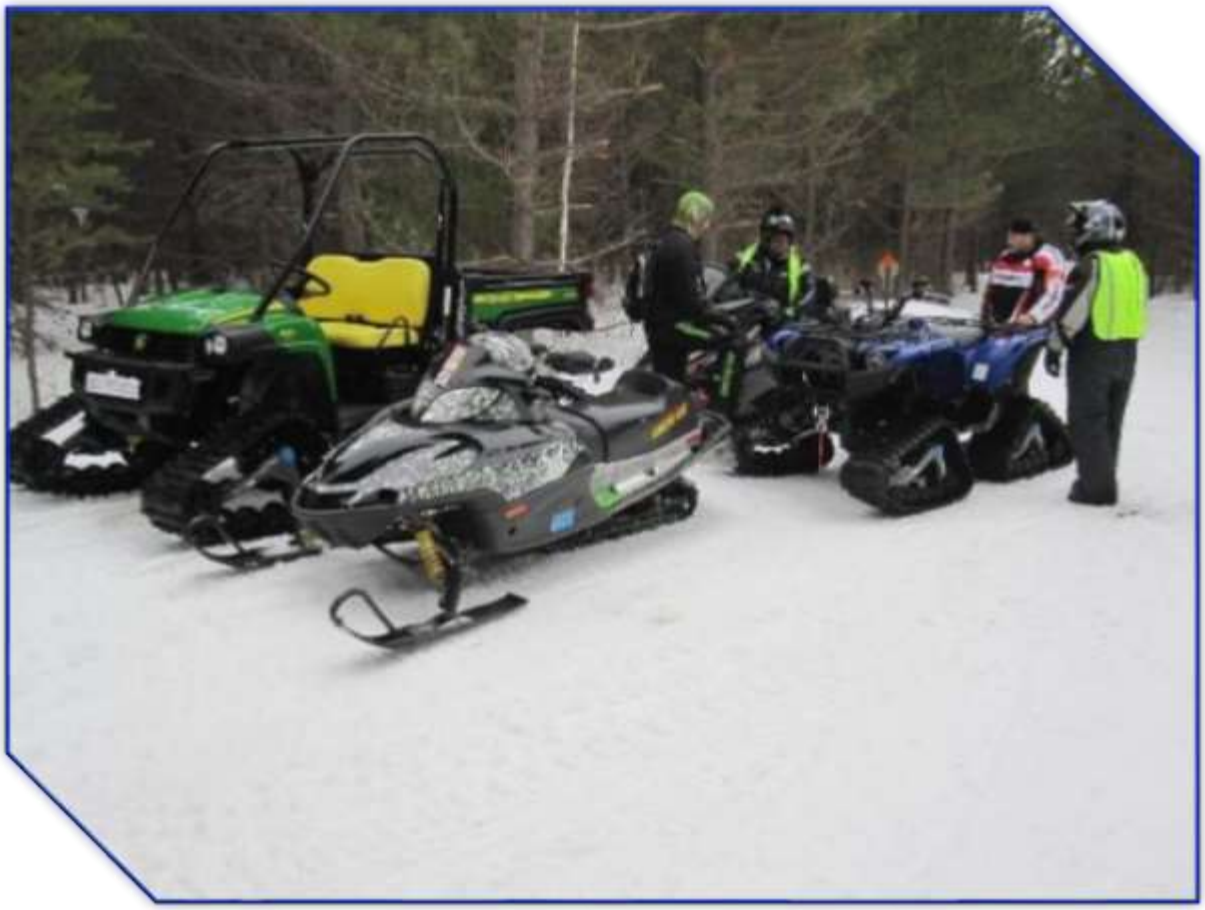
Assessment of Tracked OHV Use on Groomed Snowmobile Trails



Conducted by Trails Work Consulting
For the American Council of Snowmobile Associations

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Assessment of Tracked OHV Use on Groomed Snowmobile Trails

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ACSA's leadership and members are recognized for their input and guidance throughout this assessment project. All project management, field test evaluation, writing, and photography were provided by Trails Work Consulting. A special thank you to the trail administrators who responded to the Survey of Trail Managers; to Camoplast and Test Inc. for providing tracked OHVs for field test comparisons; to the St. Germain, Wisconsin Bo-Boen Snowmobile Club for allowing the field test to be conducted on their trail system; to ACSA's Tracked OHV Impacts Committee chair Jim Willey for his leadership and coordination; and to the numerous volunteers who helped make the field test possible.

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TABLE OF CONTENTS

LIST of TABLES

Page Table Number and Title

LIST of PHOTOS

Page Photo Number / Photo Description / *All photos by Kim Raap – Trails Work Consulting*

INTRODUCTION

New Challenges for Winter OHV Use

Many snowmobile trail managers are facing new management challenges related to OHV use that have been evolving over the past ten to fifteen years. This evolution has included significant growth in overall OHV numbers, the addition of wider side-by-side utility vehicles (UTVs), and some OHVs now being equipped with tracks. Consequently a growing number of local administrators must evaluate what's best for their local area: continuing to provide only 'single use' motorized trails for snowmobiles – or integrating concurrent snowmobile/OHV use onto some groomed trails. Somewhat surprising, a Survey of Trail Managers conducted for this project found that 24 jurisdictions (15 U.S., 9 Canada) comprising nearly seventy percent of those with groomed snowmobile trails currently allow some type or level of concurrent OHV use on their groomed trails. Therefore over 45,000 miles representing 35% of all groomed trails in the U.S. and over 28,000 kilometers representing 25% of all Canadian groomed trails are already open to concurrent OHV use.

There are strong opinions on both sides of this discussion among snowmobilers and trail managers. Many snowmobilers are concerned about this potential new use and how it will affect 'their trails' created by the fees they (snowmobilers) pay, their volunteer construction and maintenance efforts, and their work with landowners. There is also a perception that OHVs may excessively damage trails and cause safety issues. Despite many concerns, there has generally been a lack of factual information available to help guide trail administrators. Consequently this project's purpose is to begin narrowing information gaps in hopes of advancing reasoned decisions for local trail management.

This project collected information about existing or potential tracked OHV use on groomed snowmobile trails. It does not advocate for or against allowing any type of OHV use on groomed snowmobile trails; that clearly must be a local decision based upon local circumstances.

New information provided by this report includes four components:

1. A compilation of 'snowmobile' definitions currently used by U.S. and Canadian jurisdictions since this is a primary means by which tracked OHV use can be either allowed or prohibited,
2. Findings from a trail manager survey that identified current winter OHV use trends,
3. Field test observations that compared snowmobile and tracked OHV impacts, and
4. General recommendations to help guide local trail management policies.

This project builds upon a similar assessment (Evaluation of ATV Use on Groomed Snowmobile Trails; IASA/ACSA, 2006 http://www.snowmobileinfo.org/snowmobile-access-docs/Evaluation-of-ATV-Use-on-Groomed-Snowmobile-Trails.pdf) conducted by Trails Work Consulting in 2005-2006 on behalf of the International Association of Snowmobile Administrators (IASA) and the American Council of Snowmobile Associations (ACSA). Since the 2006 project addressed only wheeled ATV use on groomed snowmobile trails, this project focused on filling information gaps related to tracked OHV operation on groomed trails.

For this project's Trail Manager Survey, the term 'OHV' generally included three off-road recreational vehicle types equipped with either wheels or tracks: ATVs, UTVs/ROVs (also known as side-by-sides), and motorcycles. Wheeled OHVs were included in the 2013-14 survey only to compare 2006 wheeled survey data against current data. This project's limited 2014 field test evaluated only one tracked ATV and two tracked ROVs – no tracked motorcycles were tested. While no wheeled OHVs of any type were field tested in 2014, some comparisons were made with 2006 field test observations that included wheeled ATVs.

Comparison of Snowmobile and OHV Trends

Growth in OHV types and numbers has resulted in new OHV sales overtaking and continuing to significantly outpace snowmobile sales in the United States, Canada, and worldwide. As a recent baseline comparison,

there were about 208,000 new snowmobile units sold worldwide in 2000-2001, with around 140,000 of them being sold in the U.S. and 50,000 in Canada. New snowmobile sales for the 2013 model year were down to 48,536 units in the U.S., 44,022 in Canada, and 144,601 worldwide but then rebounded to a total of 54,028 new units sold in the U.S., 48,758 in Canada, and 157,106 worldwide for the 2014 model year. Even though its participation rate may have declined during recent years, snowmobiling still remains a very viable activity enjoyed by millions. It's estimated there are slightly more than 2.7 million snowmobiles registered worldwide with about 2 million of them being in the U.S. and Canada. (Source: International Snowmobile Manufacturers Association (ISMA))

Comparing current and past snowmobile sales and registration numbers with OHV numbers shows striking contrasts: in 2000 new ATV sales in the United States totaled about 550,000 units per year (only ATVs, does not include other OHV types). ATV sales quickly rose to over 800,000 units per year by 2002 and continued at that pace for several more years. By 2005 well over 8 million ATVs were estimated to be in use within the United States. (Source: Motorcycle Industry Council (MIC) and *Powersports Business*)

In about 2003 the sale of utility vehicles (UTVs) with side-by-side seating (also known as Recreational Off-Road Vehicles (ROVs) or 'side-by-sides') began to explode. This UTV/ROV growth eventually cut into ATV sales numbers as consumers began switching from ATVs to UTVs. MIC data shows that annual U.S. ATV sales decreased to around 321,000 per year in 2009 and then leveled off into a fluctuating range between 256,000 to 222,000 units annually from 2010 through 2013.

The total number of UTVs being sold today is stated by MIC to be 'in the neighborhood of 200,000 annually.' The U.S. Consumer Products Safety Commission (CPSC) on the other hand stated during its ROV rulemaking process that ROV sales "have risen from fewer than 45,000 units in 2003 to more than 416,000 units by 2008." (Source: CPSC, 2009) According to the Recreational Off-Highway Vehicle Association (ROHVA), there are more than 30 ROV manufacturers worldwide producing over 100 models of ROVs, with more than one million ROVs being used in North America during 2013. Additionally, 70,000 to 80,000 new off-highway motorcycles continue to be sold in the U.S. every year according to MIC.

Quite conservatively – there are likely at least 10 to 12 million OHVs currently in use just within the United States. While it's unknown exactly how many of these OHVs are in the Snowbelt, half or more could potentially be owned by people who live in non-snow states. However, if even only a quarter of the total U.S. OHV population is located within the Snowbelt, it's a still growing number that's already significantly larger than current snowmobile ownership.

It's also unknown exactly how many OHVs in the U.S. have been retrofitted with track kits, which requires an investment of a several thousand dollars. The price for an ATV track conversion kit is approximately $3,200 to $3,800 (Source: Kimpex, TJD, XGEN and Camoplast), while the price of a track kit for UTVs runs about $3,900 to $5,000 per vehicle (Source: XGEN, Kimpex, Xtrack and Camoplast). Likewise, track kits for off-highway motorcycles cost from $3,200 to $5,500. (Source: Explorer, Timbersled and Frozen Moto)

While the current number of tracked OHVs is likely quite low, there does appear to be potential for that number to continue growing – whether for recreational on-trail use, access to cabins or ice fishing, or off-trail riding where allowed – since interest appears to be trending upward across the Snowbelt.

Summary of Key Findings

Key findings from this project are summarized on the next two pages in executive summaries for the Survey of Trail Managers and the Field Test Comparisons. These results were used to help develop Chapter One: Tracked OHV Management Considerations beginning on page 5.

SURVEY OF TRAIL MANAGERS – EXECUTIVE SUMMARY

Refer to Chapter Two for the complete Survey of Trail Managers report. Key survey findings relative to North America, United States and Canada are as follows:

North America (U.S. & Canada)

- Twenty-four (24) jurisdictions (about 69% of those with groomed snowmobile trails) allow some type of concurrent OHV use on groomed snowmobile trails during winter.
- A total of 63,123 miles (101,587 kilometers) are open to some type of concurrent OHV use during winter. This represents 32% of all groomed snowmobile trails in North America.
- The 63,123 miles of groomed snowmobile trails open to concurrent OHV use represents almost 39% of all groomed trails within these 24 jurisdictions.
- Thirteen jurisdictions (54%) allow some type of OHV use (ATV, UTV or motorcycle) on 100% of their groomed snowmobile trails (but not necessarily all types on 100%); the percentage of trails open in ten other jurisdictions ranges from a high of 92% down to only 0.1%; one other jurisdiction, even though its laws would allow it, has not yet designated any miles open to concurrent OHV use.
- All jurisdictions reported that winter OHV use on snowmobile trails currently open to concurrent use ranges from 'minimal to nil' with most estimating OHV use levels in a range that doesn't exceed '5 to 10 percent' of total winter trail use.

United States

- Fifteen states (65% of the states with groomed snowmobile trails) allow some type of concurrent OHV use during winter.
- A total of 45,470 miles (35% of all groomed snowmobile trails in the U.S.) are open to some type of concurrent OHV use during winter.
- The 45,470 miles of groomed snowmobile trails open to concurrent OHV use represents 44% of all groomed trails within these 15 states.
- Eight states (53%) allow some type of OHV use (ATV, UTV or motorcycle) on 100% of their groomed snowmobile trails (but not necessarily all types on 100%); the percentage of trails open in six other jurisdictions ranges from a high of 92% down to only 0.4%; one additional state, even though its laws would allow it, has not yet designated any miles open to any type of concurrent OHV use.
- All states reported that winter OHV use on snowmobile trails currently open to concurrent use ranges from 'minimal to nil' with most estimating OHV use levels in a range that doesn't exceed '5 to 10 percent' of total winter trail use.
- Thirteen states (65%) indicated they experience off-season impacts to their snowmobile trail routes from non-winter use of OHVs while another seven states (35%) indicated off-season OHV use does not cause impacts to their snowmobile trail routes.

Canada

- Nine jurisdictions (75% of the provinces and territories with groomed snowmobile trails) allow some type of concurrent OHV use during winter.
- A total of 28,410 kilometers (just over 25% of all groomed snowmobile trails in Canada) are open to some type of concurrent OHV use during winter.
- The 28,410 kilometers of groomed snowmobile trails currently open to concurrent OHV use represents about 29% of all groomed trails within these nine Canadian jurisdictions.
- Five Canadian jurisdictions (55.5%) allow/cannot prevent some type of OHV use (ATV, UTV or motorcycle) on 100% of their groomed snowmobile trails (but not necessarily all types on 100%); the percentage of trails open to concurrent use in the other four jurisdictions ranges from a high of 50% down to only 0.1%.
- The Yukon Territories reported that OHV use approaches 20% of total winter trail use on groomed trails while Ontario indicated 'less than five percent' of total use on its groomed trails currently open to concurrent use comes from OHVs.

FIELD TEST COMPARISONS – EXECUTIVE SUMMARY

Refer to Chapter Three for complete field test observations comparing tracked OHV versus snowmobile operation on the same groomed snowmobile trail. Key observations and conclusions include:

- The 2014 field test compared the operation of two snowmobiles, one tracked ATV, and two tracked UTVs (side-by side utility vehicles) on the same groomed snowmobile trail to observe impacts related to aggressive starts, aggressive stops, and high speed pass-by on both straight and winding trail segments.
- The field test was conducted March 14, 2014 on the Bo-Boen snowmobile trail system near St. Germain, Wisconsin; air temperatures were above plus 40 degrees Fahrenheit during the entire field test.
- These observations relate to only the very specific conditions experienced at this specific site at that specific date. Different results would be expected at different locations under different conditions.
- Since the plus 40 F temperatures during this test period would generally be considered 'warmer than normal' snowmobiling conditions, these observed impacts (during warm conditions) could potentially be worse than if testing had occurred during colder temperatures; however this cannot be definitively stated since only one field test at one location was completed in 2014.
- Despite warm weather conditions, there were generally low impacts with no substantial differences observed between the depths of impressions created by tracked OHV operation versus snowmobile use on this particular groomed snowmobile trail. Overall, tracked OHV impressions left on the trail were slightly less than those created by aggressive snowmobile operation.
- The maximum (deepest) depth impressions observed during 2014 field testing were all created by aggressive stops. The overall deepest impressions were 7 and 8 centimeters (2.8 and 3.1 inches) deep and made by the two snowmobiles during aggressive stops. Comparatively the deepest impression made by the tracked ATV during aggressive stops was 6 centimeters (2.4 inches) deep and both tracked UTVs created 5 centimeters (2 inches) deep impressions during aggressive stops.
- The stopping distances of all three tracked OHVs were significantly shorter than the distance required to completely stop the two snowmobiles under the same conditions. The snowmobiles' average stopping distance was over five times longer than the distance required to fully stop the tracked ATV and over ten times longer than the distance required to fully stop both tracked UTVs.
- The tracked OHVs' stopping distances were also substantially shorter than what were observed during 2006 field testing for wheeled ATVs and snowmobiles (it should be noted that the 2006 test sleds were mountain and cross-over models with more aggressive track lugs than the 2014 field test's trail sleds). The tracked ATV's average stopping distance was nearly 2 ½ times shorter than the 2006 test snowmobiles' stopping distance, while the tracked UTVs' average stopping distance was nearly five times shorter than the 2006 test snowmobiles. The 2006 field test also indicated that wheeled ATVs generally had an average stopping distance ten to fifteen feet shorter than the 2006 test snowmobiles operated at the same speed.
- The tracked ATV's 52-inch overall width is slightly wider than a snowmobile's typical 48-inch width. Consequently a minimum groomed trail width of at least nine to ten feet is recommended if tracked ATVs are regularly allowed on a public snowmobile trail with two-way traffic. This should be accomplished by using at least a nine to ten feet wide grooming drag or tiller to ensure a consistent trail width twice or more the maximum ATV width.
- The tracked UTVs had widths of 68.5" and 70.5." Consequently a minimum groomed trail width of at least twelve feet is recommended if tracked UTVs are regularly allowed on a public snowmobile trail with two-way traffic. This should be accomplished by using at least a twelve feet wide grooming drag or tiller to ensure a consistent trail width twice or more the maximum UTV width.

This field test concluded that additional testing is needed to further evaluate tracked OHV operational characteristics and potential effects. Supplementary field testing will be scheduled during the 2014-2015 winter season to continue collecting information in a wider range of trail and weather conditions, as well as from off-trail operation in open cross-country travel areas. These supplemental field tests will also attempt to include tracked motorcycles.

CHAPTER 1: TRACKED OHV MANAGEMENT CONSIDERATIONS

All recreational vehicle use, whether snowmobiles or OHVs, requires active management. Management must ensure adherence to private or public land use prescriptions, adequate resource protection, and that safe, enjoyable visitor experiences are provided. Trail management policies must be set at the local level to ensure they best fit local circumstances. Consequently this chapter provides guidance for local trail managers to consider when dealing with existing or potential concurrent OHV use on groomed snowmobile trails. These management considerations are intended to help local jurisdictions make informed decisions about their tracked OHV management policies; they are not intended to influence local areas whether or not to allow concurrent OHV use.

SNOWMOBILE DEFINITIONS – KEY COMPONENT CONSIDERATIONS

Chapter Four provides a compilation of all 'snowmobile' definitions used across the United States and Canada. Since definitions are a key method by which tracked OHV use can be either allowed or prohibited on snowmobile trails, it's important to understand the difference between specific words and phrases within snowmobile definitions. The Chapter Four compilation shows a wide variance in the definition phraseology used across the Snowbelt – and that no two definitions are identical. This variance underscores the historical significance of local control across the snowmobile community while also emphasizing its continued importance for future trail management decisions.

Since every state or provincial situation is different – and even regions within the same jurisdiction may deserve varying approaches – it would be illogical to draft any 'model definition' suggesting one best way to either allow or prohibit tracked OHV use on groomed snowmobile trails. Instead trail managers should focus on key words and phrases within their own snowmobile definition if they wish to pursue (or must fend off) definition or management policy changes. Key components that should be carefully considered within any 'snowmobile' definition include:

1. **Use of the word OR versus the word AND:** Judicious use of the word 'or' versus 'and' is critical when identifying a snowmobile's components within a definition. These two simple words, by themselves, often determine whether or not OHV types fall within or outside a jurisdiction's definition of what is considered a 'snowmobile':
    - **Yes, to allow OHV:** Use the word **'or'** in the definition if the goal is to allow concurrent tracked OHV use on snowmobile trails; Example: '…runners, skis, endless belt or track, or any combination thereof…' Such wording offers a liberal interpretation of a 'snowmobile' and can be inclusive of tracked OHV types.

    - **No, to prohibit OHV:** Use the word **'and'** in the definition if the goal is to prohibit concurrent tracked OHV use on snowmobile trails; Examples: '…skis and track…' or '…and steered by skis…' Such wording offers a strict, conservative interpretation of a traditional 'snowmobile' and is generally exclusive of most tracked OHVs (however a tracked motorcycle steered by a ski may still qualify as a snowmobile if the definition doesn't include otherwise exclusive language).

2. **Weight and/or Width Restrictions:** Vehicle weight and/or width restrictions can be a good tool for managing the specific vehicle type(s) allowed on snowmobile trails. If the snowmobile definition includes weight or width limitations, ensure the prescribed weight and/or width very clearly either allows or prohibits the specific type(s) of vehicles you intend to address. If the existing definition does not include width or weight restrictions, consider adding one or both to help control appropriate vehicle use:
    - **Yes, to allow OHV:** If the goal is to allow some type(s) of tracked OHV use, the restriction should specify:

- An allowed width of 48" or less if the goal is to allow only tracked motorcycles,
- A maximum width of about 52" if the goal is to allow tracked ATVs but exclude UTVs,
- A weight restriction allowing up to about 2,000 pounds if the goal is to allow all tracked UTVs, or
- No width or weight restriction if the goal is to allow all types of tracked OHVs (recognize this could also include personal snow cats, etc.).

- **No, to prohibit OHV:** If the goal is to prohibit all tracked OHV use, use tight width and weight requirements that accommodate all snowmobile models while definitively precluding all types of tracked OHVs.

3. **Specific reference to OHVs:** Some definitions make statements that specifically include or exclude certain or all OHVs from the definition.
   - **Yes, to allow OHV:** Specific reference to the OHV type(s) intended to be allowed should be included in the snowmobile definition. Example: "'Snowmobile' includes an all-terrain vehicle which has been altered or equipped with skis, belt-type tracks, or treads."

   - **No, to prohibit OHV:** A specific exclusionary reference is very effective if the goal is to prohibit OHV use. Example: "'Snowmobile' does not include an all-terrain vehicle which has been altered or equipped with skis, belt-type tracks, or treads."

4. **Be cautious about depending on 'designed for operation over snow' terminology:** This terminology should be directed at the vehicle rather than at its components to be most effective.
   - **Weak Approach:** Many existing definitions state 'designed primarily for operation over snow' after a listing of a snowmobile's components. This is a generally weak approach unlikely to withstand legal challenges since it really addresses only a vehicle's listed components versus the entire original vehicle. Consequently opponents may successfully argue that track conversion kits, too, were also 'intended for over snow operation by their manufacturer.'

   - **Better Approach:** If the goal is to prevent snowmobile trail use by modified OHVs equipped with tracks, the snowmobile definition should be more specifically directed at the vehicle by stating: 'vehicle designed by its original equipment manufacturer (OEM) for operation over snow.'

RECOMMENDATIONS FOR CONCURRENT OHV MANAGEMENT

Local jurisdictions should consider the following factors when deciding to either allow or prohibit concurrent OHV use on groomed snowmobile trails. While the importance of each factor will vary by locale, all should be fully considered for informed and objective local decision making:

1. Funding Assistance: First and foremost, funding assistance from OHV riders must accompany any decision to allow concurrent OHV use on groomed snowmobile trails. There should be no winter concurrent OHV use without some degree of cost sharing or funding support from OHV riders.

Snow trails must be regularly groomed to restore them to a condition where they remain safe and enjoyable to ride. Winter trail grooming is expensive, so any increase in use may likely necessitate more trail grooming – and not because OHVs cause more damage but because traffic by all vehicles simply wears the snow surface out, requiring that it be reprocessed by grooming equipment.

Snowmobile trails are funded solely by snowmobilers' registration fees, user fees, and/or gas taxes; if OHV riders are added to these trails they should be asked to also contribute their fair share toward on-going trail maintenance costs. Additionally many snowmobile trails were developed by volunteers and/or

are operated by volunteer organizations, which further necessitates sensitivity to snowmobilers' 'ownership' in the trail systems they've helped develop and maintain. All trail users should help pay.

Who Manages OHV Permit/License Sales? This question can help determine how difficult it may be to achieve joint funding support from OHV riders for concurrent snowmobile/OHV use. Attaining funding assistance could be less difficult in jurisdictions where snowmobile trails, OHV trails, and their respective permit/license programs are all managed by the same agency or organization. It may be more difficult in jurisdictions where snowmobile and OHV permit/license programs are administered by different entities and/or are directly tied to vehicle titling laws. It will likely be the most difficult to attain OHV funding support in jurisdictions where OHV licensing or permitting is not currently required since OHV riders may not support the 'pay to ride' principle. The key in all situations will be to build a coalition with OHV riders who are supportive of helping fund concurrent use.

Funding assistance from OHV riders is critically important and can be achieved several different ways:

A. **Direct Payment:** by requiring all winter users to purchase some type of snowmobile trail permit/trail pass to operate during winter on groomed snowmobile trails.
B. **Indirectly:** by using funds from a jurisdiction's OHV/ORV account (funds received from the sale of OHV/ORV permits, registrations and/or gas tax) to help support a degree of snowmobile trail grooming, maintenance and operating costs where concurrent winter OHV use is allowed on groomed snowmobile trails during winter.
C. **Grants:** by utilizing federally funded grant programs like the Recreational Trails Program (RTP) or state/provincially funded recreation grants that help manage multiple use on trails.

2. Risk Management: Proper risk management is a critical part of managing any recreational activity. If concurrent OHV use is added to a groomed snowmobile trail system, it may constitute a 'change in use' which could trigger a new risk management assessment by the trail's manager or insurer. Risk management factors, including liability insurance requirements, may be different depending upon whether the trail is managed by a government entity or by a snowmobile club/association.

Government Agency Managed Trail: If a government entity manages the trail, special liability insurance is not generally required for operation of the snowmobile trail. However proper risk management that includes following 'best management practices' for trail management along with regular 'risk assessments' performed by qualified risk management professionals are often required. Trail managers must ensure all new activities or trail management policy changes are closely coordinated with their agency's risk management office.

Snowmobile Club or Association Managed Trail: If a snowmobile club or association provides day-to-day trail management, they typically are required to purchase special liability insurance covering their trail activities. Trail managers must check with their insurance company *prior to any decision to add OHV use (or any other new managed uses) to their snowmobile trail system* to ensure their liability insurance policy includes coverage for concurrent OHV trail use. It is essential that this issue be carefully researched; a formal 'risk assessment' may be required by the insurer.

3. Landowner/Land Manager Permission: Private (including corporate) landowners and public land managers must be involved in any decision to allow concurrent OHV use. Permission for private lands access is always especially sensitive since each landowner is but one link in a chain of many owners required to connect destinations. It takes a lot of effort to make things work, with extreme sensitivity to landowners' varied perspectives and their other land uses during both winter and non-winter months.

A landowner's use of their property during non-winter months is often a principal reason for their owning that property. Since snowmobile trail routes across private lands are generally for 'winter-only' snowmobile use, trail managers must often help ensure steps are taken to prevent use conflicts outside the snowmobiling season – or they risk losing the trail route altogether for snowmobiling.

Unfortunately OHV trespass onto private lands during non-winter months is a leading cause of why landowners cancel snowmobile trail access agreements. Trail managers must recognize that allowing concurrent OHV use on snowmobile trails could potentially further exacerbate what is already a tenuous situation with landowners in some areas. If OHV use is added, trail managers must ensure even greater efforts are made to prevent off-season OHV trespass onto private lands.

While permission from private landowners remains the single largest barrier to establishing concurrent OHV use on groomed snowmobile trails in many areas, it's interesting to note that – in some areas – landowners who have historically opposed OHV use are beginning to change their position to being supportive of concurrent uses – because they own OHVs and want to be able to run them on the trails they're permitting across their private property. This has resulted in those landowners forcing trail managers to compromise and allow joint OHV use during winter – or lose snowmobile access. While this situation is certainly not the norm, it could likely grow as more landowners purchase OHVs. Private lands access will overall remain a constantly moving target, so it's critically important to be continually adaptive to landowners' changing needs and attitudes in order to keep trail access open.

Public lands access requires permissive motorized vehicle use policies, which may or may not treat snowmobiles and other OHVs the same. If a snowmobile trail route is located on what's a designated motorized road or trail during the non-winter season, concurrent winter OHV use may likely be permitted during winter – unless the area's motorized travel plan restricts or eliminates year-round OHV use through 'season of use' dates. However more often than not, designated motorized routes typically provide year-round multiple use trail opportunities.

If an authorized snowmobile trail route on public lands is located on what's a nonmotorized trail during non-winter months, the nonmotorized designation must be respected enforced during the non-winter season. Likewise if a snowmobile trail follows a cross-country route not open to motorized travel the rest of the year, off-season management that prevents unauthorized OHV use must be provided.

The bottom line is that if winter concurrent OHV use is added on a route not open to motorized use during non-winter months, trail managers must work proactively to ensure off-season OHV trespass does not occur. While this issue can generally be addressed with on-the-ground signing, barriers, education and enforcement, it requires concentrated efforts by all trail managing partners to be successful.

4. **Groomed Trail Width:** The grooming implement (drag or tiller) used on a snowmobile trail where concurrent OHV use is allowed must be a key consideration since the implement's width determines the groomed trail's 'managed width.' Unlike other trails, a snowmobile trail must frequently be reestablished after new snowfall or drifting – oftentimes daily, several times weekly, or no less than once weekly. Therefore a single pass with the grooming implement is what ultimately establishes and maintains a snowmobile trail's width at the beginning of the season and between subsequent snowfall or wind events.

   While trail width can be widened with successive grooming passes that overlap and widen the initial groomed trail route, significant time (many hours, up to multiple days) often passes between initial trail establishment/reestablishment and widening passes. Subsequently 'widening passes' can generally not be depended upon to provide wider (than the grooming implement's width) trails that are safe for all allowed vehicles – unless the second widening pass occurs almost immediately after the first pass. This is important since 'groomed trail' status implies/requires a higher standard of care than ungroomed trails.

   Public snowmobile trails with two-way traffic should generally be managed so that a single grooming pass establishes a groomed trail width that safely accommodates at least twice the width of the widest vehicles allowed on the trail. Since all tracked ATVs and UTVs are generally wider than snowmobiles, wider trails (and therefore wider grooming equipment) may likely be required when concurrent OHV use is allowed.

The following minimum grooming implement widths should be used, according to the width of vehicles allowed on the trail, to provide minimum sufficient trail width for two-way vehicle traffic to meet. Wider grooming equipment should be considered when possible to increase the margin of safety.

Snowmobile-only Trails: A modern snowmobile is generally 48 inches or less in width; allowing twice this width (96 inches) for two-way traffic suggests that a grooming implement at least 8'-6" (102 inches) wide should be used on groomed trails where only snowmobile use is allowed (no tracked ATV/UTV use is permitted). While an 8'-6" wide implement provides minimum required clearance, a 9-feet wide implement would provide better width for two-way snowmobile traffic.

Trails with Tracked ATV Use: The tracked ATV used for this project's field test was 52 inches wide; allowing twice this width (104 inches) for two-way traffic suggests that a grooming implement at least nine feet (108 inches) wide should be used on groomed trails where tracked ATV use is allowed (but no UTV use is permitted). While a 9-feet wide implement provides minimum required clearance, a 10-feet wide implement would provide better width for two-way tracked ATV traffic.

Trails with Tracked UTV Use: The tracked UTVs used for this project's field test were 68.5 to 70.5 inches wide; allowing twice this width (137 to 141 inches) for two-way traffic suggests that a grooming implement at least twelve feet (144 inches) wide should be used on groomed trails where tracked UTV use is allowed. While a twelve feet wide implement provides minimum required clearance, a grooming implement that is at least 12'-6" wide or wider would provide better width for two-way tracked UTV traffic.

Tracked OHV use (other than tracked motorcycles) clearly requires wider groomed trail widths than what is required for snowmobile-only trails. This creates a potential need for wider grooming implements, which could create at least two new issues for trail managers:

A. **Increased Clearing Width:** A trail's 'clearing width' is its narrowest opening along the trail between gate posts, bridge abutments, trees, rock outcrops, etc. This narrowest width, even if it's at only one location, dictates the maximum width of trail grooming equipment since it must be able to cover 100% of all groomed trails. Consequently 'clearing width' may need to be enlarged on some trails if implement width needs to be increased to provide wider trails for tracked OHV use. Wider equipment could in turn require tree removal, widening of gates, removal of outcroppings, and/or widening of bridges in order to accommodate passage for nine to twelve feet wide (or even wider) grooming implements. The trail manager will subsequently incur additional costs for required trail widening work; there could also potentially be increased environmental impacts from tree removal and the other trail widening efforts.
B. **Increased Operating Costs:** Trail grooming operating costs typically increase as the width of grooming equipment increases. Pulling a wider grooming implement, particularly a 10 to 12-feet plus wide drag, could require more tractor horsepower. Using wider grooming equipment typically consumes more fuel and may also lead to higher maintenance and repair costs due to the tractor working harder to pull heavier implements. Overall grooming costs will likely increase.

5. **Trail Grooming:** Irrespective of a trail's groomed width, an evenly compacted base is crucial to trail durability and the ability to successfully increase use. Frequent trail grooming will be required at a level commensurate with a trail's overall traffic volume, as well as the frequency and amounts of new snowfall received. Trails with heavy traffic and/or regular big snowfalls require more frequent and aggressive grooming repetitions as use increases compared to trails where traffic is less or snowfall less frequent. Unless a trail has generally low traffic or is in a low snowfall area, it's likely that adding new tracked OHV use on a groomed snowmobile trail will necessitate increased grooming frequencies as OHV use increases. These additional grooming repetitions will increase operating costs.

6. **Potential Trail Use Patterns:** Potential trail use patterns that consider possible mixtures of vehicles (snowmobiles as well as OHV types) along with projected total traffic volumes from each vehicle type should be analyzed prior to establishing or expanding concurrent OHV use on a trail.

   The Trail Manager Survey showed existing OHV use on concurrent use trail systems in the U.S. ranges from 'minimal to nil;' most managers estimate winter OHV use to be in a range between '5 to 10 percent' of total trail use where it's currently allowed. Many trail managers commented that the majority of winter OHV use typically occurs within a few miles of parking areas or communities, contrasted with snowmobilers who typically venture longer distances during a typical outing. Survey feedback also indicated the volume of winter OHV use could potentially be higher in low to marginal snow areas, in low snowfall years, and during periods of warmer (cold but not frigid) temperatures.

7. **Potential Partnerships:** The potential for local partnerships should be considered when weighing the pros and cons of concurrent OHV use. Where common ground can be found, coalitions working together can generally help protect and enhance overall motorized recreation access better than individual groups working alone. While concurrent use is certainly not appropriate for every local situation, there are likely suitable opportunities in many areas which could advance multiple use objectives. When possible, these opportunities should be given due consideration.

   Beyond the local perspective, it's important to cultivate alliances between snowmobile and OHV users. It's estimated there are over 12 million OHVs in the United States, and that number continues to grow every year. Comparably there are 1.4 million registered snowmobiles in the U.S. and only 2.7 million worldwide. Coalitions of snowmobilers working where appropriate with OHV riders have the potential to be very influential. And since the 12 million OHV owners are scattered across all 50 states and snowmobilers cover only about half of the country, an alliance can help broaden snowmobiling's support base.

   There is potentially much to be gained from snowmobilers strengthening national alliances with other user groups. But since success begins and is ultimately judged at the grassroots level, local partnerships must not only exist but also function well – otherwise even the best national alliances are fruitless. Since 'divide and conquer' continues to be a tactic used by motorized opponents, the old adage 'united we stand, divided we fall' continues to be an important consideration for future snowmobiling access.

8. **Shoulder Season and Off-Season Management:** Many OHV owners are familiar with snowmobile trails because they are either current or former snowmobile owners. Consequently they sometimes mistakenly believe OHVs can be operated on snowmobile trail routes, winter or otherwise, simply because in their mind they are 'public trails.' This familiarity sometimes requires aggressive education efforts to help safeguard against improper use of trail routes during shoulder seasons, as well as year-round if OHV use is prohibited. If education efforts do not sufficiently prevent unauthorized use, more aggressive on-the-ground signing, law enforcement, and/or gate/barrier installations may be required.

   If tracked OHV use is allowed, there should be a distinct 'snowmobile season' during which snowmobile trails are groomed and OHVs are allowed. Outside this 'season' snowmobile trails themselves cease to exist and consequently trail routes either transition to other prescribed uses or they cease to exist until the next snow season. Concurrent OHV use requires that trail managers provide extra effort to:

   A. Educate all users as to when snowmobile trail routes are open or closed to various uses.
   B. Work with landowners and land managers to heighten awareness and sensitivity to other prescribed uses along trail routes, including during non-winter seasons.
   C. Work with landowners and land managers to help prevent unauthorized OHV use on snowmobile trail routes during the non-winter seasons.

CHAPTER 2: SURVEY OF TRAIL MANAGERS

BACKGROUND AND METHODOLOGY

A Survey of Trail Managers was conducted by Trails Work Consulting between August 2013 and March 2014 (2013 survey) to collect current information and identify potential issues related to concurrent off-highway vehicle (OHV) use on groomed snowmobile trails during the winter season. For this survey, the term 'OHV' included ATVs, UTVs/ROVs (also known as side-by-sides), and off-road motorcycles, whether equipped with either wheels or tracks: A survey example is available in Appendix A.

Specific survey goals included:

1. Identify whether individual jurisdictions across the United States and Canada currently allow or prohibit some type of concurrent snowmobile/OHV use on groomed snowmobile trails, and if allowed, try to quantify use levels.
2. Identify how concurrent snowmobile/OHV use is either allowed or prohibited in each state, province or territory.
3. Determine if statistics are available for crash or social conflict occurrence levels related to concurrent snowmobile/OHV use on groomed snowmobile trails.
4. Collect examples of special management practices used by jurisdictions which allow concurrent snowmobile/OHV use on groomed snowmobile trails.
5. Identify whether individual jurisdictions experience off-season impacts to snowmobile trail routes from unauthorized non-winter OHV use, and try to quantify specific impact levels related to specific issues.

A similar survey was conducted by Trails Work Consulting in 2005-2006 (2006 survey) on behalf of the International Association of Snowmobile Administrators (IASA) and ACSA. That survey addressed only wheeled ATV use on groomed snowmobile trails (Evaluation of ATV Use on Groomed Snowmobile Trails; IASA/ACSA, 2006 http://www.snowmobileinfo.org/snowmobile-access-docs/Evaluation-of-ATV-Use-on-Groomed-Snowmobile-Trails.pdf). Consequently the 2013 survey focused on tracked OHV use trends during winter while also trying to gauge if there have been changes in winter OHV use trends since the 2006 survey.

A total of 34 jurisdictions across the U.S. and Canada host groomed snowmobile trails and were surveyed for this new evaluation. Four Snowbelt states (Arizona, Nebraska, Nevada and Ohio) have zero miles of groomed snowmobile trails so were excluded from the 2013 survey.

The 2013 survey was initially e-mailed to IASA members (trail managers) on August 6, 2013 directly from IASA's Treasurer. A second notice/first reminder was e-mailed from Trails Work Consulting in early October, with a third notice being e-mailed from Trails Work on November 19, 2013 to thirteen jurisdictions which had not yet responded. More directed efforts to collect outstanding information from missing jurisdictions in the U.S. then continued through March 2014.

A total of 26 jurisdictions (21 states, four provinces and one Canadian territory) eventually responded to the 2013 survey, representing an overall response rate of 76.5% as outlined in Table 2-1. The 21 responses from U.S. jurisdictions represents a 91.3% participation rate while the five total Canadian responses represents a 45.5% participation rate.

Table 2-1: Survey Response Rate

Country	Jurisdictions with Groomed Snowmobile Trails	Number of Survey Responses	Survey Response Rate
United States	23	21	91.3%
Canada	11	5	45.5%
Total	**34**	**26**	**76.5%**

Comparatively the 2006 survey had an overall 100% response rate from all jurisdictions that actively manage groomed snowmobile trails in the U.S. and Canada. Consequently, for some questions, missing responses from two states (Alaska and Wisconsin) and seven Canadian jurisdictions (Alberta, British Columbia, Manitoba, Newfoundland / Labrador, Prince Edward Island and Quebec) have been substituted with web research and their 2006 survey data to fill in missing gaps. While this is unfortunate and certainly less than desirable, it does allow a qualified 'whole picture' glimpse of conditions in groomed snowmobile trail jurisdictions – with the understanding that data from these nine missing jurisdictions (1) may be outdated if local policies have changed since 2006, and (2) does not include full perspectives about tracked OHV use.

SURVEY RESULTS

Concurrent Snowmobile/OHV Use – Where is it Allowed?

Over two-thirds of jurisdictions with groomed snowmobile trails (24/68.6%) allow (or cannot prevent) some type of concurrent snowmobile/OHV use, while eleven (31.4%) jurisdictions prohibit any type of concurrent snowmobile/OHV use on groomed snowmobile trails. As outlined in Table 2-2, fifteen of 23 states (65.2%) allow some type of concurrent use while nine of twelve (75%) Canadian jurisdictions allow (or in all nine cases, cannot prevent due to Crown land use policies) some type of concurrent OHV use.

Table 2-2: Number of Jurisdictions Open to SOME TYPE of Concurrent OHV Use

Country	# of Jurisdictions with Groomed Snowmobile Trails	Number Open to Some Type of Concurrent OHV Use	% Open to Some Type of Concurrent OHV Use
United States	23	15	65.2%
Canada	12	9	75.0%
Total	**35**	**24**	**68.6%**

Almost one-third (31.9%) of the 128,000 miles of groomed snowmobile trails in the U.S. and 112,000 kilometers of groomed trails in Canada were identified as being open to some type of concurrent winter OHV use. Table 2-3 shows that in the U.S over 45,000 miles (35.5% of total miles) are open to concurrent winter use while more than 28,000 kilometers (25.4% of total kilometers) of Canadian snowmobile trails are open to some type of concurrent OHV use.

Table 2-3: Total Miles/KM of All Groomed Trails – Open to SOME TYPE of Concurrent OHV Use

Country	Total Miles/Kilometers of All Groomed Trails	Total Miles/Kilometers Open to Some Type of Concurrent OHV Use	Total % of All Trails Open to Some Type of Concurrent OHV Use
United States	128,129 miles	45,470 miles	35.5
Canada	111,966 kilometers	28,410 kilometers	25.4
Total	**197,701 miles / 318,170 km**	**63,123 miles / 101,587 km**	**31.9**

Concurrent snowmobile/OHV use is most prevalent in the West with 88.9% of western states (8 of 9) – due to inclusive snowmobile definitions and permissive U.S. Forest Service travel plans – and 75% of western provinces/territories (3 of 4) allowing some type of concurrent snowmobile/OHV use on groomed snowmobile trails. Comparatively 62.5% of Midwestern states (5 of 8) and 33.3% of Northeastern states (2 of 6) allow some type of concurrent use. 100% of the central/eastern Canadian provinces allow/cannot prohibit some type of concurrent use while half of the Canadian Maritime provinces (2 of 4) allow (cannot prohibit) some type of concurrent OHV use.

Table 2-4 shows there are a total of 103,298 groomed miles of snowmobile trail within the fifteen states that allow some type of concurrent OHV use. These 'Yes' states have a total of 45,470 miles of trail open to concurrent snowmobile/OHV use, representing 44% of total groomed miles within these fifteen states. The seven Canadian provinces and one territory which allow (or cannot prevent) some type of concurrent OHV use have a total of 28,410 kilometers of trail classified as open, representing 29.3% of the 96,800 kilometers of groomed trail available in these jurisdictions. Overall 38.6% of all trails within the twenty-three 'Yes' jurisdictions are open to some type of concurrent winter OHV use.

Table 2-4: 'Yes' Jurisdictions – Total Miles/KM Open to SOME TYPE of Concurrent OHV Use

'Yes' Jurisdictions	Total Miles/Kilometers of Trails in 'Yes' Jurisdictions	Total Miles/Kilometers Open to Some Type of Concurrent Use	Total % of 'Yes' Area Trails Open to Some Type of Concurrent Use
U.S. (15 States)	103,298 miles	45,470 miles	44.0
Canada (8 areas)	96,800 kilometers	28,410 kilometers	29.3
Total	**163,447 mi / 263,042 km**	**63,123 mi / 101,587 km**	**38.6**

While the comparison of 'Total Miles/Kilometers Open to SOME TYPE of Concurrent Use' in Table 2-4 provides a snapshot of how many miles or kilometers are open to concurrent use, raw percentages don't always provide full or proper context. Consequently it's important to also look at the different 'types' of OHV use allowed in individual jurisdictions to better understand differences and overall perspectives. A prime example would be Montana and South Dakota where, even though 100% of their trails are classified as 'open' to OHV use, they're open to only 'tracked motorcycles' while all other winter OHV use is prohibited.

In respect to SOME concurrent use being allowed, the degree of allowance varies widely between jurisdictions. At the top of the range nearly a third of all jurisdictions allow SOME TYPE of concurrent use on '100%' of their groomed trails. These twelve jurisdictions include: Alaska, Alberta, British Columbia, Idaho, Maine, Manitoba, Montana, Newfoundland / Labrador, South Dakota, Utah, and Wyoming. At the other end of the spectrum Minnesota and New Brunswick allow concurrent winter OHV use on only 0.4% and 0.1% of their groomed snowmobile trails, respectively. On average some type of concurrent use is allowed on about 32% of all snowmobile trails.

Table 2-5 on the next page provides a breakdown for jurisdictions that allow some level of concurrent use on groomed snowmobile trails. While numbers for some jurisdictions are estimates, they represent the best available information. And even though some would prefer that a portion of these trails not be open to concurrent use, the numbers in Table 2-5 reflect the total extent of trails classified as 'open' to concurrent OHV use – irrespective of trail manager or user group preferences.

Table 2-5: Jurisdictions That Allow SOME Type/Level of Concurrent Snowmobile/OHV Use on Groomed Snowmobile Trails – Ranked by Total Miles or Kilometers Classified as Open

State	Total Miles of Groomed Trails	Total Concurrent Miles Open	% of Total
Maine	13,995 miles	13,995 miles	100
Oregon	6,410 miles	5,900 miles	92.0
Idaho	5,500 miles	5,500 miles	100
Wisconsin*	19,028 miles	4,215 miles	22.2
Montana	4,000 miles	4,000 miles	100
Colorado	2,906 miles	2,906 miles	100
Wyoming	1,904 miles	1,904 miles	100
South Dakota	1,805 miles	1,805 miles	100
Michigan	6,400 miles	1,600 miles	25.0
Utah	1,200 miles	1,200 miles	100
New Hampshire	7,000 miles	1,000 miles	14.3
California	2,000 miles	1,000 miles	50.0
Alaska*	350 miles	350 miles	100
Minnesota	22,000 miles	95 miles	0.4
Iowa	8,800 miles	0	0
Total U.S.:	**103,298 miles**	**45,470 miles**	**44.0**
Province/Territory	**Total KM of Groomed Trails**	**Total Concurrent KM Open**	**% of Total**
Manitoba*	11,000 km	11,000 km	100
Alberta*	5,000 km	5,000 km	100
British Columbia*	4,500 km	4,500 km	100
Newfoundland/Labrador*	4,500 km	4,500 km	100
Ontario	32,000 km	1,600 km	5.0
Quebec*	31,900 km	1,500 km	4.7
Yukon	600 km	300 km	50
New Brunswick	7,300 km	10 km	0.1
Total Canada:	**96,800 km**	**28,410 km**	**29.3**
Grand Total:	**163,447 miles/263,042 km**	**63,123 miles/101,587 km**	**38.6**

* Jurisdiction's data is based upon its 2006 Survey response since it did not respond to the 2013 survey

Table 2-6 on the next page provides a summary of the exact type of OHV use allowed on groomed snowmobile trails in each jurisdiction. Since Canadian response was low, discussion focuses on the 15 states for which this information is available. While this table helps put the 'allowed OHV uses' in better context for each state, the survey did not collect data as to how many miles are open to each type of use in each state.

A summary of how much of each type of wheeled or tracked OHV use is allowed during winter on groomed snowmobile trails by the fifteen 'open' states shows:

Wheeled OHVs

- 73% of the 'open' states allow wheeled ATVs
- 47% of the 'open' states allow wheeled UTVs
- 27% of the 'open' states allow wheeled motorcycles

Tracked OHVs

- 73% of the 'open' states allow tracked ATVs
- 67% of the 'open' states allow tracked UTVs
- 73% of the 'open' states allow tracked motorcycles

Table 2-6: TYPES of Concurrent OHV Use Allowed (somewhere, but not necessarily everywhere) on Groomed Snowmobile Trails, by Jurisdiction

Please refer to Table 2-5 to get a perspective on the actual % of trails in each jurisdiction on which OHV use is allowed.

Jurisdiction	Wheeled ATV	Wheeled UTV	Wheeled Cycle	Tracked ATV	Tracked UTV	Tracked Cycle
Alaska*	YES	No	No	YES	YES	YES
California	YES	No	No	YES	YES	YES
Colorado	YES	YES	YES	YES	YES	YES
Idaho	YES	No	No	YES	YES	YES
Iowa	YES	Yes	No	YES	YES	No
Maine	No	No	No	YES	YES	YES
Michigan	YES	YES	YES	YES	YES	YES
Minnesota	YES	No	No	No	No	No
Montana	No	No	No	No	No	YES
New Hampshire	YES	YES	No	YES	No	No
Oregon	YES	YES	YES	YES	YES	YES
South Dakota	No	No	No	No	No	YES
Utah	YES	YES	YES	YES	YES	YES
Wisconsin*	YES	YES	No	No	No	No
Wyoming	No	No	No	YES	YES	YES
Total U.S.:	**11**	**7**	**4**	**11**	**10**	**11**
Alberta*	YES	No	No			
British Columbia*	YES	No	No			
New Brunswick	YES	YES	No	No	No	No
Newfoundland/Labrador*	YES	No	No			
Manitoba*	YES	No	No			
Ontario	YES	No	No	No	No	No
Quebec*	YES	No	No			
Yukon	YES	YES	YES	YES	YES	YES
Total Canada:	**8**	**2**	**1**	**1**	**1**	**1**
Grand Total:	**19**	**9**	**5**	**12**	**11**	**12**

* Denotes that jurisdiction's data is based upon web research and/or its 2006 Survey response, or is blank in respect to tracked vehicles, since it did not respond to the 2013 survey

Comparison to 2005-2006 Survey

Table 2-7: Comparison of Total Miles/KM of All Groomed Trails – Open to SOME TYPE of Concurrent OHV Use (2006 Survey looked at only wheeled ATVs, 2013 Survey looked at all 3 OHV types)

Country	Total Miles/Kilometers of All Groomed Trails		Total Miles/Kilometers Open to Some Type of Concurrent OHV Use		Total % of All Trails Open to Some Type of Concurrent OHV Use	
	2006 Survey	2013 Survey	2006 Survey	2013 Survey	2006 Survey	2013 Survey
United States	122,819 mi	128,129 mi	27,012 mi	45,470 mi.	22.0	35.5
Canada	120,156 km	111,966 km	42,060 km	28,410 km	35.0	25.4
Total	**197,480 mi / 317,830 km**	**197,701 mi / 318,170 km**	**53,147 mi / 85,532 km**	**63,123 mi / 101,587 km**	**26.9**	**31.9**

Table 2-7 above compares overall numbers from the 2006 and 2013 surveys. While the 2006 survey addressed only wheeled ATVs, the 2013 survey included all three types of OHVs. This broadened definition that includes tracked OHVs likely accounts for the additional 18,458 miles (68% more) in the United States classified as open to some type of OHV use. While overall numbers for Canada show a decrease in total kilometers open to some type of OHV use, poor response to the 2013 survey by Canadian jurisdictions likely limits this particular comparison's reliability.

Jurisdictions that Responded 'NO' Trails are Open to Any Concurrent Snowmobile/OHV Use

A total of eleven jurisdictions indicated they do not allow any type or level of concurrent OHV use on groomed snowmobile trails. This includes eight states with a total of 24,831 miles of groomed snowmobile trails and three provinces with a total of 15,166 kilometers of groomed trails. Table 2-8 below lists the jurisdictions that do not allow any type or level of concurrent OHV use.

Table 2-8: Jurisdictions That Do Not Allow Any Type/Level of Concurrent Snowmobile/OHV Use on Groomed Snowmobile Trails

State	Miles of Groomed Trails
Illinois	361
Indiana	200
Massachusetts	2,000
New York	10,500
North Dakota	2,800
Pennsylvania	1,270
Vermont	4,700
Washington	3,000
Total U.S.:	**24,831miles**
Province	**Kilometers of Groomed Trails**
Nova Scotia	4,200
Prince Edward Island*	966
Saskatchewan	10,000
Total Canada:	**15,166 kilometers**
Grand Total:	34,255 miles/55,128 km

* Based upon 2006 Survey data since that province did not respond to the 2013 survey

How is Concurrent Use Allowed or Prohibited?

Reasons for YES: The fifteen states which responded 'Yes, some type or degree of concurrent OHV use is allowed' indicated it is done through one of the following methods. A total of nineteen 'reasons' were given since four states indicated they use multiple methods to allow concurrent OHV use:

Agency Policy (8)	42%
Legislation (8)	42%
No Formal Action to Prohibit (3)	16%
Agency Rule or Regulation (0)	0%
Other (0)	0%

Five Canadian jurisdictions which did not respond to this survey previously indicated in the 2006 Survey that concurrent use was allowed solely 'because there was no formal action to prohibit since Crown lands are open to all uses.' Consequently, had these provinces responded, it is likely the three methods of 'how' concurrent use is allowed would be evenly split between policy, legislation and no formal action to preclude.

Specific reasons given by survey respondents as to 'why' concurrent OHV use is currently allowed include:

- Registration policy allows a tracked ATV to register as a sled, plus landowners want them
- State definition of snowmobile allows it, as long as is less than 800 pounds
- No restriction on snowmobile trail usage anywhere by vehicles (except in one community)
- Legislation, plus landowner determines who can use the trails (and many landowners are OHV riders)
- Legislation, allowing tracked motorcycles to fit the snowmobile definition (2)
- Very limited trial 'pilot program' due to: 1) an aggressive local OHV user group, 2) stipulation that wet areas can only be used when ground is frozen, and 3) is in a high unemployment area, so users have lots of time on their hands to go ride OHVs during winter
- In the Upper Peninsula (MI), 'unless posted closed' all forest roads are open to ORV use
- Snowmobile definition fits most all tracked vehicles
- Allowed if registered as a snowmobile
- Increased demand for winter ATV trails
- Small amount is allowed, based upon local policies and landowners
- Forest Service policy (2)
- In Canada, a 'Free Use of Crown Land' policy generally precludes limiting use to only one group so OHV use cannot typically be prohibited even when it is unwelcome by trail managers

It is noteworthy that about half of all responses indicated some type of private or public 'landowner preference' being a driving factor as to why concurrent OHV use is allowed.

Reasons for NO: The eleven jurisdictions which responded 'No, concurrent OHV use is not allowed on groomed snowmobile trails' indicated their prohibition was done through one of the following methods. A total of thirteen 'reasons' were given by the eleven jurisdictions since two states and one province indicated multiple methods by which they prohibit concurrent OHV use:

Agency Rule or Regulation (6)	46%
Legislation (3)	23%
Agency Policy (3)	23%
No Formal Action to Allow (1)	8%
Other (0)	0%

Specific reasons given by survey respondents as to 'why' concurrent OHV use is prohibited on groomed snowmobile trails includes:

- ATVs are not registered, so there is no liability insurance
- Mainly landowner concerns and perceptions about ATV use on their land
- OHVs are prohibited on all state DNR land/trails
- Snowmobile trails are funded 100% by snowmobile funds with no other OHV funding or state general funds being available; OHVs are also not considered to be compatible with snowmobile use
- Most snowmobile trails are on leased private lands, so the OHV prohibition limits potential conflict with farmland uses, etc.
- Clubs only get approval for snowmobile trails on private property, so OHV use is not allowed
- Our agency rules state 'no ATVs' on lands managed by state parks; also our snowmobile trails are only insured for sled use
- Our trail permits are sold only to snowmobiles

It is again noteworthy that, similar to reasons why concurrent use is allowed, about half of all responses indicated some type of private or public 'landowner preference' being a driving factor as to why jurisdictions prohibit concurrent OHV use. Clearly irrespective as to whether 'yes' and 'no,' landowner preference is a primary deciding factor about which types of trail uses are allowed.

What Is The Typical Season During Which Concurrent Use Is Allowed?

All survey respondents indicated concurrent OHV use on groomed snowmobile trails is allowed during the same time period as their primary snowmobile season. No other operating parameters were indicated regarding seasonal or special timing 'conditions of use.'

Wisconsin indicated in the 2006 Survey that some counties have minimum snow depth or temperature requirements for regulating wheeled ATV operation during winter, but did not formally respond to the 2013 Survey.

Are There Width Or Weight Restrictions For OHVs Allowed On Groomed Snowmobile Trails?

Six states indicated they have width or/and weight restrictions to help manage OHV use on groomed snowmobile trails, as outlined in Table 2-9.

Table 2-9: OHV Width and Weight (machine only) Restrictions

State	Machine Width Limit	Machine Weight Limit
Idaho		2,000 pounds
Maine	60 inches	
Montana	48 inches	
New Hampshire	50-62 inches	
South Dakota	48 inches	1,400 pounds
Utah		800 pounds

How Much OHV Use Actually Occurs On Trails Open To Concurrent Use?

Actual concurrent winter use on groomed snowmobile trails was generally characterized by survey respondents to be 'heavy to moderate' snowmobile use with 'minimal to nil' OHV use. Use levels were further characterized by respondents to range from being generally '90% to 95%' snowmobile use compared to only '5% to 10%' involving OHV use. One state responded that its actual winter use is '99+% snowmobile and far less than 1% from tracked motorcycles.'

Two localized exceptions to the overall heavily predominate snowmobile use trend were noted: 1) two OHV parks in New Hampshire were reported to have a '50/50' mix of snowmobile/OHV use during winter, and 2) the small 10-kilometer 'pilot program' trail in New Brunswick reported a '30/70' mix of snowmobile/OHV use. Since both examples relate to contained areas much smaller in size than typical snowmobile trail systems, this localized heavier use pattern likely correlates with a key finding from the 2006 survey: winter OHV riders typically travel much shorter distances from trailheads than what snowmobile riders do.

CRASH AND CONFLICT RATE INFORMATION

How Does the OHV 'Crash Rate' On Concurrent Use Trails Compare To the Crash Rate on Snowmobile-Only Trails?

Very little data is available to help credibly answer this question, as was also the case during the 2006 survey. Only twelve respondents (46%) answered this question. They indicated they believe the OHV crash rate in their jurisdiction, compared to snowmobiles, on concurrent use trails to be:

Unknown (7)	58.3%	About the Same (0)	0%
Lower (3)	25.0%	Higher (0)	0%
None Known (2)	16.7%		

How Does the 'Social Conflict' Incident Rate on Concurrent Use Trails Compare To the Incident Rate on Snowmobile-Only Trails?

Very little data is available to help credibly answer this question, as was also the case during the 2006 survey. The twelve respondents (46%) who answered this question indicated they believe the incident rate on concurrent use trails in their jurisdiction is:

Unknown (6)	50.0%	About the Same (1)	8.3%
Lower (2)	16.7%	Higher (1)	8.3%
None Known (2)	16.7%		

OFF-SEASON IMPACTS

Does Your Jurisdiction Currently Experience Off-Season (spring, summer, and/or fall) Impacts from OHV Use on Established Snowmobile Trail Routes?

Table 2-10 shows eighteen (18) jurisdictions (72%) indicated 'Yes, they experience off-season impacts' to their snowmobile trail routes from non-winter OHV use. Another seven (7) jurisdictions (28%) indicated they 'do not' experience off-season impacts to their snowmobile trails from OHV use.

Table 2-10: Summary of Jurisdiction Responses Regarding Off-Season Impacts

State	Off-Season Impacts Are Experienced	
	YES	NO
California	X	
Colorado		X
Idaho		X
Illinois		X
Indiana		X
Maine	X	
Massachusetts	X	
Michigan	X	
Minnesota	X	
Montana		X
New Hampshire	X	
New York	X	
North Dakota	X	
Oregon		X
Pennsylvania	X	
South Dakota	X	
Utah	X	
Vermont	X	
Washington		X
Wyoming	X	
Province/Territory	**Off-Season Impacts Are Experienced**	
	YES	**NO**
New Brunswick	X	
Nova Scotia	X	
Ontario	X	
Saskatchewan	X	
Yukon	X	
Total	**18**	**7**

The survey asked the trail managers who indicated 'Yes, they do have off-season impacts' to rank ten potential 'impacts' as to whether they are an extreme, major, or slight problem, or not a problem in their jurisdiction. Remember that 28% of survey respondents said they have no off-season impacts, so this summary quantifies the impacts expressed by the 72% who said they do have some non-winter impacts from OHV use that affect their snowmobile trail routes.

Private property trespass by OHV users during non-winter seasons was ranked as the overall top issue, being evenly split between the 'major to extreme problem' range and the 'slight problem to not a problem' range. Overall, all off-season impacts generally averaged in the 'slight problem to not a problem' range. A summary of all responses and overall average rankings is shown in Table 2-11.

Table 2-11: Off-Season Impacts – Average and Individual Rankings of Degree of Problem; the 'most frequent' responses' are highlighted

Off-Season Impact	Average Score / Degree of Problem	Number of Responses: 3 - Extreme Problem	Number of Responses: 2- Major Problem	Number of Responses: 1 - Slight Problem	Number of Responses: 0 - Not a Problem
Private Property Trespass: Permission only for snowmobiles	1.67 A Slight Problem	5	4	**7**	2
Severe Resource Damage from OHV use during the off-season/non-winter	1.47 A Slight Problem	3	3	**10**	1
Public Land Use Issues: Agency permission only for winter use of route	1.44 A Slight Problem	4	2	**7**	3
Moderate Resource Damage from OHV use during the off-season/non-winter	1.25 A Slight Problem	1	5	**7**	3
Slight Resource Damage from OHV use during the off-season/non-winter	1.19 A Slight Problem	1	3	**10**	2
Conflicts with Livestock Grazing, gates left open, etc.	0.69 Slight to Not a Problem	1	1	6	**8**
Harassment of Livestock	0.50 Slight to Not a Problem	1	1	3	**11**
Conflicts with Wildlife Production and Rearing Areas	0.50 Slight to Not a Problem	0	0	**8**	**8**
Harassment of Wildlife	0.25 Slight to Not a Problem	0	0	4	**12**
Conflicts with Nonmotorized Use of trail route during the off-season/non-winter	0.38 Slight to Not a Problem	0	1	7	**8**

Chapter 3: 2014 Field Test Comparisons

OHV FIELD TESTING BACKGROUND

A field test comparison between snowmobiles and tracked OHVs was conducted in March 2014 to help build upon OHV impact information collected through a similar project in 2005-2006 (2006 project). The 2006 project (Evaluation of ATV Use on Groomed Snowmobile Trails, available at http://www.snowmobileinfo.org/snowmobile-access-docs/Evaluation-of-ATV-Use-on-Groomed-Snowmobile-Trails.pdf) was conducted through a cooperative project between the Federal Highway Administration (FHWA), the American Council of Snowmobile Associations (ACSA), and the International Association of Snowmobile Administrators (IASA). It included extensive field testing at fifteen different sites in five states that compared various impacts created by snowmobiles and wheeled ATVs operated on the same groomed snowmobile trails.

While the 2006 project focused on wheeled ATV-snowmobile comparisons, the 2014 field test focused on tracked OHV-snowmobile comparisons to help understand potential differences between snowmobile and tracked OHV impacts when they're operated on the same groomed trails. The 2014 field study was structured similar to the 2006 project to build upon that body of data with similar testing protocols. New information gained from the 2014 test observations were used to develop a range of potential management recommendations (see Chapter One) to guide local trail managers' response to growing OHV use.

2014 FIELD TEST PURPOSE AND GOALS

One limited field test was conducted on March 14, 2014 to begin collecting data related to potential impacts from tracked OHV use on groomed snowmobile trails. Its sole purpose was to expand information currently available to local officials while gauging whether further testing may be desirable. The intent of this project was not to either encourage or discourage concurrent OHV use of any type on groomed snowmobile trails.

Specific 2014 field study goals included:

1. Collect data related to the 'depth' of impressions observed on the groomed trail surface from snowmobile and tracked OHV operation related to 'fast/aggressive' starts, stops, and pass-by on straight-away sections of trail.
2. Collect data related to the 'depth' of impressions observed on the groomed trail surface from snowmobile and tracked OHV operation during 'fast/aggressive' pass-by while negotiating turns.
3. Collect data comparing the distance required to stop snowmobiles and tracked OHVs operating at fast/aggressive speeds on the same groomed trail surface.
4. Evaluate whether additional field testing of tracked OHVs may be desirable in the future.

It was not this project's objective to measure each and every indentation observed in the trail's surface; rather it documented only the 'worst-case' (deepest) depth impressions observed from aggressive OHV and snowmobile operation. Importantly, information from this 2014 field comparison (as well as the 2006 evaluation) should be viewed as only 'one snapshot in time' which recorded observed impacts as they occurred at that particular location under the very specific conditions documented in this report.

This field test was not intended to portray a comprehensive evaluation of all potential OHV use issues or scenarios. It documented conditions present at the time and impacts observed under those conditions. These particular results are certainly subject to change under other snow and weather conditions, with different vehicles, and/or with different vehicle operators. Nonetheless this particular snapshot provides new information that can help further informed discussions regarding concurrent tracked OHV/snowmobile management. It also helped define additional needs for supplemental research.

FIELD TEST PROCEDURES AND TESTING PROTOCOL

Trails Work Consulting conducted this controlled field test at St. Germain, Wisconsin on March 14, 2014 to collect data related to the goals outlined above. Testing was done on the Bo-Boen (high line) Trail and the Bo-Boen Loop, both which had been regularly groomed throughout the entire winter season, to ensure data was collected from real-life public trail situations. This required extra precautions including advance warning signs, traffic cones, and flaggers at each end of the test course to ensure public safety.

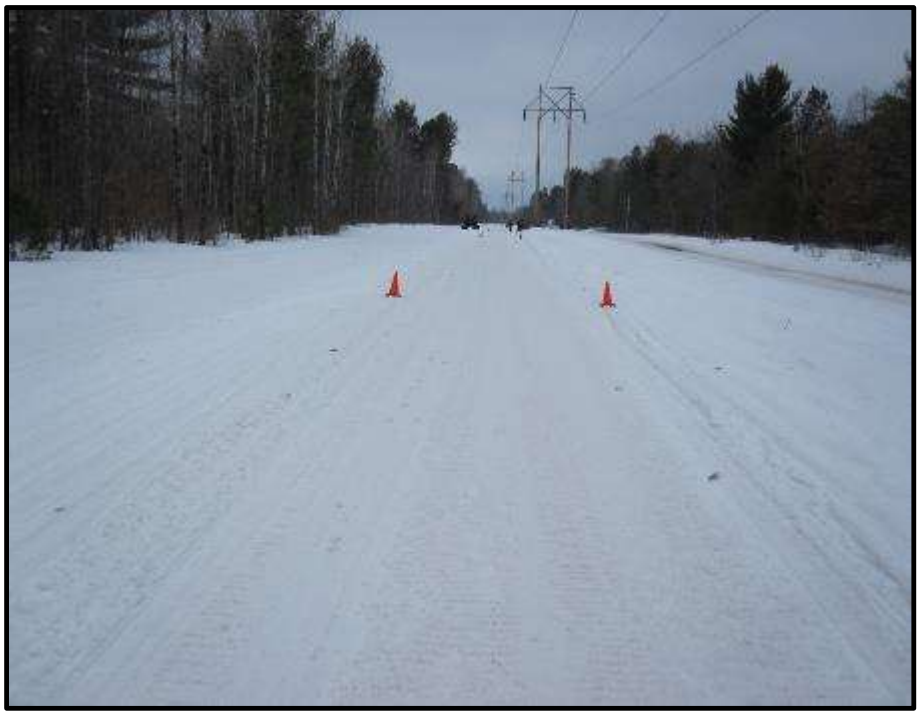

Photo 1: Bo-Boen (high line) Trail – test site #1

Three OHVs (one ATV and two UTVs) fitted with Camoplast tracks were provided for the field testing by Test Inc. (Jim Kedinger) on behalf of Camoplast. Two snowmobiles were provided for this comparison test by Jim Willey, President of the Iowa State Snowmobile Association and Chair of ACSA's Tracked OHV Trail Impacts Study Committee. Technical data for the five test vehicles is provided in Table 3-1.

Table 3-1: Technical Data for 2014 Test Vehicles

Vehicle General Description	Track Size	Total Surface on Snow	Tracked Vehicle PSI
Snowmobiles			
Snowmobile 1: 2003 Arctic Cat Fire Cat 500; track has 96 studs added	13.5" (W) x 121" (L) x 1" lug	1,180 sq. in.	0.50*
Snowmobile 2: 2012 Arctic Cat T570	15" x 144" x 1" lug	1,440 sq. in.	0.50*
OHVs			
OHV 1 (ATV): 2009 Yamaha Grizzly 700; automatic 2-speed transmission, AWD, Camoplast tracks	2 Front: 11.5" x 93.4" x 1" 2 Rear: 12.5" x 98.5" x 1.2"	2,000 sq. in.	0.55**
OHV 2 (UTV): 2009 Polaris Ranger 700 XP; automatic 2-speed transmission, AWD, Camoplast tracks	2 Front: 12.5" x 98.5" x 1" 2 Rear: 13.5 " x 116.7" x 1"	2,470 sq. in.	0.90***
OHV 3 (UTV): 2012 John Deere Gator 825i; automatic 2-speed transmission, AWD, Camoplast tracks	2 Front: 12.5" x 98.5" x 1" 2 Rear: 13.5 " x 116.7" x 1"	2,470 sq. in.	0.90***

* Average ground pressure of a snowmobile is 0.50 PSI (ISMA Snowmobiling Facts Book)
** Average ground pressure of ATV (900 lbs. with driver) on wheels is approximately 2.00 PSI (Camoplast)
*** Average ground pressure of UTV (1,800 lbs. with driver) on wheels is approximately 3.90 PSI (Camoplast)

The five test vehicles are shown in Photos 2 through 12 below:

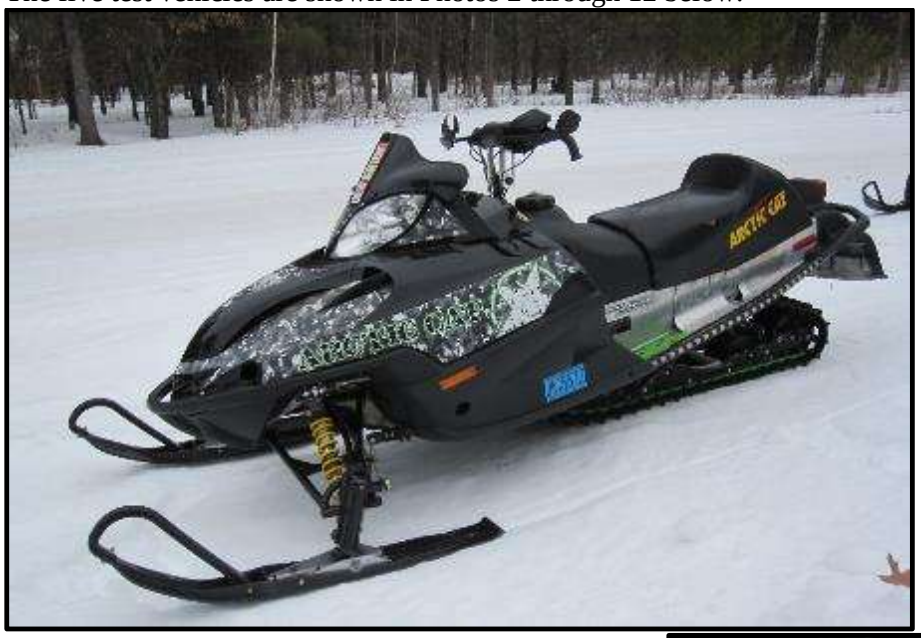

Photo 2: Snowmobile 1 – Arctic Cat Fire Cat 500

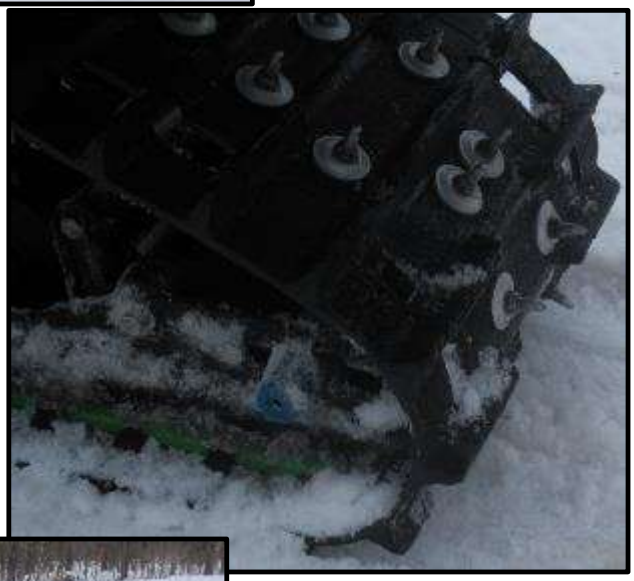

Photo 3: Fire Cat's studded track

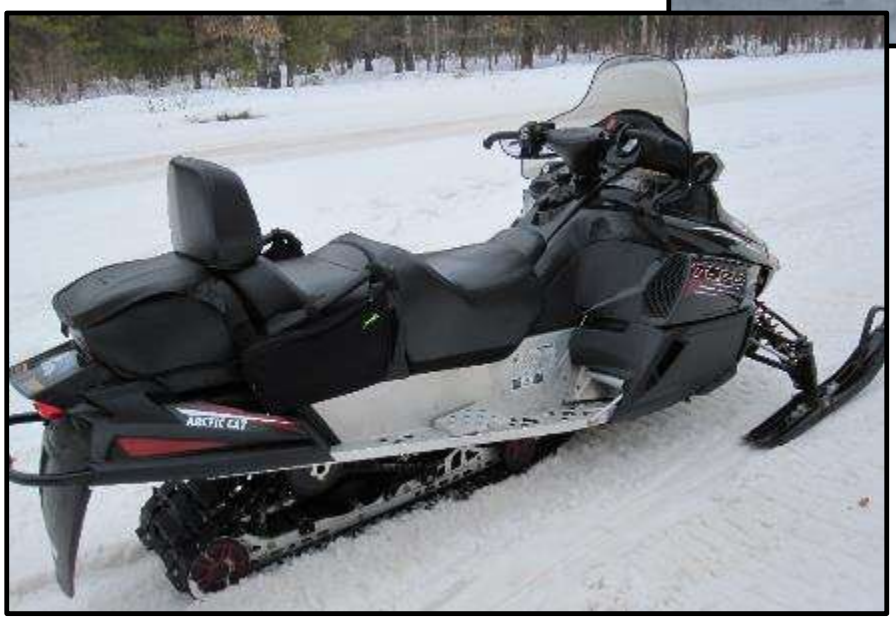

Photo 4: Snowmobile 2 – Arctic Cat T570

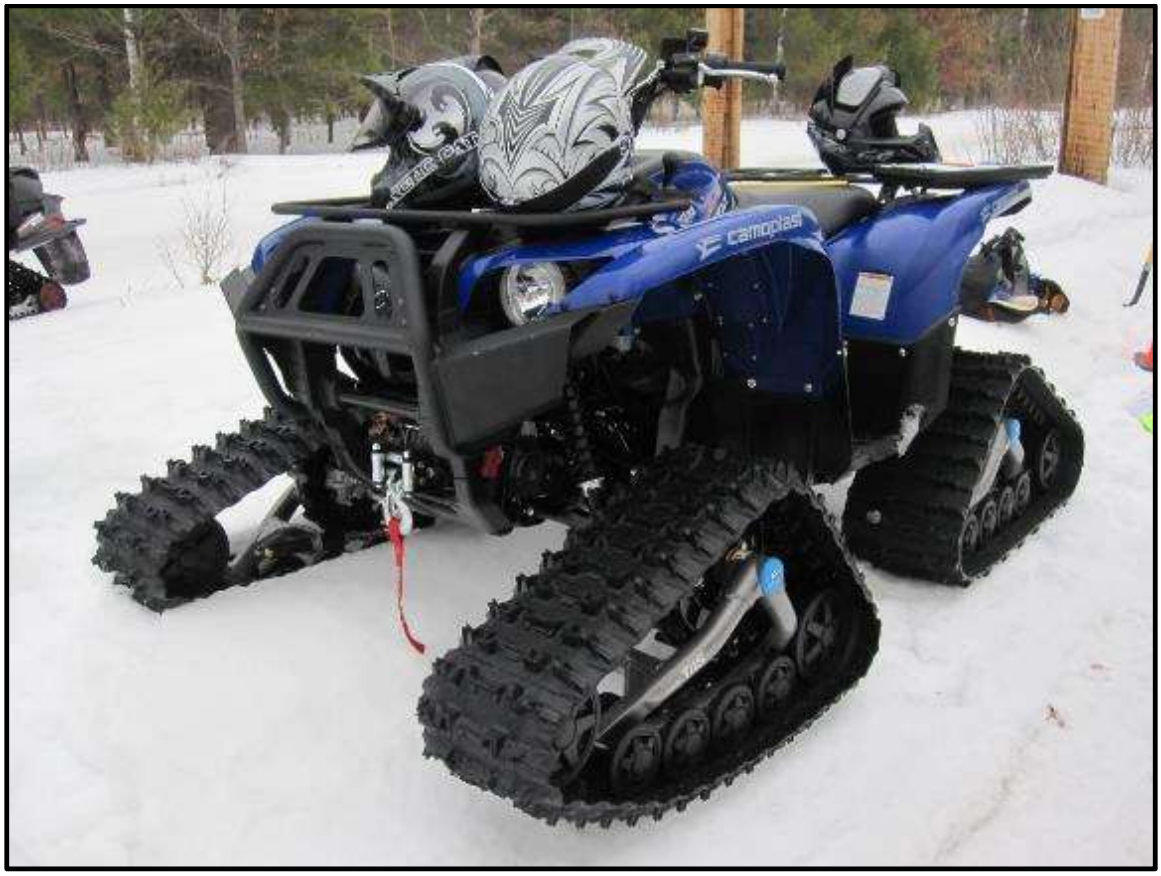

Photo 5: OHV 1 (ATV) Yamaha Grizzly 700 with Camoplast tracks, front view

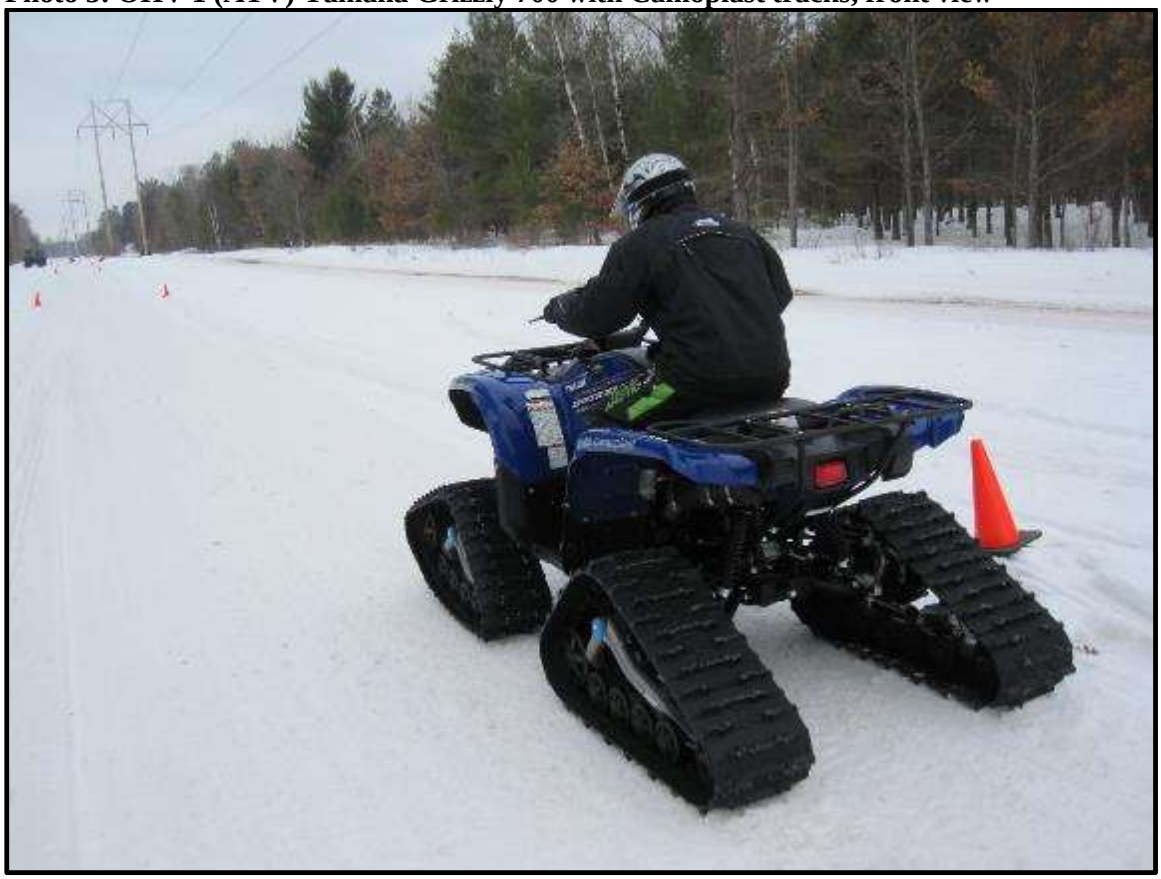

Photo 6: OHV 1 (ATV) Yamaha Grizzly 700 with Camoplast tracks, rear view

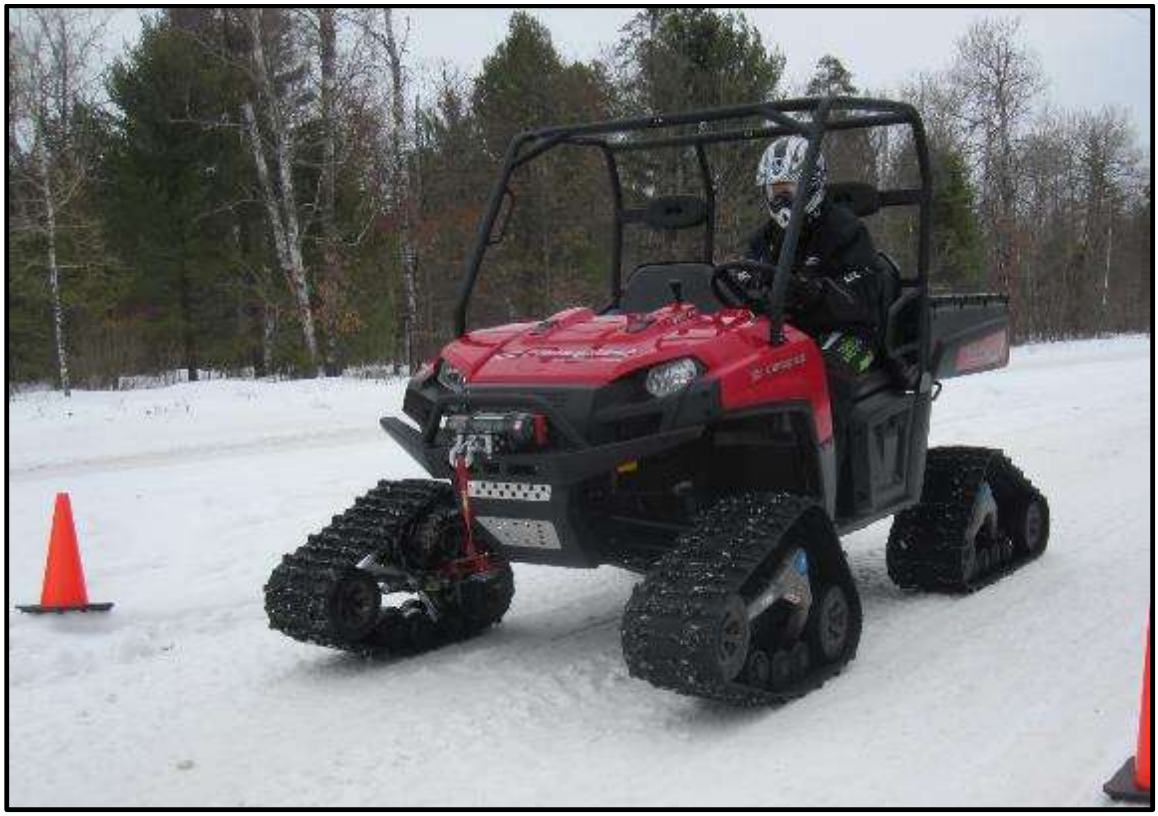

Photo 7: OHV 2 (UTV) – Polaris Ranger 700 with Camoplast tracks, front view

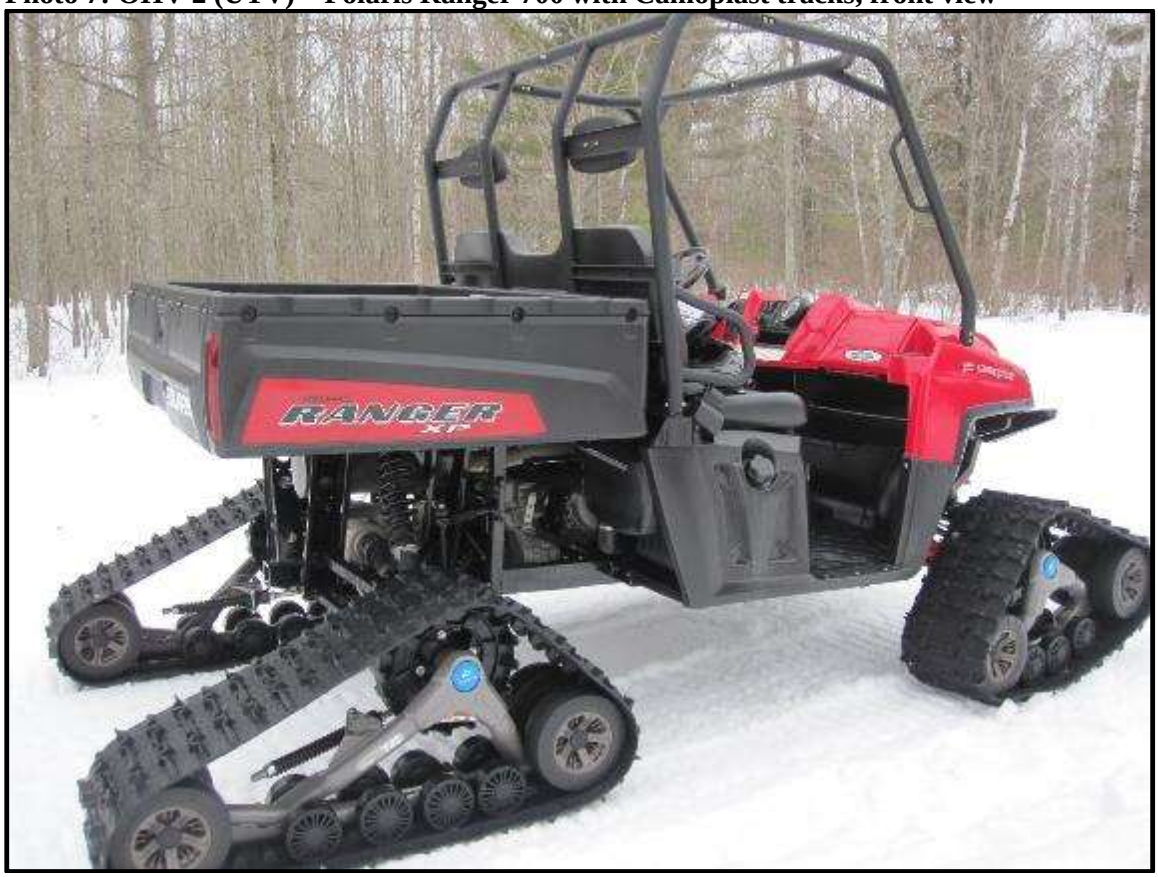

Photo 8: OHV 2 (UTV) – Polaris Ranger 700 with Camoplast tracks, side view

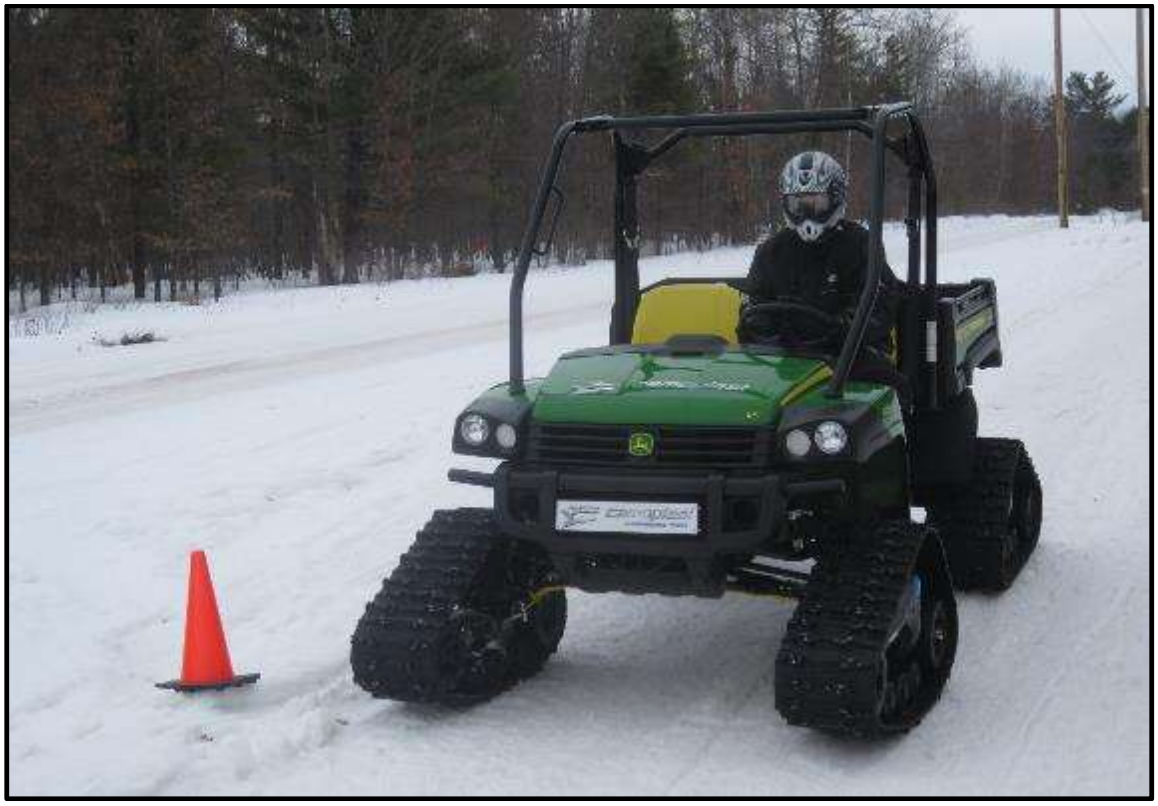

Photo 9: OHV 3 (UTV) – John Deere Gator 825i with Camoplast tracks, front view

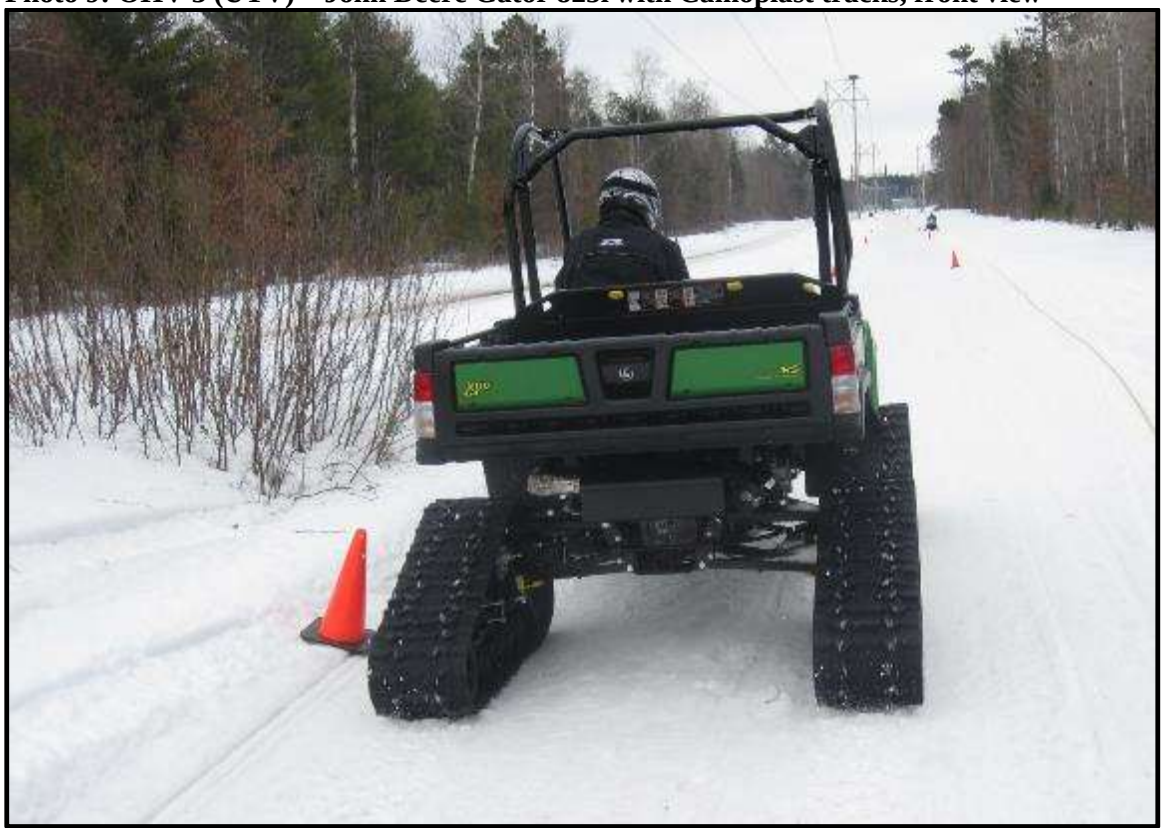

Photo 10: OHV 3 (UTV) – John Deere Gator 825i with Camoplast tracks, rear view

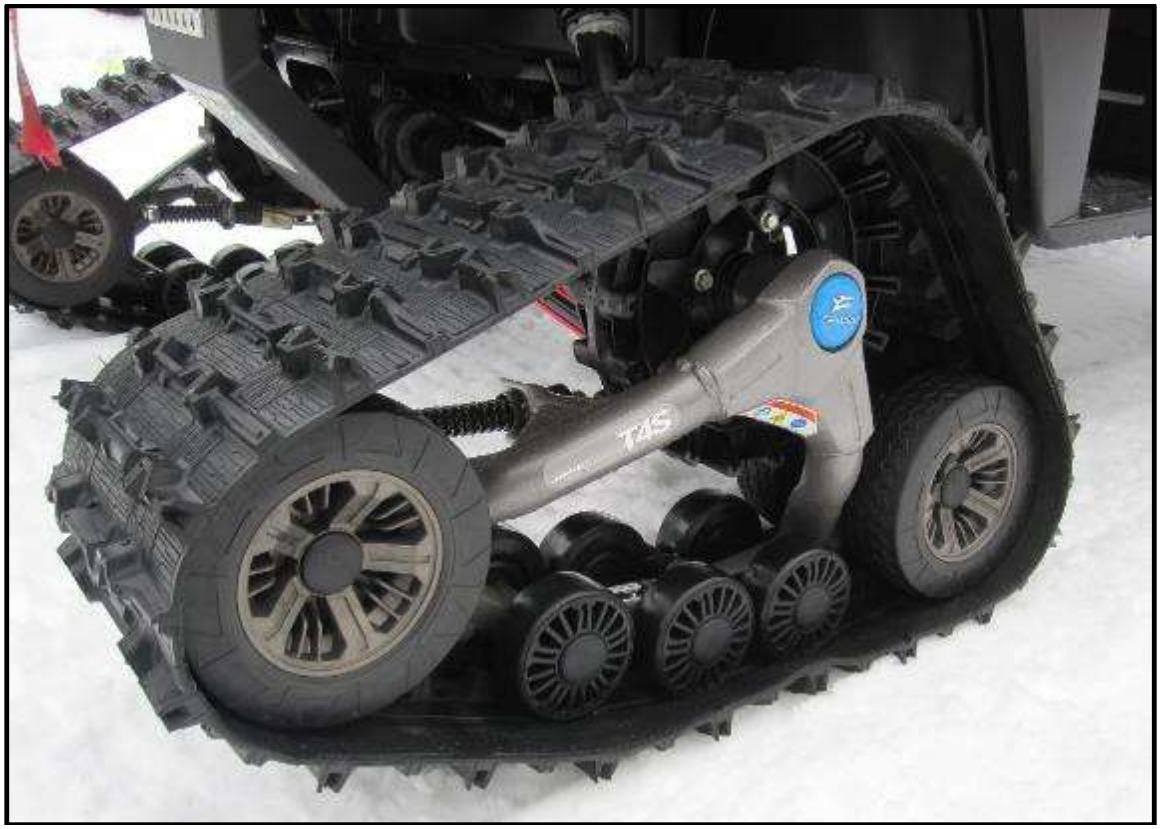

Photo 11: UTV front track

Photo 12: UTV rear track

One primary test location with good snow conditions and good visibility along an open straight-away on the Bo-Boen (high line) Trail was used to compare fast/aggressive 'start,' 'stop,' and 'pass-by' impressions (site #1). A second winding segment of the Bo-Boen Loop side trail was used to evaluate fast/aggressive passes through tight turns (site #2). In both locations, successive passes by both snowmobiles and tracked OHVs seemed to 're-level / redistribute' impressions in the groomed trail created by previous vehicle passes; consequently at no time in either location did any deep rutting or trenching occur which could have required the test track to be relocated or reset.

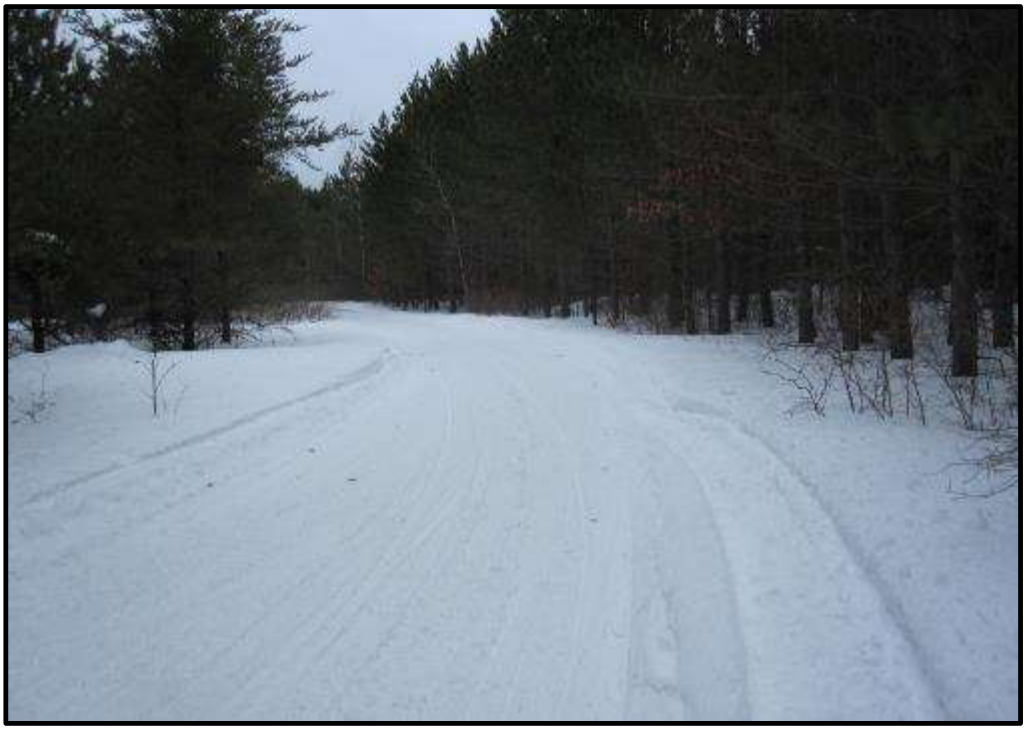

Photo 13: Bo-Boen Loop (side) Trail – test site #2

'Fast/Aggressive' operation for this test was defined as 'aggressive riding from start to finish, beginning with a pinned full-throttle start, settling into a fast pass-by (for snowmobiles, 45-50 mph even though a faster speed could have been possible; for OHVs, maximum speed at full-throttle), and then ending with an abrupt stop from fully locking up the vehicle's brakes.' Traffic cones were used to delineate a 450-feet long track for this test. A distance of 125-feet was allowed for the 'start' zone, 200-feet for the 'pass-by' zone, and 125-feet for the 'stop' zone; this is consistent with test track layout used during 2006 testing. Width and depth impressions from the tracks were measured, photographed, and recorded for all starts, pass-by, and stops. All 'width impression' measurements were universally consistent with each individual vehicle's track width; consequently impression width measurements, while captured for all, have not been carried forward into this report since the only variations observed were in the 'depth' of impressions left by different vehicle's operation. Each vehicle's stopping distance from the third cone (325-feet mark where the brakes were locked up) was also measured, recorded, and transferred to the final report.

Testing on the winding side trail (test site #2) was conducted only at fast 'pass-by' speeds. The driver was as aggressive as possible without losing control to see what 'worst-case' impressions could be left on the groomed trail surface from each vehicle being steered and powered through turns. While each snowmobile's track was typically spinning during these maneuvers, none of the OHVs had sufficient power to cause track spin while powering through the curves.

While 'Slow/Normal' operation (defined as: a start that is not fast or aggressive {no intentional spinning of track or tires}, a pass-by speed of 15 mph, and a controlled stop that is gradual and constant {no intentional sliding} typical from a non-aggressive rider) was evaluated during the 2006 study, it was firmly concluded in 2006 that "there were no observed adverse impacts from either ATVs or snowmobiles operated at 'slow/normal' speeds." Consequently 'slow/normal' operation was not included in the 2014 test protocol.

The 2006 study also looked at vehicle operation on hills and steep inclines. Many hills near the St. Germain test site had generally poor snow conditions on our test day (bare ground, low snow or icy slopes due to warm weather conditions several days prior), and those which did have adequate snow cover did not have sufficient sight distance to accomplish safe testing. Consequently formal evaluation of 'hill' operation was not attempted. There was however one small hill with a sharp pitch, on the access trail between the test group's resort/staging area and the Bo-Boen trail's testing location, that had deep snow cover (but did not have adequate sight distance for safe testing). While not formally tested or measured, all test vehicles made several passes up and down this small hill while traveling to and from testing activities: no spinning or rutting of the trail surface was observed when the tracked OHVs traveled up or down this hill.

One test driver, Tyler Willey, was used for all snowmobile and OHV passes during 'fast/aggressive' start, pass and stop evaluation on the straight-away at site #1. This was done to achieve maximum consistency for aggressive driving technique, along with more consistent reaction times for stopping distance measurements. Multiple drivers were used for the 'fast/aggressive' curve and cornering pass-by at site #2 to help minimize testing time since the public trail was temporarily closed during this evaluation; all operators proved to be sufficiently aggressive for testing needs along this winding trail.

A total of four passes (two up and two back) along the test course were run with each vehicle to gather representative average samples that documented impressions left by each vehicle. While preliminary test protocol during the 2006 project envisioned the need to run up to ten passes with each vehicle, initial testing early in that project found desired goals could be achieved with only four vehicle passes, i.e., if a vehicle was going to leave an impression in a particular mode of operation, it was typically consistent time after time. Consequently the 'four pass approach' has been carried forward from the 2006 evaluation project.

All 'depth and width' impressions were measured, photographed, and recorded by only one person, Kim Raap (Trails Work Consulting), to provide the maximum consistency. The entire test track was walked from one end to the other after every pass to identify and record the deepest impressions formed in all test zones. While the initial intent during 2006 testing was to also document the 'length' of impressions observed, early testing of the protocol in 2006 quickly determined that length was somewhat irrelevant – if an impression was there, it would have similar characteristics throughout the entire zone. Consequently 2014 testing did not record 'length' of impressions. All 'depth and width' measurements were done with a Metric scale ruler and converted to English measurements for this report using www.onlineconversion.com. All 'stopping distance' measurements were done using two open measuring tapes (one positioned at each end of the test track) and recorded in English scale by Trails Work Consulting.

All pertinent local conditions at the test site were recorded by Trails Work. A tiling spade was used to dig a snow pit in the middle of the trail so that compacted snow depth could be measured and recorded along with visual observations about the trail's general density. Uncompacted snow depth beside the trail was measured with a tape measure. Altitude and temperature was measured with a High Gear Precision Digital Altimeter and Compass. Wind speed and a second air temperature reading (for a comparison check) was measured with a La Crosse Technology Anemometer. Curve radius was measured with a Brunton Clino Master.

The St. Germain test area had great snowfall, consistently cold temperatures, and good snowmobiling conditions throughout the 2013-2014 winter season. However temperatures in the area reached plus 50 degrees F on the Monday preceding testing. Temperatures then fell to minus 18 F Wednesday night, and then warmed back up to over 30 degrees F by Thursday afternoon during scouting for test locations. By Friday morning when testing began, air temperatures were plus 40 degrees F. Despite warm conditions, the trail surface where testing was conducted remained generally very firm with good snow cover (even though other trail segments in the area had either bared off or had become quite icy).

Pertinent information regarding each vehicle (see Table 3-1) was recorded, including make, model, engine size, track types and lug depths, etc. on a test site Cover Sheet. A Daily Test Log was used to record measurements and observations regarding each individual vehicle. (See examples in Appendix B and C.)

Table 3-2: Documentation of 2014 Test Conditions

Date: March 14, 2014
Location of Testing: Bo-Boen Trail (divided, high line) and Bo-Boen Loop; near St. Germain, Wisconsin
Time of Day when testing was conducted: 9:40 AM to 12:50 PM
Elevation: 1399 feet
Air Temperature during testing: +41.1 F to +46.2 F
Weather during testing: cloudy, 6 mph W/NW wind
Trail Aspect: Bo-Boen Main (high line) Trail – flat, open corridor with two separate one-way lanes
Bo-Boen Loop Trail – flat, narrow, winding through trees with 40 to 70 degree curves
Trail Conditions: smooth, good snow cover and compaction, firm surface despite warm temperatures
Compacted Snow Depth on-trail: Bo-Boen Main Trail – 8.7 inches (22 cm) to solid ice layer
Bo-Boen Loop Trail – 19.3 inches (49 cm) to ground
Uncompacted Snow Depth adjacent to trail: Bo-Boen Main (high line) Trail – 22 inches (56 cm)
Bo-Boen Loop Trail – 32 inches (81 cm)
Area Grooming Equipment: Tucker 2000 Sno-Cat tractor with an 8'-6" wide Snow Boss multi-blade drag

SUMMARY OF FIELD TEST OBSERVATIONS

The complete range of depth measurements observed for each vehicle during 2014 testing is summarized in Table 3-3 on page 31. The general range of observed impressions are as follows:

Range of Minimum Depth Impressions: The minimum (smallest) impressions observed from the two snowmobiles were only 1.5 to 2 centimeters (0.6 to 0.8 inch) deep. The minimum impressions observed from the three tracked OHVs were slightly less at 1 to 1.5 centimeters (0.4 to 0.6 inch) deep.

Range of Maximum Depth Impressions: The maximum (deepest) depth impressions observed from the two snowmobiles were 7 and 8 centimeters (2.8 and 3.1 inches) deep and occurred during aggressive stops. In comparison the deepest impression made by the tracked ATV was 6 centimeters (2.4 inches) deep while both tracked UTVs maximum depth impression was 5 centimeters (2 inches) deep; all were also created by aggressive stops.

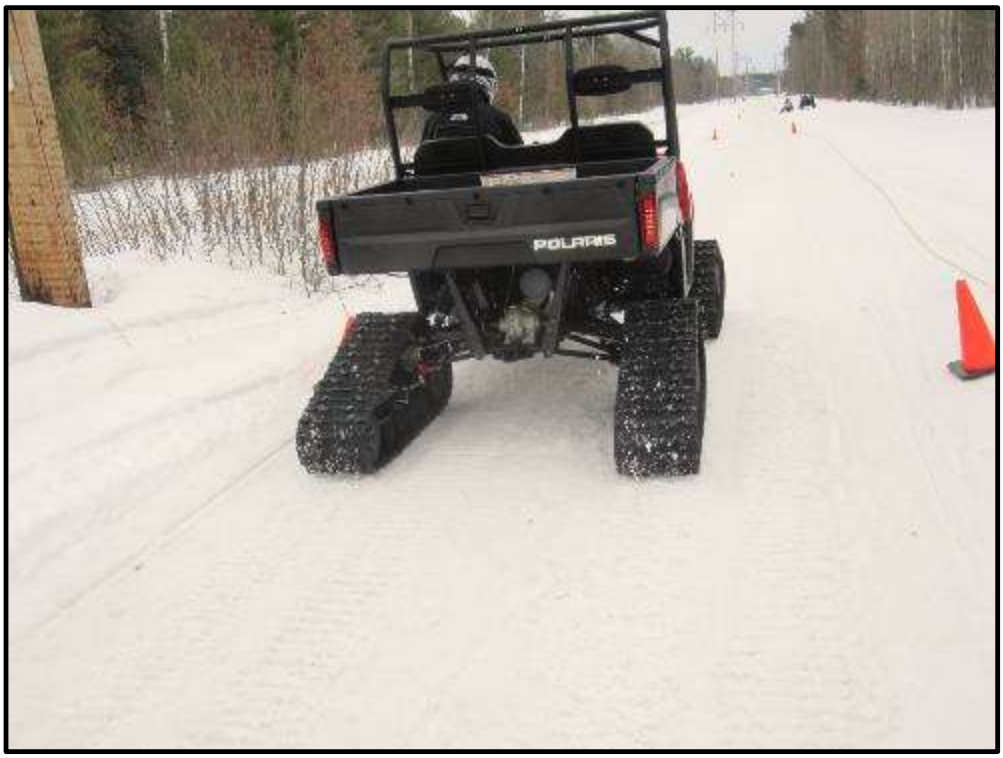

Photo 14: OHV 2 (Polaris Ranger 700 UTV) during aggressive start

Table 3-3: 2014 Field Test – Summary of Depth Impressions by Vehicle and Operating Mode

March 14, 2014 Field Testing: St. Germain, Wisconsin – Bo-Boen Trail

- Start Time: 9:40 AM End Time: 12:50 PM
- Air Temperature During Testing: +41.1 to +46.2° F
- Compacted Trail Snow Depth (Main trail – Aggressive & Fast Straight): 22 cm / 8.7 in
- Compacted Trail Snow Depth (Side trail – Curve): 49 cm / 19.3 in

NOTE: 'Maximum Observed Depths' are indicated in bold; all occurred during Aggressive Stops

Vehicle	Range of Depth Impressions (centimeters and inches)				Minimum Depth Observed	Maximum Depth Observed
	Aggressive Start	Fast Straight Pass-By	Aggressive Stop	Fast Curve Pass-By		
2014 Testing: Snowmobiles						
Snowmobile 1: 2003 Arctic Cat Fire Cat 500; 121" x 13.5" x 1" track with 96 studs	1.5 – 2 cm 0.6 – 0.8 in	2 cm 0.8 in	3 – **8 cm** 1.2 – **3.1 in**	3.5 – 6 cm 1.4 – 2.4 in	1.5 cm 0.6 in	8 cm 3.1 in
Snowmobile 2: 2012 Arctic Cat T570; 144" x 15" x 1" track	3 – 5 cm 1.2 – 2 in	2 cm 0.8 in	4.6 – **7 cm** 1.8 – **2.8 in**	2 – 3 cm 0.8 – 1.2 in	2 cm 0.8 in	7 cm 2.8 in
2014 Testing: Tracked OHVs						
OHV 1 (ATV): 2009 Yamaha Grizzly 700; with four Camoplast ATV tracks (Front: 11.5" x 93.4" x 1", Rear: 12.5" x 98.5" x 1.2")	1 – 2.5 cm 0.4 – 1 in	3 cm 1.2 in	3 – **6 cm** 1.2 – **2.4 in**	2.5 – 3 cm 1 – 1.2 in	1 cm 0.4 in	6 cm 2.4 in
OHV 2 (UTV): 2009 Polaris Ranger 700 XP; with four Camoplast UTV tracks (Front: 12.5" x 98.5" x 1", Rear: 13.5 " x 116.7" x 1")	2 – 3 cm 0.8 – 1.2 in	3 cm 1.2 in	1.5 – **5 cm** 0.6 – **2 in**	2.5 – 4 cm 1 – 1.6 in	1.5 cm 0.6 in	5 cm 2 in
OHV 3 (UTV): 2012 John Deere Gator 825i; with four Camoplast UTV tracks (Front: 12.5" x 98.5" x 1", Rear: 13.5 " x 116.7" x 1")	1 – 2 cm 0.4 – 0.8 in	3 cm 1.2 in	2 – **5 cm** 0.8 – **2 in**	2 – 2.5 cm 0.8 – 1 in	1 cm 0.4 in	5 cm 2 in

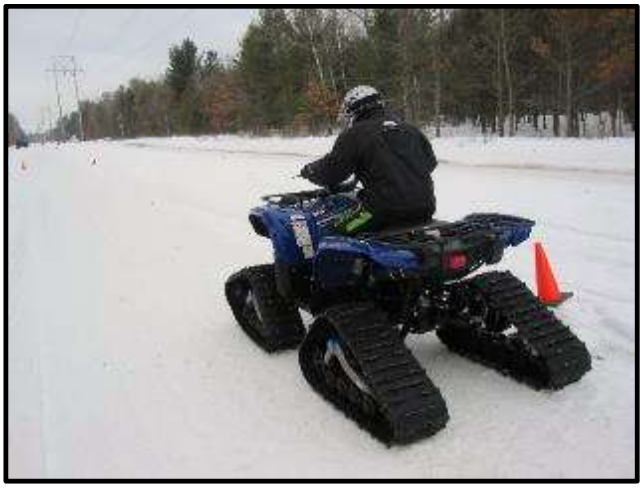

Photo 15: OHV 1 (Yamaha Grizzly 700 ATV) during aggressive start

Photos 16 through 20 below show impressions left from aggressive stops – which resulted in the deepest impressions observed, as summarized in Table 3-3 on page 31.

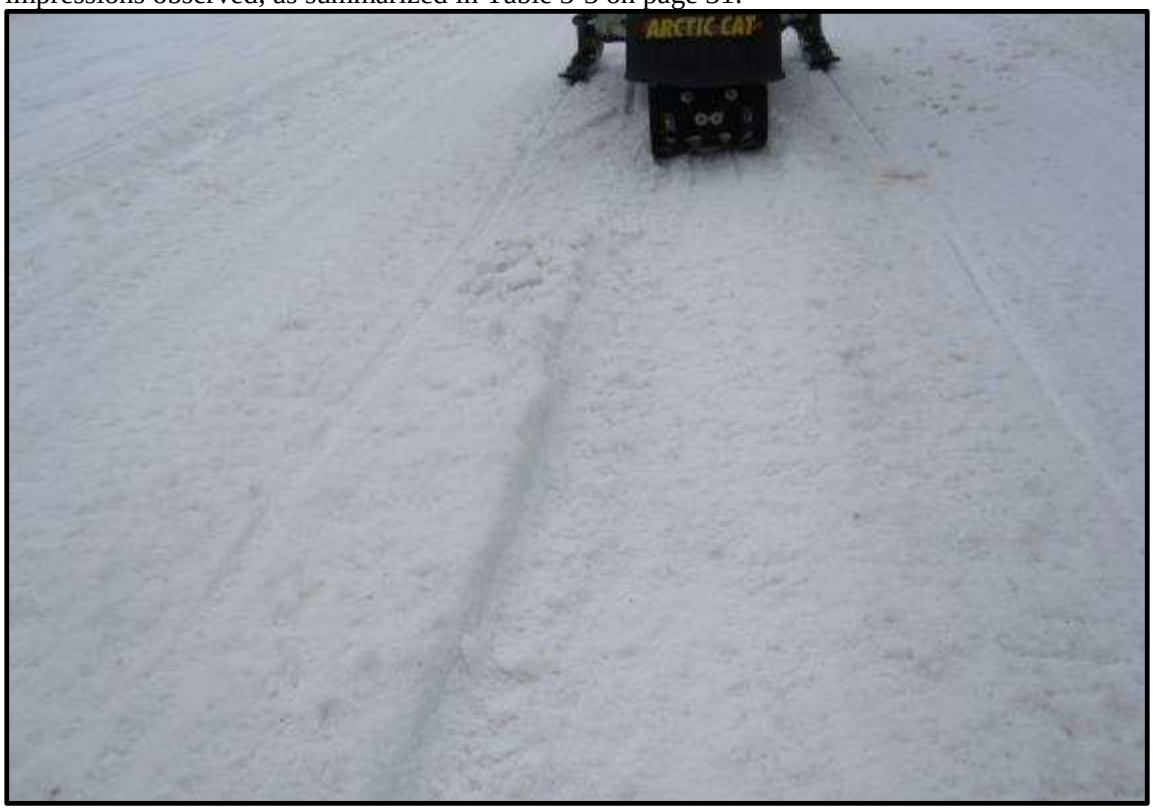

Photo 16: Snowmobile 1 (Arctic Cat Fire Cat 500) impressions from aggressive stop

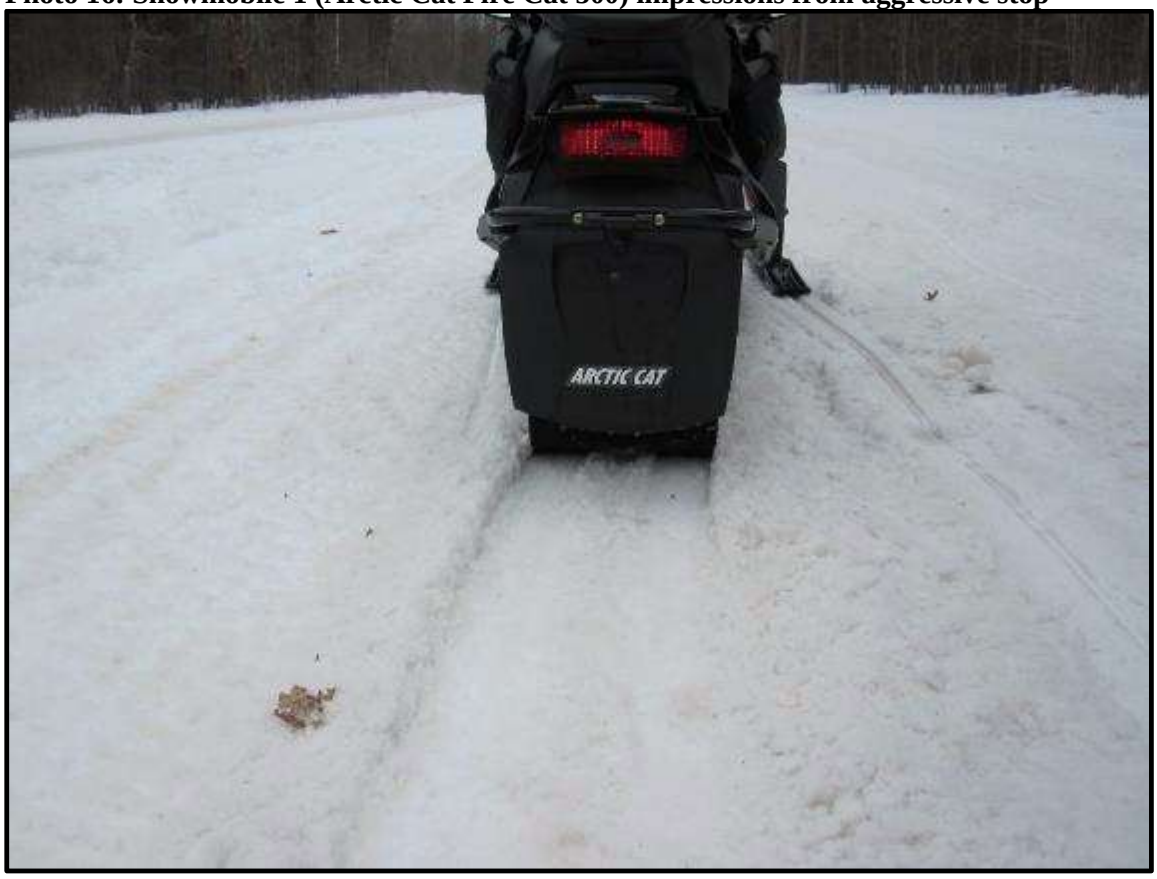

Photo 17: Snowmobile 2 (Arctic Cat T570) impressions from aggressive stop

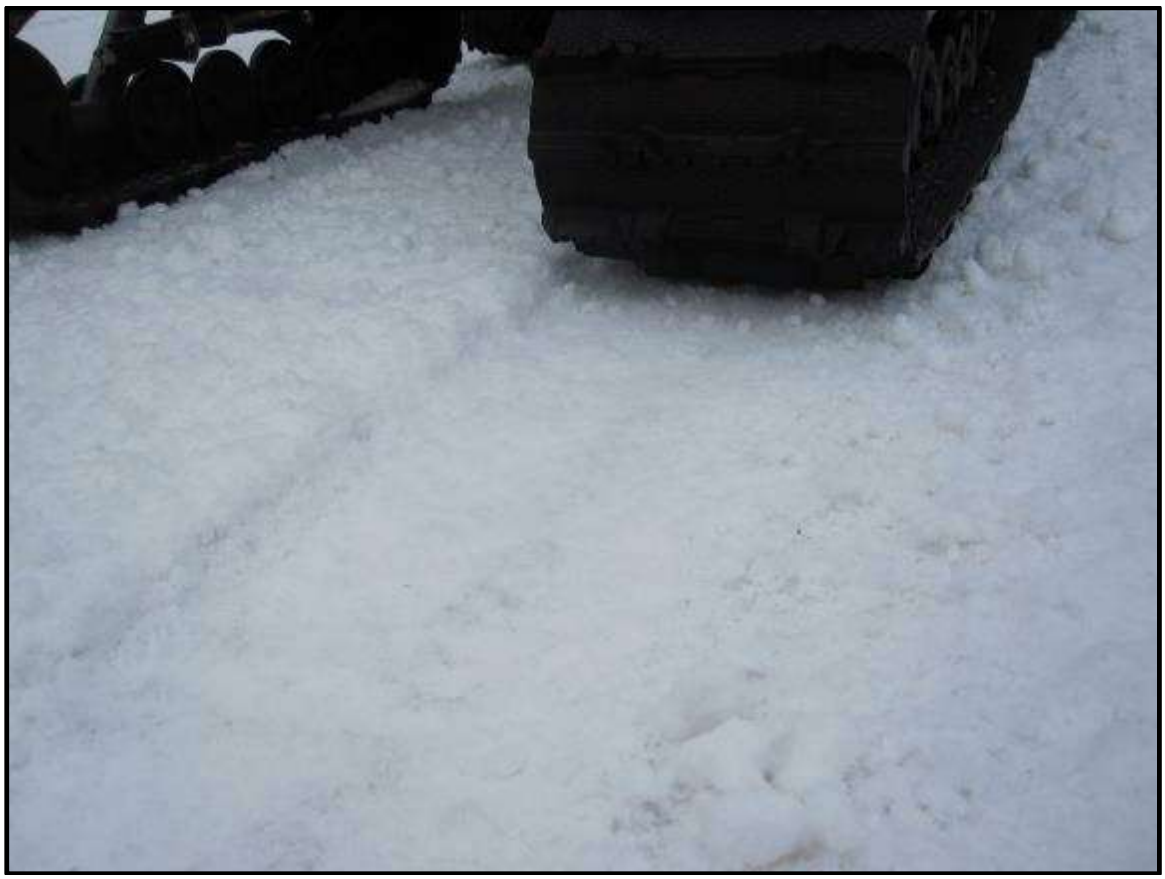

Photo 18: OHV 1 (Yamaha Grizzly 700 ATV) impressions from aggressive stop

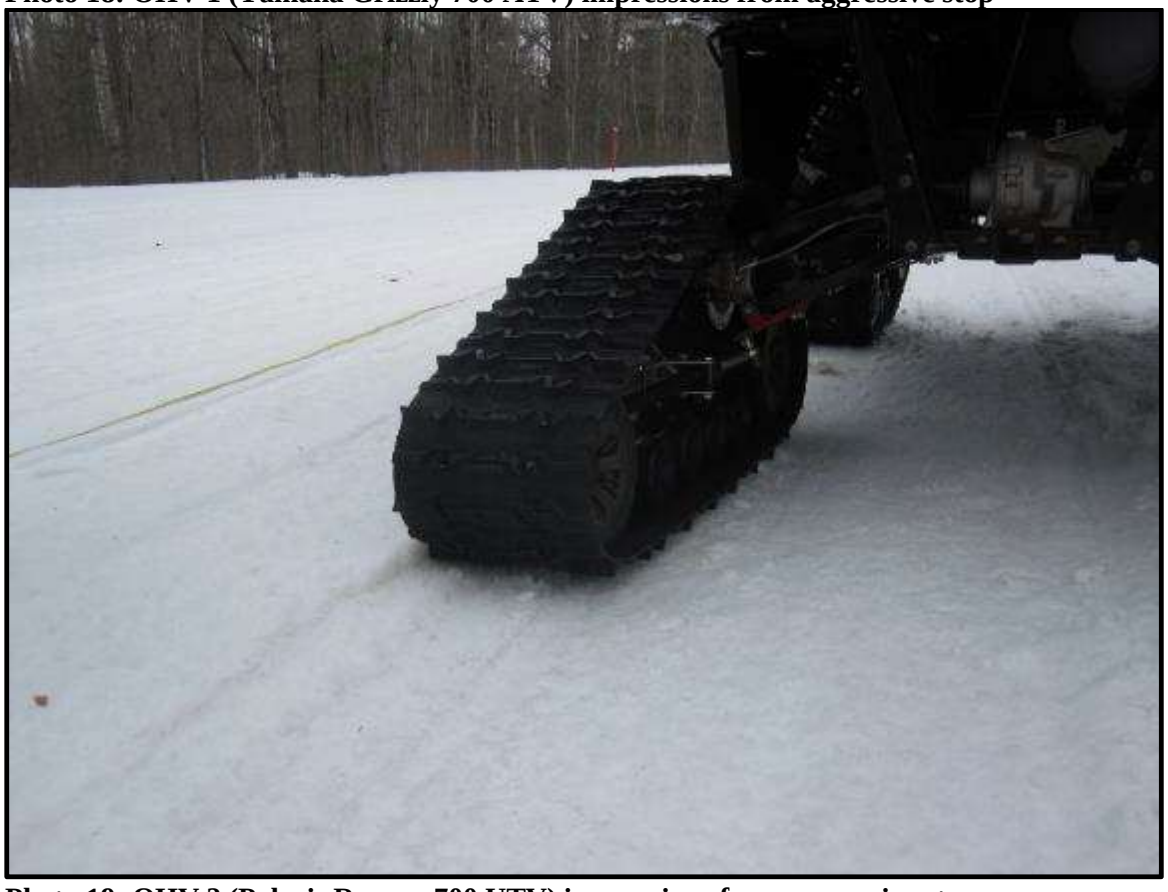

Photo 19: OHV 2 (Polaris Ranger 700 UTV) impressions from aggressive stop

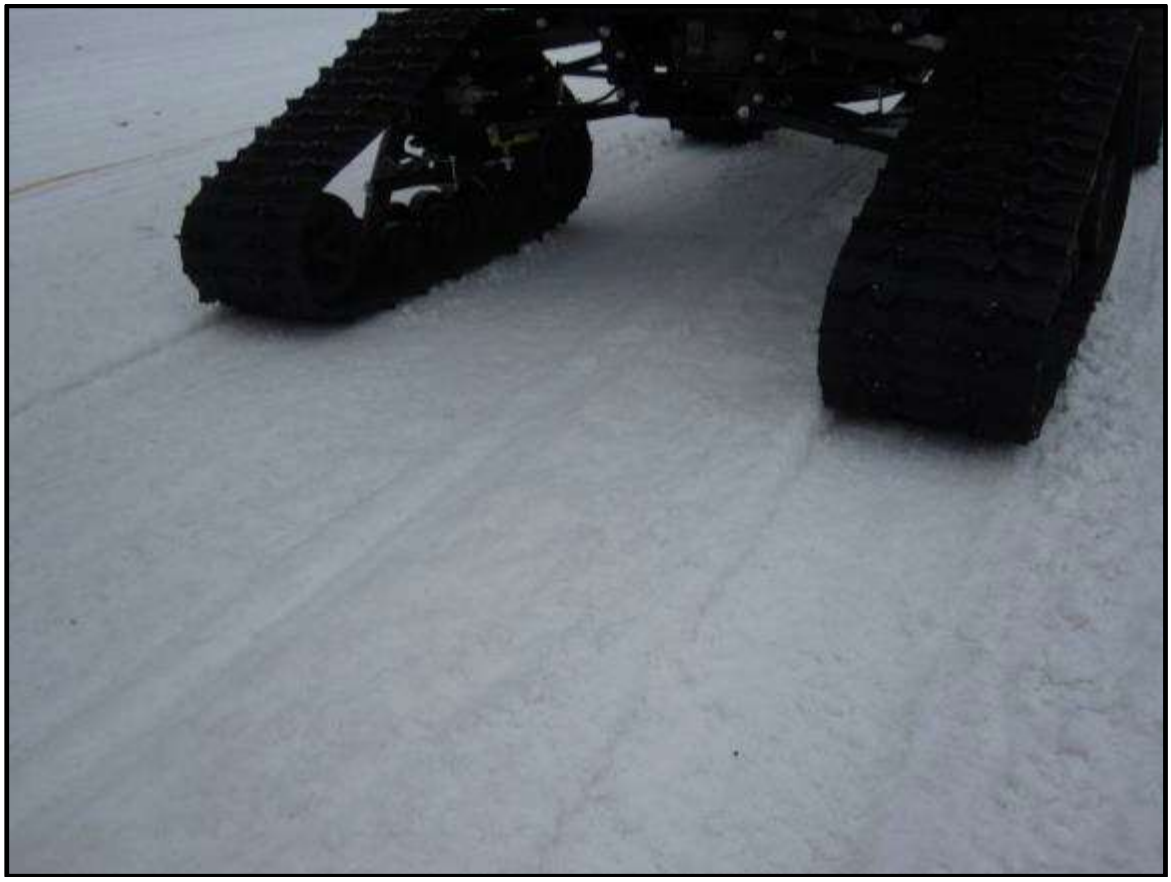

Photo 20: OHV 3 (John Deere Gator 825 UTV) impressions from aggressive stop

Comparison to Footprints: It was noted during 2006 testing that the observer (Kim Raap/Trails Work Consulting) taking measurements of vehicle impressions left boot impressions on the trail that were 2 to 5 centimeters (0.8 to 2 inches) deep. Similarly, footprints from the same observer ranged from 3 to 5 centimeters (1.2 to 2 inches) deep on the trail during 2014 testing, which occurred in warmer weather.

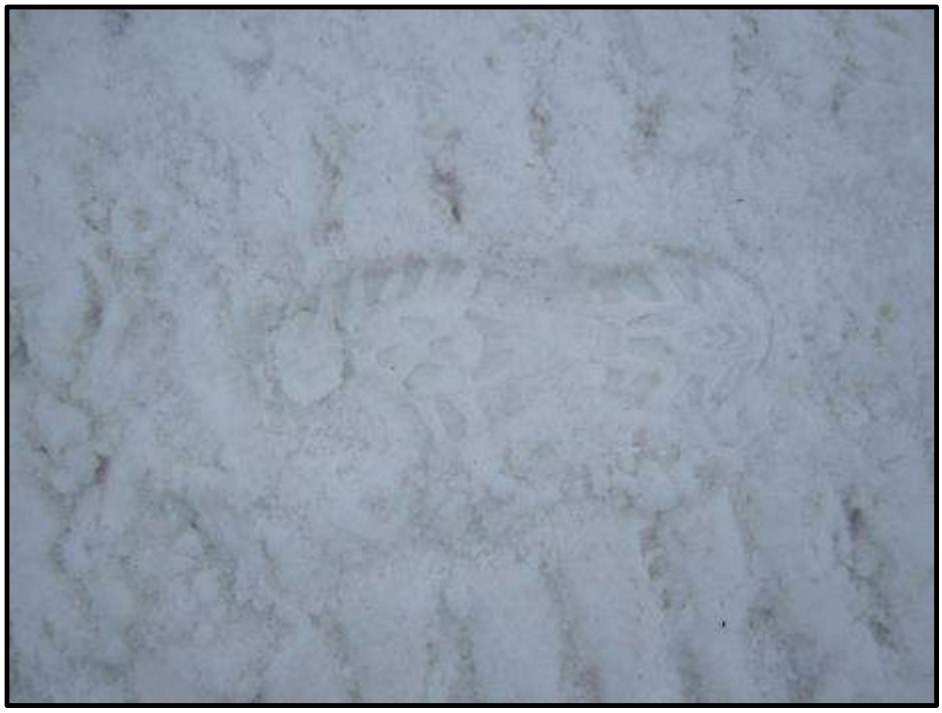

Photo 21: A footprint impression on the trail surface during 2014 test

Photos 22 through 26 below show a series of aggressive passes through the winding trail at test site #2; all vehicles left minimal impressions on the trail's surface, as outlined in Table 3-3 on page 31.

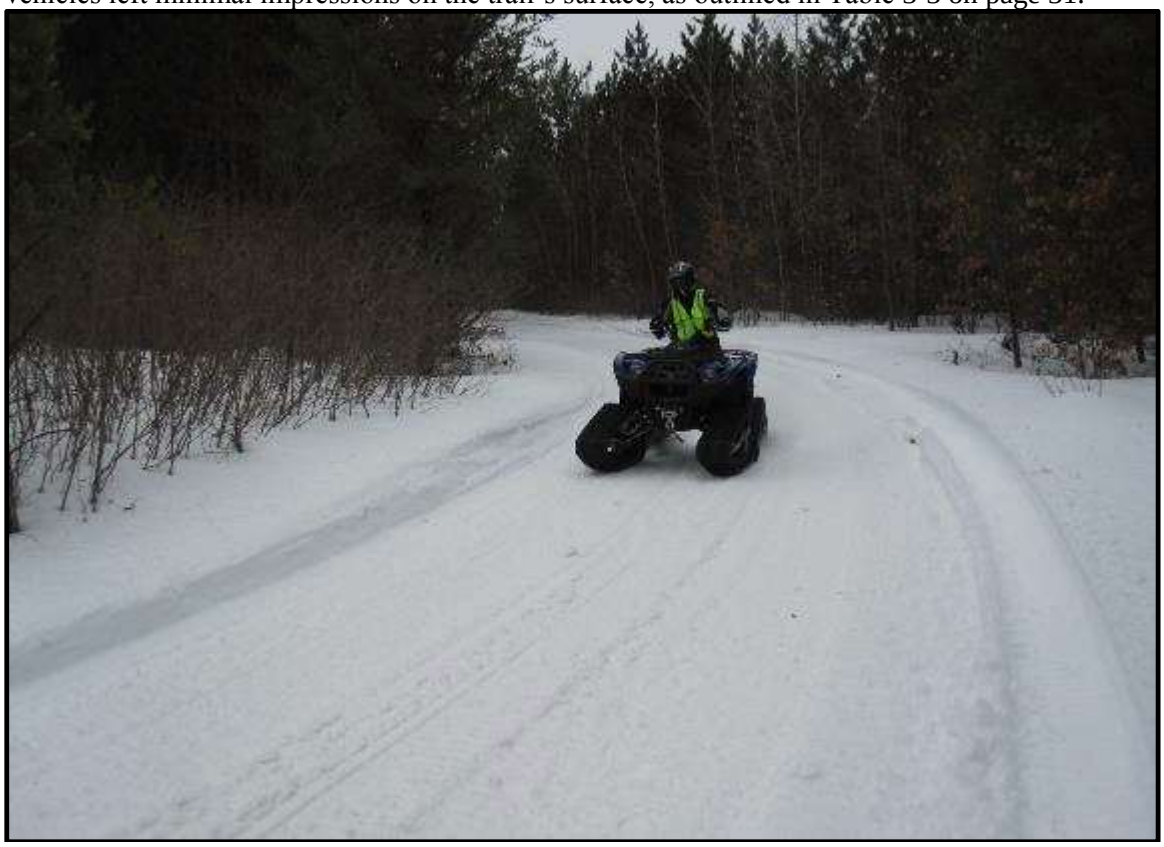

Photo 22: OHV 1 (Yamaha ATV) – fast/aggressive curve pass-by approach at site #2

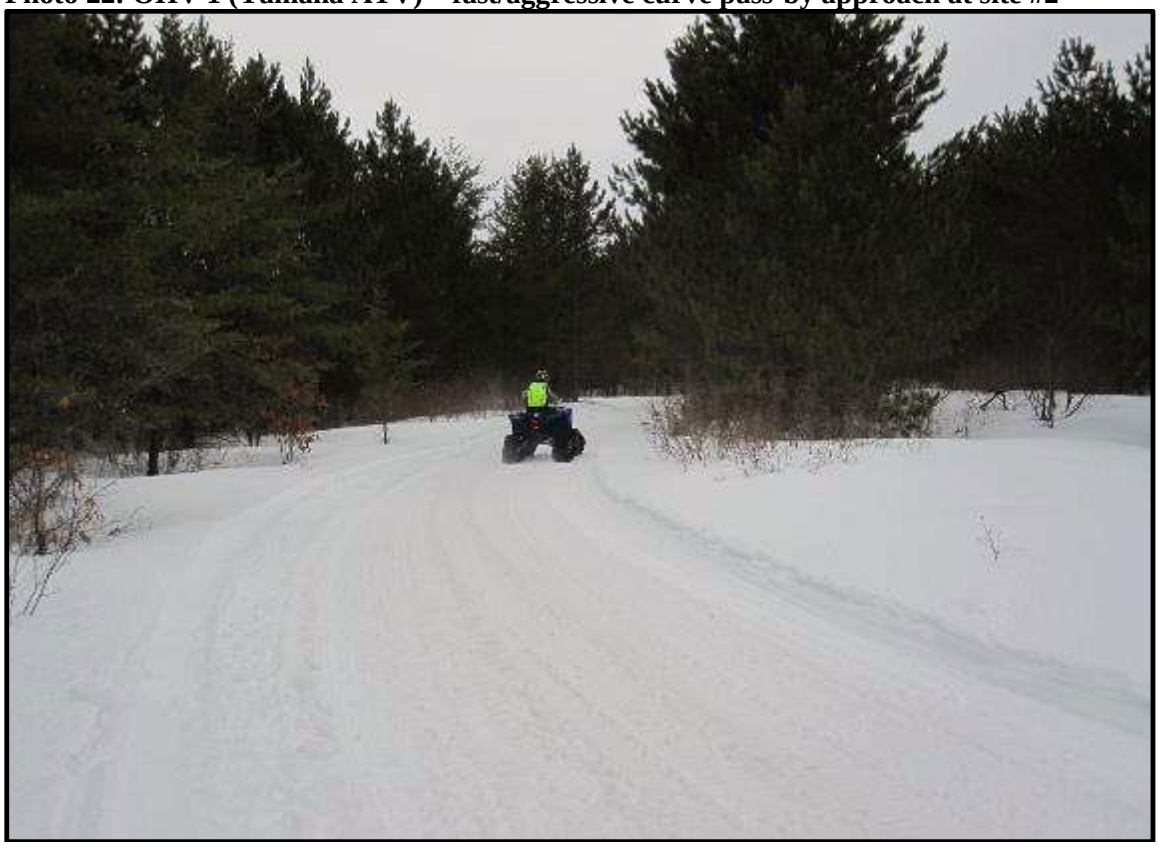

Photo 23: OHV 1 (Yamaha ATV) – fast/aggressive curve pass-by at site #2

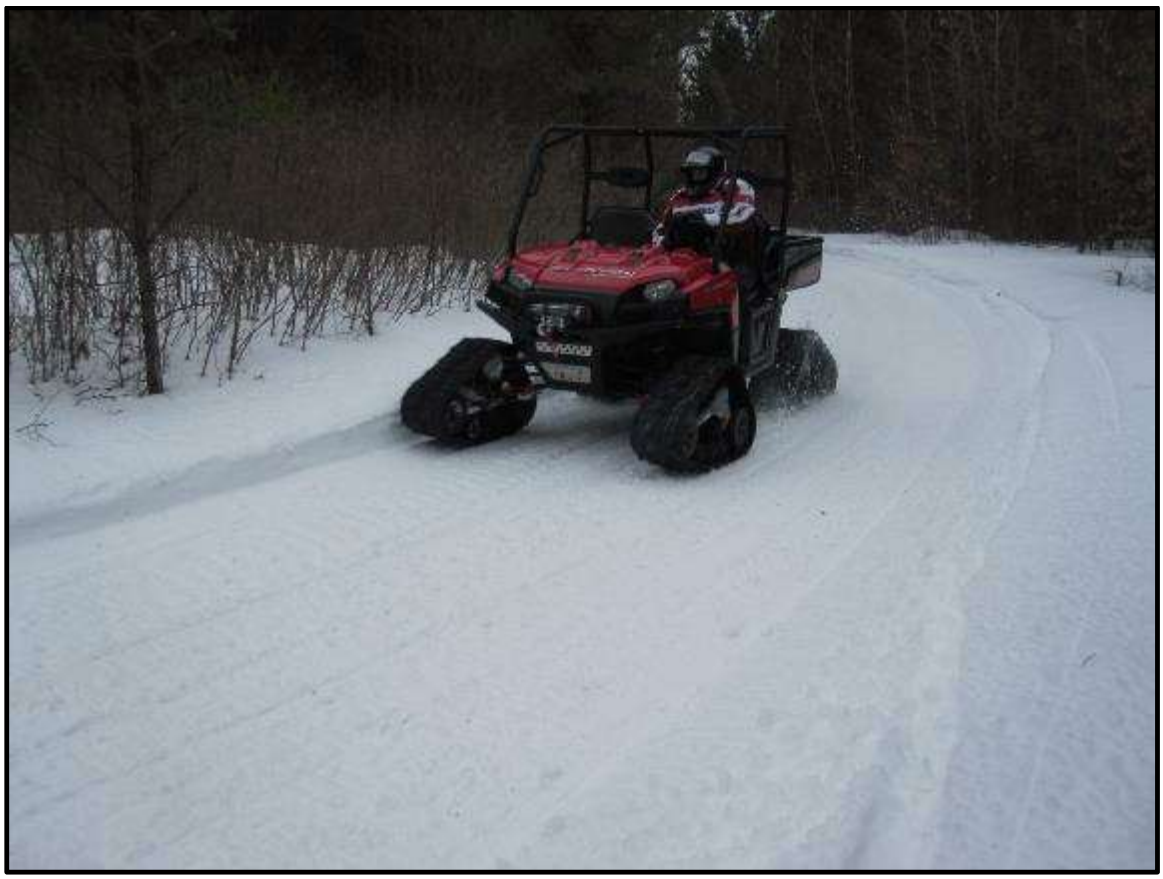

Photo 24: OHV 2 (Polaris UTV) – fast/aggressive curve pass-by approach at site #2

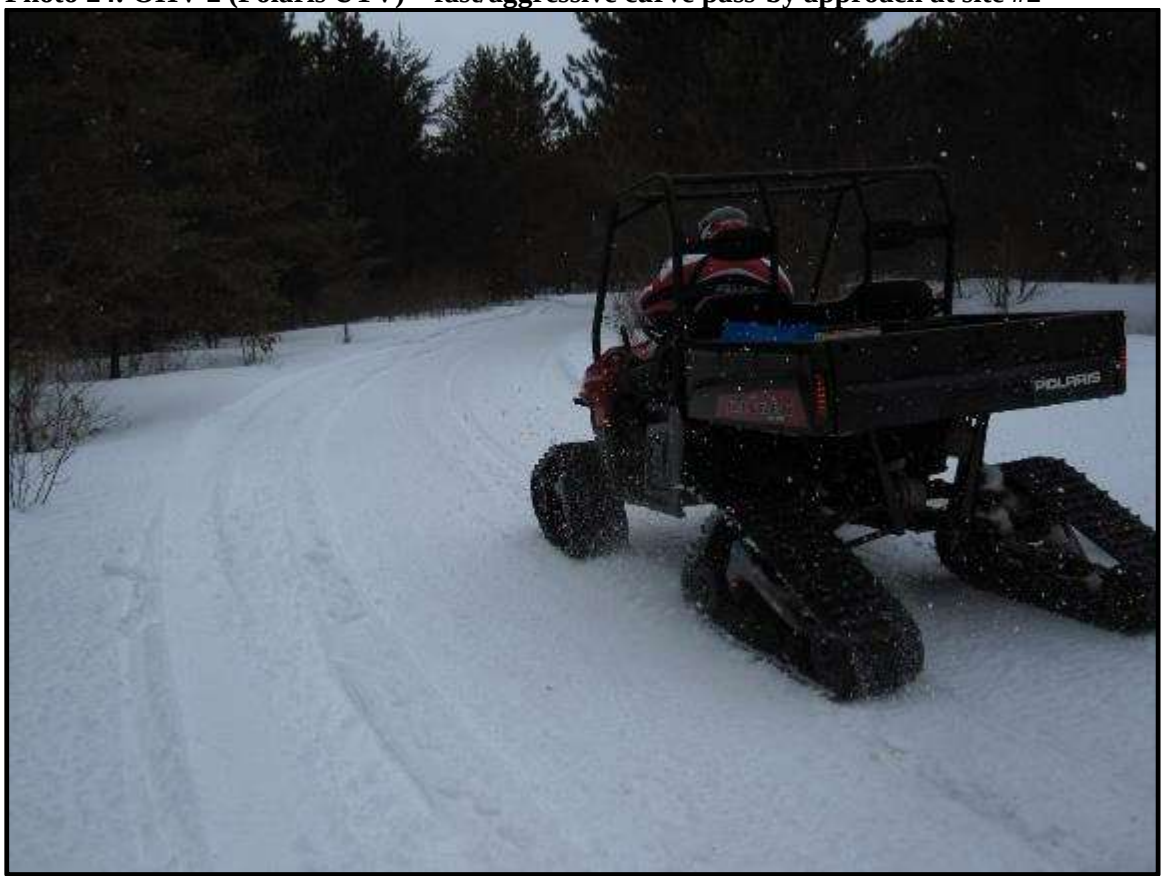

Photo 25: OHV 2 (Polaris UTV) – fast/aggressive curve pass-by at site #2

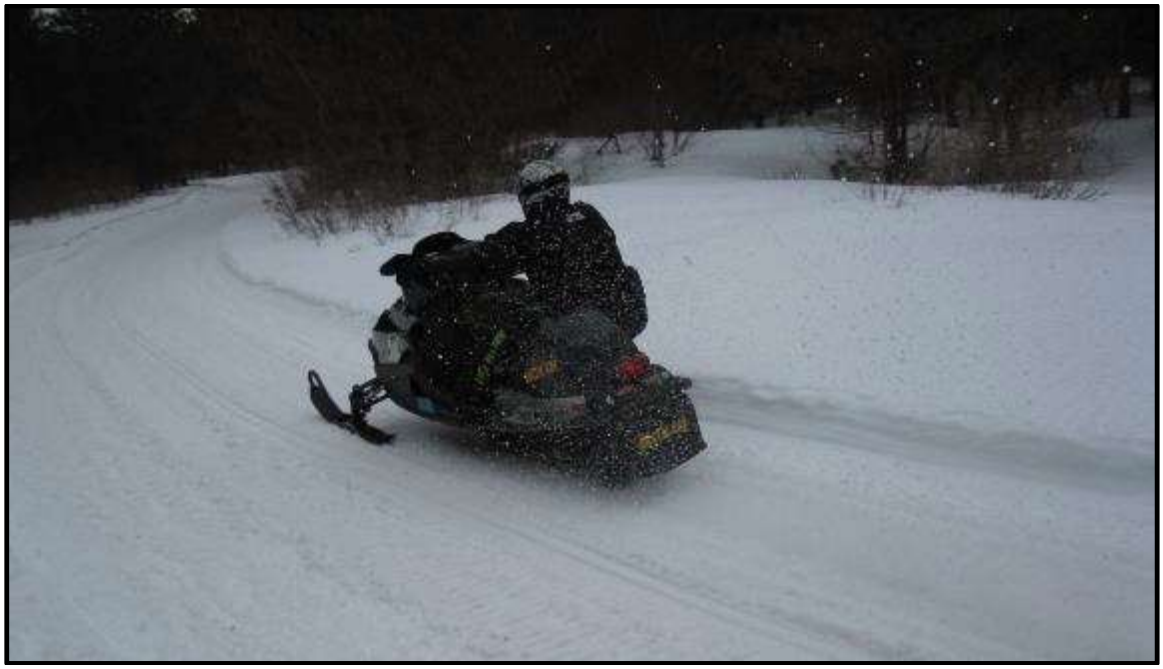

Photo 26: Snowmobile 1 (Fire Cat 500) – fast/aggressive curve pass-by at site #2

Even though all 2006 testing occurred below +32 F and the single 2014 test occurred above +40 F – meaning different results could have conceivably been observed during both tests if temperatures had been flipped – it's worthwhile to compare 2006 observations with 2014 observations since: (1) the two 2006 'control' snowmobiles had more aggressive tracks (1.25-inch and 2-inch track lugs) compared to a 1-inch lug height on both snowmobiles used for the 2014 test, and (2) it provides a comparison to impacts observed from wheeled ATV operation on groomed snowmobile trails. Table 3-4 on page 38 summarizes observations for the four 2006 'control' vehicles (two snowmobiles and two ATVs used at all 15 test sites) from which the following comparisons can be made:

Comparison to 2006 Test's Snowmobile Depth Impressions: There was little difference between minimum or maximum depth impressions when comparing 2006 and 2014 test snowmobile impacts despite the 2006 snowmobiles having more aggressive track lugs. The minimum depth impressions observed from the '2014 test' sleds with 1-inch track lugs were 1.5 to 2 centimeters (0.6 to 0.8 inch) deep while minimum impressions left by '2006 test' snowmobiles with 1.25" and 2" track lugs were 2 centimeters (0.8 inch) deep.

The maximum impressions observed from the '2014 test' snowmobiles with 1-inch track lugs were 7 to 8 centimeters (2.8 to 3.1 inches) deep during aggressive stops. This compares to maximum depth impressions of 6 centimeters (2.4 inches) created by the '2006 test' sled with 1.25-inch track lugs during aggressive starts and 9 centimeters (3.5 inches) deep impressions from the '2006 test' snowmobile with 2-inch track lugs created during an aggressive curve pass-by.

Comparison to 2006 Test's Wheeled ATV Depth Impressions: There was generally little difference between minimum depth impressions when comparing the '2006 test' wheeled ATVs and the '2014 test' tracked OHVs. The minimum depth impressions observed from the three tracked OHVs were 1 to 1.5 centimeters (0.4 to 0.6 inch) deep compared to minimum depth impressions 1 to 2 centimeters (0.4 to 0.8 inch) deep from the two 'control' wheeled ATVs when tested in 2006 at fast/aggressive speeds.

The maximum depth impressions from the wheeled ATVs tested in 2006 were over twice as deep as the deepest impressions created by tracked OHVs during 2014 testing. The deepest impressions observed from the three different tracked OHVs were 5 and 6 centimeters (2 to 2.4 inches) deep compared to maximum depth impressions of 13 to 14 centimeters (5.1 to 5.5 inches) deep which were created by wheeled ATVs during aggressive stops or fast pass-by on curves.

Table 3-4: 2006 Field Test Comparison – Summary of Depth Impressions by Vehicle and Operating Mode

Comparison with 2006 Field Testing Conducted at 15 Different Sites in 5 States

- Displays results from the 4 'control' vehicles used at all 15 sites
- Range of Air Temperatures Recorded During Testing: +11.0 to +31.9° F
- Range of Compacted Trail Snow Depth Recorded During Testing: 15 – 60 cm / 5.9 – 23.6 in

NOTE: 'Maximum Observed Depths' are indicated in bold

2006 'Control' Vehicles	Range of Depth Impressions (centimeters and inches)				Minimum Depth Observed	Maximum Depth Observed
	Aggressive Start	Fast Straight Pass-By	Aggressive Stop	Fast Curve Pass-By		
2006 Testing: Snowmobiles						
Snowmobile 1: 2006 Polaris Switchback 900; 144" x 15" x 1.25" track	2 – **6 cm** 0.8 – **2.4 in**	2 -3 cm 0.8 – 1.2 in	2 – 5 cm 0.8 – 2 in	2 – 4 cm 0.8 – 1.6 in	2 cm 0.8 in	6 cm 2.4 in
Snowmobile 2: 2006 Polaris RMK 700; 144" x 15" x 2" track	3 – 7 cm 1.2 – 2.8 in	2 – 4 cm 0.8 – 1.6 in	2 – 6 cm 0.8 – 2.4 in	2 – **9 cm** 0.8 – **3.5 in**	2 cm 0.8 in	9 cm 3.5 in
2006 Testing: Wheeled ATVs						
ATV 1: 2005 Polaris Sportsman 700; 4x4; auto transmission; 26 x 11R-12 rear tires / ½" lugs, 4 psi	2 – 7 cm 0.8 – 2.8 in	1 – 4 cm 0.4 – 1.6 in	2 – **13 cm** 0.8 – **5.1 in**	2 – 7 cm 0.8 – 2.8 in	1 cm 0.4 in	13 cm 5.1 in
ATV 2: 2006 Polaris Predator 500; 2x4; manual transmission; 20 x 11-9 rear tires / ½" lugs, 4 psi	3 – 12 cm 1.2 – 4.7 in	2 – 5 cm 0.8 – 2 in	2 – 7 cm 0.8 – 2.8 in	3 – **14 cm** 1.2 – **5.5 in**	2 cm 0.8 in	14 cm 5.5 in

Vehicle Stopping Distance: A comparison of vehicle stopping distances from both 2014 and 2006 testing is shown in Table 3-5 on page 39. General comparison between all 2014 and 2006 test vehicles indicates the following:

The two short-track snowmobiles used for 2014 testing had a substantially longer average stopping distance than the three OHVs (over five times longer than the tracked ATV and over ten times longer than the tracked UTVs). It was somewhat surprising that 'Snowmobile 1' had the longest average stopping distance (182 feet versus 168 feet for 'Snowmobile 2') since it had a studded track. This is likely due to it also having a narrower track than the other snowmobile (13.5 inches wide versus 15 inches for 'Snowmobile 2'). Consequently despite having studs added for extra traction, it had less track surface on the trail to help the snowmobile 'drag/slide' to a complete stop.

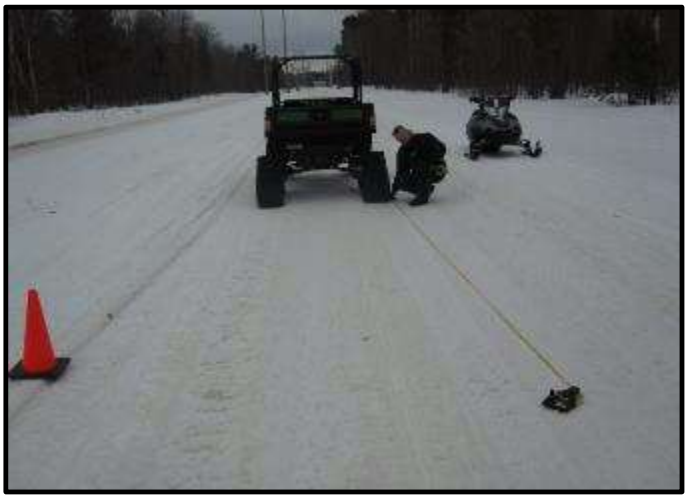

Photo 27: Measuring Vehicle Stopping Distance

The tracked ATV had an average stopping distance of 32 feet while the tracked UTVs' average stopping distances were about half of that at 16 and 17 feet. Even though all three OHVs were operated at their 'top speed' during testing, Camoplast literature notes that adding its track conversion kit results in about a one-third speed reduction – which was learned after rather than before this field test. Consequently 'observed test speeds' for the tracked OHVs have been adjusted downward to reflect more likely 'actual speeds' in Table 3-5. (All future tests will incorporate on-board GPS to better document actual vehicle speeds.) Notably, the large amount of total track surface in contact with the trail on a tracked OHV, along with notable downward thrust to its suspension when locking its brakes, combined to produce very quick and controlled stops. This 'downward thrust' effect during braking was also noted during wheeled ATV 'stops' during 2006 testing.

Table 3-5: Comparison of Vehicle Stopping Distances

Vehicle	Test Speed	Shortest Distance	Longest Distance	Average Distance
2014 Testing: Snowmobiles				
Snowmobile 1: 2003 Arctic Cat Fire Cat 500; 121" x 13.5" x 1" track with 96 studs	44-51 mph	169 feet	194 feet	182 feet
Snowmobile 2: 2012 Arctic Cat T570; 144" x 15" x 1" track	46-50 mph	155 feet	185 feet	168 feet
2014 Testing: Tracked OHVs				
OHV 1 (ATV): 2009 Yamaha Grizzly 700; with four Camoplast ATV tracks (Front: 11.5" x 93.4" x 1", Rear: 12.5" x 98.5" x 1.2")	Speedometer: 57-58 mph top end Actual w 1/3 reduction: 38-39 mph	25 feet	40 feet	32 feet
OHV 2 (UTV): 2009 Polaris Ranger 700 XP; with four Camoplast UTV tracks (Front: 12.5" x 98.5" x 1", Rear: 13.5 " x 116.7" x 1")	Speedometer: 40-42 mph top end Actual w 1/3 reduction: 27-28 mph	11 feet	22 feet	17 feet
OHV 3 (UTV): 2012 John Deere Gator 825i; with four Camoplast UTV tracks (Front: 12.5" x 98.5" x 1", Rear: 13.5 " x 116.7" x 1")	Speedometer: 44 mph top end Actual w 1/3 reduction: 29 mph	12 feet	20 feet	16 feet
Comparison to 2006 Testing: 'Control Snowmobiles'				
Snowmobile 1: 2006 Polaris Switchback 900; 144" x 15" x 1.25" track	35 mph	68 feet	90 feet	79 feet
Snowmobile 2: 2006 Polaris RMK 700; 144" x 15" x 2" track	35 mph	61 feet	82 feet	74 feet
Comparison to 2006 Testing: 'Control Wheeled ATVs'				
ATV 1: 2005 Polaris Sportsman 700; 4x4; auto transmission; 26 x 11R-12 rear tires / ½" lugs	35 mph	37 feet	84 feet	61 feet
ATV 2: 2006 Polaris Predator 500; 2x4; manual transmission; 20 x 11-9 rear tires / ½" lugs, 4 psi	35 mph	37 feet	91 feet	64 feet

The 2006 tests showed wheeled ATVs generally had average stopping distances ten to fifteen feet shorter than the 2006 test snowmobiles when operated at identical (35 mph) speeds. The 35 mph pass-by used for all 2006 tests is also likely more comparable to actual 2014 OHV test speeds when factoring in the two-thirds 'actual speed' once tracks are added to OHVs. Since the 2006 test snowmobiles had more aggressive track lugs (1.25" and 2") versus 1" track lugs on the 2014 test sleds, shorter stopping distances would generally be expected on comparable surfaces due to the extra lug depth. Nonetheless despite longer track lugs, the average stopping distance for the tracked ATV was nearly 2 ½ times shorter than the 2006 test snowmobiles'

stopping distances, while the tracked UTVs' average stopping distances were nearly five times shorter than the 2006 test snowmobiles.

Another notable difference is that, without exception, all tracked OHVs maintained a very controlled, straightforward line of travel (no significant sideways sliding) when being abruptly stopped. In comparison all other vehicles tested in 2006 and 2014 (all wheeled ATVs and all snowmobiles) experienced some degree (and sometimes a large degree) of sideways sliding when stopped abruptly.

OTHER OBSERVATIONS

After all pass-by tests described above were completed, Trails Work Consulting operated the tracked OHVs on the Bo-Boen Loop Trail to observe other operational characteristics while trail riding. Tracked OHVs were also operated on the access route between the Bo-Boen highline trail and Black Bear Lodge when traveling to and from the test sites. A summary of other observations includes:

Tracked OHV Operation off the Groomed Trail

Since 2006 field testing observed that wheeled ATVs quickly became stuck when operated off the compacted trail base – and even flipped end-over-end when only one tire got off the compacted trail – the tracked OHVs were purposely driven with the outside tracks off the compacted trail base to compare results. (Note: full off-trail OHV travel was not legal (or possible due to thick brush) in this area, so testing was limited to only the vehicle's outside tracks being operated fully off the compacted trail.)

ATV: The tracked ATV had no problem maintaining its speed or its floatation on the uncompacted snow beside the trail when both outside tracks were fully off the compacted trail – irrespective to if it was being operated in 2-wheel or all-wheel drive mode. The tracked ATV's handling and behavior was really not much different than what's experienced when a snowmobile driver dips a snowmobile's outside ski off the outside edge of a groomed trail onto uncompacted snow. The tracked ATV was able to stay on course with no observed handling issues since the outside tracks stayed on top of the uncompacted snow beside the trail.

UTVs: While both tracked UTVs were equipped with automatic all-wheel drive, they were generally operating in only 2-wheel drive mode when cruising down the trail. Consequently when the front outside track was steered onto uncompacted snow beside the trail, the UTV became stuck since its front tracks were not engaged. When this happened and the 'all-wheel drive' function was manually engaged, the vehicle could easily become unstuck by effortlessly backing up onto the trail. When both UTVs were operated with their 'all-wheel drive' function engaged, no problems were encountered when they were driven onto uncompacted snow beside the trail; they did not become stuck like when operated in only 2-wheel (rear) drive mode.

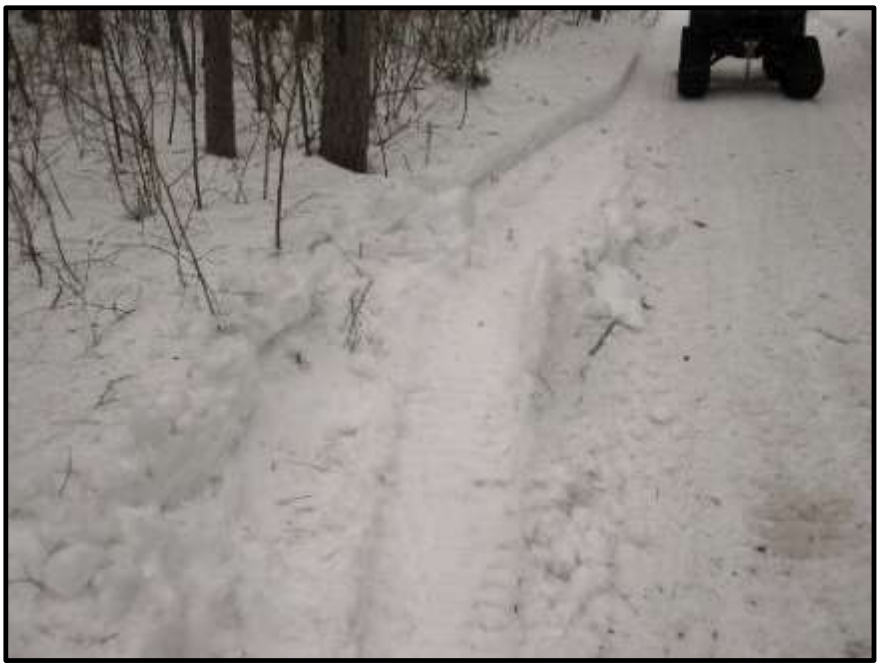

Photo 28: Tracked OHVs were able to operate okay with one track off the compacted trail base

Tracked OHVs, and particularly tracked UTVs, had a fairly significant effect on 'trail aesthetics' when the outside tracks were operated just off the groomed trail surface. See Photo 28 above. A regularly groomed snowmobile trail typically provides a cleanly finished cut (curb) on its outside edge. While this curb may be viewed as purely aesthetic (and consequently unimportant) in some areas, it can serve a functional 'visual boundary' purpose in other areas where off-trail travel is not allowed; therefore it may potentially be more important in the Northeast and Midwest than in the West. Additionally intrusion into this curb could cause trail edges to deteriorate/melt faster during warm weather. The best way to safeguard against unwanted vehicle intrusion into the clean-cut outside trail edge on a groomed trail – if it's an issue for a local area – is to provide a regularly groomed trail width that's wide enough to safely allow two-way traffic by all authorized vehicle types (snowmobiles only, or also ATVs and/or UTVs as per local management policies).

Tracked UTV – Overall Height

UTVs are generally equipped with roll-over protection systems (ROPS) with varying roll-bar or cage configurations. Consequently these vehicles are much taller than snowmobiles or ATVs. Both tracked UTVs used for this test measured 79-inches (6.6 feet) from the ground to the top of their roll-over cage systems. In comparison, the Model 2000 Tucker Sno-Cat grooming tractor used to groom the trails where testing was conducted is 112-inches (9.3 feet) tall. Subsequently, if there is sufficient clearing height on a trail for a grooming tractor, there should generally be sufficient clearing height for UTVs.

A portion of the access trail between the Bo-Boen Trail (test site) and Black Bear Lodge (where the test crew staged) followed a road which also has a small overhead power line located directly adjacent to it. Several power poles along this route have a guy wire running from the pole perpendicularly away from the road – resulting in the groomed access trail running directly beneath some of the guy wires. The first guy wire I encountered while driving one of the tracked UTVs to field testing surprised me, even though I had driven this same route the previous day on a snowmobile. Being surprised by the wire sloping across the trail caused me to instinctively over-correct to the left, closer to the power pole and away from the cable, since I thought the roll cage might hit the guy wire. Afterward I realized the grooming tractor had obviously traveled beneath the same guy wires without a problem, so they shouldn't be an issue for UTV operation.

Nonetheless the visual presence of a guy wire across the trail – even after realizing there was sufficient clearance above the UTV – caused me to continue shying away from this perceived obstruction while operating taller UTVs along this route. Their extra height definitely intensified a need to watch for potential overhead obstructions.

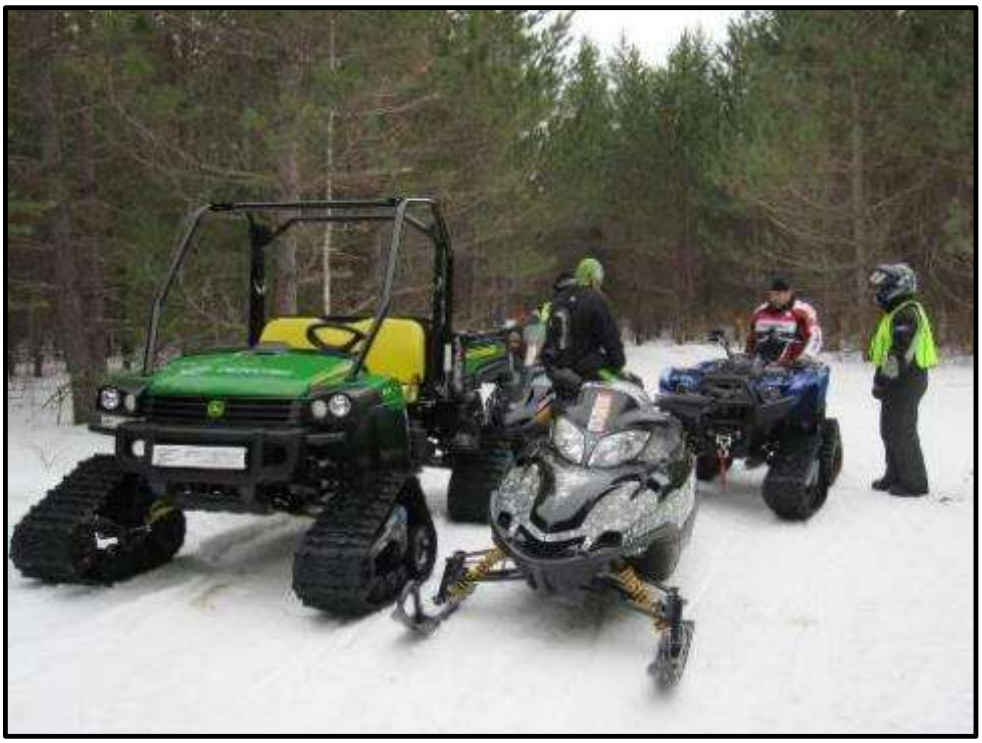

Photo 29: Tracked UTVs are significantly taller than snowmobiles and ATVs

Tracked OHV – Seat Height

Camoplast literature states that its track kit increases ground clearance (and consequently seat height) of an ATV by three inches and a UTV by five inches. The measured seat height of the tracked John Deere Gator was 37 inches above the ground, the tracked ATV's seat height was 38 inches, and the tracked Polaris Ranger's was 39 inches. Comparatively modern snowmobile seats are generally 30 to 34 inches above ground level. The variation between test vehicle seat heights is outlined in Table 3-6. While the numerical differences may not seem large, tracked OHV seat heights are 20 to 30 percent higher than snowmobile seats.

Table 3-6: Seat Height – Snowmobiles versus Tracked OHVs

Modern Snowmobiles	Tracked UTV John Deere Gator	Tracked ATV Yamaha Grizzly	Tracked UTV Polaris Ranger
30 to 34"	37"	38"	39"

From a personal operator's perspective, there was definitely a different 'feel' when driving tracked UTVs along the narrower, winding Bo-Boen Loop Trail compared to when driving a snowmobile along the same route. You felt much higher off the ground on the UTVs than when on a snowmobile as well as when on the tracked ATV – even though the ATV's seat height was similar to both tracked UTVs. This is likely the difference between sitting on a bench seat on the UTVs and sitting astride a snowmobile or ATV seat, coupled with actually being on higher all OHV seats than compared to snowmobiles.

Tracked OHV Width

The maximum width of OHVs equipped with Camoplast tracks is at the vehicle's front tracks (typically a half-inch wider than the rear track width). Table 3-7 shows a modern snowmobile's typical maximum width, the measured maximum widths of the three tracked OHVs used for 2014 testing, and the Bo-Boen Loop Trail's groomed trail width from a single pass with its 8'-6" wide grooming drag.

Table 3-7: Maximum Observed Widths – Tracked OHVs, Snowmobiles, and Bo-Boen Loop Trail

Modern Snowmobiles	Tracked ATV Yamaha Grizzly	Tracked UTV Polaris Ranger	Tracked UTV John Deere Gator	Bo-Boen Loop Trail Groomed Width from 8'-6" drag
48"	52"	68.5"	70.5"	102"

ATVs: While the tracked ATV used during 2014 testing was not substantially wider than a typical snowmobile, its extra four inches of width could be significant on narrow trails. The tracked ATV's 52-inch total width is just slightly more than half the groomed trail width created by a single grooming pass with an 8'-6" wide grooming drag (102"). Such a groomed trail width is borderline being even marginally safe for two-way traffic if tracked ATV use were allowed. Consequently a minimum regularly groomed trail width of at least nine feet (or more) should be considered if tracked ATV use is allowed on groomed snowmobile trails.

Another significant consideration regarding tracked ATV width is that wheeled ATV use is often managed with a maximum '50-inch wide rule' (and sometimes only 48 inches) on public lands. Consequently, adding a track conversion kit to an ATV would disqualify it from use on many summer ATV trails.

UTVs: Table 3-7 shows the two tracked UTVs used during the 2014 test were 20.5 and 22.5 inches wider than a typical snowmobile. This width difference is considerable and could potentially cause significant safety, environmental, and operational issues if tracked UTV use were to be allowed on many existing snowmobile trails.

Both tracked UTVs, at 68.5" and 70.5" widths, were absolutely too wide to be safely operated on a public trail whose groomed width is only 102 inches. Rather, a regularly groomed trail width of at least 12-feet (144 inches), twice or more the maximum UTV width, would be required to safely allow two-way tracked UTV traffic on a groomed snowmobile trail. Since the majority of snowmobile trails are groomed with 8 ½ to 10-feet wide drags, this would necessitate grooming equipment upgrades in many areas.

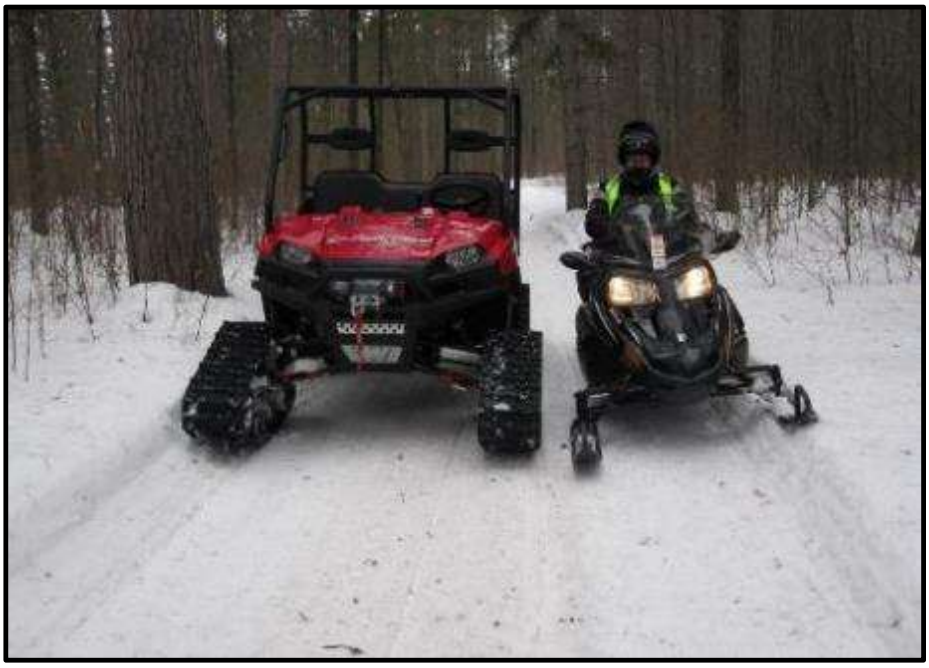

Photo 30: A tracked UTV is over 20" wider than a snowmobile

Increasing the 'groomed trail width' to at least 12-feet wide to accommodate tracked UTV use could be accomplished one of two ways. The best way to ensure a consistently groomed 12-foot wide trail width would be to use at least a 12-foot wide drag or tiller – so that the required trail width can be provided with a single grooming pass, irrespective of weather or timing conditions. Otherwise two consecutive passes with a narrower drag or tiller, timed very closely together and over-lapped to sufficiently widen the trail to at least 12 feet, would be required to provide a suitable safe trail width. Either method could be a costly change for some trail operations. Potential increased costs include needing to purchase wider, more expensive grooming drags along with larger horsepower grooming tractors to pull the larger grooming drags. This could also add increased fuel/maintenance/repair costs due to pulling wider (and heavier) grooming drags. If extra grooming repetitions must be added to provide required trail width through 'double-pass/widening' of trails, or to accommodate increased traffic from added OHV use, additional fuel, labor, equipment depreciation, and equipment maintenance/repair costs may also be incurred.

Environmental impacts may also potentially increase if tree removal, brush clearing, rock removal, and trail grading is required to accommodate wider grooming drags for tracked UTV use.

Other General Observations from Tracked OHV Operation on the Bo-Boen Loop Trail

- Both OHV types hugged the trail and negotiated all corners quite well with no noticeable damage to the trail's surface in plus 40 degrees F temperatures.
- The tracked ATV handled and steered easier when operated in 2-wheel drive mode than when in all-wheel drive mode; power steering would be a beneficial feature when operating in all-wheel drive mode.
- The tracked ATV hugged the trail and negotiated corners at high speeds better than a snowmobile did.
- Tracked UTVs were too large and overwhelmed this smaller side trail; when meeting, a snowmobile and UTV each had to be driven well off the compacted base in order to allow room for both to safely pass.
- The top-end speed of both tracked OHV types was more than adequate on this narrower, winding trail and would be comparable to snowmobile speed abilities along this same route.
- On more open trails, the top-end speed of tracked OHVs, and particularly tracked UTVs, would likely be less than (slower than) typical snowmobile speeds due to significant vehicle power being used to turn four tracks versus four wheels.

Chapter 4: SNOWMOBILE DEFINITIONS

This chapter compiles all existing snowmobile definitions used by states and provinces, as well as U.S. federal land managers. No two snowmobile definitions are exactly the same, reflecting how local control remains paramount from jurisdiction to jurisdiction.

UNITED STATES

Alaska
Sec. 28.39.250. - Definitions.
In this chapter,
(10) "Snowmobile" means a self-propelled vehicle primarily designed or altered for travel on snow or ice when supported in part by skis, belts, or cleats; "snowmobile" does not include machinery used strictly for the grooming of snowmobile trails or ski slopes.

Arizona
Snowmobile: A vehicle specifically built to travel over snow-covered surfaces for recreational touring, trail and cross-country riding, snow cross, and hill-climbing events.

California
California Vehicle Code Section 557
A "snowmobile" is a motor vehicle designed to travel over ice or snow in whole or in part on skis, belts, or cleats, which is commonly referred to as an Over Snow Vehicle (OSV).

Colorado
33-14-101. Definitions.
As used in this article, unless the context otherwise requires:
(11) "Snowmobile" means a self-propelled vehicle primarily designed or altered for travel on snow or ice when supported in part by skis, belts, or cleats. "Snowmobile" does not include machinery used strictly for the grooming of snowmobile trails or ski slopes.

Connecticut
Chapter 255 Snowmobiles and All-Terrain Vehicles
Sec. 14-379. Definitions. As used in sections 14-379 to 14-390, inclusive, subdivisions (3) and (4) of section 12-430 and sections 12-431, 14-33, 14-163 and 53-205, unless the context otherwise requires:
(2) "Snowmobile" means any self-propelled vehicle designed for travel on snow or ice, except vehicles propelled by sail;

Idaho
67-7101. Definitions. In this chapter:
(1) “All-terrain vehicle” or “ATV” means any recreation vehicle with three (3) or more tires and fifty (50) inches or less in width, having a wheelbase of sixty-one (61) inches or less, has handlebar steering and a seat designed to be straddled by the operator.
(15) "Snowmobile" means any self-propelled vehicle under two thousand (2,000) pounds unladened gross weight, designed primarily for travel on snow or ice or over natural terrain, which may be steered by tracks, skis, or runners. [Note: the weight limit was increased from 1,000 to 2,000 pounds in 2014 to specifically accommodate tracked UTVs in respect to 67-7112 below]

67-7112. Groomed Snowmobile Trails
Counties shall have the option to allow all-terrain vehicles and snowmobiles over one thousand (1,000) pounds unladen gross weight, if registered as a snowmobile, to use snowmobile trails in the county. No other vehicles shall operate on groomed snowmobile trails unless specifically allowed by the county. Any all-terrain vehicle and

snowmobile over one thousand (1,000) pounds unladen gross weight operating on groomed snowmobile trails during the winter snowmobiling season when the trails are groomed shall be registered as a snowmobile under the provisions of section 67-7103, Idaho Code. Violation of the provisions of this section shall be an infraction.

Illinois

Illinois Compiled Statutes, Chapter 625, Article 1. Definitions

"Snowmobile" means a self-propelled device designed for travel on snow or ice or natural terrain, steered by skis or runners, and supported in part by skis, belts, or cleats.

Indiana

IC 14-8-2-261

Sec. 261. "Snowmobile", for purposes of IC 14-16, means a motor driven vehicle:
(1) designed for travel primarily on snow or ice; and
(2) of a type that uses:
(A) sled type runners or skis;
(B) an endless belt tread; or
(C) any combination of these or other similar means of contact with the surface upon which the vehicle is operated.

Iowa

Iowa Code Chapter 321G

Snowmobile: A motorized vehicle weighing less than one thousand pounds which uses sled-type runners or skis, endless belt-type tread with a width of forty-eight inches or less, or any combination of runners, skis, or tread, and is designed for travel on snow or ice. "Snowmobile" does not include an all-terrain vehicle, as defined in section 321I.1, which has been altered or equipped with runners, skis, belt-type tracks, or treads.

Maine

MAINE SNOWMOBILE LAWS §13001. Definitions.

"Snowmobile" means a vehicle propelled by mechanical power that is primarily designed to travel over ice or snow and is supported in part by skis, belts, or cleats.

Massachusetts

323 CMR 3.00: THE USE OF RECREATION VEHICLES AND SNOW VEHICLES

"Snow vehicle", a motor vehicle designed to travel over ice or snow, having a curb weight of not more than 453 kilograms or 1,000 pounds, driven by track or tracks in contact with the snow or ice and steered by a ski or skis in contact with the snow or ice.

Michigan

"Snowmobile" means any motor-driven vehicle designed for travel primarily on snow or ice of a type that utilizes sled-type runners or skis, an endless belt tread, or any combination of these or other similar means of contact with the surface upon which it is operated, but is not a vehicle that must be registered under the Michigan vehicle code, 1949 PA 300, MCL 257.1 to 257.923.

Minnesota

84.81 DEFINITIONS

Subdivision 3.Snowmobile.
"Snowmobile" means a self-propelled vehicle originally manufactured and designed for travel on snow or ice steered by skis or runners. Snowmobile does not include the following vehicles equipped with aftermarket ski and track configurations:
(1) An all-terrain vehicle defined in section 84.92;
(2) An off-highway motorcycle defined in section 84.787;
(3) An off-road vehicle defined in section 84.797;
(4) A mini truck defined in section 84.797;

(5) A utility task vehicle described in section 169.045; or
(6) Any other vehicle being operated off road.

Montana
"Snowmobile" means a self-propelled vehicle of an overall width of 48" or less, excluding accessories, designed primarily for travel on snow or ice, that may be steered by skis or runners and that is not otherwise registered or licensed under the laws of Montana.

Nebraska
60-350. Snowmobile, defined.
Snowmobile means a self-propelled vehicle designed to travel on snow or ice or a natural terrain steered by wheels, skis, or runners and propelled by a belt-driven track with or without steel cleats.

Nevada
Over the Snow Vehicle: An over-snow vehicle is defined as a motor vehicle that is designed for use over snow that runs on a track or tracks and/or a ski or skis, while in use over snow. An over-snow vehicle does not include machinery used strictly for the grooming of non-motorized trails.

New Hampshire
215-A:1 Definitions
XIII. "Snowmobile" means any vehicle propelled by mechanical power that is designed to travel over ice or snow supported in part by skis, tracks, or cleats. Only vehicles that are no more than 54 inches in width and no more than 1200 pounds in weight shall be considered snowmobiles under this chapter. Snowmobiles shall not include OHRVs.

New Mexico
66-3-1001.1. Definitions.
As used in the Off-Highway Motor Vehicle Act:
E. "off-highway motor vehicle" means a motor vehicle designed by the manufacturer for operation exclusively off the highway or road and includes:
(3) "snowmobile", which means a motor vehicle designed for travel on snow or ice and steered and supported in whole or in part by skis, belts, cleats, runners or low-pressure tires;

New York
Article 47 - NY Vehicle and Traffic Law
§ 2221. Definitions. For the purposes of this article, the following terms shall have the following meanings.
1. Snowmobile. Any self-propelled vehicle designed for travel on snow or ice, steered by skis or runners and supported in whole or in part by one or more skis, belts or cleats.

North Dakota
39-24-01.8:
"Snowmobile" means a self-propelled vehicle designed for travel on snow, ice, or a natural terrain and steered by skis or runners.

Ohio
Chapter 4519: SPECIAL VEHICLES
As used in this chapter:
(A) "Snowmobile" means any self-propelled vehicle designed primarily for use on snow or ice, and steered by skis, runners, or caterpillar treads.

Oregon
Oregon Revised Statutes (ORS) 801.490 defines a snowmobile as a self-propelled vehicle that:
- Is capable of traveling over snow or ice;

- Uses, as its means of propulsion, an endless belt tread or cleats or any combination of tread and cleats or similar means of contact with the surface upon which it is operated;
- Is steered wholly or in part by skis or sled-type runners; and
- Is not registered in Oregon as a vehicle other than a snowmobile.

Pennsylvania

§ 7702.Definitions.

The following words and phrases when used in this chapter shall have, unless the context clearly indicates otherwise, the meanings given to them in this section:

"Snowmobile." An engine-driven vehicle which is all of the following:

(1) Is designed to travel over snow or ice.
(2) Has an endless belt track or tracks.
(3) Is steered by a ski or skis.
(4) Has an overall width of 48 inches or less.

The term does not include a farm tractor, construction equipment, military vehicle, vehicle with inflatable tires or machinery used strictly for the grooming of snowmobile trails.

South Dakota

32-20A-1. Definition of terms. Terms used in this chapter mean:

(8) "Snowmobile," any engine-driven vehicle of a type which uses sled type runners or skis with an endless belt tread or similar means of contact with the surface upon which it is operated and the vehicle does not exceed forty-eight inches in width;

32-20A-25. Permit to operate motorcycle as a snowmobile. Any resident owner who has titled a motorcycle which has been modified to comply with the definition of a snowmobile for use as a snowmobile on a state snowmobile trail or area established pursuant to the provisions of chapter 41-19 may purchase an annual permit valid from December first to March thirty-first, inclusive, for a fee of twenty dollars. The permit shall be affixed to the motorcycle on the right side of the unit and shall be clearly visible. The Department of Game, Fish and Parks shall collect the annual permit fee imposed by this section and shall deposit the fees in the snowmobile trails fund established by § 32-5-9.2.

Utah

41-22-2. Definitions.

As used in this chapter:

(14) "Off-highway vehicle" means any snowmobile, all-terrain type I vehicle, all-terrain type II vehicle, or motorcycle.

(22) "Snowmobile" means any motor vehicle designed for travel on snow or ice and steered and supported in whole or in part by skis, belts, cleats, runners, or low pressure tires.

Vermont

Title 23: Motor Vehicles Chapter 29: SNOWMOBILES, MOTORBOATS AND WATER SPORTS

§ 3201. Definitions

For the purposes of this chapter:

(5) "Snowmobile" means a self-propelled vehicle intended for off-road travel primarily on snow, having a curb weight of not more than 793.783 kg (1,750 lbs.); driven by track or tracks in contact with the snow and steered by a ski or skis in contact with the snow. The maximum width of a snowmobile shall be no more than 48 inches. An all-terrain vehicle converted to operate with tracks shall not be considered to be a snowmobile.

Virginia

§ 46.2-100. Definitions.

"Snowmobile" means a self-propelled vehicle designed to travel on snow or ice, steered by skis or runners, and supported in whole or in part by one or more skis, belts, or cleats.

Washington

RCW 46.10.010 Definitions

(2) "Snowmobile" shall mean any self-propelled vehicle capable of traveling over snow or ice, which utilizes as its means of propulsion an endless belt tread, or cleats, or any combination of these or other similar means of contact with the surface upon which it is operated, and which is steered wholly or in part by skis or sled type runners, and which is not otherwise registered as, or subject the motor vehicle excise tax in the state of Washington.

Wisconsin

"Snowmobile" means an engine-driven vehicle that is manufactured solely for snowmobiling, that has an endless belt tread and sled-type runners, or skis, to be used in contact with snow but does not include such a vehicle that is any of the following:

- A vehicle that has inflatable tires.
- A vehicle that is driven by a motor of 4 horsepower or less and that is operated in sanctioned races, derbies, competitions or exhibitions or only on private property.

Wyoming

W.S. 31-2-401 (a) (ii)

'Snowmobile' means any mechanically driven vehicle of a type which utilizes sled type runners, or skis, or any endless belt tread or combination of these, designed primarily for operation over snow.

U. S. FEDERAL AGENCIES

Bureau of Land Management (BLM)

Off-Highway Vehicle (OHV): OHV is synonymous with off-road vehicles (ORV). ORV is defined in 43 CFR 8340.0-5 (a): Off-road vehicle means any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: 1) any non-amphibious registered motorboat; 2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; 3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; 4) vehicles in official use; and 5) any combat or combat support vehicle when used in times of national defense emergencies.

Over-Snow Vehicle: An over-snow vehicle is defined as a motor vehicle that is designed for use over snow that runs on a track or tracks and/or a ski or skis, while in use over snow. An over-snow vehicle does not include machinery used strictly for the grooming of non-motorized trails.

Snowmobile: A motorized vehicle that is designed for use over snow that runs on a track or tracks and uses a ski or skis for steering. A snowmobile does not include machinery used strictly for the grooming of non-motorized trails.

U.S.D.A. Forest Service

Off-Highway Vehicle: Any motor vehicle designed or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain.

Over-Snow Vehicle: A motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow.

National Park Service

Over-snow vehicle: A snowmobile, snowcoach, or other motorized vehicle that is intended for travel primarily on snow and has been authorized by the Superintendent to operate in the park. An over snow vehicle that does not meet the definition of a snowcoach must comply with all requirements applicable to snowmobiles.

Snowmobile: A self-propelled vehicle intended for travel on snow, with a curb weight of not more than 1,000 pounds (450 kg), driven by a track or tracks in contact with the snow, and which may be steered by a ski or skis in contact with the snow.

CANADA

Alberta

Definition according to TRAFFIC SAFETY ACT:
117(a): "off-highway vehicle" means any motorized mode of transportation built for cross-country travel on land, water, snow, ice or marsh or swamp land or on other natural terrain and, without limiting the generality of the foregoing, includes, when specifically designed for such travel,

a) 4-wheel drive vehicles
b) low pressure tire vehicles
c) motorcycles and related 2-wheel vehicles
d) amphibious vehicles
e) all-terrain vehicles
f) miniature motor vehicles
g) snow vehicles
h) mini-bikes, and
i) any other means of transportation that is propelled by any power other than muscular or wind (but does not include motor boats)

British Columbia

"Snowmobile" is defined as a self-propelled vehicle of the type commonly referred to as a Snowmobile that is primarily designed for travel over ice or snow and is supported in part by skis, belts or cleats (external dimensions should not exceed a width of 50 in. / 127 cm). An ATV with tracks is not considered a snowmobile.

Manitoba

C.C.S.M. c. O31; The Off-Road Vehicles Act, Definitions in this Act:
"Snowmobile" means a vehicle that has a gross vehicle weight not exceeding 454 kilograms and

(a) is not equipped with wheels, but in place thereof is equipped with tractor treads alone or with tractor treads and skis, or with skis and a propeller, or is a toboggan equipped with tractor treads or a propeller,
(b) is designed primarily for operating over snow or ice, and is used primarily for that purpose, and
(c) is designed to be self-propelled;

New Brunswick

Motor Vehicle Act:
"motorized snow vehicle" means a self-propelled vehicle designed to be driven exclusively on snow or ice;

New Foundland/Labrador

Motorized Snow Vehicles and All-Terrain Vehicles Act, Definitions:
In this Act
(j) "vehicle" means all motorized vehicles designed and constructed for travel on or immediately over land, water, snow, ice, marsh, swampland, and other natural terrain, including four-wheel drive or low-pressure-tire powered vehicles, low-pressure-tire motorcycles and related two-wheel vehicles, snowmobiles, amphibious machines, ground effect or air-cushioned vehicles, but does not include a motor vehicle.

Nova Scotia

Off-highway Vehicles Act, Chapter 323 of the Revised Statutes, 1989
In this Act,
(d) "off-highway vehicle" means a

(i) snow vehicle,
(ii) all-terrain vehicle,

(iii) motorcycle,
(iv) mini bike,
(v) four-wheel-drive or low-tire-pressure vehicle,
(vi) dune buggy, or
(vii) vehicle or class of vehicle designated as an off-highway vehicle by regulation,
but does not include
(viii) a vehicle registered pursuant to the Motor Vehicle Act, or
(ix) a vehicle or class of vehicle exempted from the provisions of this Act by the regulations;

N.S. Reg. 316/2007 Off-highway Vehicles Safety and Training Regulations
2. (2) (e) "snow vehicle" means a self-propelled vehicle designed to be driven exclusively on snow or ice, and includes a snowmobile;

Ontario
R.S.O. 1990, CHAPTER M.44, Definitions
1. In this Act, "motorized snow vehicle" means a self-propelled vehicle designed to be driven primarily on snow;

Prince Edward Island
Off-Highway Vehicle Act, Chapter 0-3
In this Act
(g) "off-highway vehicle" means any motorized vehicle designed for off-highway vehicle cross-country travel on land, water, snow, ice, marsh or swamp land or on other natural terrain and, without limiting the generality of the foregoing, includes, when designed for such travel,
(i) four-wheel drive or low pressure tire vehicles,
(ii) power motor cycles and related two-wheel vehicles,
(iii) amphibious machines,
(iv) all terrain vehicles,
(v) repealed by 2006,c.14,s.1,
(vi) snow vehicles, and
(vii) minibikes

Quebec
Highway Safety Code, O.C. 1420-91, s. 1.
2. In this Regulation,
"snowmobile" means a self-propelled vehicle built for travel primarily on snow or ice, whether equipped or not with steering skis or runners;

Saskatchewan
Chapter S-52
In this Act
(l) "snowmobile" means a vehicle that:
(i) is not equipped with wheels but is equipped with tractor treads alone or with skis or with skis and a propeller; or
(ii) is a toboggan equipped with tractor treads or a propeller; and
(iii) is designed primarily for operating over snow and is used exclusively for that purpose; and
(iv) is designed to be self-propelled; and
(v) does not weigh more than 500 kilograms;

Yukon Territory
"SNOWMOBILE" means a motor vehicle, designed primarily for travel on snow or ice, having one or more steering skis, and self-propelled by means of an endless belt or belts driven in contact with the ground and includes a snowmobile Conversion Vehicle

APPENDIXES

Appendix A: Survey of Trail Managers – Sample Survey Form

Appendix B: Field Study Report Form – Cover Sheet Sample

Appendix C: Field Study Daily Test Log Sample

APPENDIX A: SURVEY OF TRAIL MANAGERS – SAMPLE SURVEY FORM

Evaluation of OHV Use on Groomed Snowmobile Trails
SURVEY OF TRAIL MANAGERS

We are conducting this survey to collect information related to ***allowing concurrent Off-Highway Vehicle use (OHV, other than snowmobiles, including wheeled and/or tracked ATVs, UTVs, side-by-sides, motorcycles, etc.) on groomed snowmobile trails during the winter season.***

It will take only a few minutes of your time – particularly if you do not allow OHVs other than snowmobiles to use groomed snowmobile trails. This survey is being conducted by the American Council of Snowmobile Associations (ACSA) in fulfillment of its cooperative agreement with the Federal Highway Administration (FHWA) to develop new products and information related to snowmobile safety and access. Results will help guide local trail managers about trends related to concurrent OHV use on groomed snowmobile trails.

Please complete this survey and return it to Trails Work Consulting **by September 20, 2013.** Completed surveys can be e-mailed to Trailswork@aol.com, faxed to 605-371-2262, or mailed to Trails Work Consulting, 4015 S. Brady Court, Sioux Falls, SD 57103. **Please respond regardless of whether your jurisdiction allows or prohibits concurrent snowmobile/OHV use** since your answers will help gauge the degree this may be an accepted management practice across the Snowbelt. If you are not the person best able to complete this survey for your jurisdiction, please forward it to the person who is.

If you have questions about this survey, please contact Kim Raap at 605-371-9799 or by e-mailing Trailswork@aol.com . *Thank you for your assistance and prompt response!*

Agency/Organization & State/Province: _____

Name of Person Completing Survey: _____ Title: _____

Phone: _____ E-Mail Address: _____

Mailing Address: _____

Part I: Please check the situation below (No or Yes) that applies to your agency, state, or provincial jurisdiction and provide the requested information as it applies to your area.

_____ **No**, our jurisdiction **does not allow** any level of concurrent OHV use ***{including wheeled and/or tracked ATVs, UTVs, side-by-sides, motorcycles, etc.}*** on groomed snowmobile trails during winter.

A. Please indicate how concurrent OHV use on groomed snowmobile trails is prohibited in your area: (please check all that apply)

____ Legislation ____ Rule/Regulation ____ Policy ____ No formal action to prohibit

____ Other (explain): _____

B. Please explain reason(s) why concurrent OHV use is not allowed on groomed snowmobile trails in your jurisdiction:

C. Total miles/kilometers of groomed snowmobile trails in your jurisdiction: _____

D. Please mail copies of legislation, rules/regulations and/or policies that prohibit concurrent OHV use on groomed snowmobile trails in your area to: Trails Work Consulting, 4015 S. Brady Court, Sioux Falls, SD 57103, or send as e-mail attachments to Trailswork@aol.com

Thank you! Please skip to Part III if you have marked 'No'

_____ **Yes**, our jurisdiction **allows** some level of concurrent OHV use ***{including wheeled and/or tracked ATVs, UTVs, side-by-sides, motorcycles, etc.}*** on groomed snowmobile trails during the winter season.

1. The following types of OHVs are allowed at some level or some location(s) on groomed snowmobile trails during the winter season (please check all that apply):

___ wheeled ATV ___ tracked ATV
___ wheeled UTV or side-by-side ___ tracked UTV or side-by-side
___ wheeled motorcycle ___ tracked motorcycle
___ other OHV (please specify): _____

2. Does your state/province/jurisdiction have any width and/or weight restrictions for vehicles allowed to operate on groomed snowmobile trails? ___ No ___ Yes (please explain):

3. Total miles/kilometers of groomed snowmobile trails in your jurisdiction: _____

4. Total miles/kilometers of groomed snowmobile trails that are open to concurrent snowmobile/OHV use in your jurisdiction: _____

5. Total number of snowmobile trail systems in your jurisdiction: _____

6. Total number of snowmobile trail systems that are open to concurrent snowmobile/OHV use in your jurisdiction: _____

7. Please provide an estimate of the 'use level' on your trails that allow concurrent snowmobile/OHV use. If you have multiple areas with varying use levels, please provide multiple answers. Indicate use levels by using two different ratios:

   a) snowmobile/OHV use in terms of heavy, moderate or minimal levels of overall use (example: moderate snowmobile/minimal OHV) _____

   b) in terms of percentage of estimated total use (example: 70% snowmobile/30% OHV): _____

8. What is the time period when concurrent snowmobile/OHV use is allowed (check one and specify dates/ months/times): ____ same as snowmobile season ____ special season restrictions
   Concurrent use is generally allowed from _____ to _____
   Please provide additional information if further explanation is required regarding 'season of use' conditions or parameters (snow depth, temperatures, time of day, etc.):

9. Please indicate how concurrent OHV use on groomed snowmobile trails is allowed in your area: (please check those applicable)

____ Legislation ____ Rule/Regulation ____ Policy ____ No formal action to allow

10. Please explain reason(s) why concurrent OHV use is allowed on groomed snowmobile trails in your jurisdiction:

11. Please mail copies of legislation, rules/regulations and/or policies that allow concurrent OHV use on groomed snowmobile trails in your area to: Trails Work Consulting, 4015 S. Brady Court, Sioux Falls, SD 57103, or send as e-mail attachments to Trailswork@aol.com

Part II: If your jurisdiction does allow some level of concurrent OHV use on groomed snowmobile trails during the winter season, please provide the following information as it applies to your area:

12. If available, please provide any information and statistics you have regarding ***crashes*** on the trails that allow concurrent snowmobile/OHV use (total number of all [snowmobile and OHV] crashes reported, breakdown of all types of crashes, causes of all crashes, etc.). If applicable, please mail/e-mail full report to Trails Work Consulting:

    If available, provide statistics (with the same breakdown as above) regarding the total number of ***crashes*** that involved an OHV and also the total number of crashes documented between snowmobiles and OHVs:

    Please indicate if the ***crash rate*** is ___ unknown ____ about the same ____ higher ____ lower than crash rates on 'snowmobile-only' trails in your jurisdiction. Additional comments or observations about this:

13. If available, please provide any information, statistics, and incident reports you have regarding ***social conflicts*** on the trails that allow concurrent snowmobile/OHV use (total number of incidents reported, breakdown on types of incidents, causes of incidents, etc.):

    If available, provide statistics (with the same breakdown as above) regarding the total number of ***social conflict*** incidents that involved an OHV:

    Please indicate if the ***incident rate*** is ____ unknown ____ about the same ____ higher ____ lower than social conflict incident rates on 'snowmobile-only' trails in your jurisdiction. Additional comments or observations about this:

14. Please provide details regarding any special management guidelines, policies, procedures, restrictions, practices, etc. used by your jurisdiction to manage concurrent snowmobile/OHV use:

15. Please provide any case history information you believe may be beneficial for developing Best Management Practices (BMPs). Mail to Trails Work Consulting, 4015 S. Brady Court, Sioux Falls, SD 57103, or send as e-mail attachments to Trailswork@aol.com

Part III: **Off-season (non-winter) impacts from OHV use on snowmobile trail routes may occur regardless if concurrent OHV use is allowed on groomed snowmobile trails during winter. Please answer the following questions to help identify the degree of existing off-season impacts from other OHVs in your jurisdiction.**

16. Does your jurisdiction currently experience off-season (spring, summer, and/or fall) impacts from OHV use on snowmobile trail routes? ____ No (Thank you for your time, you are finished with the survey!)
____ Yes (please answer the remaining questions)

17. Please rate the following potential off-season impacts from OHV use on snowmobile trail routes in respect to the overall severity of the impact in your jurisdiction (3 = an extreme problem, 2 = a major problem, 1 = a slight problem, 0 = not a problem. Please rate all potential impacts.)

____ Private property trespass – there is landowner permission for only snowmobile season use
____ Public land use issues – there is agency permission for only winter use of the trail route
____ Severe resource damage from non-winter wheeled vehicle use during the off-season
____ Moderate resource damage from non-winter wheeled vehicle/OHV use during the off-season
____ Slight resource damage from non-winter wheeled vehicle/OHV use during the off-season
____ Conflicts with livestock grazing, gates left open, etc.
____ Harassment of livestock
____ Conflicts with wildlife production and rearing areas
____ Harassment of wildlife
____ Conflicts with non-motorized use of the trail route during the off-season
____ Other (specify): _____
____ Other (specify): _____

18. What are your 'Top 3" off-season impacts?
    1) _____
    2) _____
    3) _____

19. Please provide detailed information regarding any special management guidelines, policies, procedures, restrictions, practices, etc. used by your jurisdiction to manage unauthorized off-season OHV use on snowmobile trail routes. Please mail to Trails Work Consulting, 4015 S. Brady Court, Sioux Falls, SD 57103, or send as e-mail attachments to Trailswork@aol.com

Thank You for your participation! Please feel free to provide any additional thoughts or information about this topic.

APPENDIX B: FIELD STUDY REPORT FORM – COVER SHEET SAMPLE

Evaluation of Tracked OHV Use on Groomed Snowmobile Trails
FIELD STUDY REPORT FORM – COVER SHEET

Date _____ Field Study State/Provincial Code & Number _____

Location _____

Observer _____ Elevation _____ Time/Temperature (update temperature hourly):

Start: _____/_____ _____/_____ _____/_____ _____/_____ _____/_____
_____/_____ _____/_____ _____/_____ _____/_____ End: _____/_____

Weather: ☐ Clear ☐ Cloudy/Overcast ☐ Partly Cloudy ☐ Sunny ☐ Partly Sunny ☐ Snow ☐ Rain
☐ Sleet ☐ Other _____ (check all that apply)

Wind Speed _____ Depth of Compacted Snow on Trail Base _____

Trail Aspect: ☐ Flat ☐ Uphill ____ % grade ☐ Downhill ____ % grade ☐ Other _____

Trail Conditions: ☐ Fresh Groomed – hard ☐ Fresh Groomed – soft ☐ Hard Pack - smooth ☐ Normal
☐ Lightly Moguled ☐ Heavily Moguled – Mogul Depth: ☐ 2" – 6" ☐ 6" – 12" ☐ 12" – 18" ☐ 18"+
☐ Other _____ (check all that apply)

New Snow on Groomed Trail Base: ☐ None ☐ Skiff ☐ ¼" – 2" ☐ 2" – 6" ☐ 6" – 12" ☐ 12" – 18" ☐ 18"+

Date/Time of Last Grooming _____ Grooming Equipment _____

Measuring Equipment: Distance _____
Depth _____
Other _____

****

Vehicle Information: Complete an information block for each vehicle used during the day of field testing and then use the Vehicle Code (A1, S1, etc.) to track that vehicle's performance on each corresponding Daily Test Log.

<table>
<tr><td>OHV #1
Code: O1</td><td>Make:</td><td>Model:</td><td>Year:</td><td>License #:</td></tr>
<tr><td rowspan="3">☐ 2WD
☐ AWD
☐ Tracked
☐ Tracked with front skis</td><td>Track Size:
Front -
Rear -</td><td>Track Brand/Model:</td><td>Track Lug Height:</td><td>Vehicle PSI (if known):</td></tr>
<tr><td># Tracks:</td><td rowspan="2">Track Design:</td><td rowspan="2">Transmission Type:</td><td>Engine cc:</td></tr>
<tr><td>Vehicle Weight (if known):</td><td># Passengers on:</td></tr>
</table>

Snowmobile #1 **Code: S1**	Make:	Model:	Year:	License #:
Track Lug/ Paddle Height:	Track Length: Track Width:	Ski Type: □ Metal □ Composite/Plastic □ Double Runner	Ski Carbide: □ Yes □ No	Engine cc: # Passengers on:

OHV #2 **Code: O2**	Make:	Model:	Year:	License #:
□ 2WD □ AWD □ Tracked □ Tracked with front skis	Track Size: Front - Rear -	Track Brand/Model:	Track Lug Height:	Vehicle PSI (if known):
	# Tracks: Vehicle Weight (if known):	Track Design:	Transmission Type:	Engine cc: # Passengers on:

Snowmobile #2 **Code: S2**	Make:	Model:	Year:	License #:
Track Lug/ Paddle Height:	Track Length: Track Width:	Ski Type: □ Metal □ Composite/Plastic □ Double Runner	Ski Carbide: □ Yes □ No	Engine cc: # Passengers on:

OHV #3 **Code: O3**	Make:	Model:	Year:	License #:
□ 2WD □ AWD □ Tracked □ Tracked with front skis	Track Size: Front - Rear -	Track Brand/Model:	Track Lug Height:	Vehicle PSI (if known):
	# Tracks: Vehicle Weight (if known):	Track Design:	Transmission Type:	Engine cc: # Passengers on:

Snowmobile #3 **Code: S3**	Make:	Model:	Year:	License #:
Track Lug/ Paddle Height:	Track Length: Track Width:	Ski Type: □ Metal □ Composite/Plastic □ Double Runner	Ski Carbide: □ Yes □ No	Engine cc: # Passengers on:

Appendix C: Field Study Daily Test Log Sample

Evaluation of Tracked OHV Use on Groomed Snowmobile Trails – FIELD STUDY DAILY TEST LOG

Date _____ Field Study Code/Number _____ Unit of Measure: ☐ feet/inches ☐ meter/centimeters Vehicle Code _____
Trail Conditions: ____ Smooth ____ Moguled Mogul Depth: _____ Driver: _____
Start Time: _____ Start Temp: _____ End Time: _____ End Temp: _____

Vehicle Pass #	Aggressive Start		Aggressive Pass		Aggressive Stop		Average Pass-By Speed: _____ Observations:
	Depth/Width	Distance	Depth/Width	Distance	Depth/Width	Distance	
1							
2							
3							
4							
5							
6							
7							
8							

Comments:

Vehicle Pass #	Normal Corner		Aggressive Corner		Corner/Curve		Average Normal Speed: _____ Average Aggressive Speed: _____ Observations:
	Depth/Width	Distance	Depth/Width	Distance	Radius	Distance	
1							
2							
3							
4							
5							
6							
7							
8							

Comments:

Additional General Comments: