccessible to the average user). The team used these two restrictive layers to develop maps for areas that could potentially be used by either motorized or nonmotorized users. Once the team created these layers, they assessed them and created a map of potential future recreational areas (Analysis Results map). This Analysis of Results is not a final decision plan. Rather, the analysis is a guiding tool in future planning processes for all units.

As this process evolved, the team recognized the limited information available on winter recreation and wildlife. The team requested two bibliographies that compiled the literature available on this topic (Bennett 1995; Caslick 1997). In 1997, an interagency wildlife team was created to examine specific natural resource issues, such as impacts of recreation to an individual wildlife species, or more general topics, like impacts to vegetation. Wildlife biologists wrote individual research review papers on each identified topic, describing possible or known impacts and management recommendations. These are being compiled into a report, *The Effects of Winter Recreation on Wildlife: A Literature Review and Assessment*, that will be printed in mid- to late 1999 (National Park Service, in press).

The team released a draft interagency assessment for public review in the summer of 1997. The public review period for this document was 120 days, and the team received 5,800 comments (in 1,216 separate letters). Comments ranged from reiteration of previous concerns about winter use to specific points about the preliminary report. The team addressed comments and incorporated those that were appropriate in the final report.

In addition to public comments the States of Wyoming, Montana and Idaho expressed a concern that their winter recreation management activities were not well-represented in the assessment. Team members met with representatives from each state to listen to and gather information about the states' programs. The team incorporated these into the report, and the state representatives reviewed the report before it was finalized. The final report, *Winter Visitor Use Management: A Multi-Agency Assessment*, was printed in the spring of 1999.

The interagency report collates information on winter recreation in the Greater Yellowstone Area. The report makes no decisions about implementing management actions or reallocating land uses to address issues. Rather, it defers all decisions to unit-specific planning, such as forest plan revisions for the national forests or new winter use plans for the national parks (Greater Yellowstone Coordinating Committee 1999).

Lawsuit

Just before the release of the draft interagency report, the Fund for Animals and other organizations and individuals filed suit against the National Park Service in U.S. District Court in Washington, D.C. over winter use in Yellowstone and Grand Teton National Parks. In the winter of 1996-1997, about one-third of the bison living in Yellowstone National Park died. Some starved, but federal and state wildlife staff killed many because they strayed from the

Park and were believed to pose a potential source of brucellosis for livestock. The Fund for Animals and other plaintiffs filed suit, alleging that the winter roads in the Park had eased bison departure (*The Fund for Animals v. Babbitt* (D.D.C., Civ. No. 97-1126)).

The lawsuit identified three primary complaints. The plaintiffs alleged that the Park Service had failed to prepare an environmental impact statement concerning winter use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway. They also alleged that the NPS had failed to consult with the U.S. Fish and Wildlife Service on the impacts of winter recreation on threatened or endangered species and had failed to evaluate the effects of trail grooming in the parks on wildlife and other park resources.

On October 27, 1997, the court approved a settlement agreement. Under the terms of the agreement, the National Park Service agreed to prepare a new winter use plan and corresponding environmental impact statement, to consult with the U.S. Fish and Wildlife on the effects of winter use on threatened and endangered species and to prepare an environmental assessment in the winter of 1997-1998 to evaluate the effects of temporarily closing a segment of road to study wildlife movements on groomed roads within the Park.

Road Closure Assessment

The most immediate outcome of the settlement agreement was preparation of an environmental assessment to analyze possible winter road closures to study wildlife movement. The purpose of the assessment was to analyze the benefits and costs of a winter road closure on understanding bison use of winter roads and on the visitor experience and local economies.

Wildlife use of the groomed winter roads has been an issue for a number of years, with some biologists and winter recreationists arguing that winter roads impact wintering wildlife. They say that the groomed roads provide an energy-efficient route for the animal movement, leading to population increases and changing distribution and habitat use patterns (Meagher 1993). Some argue that groomed roads contribute to bison migration out of the Park. With the population increases and easier movement, some also argue that groomed roads have increased the number of bison killed outside the Park. Others assert that there is no relationship or no effect of groomed roads on wildlife (National Park Service 1997b).

The assessment considered two road segments for possible closure. On Yellowstone's east side, the Park proposed closing the segment between Fishing Bridge and Canyon through Hayden Valley. On Yellowstone's west side, the closed segment would be between Norris and Madison along the Gibbon River. Neither segment would be closed at the same time as the other, and the implementation schedule would vary between segments. The Park chose these segments because bison used the areas that included the road segments and because closing either of the segments would not deny visitor access to all of Yellowstone's major features (such as the Old Faithful and the Grand Canyon of the Yellowstone). All entrance roads would have remained open, and all features would have been accessible; however, travel

to some of those features would have been much longer from some entrances.

The Park completed the *Environmental Assessment-Temporary Closure of a Winter Road, Yellowstone National Park* in November 1997 and placed the document on public review for 45 days. A total of 2,742 letters containing 6,443 different comments were received during the comment period. On January 16, 1998, the National Park Service signed a Finding of No Significant Impact that deferred a road closure because further research was necessary before closing a road would provide useful research information. At the end of three winter seasons (Fall 2000), the park will evaluate ongoing research and monitoring efforts and determine if a road closure is warranted. All road segments were to be considered for possible closure, not just the two identified in the environmental assessment. If a decision is made to close a road, the National Park Service is committed to providing one year's notice to the public. The Park Service believed there was a lack of information about wildlife use of the groomed roads, and that information should be gathered first, while the roads are open and available to the public.

Another Lawsuit

On February 18, 1998, the Fund for Animals and other organizations restated their concerns about the road closure decision by filing suit against the National Park Service to enforce the settlement agreement, again in U.S. District Court in Washington, D.C. The plaintiffs alleged that the National Park Service did have the necessary data to make the decision to close a road segment in Yellowstone. In addition, the plaintiffs alleged that the unlimited road grooming and lack of winter-use management practices were harming the plaintiffs' short- and long-term interests in recreating and in protecting and observing and studying the environment and wildlife within Yellowstone. They also alleged that the Park Service violated the settlement agreement by failing to close a road. During an October 1998 hearing on the lawsuit, the court combined the February 1998 action with the earlier lawsuit and granted intervention status to groups and individuals representing snowmobile and commercial interests.

On March 31, 1999, the U.S. District Court upheld the Finding of No Significant Impact for the temporary winter road closure environmental assessment. The court reasoned that the Finding of No Significant Impact was not arbitrary and capricious and did not violate the settlement agreement. The court also deferred deciding on whether continued road grooming violated the Organic Act and the Endangered Species Act until a new winter use plan and environmental impact statement are finished. However, the court retains jurisdiction to enforce the settlement agreement, and the judge expected that some of the issues raised by the plaintiffs would be addressed in the forthcoming environmental impact statement for the new winter use plans.

New Winter Use Plans

The other major outcome of the October 1997 settlement agreement was the preparation of new winter use plans for Yellowstone and Grand Teton National Parks, along with an

environmental impact statement. The settlement agreement specified that the draft plans and environmental impact statement be made available for public review by August 1, 1999, and the final plan be completed by September 1, 2000. The National Park Service regional director will sign the Record of Decision about October 1, 2000. In the settlement negotiations, the plaintiffs demanded that no more than three winters pass before the Park Service reach decisions on a new winter plan. The plaintiffs wanted those decisions implemented by the 2000-2001 winter season.

The settlement agreement also identified the NPS would ask the U.S. Forest Service to be a cooperating agency under the provisions of the National Environmental Policy Act (NEPA). NEPA specifies that federal, state or local agencies or Indian tribes may be designated cooperating agencies on the basis of their special expertise or legal jurisdiction. Soon after the settlement agreement was signed, counties and states around the Park requested that they also be designated cooperating agencies. In early 1998, the Director of the National Park Service agreed that three states (Wyoming, Idaho and Montana) and five counties (Park and Teton in Wyoming, Fremont in Idaho and Park and Gallatin in Montana) would also be invited to be cooperating agencies. As cooperators, the states or counties have no jurisdiction over the decisions to be made by the national parks in winter use planning. Memorandums of Agreement identified the cooperators' special expertise, which was primarily socioeconomic. In addition, the states identified special expertise in matters related to air quality and wildlife.

An early question in the planning process was whether to continue with the commitment to prepare winter use plans or, instead, spend the time and money to prepare a General Management Plan. General Management Plans are to provide broad direction for resource preservation and visitor use. The 1978 National Parks and Recreation Act (P.L. 95-625) requires that all units have a current General Management Plan. Yellowstone and Grand Teton National Parks have master plans, predecessors to the General Management Plans, that were approved in 1974 and 1976, respectively. National Park Service management was concerned that the time and money needed to complete a winter use plan could be better devoted to a General Management Plan that would address winter, as well as spring, summer, and fall use.

Because of the short time frame and number of cooperators, the Park Service decided to defer General Management Plans and proceed with winter plans. That decision was reached in March 1998, but National Park Service funds for the winter plans were limited to \$800,000. Earlier estimates had been about \$2.2 million dollars to complete the effort. To make up the shortfall, the parks have used park base funding and fee demonstration money to pay staff members working on the project and to fund natural and social science-related studies to better understand winter issues.

After the settlement agreement was signed, the Park Service envisioned that the planning team consisting of staff from the two parks, with the bulk of the team members from the Denver Service Center. Staffing has proven problematic, however.

Two key individuals at Grand Teton National Park who were involved in the interagency assessment left the Park in 1998. In addition, the Denver Service Center was downsized.

In the mid-1990s, Congress became concerned about the expense of accomplishing construction projects in the national parks and the inability of the Park Service to explain how it prioritized its construction projects. The National Park Service had one of the largest central planning, design and construction supervision offices of the civilian federal agencies, with over 700 employees in the early 1990s. A review by the National Academy of Public Administration recommended that the number of federal employees be dramatically reduced at the Denver Service Center and that their work be accomplished by contractors (National Academy of Public Administration 1998). By early summer 1999, about 260 full-time employees will be at the Denver Service Center. Several Denver-based winter plan team members left the team by early 1999 and have not been replaced.

In May 1998, the National Park Service approved a new planning guideline, Director's Order 2. The guideline revamped how General Management Planning was to be done for the parks, focusing on broad goals to be achieved for the unit, rather than addressing specific issues. Concerns about General Management Plans had focused on their cost, length of time to prepare, and limited shelf life (often only until the next superintendent arrived). The new guideline addresses why a unit exists and what the desired future conditions of a park are to be. The guideline defers specifics of how to achieve those desired future conditions to later site-specific planning. The intent is to be more prescriptive rather than descriptive about a park, to give management the flexibility to respond to varying issues in the future (National Park Service 1998). This new guideline was adopted for use in the winter plans, which meant that the team members, especially those in the parks, had to learn new vocabulary and approaches to planning while in the midst of preparing the plan.

The team accepted public scoping comments on the winter use plans and environmental impact statement from April 14, 1998 to July 18, 1998. It mailed scoping brochures to 6,000 interested parties and held 16 public meetings throughout the Greater Yellowstone Area and the states of Idaho, Montana and Wyoming. In addition to local area and regional meetings, the team held national meetings in Salt Lake City, Denver, Minneapolis and Washington D.C. The team received approximately 2,500 comment letters.

The cooperating agencies have continued active involvement in the winter use EIS process. In October 1998, the National Park Service and the cooperating agencies met in Idaho Falls, Idaho, to formulate initial concepts for alternatives. Twenty-five participants and approximately 10 observers attended the three-day workshop. Both parks held similar workshops during the week of October 26. The team incorporated the majority of the ideas generated at the workshops into draft preliminary alternatives.

In late January 1999, the team presented preliminary alternatives to the National Park Service's regional director, who will eventually sign the Record of Decision. Intensive reviews at the Park Service's regional and Washington, D.C. offices, and by the Assistant Secretary for Fish and Wildlife and Parks occurred over the next three months. The team released the draft preliminary alternatives to the cooperating agencies on April 22, 1999. In keeping with the new planning guidelines, these alternatives prescribe the desired future conditions for the parks, but they do not describe the specific implementation steps. The analysis of the

alternatives is currently underway, and the team asked the cooperators to provide information that will assist in that analysis.

A 60-day extension of the August 1 deadline was requested of the plaintiffs, who responded favorably, if the National Park Service would agree to two conditions. First, the National Park Service had to initiate public comment on the Bluewater Network petition (see below) by April 21, 1999 and complete response to the petition within one year of its submission (January 2000). In addition, the Park Service was asked to delay grooming the winter roads until December 15, 2000, in order to allow judicial review of the Record of Decision due for approval in October 2000. The Park Service did not agree to the conditions. Negotiations resulted in a two-week extension for release of the draft plan and EIS (until August 15, 1999).

The Bluewater Network Petition

The Bluewater Network petition was one of two twists in the winter use saga in 1999. In January 1999, a coalition of environmental groups represented by the Bluewater Network filed a petition with the National Park Service to ban snowmobiles from all 28 national park units where they were allowed (Bluewater Network 1999). Of the 28 units, snowmobile use is common in only about seven (Yellowstone, Grand Teton, Denali, John D. Rockefeller, Jr., Memorial Parkway, Voyagers, Rocky Mountain and Crater Lake). For many of the rest, it is typically incidental and often for in-holder use.

The Park Service is currently developing a response to the petition. In the meantime, the petition affected the new winter use plan in two ways. First, evaluation of the petition delayed the review and approval of the draft alternatives by more than two months. Second, the team added an alternative that would make the mode of over-snow transportation snowcoaches, essentially banning snowmobiles.

EPA Regulations

The other twist occurred in February 1999. The U.S. Environmental Protection Agency initiated the regulatory process to establish emission rules for snowmobiles as part of an effort to control oxides of nitrogen, hydrocarbons and carbon monoxide from large nonroad, spark-ignition engines (Environmental Protection Agency 1999). EPA's first step in the regulatory process was to publish a proposed finding on the amount of emissions that these engines contributed to the nation's air pollution. Most of the draft alternatives call for emissions reductions, but those alternatives may or may not coincide with the forthcoming EPA regulations.

Research

Since 1994, a number of research, monitoring and literature reviews have been underway to help national park (and other) managers understand winter use issues. Many of these studies are ongoing and reports are being prepared, so reviewed and published results are not always available.

This paper references some of the complete studies. Many of the research results will be available after the new winter use plans are completed in the fall of 2000. Thus, much of the information will be most useful in guiding actions taken to implement the winter plans. This section focuses on the information that the studies will add to our knowledge base.

Wildlife has been a key concern of the public and the agencies for some time. Information from two literature searches (Bennett 1993; Caslick 1997) and other literature reviews was organized into a series of papers that evaluate the effects of winter recreation on wildlife. The report, *The Effects of Winter Recreation on Wildlife: A Literature Review and Assessment*, is in press and should be completed later this summer. Several current wildlife monitoring and research projects that should help us better understand the effects of groomed roads and winter recreation on wildlife, especially bison and elk.

Air quality has been a key concern centered on emissions from snowmobiles. A variety of laboratory and field studies have measured emissions, exposure of employees and visitors to emissions, deposition of pollution in the snowpack, and pollution in snowmelt. Some of the studies have also looked at the effects of using oxygenated fuels and biodegradable lubricants to reduce pollutants (Bishop and Stedman 1998; Ingersoll and others 1997; Radtke 1997; Snook and Davis 1997; State of Montana undated; White and Carroll 1998; Wright and White 1998;).

Related to the air quality issues are efforts to create a clean and quiet snowmobile. A private citizen and a Teton County, Wyoming commissioner are organizing the Clean Snowmobile Challenge 2000. The challenge is a student design competition sponsored by the Society of Automotive Engineers to develop a cleaner and quieter snowmobile with good performance characteristics. The challenge is set for March of 2000 in Jackson, Wyoming. A Montana-based company has been exploring the possibility of building an electric (battery-powered) snowmobile. We hope to see a prototype of the machine this coming winter.

Visitors and park staff identified crowding and the degrading quality of the visitor experience as concerns. A series of visitor studies have been done to investigate these issues, beginning with Littlejohn (1996) and culminating in the paper being presented by my colleagues from the University of Montana and University of Vermont as part of this conference (Borrie and others 1997).

Gateway communities, counties and states are concerned that any change in visitor use patterns will affect businesses and economies, so economics is a key issue. To aid understanding of the economic issues, a series of surveys are being conducted in 1999. A winter visitor survey was done in 1998/1999, a regional and nationwide telephone survey is taking place this spring and a summer visitor survey is underway. These surveys, all asking similar questions about winter use and bison management issues, will provide us a three-season regional and nationwide picture of public opinion of these issues. The visitor surveys are exploring visitors' willingness to pay for certain management actions, such as clean and quiet snowmobiles.

Unwanted sound, or noise, is a concern highlighted by park staff and visitors alike. It is also one of the least studied concerns. Some limited ambient sound monitoring has occurred in Grand Teton National Park along the Continental

Divide Snowmobile Trail. The key goals that the National Park Service would like addressed are a field-friendly way to measure the sound created by a snowmobile and to evaluate the sources of snowmobile sound so that a quieter snowmobile can be produced.

Snowmobiles create moguls as they slightly accelerate and decelerate, which creates small ridges in the snow that are pushed up into a series of bumps that may be three feet from top to bottom. Creation of these moguls is more likely during warm conditions and are a primary complaint of visitors who must travel miles over rough trails. Studies of the mechanics of moguls, how to groom the snow surface better, and how to advise visitors of the conditions they are going to face will be underway next winter.

These research topics address the key issues raised by park staff and the public over the past decade. The results should help park managers adjust how the new winter use plans are put in place.

Conclusion

This paper presents a case study of a land management issue that is in progress. The winter recreation issue will continue to evolve, as it has over the past decade, and a paper presented a year from now on this topic will certainly present some different perspectives. However, a couple of conclusions will probably hold true. The highly contentious nature of the winter use issue will continue, and any changes (or the status quo) will be scrutinized and intensely debated in the public forum. Since 1990, the National Park Service has been involved in a variety of planning processes to address winter recreation. Each process has reached a similar conclusion. Decisions have been deferred, to another planning process, to the collection of additional monitoring and research data, or both.

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