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Comments:

August 9, 2015

Phyllis Ashmead

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Dear Phyllis:

I felt that the best way to make know my comments with regard to the Proposed Travel Management Plan for over the snow vehicles was to take the Snowland's Newsletter which discusses the objectives in the Winter Travel Management Plan.

At the end of this, I am also commenting on Mr. Buckley's comments to this plan, and last I have attached some actual recorded and noted studies regarding most of Mr. Buckley's comments.

One of my biggest challenges in all of this process is the maps. Without some topography as well as forest service roads and trails being shown on those maps, it has been tough to say the least to figure out what areas are being considered for closure and what stays open.

I hope you take the time to read through everything, especially the studies at the end and my final comments.

Thank you,

Kim Hembree

EXCERPT FROM SNOWLANDS NEWSLETTER

A guide to the

cross-country ski and snowshoe trail system

at Pinecrest, California

The Pinecrest area near Dodge Ridge Ski Resort along Highway 108 is home to an extensive, marked,

backcountry, ski and snowshoe trail system. It was developed over many years by the Pinecrest Nordic Ski Patrol.

There are two trailheads, the Crabtree and the Gooseberry, from which 14 trails form an array of opportunities for skiers and snowshoers ranging from beginner to advanced. One of the nice things about these trails is that it is easy to form loops.

Snowlands Network, in cooperation with [www.BackcountrySkiTours.com](http://www.BackcountrySkiTours.com) and the Pinecrest Nordic Ski Patrol, has created a detailed guide to these trails. Below are links to both high resolution and low resolution versions of the guide.

Objectives in the

Winter Travel Management Process

Stanislaus, Eldorado, Tahoe, Plumas and Lassen National Forests

December 2014

### 1. Create a Fair Balance of Recreational Opportunity

Snowmobile (OSV) recreation impacts and displaces nonmotorized recreation. These impacts have substantially increased over the last 25 years, due to growth in population, changes in snowmobile technology providing them greater power and range, and substantial growth in demand for nonmotorized winter recreation. Backcountry skiing, snowshoeing, and Nordic skate skiing are each sports that barely existed 30 years ago (ten years ago in the case of snowshoeing!) and are now highly popular. This growth has increased conflict and created the need for greater restrictions on snowmobile recreation, as well as the need for greater access for all backcountry winter sports.

RESPONSE: As shown above in Snowland's newsletter they currently have an extensive backcountry experience with over 14 trails in the Gooseberry and Crabtree area. Most of the area being proposed for non-motorized use i.e. Eagle Meadows and Long Valley (mountains around these areas) are more than 17 miles from the snowpark and all uphill (there is one downhill). You are rising from 6000 feet at the snowpark to approximately 7850 in Long Valley. I personally have never seen anyone skiing or snow shoeing past the Mill Creek area on Highway 108. So why limit snowmobiling in these areas that I, and many others have been snowmobiling in since 1986.

### 2. Create Opportunities for Nonmotorized Winter Users to Have a Wilderness-like Experience

In winter, much of the federally-designated Wilderness is inaccessible due to its distance from winter trailheads. Thus, the role of Wilderness in serving the recreational needs of the nonmotorized visitor is substantially different in winter than in summer. However, it is still very important to many users to be able to obtain a wilderness-like experience in winter, and there is more than enough forest land in the Sierra Nevada and Southern Cascade Range to accommodate this demand as well as the demand for other types of recreation, including snowmobiles. The Forest Service needs to take into account this critical difference between winter and summer recreation in the winter travel management process.

RESPONSE: I feel that this was answered above.

### 3. Create a Framework that Will Nurture Growth in Ski Tourism

As compared to other areas of the West, California stands out as having relatively little Nordic ski tourism: tourism driven by skiers and snowshoers wanting groomed trails. Community ski areas have been highly successful throughout the west. Many areas of the West, such as the Sawtooths, the Wasatch and the central Cascades have more miles of publicly available groomed Nordic track (i.e., available for free, for a suggested donation, or for a modest access fee) than can be found in the Sierra Nevada, and substantially greater Nordic tourism.

We believe this circumstance - unfortunate for the gateway communities in the Sierra Nevada - is due to a variety of factors, some fortuitous, and does not reflect any deficiency in the natural recreation opportunity in California, even with our warmer-trending winters. Winter travel management needs to address areas of existing conflict but also needs to set the framework whereby California can obtain its fair share of Nordic ski tourism, for the benefit of both local economic communities and local population users. The winter travel management process should lay a foundation for growth in such recreation and not perpetuate conditions that have discouraged such growth. Due to the amount of land in the Sierra Nevada and the Southern Cascades, this objective can be met while fully preserving existing snowmobile tourism and opportunity.

RESPONSE: I believe you have shown that you have 14 trails and that you need to promote these more. Non-motorized users can pull off at any wide point in the road and take off on their skis or snowshoes. Motorized users cannot.

I don't believe that snowshoers or Nordic skiers will spend any more money than snowmobilers do. As to free sites - that's nice. I would like to play for free also. However, I pay green sticker money on my snowmobile and I also have to pay for a snowpark pass. Why one group paying and the other are is not?

#### 4. Separate Motorized and Nonmotorized Use

This objective is included in the foregoing three objectives but merits separate focus. A major complaint of nonmotorized users is the noise and toxic emissions concentrated at trailheads and other heavily used locations. The creation of nonmotorized trailheads and trails, even when the adjacent areas are shared by motorized users, substantially enhances the nonmotorized experience. Where areas can be accessed through multiple trailheads, certain trailheads should be designated for nonmotorized use only.

RESPONSE: I agree that in the "motorized snowpark" you will have noise and the smell of exhaust. Again, as you stated in your newsletter you have 14 trails that you can use and won't be subject to any of this. If you come to a "motorized snowpark" you have to expect you are going to see, hear, and smell snowmobiles. Nordic skiers and snowshoers have access to go anywhere in the forest. You are not limited as motorized users are. (Please see environmental impacts studies below regarding noise and pollution.)

\* \* \*

In managing for the above objectives, land and community managers should recognize that there are three relatively distinct kinds of experience sought by backcountry skiers and snowshoers. Snowmobile activity can also be meaningfully analyzed in the framework of these three activities. The winter travel management process needs to create a fair balance of opportunity for each type of activity.

RESPONSE: I too would like to see a fair balance. The proposed Map being shown at recent meetings by the Forest Service has only taken away all of the nice motorized riding area that snowshoers and Nordic skiers will never be able to get to as the mileage to these locations is over 17 miles. I have done Nordic skiing and still have my skis. I would never be able to make it to these areas to have a downhill Nordic experience.

#### A. Trail Touring

When engaging in the trail touring activity, users seek designated trails, preferably groomed, with moderate climbs and descents. Travelling fast and working on technique are important aspects of the experience. Users are often more concerned about the quality of the trails than obtaining a wilderness-like experience. Safety issues (as well as other snowmobile impacts) effectively preclude shared use of the more popular groomed trails. For snowmobile users, trail touring is often a family activity, and can be readily enjoyed using cleaner and quieter snowmobiles.

While grooming of trails requires funding, which is outside the scope of the travel management process, the process should create the framework and conditions where such funding is encouraged, rather than discouraged.

RESPONSE: While groomed trails are nice for motorized and non-motorized, especially after a 3 foot snowfall, experienced snowmobilers prefer being off trail and riding up the mountains, valleys and meadow like areas.

There is NO technique involved in riding a groomed trail other than any other driving experience, i.e. not going around corners too fast. Inexperienced and experienced snowmobiler's alike enjoy a smooth ride up to Dardanelle Resort (when they are open) for breakfast, lunch, and dinner. It is also nice having a groomed, smooth trail if you are travelling to the top of Sonora Pass (approximately 50 miles roundtrip).

As to safety issues, I don't know of any incidents between the two groups on Highway 108 where anyone has been hurt or harmed.

Nordic striding skiers and snowshoers do not need groomed trails in order to engage in the trail touring activity.

What they do seek are clearly-marked and easy to follow trails, preferably with scenic value. The unplowed forest roads provide the best variety of such trails, but most of these roads are dominated by snowmobile use with snowmobile grooming provided by State funds. These routes are also popular with skiers and snowshoers.

RESPONSE: Again on Highway 108 you have stated that you have over 14 trails. The Highway is not a Forest Service Road. One area you may want to try is going out behind Long Barn. That is the area that we always went to for cross country skiing. It is a beautiful gradual upslope except at the very beginning and there is usually enough snow there for skiing but not for snowmobiling.

It needs to be recognized that the nonmotorized users are not free-loading on motorized funds. First, the funds are provided through a State funding directive, rather than directly financed from user fees. More importantly, the grooming is not the critical aspect of these routes; the wide roadbed, gradual grades, and scenic routing are the critical aspect. A fair balance of these unplowed roads need to be protected for nonmotorized use, even if that results in a loss of grooming.

RESPONSE: To my knowledge OSV green sticker money is paying for grooming. Park pass money goes toward parking enforcement and snow removal of parking lots. Motorized trails on Highway 108 are from the Snow Park gate closure to Kennedy Meadows and on Eagle Meadow Road to Eagle Creek. That is approximately a 52 mile round trip. To limit that is ludicrous.

#### B. Backcountry Exploring

When engaging in the exploring activity, users seek a wilderness-like experience. In areas where snowmobile use is infrequent, shared use is possible, in particular with the imposition of BAT standards. (Best Available Technology standards limit motorized use to cleaner and quieter machines.) In areas where snowmobile activity is more than infrequent, there needs to be complete separation of activities in order for the nonmotorized user to obtain a wilderness-like experience.

While many snowmobile riders also may enjoy backcountry exploring, a half-hour encounter with a snowmobile by a non-motorized user far from the trailhead can significantly impact the nonmotorized experience of enjoying natural soundscapes and clean air. (While, on the contrary, there is little impact to the snowmobile user from sharing such space with skiers and snowshoers, who generally have a much narrower range, cover far less territory and are clean and quiet.) The winter travel management process needs to acknowledge that federally-designated Wilderness areas are generally inaccessible to day users in winter. Skiers and snowshoers seeking a wilderness-like experience in winter must be able to do so from available winter trailheads, and generally these trailheads are in motorized areas. This needs to change, through the creation of more nonmotorized areas adjoining winter trailheads.

RESPONSE: I will refer you to the studies below as to the new technology on the snowmobiles. Very rarely would any skier or snowshoer have a half hour experience with a snowmobile rider as they are usually going to some destination that a skier cannot reach. A skier may be subject to 30 seconds with a snowmobile out in the backcountry.

#### C. Alpine Adventure

In recent years, with the advent of improved backcountry ski and snowboard equipment, chasing powder on steeper backcountry slopes has become highly popular in California as elsewhere. Some snowmobile riders also chase powder, seeking to highmark steep slopes. Conflicts between motorized and non-motorized "alpine adventure" recreation rarely allow for any degree of shared use. This is due to safety issues, noise issues, and clean air issues and also, perhaps most significantly, the substantially disproportionate impact of each use in consuming (shredding) powder snow.

Due to its power and speed, a single snowmobile can consume (shred) a powder-covered slope that otherwise would provide recreational opportunity for a hundred skiers. In chasing powder, skiers and snowshoers cannot compete with snowmobiles. Where snowmobile activity is frequent, skiers are completely displaced from areas open to snowmobiles.

With regard to protecting the "alpine adventure" activity, primary factors for consideration are (i) relative demographics, e.g. the relative demand for each type of activity, (ii) issues of sustainability and (iii) the fact that snowmobile riders can easily access slopes that are several miles from the winter trailhead, while skiers and splitboarders cannot.

It is fact that far more skiers and snowshoers than snowmobiles can be accommodated on one slope. It is also fact that demand for nonmotorized backcountry downhill recreation exceeds demand for snowmobile downhill recreation, very substantially in California. These demographics and trends have been repeatedly acknowledged in Forest Service assessments of winter recreation demand in California. We believe the current designation of nonmotorized backcountry downhill recreation areas is significantly out of balance with what is necessary and appropriate to meet current demand and provide sustainability for future growth.

RESPONSE: Because of the terrain on Hwy 108, the only "alpine adventure" recreation would occur on the top of Sonora Pass as that is the only area open enough for the Alpine experience. You have to have a snowmobile

to get there and it is preferable that the road is groomed. The other area to have this experience is in the Eagle Meadow and Long Valley Area. You still need a snowmobile to get there. I am not familiar with the 14 trails at Crabtree and Gooseberry but you stated that it was for all levels. One other area for the alpine experience is the Burst Rock area which is above the Dodge Ridge ski area accessible from Dodge Ridge Road, Gooseberry Road, and Crabtree Road. This area is restricted from motorized use. I do not agree with your statement regarding the demand for motorized recreation is less than non-motorized recreation. When the weather is good and we have good snow, our Hwy 108 snow parks overflow on to the Hwy. There are people from the valley as far away as Livingston, and up to Roseville, San Jose and the Bay Area that travel here to snowmobile. If there were a larger snow park, it would still overflow during good weather and good snow pack.

#### Comments to Mr. Buckley's comments

On Page 5, last paragraph - surveys (it doesn't state whose surveys) of overall recreational visitors to the forest that motorized users represent only 1.7%. That may be if you take in year round numbers but not if you use just winter user numbers. Also the implication is that non-motorized users are the only "family" oriented users. There are generations of families in the Long Valley area and the Hwy 108 corridor that have been snowmobiling and using their cabins year round.

Mr. Buckley keeps referring to Roadless Near Natural and the fact that Congress will never designate an area with roads in it as Wilderness. One of the things that concern me is that most of these areas that he is discussing do have forest service roads and trails in them currently. Why would any plan designate land next to privately owned parcels as Near Natural?

Forest Service road 4N12 goes out and through Groundhog Meadow. There is a trail along Hamill Canyon to McCormick Pocket. Forest Service Road 5N06Y, 5N74 are 4 wheel drive trails to Eagle Peak area. Forest Service Road 5N01, 5N09, 5N04, 6N19Y, 6N38Y, 6N24, 5N87, and 5N13Y are in the Niagara Creek and Double Dome Rock area. FS Road 5N01, 5N33, 5N01D go through to Long Valley, Sardine Meadow, go through and alongside of Red Rock Meadow, to the Silver Mine and Haypress Meadow and Lake. All along 5N01 are private parcels and there are roads from 5N01 to these parcels. These are NOT roadless areas. I cannot speak for the Hwy 4 side of things but I imagine it is the same.

As to comments on Page 8 of his response to at risk furbearing animals where he cites the existing grooming on Hwy 4 and Hwy 108. Logically, at least to me, if you are having one Snow Cat grooming these Highways and you normally have (I'm guessing here) maybe 300 to 400 cars, trucks, motorcycles per day going over these same highways from June through October/November/December, the impact should be less. There is a study at the very end of all these comments that addresses this.

Actually, per Adam (Forest Service), there has been no determination that the Red Fox is even in this area. Adam stated at the last meeting in Pinecrest that, if found, the Red Fox would likely be on the top of ridgelines probably up on Sonora Pass. If that is the case, you will not want anyone hiking along St Mary's Trailhead nor do you want the Marines practicing maneuvers in that area as well, correct?

As to the toads and frogs, when asked at the first Pinecrest meeting, Steve Holdeman (Forest Service) said there were no studies to show that over the snow vehicles are affecting them.

On Page 9 Mr. Buckley states that "CSERC IS NOT PRESSING FOR GROOMING TO BE ENDED IN MOST AREAS NOW GROOMED DESPITE THE POTENTIAL NEGATIVE IMPACTS THAT EXISTING GROOMING NOW HAVE AND CONTINUE TO HAVE FOR AT-RISK WILDLIFE SPECIES. CSERC IS NOT ASKING THAT SNOWMOBILE USE BE CURTAILED ALONG HIGHWAY 4, ALONG AN UNGROOMED HIGHLAND LAKES ROAD CORRIDOR, IN THE SPICER AREA, OR IN THE EAGLE MEADOW TO SARDINE MEADOW AREA.

CSERC IS GENERALLY ACCEPTING OF ALLOWING MOST OF THE LEGAL "STATUS QUO" USE AREAS TO CONTINUE TO HAVE SNOWMOBILE USE IN RECOGNITION OF THE NEED FOR BALANCED TRADE-OFFS WITH FOREST MANAGEMENT PLANS. BUT WHEN IT COMES TO IMPACTS ON FURBEARERS, CSERC BELIEVES THAT THE PROPOSED ACTION IS HIGHLY VULNERABLE TO A LEGAL CHALLENGE EVEN IF THE SOLE ISSUE IS ITS IMPACT TO RARE, AT-RISK WILDLIFE." But on Page 19 he feels the solution is it be fully analyzed. I think there have been plenty of studies as shown below. He also then states in his Middle Ground Proposal on Page 26 that none of the areas showing (now in Yellow) have access for over the snow vehicles. I'm confused. I thought you stated that you didn't want snowmobiling curtailed in these areas. Again there are roads, forest service and private roads in these areas.

On Page 22 Mr. Buckley states that the motorized vehicles have all the access on the highways. Yes, because that is the only place there are snow parks that motorized users can park and ride from. Motorized users are not allowed to park in a turnout and take off from that point, unlike non-motorized users. Since I cannot see the map that he is proposing, I'm not sure what is being proposed. He talks about motorized users being able to ride in the Experimental Forest. Well, as far as motorized users knew, they have never been allowed to ride there, so I'm not sure what he is speaking of. Just as all the areas that motorized users are currently riding in they have never been told that they were not supposed to. I'm not sure how much public input there was on the plan that was adopted in 1991. I was riding snowmobiles then and do not remember any public outreach or input being sought.

It seems to be that CSERC's Alternative Proposal that everything per the 1991 Plan stay status quo but that Herring Creek be added as off limits to OSV users. I'm not sure how this is a middle ground proposal.

Mr. Buckley stated at the Pinecrest meeting in March when a group of us were discussing the mileage out to Long Valley area and the fact that most non-motorized users would never get there as it is approximately 17 miles from the snowpark, which he used to ride his snowmobile out to that area to go skiing. Hmmm, so he admits it is highly unlikely that any non-motorized user would ever get there without the use of a motorized vehicle.

I cover a lot of ground when I ride my snowmobile, especially if we are staying at our cabin in Long Valley. To clarify what that means, in a normal snow year I normally put 1,000 to 1200 miles on my snowmobile. To say that any of this area is "roadless", I beg to differ, unless that is, there is a different definition for "roadless". I use these roads summer and winter and know the area very well.

\*I do not chase or harass wildlife and my goal is not to disturb them.

\*I don't have a problem with sharing the roadway for non-motorized users. When I have seen them on the highway, I slow down and go by at a reasonable speed. I do not wish to endanger anyone.

\*If there is a depth of 12 inches, I will be riding the road. Unlike some believe, I have no wish to damage the environment, hurt myself, or my snowmobile.

I would propose that the area in the Experimental Forest, around Dodge Ridge and up to Crabtree and Gooseberry area be designated as non-motorized for winter. I would want to talk a bit more about designating Herring Creek area as non-motorized. I think it makes sense to designate the ridgelines as boundaries, but would like to see everything in pink designated as Near Natural to Proposed OSV 12" depth. That includes the area known as Three Meadows, Cooper Peak, Castle Rock, Three Chimneys, East Flange Rock, Silver Mine, Red Rock Meadow, Eagle Creek Trail, Bennet Juniper, Sardine Meadow, and Haypress Meadow. Enforcing the ridgelines is an easy boundary for both the snowmobilers and the Forest Service enforcement officers.

Last but not least, you should be receiving comments from ORBA and I fully endorse everything that is being stated in their comments.

Studies regarding noise, pollution and "footprint" of over the snow vehicles.

#### Yellowstone National Park Studies

(1) 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.'

(2) 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

(3) 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 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.

(4) Wildlife: "Winter use will have some effects on wildlife, just like every other form of visitor access to the park. Extensive studies of the behavioral responses of five species (bison, elk, bald eagle, trumpeter swans and coyotes) to over snow traffic showed that these animals rarely showed highintensity responses (movement, defense postures, or flight) to approaching vehicles. For individual animals, 8 to 10 percent of elk and bison show a movement response to snowmobiles and snowcoaches. Approximately 90 percent of elk or bison either show no apparent response or a "look and resume" response. This level of reaction was consistent for a wide range of daily average oversnow vehicle use (ranging from 156 to 593 vehicles per day). Thirty-five years of census data do not reveal any relationship between changing winter use patterns and elk or bison population dynamics. No wildlife populations are currently declining due to winter use (swan populations are declining, but this is being experienced regionally and due to factors unrelated to winter use in the park or region). Use will be well below levels previously studied by NPS wildlife biologists and well within the limits recommended by those studies. There is no reason to suspect that recent winter use levels pose a risk of unacceptable impacts or impairment to any wildlife population. All visitors utilizing motorized oversnow vehicles travel with commercial guides, learning about and enjoying the abundant wildlife sightings." In 2009 Winter Wildlife monitoring showed that 80% of Trumpeter Swans had no reaction to 26 snowmobiles. 11% responded with 'a look and then resume' reaction. No swans had a flight response. It was reported by behavioral response monitoring that 92% of the Bald Eagles in Yellowstone had no response to snowmobile events. 5% had a 'look and resume' response and there was 0% flights initiated by snowmobiling.

## SNOWMOBILERS

The following comments were made by John Monarch, President of an ecological consulting firm in Colorado. His input reflects the reality of just how twisted the process of "protecting our environment" has become.

I have been a wildlife biologist who has conducted wildlife studies for over 35 years in the intermountain west. During that time I have used snowmobiles to access areas where I have conducted studies. Having observed wildlife responses to snowmobiles over that time I would support Ed's (Klim, President of the International Snowmobile Manufacturers Association) observation that there have been no studies to support the notion that there have been significant impacts to wildlife. As a matter of fact I would doubt one could prove even through studies that elk, deer, bison and other wildlife are affected at not only the population level, but the individual level. The potential risk to wintering wildlife by snowmobile activity is minimized by the fact that most snowmobiling occurs in non-winter use areas. An example is the White River National Forest where less than 3% of the forest is considered to be winter habitat for big game animals. And of this area portions of that are not accessible to snowmobilers. 28

The argument that snowmobiling affects humans is driven primarily by the cross-country skiers who feel the snowmobilers are impacting their wilderness experience. They are unwilling to accept that with the new exhaust systems sound levels are very low and one can't hear them very far away. I enjoy cross-country skiing as much as snowmobiling and have never had a problem with noise or discourteous riders.

As for the environment there are no studies to prove snowmobiles affect the environment. There may be evidence that sleds have been in an area, but no evidence that the environment has been harmed. The special interest groups don't want to accept the fact that snowmobiling occurs on the snow and, with few exceptions, do not affect vegetation or habitat. The few exceptions I reference are those instances when snowmobilers ride during marginal snow conditions and tear up the vegetation. This is an education and self-policing issue that we must continue to work on and not a reason to close down national parks or portions of the forests or BLM lands.

Whenever I deal with environmental issues, I find that they have an opinion and are pushing an agenda and don't care what the facts or lack thereof show. What people need to do is spend as much time in the field as I have over the past years then maybe they would have a better understanding of how wildlife reacts to not only winter, but year around recreation and other activities. Then, maybe they wouldn't be so inclined to get on the bandwagon in opposition of motorized recreation. I should further point out that over my many years of observations I have found that wildlife reacts more to a person walking or cross country skiing than when they are in a vehicle, or on a snowmobile or ATV.

## EFFECTS ON SNOWMELT

The effect of snowmobile emissions on the chemistry of snowmelt water was extensively studied in Yellowstone National Park during several consecutive winters, beginning in 2003 (Arnold 2006). This study represents the most extensive body of information on this topic. 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 tertbutyl 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. However 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 also 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 and more acidic with higher concentrations of sodium, ammonium, calcium, magnesium, fluoride, and sulfate than in snow off the trail; 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.

A study of snowpack chemistry on heavily traveled snowmobile trails in Vermont (VHB Pioneer 2010) indicated no detectable levels of VOC or total petroleum hydrocarbons in surface waters located immediately down gradient (downstream) of snowmobile trails. Soil chemistry monitoring also indicated no detectable levels of VOC or total petroleum hydrocarbons.

#### COMPACTION AND VEGETATION

Everything we do has some effect on the environment. When a hiker steps on a flower, he affects the environment. When land is paved over for a bicycle path, it affects the environment. Many of the foot paths man has used for centuries still exist and are clearly visible throughout the world. However, it's a fact that a snowmobile and rider 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). Average pounds of pressure per square inch exerted on earth's surface: 34

##### Object Lbs. of Pressure

Four-Wheel Drive Vehicle .....	30
Horse .....	8
Man .....	5
All-Terrain Vehicle .....	1.5
Snowmobile .....	0.5

(All vehicle weights considered include 210 lbs. estimated weight of one person and gear.) Moreover, the snowmobile's 1/2 pound of pressure is further reduced by an intervening blanket of snow. In many jurisdictions, snowmobiles are not classified as off-road vehicles.

By both definition and management policies, these jurisdictions have completely separated snowmobiles from off-road vehicles. As the U.S. Department of the Interior concluded in an environmental statement: "A major distinction is warranted between snowmobiles and other types of off-road vehicles. Snowmobiles operated on an adequate snow cover have little effect on soils - and hence cause less severe indirect impacts on air and water quality, and on soil-dependent biotic communities, than other ORV's do." Given adequate snowfall and responsible operation, all evidence of snowmobile operation disappears when the season changes and the snow melts. In its environmental statement regarding off-road vehicle use of public lands, the U.S. Department of the Interior stated: "Where snowmobiles are used exclusively over snow on roads and trails, the impact on vegetation is indeed virtually nil." A University of Wisconsin study of J. W. Pendleton entitled Effect of Snowmobile Traffic on Non-Forest Vegetation discovered that snowmobile traffic had no effect on grain yield of winter wheat, alfalfa, red clover plots or grass legume. Species of turf grass showed slightly reduced yields at first harvest, but were not negatively affected in subsequent harvests.

There is no evidence that snow compaction caused by snowmobiling, ski-touring or snowshoeing has a significant impact on the population of small burrowing animals. Since these recreations take place over a minuscule portion of the total land area, the ecosystems of burrowing animals tend to be overwhelmingly affected by natural forces-such as wind-induced compaction, early and late snowfalls, temperature fluctuations resulting in thaws and freezes, etc.

#### SOUND

Sound levels for snowmobiles have been reduced 94% since inception. Pre-1969 snowmobiles were noisy. At full

throttle, these machines emitted sound levels as high as 102 dB(A) from a distance of 50 feet.

Snowmobiles produced since February 1, 1975 and certified by the Snowmobile Safety and Certification Committee's independent testing company emit no more than 78 dB(A) from a distance of 50 feet while traveling at full throttle when tested under the Society of Automotive Engineers (SAE) J-192 test procedure. Additionally, those produced after June 30, 1976 and certified by the Snowmobile Safety and Certification Committee's independent testing company emit no more than 73 dB(A) at 50 feet while traveling at 15 mph when tested under the SAE J-1161 test procedure. For comparison purposes, normal conversation at three feet produces approximately 70 dB(A). It would take 256 -78 dB(A) snowmobiles operating together at wide open throttle to equal the noise level of just one of the pre-1969 snowmobiles.

Problems with excessive noise levels do occur when irresponsible snowmobilers modify the snowmobile exhaust system or substitute the factory system with an after-market racing exhaust. In most states and provinces, this practice is illegal and grossly misrepresents the sport. Other wildlife are affected at not only the population level, but the individual level.