Multiple Use Trails For Winter Recreation

Facts and Myths about Snowmobiling

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Written By Kim Raap/Trails Work Consulting
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For additional information regarding snowmobiling and access for snowmobiling, refer to ACSA's *Access Guide for Snowmobiling on Private and Public Lands* at: http://www.snowmobilers.org/resources.asp

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Snowmobiling –

Snowmobiling...

A Provider of Multiple Use Trails and Opportunities

Snowmobiling is a favorite winter pastime for over two million people in the United States. Snowmobiling also helps provide a large number of recreation opportunities for other trail users since the majority of the 137,000 miles of snowmobile trails in the U.S. are open for multiple uses and help provide important winter access, services, and trailheads.

ISMA Photo

Snowmobiling provides opportunities for families and friends to enjoy wintertime companionship while experiencing splendid scenery like no other season offers; opportunities for challenge, physical exertion and stress relief while recreating in the great outdoors; and opportunities to connect with nature in the solitude of secluded winter backcountry. These opportunities combine to help teach respect and conservation of the environment, while also instilling a strong appreciation for private and public lands.

Snowmobile trails are funded solely by snowmobile users through:

- Snowmobile registrations,
- Snowmobile trail or user permits,
- Snowmobile gasoline tax rebates, and
- An immense number of hours snowmobilers volunteer each year to clear, maintain, sign and groom trails.

Did you know...

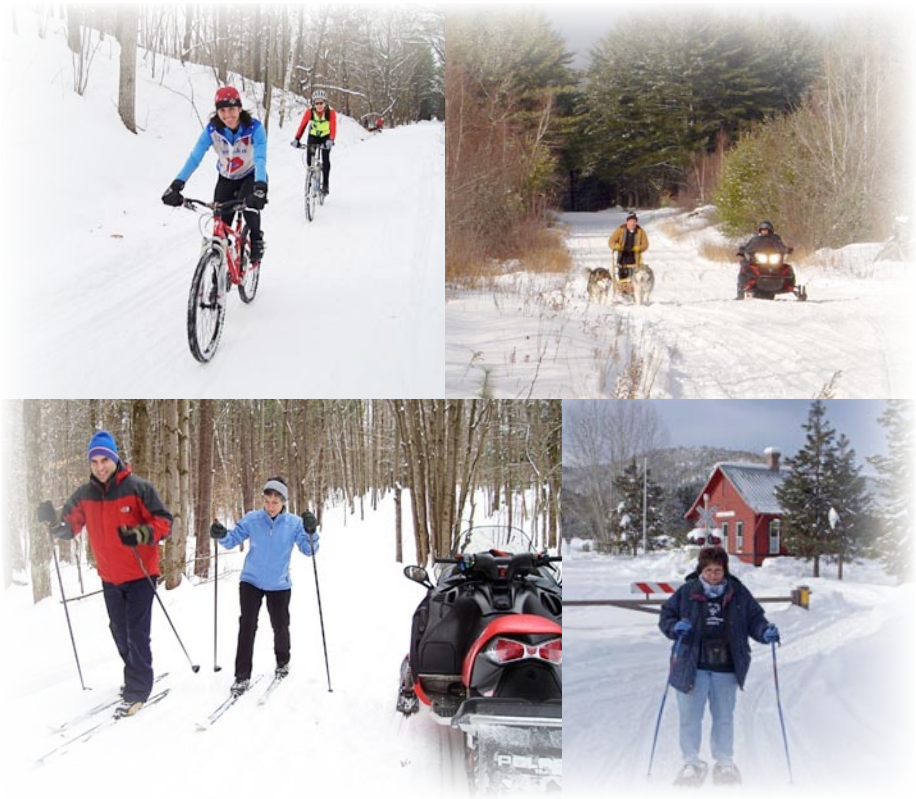
The majority of the 137,000 miles of snowmobile trails are open for multiple uses.

The efforts by snowmobilers provide a myriad of opportunities for other winter recreationists, including cross-country skiers, backcountry skiers, snowshoers, dog sledders, winter hikers and bicyclists, and in some areas, winter ATV riders. All of this typically comes at no cost to the other winter trail users. Additionally, many snowmobile trails are also used by hikers, bicyclists, equestrian riders, OHV riders, and a host of other recreationists during the summer season. Contributions from snowmobilers often help public land managers accomplish their goals for providing winter recreation opportunities – at little or no cost to the agencies.

Snowmobiling occurs on private and public lands across the northern tier of the country. It involves many different riding styles which include on-trail riding, cross-country riding off trails in powder and gentle open areas, boon-docking in forested areas, and hill climbing in mountainous regions. This wide range of riding styles requires an equally wide variety of recreation settings ranging from gentle on- and off-trail opportunities for families to challenging off-trail opportunities for experienced and expert riders.

A growing trend is that – particularly with the aging population – more elderly and people with disabilities are using snowmobiles to access areas where they may have skied or snowshoed to when they were more mobile. Snowmobiles also provide opportunities for disabled children and the elderly to experience the great outdoors in the winter in a way that would not otherwise be possible.

Snowmobile technology has changed immensely and today's snowmobiles bear little resemblance to snowmobiles produced ten or twenty years ago. They are regulated by the U.S. Environmental Protection Agency (EPA) and are significantly cleaner and quieter than early models. As a result, multiple use trail sharing is now even more viable than ever before.



Photos by: *(Clockwise from left)* Vito Sarkauskas, Andy Holland, Vito Sarkauskas, sumpter.org

Fact...

Hybrid motorized / nonmotorized recreation is growing in popularity.

Photo by Shad Hamilton

Many backcountry skiers and snowboarders have embraced snowmobiling as a means to gain access farther into the backcountry or closer to nonmotorized opportunities at Wilderness boundaries. These 'hybrid users' value the ability snowmobiles give them to get 10 or 20 miles away from their vehicles – which is substantially farther than they could ski into the backcountry on day trips. These cross-over motorized / nonmotorized recreationists embody the ultimate characterization of 'multiple use' on public lands.

Snowmobiling...

A Catalyst for Winter Economies

Snowmobiling generates over $22 billion in annual spending across the United States and is responsible for over 90,000 fulltime jobs in North America. Its overall economic impact is particularly important to many rural communities where snowmobiling-related tourism helps provide income and jobs during what otherwise would be an off-season. This literally helps many businesses keep their doors open and people employed year-round. This spending also generates important tax revenues for governments.

According to the International Snowmobile Manufacturers Association (ISMA Snowmobiling Fact Book 2009), the average snowmobiler is 44 years old. Approximately 70% of all active snowmobilers are male; 30% are female.

The average snowmobiler rides their snowmobile 1,314 miles per year and spends $4,000 each year on their snowmobile-related recreation. The average annual household income for snowmobilers is $75,000.

About 60% of snowmobilers usually trailer their snowmobiles to go riding. The other 40% either snowmobile directly from their primary residence or have a vacation home where they keep and use their snowmobiles.

Snowmobilers are also caring neighbors. They raise about $3 million for charity each year – and this is above and beyond the fundraising and other volunteer work they do to provide public snowmobile trails.

Snowmobiling requires a substantial investment of tens of thousands of dollars for a snowmobile, clothing, trailer, and a tow vehicle – along with higher daily trip costs for fuel, oil, repair parts, user fees, and other associated trip expenditures like food and often times lodging.

ISMA Photo

On the other hand, it is much less expensive to participate in nonmotorized recreation. Cross-country skiers and snowshoers can get started in their sport for as little as $100 or $200 – and even the most advanced technology gear is thousands of dollars less than a $6,000 to $12,000 snowmobile. Additionally, daily trip costs for nonmotorized recreationists are next to nil compared to snowmobilers.

Many States have commissioned studies to determine their specific economic impacts from snowmobiling. Economic benefits vary based upon ratios of local/resident riders (lower total spending) versus levels of non-resident and non-area riders (higher total trip expenditures). A sampling of state survey results includes:

Alaska: The economic impact of snowmobiling in the Anchorage and Mat-Su Borough was found to be over $35 million annually (Anchorage Economic Development Corp. 2000).

ISMA Photo

Iowa: Snowmobiling generated $65.4 million in annual economic activity, resulting in 899 jobs (Iowa State University 2005).

Maine: The economic impact of snowmobiling in Maine was estimated to be $261 million per year (University of Maine 1998).

Massachusetts: The economic impact of snowmobiling was estimated to be $54.7 million annually (University of Massachusetts 2003).

Michigan: The average snowmobiler spends $4,218 annually on snowmobiling activity, equipment, and vacationing within the state of Michigan. Additionally, over $1 billion in economic impact is generated and over 6,455 full time jobs are created (Michigan State University 1998).

Minnesota: The snowmobile industry generates substantial tax revenues at the state and local level. Over $51 million in taxes were paid at the local and State level directly related to snowmobiling activity (University of Minnesota Tourism Center 2005).

New Hampshire: The economic impact of snowmobiling in the State of New Hampshire was $1.2 billion annually (Plymouth State University 2004).

Pennsylvania: The annual economic impact of snowmobiling in Pennsylvania was estimated to be approximately $161 million per year (Lebanon Valley College of Pennsylvania 2000).

Utah: Total annual expenditures resulting from snowmobiling are about $52.6 million; 31% of Utah riders have college or technical training and an additional 31% have a B.A. or Graduate degree; and about 87% of Utah riders have not experienced any conflicts with other types of winter recreationists (Utah State University 2001).

Vermont: The economic significance that the sport of snowmobiling has on the State of Vermont exceeds $600 million annually (Johnson State College 2003).

Washington: The annual economic impact of snowmobiling in Washington is $92.7 million (Washington State University 2001).

Wyoming: A University of Wyoming report (1995) concluded that snowmobiling was responsible for $189.5 million in economic impact and "is extremely important to the economy of the State of Wyoming." The University of Wyoming conducted a follow-up study in 2001 and concluded that snowmobiling-related spending totaled more than $234.3 million – a 24% increase in just five years. Of this amount, about forty percent was by nonresidents, forty percent was from residents, and nearly twenty percent was attributed to snowmobiling outfitters' clients. This spending directly or indirectly supported over 3,800 jobs and generated over $50.2 million in labor income and over $10 million in government taxes and revenue.

Fact...

Snowmobiling generates over $22 billion in annual spending across the United States - much of which is in rural areas.

New York:
The economic impact of snowmobiling in New York State was estimated to be $476.2 million in 1998 (SUNY Potsdam). In 2003 the State of New York again surveyed snowmobilers and calculated the economic impact of snowmobiling had increased to $875 million annually – ***an increase of 84% in just five years.***

Snowmobiling...

Cooperative Partnerships

Cooperative partnerships are important to the snowmobile community and are the basis for many multiple use winter trails. Through their funding and volunteer labor efforts, snowmobilers help provide multiple use winter recreation opportunities and management that includes:

Photos by Kim Raap

- Trail grooming
- Trail signing
- Trail clearing and maintenance
- Trail monitoring
- Law enforcement
- Avalanche forecasting, education, and weather monitoring equipment
- Safety and ethics education
- Search and rescue equipment
- Trailhead and trailside facilities

Examples of equipment provided for partners by snowmobilers: (clockwise from top right)
trail grooming equipment, snowmobile for law enforcement, weather monitoring equipment for avalanche forecasting, snow ambulance for search and rescue

Snowmobilers are also dynamic partners in local community service projects.

A good example as to how snowmobilers strive to reach out and work with land managers is the service-wide Memorandum of Understanding (MOU) with the USDA Forest Service, which was entered into by the snowmobile community in 2005 to help promote cooperative partnerships. The snowmobile groups who signed this MOU included the American Council of Snowmobile Associations (ACSA), International Association of Snowmobile Administrators (IASA), and the International Snowmobile Manufacturers Association (ISMA). These three 'cooperators' represent the organized snowmobiling public/industry and are recognized leaders in establishing snowmobile ethics, safety standards, volunteerism, and fostering appropriate land use management on Federal and non-Federal lands.

The MOU noted a need to actively promote public-private partnerships that encourage responsible use of public lands by visitors participating in snowmobile travel and recreational activities. The MOU established a general framework of cooperation upon which mutually beneficial programs, work projects, and snowmobile activities may be planned and accomplished on National Forest System lands. It also recognized that such programs, projects, and activities complement the Forest Service mission and are in the best interests of the public.

Photo by Kim Raap

The MOU outlines that snowmobile groups/cooperators will:

- Provide technical assistance to land managers and communities involved in work projects, educational activities, and snowmobile opportunities.
- Encourage its members to work with local Forest Service officials to discuss and identify opportunities for cooperative work on mutually beneficial projects or activities.
- Promote Tread Lightly! ethics by providing training and instruction to its members.
- Use the name "USDA Forest Service" when referring to the Forest Service and submit to the Forest Service for approval, prior to production, the final layout of all promotional materials which use the Forest Service's name and insignia, any employee by name or title, or this agreement, as requested by the Trails Coordinator, Recreation, Heritage, and Wilderness Resources staff.
- Not publicize, or otherwise circulate, material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications, including world wide web sites) which states or implies Governmental, Departmental, Agency, or Government employee endorsement of a cooperator product, service, or position. No release of information relating to this agreement may state or imply that the Government considers a specific cooperator's work product or service to be superior to other products and services.
- Complete Job Hazard Analyses for cooperator project activities on National Forest System lands and conduct safety training sessions prior to each individual project activity. These sessions will review hazards anticipated and measures that should be taken to reduce the hazard.

The MOU outlines that the Forest Service will:

- Provide the cooperators information regarding the development and presentation of training materials related to snowmobiling safety and ethics, and the availability of snowmobiling opportunities on National Forest System lands.
- Encourage local Forest Service officials to participate with snowmobile clubs and associations in the development of mutually beneficial work projects, educational activities, and snowmobile opportunities.
- Make National Forest System lands available for the furtherance of this MOU, subject to applicable Federal laws, regulations, Forest plans, and other management direction.
- Provide information on completing Job Hazard Analyses and conducting safety training sessions for cooperator project activities on National Forest System lands.

Snowmobiling...

Soil and Vegetation Compaction

Myth: ***Snowmobiles compact soil and damage vegetation.***

Facts: Snowmobiles exert dramatically less pressure on the earth's surface than other recreational activities (i.e., just one-tenth the pressure of a hiker and one-sixteenth the pressure of a horseback rider, as shown in the table below). Additionally, a snowmobile's one-half pound of pressure is further reduced by an intervening blanket of snow.

Pressure Exerted by Various Recreation Travel Modes

Object	Pounds of Pressure exerted per square inch
Four-Wheel Drive Vehicle	30
Horse	8
Man (hiking)	5
All-Terrain Vehicle	1.5
Snowmobile	0.5

Numerous studies looked at potential compaction when snowmobiles first started growing in popularity in the 1970s and concluded that potential impacts were minimal:

- A study of the effects of snowmobile traffic on bluegrass (Foresman 1976) concluded that 'early growth was slower but summer yields were the same; no soil compaction was detected in the treated plots.'

- A research symposium report published by Michigan State University (1974) stated that 'where snow cover exceeded 3 inches in depth there were no detrimental effects on grass or vegetation stands, their vigor, or yield; high-grade grasses recover naturally from heavy snowmobile traffic; and snowmobile traffic caused no stand reductions, but did cause a slower recovery in early spring.'

- A study in Maine (Wentworth 1972) concluded that 'compaction of the snow cover had little effect on average soil temperature under the different treatment areas.'

- A study of snowmobile traffic on several forage species and winter wheat (Ryerson 1977) over a 3-year period showed no detrimental effects on four forage species and that winter wheat yields were not reduced. It concluded that trail use rather than open, uncontrolled use would be most appropriate in crop vegetation environs.

- A study in Nova Scotia (Keddy 1979) concluded that 'marsh vegetation showed no significant effects of snowmobile treatment' since its roots are under solid ice cover during the winter.

Photos by Kevin Dreyer

Given adequate snowfall and responsible operation, all evidence of snowmobile operation generally disappears when the seasons change and snow melts.

The photos to the right show the same locations in both winter and summer; the top photo set is of a heavily used trail while the bottom set shows a heavily used off-trail location adjacent to a busy parking area.

Additionally many snowmobile trails are located on snow over the top of roadways or hardened trails, where the impact on vegetation is in effect zero.

Photos by Kim Raap

Fact...

Numerous studies concluded that 'there were no detrimental effects' to soil or vegetation from snowmobiling.

Did you know...

A man hiking exerts 10 times the pressure per square inch than a snowmobile.

Snowmobiling...

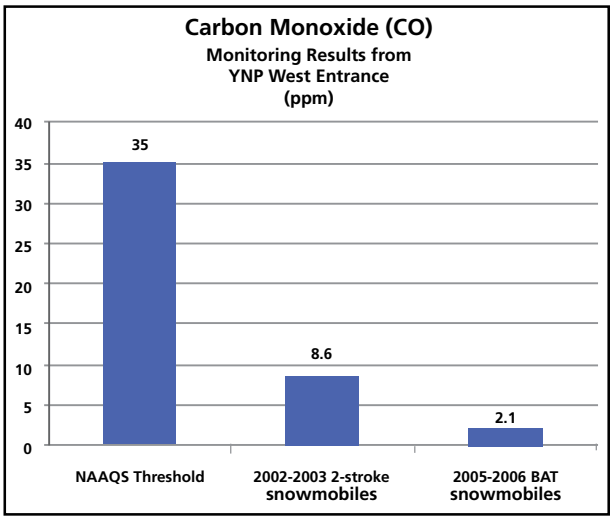
Emissions and Air Quality

Myth: ***Snowmobile emissions cause air pollution and harm the environment.***

Facts: Comparisons are often made between snowmobile engines and personal watercraft engines – they are simply not the same, so this analogy is inappropriate. Likewise, old lawn mower emission studies are often characterized as snowmobile emission studies – this too is inappropriate and inaccurate science. The truth is that snowmobile engines are dramatically cleaner than portrayed and they do not cause unacceptable air pollution.

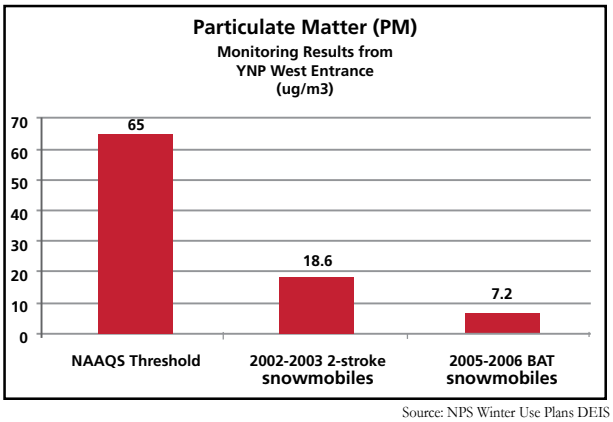
This issue has been studied more intensely in Yellowstone National Park (YNP) than anywhere else in the world. Prior to implementation of a new management plan in late 2004, the YNP West Entrance clearly represented a worst-case scenario in respect to snowmobile emissions. However despite all the rhetoric and poor management historically at this location, National Ambient Air Quality Standards (NAAQS) have never been exceeded in Yellowstone, or anywhere else, due to snowmobile use.

Yellowstone National Park Air Quality Monitoring – CO



Source: NPS Winter Use Plans DEIS

Yellowstone National Park Air Quality Monitoring – PM



Source: NPS Winter Use Plans DEIS

The NAAQS 1-hour threshold for Carbon Monoxide (CO) is 35 parts per million (ppm). The winter season of 2002-2003 represents the 'highest snowmobile visitation levels' for the most recent years when 'any snowmobile model' (primarily 2-strokes) could be used in YNP; monitoring showed the 1-hour average for CO at the YNP West Entrance was 8.6 ppm (about one-fourth the NAAQS threshold). In 2005-2006 the requirement for only Best Available Technology (BAT) model snowmobiles (all 4-strokes) was fully implemented in Yellowstone; monitoring showed the 1-hour average for CO dropped to 2.1 ppm (6% of the NAAQS threshold). CO emissions from both engine types were significantly below the NAAQS threshold.

Air quality monitoring during the same time period at the YNP West Entrance also measured Particulate Matter (PM 2.5). The NAAQS 24-hour threshold for PM 2.5 is 65 micro-grams per cubic meter (ug/m3). The average 24-hour concentration observed during the 2002-2003 YNP winter season (primarily 2-stroke models) was 18.6, while the average during the 2005-2006 season (all

4-stroke models) was 7.2 ug/m3. PM emissions from both engine types were well below the NAAQS threshold (28% and 11% of the threshold, respectively).

EPA Snowmobile Emission Standards

Model Year	Emission Standards		% of Fleet Phase-In
	HC g/kW-hr	CO g/kW-hr	
2002 baseline 2-stroke snowmobile	150	400	NA
2006	100	275	50%
2007 – 2009	100	275	100%
2010	75	275	
2012	75	200	

In 2002 the U.S. Environmental Protection Agency (EPA) issued the first-ever snowmobile engine emissions regulations – something the snowmobile community had been requesting for several years. These regulations target Carbon Monoxide (CO) and Hydro-Carbon (HC) emissions from snowmobiles on an engine family (fleet average) basis and apply to model year 2006 or newer snowmobiles. The first two stages (2006 through 2009 model years) of the regulations reduced overall CO and HC emissions by a minimum of 30% over 2002 baseline emissions. The final stages (2010 and 2012 model years) reduce baseline emissions by a minimum of 50%. The result is that snowmobile engines have significantly lower emissions and are now much cleaner.

New four-stroke engines and direct or semi-direct injection engine technology have truly driven a major transformation in snowmobile engine technology. Additionally the use of low-emission synthetic engine oils has greatly reduced snowmobile emissions.

Other air quality monitoring studies related to snowmobiling include:

- A two-year air quality monitoring study was conducted by the USDA Forest Service Rocky Mountain Research Station (Musselman 2007) at the Green Rock snowmobile staging area in the Snowy Range of Wyoming. It found that snowmobile emissions did not have a significant impact on air quality at this extremely busy snowmobiling area located in a high-elevation ecosystem. The study measured levels of nitrogen oxides (NOx, NO), carbon monoxide (CO), ozone (O3) and particulate matter (PM10 mass); air quality data during the summer was also compared to winter data. It determined that pollutant concentrations were generally low both winter and summer, and were considerably lower than maximum levels allowed by NAAQS.
- Portable emission measurements in Yellowstone National Park (Bishop 2007) indicated that '4-stroke snowmobiles had on average lower gram/mile emissions for all species and lower gram/mile/person emissions for CO and HC than the average snowcoach.'
- Winter air quality monitoring in Yellowstone National Park (Ray 2007) indicated that 'snowmobiles and snowcoaches may have approximately equal contributions to the concentrations of carbon monoxide (CO)' and 'air quality at both locations (West Entrance and Old Faithful) is good during the winter and is well below the national ambient air quality standards.'

Photo by Kim Raap

Clean Snowmobile Challenge

Both the local and national snowmobiling communities, along with the four snowmobile manufacturers, have been strong supporters of the Society of Automotive Engineers (SAE) Clean Snowmobile Challenge since it was founded in 2000. This Collegiate Design Series event requires students to take a stock snowmobile and re-engineer it to reduce emissions and noise while maintaining or boosting the performance. A total of 16 universities from across the United States and Canada participated in the 2009 event.

The 200-plus students, advisors and sponsors who take part in this event are making a difference for the future of snowmobiling. Over 30 technical papers have been produced as a result of this event; it continues to be a prime driver in efforts to lower snowmobile emissions and sound levels. Many of the student competitors have been hired as engineers by snowmobile manufacturers after they graduate.

Snowmobiling...

Snow and Water Quality

Myth: ***Snowmobile engines deposit gasoline, oil, and other contaminants on snow, which leads to ground and surface water quality degradation and subsequently impacts aquatic life.***

Facts: Scientific monitoring has proven that snowmobiles do not emit gasoline and other contaminants directly into the snowpack or have a negative effect on water quality.

The effect of snowmobile emissions on the chemistry of snowmelt water was extensively studied by Yellowstone National Park's Center for Resources – Fisheries and Aquatic Sciences Section (Arnold/Koel 2006) over several consecutive winters. This long-term research study represents the most extensive and accurate body of scientific information available on this topic.

Photo by Dan Gould

The Yellowstone monitoring project began during late March through mid-April of 2003, when two-stroke snowmobile visitation was around 75,000 units per year, and continued for consecutive winters. Snowmelt runoff samples were collected from four sites along the heavily traveled road corridor connecting Yellowstone's West Entrance at West

Yellowstone, Montana, and the Old Faithful area. Three sites were located immediately adjacent to the roadway in the vicinity of the West Entrance, Madison Junction, and Old Faithful. The fourth site was used as a control and was located near Madison Junction approximately 100 meters from the roadway, away from the effects of snowmobiles. Each site was visited on 9–10 different days during the spring sampling period, with visits dependent on having a daily temperature >5 degrees Celsius for good potential to obtain snowmelt runoff. Water quality measurements related to water temperature, dissolved oxygen, pH, specific conductance, and turbidity were collected at each site.

Snowmelt runoff samples were analyzed for nine volatile organic compounds (VOCs), including benzene, ethylbenzene, ethyl tert-butyl ether, isopropyl ether, meta and para-xylene (m- and p-xylene), methyl tert-butyl ether, ortho-xylene (o-xylene), tert-pentyl methyl ether, and toluene. Of these nine compounds, only five were detected during any one sampling event. The detected compounds included benzene, ethylbenzene, m- and p-xylene, o-xylene, and toluene.

All water quality measurements were within acceptable limits and the concentrations of all VOCs detected each year were considerably below the U.S. Environmental Protection Agency's water quality criteria and guidelines for VOCs targeted in this study. During the course of the study, VOC concentrations of snowmelt runoff in Yellowstone National Park were well below levels that would adversely impact aquatic systems.

A USDA Forest Service Rocky Mountain Research Station study (Musselman 2007) in the Snowy Range of Wyoming measured water chemistry and snow density from snow samples collected on and adjacent to a heavily used snowmobile trail. Snow on the trail was denser than it was off-trail, which would stand to reason since it had been compacted by trail grooming.

Snow chemistry was significantly different between on- and off-trail locations. On-trail snow was more acidic with higher concentrations of sodium, ammonium, calcium, magnesium, fluoride, and sulfate than what was found in snow off the trail, especially early in the season. However since the trail followed a roadway, researchers felt the higher early-season concentrations may have likely been affected more by roadway chemistry conditions than by snowmobile traffic. However all levels were within acceptable limits and well below levels that would adversely impact aquatic systems.

The study also found that snowmobile activity had no effect on nitrate levels in snow; they were the same both on- and off-trail.

Yellowstone Tour & Travel photo

Fact...

VOC concentrations of snowmelt runoff were well below EPA criteria and well below levels that would adversely impact aquatic systems.

-Arnold 2006

Snowmobiling...

Sound Levels

Myth: ***Snowmobiles are noisy and pollute natural soundscapes.***

Facts: Sound levels for snowmobiles have been reduced 94% from early models since pre-1969 snowmobiles were quite noisy. At full throttle, early machines emitted sound levels as high as 102 decibels at a distance of 50 feet.

Snowmobiles produced since 1975 are certified by the Snowmobile Safety and Certification Committee (SSCC) through an independent testing company. They emit no more than 78 decibels from a distance of 50 feet while traveling at full throttle. Additionally, those produced after 1976 are certified by SSCC to emit no more than 73 decibels at 50 feet while traveling at 15 mph.

Examples of Comparative Sound Levels

Sound Source	Sound Level dB(A)
75-piece orchestra	130
Car horn, snow blower	110
Pre-1969 snowmobile	102
Blow dryer, diesel truck	100
Electric shaver, lawn mower	85
Garbage disposal, vacuum cleaner	80
Post-1975 snowmobile (full throttle at 50 feet; maximum allowed by law)	**78**
Alarm clock, city traffic	70
Dishwasher	60
Leaves rustling, refrigerator	40

Comparatively, normal conversation at three feet produces approximately 70 decibels. And since sound levels are logarithmic, it would take 256 78-decibel snowmobiles operating together at wide open throttle to equal the noise level of just one pre-1969 snowmobile.

According to a Michigan Technological University (MTU) study (Blough 2009), 'exhaust noise has long been considered to be the primary noise source on a snowmobile. Historically most snowmobiles have been powered by 2-stroke engines which require a tuned exhaust to produce maximum power. This tuned exhaust is composed of a tuned expansion chamber and a "can" or muffler. In the past, the muffler was not always designed to provide significant noise attenuation. However, in the last 5 to 8 years modern snowmobiles have significantly modified this approach to their exhaust system designs. Many snowmobiles are now powered by 4-stroke engines which do not require a tuned expansion chamber to produce maximum power, leaving the muffler as the only exhaust system component besides the requisite downpipes and piping. The newer 2- stroke snowmobiles still require the tuned expansion chamber however they are now fitted with a very significant muffler, like the 4-stroke snowmobiles, which provides a very significant reduction in exhaust noise. These advances in the reduction of the exhaust noise can clearly be heard on the modern snowmobiles. In many cases, under many operating conditions the dominant noise source now appears to be the track system.'

The MTU study also found that 'snowmobile manufacturers are employing nearly all of the state of the art noise reduction technologies that the automotive and heavy equipment manufacturers use. The snowmobile industry has spent a large sum of money over the last 7 to 8 years to modernize and upgrade both the facilities and software capability to deploy these technologies throughout the design and manufacturing of their snowmobiles. They

use finite element analysis, rigid body dynamics, boundary element analysis, modal analysis, transfer path analysis, sound intensity and near-field acoustic holography to optimize their designs. In every new product release by the snowmobile manufacturers the snowmobiles have been heavily optimized and tested for noise and in many cases hard decisions have to be made between weight, cost, performance, and noise. Upon listening to a new snowmobile it is very evident that in the tradeoff situations, noise has become much more important and driven the final design decisions much more often than in the past designs.'

Protocol for SAE test J2567 was issued in January 2004 and has since been adopted as a sound enforcement tool by several states. This new test established a sound level threshold of 88 decibels at 4 meters (13 feet) which, due to the logarithmic nature of sound levels, corresponds to the '78 decibels at 50-feet' sound law. The result is that illegally altered exhaust systems can now be easily identified with an enforcement tool that is safe to administer in the field and will also hold up in court.

Photo by Kim Raap

A snowmobile's sound level is being measured by a law enforcement officer using the SAE J2567 stationary sound test.

There has been much public discussion regarding snowmobiling in Yellowstone National Park over the past decade. Consequently numerous sound monitoring projects have been completed to compare snowmobile sound levels between different model types and with snowcoaches. Results of these studies include:

- Natural soundscapes monitoring by the National Park Service (Burson 2006) found that 'although on average snowmobiles were audible for more time than snowcoaches (because there were significantly more snowmobiles than snowcoaches in the park), snowcoaches in general had higher sound levels, especially at higher speeds.'
- An earlier Park Service report (Burson 2005) concluded that 'the sound level and percent time oversnow vehicles were audible remained substantially lower than oversnow vehicle sounds from the 2002-2003 winter use season.' This reflects the regulation change whereby only Best Available Technology (BAT) snowmobiles with a maximum sound level of 70 decibels are allowed into the park.
- A State of Wyoming study (Daily 2002) concluded that 'the sound levels of many late model snowmobiles overlap or are quieter than snowcoaches under the same or similar testing conditions. The quietest snowmobile at 20 mph produced less sound than any of the snowcoaches at the same speed. The loudest stock over-snow vehicle at a steady state speed was a Bombardier snowcoach.' The report recommended that 'any regulations written should reasonably consider that over-snow vehicle sound levels are not attributable to just engine sounds, but also must factor in the other mechanical sounds (clutch, track and skis) associated with tracked vehicles.'

Fact...

Snowmobile sound levels have been reduced 94% as compared to early models.

Problems with excessive noise levels do occur when irresponsible snowmobilers modify their snowmobiles' exhaust systems or substitute factory systems with after-market racing exhaust systems. In most states this practice is illegal and grossly misrepresents the sport. To respond to this issue, the snowmobile industry worked with the Society of Automotive Engineers (SAE) and State DNR agencies to develop a stationary sound test for snowmobiles – since the '78 decibels at 50-feet under full throttle' standard is not safe or practical for law enforcement officers to use on trails.

Snowmobiling...

Wildlife Impacts

Myth: ***Snowmobiles disrupt and harm wildlife populations.***

Facts: Throughout the years, many studies have been done regarding the impact of snowmobiles on wildlife. These studies cover a wide spectrum of time – from the early 1970s when snowmobiling was an emerging winter activity to those completed within the past few years. Whether one looks at early studies (whose results remain valid today) or new ones recently completed, the conclusions are the same – impacts are minimal or can at least be managed. Snowmobilers and wildlife populations can coexist very well and, in actuality, have done so for over 50 years.

Yellowstone National Park Studies

The most recent snowmobile/wildlife related studies were conducted in Yellowstone National Park and represent some of the most intensive winter monitoring ever conducted. This body of scientific research includes:

- A National Park Service study in Yellowstone (White 2006) concluded that 'human disturbance did not appear to be a primary factor influencing the distribution and movements of the wildlife species studied; there was no evidence that snowmobile use during the past 35 years adversely affected the demography or population dynamics of bald eagles, bison, elk, or trumpeter swans.'
- A previous Yellowstone study conducted by the Park Service (White 2005) concluded that 'responses by these wildlife species to over-snow vehicles were relatively infrequent, short in duration, and of minor to moderate intensity; ungulates habituated somewhat to motorized recreation; there was no evidence of population-level effects to ungulates from motorized winter use because estimates of abundance either increased or remained relatively stable during three decades of motorized recreation prior to wolf colonization in 1998. Thus, we suggest that the debate regarding the effects of motorized recreation on wildlife is largely a social issue as opposed to a wildlife management issue.'
- A road survey which monitored wildlife/human interactions in Yellowstone (Jaffe 2003) observed that 87% of 21,936 animals observed during road surveys had no visible response to over-snow vehicles (OSVs). Of the

Photo by Kim Raap

Researchers monitoring wildlife/human interactions in Yellowstone National Park

13% of total animals which exhibited an observable response, 68% looked directly at the people viewing them and then resumed their activity. 32% (of the 13% which had a response) were more active, including walk/swim away, rise from bed, attention/alarm, flight, agitate (buck, kick, bison tail-raise), jump snow berm, and charge. Of the 17,209 animals counted within 100m of the road, 17% showed an observable response to the presence of OSVs that stopped, while only 3% of 7,924 animals counted further than 100m from the road showed any visible response.

- A workshop sponsored by the National Park Service, which included experts from federal agencies, state agencies, and universities, was held in Denver, Colorado on April 10-12, 2001 to summarize the state-of-science on monitoring the effects of snowmobiles on wildlife in national parks and surrounding lands. The report from this workshop (Graves 2001) states that 'experts in the field of wildlife (and wildlife reactions to disturbance) are uncomfortable passing judgments on whether snowmobiles adversely (or, for that matter, positively) affect wildlife. Even under circumstance with the best available information, the question of when an impact becomes serious enough to warrant taking action is a subjective value judgment, and many respondents recognized this. The majority felt that insufficient data exist to even begin to understand the issue. Only for ungulates are some scientists willing to say data are adequate, but even for these commonly studied species, most respondents have serious concerns.'
- A study of bison and elk responses to winter recreation in Yellowstone (Hardy 2001) found that 'both species behaviorally responded more often to people off-trail than to people on trails, and these activities prompted more behavioral responses than activities on roads. The predictability and frequency of OSV activities facilitated habituation to the majority of the winter recreation activities. Despite varying responses to increased winter visitation since the late 1970s, bison and elk return to winter in the same area each year, coexisting with winter recreation without incurring losses at the population level.'
- Older Yellowstone studies (Aune 1981) concluded that 'winter recreation activity was not a major factor influencing wildlife distributions, movements, or population sizes.' Prior to that it was observed (Chester 1976) that 'variation in the intensity of human use did not appear to be responsible for shifts in wildlife distribution.'
- A study of elk responses to disturbances by cross-country skiers in Yellowstone (Cassirer 1992) found that 'elk in this study had a low tolerance for disturbance by people on foot or skis. Disturbance caused temporary displacement of the elk.'

NPS photo by Jim Peaco

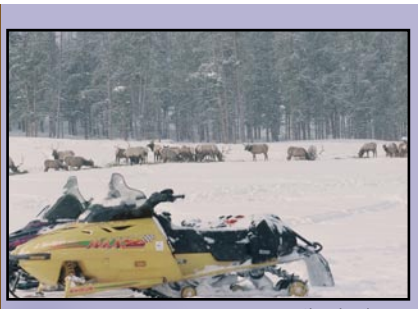


Photo by Kim Raap

Fact...

Researchers have concluded that 'the debate regarding the effects of motorized recreation on wildlife is largely a social issue as opposed to a wildlife management issue.'

-White 2005

Did you know...

Numerous studies have concluded that wildlife species are disturbed more by cross-country skiers and people on foot than by snowmobiles.

Wildlife Impacts

Other Wildlife Studies

While many snowmobile/wildlife studies are 20 or 30 years old, they still represent the 'best available science' and largely have not been updated because scientists feel there are not new issues which warrant spending their precious research funds to simply reconfirm old conclusions. The results of these studies are still applicable – and the impacts are the same if not even substantially lower given the significant decrease in snowmobile sounds and exhaust emissions compared to 1970- and 1980-era snowmobiles. Other wildlife studies, by impact species, include:

Deer, Elk and Moose

- A Montana study of ungulates (Canfield 1999) concluded that 'snowmobiles appear less distressing than cross-country skiers.' The report also stated that 'big game hunting has more immediate effects on ungulate population densities and structures than any other recreational activity.'
- A Colorado study (Freddy 1986) found that 'mule deer were disturbed more by persons on foot than by snowmobiles.'
- A Wisconsin study (Eckstein 1979) states 'data showed that snowmobile activity had no significant effect on home-range size, habitat use, or daily activity patterns of white-tailed deer wintering in Wisconsin.' Additionally it concluded that 'deer appeared to react more to a person walking/skiing than on snowmobiles.'

deer-pictures.com photo

- A Maine study (Richens 1978) concluded that 'white-tailed deer response to snowmobiles seemed dependent on the deer's apparent security. Animals in the open or in hardwood stands tended to run when approached by snowmobile. Deer in softwood stands, which provide more cover, showed a greater tendency to stay when approached. A significantly greater number of deer ran from a person walking than from a person on snowmobile.'
- Another Maine study (Lavigne 1976) found that 'disturbance of deer by snowmobiles did not cause them to abandon preferred bedding and feeding sites. Snowmobile trails enhanced deer mobility and probably reduced their energy expenditure.'
- A Montana study (Aasheim 1980) concluded that 'animals accustomed to humans are less affected by snowmobiles than animals in more remote areas.'
- An Alberta study (Ferguson 1985) regarding the influence of Nordic skiing on distribution of elk and moose determined 'cross-country skiing influenced the general over winter distribution of moose but not of elk. Both species, however, tended to move away from areas near heavily-used trails during the ski season.'
- A Wyoming study (Ward 1980) fitted elk with heart rate monitors and determined that 'elk responded most strongly to sonic booms, gunshots, and people on foot. Elk seldom reacted when approached by an OSV.'

- Another Wyoming study (Colescott 1998) found that 'the frequency of snowmobile traffic did not seemingly affect the average percent of moose active, or the numbers of moose present in the study areas.'

moose-pictures.com photo

- A study of the effects of snowmobile noise on deer and rabbits (Bollinger 1974) indicated that 'the deer and rabbits were not forced to move out of their normal home ranges, nor did they seek shelter or remain stationary with fright while snowmobiles were being operated.'
- A study of the impact of snowmobile tracks on animal mobility in Maine (Hubbe 1973) found that 'snowmobile tracks were helpful' since they help animals save energy in powder snow.

Reindeer

- A study in southern Norway (Reimers 2003) determined that, 'overall provocations by skiers and snowmobiles revealed similar behavioral responses.'

Caribou

Conflicts over caribou and snowmobiling have recently emerged in north Idaho; there is generally a lack of sound scientific data on this issue. Consequently caribou management is being directed by the Federal court system as the result of litigation. North Idaho appears to be fringe range for a Canadian herd; therefore the survival of these animals hinges on habitat in Canada, not the United States.

Caribou range in Canada is heavily used for snowmobiling, and they appear to co-exist with the sport quite nicely. There has been no evidence that snowmobiling has caused any caribou mortality in the U.S.; rather predation appears to be the major cause of their losses. Research needs to be conducted to determine whether or not the Idaho animals are simply a part of the Canadian herd, or if they truly should have protections established in the U.S.

Emergency closures can be imposed immediately if any animals are in fact detected moving through potential caribou habitat zones. However it is improper to establish closures in areas where there have been no caribou for years, and where they are unlikely to ever be seen again.

Mountain Goats

- A Greater Yellowstone Area assessment (Olliff 1999) concluded that 'because mountain goat winter range is inaccessible and precipitous, goats and recreationists are not often coming into conflict.'

Fact...

Numerous scientific studies have concluded that snowmobile activity has no significant effect on wildlife populations; in some situations snowmobile trails have been found to enhance wildlife mobility and help animals save energy in deep powder snow.

Yellowstone Tour & Travel photo

Wildlife Impacts

Mountain Sheep

- A Greater Yellowstone Area assessment (Olliff 1999) concluded that 'skiing, snowmobiling, mountaineering, and snowshoeing will most likely only affect bighorn sheep wintering at higher elevations. The encounters between these recreationists and the bighorns may be infrequent enough that there would be little or no impact to the animals.'

Photo by Kim Raap

Rabbits

- A study of the effects of snowmobile noise on deer and rabbits (Bollinger 1974) concluded 'the research team was unable to detect a severe or negative animal reaction to noise generated by vehicles. Conclusions of the study indicate that the deer and rabbits were not forced to move out of their normal home ranges, nor did they seek shelter or remain stationary with fright while snowmobiles were being operated.'

Birds

- A Washington study (Skagen 1980) found that 'eagles were found to be more sensitive to disturbance while feeding on gravel bars than while perching, and to approaches by humans on foot and concealed than by people in vehicles.'
- An Iowa study (Sodja 1978) found 'no effects of snowmobiling on pheasant movements or behavior.'

Vermont Fish & Wildlife Department photo

Lynx

The Canada Lynx was listed as "threatened" under the Endangered Species Act in 2000. In February 2009, the U.S. Fish and Wildlife Service announced its designation of critical lynx habitat in parts of Wyoming, Idaho, Montana and Washington, as well as Maine and Minnesota.

The designation of 39,000 square miles of lynx habitat in the six states marked a steep increase from the original designation of fewer than 1,850 square miles in only three states. The Washington and Wyoming state snowmobile associations filed suit in

Federal court in response to this substantial increase. The following response to this lawsuit appeared in the May 7, 2009 *Casper Star-Tribune*:

> **Lynx biologist: Snowmobiling is no problem**
> CHEYENNE -- The lead lynx biologist for the U.S. Fish and Wildlife Service said Wednesday the agency doesn't consider snowmobiling to be a problem in lynx habitat and doesn't understand why snowmobile groups are suing over the issue.
>
> The Wyoming State Snowmobile Association and the Washington State Snowmobile Association filed their lawsuit against the Fish and Wildlife Service on Monday in U.S. District Court in Cheyenne. They're challenging the federal government's designation of 39,000 square miles of land in six states as critical habitat for the threatened Canada lynx.
>
> The groups claim that the agency's designation of critical habitat for lynx amounts to a major federal action that requires a detailed environmental study. They say the designation will restrict snowmobiling opportunities in both states.
>
> Shawn Sartorius, lead lynx biologist for the Fish and Wildlife Service in Helena, Mont., said his agency hasn't identified snowmobiling as a problem in lynx habitat.
>
> "We haven't identified trail maintenance as being a problem for critical habitat, and we don't expect trail maintenance to be a problem for critical habitat. And we don't see new trails as being a problem for critical habitat," Sartorius said. "So we don't see that there's a basis for those fears."

USDA Forest Service Lynx Management Direction discourages the expansion of designated over-the-snow routes and play areas into uncompacted areas and ultimately sets a 'no net increase' guideline to maintain the existing level of groomed and designated routes. This is a guideline, not a standard. Therefore there may be some cases where expansion of over-the-snow routes would be warranted and acceptable, or where research indicates there would be no harm to lynx.

Other Lynx guidance states:

- The best information available has not indicated compacted snow routes increase competition from other species to levels that adversely affect lynx populations, and under the selected alternative the amount of areas affected by snow compacted routes would not substantially increase (USDI FWS 2007).
- The Washington state recovery plan for lynx (2001) states 'the major factors affecting habitat and the lynx population include forest management, fire and fire suppression, insect epidemics, and management of lynx harvest and habitats in southern British Columbia.'

Fact...

The lead lynx biologist for the U.S. Fish and Wildlife Service says "the agency doesn't consider snowmobiling to be a problem in lynx habitat."

- S. Sartorius 2009

Wildlife Impacts

Subnivean (under-the-snow) Animals – Shrews and Voles

A California study for the USDA Forest Service (Wildlife Resource Consultants 2004) represents the most current information regarding the effects of winter recreation on subnivean mammals. Study conclusions include:

- Snowmobiles and cross-country skiing may affect the amount of subnivean space, but both snow depth and vegetation are also strong influences.
- Winter recreationists would be unlikely to affect the early season formation of subnivean space over woody shrubs or large woody debris. Until there is a deep snow cover, recreationists tend to avoid woody shrubs as they are difficult to move through and logs can be difficult to cross because of breaking into the subniveal space. Later in the season as snow depth increases, recreational use of these sites probably has a minimal effect due to the snow depth.
- Wet meadows at low elevations with low snow depth probably have the most subnivean space. This study's findings were not as conclusive regarding the effects of recreational use on subnivean space. But there is some suggestion that winter recreation may impact subnivean space at low elevations. Winter recreation probably has the greatest effect at low snow depths.

Earlier studies on this topic concluded:

- Skiers may do more damage to the snowpack than snowmobilers because narrow skis cut deeper into the snowpack and because skis have a greater foot load (amount of weight per surface area) in comparison to a snowmobile track. For both ski tracks and snowmobile tracks, multiple passes over the same track will have more impact than a single pass. (Halfpenny 1989)
- An early Minnesota study (Jarvinean 1971) suggested there 'may be increased winter mortality of small mammals beneath snowmobile compacted snowfields.' However the report concluded that 'more information is necessary.' Given the dramatic evolution of snowmobiles over the nearly 40 years since this study was conducted, it is likely this report has little real relevance today even though it is still sometimes cited.

Did you know...

Skiers may do more damage to the snowpack than snowmobiles because narrow skis cut deeper into the snowpack and have a heavier foot load.

- Halfpenny 1989

Wolverines

The wolverine has emerged as one of the latest species of concern in respect to winter recreation. Because of this, the Western Chapter of the American Council of Snowmobile Associations has 'adopted' the wolverine in an effort to partner with researchers to gain better information about potential winter recreation/wolverine issues.

The wolverine is one of the rarest animals in North America, and the least known of large carnivores (Banci 1994). Recent research on wolverines (Copeland 1996, Copeland et al. 2007, Squires et al. 2007) indicates that wolverines are wide-ranging, inhabit remote areas near timberline, and are sensitive to human disturbance at natal and maternal den sites.

Researchers are only beginning to learn about wolverines' habits as they may interact with winter recreation:

- The Greater Yellowstone wolverine monitoring program's 2007 report (Inman 2007) includes a photo (shown here) 'that shows an important aspect of the wolverine/winter recreation interaction that we would like to learn more about. F121's natal den site is marked with the arrow on the right. The snowmobiling shown in the picture occurred while the den was active (relatively close to the den site). She has remained at this den site to date.' This represents some of the first real data documenting wolverine/snowmobile interactions – and the animal was not displaced from its den site.

Wolverine Den Site

The Wolverine Foundation photo

- The Glacier National Park wolverine monitoring project (Copeland 2006) reported on 19 wolverines and documented den sites for two adult females. It was reported that 'these dens represent nearly 50% of all wolverine dens ever found in the continental U.S.,' which shows how rare and elusive these animals really are.

The Wolverine Foundation photo

Fact...

The first real data documenting wolverine/ snowmobile interactions found that the animal was not displaced from its den site.

- Inman 2007

Snowmobiling...

Social Conflicts

Photo by Dan Gould

Myth: ***Conflicts require that multiple use management practices be abandoned.***

Facts: It is important to recognize that 'user conflicts' are really 'social conflicts' and that these conflicts are based upon the collision of different ideals and expectations – with the degree of conflict ultimately influenced by varying degrees of intolerance for those who choose differently. Public land managers are not the 'social police' and the resolution of social conflicts and intolerance is an issue which is ultimately outside their missions. Focus should instead be upon fulfilling missions which are largely based upon multiple use management principles – sharing public land versus yielding to society's growing intolerance for those who think, act, or recreate differently.

While every acre is certainly not suitable for every use, abundant Wilderness and a growing push for more nonmotorized or 'quiet-use' areas continues to diminish snowmobilers' freedom of choice across public lands. In particular the quiet-use movement has forced snowmobilers out of open terrain like meadows and creek bottoms and into less safe and more avalanche-prone riding areas. While steep areas are attractive to some snowmobilers, the result of losing open terrain close to roads and parking areas is that family-friendly snowmobiling terrain continues to erode away – which is not an acceptable or desired condition. More emphasis must be placed on ensuring snowmobiling areas are available close to parking areas for families and novice riders.

In public lands planning, more emphasis should be placed on requiring all user groups to 'play together in the sandbox' versus divvying up public lands since it unnecessarily and inappropriately pits user groups against one another – and doesn't solve the root issue of growing intolerance within our society.

'Increased demands' don't always correlate to not already having 'adequate supplies' of nonmotorized or quiet-use areas. All too often groups push this issue as a social/moral change agenda, versus it being a real on-the-ground issue for winter visitors. It is important that thoughts of 'segregation' should start with first ensuring nonmotorized users are fully utilizing their existing 'exclusive use' nonmotorized areas (plus they can travel everywhere motorized recreationists are allowed, if they so choose).

Even though they essentially already 'have it all,' many groups continue to try to close more and more areas to motorized recreation. Agencies should avoid falling into this 'exclusive use' trap and return to the principle that public lands are best managed for multiple uses. A local 'needs assessment' (and not a 'wants assessment') should be conducted for local areas before considering any reallocation of lands for recreational uses.

Myth: ***Segregation and separating uses is always the best way to manage winter recreation on public lands.***

Facts: 'Separating uses' is a poor 'last resort' option for managing public lands. It is an extremely polarizing premise and nearly always leads to long-term ill-will and decreased support for agencies in general. Public land managers should be extremely cautious about enthusiastically embracing 'segregation' as its management premise.

Segregation was proven to be poor public policy for this country in many respects. It is therefore unlikely that 'segregating recreational users' based upon motorized and nonmotorized uses – as is often purported to be a 'quick fix' cure-all on public lands – will be any more appropriate or successful when evaluated over the long-term.

Federal agencies preface their land use planning documents with a statement similar to what is used by the Forest Service: "The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program." 'Recreation conflict' is often addressed at length in these planning processes and is really 'social conflict.' And many social conflicts are in reality connected to differences in political beliefs, age, sex, religion, and/or race. Additionally, persons with disabilities and the elderly are more dependent upon motorized vehicles for their recreational outings. Therefore segregating recreational users based upon their class of use seems to be a violation of this anti-discrimination standard. Segregation is simply poor policy for public lands management.

Myth: ***Pristine untracked terrain for skiers and snowshoers is rapidly disappearing under the tracks of snowmobiles.***

Facts: Reality is that untracked terrain is important to motorized and nonmotorized winter recreationists alike – so education directed at both groups as to how to 'share the powder' is likely to gain more ground than misdirected efforts to enact large closures to snowmobiling under the pretense of 'saving powder.'

It is illogical to claim that 'snowmobilers traveling freely are tracking up the landscape' since the vast majority of skiers and snowshoers never get beyond a '3- to 5-mile radius' from where they park their car – so what difference does it really make if lands beyond that zone are tracked up or not? Efforts to provide untracked terrain for skiers are important but should be focused close to their access areas. At the same time experience shows that these set-asides don't really solve the conflicts because it ultimately just shifts the rift to being an issue within like user groups (skiers complaining about skiers).

Photo by Kim Raap

For nonmotorized and motorized recreationists alike the question really becomes 'who gets to track up the terrain first?' The answer is that this is not an agency's issue to solve – it's rather a case of 'the early bird gets the worm' (powder) and everyone else gets the leftovers until the cycle repeats itself after the next storm.

Snowmobiling...

Planning for Multiple Use Winter Recreation

Myth: ***Snowmobiling creates conflicts, so it is best managed by reducing or eliminating snowmobile access on public lands.***

Photo by Kim Raap

Facts: Public land managers are sometimes reluctant to expand, grant new, or even continue snowmobiling access due to concerns about 'conflicts' between winter recreationists. However many situations can be better addressed through improved management practices versus through area closures.

Since trailheads and parking areas are where conflicts between snowmobilers and nonmotorized winter recreationists most typically begin – if they are going to occur – addressing conflicts at their origin is the single best management tool for managers and recreationists to consider.

Parking is truly *the* 'root stressor' for winter recreation. While a nonmotorized family of four can easily park their vehicle in about 20 feet or less, a motorized family of four needs close to 60 feet of room to park their 4-place trailer and tow vehicle. Plus they need extra room for loading and unloading their snowmobiles, as well as room to pull in and out with their extended length vehicle. And some snowmobilers travel with even longer trailers – for six or more snowmobiles – which increase their needs for adequate parking and maneuverability even more.

The result is that, if parking is not designed and managed well, winter recreationists (motorized or nonmotorized) can begin to become stressed the minute they turn into poor parking areas. And their stress and 'conflict' builds from that point on, for the remainder of their outing.

Winter 'conflicts' oftentimes are really just a need for 'more and better winter parking.' This typically requires project-specific NEPA analysis to address. These issues can also sometimes be addressed by separating uses for only a short distance out of trailhead areas.

The following planning principles can be instrumental toward addressing winter conflict issues where they most often originate – in the parking areas:

- When space allows, it can be beneficial to provide separate parking areas for motorized and nonmotorized recreationists to eliminate the necessity for interaction between the groups while loading and unloading. When this is done, good on-the-ground signing is critically important to help guide recreationists to the staging area appropriate for their recreation choice. If possible, egress and ingress routes should also have some degree of separation between user groups to minimize interaction versus immediately placing them together in the same areas or onto the same trail routes.
- If available space does not allow for separate parking areas, staging areas should be zoned for nonmotorized and motorized parking areas. Again, good on-the-ground signing is critical to help guide recreationists to their designated parking zones.
- When designing and/or zoning winter parking and staging areas, it is critical to remember that the space required for maneuvering, parking, and unloading vehicles with trailers is significantly more than the space required by most nonmotorized users – so parking zones should be arranged and allocated accordingly.
- When staging areas must be shared, it can be helpful to provide separate egress/ingress access routes that are designated to disperse nonmotorized users and snowmobilers to recreational areas beyond staging areas. Cross-use should not be allowed on designated trail routes (No snowmobiles permitted on nonmotorized routes, as well as no nonmotorized use permitted on snowmobile routes.) and this restriction should be signed and enforced.
- If possible, have motorized and nonmotorized egress/ingress routes depart from separate sections of parking areas, correlating to the separate parking zones. If topography or ultimate destinations for both groups make it necessary to depart staging areas from the same location, still designate separate motorized and nonmotorized routes and delineate them with on-the-ground snow poles and signing – and enforce it.
- If feasible, it is often advantageous to route nonmotorized users along or slightly into the tree line (if adjacent to open areas), while simultaneously routing snowmobile traffic either along the opposite side of openings or through the middle of open areas. If access routes must be located entirely within woods, consider cutting two trail routes with a degree of separation between them if possible.

Did you know...

Parking is truly the root stressor for winter recreation.

- When designing or zoning staging areas for snowmobilers, it is important to recognize the need for snowmobile 'warm-up' areas close to parking areas. Oftentimes, older snowmobiles that have been hauled any distance on trailers tend to have their carburetors 'load-up' (flood), which requires that the machines be run a bit to clear their engines. While newer sleds with fuel injection have fewer problems with this, cold weather conditions can still create needs to warm up all snowmobiles. It is therefore important to have either open areas or extra trail space adjacent to parking areas so snowmobiles can be properly 'warmed up' prior to families and groups departing for their outings.

Planning for Multiple Use Winter Recreation

Myth: ***Summer and winter travel planning is very similar and is best conducted simultaneously to address conflicts.***

Facts: It is important to recognize there are significant differences between summer and winter motorized activities. This often creates immense difficulties and confusion when travel planning is conducted simultaneously. Therefore summer and winter travel planning is generally the most successful when conducted separately since snow is a transient medium and winter tracks over snow disappear from the landscape.

NOHVCC photo

While trails are important to get from one place to another, they are not the only focus of snowmobiling activities in many areas of the country; consequently both on- and off-trail opportunities are very important. Motorized winter recreation generally encompasses large areas and its participants are often quite mobile. By comparison most nonmotorized over-snow recreation takes place within 3 to 5 miles of trailheads. An exception is that a growing number of nonmotorized recreationists are using snowmobiles to access distant areas for backcountry skiing or snowboarding.

Modification of current winter travel management plans should be undertaken only when changing resource issues clearly indicate that adjustments are needed. Any modifications should consider both motorized and nonmotorized activities, examining how adequately existing plans are meeting public needs. Existing closures should be re-evaluated to see if they are still serving the public interests and are still needed, and whether the mix of uses should be modified in view of changing demands and/or resource issues.

It is also important to assure a level playing field for both motorized and nonmotorized activities when approaching winter recreation management. If wildlife issues are driving area closures, it is likely that all forms of winter recreation may need to be excluded. While animals can be stressed by all human activities, they are often more likely to be stressed by nonmotorized recreationists since their 'more quiet' approach can resemble predator behaviors and ultimately elicit threat responses from animals.

The issue of managing 'conflict' must work both ways since – if those asserting conflict are regularly rewarded at the expense of other users – their incentive to continually push conflict as an issue becomes more appealing and can essentially become an unending enterprise. All too often these types of conflicts are inappropriately elevated to decision-determining levels when the issues are actually very minor or isolated. When considering allocating exclusive use for one group or another, all uses should stand equal chances to be excluded. If skiers insist that snowmobiling is incompatible

with skiing, they should in turn be excluded from areas open to snowmobiling; otherwise the unending conflict enterprise continues to repeat itself. Past winter travel management has largely allowed nonmotorized users to have their exclusive areas, plus free and unfettered access to all snowmobile areas – and the question has typically been 'how much more area should the motorized community give up'. This simply is not a satisfactory approach to winter travel planning; rather all users should have something to win or lose to help reach more effective compromises on management issues.

ISMA photo

The following principles can be important when conducting winter travel planning:

- Evaluate the unit's entire land base – including areas currently closed to specific uses – to determine which areas are suitable or unsuitable for various winter recreation activities. While Congressionally-designated Wilderness is not available for motorized recreation, it is exclusively available for nonmotorized recreation and should be considered as such in determining the mix of uses. When performing this evaluation, consider new information, new science, and changes resulting from natural forces such as wildfires, diseases or other factors which may have changed the landscape.
- Determine – with the assistance of various user publics: where people recreate on the public lands unit, and where they would go if given the opportunity to do so; what are the primary access locations and trails; where are the current loop opportunities, and where can new ones be developed; where are the play areas; what parking and trailheads are currently available, and what new ones are needed; and what attributes of the winter experience are truly important to the different user groups?
- Evaluate the amount of use taking place currently by various user groups and examine likely trends in future demands for each.
- Use collaborative efforts between agencies and all user groups with a stake in the outcome early in planning processes. This collaboration should be used to help develop formal alternatives or proposals. The results of this collaboration should be used in good faith by agencies through their processes.

Did you know...

A growing number of nonmotorized recreationists are using snowmobiles to access distant areas for backcountry skiing or snowboarding.

Photo by Shad Hamilton

Planning for Multiple Use Winter Recreation

- Fully evaluate potential economic impacts of various proposals on surrounding counties, communities, and the region.
- Use adaptive management to ensure decisions can be adjusted in the future in response to changing conditions, such as new science, new trends, or large fires that modify native vegetation and wildlife habitats.
- Consider both direct and indirect management actions to help manage winter visitor use. This may include actions such as: trail grooming, trailhead snow removal, developing or expanding existing parking areas, providing loop opportunities, establishing access routes from communities, construction of warming huts, and/or placement of restroom facilities.
- Consider how improvements are to be funded and maintained. Snowmobiling largely pays its own way via gas taxes and registrations or trail use fees; how can other winter users also help pay their way for facilities they share with motorized users or for services such as ski trail grooming that may have historically been provided solely by agency funds?
- All closure areas should be fully evaluated and be based upon a clear and documented need. Closure areas should be manageable, enforceable, and clearly definable on the ground. The need for designated linear travel routes through closed areas to provide access to broad and important open use areas should be considered and accommodated whenever possible.
- The final step in winter travel planning should be the development of detailed yet user-friendly maps that clearly identify boundaries of areas appropriate for over-snow vehicle travel and areas designated for only nonmotorized uses.

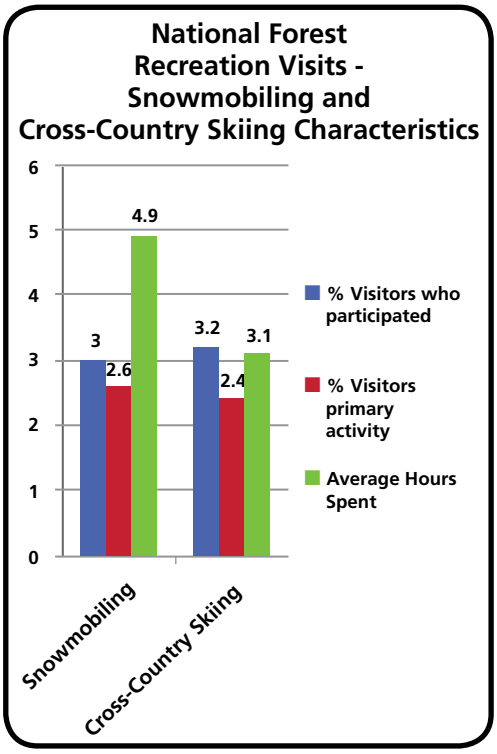
Photo by Shad Hamilton

Once travel planning is completed, agencies should continue to work closely with their various user groups to assure that implementation of the management plan is working as intended. User groups are almost always willing to work with agency staff when given the chance to do so and can provide valuable assistance with plan implementation, including the maintenance and construction of facilities, trails, parking lots, and signage, along with providing education/enforcement, maps and informational brochures. Partnerships and the establishment of trust between agencies and user groups are critical to success.

Myth: ***There should be substantially more miles of groomed trails allocated for cross-country skiing since it is a more popular winter activity.***

Facts: The USDA Forest Service National Visitor Use Monitoring Report (NVUM FY 2007 National Summary Report, 2008) provides the best available information regarding the relative popularity and participation levels for snowmobiling and cross-country skiing. Overall, participation levels are actually quite similar: 3.0% of Forest visitors participated in snowmobiling, while 3.2% participated in cross-country skiing.

In respect to visitors 'primary activity' during their Forest visit, 2.6% participated in snowmobiling, while 2.4% participated in cross-country skiing. By comparison, the top five primary activities for National Forest visitors (nationwide, year-round) were: 1) hiking/walking (16.5%), 2) downhill skiing (14.8%), 3) viewing natural features (13.4%), 4) hunting (8.0%), and 5) fishing (7.0%). Snowmobilers spent an average of 4.9 hours per recreation visit engaged in their activity, while cross-country skiers spent an average of 3.1 hours participating in their activity per visit.

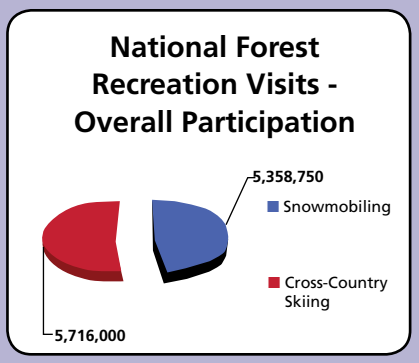


While the popularity of the two activities is similar, the needs for space are actually quite different. It is therefore important to remember when planning winter trails and overall winter access areas that snowmobilers require significantly more miles of trail for typical day outings than what nonmotorized recreationists typically do – 60 to 120 miles in the West and up to 100 to 200 miles per day for snowmobilers in the rest of the country compared to only 5 to 10 miles for nonmotorized day trips.

It is also important to consider that there is a much greater need for snowmobile trail grooming than there is for ski trail grooming since snowmobile traffic has a tendency to create moguls on trails, which requires frequent grooming to keep them smooth and safe. Additionally, a large percentage of cross-country skiers and snowshoers do not desire or require groomed trails for their backcountry recreational experiences; and since the purpose of snowshoes is to provide flotation for travel across the top of uncompacted snow, groomed trails are often not required.

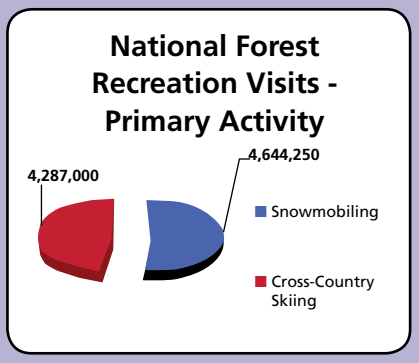
When looking at 'overall participation' numbers nationwide on National Forest lands, it is estimated there were 5,716,000 cross-country ski visits (51.6%) and 5,358,750 snowmobile visits (48.4%).

National Forest recreation visits – total 'overall activity' participation numbers



When comparing 'primary activity' participation numbers nationwide on National Forest lands, it is estimated there were 4,287,000 cross-country ski visits (48%) and 4,644,250 snowmobile visits (52%).

National Forest recreation visits – total 'primary activity' participation numbers



Planning for Multiple Use Winter Recreation

Myth: ***The designation 'multi-use' is a misnomer and is rather de facto 'single use motorized' because the opportunity for human-powered recreation experiences are often lost on lands designated as multi-use since those lands are often dominated by motorized use.***

Photo by Kim Raap

Facts: Concerns about multi-use and single-use can cut both ways. Snowmobilers usually pay 100% of the cost to groom their trails and then allow them to be used for other 'multi-uses' like cross-country skiing, snowshoeing, dog sledding or winter biking. So if it were not for the generosity of snowmobilers allowing the multiple-use of trails they fund, there would often be no groomed trail opportunities for nonmotorized recreationists.

On the other hand, as nonmotorized trail users continually try to whittle away at snowmobiling access with more closures to motorized uses, a growing number of snowmobilers are starting to advocate for single-use (snowmobiles-only) on groomed snowmobile trails. So a prime issue for continued multi-use is self-generated funding – or the lack thereof in respect to nonmotorized.

The reality is that closures to snowmobiling which extend farther than a 3- to 5-mile radius from plowed access areas – and are in non-Wilderness settings – are for all intents and purposes unnecessarily closed to all uses since they are too remote to be accessed by most cross-country skiers and snowshoers. The focus for nonmotorized use areas should therefore be within zones that are close to parking areas. Beyond those zones multiple use – or even 'domination' by snowmobiles – should be acceptable since no one else (or very few) will likely be there.

Myth: ***Substantially large areas should be closed to snowmobiles to create more areas for nonmotorized winter recreationists in every national forest.***

Facts: Those pushing this agenda are inappropriately twisting the truth and applying global statistics to issues that are best considered at local landscape levels. While there are always localized situations where motorized and nonmotorized recreationists can benefit from working better together to resolve concerns, the situation on national forest lands is not as bleak or as one-sided as is often portrayed.

There are no credible reasons to support wholesale and widespread additional closures to snowmobiles on national forest lands; it simply is not justified or needed. Rather solutions should start by addressing conflict issues with plowed winter parking and dispersal of uses from trailheads. That (parking) truly is the root of most all 'real' versus 'contrived' conflicts and should receive the highest attention by winter planning processes.

In some cases access and uses may be able to be separated, but often it will likely need to continue to be shared. While there is no disagreement that nonmotorized users need areas designated for their use close to parking, 'cherry stem' routes may also need to be provided to move snowmobilers through and beyond nonmotorized zones so that de facto 'no-use zones' are not unnecessarily created.

A growing number of skiers and snowboarders are also using snowmobiles to access backcountry areas. These hybrid users represent multiple use principles at their best and are one more reason why large blocks of forests should not be closed off to motorized access. The bottom line is that public lands are simply best managed for multiple uses.

Myth: ***There is disparity in the total miles of groomed trails provided on USDA Forest Service lands, particularly in the West where some groups complain that there are over 18,000 miles of groomed snowmobile trails and only about 1,700 miles of groomed 'nonmotorized-use-only' trails.***

Facts: *First and foremost*, there are over 18,000 miles of groomed snowmobile trails on national forests in the West – and 137,000 miles of snowmobile trails nationwide – only because snowmobilers have chosen to tax themselves through state snowmobile registrations, user fees, and gasoline taxes they pay to fund the grooming of these trails. And 100% of these 18,000 miles of groomed trails in the West (and all 137,000 miles across the country) are open to all winter nonmotorized recreation uses.

In no instance is the Forest Service unilaterally paying for the grooming of snowmobile trails with Forest Service funds. In contrast, the grooming that occurs on the majority of the 1,700 miles of nonmotorized trails on these forests is either funded directly by the Forest Service or is subsidized with state Recreational Trails Program (RTP) grant funds – which are derived from the federal fuel tax paid on fuel used in snowmobiles, ATVs, off-road motorcycles and light duty trucks used off-road; all RTP funds are from motorized users. If there is an inequity it is that nonmotorized winter recreationists need to bring their own funding to the table, as the snowmobilers have done, if they want more miles of groomed trails.

Photo by Shad Hamilton

Second, a large percentage of cross-country skiers and snowshoers do not desire nor require groomed trails for their backcountry recreational experience. Thus the perception of disparity is misconstrued and overstated.

Planning for Multiple Use Winter Recreation

Third, snowmobilers require significantly more miles of trail for typical day outings than what typical nonmotorized recreationists do. Numerous state snowmobile studies show that the average distance traveled by snowmobilers in a day ranges from 60 to 120 miles in the West to around 100 to 200 miles per day in the Midwest or New England. By comparison, cross-country skiers and snowshoers generally state they are hard pressed to cover more than five to ten miles on ungroomed snow in a day's time. Additionally, national forest planners commonly use a '3-mile radius (6-mile round trip) from a trailhead' as the distance traveled 'by the average skier or snowshoer' during a typical day trip outing.

Thus snowmobilers require 6 to 24 times more miles of trail and open riding area than what cross-country skiers and snowshoers do for an 'average' daily outing. Therefore, this 10 to 1 ratio is not an inequality but rather what is needed to provide a reasonable range of opportunities for snowmobiling.

Myth: ***70% (81 million acres) of USDA Forest Service lands in the western continental U.S. are open to snowmobiles.***

Facts: While up to 81 million acres of forest lands may technically be 'open to snowmobiles,' a significant amount of these acres often do not either have enough snow cover to support snowmobile use, or are too heavily timbered or too steep to be accessible by snowmobiles. Therefore these lands, while technically 'open,' are often classified as 'unsuitable' or 'not practical' for snowmobiling in agency land use planning processes.

While the exact number of total 'unsuitable' or 'not practical' acres on national forests is unknown, it is a substantive portion which generally exceeds at least 25 to 50 percent of individual forest lands. At least 10 percent (over 8 million acres) of western forest lands are located on the fringe of the Snowbelt and host zero miles of snowmobile trails.

ISMA photo

Some forests have determined through travel planning processes that their total 'suitable' snowmobiling

acres are really quite minimal. For instance, the White River National Forest in Colorado – a heavy snow area extremely popular for all winter sports – determined only 7.3% of their lands (168,000 acres out of a total of 2.3 million acres) were 'practical' for snowmobiling due to a combination of heavily forested areas and extremely steep topography (WRNF Travel Management Plan and Draft EIS, 2006). This scenario is common across the West.

Photo by Kim Raap

Myth: ***Only 30% (35 million acres) of USDA Forest Service lands in the western continental U.S. are managed as 'nonmotorized' recreation areas.***

Facts: Nearly 100% of National Forest lands are managed as open to all nonmotorized winter recreation uses. The only exceptions are small areas where crucial wildlife winter range or other sensitive habitats have been closed to all human presence. Otherwise nonmotorized recreation can – and does – occur everywhere.

Myth: ***More areas should be closed to motorized uses since about two-thirds of the '35 million acres' managed as nonmotorized recreation areas in the West lie within designated Wilderness areas – so they shouldn't really count since they are often inaccessible to skiers and snowshoers given long distances from plowed roads and trailheads to reach many of them.***

Facts: Just because some Wilderness areas may not be easily accessible due to their remoteness does not warrant advocating for more areas to be closed to snowmobiling. Motorized access has already been removed from Wilderness areas. Therefore nonmotorized recreationists should work with land managers to make better use of lands they already have exclusive use of – versus being quick to say 'we can't access them easily so we want other (closer) areas set aside for us.'

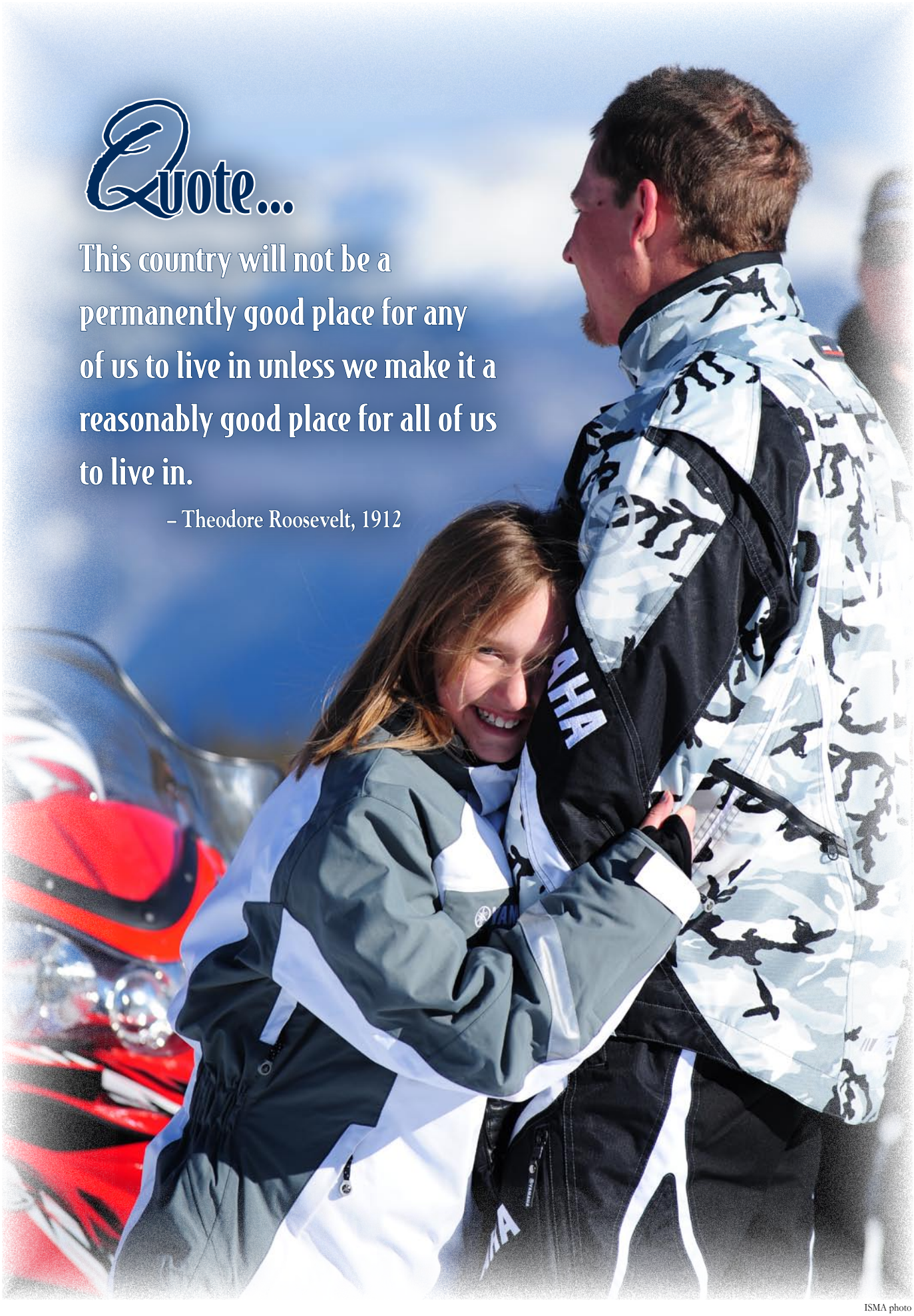
To a large degree, all lands greater than a three-mile radius from plowed parking areas are equally 'inaccessible' to nonmotorized uses irrespective as to whether they are within designated Wilderness areas or not – since they would be too far for the average person to access under human-power.

This position should be resisted since it is a pretense to push principle-based set-asides (which realistically would be used by none or very few) versus set-asides that are logical and practical for nonmotorized recreational access, i.e. within 3 miles of a trailhead.

'Twelve Principles' for Minimizing Conflicts on Multiple Use Trails...

These 'Twelve Principles' are recommendations from *Conflicts on Multiple Use Trails: Synthesis of the Literature and State of the Practice*, written by Roger Moore (1994). The American Council of Snowmobile Associations supports them as a way to maximize winter recreation opportunities while simultaneously managing public and private lands to minimize real conflicts.

1. **Recognize Conflicts as Goal Interference** – Do not treat conflict as an inherent incompatibility among different trail activities, but rather as goal interference attributed to another's behavior.
2. **Provide Adequate Trail Opportunities** – Offer adequate trail mileage and provide opportunities for a variety of trail experiences. This will help reduce congestion and allow users to choose the conditions that are best suited to the experience they desire.
3. **Minimize Number of Contacts in Problem Areas** – Each contact among trail users has the potential to result in conflict. So, as a general rule, reduce the number of user contacts whenever possible. This is especially true in congested areas and at trailheads.
4. **Involve Users as Early as Possible** – Identify the present and likely future users of each trail and involve them in the process of avoiding and resolving conflicts as early as possible, preferably before conflicts occur.
5. **Understand User Needs** – Determine the motivations, desired experiences, norms, setting preferences, and other needs of the present and likely future users of each trail. The 'customer' information is critical for anticipating and managing conflicts.
6. **Identify the Actual Sources of Conflicts** – Help users to indentify the specific tangible causes of any conflicts they are experiencing. In other words, get beyond emotions and stereotypes as quickly as possible, and get to the roots of any problems that exist.
7. **Work with Affected Users** – Work with all parties involved to reach mutually agreeable solutions to these specific issues. Users who are not involved as part of the solution are more likely to be part of the problem now and in the future.
8. **Promote Trail Etiquette** – Minimize the possibility that any particular trail contact will result in conflict by aggressively promoting responsible trail behavior.
9. **Encourage Positive Interaction Among Different Users** – Trail users are usually not as different from one another as they believe. Providing positive interactions both on and off the trail will help break down barriers and stereotypes, and build understanding, goodwill, and cooperation.
10. **Favor 'Light-Handed Management'** – Use the most 'light-handed approaches' that will achieve objectives. This is essential in order to provide the freedom of choice and natural environments that are so important to trail-based recreation. Intrusive design and coercive management are not compatible with high-quality experiences.
11. **Plan and Act Locally** – Whenever possible, address issues regarding multiple use trails at the local level. This allows better flexibility for addressing difficult issues on a case-by-case basis.
12. **Monitor Progress** – Monitor the ongoing effectiveness of the decisions made and programs implemented.


Quote...
This country will not be a permanently good place for any of us to live in unless we make it a reasonably good place for all of us to live in.
– Theodore Roosevelt, 1912

ISMA photo

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