

THE FEASIBILITY OF CONSTRUCTION
OF SNOWMOBILE TRAILS IN
MANITOBA

A PRACTICUM

PRESENTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE
MASTER OF NATURAL RESOURCE MANAGEMENT
IN THE GRADUATE SCHOOL OF THE
UNIVERSITY OF MANITOBA

BY

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MARCH 1972

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PREFACE

Deciding whether the snowmobile is just a passing fad, whether it is here to stay, or whether at least its recreational use will eventually be banned by legislation is not an easy question to answer; (conceptually, a "fenced range", as opposed to an "open range", position regarding the use of snowmobiles has been adopted in Manitoba through the enactment of legislation). In the interim, snowmobile use areas should be designated.

This report was undertaken for the Department of Mines, Resources and Environmental Management in conjunction with the Natural Resource Institute at the University of Manitoba. The problem to be solved involves the snowmobile and the feasibility of constructing snowmobile trails, or designating areas of use for this vehicle.

Material for the report was gathered with the help of people not only in the Manitoba Departments of Mines, Resources and Environmental Management, Parks and Recreation, and Highways, but also various Federal Departments and government departments in other Provinces and States. People in private industry, professors and researchers from various universities, members of snowmobile clubs, and other individuals interested in the topic were consulted.

There are too many people involved to be able to thank them all individually, but I would especially like to thank:

Professor C. Harvey - Faculty of Law, University of Manitoba
Dr. W. O. Pruitt, Jr. -- Department of Zoology, University of Manitoba
Mr. J. A. Barr -- Department of Mines, Resources and Environmental Management

who so ably advised me on the study. I would also like to thank Dr. S. Sinclair, Director of the Natural Resource Institute which provided the funds for the project.

PART I
SUMMARY REPORT

INTRODUCTION:

"The trouble, as always, is that man seems incapable of confining his inventions to sane uses and simple pleasures, but must convert them at once into instruments of destructive power and a blight on his most fragile surroundings . . .

What is needed is strict registration and licensing, a severe limit to the sound level and rigid confinement of snowmobiles to designated areas at designated times under specified weather and trail conditions."¹

Across the snow belt, in all areas where snowmobiles are used today, snowmobilers, government officials, environmentalists and even people unfamiliar with the activity are debating the pros and cons of this new winter sport. Why has this sport become the subject of so much controversy? Are the arguments, both for and against the machine, well founded?

Perhaps one of the reasons this sport has received so much attention in the news media is a result of environmental concern. The noise, the air pollution, the possible destruction of vegetation, as well as the number of injuries and deaths attributed to the snowmobile has caused most of the discussion about the machine. In Manitoba in 1963, there were approximately 500 machines in use; the number had risen to 1,900 by the next year. At the end of the 1970-71 season, the number of registered snowmobiles was 16,241. The number to date this year is approximately 20,000 machines.

In North America, the total number of snowmobiles is 1,400,000. The retail sales figure for 1970-71 was approximately 500,000 machines. The total figure is expected to reach 2 million machines after the 1971-72 season.

Benefits and Liabilities of the Snowmobile

What are some of the benefits and liabilities of the snowmobile?²

Benefits:

- 1) recreation enjoyment - family togetherness.
- 2) public appreciation of remote and less accessible areas.
- 3) accomplishment of jobs in areas of no roads and limited accessibility.
- 4) used for harvesting of wild furs in the North and for use on traplines.
- 5) allows commercial fishermen the opportunity of winter fishing.
- 6) distribution of angling and hunting pressures to remote under-harvested areas.
- 7) social development due to better communications and means of travel in the North.
- 8) increased accessibility allowing for the use of summer cottages and facilities in the winter.

Liabilities:

- 1) the pursuit of wildlife.
- 2) careless actions which aggravate farmer-sportsmen relations.
- 3) noise.
- 4) abuse of recreational environment due to buildup of machine use.
- 5) potential for reducing numbers of big game.
- 6) capability to flush wintering animals and birds from limited and essential winter cover; this contributes to overexposure of wildlife at a critical time of the year.

- 7) snow compaction - increase in ice depth.
- 8) air pollution.
- 9) plantation, shrub and tree damage.
- 10) vandalism, trespassing - invasion of private property.
- 11) litter.
- 12) conflict of recreation and other land use activities.
- 13) soil damage.

Definition of the Problem

In Manitoba, there is legislation and there are regulations placing restrictions on the areas where snowmobiles may or may not operate. According to the Snowmobile Act, no snowmobiles shall be operated on private property without the consent of the owner or other persons having lawful possession or control of the property. This restriction includes railway tracks and the ditches alongside the tracks. Snowmobilers are also restricted within one hundred feet of a dwelling between midnight and seven o'clock in the morning, except on his own property or as a guest on same. They are also restricted within one hundred feet of a slide or skating area that is in use at the time.

In general, snowmobile use within all cities and towns in Manitoba is prohibited. It is only in outlying areas of the towns and cities where snowmobile use is allowed. In Winnipeg, snowmobiles are prohibited in all Metro Parks and golf courses.

What actual areas are set aside for snowmobile use? Snowmobiles

have no special restrictions on public lands except those mentioned above or as posted in specific areas according to Municipal legislation. Therefore, use along the Winnipeg floodway and along the river in outlying areas is allowed. Snowmobiles may be operated in the ditches or the right-of-way of a highway adjacent to the roadway. Along with these open areas, the Manitoba Department of Tourism and Recreation has established snowmobile trails at:

- Grand Beach Provincial Park
- Spruce Woods Provincial Park
- Falcon Lake - Rennie Area
- West Hawk Lake - Falcon Lake Area
- Turtle Mountain Provincial Park
- Birds Hill Provincial Park
- Duck Mountain Provincial Park

A trail is also in existence in the Riding Mountain National Park.

Due to the density of population, Winnipeg has approximately one-third of the total number of registered snowmobiles (5,529 in 1971) and very few easily accessible snowmobile use areas. Therefore, some provisions must be made to provide proper facilities for snowmobile use. As the number of registered snowmobiles continues to rise and as more people become acquainted with the available facilities, provision for additional sites will have to be made.

There are, I feel, many reasons justifying the provision of additional sites. One of the most obvious reasons involves the registration fee. Snowmobiles are required by law to be registered. The

money from registration fees should, in part, be used for the benefit of the snowmobile user. Part of this fee is to be used on a safety program initiated by the Motor Vehicles Branch while the remainder or part thereof should be used for the construction and maintenance of areas for snowmobile use.

A second very important reason for establishing areas for snowmobile use involves safety. Safety, not only for the snowmobile user, but also for non-snowmobilers. According to an article in Time magazine, Social Science Professor, David Klein, in a recent issue of the Journal of Safety Research stated that snowmobile enthusiasts court danger to achieve satisfactions their dull jobs cannot provide; the Time article continues, "so great is the need to live dangerously, Klein believes, that most efforts to promote safety are doomed to failure: Americans do not want as safe an environment as could be achieved. If an individual seeks risks, incorporation of safeguards into a recreational device is likely to send him in search of a less safe device".³ With this in mind, it becomes very important to design a trail that is safe but still adds the challenge to attract the snowmobile enthusiast. It should incorporate scenery, historical sites and a variety of topography, with some open space for the snowmobile operator to "blow it out". By setting aside areas for this activity, other recreationalists and the public in general do not come into conflict with this activity. People can drive their automobiles down highways and not be afraid of a snowmobile crossing the highway; or individuals who cross-country ski, toboggan, or downhill ski will know where the

designated snowmobile areas are located and can enjoy their sport without fear of being interrupted either by noise, by snowmobile tracks, or by the snowmobile enthusiast himself by simply avoiding these areas.

Damage to the environment is a favorite complaint against the snowmobile. By designating areas for snowmobile use, as in a trail system, environmental effects can be controlled to a certain extent and directed away from delicate areas. The use of old logging roads, firebreaks, and other trails already in existence confines damage to certain areas. By providing specific areas for snowmobile use, the total area of snowmobile use in general throughout the province will undoubtedly become less and thus environmental damage will also decrease.

Establishment of a good trail system could increase the winter tourist trade. Individuals and snowmobile clubs throughout the snow belt are continuously searching for new trail areas to try their machines.

Finally, but not any less important, is the fact that the snowmobile has brought new opportunities to outdoor recreation. People who originally remained inside during the winter months are now able to enjoy the outdoors. Winter excursions, camping, picnics and the like have increased remarkably since the snowmobile was introduced to the general public. Unfortunately, many of the snowmobile facilities in existence in Manitoba are too far away to be utilized by people journeying out on a one day excursion. People would rather spend more time

on the trail and less time on the highway. The Birds Hill Trail is popular since it is close to Winnipeg⁴. The Whiteshell Area is heavily used because people can utilize their summer cabins in the winter.

Ideally, what we require is an area within one hour's drive of Winnipeg which offers the diversification required for a proper trail system. In time, a trail system might be constructed that leads from Winnipeg to the Sandilands Forest Area and finally connects with the Whiteshell Trail System.

Area of Study

The Sandilands Area was chosen for this study firstly because of the variation in topography and scenery and, secondly, due to its geographic location. Some of the local snowmobile clubs were consulted to discover what areas they used for trail rides and why they chose these areas. The Sandilands Area seemed to have the favoring characteristics needed for snowmobile use. The actual study area referred to in this report as the "Sandilands Area" revolves around two central locations, Marchand and Milner Ridge. The northern area extends from the Trans-Canada Highway north to Township 14 extending from Range 9E to Range 13E. The southern region extends south from the Trans-Canada to the Minnesota border from Range 8E to Range 17E (Appendix). After establishing an initial study area, a closer review of the area was undertaken to establish whether the area could actually be used for snowmobile trails.

The actual study involved legal implications, economic impact, environmental effects and a land capability study of the entire area. The study was conducted to establish whether trails could be constructed to

establish what other activities, if any, could be carried out in the area; what other recreational use was being made of the area; whether the statutes prohibited activities of this nature from taking place; and what effects on the environment would result. A study of the economic impact was initiated to show the effect the total snowmobile industry is having on Manitoba. Through research of this nature, it was hoped that an optimum solution could be achieved that would agree with the interdisciplinary ideas of the various factions concerned: government officials, snowmobile users, the public in general, environmentalists, and other recreationalists.

CONCLUSIONS AND RECOMMENDATIONS FOR ACTION:

The study concluded that the snowmobile has made a definite impact on Manitoba, not only from the economic standpoint but also by the way it has changed the winter recreation scene. Economically, revenue is generated to the government; from the industrial side, only within the last year has the market changed from a seller's market to a buyer's market. The sale and repair of the machines, clothing and accessories has allowed many seasonally employed people to now be employed year round.

The charges made of snowmobile effects on the environment have been many. Some of these charges are well founded, others are caused by the actions of a careless few, and still others are totally unwarranted. The environmental effect is one aspect of the total snowmobile industry that lacks comprehensive information. Research in areas of snowmobile safety and snowmobile effects on the environment have only recently

received the attention these areas require. Effects of noise on wildlife and its effect on specific plant life are lacking in factual results. Manitoba must embark on specific studies for environmental effects caused not only by snowmobiles but also by the various all-terrain vehicles used in Manitoba.

Recommendations

- 1) Use of the Marchand Area - The total study area is divided by the Trans Canada Highway; thus, we have two distinct areas that could be developed for snowmobiles. One centers around Milner Ridge, the second around Marchand. I recommend that the area surrounding Marchand be given preference for development. Marchand was chosen for the following reasons:
 - a) it will have less conflict with centers of population, good agricultural land, and private lands.
 - b) there are more logging roads, trails and existing roads that can be utilized as trails in the area (appendix).
 - c) the majority of land with good wildlife capability is in the upper area.
 - d) the southern area is geographically larger and thus allows more opportunity to route trails around potentially fragile areas, or areas of danger.
 - e) due to the Dawson Trail, potentially better camp site areas and general recreational areas, the southern area has greater overall potential for proper snowmobile trail development.

- 2) Make the trails interesting, challenging and varified in topography -- The Sandilands Area has the potential to be an ideal snowmobile trail area. It can, if properly laid out, combine forest trails with open stretches (unplowed highways not used during the winter), with scenic views and historical sites. The Dawson Trail is ideal for historical significance. Furthermore, information gathered from the Canada Land Inventory indicates areas possessing good scenic views exist throughout the region.

- 3) Trails should be well marked and well maintained -- Maps of the trail area should be made available at the start of the trail system. The use of a universal recognizable system of signs, i.e. the ISIA International Sign System, is important since many people operate their vehicles in various areas or provinces. These signs could indicate tree plantation areas, prohibited areas, areas of danger as well as indicate speed, direction and the number of miles to the next rest area.

The trails should be well maintained for reasons of safety and enjoyment. The trail should be groomed a minimum of once a week. Only if trails are poorly maintained do people leave the trail.

- 4) A patrol system should be used -- The use of a patrol system is three-fold: regulation, aid, and for information. The

need for regulation on a trail system is more for the protection of the majority than for the punishment of a minority. The knowledge that a patrol is on duty is usually enough to deter violators from leaving the trail or from travelling at excessive speeds making the area unsafe for others.⁵

The patrols, which could be made up of conservation officers or even volunteer snowmobile enthusiasts, should be equipped with a two-way radio to enable them to aid snowmobiles experiencing mechanical trouble or some other form of trouble along the trail. They could also serve the function, as in the ski-patrol system, of giving aid in the case of an accident.

Lastly, for people unfamiliar with the area, or tourists visiting from other Provinces and the United States, a patrol system could serve as a source of information. It could give on-site information on trail conditions, scenic areas to view, or other information of this nature.

However, the terms of reference under which the patrol system would operate would have to be set up. Either through statutory regulation or through a less formal authoritative device, rules relating to snowmobile use must be set for the area. At present, Conservation Officers are required to enforce all Acts and Regulations relating to the conservation of Timber, Wildlife and Fisheries. These duties include patrols, investigations,

apprehension of violators, seizures of equipment, prosecutions, and court appearances.

- 5) Facilities should be established -- There is no need to build a fancy restaurant or service station in the area. Basic facilities, however, should be established. These would include adequate parking facilities, washrooms at the start of the trail and perhaps at the halfway point, warming huts and picnic tables dispersed throughout the trail system to allow people to enjoy the out-of-doors or to simply rest or secure shelter.

Numerous receptacles for litter should be strategically placed to encourage people to carry their refuse out of the bush.

- 6) More research should be started on environmental effects -- The amount of research being done in the field of safety for snowmobiles has increased over the years. Manufacturers, being required to meet government standards to be able to market the machine are upgrading their own safety standards. Research in the environmental field is lacking. Studies of snowmobile effects on wildlife should be started immediately. More research is required on damage done to trees and vegetation. If conclusive evidence is found that there is damage being created, the amount and the type of preventive treatment required from the environmental aspect can be established.

- 7) Interdisciplinary methodology should be adopted - The methodology used in this report should be adopted for assessing other problem areas of this nature. Only by objectively looking at all sides of the problem can a satisfactory solution be resolved. The concept of buffer zones and setting aside of fragile areas is important, especially in areas where total knowledge of all aspects is unavailable. Since our knowledge of snowmobile effects on wildlife is limited or totally absent in some areas we should preserve these few fragile or highly capable areas since once lost they might be impossible to replace. Temporary buffer zones can be set up for other purposes depending on the project. In our case, they can be used to identify areas that should not be used until sufficient snow cover has fallen.

The snowmobile in Manitoba need not be the menace that it is reputed to be. If enthusiasts are given the proper facilities they need not conflict with other recreationalists or resources. Properly administered, the snowmobile should provide a form of recreation that allows many Manitobans to enjoy the long cold northern winters.

If constructed, this area will serve the needs of snowmobile operators in close proximity to the Winnipeg Area. If demand for these facilities increases in the future, provisions could be made to connect the Whiteshell Trail System with the Sandilands System and provide facilities more than sufficient to handle all demands.

In other parts of the province, the problem is not as acute. In the southwestern part of the province, the Spruce Woods Provincial Park and the Turtle Mountain Provincial Park trail systems should be sufficient to handle local needs. Also in the Dauphin Area, the Duck Mountain Provincial Park and Riding Mountain National Park trails are adequate for these areas. The advantages the rural areas have over Winnipeg are two-fold; firstly the number of snowmobiles is less concentrated, secondly, knowledge of local surrounding areas allows more use of local areas. The fact that areas for snowmobile use are more easily accessible is also an important factor.

PART II
MAIN REPORT

To justify the Sandilands Area for use as a designated snowmobile trail use area, the study covered various interdisciplinary areas. These areas are covered in detail in the main report. The areas dealt with are:

- a) the legal implications
- b) the economic impact
- c) environmental effects
- d) land capability
- e) snowmobile trail specification

A. LEGAL IMPLICATIONS:

For the purpose of determining whether or not snowmobile use and trail construction are allowed in the study area, statutes of Manitoba related to probable areas of conflict were reviewed. The specific Acts consulted were:

The Snowmobile Act⁶

Forest Act⁷

Provincial Parks Act⁸

Wildlife Act⁹

The Snowmobile Act does not place any restriction on use of the machine except according to Section 25 which does not allow operation of a snowmobile on a roadway, or on, or across, a median of a divided highway except according to Section 26(1) - :

The operator of a snowmobile, if he is over the age of sixteen years and holds a valid subsisting driver's licence, chauffeur's licence, or motorcycle operator's licence may operate the snowmobile directly across a roadway from one side to the other

- a) at or within fifteen feet of an intersection of two or more roadways;
- b) at any place where the distance between the nearest intersection of roadways is two or more miles; or
- c) at any place designated by the traffic authority of the highway by by-law or regulation as a place on the highway where snowmobiles may cross the roadway; or
- d) along any highway or portion thereof, which the traffic authority has, by by-law or regulation, permitted snowmobiles to cross without regard to location.

In case of an emergency such as a blizzard, provision may be made for snowmobile use on highways.

It is provided in S.25(1):

No person shall operate a snowmobile

- a) on private property without the express or implied consent of the owner or other person having lawful possession or control of the property; or
- b) within one hundred feet of a dwelling between the hours of twelve midnight and seven o'clock in the morning, except within one hundred feet of a dwelling on his own property or property under his control or as an invited guest; or
- c) at a speed greater than five miles an hour when within one hundred feet of a person engaged in ice fishing or a fishing shanty or shelter; or
- d) within one hundred feet of a slide, ski or skating area that is in use at the time, unless the area is enclosed or fenced or unless the snowmobile is required for the maintenance or operation of the ski area.

Since the area of study involves land set aside as Provincial Forest, the Forest Act was consulted. These provincial forest areas come under the control of the Department of Mines, Resources and Environmental Management. No restrictions as to snowmobile use or other recreational use of this nature was found. Some of the jurisdictional information which follows is quite relevant to present use of the area and to possible future development of the area.

With regard to roads and highways within the area, s.24(2) states - :

Every road and highway, the title to which is vested in the Crown and that lies between parcels of land contained in a provincial forest, shall, for the purposes of forest administration, be deemed to be part of the provincial forest.

The Forest Act also makes provision for a provincial park or recreation area such as might be established by the construction of snowmobile trails by stating in s.28 - :

Where, under the Provincial Parks Act, a provincial park or provincial recreational area is constituted and established within a provincial forest, the area within the provincial park or the provincial recreational area, as the case may be, is not thereby withdrawn from the provincial forest.

Regulations to protect the area have been provided for and may be put into effect by the minister. These include s.43(k) "respecting the conservation, protection, and management of Crown forests and the control and management of the flora and fauna in such areas and the occupancy of the lands in provincial forests" and s.43(1) "respecting the removal and exclusion of undesirable persons and trespassers, . . ."

Also of concern to the area of study is the Wildlife Act. Although no wildlife management areas exist in our area of study, s.6(1) states - :

The Lieutenant-Governor in Council may by regulation, designate Crown lands as wildlife management areas which, subject to the regulations, shall be maintained for the management and conservation of wildlife in the province.

The only other restriction the Wildlife Act presents is through regulation and involves the use of snowmobiles for hunting purposes. It basically describes how snowmobiles must stay on designated hunting trails and how the machine may not be used on the hunt. The machine may only go into an area to retrieve game, after it has been killed,

or to carry in supplies for the sake of setting up camp.

The Provincial Parks Act makes provision for the establishment of park and recreation areas. Although the Provincial Forest is under a separate department, in order to consolidate snowmobile recreation under one jurisdictional head, some coordination may be sought for the overall development of trails. The Provincial Parks Act, s.3(1) states - :

Subject as herein provided, the Lieutenant-Governor in Council may, by order, constitute, establish, and maintain parks and recreational areas for the use, benefit, health, enjoyment, recreation and education of the citizens of Manitoba and visitors to the province.

The development of such lands can take place only if the area is constituted as Crown land.

The establishment of a recreational area by no means restricts the land since varying uses of the area are considered as in s.6(2) and (3) which state:

(2) "Subject to subsection (3) and the regulations, a provincial recreational area shall not be used by any person for other than recreational purposes."

(3) The Minister may permit the use of a provincial recreational area by any person for other than recreational purposes only in so far as is desirable for the protection, preservation, improvement or proper management thereof.

The regulations of the act allow the minister to administer, if need be, rules "respecting the preservation, destruction, management or improvement of all things of value to which The Wildlife Act and The Fisheries Act do not apply or relate whether vegetable, animal or mineral and whether natural or otherwise".

This brief review of the prevailing statutes indicates no restriction regarding the recreational use of snowmobiles in the study area.

Thus if desired, snowmobile trail construction could take place.

In general, the Manitoba Snowmobile Act ranked with similar acts in other provinces and states would probably stand near the middle. By this I mean it is neither totally lenient nor totally restrictive in its content. The Manitoba Act has taken the better parts of various other established snowmobile acts from other areas and has combined them to form a good set of standards for Manitoba.

B. ECONOMIC IMPACT:

The snowmobile industry, as such, does not exist in Manitoba. That is to say, no employment is generated through the existence of large snowmobile manufacturing industries or through the existence of snowmobile clothing industries and other such snowmobile accessory industries. Although no communities are boasting of increased employment or publicizing information on an economic boom in their area, as has occurred in some Eastern Canadian communities due the advent of the snowmobile, an indirect economic impact does exist. The sale of snowmobiles, snowmobile accessories, clothing and other articles of this nature has increased considerably over the past few years. Approximately 35 manufacturers of snowmobiles in North America are represented in Manitoba. Some of these manufacturers have 30-40 dealers dispersed across the province, many of these are marina and boat sale dealers in the summer, and are now employed year round due the increased demand derived from the snowmobile trade.

At present, in Manitoba there are approximately 20,000 registered snowmobiles. The Motor Vehicle Branch suggests there are probably another 5,000 unregistered machines for a total of close to 25,000 snowmobiles in the province. As the law stands at present, the only snowmobiles that need not be registered are those existing according to Manitoba Regulation 160/70, clauses 1-4.¹⁰

The economic aspects of the sport are many. First to be considered is the registration fee. The fee for a three year period is fifteen dollars. The Manitoba Motor Vehicles Registration Statistics for 1971 listed the exact number of registered snowmobiles to be 16,241. The unofficial registration figure for this season is approximately 20,000 vehicles. The return to the government per year averages around \$81,000 from this source.

The number of machines sold in the 1970-71 season was approximately 10,000 machines while the number of sales for this season 1971-72 is projected to be approximately 12,000 machines in Manitoba. The average price is \$1,100.00 per machine. The revenue generated by the 5% sales tax on 10,000 machines would be \$550,000.00.

Revenue generated through the (ordinary) gasoline tax applied to the gasoline consumed by snowmobiles is another governmental source of income. It has been stated; that the average snowmobiler fills his gas tank 2.3 times a week over a period of 30 weeks, the average snowmobile season in the snow belt.¹¹

To show the actual impact, a simple illustration is shown which depicts the revenue flowing to government from the initial tank filling alone:

16,241	Registered snowmobiles (Manitoba)
<u>5</u>	Gallons of gasoline
81,205	Gallons of gasoline (total)
<u>.17</u>	Provincial share of gasoline tax
\$13,804.85	Amount of revenue the Provincial Government receives

The above figures deal strictly with gasoline used for the snowmobile and does not take account of gasoline used by the operators to transport their machines by automobile to trail and other use areas.

Oil and repairs are two other expense areas to be considered when analyzing the operational costs for the operation of the snowmobile. Oil is used on the basis of 1 quart per 5 gallons of gasoline. This would generate approximately \$56,000 by the 5% sales tax if we were to calculate according to the average user rates set up by ISIA. Repairs are expected to average \$35 for the season per machine.

To transport the machines, the owners require trailers which average \$230.00 per unit. It was estimated that 6,000 snowmobile trailers were sold in the 1970-71 season thus generating \$39,000 in sales tax.

The last important area of generated revenue deals with snowmobile clothing. When one considers that there are, on the average, three snowmobile users for every snowmobile and that each requires an outfit averaging \$80-\$100, one can see the additional impact of the snowmobile clothing industry. By means of interviews with local snow-

mobile club members, it was found that the average snowmobile outfit lasts 3 seasons at the maximum. Thus the sales tax generated by this means would be \$81,200 considering 16,240 suits at \$100 each.

To look at the overall figure generated, considering only the registered snowmobiles (16,241) for the 1970-71 season, the figures are as follows: (figures rounded)

Registration fee (per year)	\$ 81,200
Machines (5% tax on 10,000 machines @ \$1,100 each)	550,000
Gasoline (\$13,800 x 2.3 (av.fill/wk.) x 30 (wks./season))	952,000
Oil (16,240 x 2.3 (av.fill/wk.) x 30 (wks.) x .05 (tax))	56,000
Repairs (16,240 x \$35 x .05 (tax))	29,000
Accessories - trailers (5% tax on 6,000 units @ \$230/unit)	69,000
Clothing (5% tax x 16,240 suits x \$100 ea.)	81,200
	<hr/>
	\$1,818,400

These estimates do not include monies spent on accommodation, food, and other related expenditures encountered in the use and enjoyment of the machine.

C. ENVIRONMENTAL EFFECTS:

One of the major complaints against the snowmobile is its damaging effect on the environment. What are these effects and are the complaints well founded?

The major areas of complaint revolve around air pollution, litter, snow compaction, noise effects, and damage to vegetation and soil

and to wildlife and fish.

i) Air Pollution and Litter

The litter problem is not confined to snowmobilers since it is a universal problem found throughout cities, picnic areas, fishing holes, along highways, and virtually anywhere that man has travelled. Regardless, trash receptacles must be provided in areas where snowmobiling does take place.

With regards to air pollution, as has been done in the newer model automobiles, pollution control devices must soon be adopted to control exhaust emission. The two-cycle engine having the oil mixed with the gasoline, emits all the products of combustion into the atmosphere as components of total air pollution. Dr. Pruitt in a recent paper¹² cited an example of 12,000 snowmobiles using between 120,000 and 180,000 gallons of gasoline and 6,000 to 9,000 quarts of oil per week (each machine used 10 to 15 gallons of gasoline and 2 to 3 quarts of oil per week). He then calculated that from 850 to 1,250 gallons of tetraethyl lead were added to the environment every week from recreational snowmobiling. The amount of tetraethyl lead deposited from the approximately 20,000 machines now in Manitoba would be slightly less than double Dr. Pruitt's figure for one week.

ii) Snow Compaction

This is one area of environmental damage in which actual studies and experiments have been carried out. Separate studies have been carried out by W. J. Waneck¹³, J. A. Jarvinen¹⁴ and W. O. Pruitt¹⁵ to determine

the change in temperature attributable to the compaction of snow, effects on tree seedlings and saplings, compaction of the sub-nivean environment and general differences between compacted and uncompacted snow covered areas.

The Wanek report although not fully completed, has reached at least three conclusions relating to compaction of snow. Firstly, certain soil levels freeze earlier and are held at temperatures below the freezing point. The result of this action is that microbial activity is retarded and thus litter decomposition and nutrient cycling are also retarded (see appendix "A" for charts on temperatures).

The second conclusion reached involves the fact that compacted areas warm more slowly in spring. This is detrimental to forest species whose existence is reliant upon coming up early in the spring and completing most of their life cycle before the trees leaf out and shade them. Also, the aesthetically pleasing spring flora has the potential of being deteriorated.

The third conclusion involved tree plantation areas. Small trees, as an example, evergreens, are subjected to warm temperatures while their roots are unable to obtain moisture from the frozen soil. Thus the trees succumb due to dessication. Plain mechanical damage also occurs.

By means of experiments, the Jarvinen report found that snowmobile packing reduces the insulative quality of snow cover by first decreasing the depth of the snow and second by increasing thermal conductivity. Jarvinen also found that snowmobile activity destroys the

mild sub-nivean microclimate and that a real potential for extensive habitat destruction exists through uncontrolled use of the machines.

In his finding, W. O. Pruitt explained how snow acts as an insulating blanket which protects plants and many kinds of animals from the rigorous winter climate. It does this because snow is actually an emulsion of air and tiny complex crystals of ice. The dead air spaces between the crystals act as an insulator. The way in which the snow protects involves constantly trapping the heat flowing from the earth. Dr. Pruitt measured the characteristics of undisturbed snow, snowmobile compacted snow and snow compacted by snowshoe tracks. The results of the measurements are recorded below:

Snow-Compaction Effects

	Undisturbed Snow	One Pass With Snowmobile	Two Passes With Snowmobile	50 "People-passes" On Snowshoes
Thickness	33 cm.	14 cm.	23 cm. (after drifting)	15 cm.
Density	0.14-0.20	0.26	0.36	0.39
Hardness	4-80 gm/cm ²	3,000 gm/cm ²	7,000 gm/cm ²	2,500-4,000 gm/cm ²
Thermal Transmission	ca. 1.52×10^{-4} cal/cm ² /sec/°C	ca. 2.49×10^{-4} cal/cm ² /sec/°C	ca. 6.4×10^{-4} cal/cm ² /sec/°C	ca. 6.4×10^{-4} cal/cm ² /sec/°C
Ice Crystals	Present, 9 cm. thick	Absent	Absent	Present, 5 cm. thick

The notable difference occurred with the preservation of the fragile, lattice-like layer of "pukak" at the base of the cover of undisturbed snow.

The effect of heat loss through the compaction of snow is not restricted solely to land areas. On lakes, light penetration sometimes results in oxygen starvation, a "winterkill" of fish in the lakes.

Many people ask, "why do we need these rodents and sub-nivean animals?" To answer this we state first that they convert large quantities of dead plant material into useable soil nutrients again. Also, although not many people would notice the disappearance of a million mice, the eagles, hawks, owls, coyotes, bobcats and foxes would.

With the construction of trails, this damage is limited to specific areas and with the use of logging roads, fire breaks and existing trails the areas of concern are reduced considerably. It is only when snowmobiles are allowed to run uncontrolled through forested areas or across large expanses of land that grave damages occur.

iii) Noise Effects

No conclusive evidence is available as to the effects of snowmobile noise on wildlife. Conflicting reports as to the effects of noise augment the difficulty in this area. Around the Brandon hills and through Birds Hill Park, decline in deer populations have been noted since the use of snowmobiles in these areas. However, in the Whiteshell Area it has been observed by park workers that snowmobile trails going through moose habitat have not affected moose feeding in this area. In still other areas, the frequency of deer tracks in relation to snowmobile

trails increased as one moved away from the snowmobile trail. However, other species such as foxes and coyotes seemed to favour snowmobile trails for travel and the opposite effect occurred.

In Yellowstone National Park where summer vehicle traffic can be a common sight and sound to native animals, these same animals give little heed to snow vehicles. Animals living in areas free from motorized equipment usually are visibly frightened by intruding vehicles and unfamiliar sounds.

Most wildlife species (moose, deer, rabbits) are under stress in this climate in the winter, even when they are not being disturbed. One line of thinking, backed by no conclusive evidence, suggests that noise may affect mating during breeding season of animals with a high metabolic rate. Another complaint involves the snowmobile being able to flush wintering animals and birds from essential winter cover. This contributes to overexposure of the wildlife at a critical time of the year.

It is true that the snowmobile is noisy, but incoming legislation will soon require snowmobiles to lessen the decibel level of the machine. The question is, what can we do now? (See appendix "B" for chart on decibel level of snowmobiles compared with other common vehicles and machines.)

The solution to the noise problems from the wildlife standpoint is to construct trails away from the important wildlife habitats. Again the use of established roads, paths and trails will aid in this venture. The section on Land Capability will further explain the existence of important wildlife areas.

iv) Vegetation and Soil Damage

Much of the effect of the snowmobile on vegetation has been mentioned in conjunction with snow compaction. The most striking vegetation effects occur in areas such as golf courses, marsh land and forest plantation areas. With the construction of snowmobile trails, use of the above mentioned areas would not be required. In most cases, vegetation was killed since sufficient snow cover was not allowed to accumulate. In most cases, the vegetation grows back the following year. In marsh land, duck nesting requires old vegetation; thus, even though new vegetation grows back, this is not adequate for waterfowl habitat.

Soil damage results mainly from erosion. The destruction of soil holding vegetation is the main cause of this process. Again, the restriction of snow vehicles to areas especially suited for them alleviates problems in this area.

v) Wildlife and Fish

The stress on wildlife and noise effects have both been mentioned earlier. The remaining area evolves around fish. Easier access to remote lakes can have two distinctly different results. First since the snowmobile allows fishermen to reach lakes previously totally inaccessible fishing pressure is alleviated from the more accessible lakes. However, because fishermen can now reach these smaller lakes they can also deplete the fish stock much sooner than before. Unfortunately, the only solution to this problem involves stricter control over fishing, which may not be an easy task.

Hunting has been somewhat controlled by allowing hunters on specific hunting trails only. The hunter must leave his machine on the trail

and venture into the area on foot to stalk his game. He may take his snowmobile into the areas only to retrieve his game or to carry supplies in to set up a camp.

Cases of snowmobilers chasing game do occur, but only in rare cases. One cannot condemn a whole industry for the actions of a small minority.

D. LAND CAPABILITY:

To best assess the land capability and possible uses of the area Canada Land Inventory surveys were reviewed and people with expertise in the varying fields of forestry, wildlife, recreation, and those with intimate knowledge of the area were consulted. The Canada Land Inventory was used because it "is a comprehensive survey of land capability and use designed to provide a basis for resource and land use planning".¹⁶ The principle aims in delineating the land capability of the area are twofold; first to identify areas that could possibly result in conflicting land use or conflict through people related problems, and second, with the help of experts to set out exclusion areas and buffer zones around areas where snowmobiles should not be allowed. This zone concept is not selective for this project alone, but is a research methodology which should be used in all projects that involve a multi-resource study.

The buffer zone concept in general is used to keep snowmobiles a certain distance from areas of delicate plant associations, or particular wildlife habitats. Some areas could be set aside to be used on a conditional basis. Such areas would include slow freezing lakes.

Once these areas have been established, I recommend that a layout of the designated trail area may proceed along the existing trails, logging roads, and fire breaks throughout the area. The actual type of trail design is included in a separate section of this paper.

In general, the Canada Land Inventory studies have definite goals to achieve in each of the sectors: agriculture, wildlife, forestry and recreation. The aims and terms of reference are briefly discussed herein to show their scope and explain what they are designed to achieve.

In the agricultural sector, the capability information is particularly useful to delineate agricultural lands, identify sub-marginal farm land, consolidate farms into viable units, establish an equitable base and indicate where urban and industrial expansion might take place without unduly reducing agricultural production. The capability inventory is based on the interpretation of the data provided by systematic soil surveys, generally at the scale of one or two inches to the mile. After interpretation, the soils are ranked according to their general suitability for the production of common field crops, taking into account the effects of climatic and soil limitations in a system of mechanized farming.

Soils in classes 1, 2, 3, and 4 are considered capable of sustained use for cultivated field crops, those in classes 5 and 6 only for perennial forage crops and those in class 7 for neither.

The objective of the land capability inventory for forestry is to describe the potential capability of the land under indigenous tree species, growing at full stocking, assuming management capability is in

terms of mean annual increment per acre, expressed in cubic feet.

The best lands of Canada for commercial tree growth will be found in Class 1; those in Class 7 cannot be expected to yield timber in commercial quantities; these classes represent the extremes.

The objectives of the recreation land classification program are to provide a reliable estimate of the quality, quantity, type and distribution of outdoor recreation resources within settled parts of Canada and to supply basic information necessary for the formulation of policy and plans by the levels of government involved. The basis of the classification is the quantity of recreation land use which may be generated and sustained per unit acre of land per year, under perfect market conditions. A high class land unit, therefore, has a high index of attraction in terms of popular preference and a "use tolerance" which permits intensive use without undue degradation of the resource.

The land capability classification developed for wildlife reflects the physical characteristics of land units, meteorological and other factors which influence wildlife.

The seven classes in each sector are further broken down into sub-classes, each with its own characteristic kind of limitation depending on the sector. Some of the sub-classes in agriculture include adverse climate, erosion damage, stoniness or excess water limitations to name a few. In the case of forestry, the list includes exposure, restriction to rooting zone by bedrock or low fertility. The lists of sub-classes in each area are quite extensive and thus cannot be listed here. I recommend for further reference, available from the Department of

Regional Economic Expansion, The Canada Land Inventory Objectives,
Scope and Organization, Report No. 1, 1970.

Investigation of the land inventory maps in specific detail
yield the following results: (Appendix "C")

i) Soil Capability for Agriculture

The class of soils in the southern part of the study area (south
of the Trans Canada Highway) range from tiny isolated patches of class
2 and class 3 soils, to an increasing number of class 4 and class 5
areas to an overall dominance of class 6 and class 0 soils. The class
0 soils indicate organic soils and no provision is made for them in the
soil capability classification.

The sub-classes consist of "P" indicating stoniness, "S" adverse
soil characteristics and either "W" or "M" indicating excess water or
an insufficient amount of water respectively. The overall dominance of
the class 6 and class 0 soils would indicate that this area does not
have a good capability for agricultural production now or in the future.
The best one could hope to achieve with a class 6 soil is production of
perennial forage crops. Improvement practices are not feasible for this
type of soil.

In the northern part of the area (north of the Trans Canada High-
way) class 0 is again the predominant soil classification. However,
class 2, 3, 4, and 5 soils have greatly increased in occurrence especially
along the Winnipeg and Whitemouth Rivers. Along the course of the river,
class 2 and class 3 soils predominate having a sub-class restriction of
either stoniness or excessive water. Throughout the remainder of the

area, class 4 and class 5 soils are more evenly distributed than in the southern area. The sub-class limitations for these soils include predominantly stoniness and adverse soil characteristics and to a lesser extent, excessive water.

The soil capability indication reveals that the northern part of the study area has greater capability for agricultural production. The class 2 and class 3 soils have at worst moderately severe limitation that will restrict the range of crops and require some conservation practices. The class 4 and class 5 soils can be used more for producing perennial crops although improvement practices may be necessary.

Observing the total area, the majority of the land is in the Provincial Forest. Some of the remaining land is provincially owned Crown land, the remainder being privately owned. From the agricultural standpoint, the southern part of the study area is better suited for trails over the northern part for various reasons. Firstly, the agricultural capability in the northern area far surpasses the capability of the southern area. Secondly, there is more privately owned land in the northern area, especially bordering the Winnipeg and Whitemouth Rivers. To prevent conflicts from arising between private land owners, farmers and the snowmobilers, it is best to stay away from agriculturally suited areas. Thirdly, there is a more extensive network of forestry roads in the southern area. This will allow us more area with which to work with in the construction of trails, and will limit the amount of area that will require clearing of native vegetation.

ii) Forest Capability

The forest capability throughout the total area is limited by soil capability. Soils in the region of study, both in the north and south areas, are of the 5SM (boreal temperate moist subhumid) soil capability. The soil class ranges from class 4 to class 7 with small patches of class 3 dispersed in isolated areas. The limitations for class 4 include, in various combinations, excessive moisture, soil moisture deficiency, excessive levels of calcium, physical restriction to rooting caused by dense or consolidated layers, and finally soils periodically inundated by streams or lakes. The class 5 soils have the same restrictions adding low fertility to the list. Class 6 deletes excessive calcium and adds excessive levels of toxic elements such as soluble salts to the list. Class 7 deletes low fertility but keeps the remainder of the list.

The main types of trees in the area are black spruce, white spruce and jack pine, with tamarack, cedar and birch occurring to a lesser extent.

Snowmobile trails through the various areas will have to be accommodated with commercial forest operations taking place throughout the southern region. Until 1980, the area is contracted out to 160 quota holders and guarantees them a certain amount of timber each year. The cutting operations move yearly from area to area. The operations may move strictly for silviculture reasons or as the result of changes in the economic market, or as a result of insect or disease infestation. Market changes cause a demand for different species and thus new locations must

be found to furnish the desired species. The commercial forest production in this area is good by Manitoba standards. Much of the pulp is sent to the Pine Falls plant. Other products include lumber, poles and fuel. Provisions should be made to be adaptable in trail layout in case timber operations should conflict with trail location. The trails should be kept away from these operations.

At present, other than plantation areas, there are no fragile ecosystems or areas in the study area to be preserved. Areas used for plantation purposes change from year to year and thus must be marked at the commencement of each winter. By restricting travel to designated routes, no harm can be done to the area. The wooded areas consist of a good amount of low brush. This in itself should act as a deterrent to most people from wandering haphazardly through the forests. The forest capability applies to both the north and south study regions.

iii) Recreational Capability

To assess the recreational capabilities, we must recognize that snowmobiling as such was not recognized as a recreational activity in 1969 when the recreation capability study was carried out. In the classification of land for its natural capabilities to provide the opportunity for recreation, the following are a few of the assumptions made:

- sound recreational land management and development practices are assumed for all areas in practical relation to the natural capability of each.

- no judgment is made concerning the possibility of major modification of land which may make it suitable for recreation use.
- location and present access development do not influence classification.
- uniform demand and accessibility conditions are assumed throughout the inventory area.
- present use or management does not influence ratings except that: land at present firmly committed to intensive urban or industrial use is normally not classified; where there is permanent major artificial modification of the resource base, land (other than urban or industrial land) is evaluated in its present state; permanent man-made structures in a non-urban setting may be considered to be a recreational feature.

In our research of recreation classification, our main aim is to avoid conflicts in recreational use of the land. Snowmobiling due to the nature of the activity is not conducive to multi-use recreational areas.

The Sandilands Area cannot be classed as ideal recreational area for most types of recreation. It has good potential for summer recreation activities such as hiking, nature study, camping and viewing of various species of wildlife. In the winter, the major recreation conflict results from simultaneous use of the area by snowshoers, cross-country skiers and snowmobile enthusiasts. The establishment of specified snowmobile trails will definitely solve any problems of use conflict

for either sport. No snowmobiles will run over virgin snow desired by the skiers, and in turn the snowmobiler will be able to drive un-daunted by passing skiers or snowshoers.

Historical sites are also included with the recreation classification. Historical sites located in the area of study include early explorer or fur trade routes. The Dawson Trail used in early days by fur traders and trappers runs through the Sandilands Area. This trail could possibly be used to add not only a point of interest to the trail but also to serve as a point of educational value.

A point to consider when reviewing the recreation capability map involves the numbering system. The activities in the area are mostly ranked in the 5, 6, and 7 class. Compared with other recreation, they are ranked at higher numbers, but in themselves this may be of class 1 or 2 camping potential or class 1 land for viewing upland wildlife for this particular area. Recreationally, the advantages the southern part of the region has over the northern part, include:

- 1) A greater number of areas classified as general outdoor recreation areas for hiking and nature study.
- 2) A greater number of areas with the capability for camping.
- 3) The Dawson Trail runs through this region.

iv) Wild Ungulate Capability

The wild ungulate capability in the area ranges from class 1 to class 6. The main ungulates classified are moose and deer. The characteristics that limit the land for producing suitable food and cover throughout the region include a) the lack of available nutrients in the

soil for optimum growth of food and cover plants, b) poor distribution or interspersion of land forms necessary for optimum ungulate habitat, and finally c) poor soil moisture conditions, either excessive or deficient which adversely affect the development and growth of vegetation or which limit the mobility of the ungulates.

Of all the capabilities studied, the wild ungulate capabilities indicate the most potential for the area. In the northern area, class 1, 2, and 3 moose and deer capability areas are numerous. The class 1 area occurs along the Winnipeg and Whitemouth Rivers. In the southern region, the class 1 capability also occurs along the Whitemouth River. The class 2 areas are found mostly in townships 1 and 2 of this region. The class 3 capability areas are scattered quite evenly throughout both the northern and southern regions.

To review both areas as regards the ungulate capability, I would have to favor the southern region for the establishment of snowmobile trails for two reasons. First the northern area has a greater percentage of class 1 land capability for ungulates, and secondly the southern area is larger in total area and therefore would allow greater leeway in establishing trails around potentially good habitat areas.

Wildlife experts familiar with the area feel that presently no particular areas exist that could be considered populated areas for either moose or deer. The game is dispersed throughout the area and not in any great numbers. However, since we do not have conclusive evidence on how moose and deer are affected by the snowmobile, care should be taken if routing snowmobile trails through the area. I would propose

that the area classified as class 1 and class 2 capability for the game be preserved as such. This should be done since at worst this land only has slight limitations to the production of ungulates. Even though this land may not be in use at present by these ungulates, it has the greatest potential for use in the future. Also some of the class 3 areas, larger areas possessing the least number of limitations, should also be used as little as possible or not at all.

This area is more important for its upland game bird population such as the ruffed grouse. Unfortunately, again, they are not dependent upon a specific area and no provision can be made to establish, for the purpose of this report, areas that should be set aside or where buffer zones could be placed to protect them.

One particular area where species such as the goshawk, great grey owl, great horned owl, and pileated woodpecker find habitat, is along the Bedford Hills escarpment. This escarpment which is identified by a variation in landform should not be travelled along by snowmobiles since this type of area serves as a good habitat for various forms of birds and wildlife. If need be, the area could be crossed in various locations but by no means followed.

Apart from plantation areas, cutting areas, and wildlife zones, I feel that trails should be routed away from particularly dangerous areas. A buffer zone should be placed around particularly steep land forms and around any existing open water areas or areas that freeze with only a thin layer of ice due to fast moving currents. The buffer zone is thus a form of protection for both the environment and the recreationalist.

E. SNOWMOBILE TRAIL SPECIFICATIONS:

When planning the construction of snowmobile trails, two very important conditions must be kept in mind. The first is to make the trail as safe as possible for the user and the second is to cause as little harm as possible to the environment or as little inconvenience as possible to other existing and proposed interests.

The first aspect to deal with is snow depth. To build a trail the average required depth of snow is 1 inch or more for a minimum of 100 days. For actual snowmobile operation, a minimum depth of 3 inches is recommended.

There are two possible approaches to the design of snowmobile areas. The first consists of setting aside an area with a "turn everyone loose" attitude. This method has many drawbacks. One of these is that boundaries would have to be clearly marked to prevent riders from leaving the area and causing conflicts with other recreation seekers and land owners. However, this method has too much chance of conflicting with not only other recreation activities such as cross-country skiing, ice fishing and snowshoeing, but also with farming, mining, home owners and other individual or commercial interests.

The second approach, and the one I propose, is the setting up of a trail system with open stretches of land strategically dispersed throughout the area. The trails should be of varying lengths and have a variety of topography to keep the snowmobiler occupied and interested.

Designed trails accomplish the following:

- 1) Reduction of game harassment by routing snowmobiles away from game habitat areas.
- 2) Reduction of vandalism and property damage by directing activities away from areas susceptible to damage.
- 3) Reduction of accidental trespass and noise intrusion.
- 4) Simplification of the search and rescue problem.
- 5) Reduction of conflicts with other winter uses.
- 6) Reduction of accidents.
- 7) Localization of any litter problems.
- 8) Provision of opportunities for the less venturesome snowmobiler.
- 9) Attraction of snowmobilers, thus having a definite economic impact.¹⁷

Trail Specifications ¹⁸

Length -- A trail may be virtually any length, but a distance of 15-30 miles is most desirable, while 40-50 miles is a practical maximum and 5-10 miles should be the minimum considered. Ideally, trails should be of loop design -- bringing the riders back to the starting point (for convenience in returning to cars, accommodations and such). More ideally, they should be restricted to one-way travel, not only for safety but also for economy of construction and maintenance. And, again ideally, there should be alternate shorter routes or "loops" within the main trail area.

A short "loop" of approximately one mile at the start of the trail is recommended for the novice snowmobiler or for use when several persons are taking turns operating one machine.

Width - Width of a one-way trail should be 8 feet with 4 feet considered minimum and 12 feet maximum.

In addition to these minimum distances, brush should be cleared from the area 2 feet outside the trail edges. Clearing should be done to a height 10 feet above normal snow accumulation and an ample allowance should be made for limbs loaded with snow.

Clearing width can be varied according to the desired vehicle speed; the faster the allowable speed the wider the clearing should be. ~~The advantage of using existing trails and roads alleviates much of the desirable width problems.~~

Turning Radius - Radius can be varied according to the desired speed. Abrupt changes in either speed or turning radius should be avoided. A minimum 25 ft. radius is recommended.

Visibility - Vertical and horizontal sight distances should be a minimum of 50 feet throughout the trail. At any road crossings, snow banks should be cut back at least 200 feet in both directions on both sides of the roadway.

Grades and Slopes - A rise or fall of 25 per cent is the maximum suggested grade for ease of travel and safety. Run-ins should be straight and as long as possible prior to the steeper sections.

Due to blowing and drifting, the effective grade of a slope can vary considerably in winter.

On long grades and those exceeding 25 per cent, alternate flatter routes could be provided to by-pass the steep sections. Trails should generally cross perpendicular to contours and not cut along side slopes. The advantage of not cutting across slopes, apart from the safety standpoint, is the avoidance of erosion problems that could result.

Bodies of Water - The trail should not be routed over lakes, streams or other bodies of water. If stream crossings are unavoidable, aesthetically pleasing bridges at least 8 feet wide should be constructed and the bed should be capable of retaining snow cover. Guard posts and guard rails should be provided. If trails must be routed over lakes, adequate safeguards must be made to ensure that proper freezing and ice depths have resulted.

Roads - Ideally, the trail should not cross any road open to automobile travel.

Parking - Parking is necessary at the trail beginning for three types of use: pull-through parking for autos with trailers, regular parking for automobiles, and a parking and assembly area for snowmobiles.

A suitable area is needed for loading and unloading snowmobiles (ramps) to reduce traffic congestion and provide safety for snowmobilers and pedestrians.

Optional Trail Facilities

- 1) Warming shelters and rest-rooms may be desirable at the trail beginning and at the half-way point. Take advantage of existing facilities at parks and scenic sites.
- 2) Camping facilities may be desirable along extremely long trails. An existing campground could be used as the starting and ending point of the trail.
- 3) Trails should be routed, where possible, in the vicinity of existing first-aid and emergency facilities, telephones, fuel and repairs. Directional signs to these areas are recommended and they should be noted on all maps and trail information signs.

Other Considerations

- 1) Weather forecasts and trail conditions should be posted at the trail entrance.
- 2) Snowmobile patrols should be utilized to police trails and aid disabled snowmobilers or injured persons.

Trail Signs (Appendix "D")

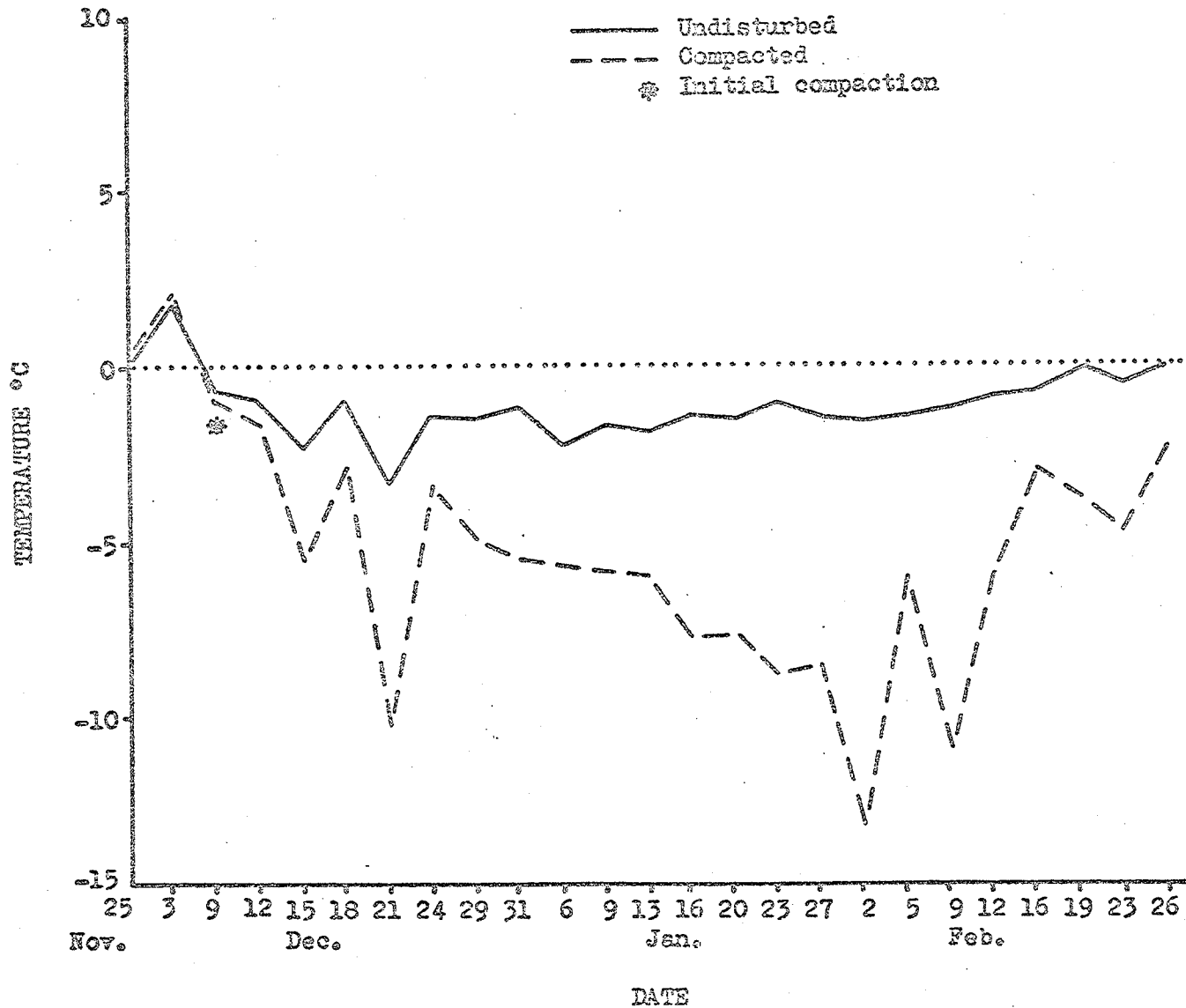
The use of the accepted international snowmobile sign system should be adopted. Sufficient numbers of signs should be utilized along the trail to keep people on the desired trail and away from areas of danger and areas of ecological importance. Also, adequate signing will prevent people from getting lost and if trouble should occur along the trail help can more easily be provided.

By the utilization of old logging roads, unplowed or unused highways, and other established trails, cost of trail construction is relatively inexpensive. Costs occur in building bridges over land and water hazards, the clearing of new or connecting trails and by the erection of barriers around dangerous or sensitive areas.

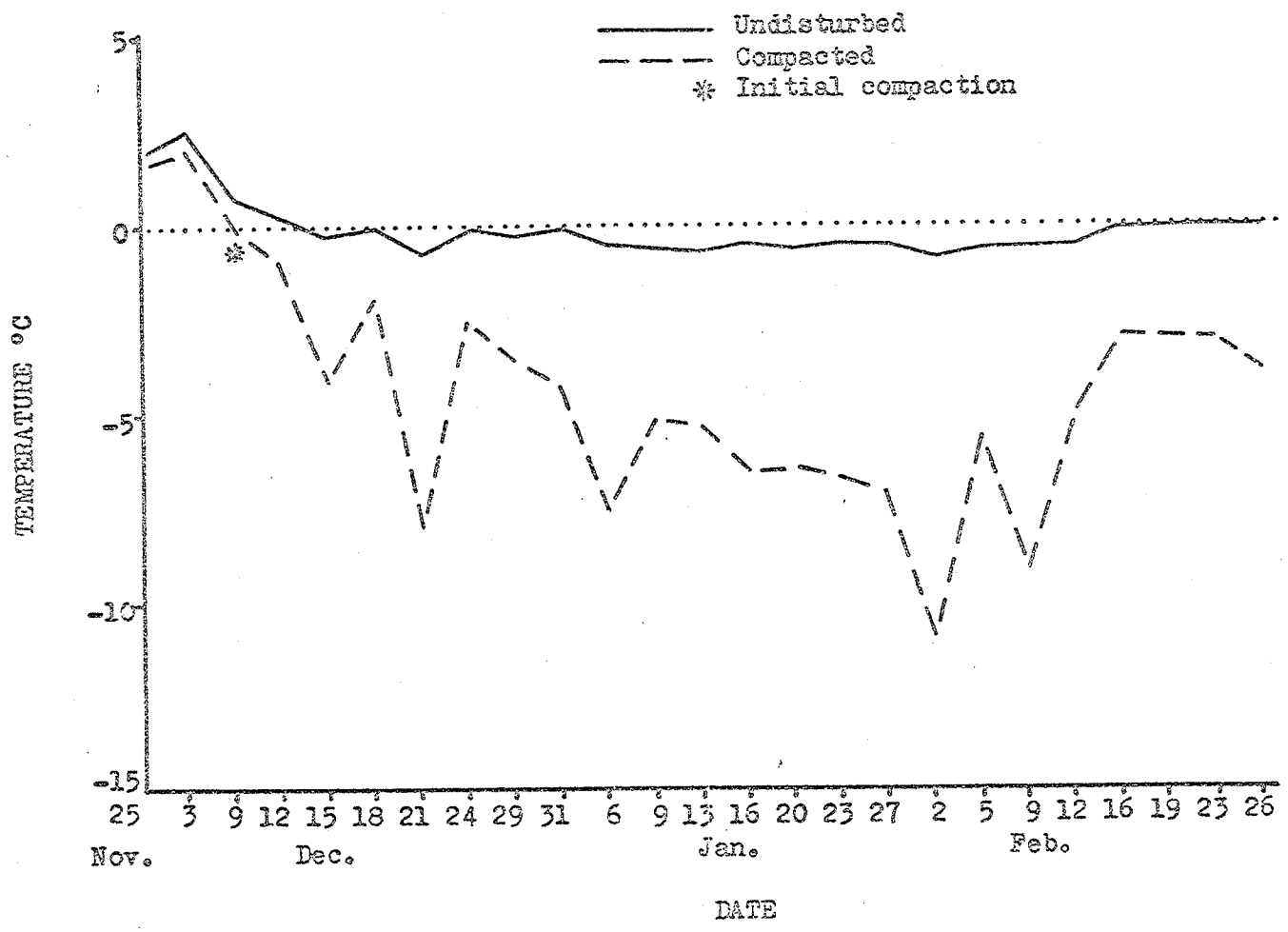
From records kept of previous trail development, the cost of development was found to range from \$100 to \$150 per mile depending on the type of terrain, and the amount of equipment and manpower required.¹⁹

Throughout construction of the trail, a purpose should be given to its development. It should include scenic areas, points of historical interest, while the topography should be varied enough to keep the rider interested.

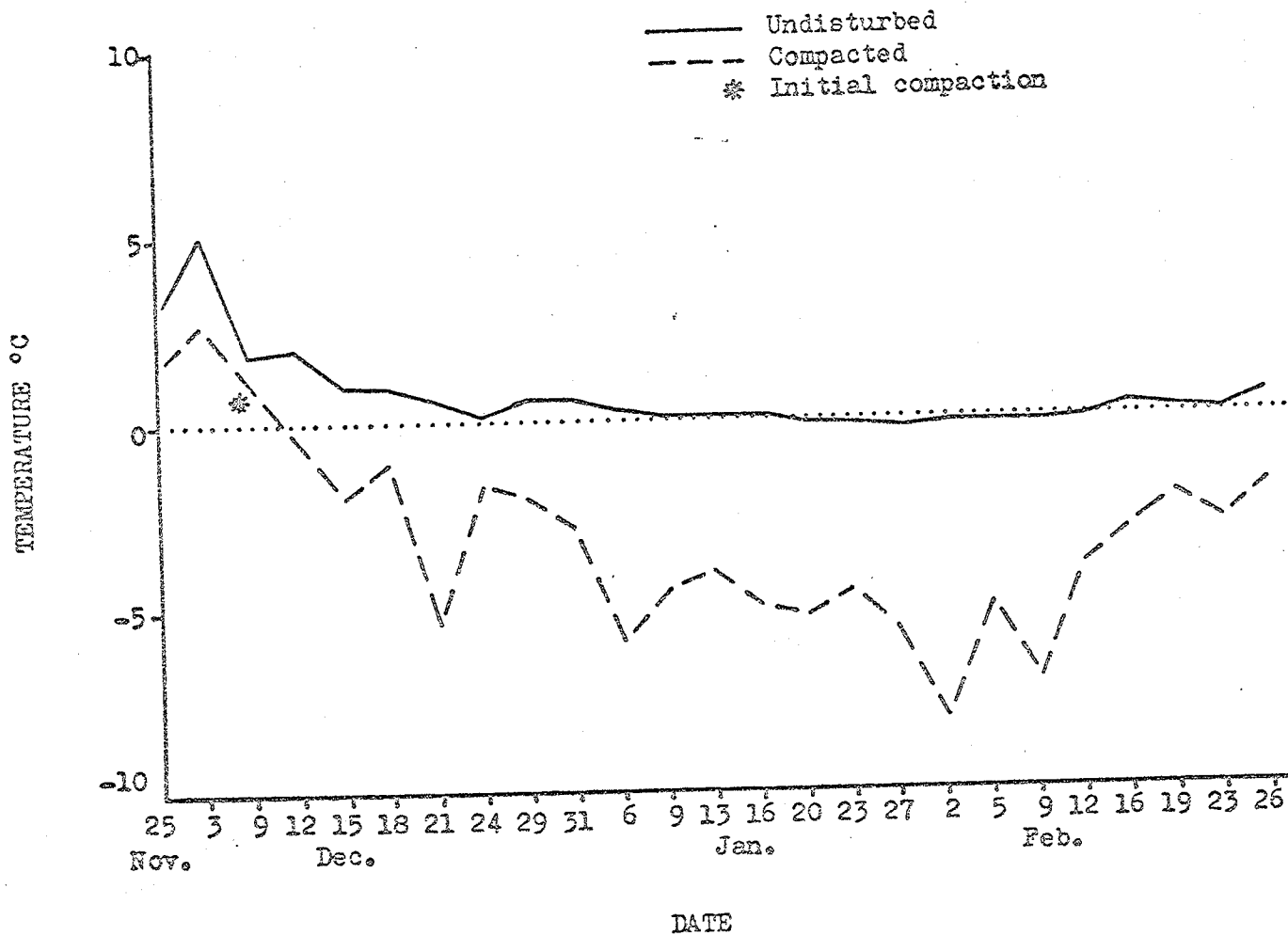
APPENDICES



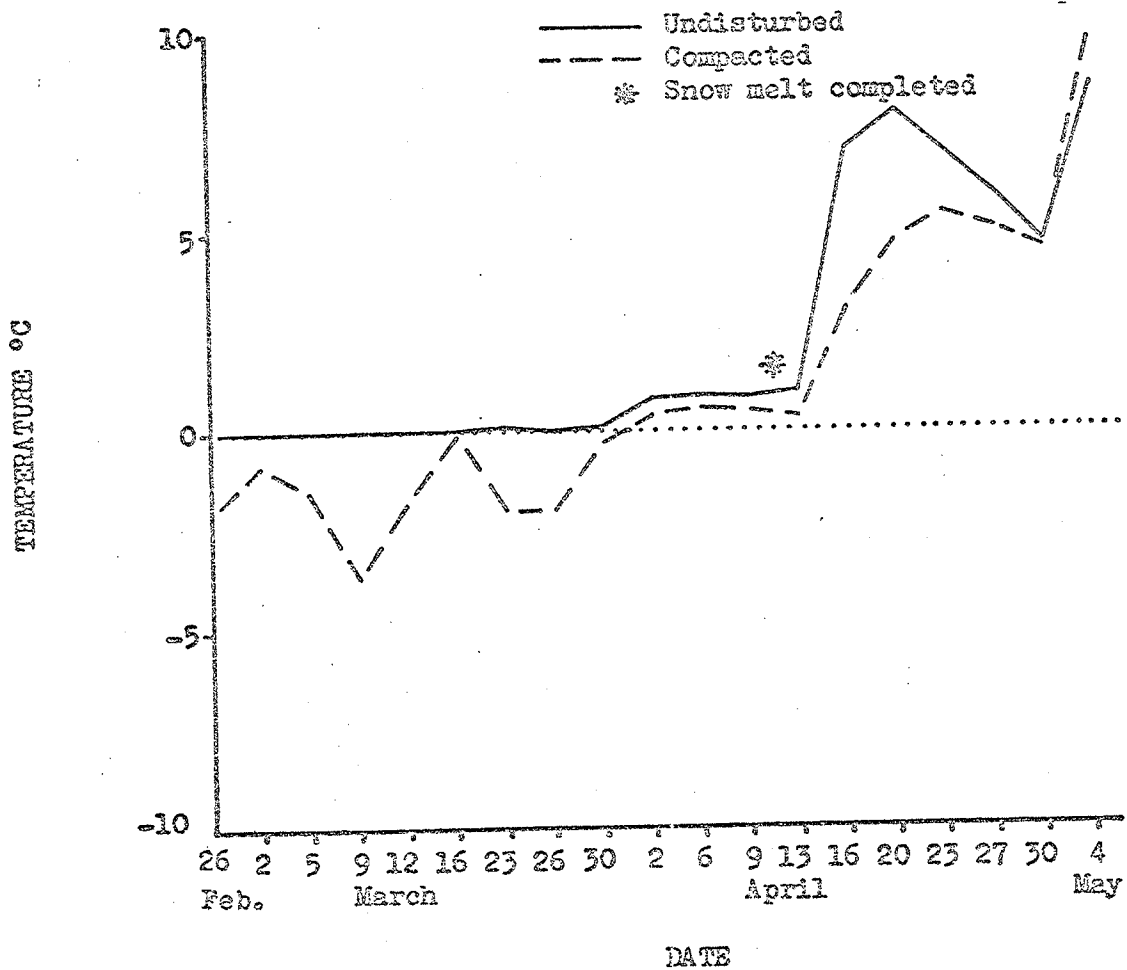
Slide 1. Comparison of litter temperatures under undisturbed snow and litter temperatures under compacted snow in the forest plot (averages of two stations).



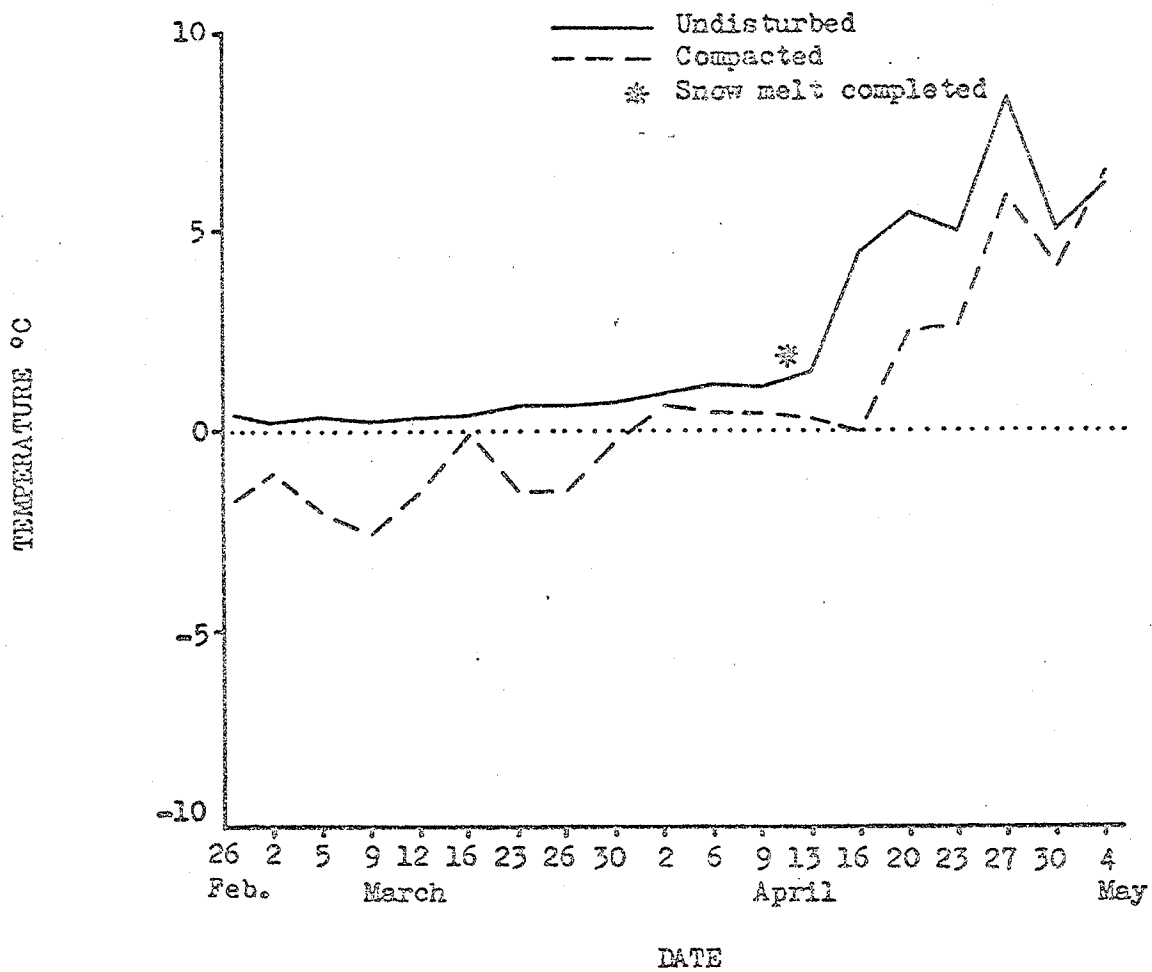
Slide 2. Comparison of temperatures at the duff - A₁ horizon interface under undisturbed snow with those under compacted snow in the forest plot (averages of two stations).



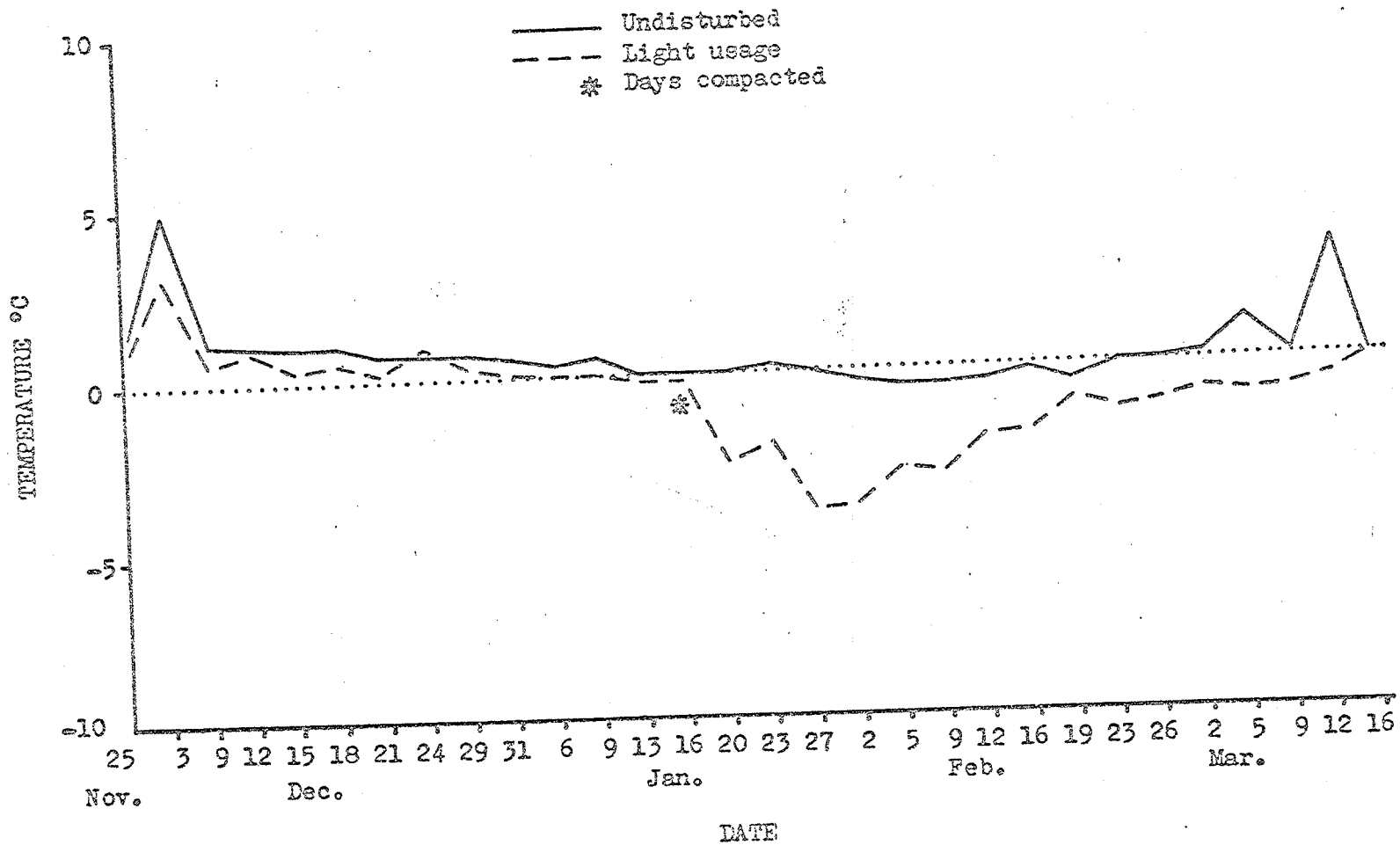
Slide 3. Comparison of temperatures at the lower A₁ horizon under undisturbed snow with those under compacted snow in the forest plot (averages of two stations).



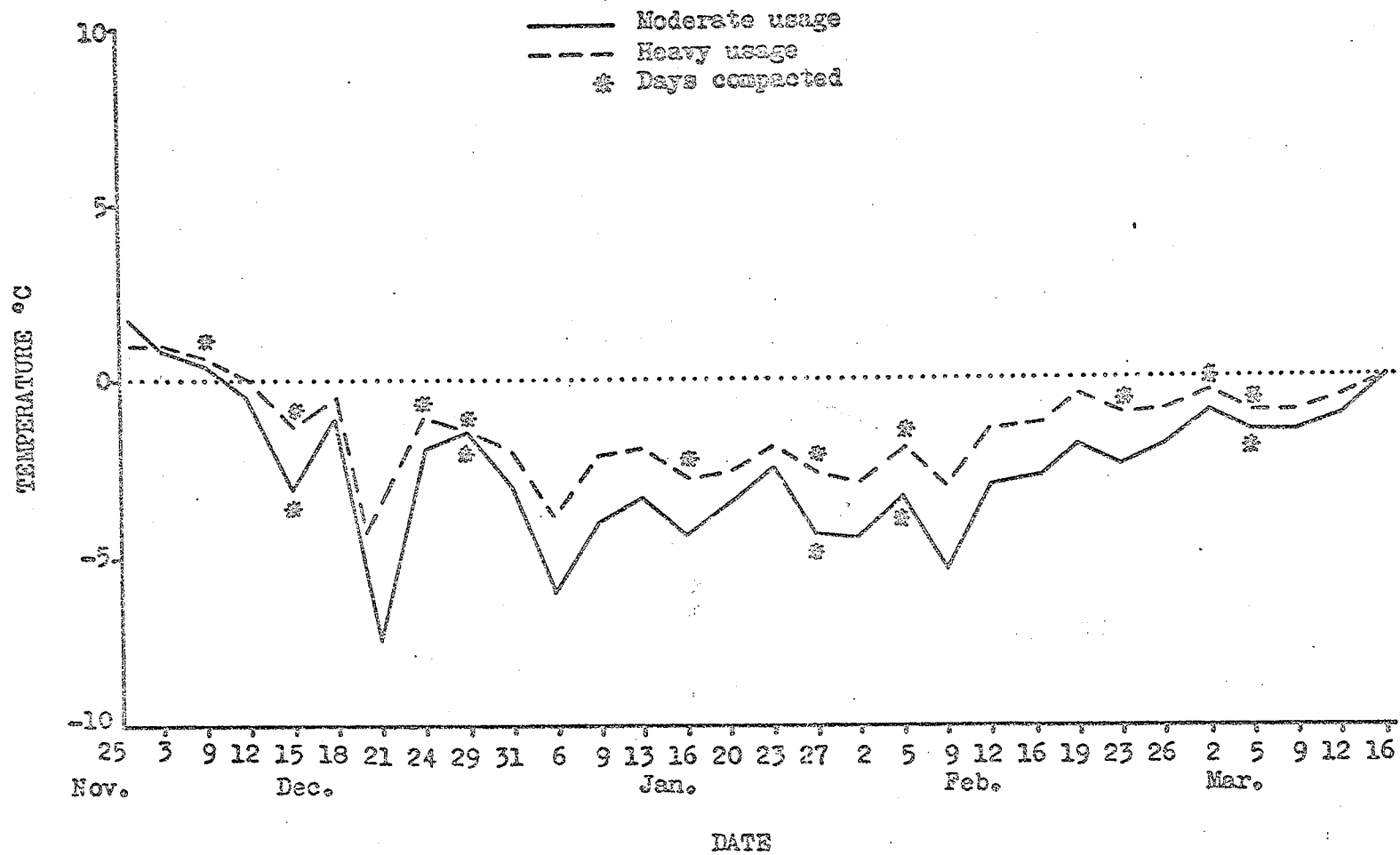
Slide 4. Comparison of temperatures at the duff -A₁ horizon interface under undisturbed snow with those under compacted snow in the forest plot during the spring thaw (averages of two stations).



Slide 5. Comparison of temperatures at the lower A₁ horizon under undisturbed snow with those under compacted snow in the forest plot during the spring thaw (average of two stations).



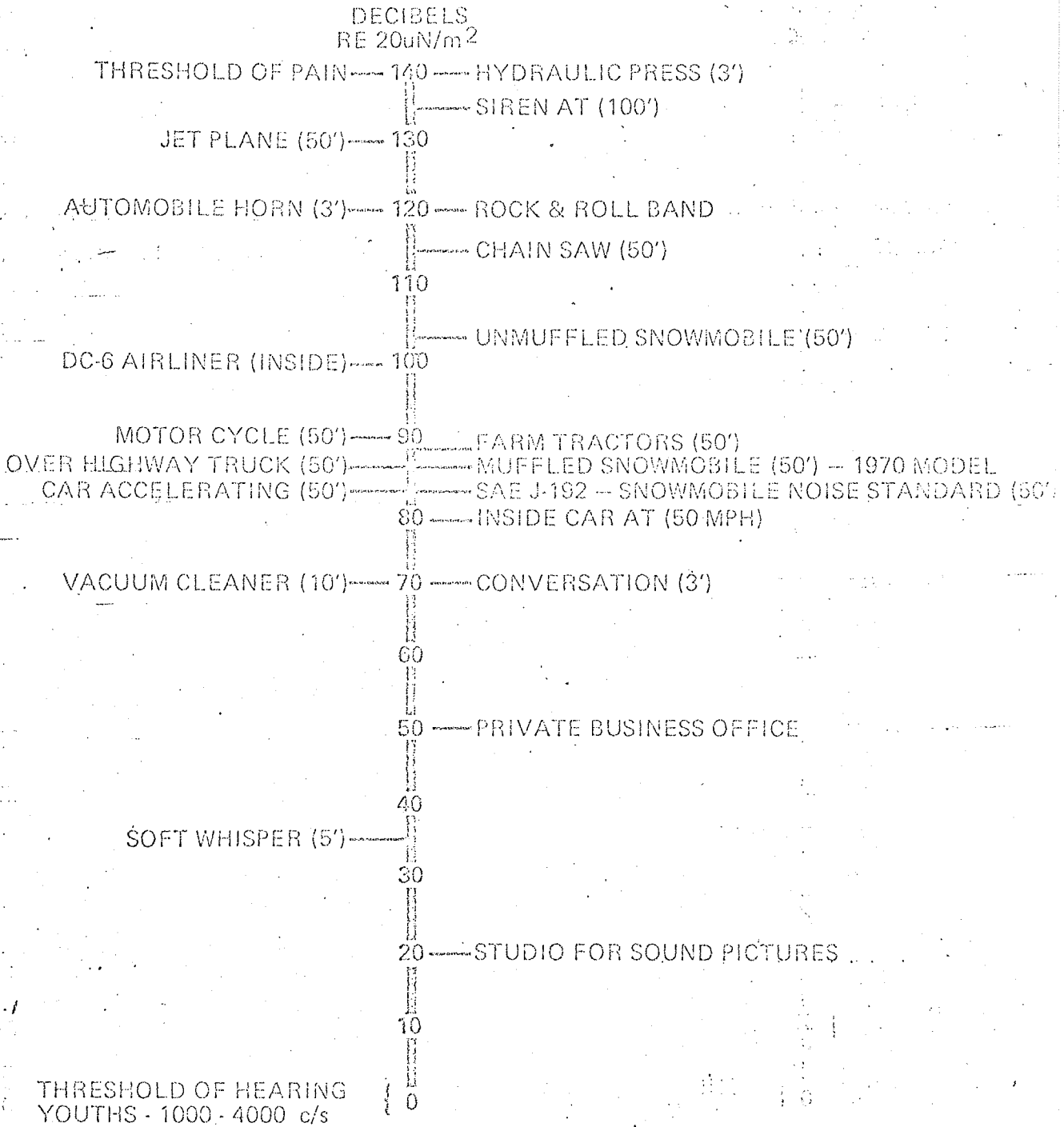
Slide 6. Comparison of temperatures at the lower A₁ horizon of the control lane with those of the light usage lane in the plantation study plot.



Slide 7. Comparison of temperatures at the lower A₁ horizon of the moderate usage lane with those of the heavy usage lane in the plantation study plot.

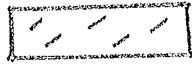
B. COMPARISON OF SOUND LEVELS

TYPICAL A-WEIGHTED SOUND LEVELS



Typical A-weighted sound levels measured with a sound level meter. These values are taken from the literature. Sound-level measurements give only part of the information usually necessary to handle noise problems, and are often supplemented by analysis of the noise spectra.

C. LAND CAPABILITY CLASSIFICATION:



- agricultural classification

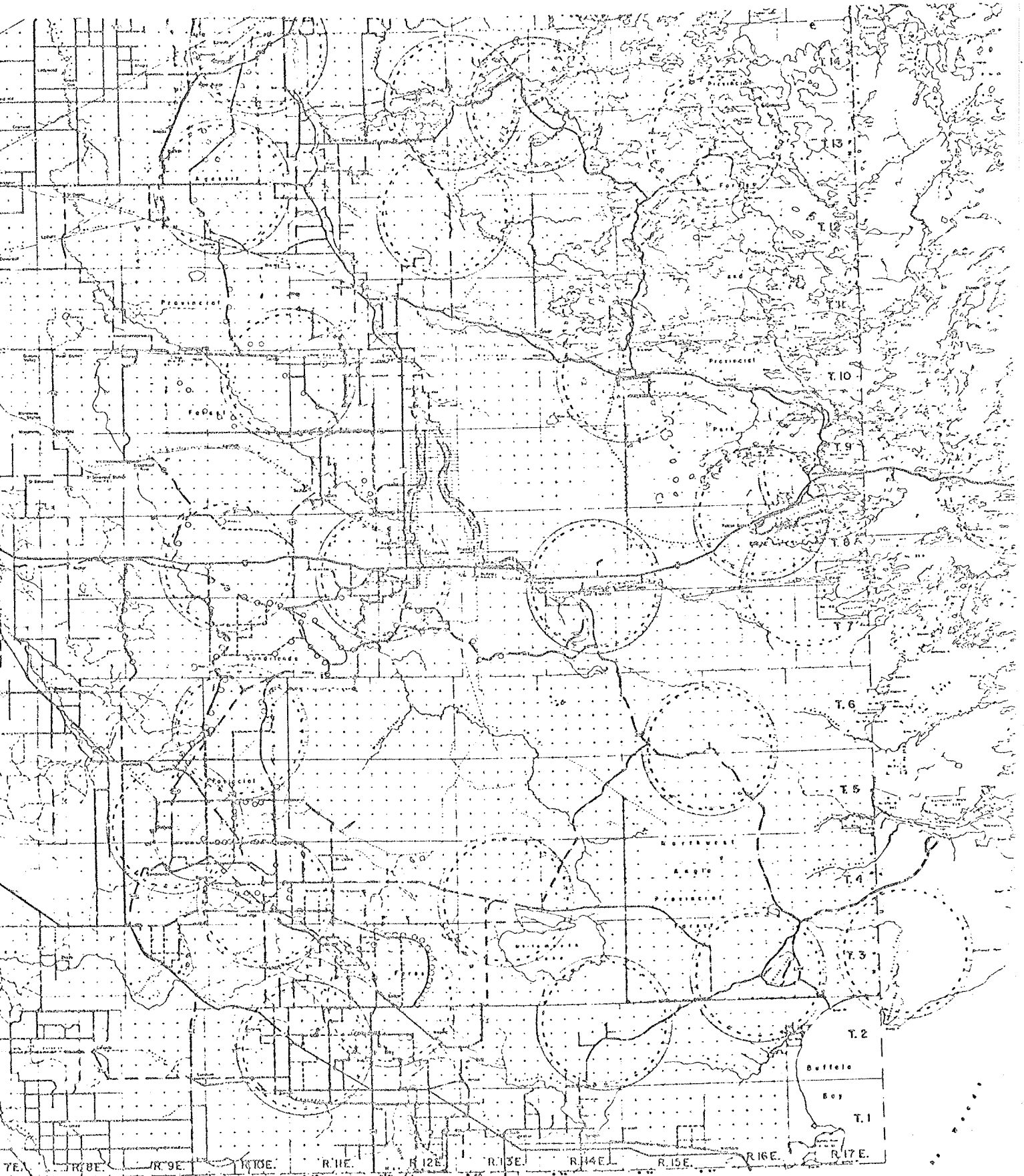


- wildlife classification

The following map illustrates areas of class 1, 2 and 3 classification (as marked on the map). The agricultural classification also lists the sub-class restriction that restricts the soil.

The "H" classification listed, illustrates the Dawson Trail and historical sites situated in the area.

Forest Roads in Area



D. TRAIL MARKERS AND SIGNS:²⁰

Sign Criteria

The standardization of snowmobile signs and symbols is highly important for user comprehension. Snowmobile owners are quite mobile and can reach trails in several provinces operated by a number of management agencies. For appropriate user response and safety, snowmobilers should be guided by the same type of signing on all of these areas.

Some of the primary criteria considered in the design of snowmobile signs are as follows:

1. The system should be unique in color, size, and shape. The primary purpose of signing is for the safety and reassurance of trail users. The signing system should be aesthetically acceptable; that is, it should show up in winter but not be offensive in other seasons.
2. An effective signing system should be low to moderate in cost to procure, install, and maintain.
3. Reflectorization is of prime importance for certain types of signs because 25 percent of the snowmobiles use is during hours of reduced light.
4. Minimum yet adequate signing should be the rule. Sufficient signs are needed to ensure user safety, to facilitate enforcement, and to satisfy liability claim requirements.

5. Symbolization should be introduced into the field of snowmobile and recreational signing on a nationwide basis. Symbolization of informational and directional signing permits more rapid comprehension and user response.
6. Consideration should be given to the possibility of incorporating some snowmobile trails into the multipurpose trails system. The possibility of signing for multipurpose trails should not be overlooked.

Snowmobile Sign Design

Sign design should follow, as closely as possible, established signing standards which the public already knows and understands. The signing of snowmobile trails should be adequate but not overdone. If the situation warrants a sign - USE IT.

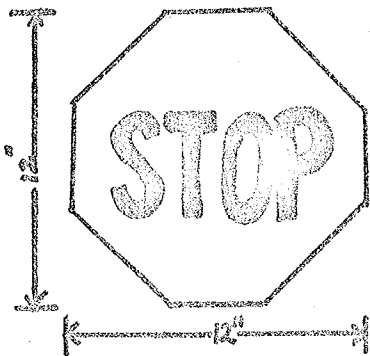
1. Warning signs on highways should be placed at all locations where snowmobile trails cross maintained vehicular roadways. Warning signs should be placed at the following distances on each side of the trail crossing:
 - a. 250 feet for speeds below 35 mph (vehicular speed)
 - b. 400 feet for speeds of 36 to 45 mph
 - c. 500 feet for speeds of 46 to 55 mph
 - d. 750 feet for speeds of 56 mph and greater

Where possible, highway crossings should be eliminated by rerouting the trails.

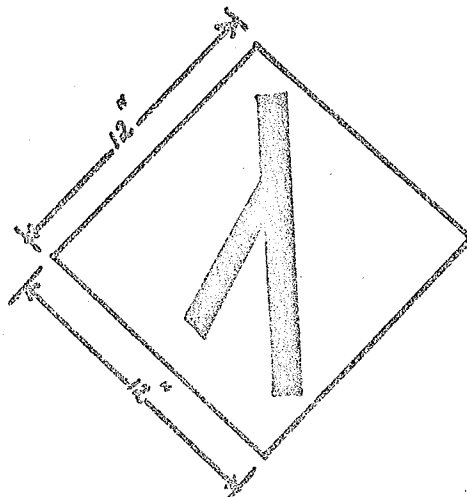
2. Cautionary signs should retain their familiar shape and color for rapid comprehension and to ensure maximum safety. Aesthetic qualities must be a secondary consideration in the use of cautionary signing. We recommend the adoption of highway type stop and caution signs. All cautionary signs should be reflectorized for night use.

The stop sign should be a red octagon with white letters and the caution sign should be a yellow diamond with black symbols or letters. Examples of caution signs are "Stop Ahead", "One-way --- Do Not Enter", "Intersection", "Avalanche Danger", and "Cliff Ahead".

The use of symbols is preferred over lettering where they can be utilized because of faster reaction time. "Stop Ahead" and "One-way --- Do Not Enter" are notable exceptions to symbolization.



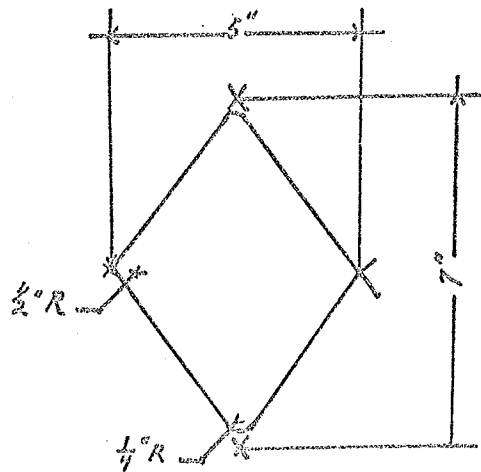
STOP SIGN



CAUTION SIGN

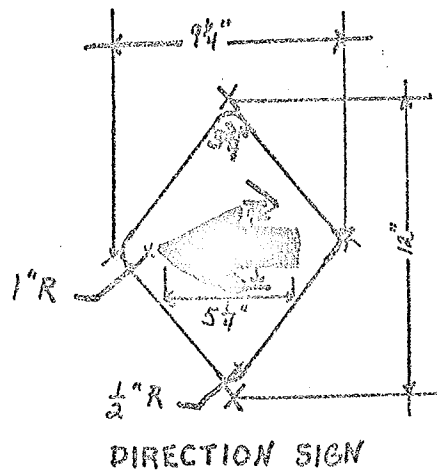
The 12" x 12" size sign illustrated above, should be considered a minimum size. It may be necessary to increase the size of the stop and caution signs to 18" x 18" or 24" x 24" for safety reasons.

3. The trail blazer or path finder is required to delineate the trail and to give the user reassurance that he is on the trail. Its sole purpose is to identify the trail route. To avoid confusion, it should not contain information, control, or directional features. The blazer should be standard on all snowmobile trails and reflectorized for night use. A 5" x 7" elongated diamond was recommended over many other shapes because of its compact size and shape and its larger effective light surface. A reflective orange such as 3-M's Scotch-lite 3274 or equal, was recommended.



TRAIL BLAZER

- Adequate directional signing will be needed to supplement the trail blazer at intersections and other key locations. The directional sign should be the same shape and color as the blazer. This sign should be reflectorized and should include or be used with directional arrows or symbols.



- Informational signing can conform to the current signing practices established by the individual land management agencies. These signs are familiar and are generally understood by most users. They are aesthetically acceptable and constitute no particular safety problem. Trail maps, entrance and approach signs, points of interest, trail regulations, use controls, distance markers, and agency identification symbols are examples of informational signing.

Sign Placement

The frequency of sign placement will depend upon trail conditions and the particular situation for which you are signing.

1. Cautionary signs should be placed wherever a situation warrants a sign. "Stop" signs should be placed about 25 feet from the edge of a road crossing and "Stop Ahead" signs should be 300 feet from the crossing.
2. Informational signs should be placed on conspicuous locations at the entrance or beginning of the trail, at major intersections and at specific features along the trail.
3. The blazer should be placed often enough to reassure the user. Again, natural conditions will determine the frequency of placement. Generally 250 feet to 300 feet or line-of-sight placement should be followed. However, in very dense woods the frequency of placement could be less than in open areas where it is more difficult to follow the trail. In some cases the larger directional sign will be required for marking trails across large openings.

All signs should be located to the right side of the user at a distance of not less than 3 feet or more than 6 feet from the edge of the trail. Signs should be placed not less than 40 inches above the normal maximum

annual snow accumulation. In areas of great accumulations, it will be necessary to devise a system of height adjustment.

It is difficult to determine a specific method of actual sign placement. Some agencies may desire to place all signs on posts while others will nail signs to trees. Agencies should select one placement method and follow it so the user will know where to look for trail signs. Consistence is particularly important for the placement of the blazer.

FOOTNOTES

- 1 New York Times editorial.
- 2 K. H. Doan, a paper presented on September 18, 1970, at the annual meeting of the International Association of Game, Fish and Conservation Commissioners at New York City.
- 3 February 28, 1972.
- 4 Recently, it was suggested that the snow removed from the streets of Winnipeg, rather than being dumped on the rivers, be dumped at a suitable site on the outskirts of Winnipeg. This practice would not only overcome the pollution affects of the contents of the snow on the rivers, but also facilitate the provision of an additional type of snowmobile activity area. This would not be a substitute for a well designed trail system, but only an additional limited local facility.
- 5 Incidentally, one of the major problems involved in the enforcement of snowmobile operation regulations concerns the identification of vehicles and operators; identification of vehicles would be greatly facilitated if it became mandatory for the manufacturers to put a serial number upon the tracks of snowmobiles which would leave a satisfactory imprint in snow.
- 6 SM 1970, c.S150, c.59 as amended by SM 1971, c.34. It would be salutary for a comparative survey to be carried out periodically of the legislation in existence in other jurisdictions in Europe and North America. It is equally imperative that the authorities should keep abreast of the research being done with respect to the environmental and safety aspects of snowmobile operation.
- 7 RSM 1970, c.F150.
- 8 RSM 1970, c.P20.
- 9 RSM 1970, c.W140 as amended by SM 1970, c.89.
- 10 Manitoba Regulation 160/70:
 1. In this regulation;
"Act" means The Snowmobile Act.
 2. Subject to Section 3, sections 2 and 5 of the Act do not apply to an operator, or owner of a snowmobile, that is owned by a person residing in that portion of the Province

lying north and east of a line drawn along the fifty-third parallel, beginning at the boundary line between the Province of Manitoba and the Province of Saskatchewan, to the most easterly shoreline of Lake Winnipeg, thence southwest-erly following the sinuosities of the east shoreline of Lake Winnipeg to the fifty-first parallel; thence east along the fifty-first parallel to the boundary line between the Province of Manitoba and the Province of Ontario.

3. Section 2 does not apply to any person residing in that part of the Province described in section 2, and who resides

(a) in, or within ten miles of, any settlement, village, town or city, situated on any public road; or

(b) resides along, or within ten miles of, any public road servicing that part of the Province described in section 2.

3A. Notwithstanding Section 3, Sections 2 and 5 of the Act do not apply to an operator, or owner of a snowmobile that is owned by a person residing in that part of the Province lying north of the fifty-sixth parallel.

4. Sections 2 and 5 of the Act do not apply to snowmobiles owned by a manufacturer, or distributor, which are exclusively used for the purpose of

(a) conducting experimental work; or

(b) testing of new models, design modifications, or new components of snowmobiles;

provided, however, that such tests are conducted in remote parts of the Province and the snowmobile is at no time operated upon, or across, a highway, and that at the time the snowmobile is being operated there is displayed on each side thereof a sign bearing the words "TEST VEHICLE", in letters of not less than five inches in height.

11 International Snowmobile Industry Association newsletter, June, 1970. 5100 Edina Industrial Blvd., Minneapolis, Minnesota 55435.

12 W. O. Pruitt "Some Ecological Effects of Snowmobiles" paper presented to Metro Council of Greater Winnipeg, 1971.

13 W. J. Wanek "Observations on Snowmobile Impact" The Minnesota Volunteer, November-December, 1971.

- 14 J. A. Jarvinen "Snowmobile Use and Winter Mortality of Small Animals" paper presented at Michigan State University Research Symposium, 1970.
- 15 Op.cit., Pruitt "Snowmobiles".
- 16 The Canada Land Inventory Report No. 1 - Objectives, Scope and Organization.
- 17 The query has been raised as to whether or not the provision of snowmobile trails will generate (similar to the provision of intra-city limited access thoroughfares) an ever increasing use of snowmobiles and demand for trails.
- 18 Snowmobile Trails - Basic Recommendations, International Snowmobile Industry Association.
- 19 John W. Hethrington, "A Survey of Snowmobile Trail Facilities" presented at Snowmobile Research Symposium, June 14, 1971, at Michigan State University.
- 20 Hollenbaugh, William C. "Trails and Signs Design" taken from Proceedings International Snowmobile Conference, May 20-21, 1969, Albany, New York.

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- Canada Land Inventory Land Capability Classification for Forestry, Report No. 4, 1970
- Canada Land Inventory Land Capability Classification for Outdoor Recreation, Report No. 6, 1969
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- Landscape Architecture Research Office Three Approaches to Environmental Resource Analysis, Harvard University
- McHard, Ian Design with Nature
- Parsons, G. S. International Snowmobile Conference, Report on Proceedings, Albany, New York, May 20-21, 1969
- Rygg, Robert H. Assistant Commissioner, Minnesota Department of Conservation, Snowmobile Programming - Regulatory Encouragement, Snowmobile Congress, Bangor, Maine, September 11, 1969
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- University of Michigan Snowmobile and Off-the-Road Vehicle Symposium Proceedings, June 14-15, 1971, East Lansing, Michigan
- Veitch, P. M. Ecology and the Off-Road Vehicle, paper presented to The Outdoor Writer's of Canada National Convention, May 22, 1971, Quebec City
- Wanek, W. J. A Study of the Impact of Snowmobiling on Northern Minnesota Ecology Center for Environmental Studies, Bemidji State College

1ST SESSION, 29TH LEGISLATURE, ONTARIO
20 ELIZABETH II, 1971

An Act to amend The Motorized Snow Vehicles Act

MR. SHULMAN

TORONTO
PRINTED AND PUBLISHED BY WILLIAM KINMOND, QUEEN'S PRINTER AND PUBLISHER

BILL 19

1971

**An Act to amend
The Motorized Snow Vehicles Act**

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. *The Motorized Snow Vehicles Act*, being chapter 283 of ^{fs. 9a,} the Revised Statutes of Ontario, 1970, is amended by adding thereto the following section:

9a. No person shall, while driving or riding on a motorized snow vehicle, ^{Firearms or bows, pursuing a deer, bear or wolf}

(a) have in his possession,

(i) any firearm unless it is unloaded and encased, or

(ii) any bow unless it is unstrung or encased; or

(b) drive or pursue any deer; bear or wolf.

2. This Act comes into force on the day it receives Royal Assent. ^{Commence-ment}

3. This Act may be cited as *The Motorized Snow Vehicles Amendment Act, 1971*. ^{Short title}

EXPLANATORY NOTE

Self-explanatory.

BILL 19

An Act to amend
The Motorized Snow Vehicles Act

1st Reading

December 15th, 1971

2nd Reading

3rd Reading

MR. SHULMAN

(Private Member's Bill)

1ST SESSION, 29TH LEGISLATURE, ONTARIO
20 ELIZABETH II, 1971

**An Act to provide for the
Control and Regulation of Snowmobiles**

MR. SHULMAN

**An Act to provide for the
Control and Regulation of Snowmobiles**

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. In this Act,

Interpre-
tation

- (a) "highway" includes a common and public highway street and bridge intended for or used by the general public;
- (b) "municipality" means a locality the inhabitants of which are incorporated;
- (c) "snowmobile" means a motorized, self-propelled vehicle intended primarily for travel on snow or ice.

2. No person shall operate a snowmobile upon a highway.

Snowmobiles
prohibited
on highways

3.—(1) A municipality may temporarily close a highway within the municipality in order to permit the holding of a snowmobile race or derby.

Snowmobile
derbies

(2) Notwithstanding subsection 1, no part of the King's Highway or any highway that intersects or runs into the King's Highway shall be closed under subsection 1.

Not to
affect King's
Highway

(3) Where a highway is temporarily closed by a municipality under subsection 1, the municipality shall give written notice of the closing to the chief of police or the chairman of the board of commissioners of police, as may be applicable, of the municipality and to the Minister of Justice and Attorney General.

Notice

(4) A notice under subsection 3 shall be delivered not less than one week prior to the date of the closing of the highway and shall state the date, length of time and purpose of the closing and the name and location of the highway to be closed.

Contents
of notice

EXPLANATORY NOTE

Self-explanatory.

- Police action** (5) The chief of police or the board of commissioners of police, as the case may be, upon receipt of the notice under subsection 3 shall take all steps necessary to provide for the protection of persons and property and the regulation of traffic as a result of the temporary closing and the holding of the snowmobile race or derby.
- Municipality not liable** (6) Where a municipality complies with the requirements of this section, the municipality shall not be held liable for any loss or damage arising out of the closing or any snowmobile race or derby held in connection therewith.
- Age restriction** 4. No person under the age of twelve years shall drive a snowmobile across a highway.
- Fire-arm restricted** 5.—(1) No person shall have a fire-arm on a snowmobile unless the fire-arm is unloaded and contained in a carrying-case.
- Bow restricted** (2) No person shall have a bow on a snowmobile unless the bow is unstrung or contained in a carrying-case.
- Hunting** 6. No person shall use a snowmobile for the purpose of driving or pursuing any deer or bear or wolf.
- Permitting operation by impaired person prohibited** 7. No person shall permit the operation of a snowmobile by a person whose ability to operate a snowmobile is impaired by reason of age, physical or mental disability, alcohol or a drug.
- Offences** 8. No person shall drive a snowmobile,
- (a) at a rate of speed greater than reasonable under the circumstances;
 - (b) without due care and attention or without reasonable consideration for other persons or property;
 - (c) while under the influence of alcohol or a drug;
 - (d) in a manner that creates an excessive or unusual level of motor or exhaust noise; or
 - (e) unless it is equipped with a muffler in good working order and in constant operation.
- Penalty** 9. Every person who contravenes any provision of this Act is guilty of an offence and on summary conviction is liable for the first offence to a fine of not less than \$50 and not more than \$100; and, for the second contravention of the

same provision within one year from the date of the first offence, to a fine of not less than \$100 and not more than \$500.

10. No snowmobile may be operated at a noise level greater than 86 decibels measured at 50 feet from the machine. ^{Noise level}

11. This Act comes into force on a day to be named by the Lieutenant Governor by his proclamation. ^{Commencement}

12. This Act may be cited as *The Snowmobile Regulation Act, 1971*. ^{Short title}

BILL 21

An Act to provide for the
Control and Regulation of Snowmobiles

1st Reading

December 17th, 1971

2nd Reading

3rd Reading

MR. SHULMAN

(Private Member's Bill)

*Tribe Jan
25/73*

Snowmobiling permits soon on city rivers

By BILL BURDEYNY

Urban Affairs Reporter

Snowmobilers will soon require permits to operate their machines on the Red, Assiniboine and Seine rivers within city limits and the additional zone, a five-mile radius around the outer boundaries of Winnipeg.

City council agreed Wednesday that steps be taken to place snowmobiles and portions of the rivers within the prescribed boundaries under the jurisdiction of the Winnipeg River Control Board.

The board, created by the Manitoba Legislature in 1934, regulates the use of vehicles on the frozen rivers. To operate a vehicle on the frozen surfaces, a permit is required from the board.

A vehicle in the River Control Board Act is defined broadly to include any conveyance drawn, propelled or driven by any kind of power.

Council will instruct the city solicitor to have the board's legislation amended to include snowmobiles under the definition of vehicles.

The board has the power to regulate the use of frozen rivers by pedestrians and vehicles with a view to prevent accidents and loss of life.

Members of the board are representatives of the former Winnipeg city, St. Boniface,

East and West Kildonans municipalities.

The portions of the rivers which flow through city-owned property gives the city full legal ownership to the bed of the river or part of it where the property is owned only on one side — subject only to the right of navigation by the public.

In a report on the matter, city solicitor Duncan Lennox stated that such navigation rights apply to floating surface vessels and therefore there is hardly any navigation in the proper sense of the word during the times the river is frozen.

Earlier this week, representatives of the Manitoba Snowmobile Association appeared before the city's environment committee seeking access routes to reach areas beyond the city.

The group had also opposed the city's proposed bylaw which would, if passed by city council, ban power toboggans on public property within city limits and restrict their operation on private properties to within certain hours.

The association representatives suggested the city set up a snowmobile patrol similar to the harbor patrol, which operates in summer months.

prepared, Jan. 1972

Snowmobile cases - Canada

Ainge v. Siemon [1971] 3 O.R. 119 (Ont. 1971)

Assiniboine S.D. #3 v. Hoffer (unreported) Man.
21 D.L.R. (3d) Part 5. p. 608

- U.S.A. -

State v. Carkhuff 270 N.E. 2d. 379 (1971 Ohio)

State v. Johnson 183 N.W. 2d. 541 (Minn. 1971)

Davies v. Ski-Doo West Inc. 478 P. 2d. 695 (Colorado, 1971)

Reed v. AMF Western Tool Inc. 431 F. 2d. 345 (Idaho C.A. 1971)

Hamblin v. Arzy 472 P. 2d. 933 (Wyo. 1970)

Magnusson v. Rupp Mfg. Inc. 171 N.W. 2d. 201 (Minn. 1969)

legislation relating to SNOWMOBILES in Canada.

Province	No Legislation found	legislation
Alberta		Snow Vehicles Act, R.S.A. 1970, c. 344.
British Columbia	/	
Manitoba		Snowmobiles Act, R.S.M. 1950, as am. S.M. 1970 c. 59; S.M. 1971 c. 34
New Brunswick	/	
Newfoundland	/	
Northwest Territories	/	
Ontario	/	The Motorized Snow Vehicles Act R.S.O. 1970, c. 273
P.E.I.		
Quebec	/	
Saskatchewan	/	
Yukon	/	

Legislation relating to SNOWMOBILES in U.S.A.

state	No legislation found	legislation
Alabama	/	
Alaska	/	
Arizona	/	
Arkansas	/	
California	/	
Colorado		c. 62-13 et seq.
		[Game, Fish & Parks 1963 Art. 13]
District of Columbia	/	
Connecticut		title 14-379 et seq.
Delaware	/	
Florida	/	
Georgia	/	
Hawaii	/	
Idaho		# 49-2603 et seq.
Illinois		# 121 1/2 - 502.1
Indiana		title 47-3701 et seq.
Iowa		# 321 G.†
Kansas	/	
Kentucky	/	
Louisiana	/	

Maine		v. 12 # 1971 et seq.
Maryland	/	
Massachusetts		90B # 20635
Michigan		title 257 # 1501 et seq.
Minnesota		title 84.81 et seq.
Mississippi	/	
Missouri	/	
Montana		title 53-1012 to 1028.
Nebraska	/	
Nevada		title 503.010 (hunting from is unlawful)
New Jersey	/	
New Hampshire	?	
New Mexico		c. 64-36-1 et seq.
New York		Conserv. s. 8-0101 et seq. Gen. Obl. s. 9-103 Vehicle o.T. s. 375-a; 375(33); 410; 415.
North Carolina	/	
North Dakota		title 39-24-01 et seq.
Ohio	could not find, but see State v. Carckhuff 270 N.E.2d 379,	
Oregon		c. 481.024, .048, .053
Pennsylvania		Act 75 (1971)

Rhode Island

South Carolina

South Dakota

title 32-5 ; -6 ; -20A.

Tennessee

Texas

Utah

title 41-22-2 et seq.

Vermont

title 31 #801 et seq.

also title 10 #4705

" 23 # 4

" 30 # 1478

" 32 # 3692

Virginia

West Virginia

Washington

c. 29 (1971)

Wisconsin

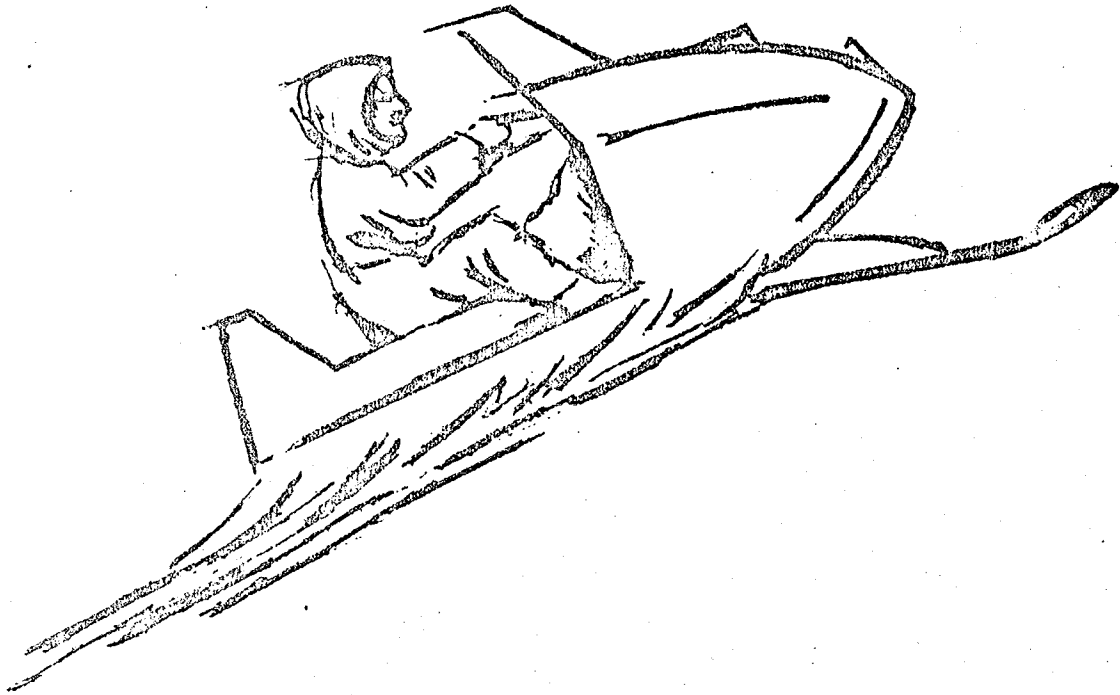
title 350.01 et seq.

Wyoming

title 31-76-21 to 29

D. Russell

SUMMARY OF SNOWMOBILE LEGISLATION



Prepared by:

UPPER GREAT LAKES REGIONAL COMMISSION
504 Christie Building
120 North Fourth Avenue West
Duluth, Minnesota 55802

circa 1971

SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
<u>ALASKA</u>	Identification no. to be displayed on front of machine. Cert. of Reg. to be available at all times.	\$5/2 yrs.	None	Traffic laws apply.	Not on roadway of State Hwy., but on shoulder adjacent to. Cross highway.	Brakes Muffler Head Lamp Tail Lamp Throttle	\$100/Damage Personal injury	83 dcb/50 ft.	No driving, herding or molesting of game.
<u>CALIFORNIA</u> Dept. of Motor Vehicles	Identification plates must be displayed. Card should be carried at all times.	\$5	None	N/A	Cross highway.	NA	N/A	N/A	May not herd, drive or molest animals.
<u>COLORADO</u> Div. of Game, Fish and Parks *	Cert. of Reg. issued. Validating date tag issued each year. The reg. numbers must be displayed.	\$5/Orig. \$3/ renewal	10-16 (Priv. land) 18	Safe manner. Licensed operators No liquor/ drugs Reasonable speed	Not on Freeway or Interstate, nor R/W. Cross highway. Not on R/W of operating RR.	Brakes Muffler Head Lamp Tail Lamp	Yes Training Course	No excessive noise.	No hunting. Firearms must be empty and enclosed. May not pursue, drive or disturb wildlife.
<u>CONNECTICUT</u> Div. of Motor Vehicles *	Reg. of vehicles required. Number to be displayed. Cert. of Reg. carried on machine at all times.	\$3/1 yr.	16	Reasonable speed No liquor/ drugs	Cross highway. Not on RR R/W	Brakes Muffler Head Lamp Tail Lamp	Fined for violation of laws.	Exhaust noise prohibited.	No harassment of game or domestic animals.
<u>IDAHO</u> Motor Vehicle Div., Dept. of Law Enforcement *	Reg. number to be displayed.	\$5/yr.	None	Safe speed No liquor/drugs	On hwy. or public roadway not maintained for motor vehicles. Cross highway.	Brakes Muffler Headlight Taillight	Yes \$100/Damage Personal injury	No excessive noise.	May not damage or harass wild animals and birds, or domestic animals.
<u>ILLINOIS</u> Dept. of Conservation *	Reg. number to be displayed on front of machine.	\$6/2 yrs.	N/A	Reasonable speed No liquor/drugs Not in careless manner	Cross highway. Not on RR	Brakes Sound Sup- pression equipment Headlight Taillight	Yes \$100/Damage Personal injury	82 dcb/50 ft.	Not in tree nursery in manner damaging stock. Not in nature preserve area. May not hunt any bird or animal from snowmobile. May not carry loaded firearms.
<u>INDIANA</u> Dept. of Natural Resources *	Identification number to be displayed on machine.	\$6/3 yrs.	14 Under on land of parents	Valid Drivers License Reasonable speed No liquor/drugs	Public R/W adjacent to hwy. Cross highway. County highway. Not on RR or R/W	Brakes Muffler Headlight Taillight	Yes \$100/Damage Personal injury Fine for violation of law.	No excessive noise.	No annoying smoke. Not in cemetery. No hunting. Not in forest nursery.

UPPER GREAT LAKES REGIONAL COMMISSION

SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
IOWA State Conservation Commission	Identification number to be displayed on machine. Reg. cert. to be available.	\$6.50/ year	16	Reasonable speed No liquor/drugs Drivers License Not in careless or reckless manner.	Not on R/W of Freeway or Interstate. On unplowed city or town highways. Cross highway.	Muffling device Headlight Taillight	Yes \$100/Damage Personal injury	No excessive noise.	Not in tree nursery, nor damaging or destroying growing stock. No firearms in vehicle.
MAINE Dept. of Inland Fisheries *	Reg. number to be displayed on front of machine.	\$10/yr.	14	No liquor/drugs No reckless operation. Reasonable speed.	Not on public way. Cross highway. Not on RR/RW without written permission.	Muffler Headlight Taillight	Yes \$100/Damage Personal injury	No excessive noise.	Not in cemeteries.
MASSACHUSETTS Division of Motorboats *	Reg. number to be displayed on machine. Reg. cert. to be available at all times.	\$5/yr.	16-1/2	Operation must be safe. No liquor/drugs	Cross highway. No state, county, city or town way, nor on plowed snowbanks of such ways.	Brakes Headlight Taillight Red rear reflector	Yes \$50/Damage Personal injury	73 dcb/50 ft. Machine must conform to "A" scale.	No harassment of wild life. Firearms must be encased and not loaded. Not in reforested or planted area. No vehicle shall be operated which emits obnoxious fumes.
MICHIGAN Jointly by Dept. of Natural Resources and Dept. of State *	Reg. number to be displayed on machine. Reg. cert. to be carried.	\$9/3 yrs.	12/ 1972 After '73, 12-16 only with adult	Reasonable speed. No liquor/drugs	R/W Public Hwy. except limited access hwy. Cross highway. County highways not maintained for winter.	Brakes Muffler Headlight Taillight	Yes \$100/Damage Personal injury	86 dcb/50 ft. "A" After Feb., 1972, new machines 82 dcb/50 ft.	Not for hunting or in forest plantings, cemeteries, RR R/W, or 100 ft. of slide, ski or skating areas. Minimum speed 100 ft. of dwellings at night and persons on ice. No annoying smoke.
MINNESOTA Dept. of Natural Resources *	Reg. number to be displayed on machine. Reg. cert. to be available.	\$12/ 3 yrs.	14	Reasonable speed Not in careless manner. No liquor/drugs.	Not on Interstate or Freeway. Cross highway. Extreme right of open portion of R/W, with flow of traffic.	Brakes Muffler Head Lamp Tail Lamp Reflector material	Yes Training	86 dcb/50 ft. "A"	Not in tree nursery or planting in manner that destroys stock. Unprotected animals not to be chased. No State Park, except posted trails.
MONTANA Fish and Game Commission *	Cert. of Ownership required. Reg. decal obtained. P.P. taxes paid.	\$2/yr.	MV Age	Drivers License on public rdway, street, hwy. MV speed. No liquor/drugs. With care.	Not on controlled access highway Cross highway. Not on RR/RW	Head Lamp Tail Lamp Brakes Muffler	Yes \$100/damage Personal injury	50 dcb/15 ft. for races After 6/1972, new machines 85 dcb/15 ft. "A"	No harassment of animals. No hunting.
NEBRASKA Div. of Motor Vehicles *	Reg. numbers to be displayed on machine.	\$8/yr.	16	Reasonable speed.	Not on Freeway/ Interstate R/W-street or hwy. except during night. Yield to MV travel.	Muffler Head Lamp Tail Lamp Brakes		No excessive noise.	Not in tree nursery or planting. No hunting. Firearms must be encased and not loaded.

UPPER GREAT LAKES REGIONAL COMMISSION

SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
<u>NEVADA</u>	None	None	None	None	None	None	None	None	Unlawful to molest, stir up, drive, or shoot any game animals or birds from snowmobile.
<u>NEW HAMPSHIRE</u> Fish and Game Department *	Reg. number must be displayed.	\$9/yr.	16-To cross hwy. MV Lic.	Reasonable speed Not under influence of liquor/drugs. Not in careless manner.	No Freeway/ Interstate Cross highway On hways. not maintained for convenience of motor vehicles No RR/Airport RW	Brakes Headlight Taillight Muffler	Yes \$50/Damage Personal injury	No excessive noise.	Firearms/unloaded and in case
<u>NEW MEXICO</u> Dept. of Game and Fish *	Reg. number displayed on both sides of front of machine. Cert. of Reg. available for inspection.	\$7.50/3 yrs.	None	Not required to be licensed. Not under influence of liquor/drugs Not in careless manner.	Not on Freeway or limited access highway Cross highway Yield to MV traffic Not closer than 10 ft. to inside of plow bank	Headlight Taillight Muffler	Yes \$50/Damage Personal injury	86 dcb/50 ft. No excessive noise	Not in pursuit of animals. No firearms unless unloaded and encased.
<u>NEW YORK</u> Dept. of Conservation *	Reg. number must be displayed at all times. Validating date tag of current registration issued and displayed. Cert. of Reg. must be available for inspection.	\$5/yr.	10 yrs. on private property when with 18 yr. old, or 14 with safety cert. 18	Reasonable speed No careless operation No liquor/drugs	Not on RR tracks Not on State Freeway or Interstate, or limited access State Hwys. Cross on other hways. Yield to MV travel.	Brakes Headlight Taillight Muffler Horn Red rear reflector Light illuminated plate Reflector mat. on cowling.	Yes \$100/Damage Personal injury	82 dcb/50 ft.	Not in tree nursery or planting, in manner that destroys stock.
<u>NORTH DAKOTA</u> Highway Dept. State Park Dept. *	Reg. number to be displayed. Validating tag for current registration to be displayed.	\$2/2 yrs.	14	No liquor/drugs Reasonable speed No reckless driving	Not on Interstate Hwy. Cross highway Yield to MV travel. On highways not maintained for motor veh. travel.	Brakes Head Lamp Tail Lamp Muffler	Violation of law is a misdemeanor.	No excessive noise.	No excessive fumes. Not in tree nursery or planting area. No harassing of animals. No hunting.
<u>OHIO</u> Director of Highway Safety *	Reg. number on each side of cowling.	\$5/yr.	16 MV Oper. License	No liquor/drugs Reasonable speed No reckless driving	Not on Interstate Hwy. Cross highway Not on limited access hwy. or freeway Not on RR R/W	Headlight Taillight Brakes	\$50/damage Personal injury	82 dcb/100 ft.- 1973 No excessive noise	No harassment of animals No hunting Not in nursery or planting area Firearms not loaded, encased

SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
OREGON Motor Vehicle Division *	Reg. number must be displayed. Cert. of Reg. to be available for inspection. Validating date tag issued for current registration.	\$10/2 yrs.	12	Proper speed under conditions. No drugs/liquor. No careless driving.	Not on paved portion, shoulder, inside bank, slope or median of any highway. Cross highway. Yield RW to MV. On hwys. closed to MV travel during winter months. Not on or across RR right-of-way.	Brakes Headlight Taillight Muffler	Yes \$200/Damage Personal injury	No excessive noise 82 dcb "A"	No excessive exhaust Not in manner to damage soil vegetation or damage or destroy trees/crops. No firearms. No hunting. No harassing or chasing of animals.
RHODE ISLAND Dept. of Natural Resources *	Reflectorized identification no. assigned when vehicle is registered. Number to be affixed to machine.	\$10/1 yr.	16-18 to cross hwy must have operator's license. Under 16 may not cross.	Reasonable speed. No liquor/drugs. No careless driving.	Not within R/W of Freeway or Interstate. Not on RR. Cross highway.	Brakes Head Lamp Tail Lamp Muffler Reflector material on front of machine.	Fined for any violation of any part of law.	82 dcb/50 ft. "A"	Firearms must be unloaded and encased. Not in tree nursery or planting in a manner which damages or destroys growing stock. Operate on private land only with permission.
SOUTH DAKOTA State Highway Commission Dept. of Motor Vehicles *	Reg. plates to be displayed on machine. Receipt of registration issued with plates.	\$10	16	Reasonable speed under circumstances. No reckless driving. No liquor/drugs.	Not on controlled-access hwy. Not on RR R/W In right-hand ditch outside the roadway of other than controlled-access hwys. Cross highway.	Head Lamp Tail Lamp Muffler	Violation of law is a misdemeanor.	No excessive noise.	Firearms must be unloaded and encased. No harassing or chasing of birds and animals.
UTAH Dept. of Natural Resources	Reg. number to be displayed on machine. Affidavit of ownership required for registration. Property tax on machine for current year must be paid.	\$5/yr.	None	Not under influence of liquor/drugs	Public land.	N/A	Violation of Act is a misdemeanor.	Noise must be curtailed.	No harassment of animals. No pollution of air, water or land. No impairment of plant or animal life.
VERMONT Dept. of Public Safety *	Reg. number to be displayed.	Not in law.	16	N/A	Cross highway.	N/A	N/A	Noise regulated.	N/A

UPPER GREAT LAKES REGIONAL COMMISSION

SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
WASHINGTON Dept. of Motor Vehicles *	Reg. number to remain with machine. Reg. cert. to be issued. Validating date tag to be issued at each renewal.	\$15/ 3 yrs.	12 12 - 18 must have safety education course.	Reasonable speed under conditions Not under influence of liquor or drugs. No reckless driving.	Unlawful on paved portion, shoulder or inside slope or bank. Cross highway. Not within 100 ft. of any public rdwy. or hwy. intersection Yield R/W to motor vehicles using public hwy. or roadway.	Brakes Headlight Taillight Muffler	\$200/Damage Personal injury Violation of Act is a misdemeanor.	82 dcb/100 ft.	No hunting. No harassing of deer, elk, wildlife, etc. Unlawful to injure, damage or destroy trees or crops.
WISCONSIN Dept. of Natural Resources *	Reg. number to be properly displayed at all times. Reg. cert. in possession of user at all times.	\$6/ 3 yrs.	12 to cross hwy. 16 to cross State highway.	Reasonable speed No careless driving. No liquor/drugs	Adjacent to hways. at a distance of 10 or more feet from traveled portion of hwy. Not on median of highway Cross highway.	Brakes Head Lamp Tail Lamp Muffler	Violation of law will result in a fine.	No unusual noise	Firearms must be unloaded and encased. No harassing or driving of deer, bear or other game.
WYOMING Recreation Commission of Wyoming	Reg. number to be properly displayed at all times. Reg. cert. must be available at all times.	\$8/yr.	None	N/A	N/A	N/A	N/A	N/A	N/A
ALBERTA Registrar of Motor Vehicles *	Cert. of Reg. required at all times. Number plates must be displayed at all times.	N/A	N/A	N/A	Not on roadway, parking area or sidewalk portion of highway. Not on hwy. between sunset and sunrise. Cross Highway. Yield R/W to motor vehicle.	N/A	\$100/Damage Personal injury	N/A	N/A
BRITISH COLUMBIA Dept. of Motor Vehicles	Reg. number to be displayed.	\$6.80 Year	None Valid Dri. Lic. Required.	N/A	Cross highway. Yield to other mot. vehicles.	N/A	N/A	Not regulated.	N/A

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SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
<u>MANITOBA</u>	Reg. numbers to be displayed. Reg. cert. to be available for inspection.	N/A	16 Under 16 when with one 18 or over.	Reasonable speed.	Not on private property unless consent is received.	Muffler	Training course required. Liability insurance required	No excessive noise, based on decibels, "A" scale.	N/A
<u>NEW BRUNSWICK</u> Prov. Secretary	Reg. plate property of Crown. Number must be displayed.	\$4/yr.	16	N/A	Cross highway. Passengers get off before crossing hwy. Lt. Gov. of Council designates hways. to be used by snowmobiles.	Head Lamp Rear Lamp Side Lamps	Liability insurance required.	N/A	N/A
<u>NOVA SCOTIA</u> Registrar of Motor Vehicles	Reg. number must be displayed on snowmobile. Cert. of Reg. must be available for inspection.		12 Under 12 when supervised by one over 16.	No careless driving. No alcohol. No excessive speed under conditions.	Not on RR R/W Not on traveled portion or shoulder of highway. Cross highway at designated places.	N/A	N/A	N/A	No chasing, hunting or pursuing of game or animals.
<u>ONTARIO</u> Dept. of Transport	Number plate to be displayed on front of machine.	\$4/ 2 yrs.	16	Need operator's license. Reasonable speed. No careless driving.	Not on King's Hwy., nor on Secondary Hways., except as set up by Minister of Transport.	Head Lamp Tail Lamp	Insurance required. \$200/Damage Personal injury.	N/A	N/A
<u>PRINCE EDWARD ISLAND</u>	N/A	N/A	Licensed Driver	Must have valid driver's license. Yield R/W to mot. veh.	Cross highway. During daytime between the boundary line of hwy. and the nearer line of the shoulder of the hwy. to that boundary line.	Head Lamp Tail Lamp	N/A	N/A	N/A
<u>QUEBEC</u> Dept. of Transport	Reg. required. No. to be displayed.	\$6/yr.	Licensed Driver	N/A	N/A	N/A	N/A	Not regulated	N/A

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SNOWMOBILE LEGISLATION

STATE	REGISTRATION	FEE	MINIMUM AGE	OPERATION	USE AREAS	EQUIPMENT	SAFETY RESPONSIBILITY	ENVIRONMENTAL RESTRICTIONS	
								NOISE	OTHER
SASKATCHEWAN Motor Vehicle Administration	N/A	N/A	N/A	Yield to Motor Vehicles	Not on traveled portion of hwy. outside a city unless untravelled portion of hwy. is unsuitable for the driving of a snowmobile. Cross highway.	Horn Adequate brakes. Head Lamp	N/A	N/A	N/A

FOOTNOTES:

* Dealers Registered

N/A Not Available

Information used for this cursory study of Snowmobile Legislation was obtained from material received from the States listed. We request suggestions on the format of this study, as well as corrections and additions to bring the report to a current status.

Data should be sent to:

UPPER GREAT LAKES REGIONAL COMMISSION
504 Christie Building
120 North Fourth Avenue West
Duluth, Minnesota 55802

Miscellaneous Material

- Proceedings - Conference on
Snowmobiles & All Terrain
Vehicles, Faculty of Law,
U. of Western Ont.

- Ralph Nader on Snowmobiles
as reported in Globe & Mail
May 25, 1972

French ban snowmobiles as environmental hazard

By TIM CREERY

Tribune Staff Correspondent

FRANCE — The snowmobile has been all but knocked out of action in France as one of the first targets of the new department of the environment, established last year.

Hitting harder and faster than Quebec, which is preparing legislation to control use of snowmobiles, Environment Minister Robert Poujade has banned them for personal use.

Their use for recreation will be restricted to controlled tracks where people will be able to rent them from concessionaires. Otherwise, they

will be allowed only for maintenance or emergency services.

An official of the department said the restrictions were imposed for reasons of noise, pollution and danger. Several ski resorts had already banned the machines on their own.

Mr. Poujade's orders will be implemented by local municipalities. Of more than a thousand snowmobiles sold so far in France, the majority are reported to be imported from Japan. The French action follows widespread banning of the machines at ski resorts around Europe.

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THE TRIBUNE, Friday, March 10, 1972.

Charged with chasing fox

OAK LAKE (CP) — William Vernon Blackwell, 48, of Oak Lake has been charged with chasing and harrassing wildlife following an incident March 4 when a man was ob-

served on a snowmobile chasing a fox.

Blackwell will appear in Brandon magistrate's court this week.

Oak Lake is 35 miles west of Brandon.