

Ban Recreational Snowmobile Use in

Yellowstone

Sarah Trester

Background

Current National Park Service policy allows each park to decide on an individual basis whether recreational snowmobile use should be allowed. About thirty parks permit restricted recreational snowmobile use while others, such as Yosemite and Glacier National Parks, have banned snowmobiles.¹ Originally, Yellowstone's authorities did not study the environmental effects of snowmobiles because snowmobiles were regarded as the winter equivalent of automobiles. However, in May of 1997, the Fund for Animals led a suit against the U.S. Department of the Interior and the superintendents of Yellowstone for not evaluating snowmobiles' effects on wildlife. In response the Park Service began an environmental impact study. From studies that are now being conducted on the snowmobile's impact on the environment, debates that began in the 1940s about the wintertime use of the park are again surfacing.

Proposal

Concern for the welfare of Yellowstone's wildlife is a valid issue. Recreational snowmobiles have virtually overtaken the park, causing stress to the animals and the vegetation, as well as disturbing visitors who do not use recreational snowmobiles. Because snowmobiles endanger wildlife, I propose that a full ban be enacted on

recreational snowmobile use within Yellowstone National Park. This ban would address only the recreational use of snowmobiles; park employees and nearby residents who rely on snowmobiles for transportation would not be affected. Snowmobiles cause air and noise pollution that disturb and endanger wildlife. Furthermore, the tracks that snowmobiles leave are detrimental to burrowing animals, and also allow bison to wander out of the park's protection. Though the annual number of automobiles entering the park exceeds the number of snowmobiles, automobiles are not responsible for the high levels of pollution in the park due to their cleaner engine type. The motivation for Yellowstone's creation was to offer visitors a place to experience wildlife in a natural setting, not to produce revenue. Some local businesses may benefit from a winter tourism season partly generated by snowmobiles. However, the park was never intended to be an economic support, and the welfare of the park and the wildlife should be the priority. In fact, visitors will still be able to enjoy Yellowstone during the winter through the use of snowcoaches, which will still generate revenue. A ban on recreational snowmobiles is necessary to preserve Yellowstone's environment.

Why Ban Recreational Snowmobiles and Not Automobiles?

Given that the number of automobiles that enter Yellowstone annually is sixteen times the number of snowmobiles that enter the park, some may argue that automobiles cause as much damage as snowmobiles.² However, there are significant differences between automobiles and snowmobiles, making it clear that snowmobile pollution is a far greater concern.

Automobile and snowmobile engines have structural differences that make the effects of snowmobiles more damaging. Automobiles operate using a cleaner spark-ignition engine that does not cause as much pollution as a snowmobile's engine. It is estimated that 68% of the park's carbon monoxide emissions, and 90% of the park's hydrocarbon emissions, are caused by snowmobiles.³ The two different configurations for spark-ignition engines are four-stroke and two-stroke. Automobiles are powered by a four-stroke engine, meaning that the engine's piston moves four strokes, and the crankshaft completes two rotations for every engine cycle. The first stroke, or the compression stroke, compresses the air-fuel mixture. Next, during the power stroke, the ignition of the spark plug forces the piston down, giving power to the engine. The third stroke is called the exhaust stroke because the piston again moves, plunging the combustion products through the exhaust valve. The final stroke, or the intake stroke, occurs as the piston moves down a second time and new air-fuel mixture enters the cylinder. This process then repeats.

Unlike automobiles, snowmobiles are powered by a two-stroke engine that accomplishes the above four-stroke piston movement in just two strokes, or one crankshaft rotation. The process begins with the fuel-air mixture entering the cylinder. During the first stroke, or the compression stroke, the piston moves upward, sealing off the intake port, thus pushing the exhaust out, and replacing it with the fuel-air mixture. At the end of this stroke, the exhaust port is sealed. The spark plug then fires, causing the piston to move down in the second, or power stroke, and allowing the exhaust to begin moving out of the exhaust port.

While two-stroke engines are simpler and less expensive than four-stroke engines, they also cause more pollution. Two-stroke engines emit 20% more carbon monoxide (CO) and 65% more hydrocarbons (HC) than four-stroke emissions. According to the most common two-stroke engine test, the ECE-R 40.01 test, two-stroke snowmobile engines equal to or larger than 50 cm³ produce 2-10 g/km of CO, and 4-8 g/km of HC.⁴ These high emissions occur because the compression stroke causes some unburned fuel to enter the atmosphere as the piston is pushing out the exhaust. In other words, the snowmobile's two-stroke engine yields about as much HC pollution in one hour as an automobile's four-stroke engine yields in one year.

Air Pollution Effects

Snowmobiles' two-stroke engines cause an enormous amount of pollution that negatively affects Yellowstone. The first effect is a blue haze that develops in the air from snowmobile exhaust, which eventually settles into the snow, contaminating the park's water supply as the snow melts.⁵ The most popular area for winter visitors is located around Old Faithful, most accessible from the West Entrance to the park, where as many as 1200 snowmobiles can pass through during any given day. Here the exhaust is so thick that it is considered harmful to the park rangers operating the tollbooths. The tollbooths have been coated in Plexiglas, and fresh air is pumped inside to protect the rangers from the harmful fumes.⁶ Unfortunately, the park's wildlife does not have a way to escape the fumes, and is constantly subjected to their harmful levels.

Noise Pollution Effects

In addition to air pollution, snowmobiles also cause high levels of noise pollution. Many animals such as elk and deer conserve energy during the winter months by moving only to search for food. Research has shown that moose spend half of the day resting, using energy only when foraging. Animals that run because they are startled by the loud growl of a snowmobile deplete their energy reserves, decreasing their chances of winter survival. A specific study involving mule deer showed that after only nine minutes of noise harassment from a snowmobile, the deer's feeding patterns changed, and they produced fewer offspring the next year.⁷ Noise pollution also affects visitors to the park who are trying to enjoy solitude and nature. However, this escape is difficult when approximately every 30 to 60 seconds a snowmobile enters the park.⁸ This dependable roar shatters the stillness and detracts from the purpose of the park, which is to provide a place to experience the outdoors.

Other Adverse Effects

In addition to noise and air pollution, snowmobiles adversely affect animals by the tracks snowmobiles leave in the snow. With increased technology, snowmobiles have become faster and more powerful. Though groomed trails are provided, many snowmobile users venture into the woods. When snowmobiles repeatedly run over the same area, they pack the snow down, making it colder and denser. This provides less air space for burrowing animals such as spotted skunks and short-tailed shrews, who then must use more energy to protect themselves from the elements. Voles are especially at risk because they develop vast tunnel networks that can cave in and crush them under the weight of a snowmobile. The groomed trails also allow bison to wander out of the park in

search of food. Once they are out of the park, the Department of Livestock shoots them on sight because ranchers fear that their livestock might become infected with brucellosis, a disease carried by bison, yet never proven to contaminate cattle.⁹

Snowmobile pollution, therefore, extends beyond air and noise pollution to other harmful effects on wildlife.

Conclusion

Many studies have been performed to determine how different kinds of pollution from snowmobiles affect Yellowstone's environment. These studies have revealed that snowmobiles produce excessive carbon monoxide and hydrocarbon emissions, as well as noise pollution, all of which harm the environment. The weight of snowmobiles and the tracks they leave behind are also detrimental to the park's wildlife. Recently, park officials have suggested that a ban on recreational snowmobiles be enacted, but a final decision will not be made until November 1, 2000.¹⁰ I fully support this proposed ban, and believe it will uphold the integrity of our nation's first National Park.

Notes

1. Richard Woodbury, "Arctic Cats and Buffalo," *Time* 17 Mar. 1997: 62.
2. "Snowmobiles Worst Polluters in Yellowstone, Park Service Reports," *Dallas Morning News*, 31 Oct. 1999: 11G.
3. The Greater Yellowstone Coalition, "Snowmobile Exhaust Threatens Park and People," 4 May 2000 <[www.greater yellowstone.org/winteruse.html](http://www.greateryellowstone.org/winteruse.html)>.

4. "Controlling Two-Stroke Engine Emissions," Automotive Engineering International Feb. 2000: 27.
5. Heidi A. Schuessler, "Quiet Please!" Travel Holiday Apr. 1999: 88-90.
6. Woodbury 63.
7. Marla Felcher and Ellen C. Liberman, "Intruders in the Snow," Wildlife Conservation Jan./Feb. 2000: 28.
8. "Fuel from Snowmobiles polluting Yellowstone," Seattle Post-Intelligencer, 2 Nov. 1999, 1 June 2001 <<http://seattlep-i.nwsourc.com/opinion/yeled.shtml>>.
9. Felcher and Liberman 28.
10. Jim Hughes, "Snowmobile Ban Favored," Denver Post, 15 March 2000: A1.

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