Supplemental Assessment of Tracked OHV Use on Groomed Snowmobile Trails

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

June 2015 – Final Report

Supplemental Assessment of Tracked OHV Use on Groomed Snowmobile Trails

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ACKNOWLEDGEMENTS AND DISCLAIMER

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ACSA's leadership and members are recognized for their input and guidance throughout this on-going series of assessments. All project management, field observation assessments, writing, and photography for this report were provided by Trails Work Consulting. A special thank you to Polaris Industries Inc. for providing the tracked RZR UTV used for observations at all 2015 assessment sites. It should be noted that Polaris does not support or promote the use of OHVs on snowmobile trails, but provided equipment for this project to help further education and information collection efforts. Appreciation is also given to the Wyoming State Trails Program for providing a tracked ATV for added assessment and demonstration at two Wyoming snowmobile trail locations.

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BACKGROUND INFORMATION

For the purposes of this Assessment, the term 'tracked OHV' means an off-road / off-highway recreational vehicle (OHV) generally produced by its original equipment manufacturer (OEM) equipped with wheels – but which has been converted by its owner to a tracked vehicle by replacing its wheels with either multiple tracks or a rear track/front ski combination. The tracked OHVs observed during this assessment process included three vehicles types: 1) tracked ATVs, 2) tracked UTVs/ROVs (also known as side-by-sides), and 3) tracked motorcycles.

It is not the intent of this assessment project to either encourage or discourage concurrent tracked OHV use of any type on groomed snowmobile trails; that decision must be made at the local level in accordance with local priorities and circumstances. Consequently this report's only intent is to help expand the body of information related to tracked OHV operational characteristics and potential impacts so that local decision makers can make informed decisions related to snowmobile trails management.

This 2015 'Supplemental Assessment of Tracked OHV Use on Groomed Snowmobile Trails' report builds upon information learned during the 2014 *Assessment of Tracked OHV Use on Groomed Snowmobile Trails* (2014 Assessment) which is available at http://www.snowmobileinfo.org/snowmobile-access-docs/Assessment-of-Tracked-OHV-Use-on-Groomed-Snowmobile-Trails.pdf. Even though the 2014 Assessment included only one day of formal field testing, valuable new information was gained. Assessment sponsors concluded that additional field observations would be useful to help further evaluate potential tracked OHV effects in a wider range of groomed trail and weather conditions, as well as during off-trail over-snow operation in open cross-country travel areas. Consequently the 2015 Supplemental Assessment focused on documenting tracked OHV operating characteristics and impacts in a wider variety of on- and off-trail settings. It also broadened the tracked OHV database by observing and documenting tracked motorcycle operation on groomed snowmobile trails.

The 2014 Assessment's March field testing was highly structured and focused on formal 'aggressive pass-by' tests. It compared impacts from the operation of two snowmobiles, one tracked ATV, and two tracked UTVs (side-by side utility vehicles) on the same groomed snowmobile trail near St. Germain, Wisconsin and documented depth impressions from each vehicle during aggressive starts, aggressive stops, and high speed pass-by on both straight and winding trail segments. Air temperatures during this limited testing were above plus 40 degrees Fahrenheit during the entire field assessment, which is generally considered to be 'warmer than normal' snowmobiling conditions. Despite warm weather conditions, there were generally low impacts with no substantial differences observed between the depths of impressions created by the tracked OHVs versus impressions created by snowmobile use on that particular groomed snowmobile trail. And the tracked OHV impressions left on the trail during the 2014 Assessment were overall slightly less (shallower) than those created by aggressive snowmobile operation since it was impossible to 'spin' the tracks on any of the tracked OHVs which were observed during the assessment.

Consequently, since 2014 field evaluations showed little difference between snowmobile and tracked OHV impacts during aggressive pass-by testing, the 2015 field assessment focused solely on observing potential impacts from actual trail riding on groomed snowmobile trails and off-trail operation of tracked OHVs in open cross-country areas rather than conducting additional formal pass-by tests on groomed trails.

Executive Summary of Key Findings

Detailed information learned from the four 2015 field assessments is provided in each assessment's Trip Journal, beginning on page 12. Key findings from all assessments are summarized below. Findings from both the 2014 and 2015 Assessments have also been integrated to develop 'Management Considerations for Concurrent Tracked OHV Use on Groomed Snowmobile Trails' in Chapter Two, beginning on page 28.

1. **None of the tracked OHVs observed operating on groomed snowmobile trails during the 2014 and 2015 Assessments created rutting of the trail or any other adverse effects to the groomed trail surface.** Tracked OHVs appear to generally have a large enough tracked footprint and low vehicle PSI (pounds per square inch), meaning the vehicle's weight is generally evenly dispersed over the trail surface, and are not excessively heavy to be supported by the groomed trail surface. Additionally, none of the tracked OHVs observed were able to 'spin' its tracks on the trail to purposely create ruts, most likely because significantly more power is required to turn large tracks on an OHV versus what is required to turn its original equipment wheels. Generally, impressions left on the groomed snowmobile trail surface by tracked OHVs were the same or less than the impressions left on the trail by snowmobiles, particularly since OHV track lugs are generally only about one-inch long compared to many snowmobiles which have deeper track lugs as well as the ability to easily 'spin' their tracks. The track impressions left on firmly groomed trails by tracked OHVs were consistently only about one-inch deep.

2. **The tracked OHVs operated off-trail and on fresh snowfall performed well and had adequate flotation and power.** The track impressions left in the uncompacted new snowfall by tracked OHVs were no different than what would have been left by a snowmobile riding through the same new snow. The tracked RZR and tracked ATV used during this Assessment easily negotiated uncompacted snow up to three feet deep without becoming stuck.

3. **All tracked ATVs and UTVs are slightly or significantly wider than a snowmobile, so this increased width must be carefully considered and managed.** The wider width of tracked OHVs is potentially the most significant, and least subjective, decision factor when assessing whether concurrent tracked OHV use should be allowed on groomed snowmobile trails. All ATVs and UTVs become markedly wider when equipped with tracks. Therefore a snowmobile trail must have sufficient overall 'maintained' trail width to ensure two-way traffic for all vehicle types allowed on the trail can be properly accommodated.

   Of note, the 2014 Polaris 570 RZR used for the 2015 Assessment – which is 50 inches wide when equipped with wheels and considered a 'trail legal' vehicle width in respect to wheeled OHV use on many summer trails – is 61 inches wide when equipped with tracks. A 2014 Yamaha 700 Grizzly also used for the Assessment is 46.5 inches wide when equipped with wheels but is 54 inches wide when tracks are installed.

   Tracked OHV width is a prime concern since a snowmobile is generally 48 inches or less in total width. In comparison, assessments show that a tracked ATV's width ranges from being four to six inches (8 to 12.5%) wider than a snowmobile's and that the various tracked UTV models encountered were thirteen (27%) to nearly twenty-three inches (48%) wider than a snowmobile. This is likely the most tangible factor in the debate over whether tracked OHVs should be allowed on groomed snowmobile trails and should not be ignored when considering potential trail safety issues.

4. **Tracked UTVs and ATVs may require headlight adjustments to compensate for increased vehicle ground clearance / height when their wheels are replaced with tracks.** An ATV's ground clearance is generally increased at least three inches, while an UTV's ground clearance is increased at least five inches when tracks are added. It's likely that headlights may need to be adjusted downward to ensure proper nighttime visibility directly in front of tracked OHVs.

5. **Many tracked motorcycles are motocross models which do not have headlights or taillights.** Although many jurisdictions do not require a snowmobile's headlight to be turned 'on' during daylight operation, this may be a potential safety consideration in some jurisdictions or some applications.

Chapter One: 2015 Field Assessment Observations

2015 FIELD ASSESSMENT PURPOSE

Since 2014 field evaluations showed little difference between snowmobile and tracked OHV impacts during aggressive pass-by testing, the 2015 field assessment focused on observing potential impacts from actual trail riding and off-trail operation of tracked OHVs rather than conducting additional formal pass-by tests on groomed snowmobile trails. This assessment was not intended to portray a comprehensive evaluation of all potential tracked OHV use issues or scenarios imaginable. Rather it documented conditions present at the time of tracked OHV operation and any 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. Nevertheless this assessment was successful in providing new information to help further informed discussions regarding the pros and cons of concurrent tracked OHV / snowmobile trails management.

THE 2015 FIELD ASSESSMENTS

Assessment Locations

Snow conditions during the 2014-2015 winter season were up and down due to variant weather patterns throughout the winter in much of the Snowbelt. Consequently snow and trail conditions were inconsistent during the end of January through March time frame when the primary tracked OHV test vehicle was available to Trails Work Consulting for this field testing. Additionally, tracked OHVs can only be legally operated on groomed snowmobile trails in a limited number of jurisdictions. Consequently sites in and around Wyoming were used for this assessment project due to 1) adequate snow conditions at the time of testing and 2) legal access for tracked OHVs on groomed snowmobile trails.

Formal tracked OHV field assessments were conducted on snowmobile trails at three locations in February 2015. A tracked OHV demonstration was also provided for ACSA Western Chapter meeting participants prior to their snowmobile ride near Pinedale, Wyoming on February 21, 2015. Additionally, incidental tracked motorcycle operation by private motorcycle owners was observed while snowmobiling on trails in the Beartooth Mountains in northern Wyoming and the adjacent Cooke City, Montana area on January 24-25, 2015. A summary of dates, locations and the OHV use observed is provided in Table 1-1:

Table 1-1: Assessment and Demonstration Locations

Date	Assessment Location	OHVs Observed
January 24-25, 2015	Beartooth Mountains north of Cody, Wyoming and the Cooke City, Montana area	Tracked motorcycles being operated on groomed trails by their owners
February 15, 2015	Bearlodge Mountains, near Sundance, Wyoming	Tracked Polaris RZR
February 17, 2015	Black Hills, along the Wyoming-South Dakota border	Tracked Polaris RZR
February 19, 2015	South Pass along the Continental Divide south of Lander, Wyoming	Tracked Polaris RZR & tracked ATV
Demonstration Location		
February 21, 2015	Upper Green River parking area north of Pinedale, Wyoming	Tracked Polaris RZR & tracked ATV

The Tracked OHVs Used for this Assessment

A Polaris 570 RZR UTV equipped with Polaris Prospector Pro tracks (these tracks are specially manufactured for Polaris by Camoplast) was loaned to Trails Work Consulting by Polaris Industries' RiderX Program, from the end of January through March 2015, for this assessment project. This vehicle was the primary OHV used for assessment and demonstration at all 2015 Assessment sites. A Yamaha 700 Grizzly ATV equipped with Camoplast tracks was also provided by the Wyoming State Trails Program for the South Pass, Wyoming field assessment and for the Western Chapter demonstration.

Technical data for the two test vehicles is shown in Table 1-2 below. The average ground pressure of a snowmobile is about 0.50 pounds per square inch (PSI). Generally, the lower a vehicle's PSI is, the better its flotation in snow will be. In comparison, the two tracked OHVs used for this assessment had a PSI of 0.55 and 0.60 and the two larger UTVs used for the 2014 assessment, a 2009 Polaris Ranger 700 XP and a 2012 John Deere Gator 825i, had a PSI of 0.90.

Table 1-2: Technical Data for the 2015 Assessment Vehicles

Vehicle General Description	Track Size	Total Surface on Snow	Tracked Vehicle PSI
OHV 1 – Primary Test Vehicle (UTV): 2014 Polaris RZR; 570 cc, automatic 2-speed transmission, AWD, Polaris Prospector Pro tracks (manufactured by Camoplast)	2 Front: 12.5" x 98.5" x 1.125" 2 Rear: 13.5 " x 116.7" x 1"	2,470 sq. in.	0.60
OHV 2 - Secondary Test Vehicle (ATV): 2014 Yamaha Grizzly; 700 cc, automatic 2-speed transmission, AWD, Camoplast T4S tracks	2 Front: 11.5" x 93.4" x 1.25" 2 Rear: 12.5 " x 98.5" x 1.25"	2,000 sq. in.	0.55

The tracked UTV and tracked ATV used for the 2015 Assessment are shown in Photos 1-1 through 1-10 below:

Photo 1-1: OHV 1 (UTV) – Polaris 570 RZR with Prospector Pro tracks, side view

Photo 1-2: OHV 1 (UTV) – Polaris 570 RZR with Prospector Pro tracks, front view

Photo 1-3: OHV 1 (UTV) – Polaris 570 RZR with Prospector Pro tracks, rear view

Photo 1-4: OHV 1 (UTV) – Polaris 570 RZR, Prospector Pro front track

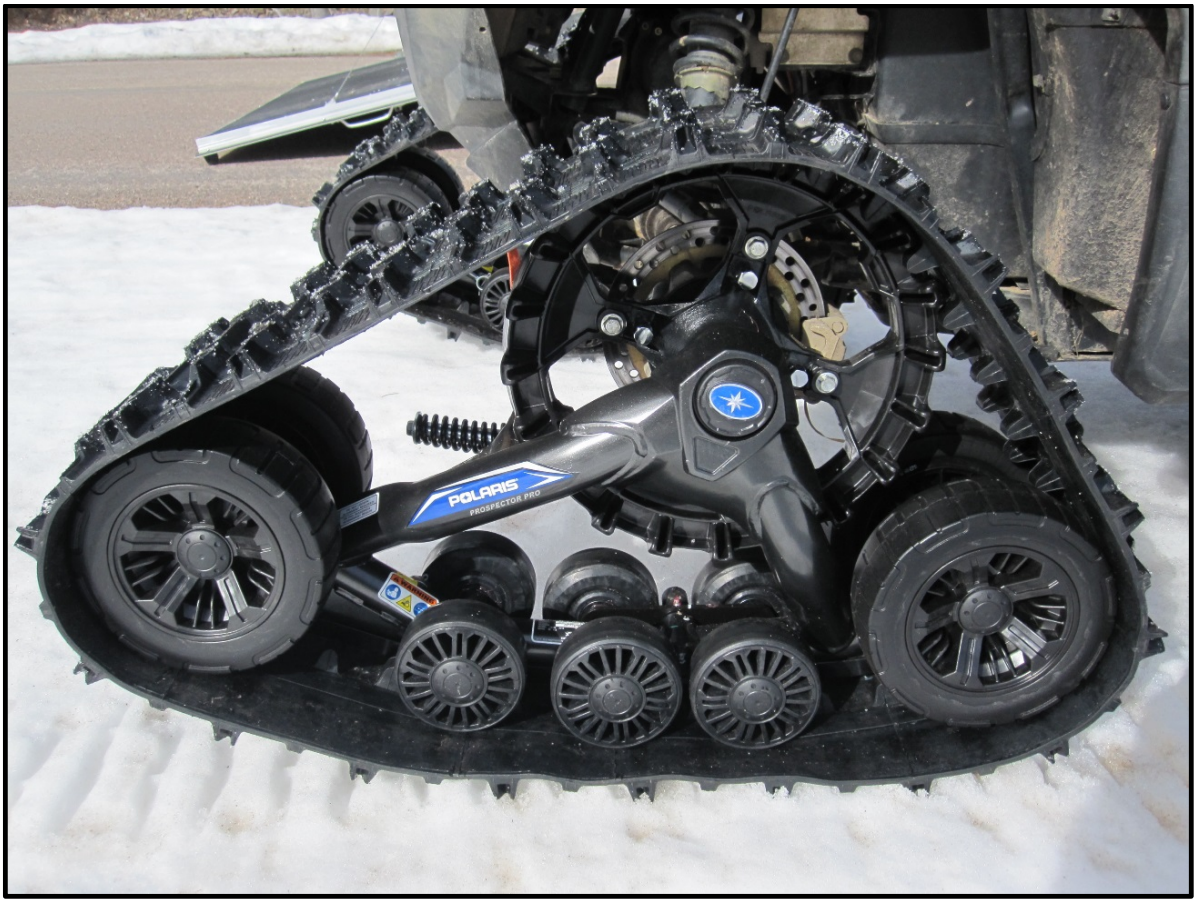

Photo 1-5: OHV 1 (UTV) – Polaris 570 RZR, Prospector Pro rear track

Photo 1-6: OHV 2 (ATV) – Yamaha 700 Grizzly with Camoplast tracks, side view

Photo 1-7: OHV 2 (ATV) – Yamaha 700 Grizzly with Camoplast tracks, front view

Photo 1-8: OHV 2 (ATV) – Yamaha 700 Grizzly with Camoplast tracks, rear view

Photo 1-9: OHV 2 (ATV) – Yamaha 700 Grizzly, Camoplast T4S front track

Photo 1-10: OHV 2 (ATV) – Yamaha Grizzly 700, Camoplast T4S rear track

Tracked OHVs' Increased Width – A Primary Consideration
OHVs become markedly wider when equipped with tracks. And all tracked ATVs and UTVs are slightly or significantly wider than a snowmobile. Therefore a snowmobile trail must have sufficient overall 'maintained' trail width to ensure two-way traffic for all vehicle types allowed on the trail is properly accommodated.

Of note, the 2014 Polaris 570 RZR used for the 2015 Assessment – which is 50 inches wide when equipped with wheels and considered a 'trail legal' vehicle width in respect to wheeled OHV use on many summer trails – becomes 61 inches wide when equipped with tracks. And while the 2014 Yamaha 700 Grizzly's wheeled width is 46.5 inches, this test vehicle's width became 54 inches once tracks were added.

Table 1-3 shows the measured maximum vehicle widths from the tracked OHVs used for field testing in 2014 and 2015 – compared to a modern snowmobile's maximum width that doesn't typically exceed 48 inches. While a tracked ATV's width ranged from being four to six inches (8 to 12.5%) wider than a snowmobile's, the various tracked UTV models were thirteen inches (27%) to nearly twenty-three inches (48%) wider than a snowmobile.

Table 1-3: 2014 & 2015 Assessments – Maximum Observed Widths of Tracked OHVs versus Snowmobiles

Tracked ATV Yamaha Grizzly	Tracked UTV Polaris RZR	Tracked UTV Polaris Ranger	Tracked UTV John Deere Gator	Modern Snowmobiles
52" to 54"	61"	67.5" to 68.5"	70.5"	48"

It is likely that allowing tracked ATVs or UTVs on a groomed snowmobile trail may require wider grooming equipment than if only 48-inch wide snowmobiles are allowed. The most commonly used trail grooming drags are eight, nine, or ten feet wide, and those areas using a tiller to groom are generally locked in around 10 feet wide. While some areas use grooming drags that are twelve or even fourteen feet wide, this requires significantly larger groomer tractors and considerably wider trail clearing widths. Wider grooming equipment may also cause greater environmental impacts due to the need for more tree removal, brush clearing, rock removal, and wider trail grading to accommodate wide equipment.

The 'maintained' trail width should generally be at least twice as wide as the widest vehicle allowed to operate on a trail in order to best accommodate two-way traffic. Maintained trail width essentially refers to 'clearance width,' which may or may not be in a groomed condition, and is more important in forested areas than it is in open areas. Table 1-4 below provides recommended example maintained trail widths for the various vehicles observed during the 2014 and 2015 Assessments.

Table 1-4: Recommended Minimum Maintained Trail Widths for Various Tracked Vehicles

Width Factor	Snowmobile	Tracked ATV	Tracked 50" 'trail model' RZR	Tracked Ranger	Tracked Gator
Observed Tracked Vehicle Width	48"	52" to 54"	61"	67.5" to 68.5"	70.5"
Minimum Drag Width – to best provide optimum maintained trail width for 2-way traffic with a single grooming pass	8 feet	9 feet	10 feet	12 feet	12 feet

The most expedient way to provide sufficient maintained trail width is to use a drag or tiller that's wide enough to provide the desired maintained width with a single grooming pass. Otherwise two consecutive passes with a narrower drag or tiller, if possible timed fairly close together and over-lapped to widen the trail, would typically be needed to provide a maintained trail width sufficient for two-way trail traffic on groomed snowmobile trails.

If snowmobile trails must be maintained wider than they currently are for snowmobile use in order to accommodate tracked OHV use, operating costs could likely increase. Potential increased operating costs could be caused by: 1) a need to purchase wider grooming drags, 2) a need to purchase larger horsepower grooming tractors to pull wider grooming drags, 3) increased fuel, maintenance, repair and equipment depreciation costs due to pulling wider (and heavier) grooming drags, 4) extra grooming repetitions required to provide desired trail width through 'double-pass/widening' of trails, and/or 5) extra grooming repetitions needed to accommodate increased traffic from added OHV use.

Field Assessment Conditions

Temperatures during the 2015 field assessments ranged from plus 9 degrees up to 39 degrees Fahrenheit as summarized in Table 1-5. Weather conditions during assessments ranged from being clear and sunny to cloudy, windy and snowy. The Black Hills assessment was conducted immediately after over 24 hours of snowfall which provided eight to twelve inches of fresh snow for the assessment. On-trail and off-trail snow conditions were otherwise generally very firm despite or because of warm temperatures during or preceding the assessments.

Table 1-5: Summary of 2015 Field Assessment Temperatures and Weather Conditions

Location	Temperature Range	General Weather Conditions
Beartooth Mountains	+ 22 to + 31 degrees Fahrenheit	cloudy, windy and snowy on Day 1 clear and sunny on Day 2
Bearlodge Mountains	+ 28 to + 39 degrees Fahrenheit	clear and sunny
Black Hills	+ 9 to + 11 degrees Fahrenheit	cloudy and windy, immediately following over 24 hours of snowfall
South Pass	+ 28 to + 34 degrees Fahrenheit	clear and sunny with moderate winds

SUMMARY OF FIELD ASSESSMENT OBSERVATIONS

General Operational Observations and Conclusions

General operational observations and conclusions from the 2015 supplemental tracked OHV field assessments are summarized below. All detailed information learned from each field assessment can be found in the individual Trip Journals for each assessment, beginning on page 12. While operation of ATVs and UTVs which are larger or heavier than models used for this assessment could potentially result in different observations, particularly off-trail, knowledge learned through these assessments indicates that differences would likely be slight and unlikely to be adverse due to the relatively good flotation demonstrated by tracked OHVs operated on snow.

1. There were no adverse effects observed on the groomed snowmobile trail surface from several tracked motorcycles seen operating within groups of snowmobile riders. All tracked motorcycle impressions were generally consistent with tracks left on the trail by snowmobile traffic.

2. Many of the tracked motorcycles observed operating on snowmobile trails did not have functioning headlights or taillights. While it must be recognized that many jurisdictions do not require a snowmobile's headlight to be turned 'on' during daylight operation, this may be a potential safety consideration in some jurisdictions. Some motorcycles may also have increased sound levels compared to stock (unmodified) snowmobile exhausts.

3. There were no adverse effects observed on the groomed snowmobile trail surface from operation of the tracked RZR or from the tracked ATV. The track impressions left on the trail were similar to one another and no different than those created by snowmobiles being driven on the trail. All track impressions were generally only about one inch deep – consistent with each OHV's track lug height.

4. There were no adverse effects observed on the snowmobile trail when the tracked RZR was operated on freshly fallen snow. The track impressions left in the uncompacted new snowfall were no different than what would have been left by snowmobiles riding through the same new snow.

5. The tracked RZR and tracked ATV both performed well when operated off the trail in one to three-foot deep uncompacted snow. Both OHVs stayed on top of the snow when operated in deeper, softer snow areas. Of note, on firm off-trail snowpack where the RZR stayed on top of the snow's crust while leaving only one-inch deep track lug impressions, the author sank into the snow over his knees when walking over the same crusted snow to photograph the vehicle.

6. It was impossible to 'spin' either OHV's tracks in a deliberate attempt to rut the trail surface under any trail or snow conditions; there simply was not enough engine torque from either vehicle to spin four large tracks.

7. There is consistently a one-third reduction in actual vehicle speed when a wheeled OHV is converted to a tracked OHV. Consequently, unless modified, a tracked OHV's speedometer will generally be inaccurate and overstate actual travel speed by one-third. The maximum actual travel speed attained by the various tracked OHVs operated during 2014 and 2015 assessments ranged between 28 to 31 miles per hour for tracked UTVs and between 35 to 39 miles per hour for tracked ATVs. This reduced/slower maximum tracked OHV speed differential (compared to maximum snowmobile speeds) may be an important user pattern consideration in some areas when assessing potential impacts from mixed snowmobile/OHV use.

8. Tracked UTVs and ATVs may require headlight adjustments to compensate for increased vehicle ground clearance (height) when their wheels are replaced with tracks.

9. The tracked RZR was generally on the verge of overheating when operating in most snow and trail conditions. This may have been due to the vehicle's smaller 570 cc engine having to work harder to turn four large tracks than it has to work to turn four wheels.

10. While none of the tracked OHVs became stuck during field assessments, extraction of a stuck tracked OHV warrants special consideration due to its added weight with tracks as well as different operational characteristics in snow. This factor may warrant new educational efforts to help tracked OHV riders understand and learn different riding techniques for when operating in snow. In all likelihood a stuck OHV will become high-centered in snow, which is very analogous to when a 4-tracked snowmobile trail groomer

(Sno-Cat) becomes stuck in snow. Lessons learned from Sno-Cat operation suggest that the best solution would likely be to immediately stop as soon as the vehicle start bogging down, get the shovel out to clear snow away from beneath and behind the OHV, and then gently try to back the vehicle out of the hole it created without spinning the tracks.

While the first instinct for wheeled OHV riders when trying to avoid getting stuck in mud or sand is often to 'pin' the throttle in an attempt to power through the situation, this is likely to be a poor/worst reaction when riding in snow. First, a significant amount of power is lost when an OHV's wheels are replaced with tracks – so there will not be a lot of surplus power left to help 'power' the vehicle through a 'getting stuck' situation. Second, trying to power the vehicle through the situation will most likely only result in digging the OHV deeper into the snow rather than propelling the vehicle's front tracks back up and onto the snow's surface – like what can be done with a snowmobile. And third, any spinning of the tracks which is created would likely lead to stressing and damaging the OHV – resulting in a much worse situation of being both stuck and broke-down in the middle of a snowbank. Consequently tracked OHV riders need to, rather, let off the throttle immediately when they first feel the vehicle getting stuck (to avoid making the problem worse), stop the vehicle, remove snow from beneath and behind the OHV with a shovel, and then try to gently back the vehicle onto more stable snow in its path to the rear (which was somewhat 'compacted' by the OHV traveling over it) without spinning the tracks.

Another important consideration is that – even though many OHVs are equipped with a winch – it's unlikely a stuck tracked OHV will be in a position where the winch can be attached to a firm anchor point, particularly if it's off-trail. In any case where a winch may be used it is paramount that safe winching practices be followed; under no circumstance should a winch be strung across a snowmobile trail without first blocking all on-coming trail traffic from both directions. Most likely a stuck tracked OHV will need to be removed backwards – in the direction from which it came – making front-mounted winches useless if the rider is attempting a self-extraction. Consequently the most likely successful method to get a tracked OHV unstuck will be to use a shovel to clear a path behind the OHV while also removing snow from beneath the vehicle until it is no longer high-centered.

So when operating a tracked OHV, the rule should be: stop, don't spin, get the shovel out, and then gently try back the OHV out of the hole onto firmer compacted snow. And if it still won't go – shovel some more.

Specific Trip Journal Observations

Specific observations from the four different field assessments were documented in Trip Journals that included extensive photo documentation of impressions created on the trail and in uncompacted off-trail snow by tracked OHV operation. Trip Journals #1 through #4 on pages 13 through 27 below provide specific observation details from each assessment site:

TRIP JOURNAL #1 (J1)
Tracked OHV Field Assessment Photo Documentation and Observations
January 24-25, 2015
Beartooth Mountains in Northwest Wyoming north of Cody and adjacent Cooke City, Montana area

Location: along approximately 30 miles of Trail A in the Beartooth Mountains north of Cody, Wyoming and into Cooke City, Montana
Tracked OHVs Observed: several tracked motorcycles being operated on the groomed trail by their private owners
Elevation: trail ranged from approximately 7,000 feet up to 9,500 feet
Temperature Range: between +22 and +31 degrees F during the two days of riding
Time of Day: from mid-morning to mid-afternoon both days
Weather: cloudy, windy and snowy on January 24; clear and sunny on January 25
Trail Conditions: groomed the prior night, excellent condition

General Trip Description and Observations

These coincidental observations are from a two-day snowmobiling trip in the Beartooth Mountains area in extreme northwest Wyoming and into the adjoining Cooke City, Montana area. Tracked motorcycles are legal on this trail system since they fit within both state's definition of a snowmobile.

Numerous tracked motorcycles were observed being operated by private owners within groups of other snowmobile riders. As can be seen in Photo J1-1 below, the motorcycle's track and ski are very similar to a snowmobile's track and skis. Consequently all impressions left by tracked motorcycles which were observed over the two-day period were very similar to impressions left by snowmobile traffic on the trail – essentially only surface chew consistent with the depth of track lugs.

The ski mark left on the trail by motorcycles was the same as that left by snowmobiles and there was no rutting of the trail surface observed from tracked motorcycle use.

Photo J1-1: Tracked motorcycle riding on a groomed snowmobile trail in the Beartooth Mountains

Photo J1-2: Tracked motorcycle riding within a group of snowmobiles in the Beartooth Mountains

General Conclusions

1. There were no adverse effects observed on the groomed snowmobile trail surface from several tracked motorcycles seen operating within groups of snowmobile riders. All impressions were generally consistent with tracks left on the trail by snowmobile traffic.
2. The tracked motorcycles which were observed operating on snowmobile trails did not have functioning headlights or taillights. While it must be recognized that many jurisdictions do not require a snowmobile's headlight to be turned 'on' during daylight operation, this may be a potential safety concern in some areas.
3. The sound level emitted by some tracked motorcycles was louder than snowmobiles within their group.

TRIP JOURNAL #2 (J2)
Tracked OHV Field Assessment Photo Documentation and Observations
February 15, 2015
Bearlodge Mountains north of Sundance in Northeast Wyoming

Location: Trail A between the Reuter Parking Area to Warren Peak and a portion of Trail B into Ogden Canyon
Tracked OHV Observed: 2014 Polaris RZR 570 UTV
Elevation: trail ranged from approximately 5,600 feet up to 6,400 feet
Temperature Range: between +28 F at higher elevation and +39 degrees F at the lower elevation parking area
Time of Day: Noon to 3:00 PM
Weather: clear and sunny
Trail Conditions: good, smooth condition with some bare sections of asphalt at lower elevations on 'Trail A' due to previous extended warm weather
Driver: Kim Raap – Trails Work Consulting
Total Distance Traveled in Tracked OHV: 20 miles

General Trip Description and Observations

This was the first trip out on the trail with the tracked RZR. The Bearlodge Mountains snowmobile trail system is located at the north end of the Black Hills National Forest in northeast Wyoming. It is managed and groomed by the Wyoming State Trails Program. Tracked OHVs are legal on this trail system since they fit within the state's definition of a snowmobile. The purpose of this trip was to get acquainted with the tracked RZR's operation and to observe any impacts upon the snowmobile trail surface along with how the vehicle performed off-trail.

The trail had not been groomed recently due to an unseasonably warm weather pattern experienced in the area over previous weeks. Consequently long sections of 'Trail A' leading from the parking lot had bared off due to being located on an asphalt access road with a southern exposure. After traveling about one mile from the parking area the trail turned from intermittent snow/bare spots to a good, well compacted snow surface. Despite having

not being groomed for several days prior, the trail surface was firm and smooth due to on-going freeze-thaw cycles compacting and re-leveling the surface. Compacted snow depth on the trail surface, once beyond the lower elevation bare spots, generally ranged from six inches up to more than two feet deep.

Photo J2-1: The tracked RZR on the Bearlodge Mountains snowmobile trail

The tracked RZR clearly stayed on top of the compacted trail surface. Only lug impressions about one-inch deep were left on the trail's surface. See Photo J2-2 below.

The tracked RZR overheated during the long, uphill trip from the parking area to Warren Peak. This may have been due to the long climb and the 570 cc unit working harder to turn four large tracks versus four wheels. It may have also been aggravated from mud discovered in its radiator fins after further investigation. Nonetheless this condition caused the trip to be shortened rather than spending more time touring trails in the RZR.

Photo J2-2: 1" deep RZR track impression on the trail during return trip over the same trail

The tracked RZR was operated in two off-trail scenarios. Photo J2-3 shows the RZR parked off-trail in ungroomed snow that ranged between being two to three-feet deep. The snow was very firm from the preceding freeze-thaw cycles, consequently only one-inch deep track tread impressions were left on the snow surface by the RZR. These shallow track lug impressions can be seen in the snow in front of the front left track, between the front and rear tracks on the driver's side, and in the extreme right-hand lower corner of the photo. It should be noted that footprint impressions in the snow were much deeper (six to eight inches deep) than impressions from the RZR.

Photo J2-3: Footprints in off-trail snow (to the right of front track) are deeper than the RZR's track impressions

The second scenario (Photo J2-4) involved running the RZR with its left track on the compacted trail and its right track off-trail in two-foot deep uncompacted snow beside the trail. The outside track sunk into the uncompacted snow about six inches while the left track created only one-inch deep tread impressions on the trail.

Photo J2-4: RZR track impressions with left track on-trail and right track in 2' deep uncompacted snow beside the trail

An ATV's ground clearance is generally increased at least three inches, while an UTV's ground clearance is increased at least five inches when tracks are added. Photos J2-3 and J2-4 above show how this increased the height of the RZR's headlights and taillights. While the RZR was not operated at night, it's likely that headlights may need to be adjusted downward to ensure proper nighttime visibility directly in front of tracked OHVs.

The 2014 field testing showed a one-third speed reduction in a tracked OHV's actual travel speed versus what the vehicle's speedometer displays. Consequently a Garmin Montana 650t GPS was carried on-board to ground truth travel speed during all 2015 assessments. While the RZR's speedometer displayed a maximum speed of 45 miles per hour, the actual maximum travel speed attained by the tracked RZR during this trip, as per the GPS, was 29.7 miles per hour. This reconfirms that there is a one-third speed reduction in a tracked OHV's speed.

General Conclusions

1. There were no adverse effects observed on the groomed snowmobile trail surface from tracked RZR operation. It was impossible to spin the tracks, even where the trail surface was icy.
2. The tracked RZR had no issues operating off trail. While the off-trail snowpack was visibly hardened from recent freeze-thaw cycles, there were enough soft pockets in the snowpack to determine the tracked vehicle was capable of off-trail travel in the observed conditions with no issues. Of note, the author sank into snow above his knees when walking over the same off-trail snowpack where the RZR stayed on top of the snow's crust while leaving only one-inch deep track lug impressions.
3. There is consistently a one-third reduction in vehicle speed when a wheeled OHV is converted to a tracked OHV. Consequently, unless modified, a tracked OHV's speedometer will be inaccurate.
4. Tracked UTVs and ATVs may require headlight adjustments to compensate for increased ground clearance.

TRIP JOURNAL #3 (J3)
Tracked OHV Field Assessment Photo Documentation and Observations
February 17, 2015
Black Hills along the Wyoming-South Dakota border southwest of Lead, South Dakota

Location: Unplowed/ungroomed roads from the Hardy Work Center in South Dakota to Trail #3 in the Lost Canyon area of Wyoming, and then off-trail on ungroomed side roads and in open draws in Wyoming
Tracked OHV Observed: 2014 Polaris RZR 570 UTV
Elevation: trail and off-trail riding area ranged from approximately 6,350 feet up to 6,500 feet
Temperature Range: between +9 and +11 degrees F
Time of Day: 10:30 AM to 12:30 PM
Weather: cloudy and windy, immediately following over 24 hours of snowfall
Trail Conditions: 8 inches to 12 inches of new snowfall with 2 to 3-feet deep drifts lengthwise along access road; 2 ½ to 3-feet of uncompacted snow depth in off-trail/off-road areas
Drivers: Kim Raap, Trails Work Consulting and Shannon Percy, South Dakota Department of Game, Fish and Parks – Black Hills Snowmobile Trails Manager
Total Distance Traveled in Tracked OHV: 14 miles

General Trip Description and Observations

The Black Hills snowmobile trail system is located in the Black Hills National Forest along the South Dakota-Wyoming border with several of its trails interwoven between the two states. The Wyoming portion of the trail system is maintained by the State of South Dakota through a cooperative grooming contract with Wyoming. All tracked OHVs are legal on the Wyoming portion of this trail system since they fit within Wyoming definition of a snowmobile. Since only tracked motorcycles can be legally operated on South Dakota's snowmobile trails, none of South Dakota's groomed snowmobile trails were used during this assessment.

This trip occurred immediately following over 24 hours of snowfall that brought up to twelve inches of new snowfall to the northcentral Black Hills area. This provided an excellent opportunity to observe the tracked RZR in fresh fallen, uncompacted snow conditions. I was accompanied on this assessment trip by Shannon Percy, the Black Hills Snowmobile Trails Manager for the South Dakota Department of Game, Fish and Parks. We traveled from South Dakota's Hardy Work Center, which is located about one mile from the Wyoming border, in a short

section of road ditch and then on unplowed Forest Service roads until we intersected snowmobile Trail #3 in Wyoming. This included operating in deep snow and traversing a plowed highway where the RZR had to go up and over a 3 1/2-feet high snowplow berm – all which it easily handled. The unplowed roadway had deep, uncompacted snow two to three feet deep over much of the three-mile trip to Trail #3. Long sections of the unplowed roadway had 2 to 3-feet deep drifts lengthwise along the road. The tracked RZR performed well, maintaining a steady speed of about 18 up to 25 miles per hour (as per the GPS) along the entire route.

Trail #3 follows a long valley interspersed with pockets of trees and open areas. The new snow depth along the trail ranged from eight to twelve inches deep with minimal drifting on the trail itself since winds had blown new snow across or off the trail versus depositing snowdrifts on it. The RZR left six to eight-inch deep tracks in the new snow and had no problems maneuvering on the trail.

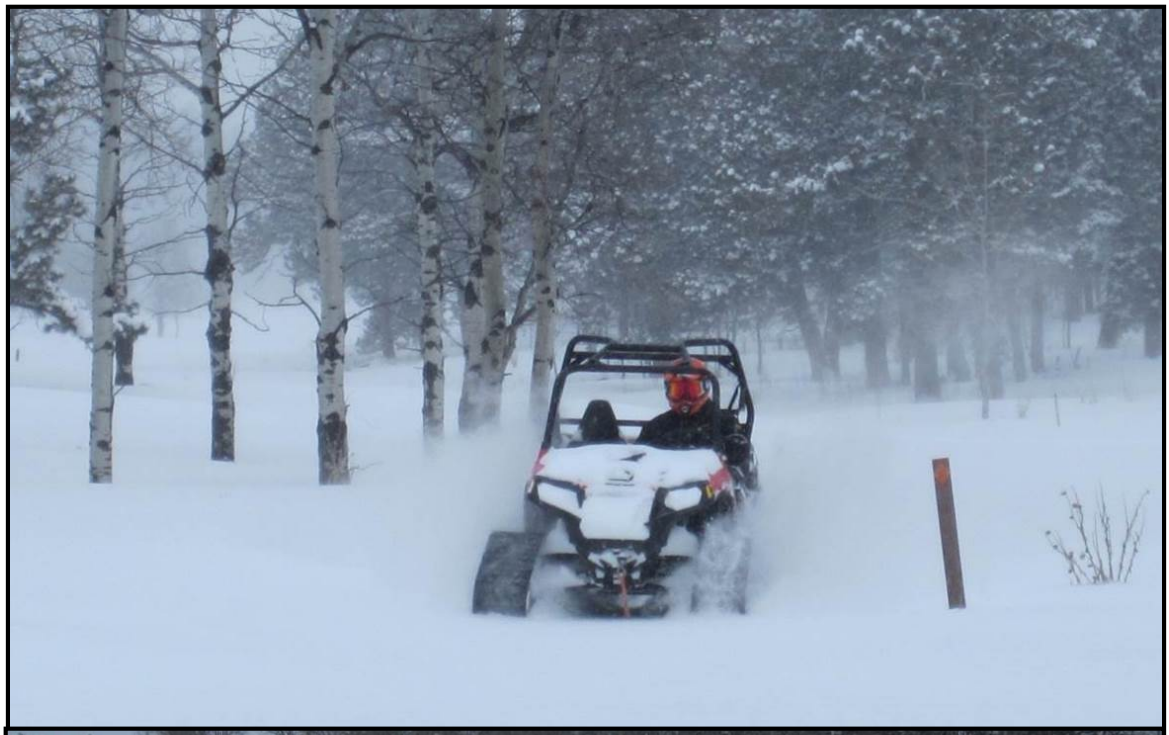

Photo J3-1: The RZR operating in new snow on Trail #3 in the Black Hills

Photo J3-2: 6” to 8” deep impressions created in new snowfall by the RZR on Trail #3

Photo J3-3: Rear view of the RZR operating in new snow on Trail #3

Photo J3-4: Front view of the RZR after several passes in new snow on Trail #3

The tracked RZR was also operated on several miles of ungroomed roads up side draws and in open meadows where there was three feet or more of uncompacted snow. It performed impressively in all situations encountered. It had good flotation and stayed on top of the snow very well. In no case did it ever begin to spin out. It was also stopped and then restarted while in deep snow with no performance issues.

Since the tracked RZR was not equipped with a windshield, top or side covers, operating it in deep, uncompacted snow proved to be a very snowy ride. The front tracks brought snow up and over the hood, as shown in Photos J3-5 below. This deposited lots of snow into the cab's seat and foot-well area and at times threw snow into the lap and face of the driver and passenger. At a minimum, a windshield would be a recommended accessory for over-snow operation.

Photo J3-5: RZR's front track throwing snow up on driver

Photo J3-6: Snow deposited into cab area of the RZR during operation in uncompacted new snow

The tracked RZR ran extremely warm during the entire trip. While it did not overheat like during the Bearlodge Mountains trip, it was very close despite having tried to clean some mud from the vehicle's radiator and adding antifreeze between trips. The 570 cc unit definitely worked hard to turn four large tracks in deep, uncompacted snow, yet was very steady and performed well. Consequently thoughts of a longer trail ride were tabled to avoid potentially overheating the vehicle.

General Conclusions

1. There were no adverse effects observed on the snowmobile trail surface from tracked RZR operation. The track impressions left in the uncompacted new snowfall were no different than what would have been left by snowmobiles riding through the same new snow.
2. The tracked RZR had no issues operating in deep, uncompacted snowfall on or off the trail. It easily negotiated over three feet deep uncompacted snow off-trail while leaving track impressions that were generally six to eight inches deep through the uncompacted snow.
3. The 570 cc vehicle was continually on the verge of overheating when operating in the uncompacted snow conditions.

TRIP JOURNAL #4 (J4)
Tracked OHV Field Assessment Photo Documentation and Observations
February 19, 2015
South Pass area along the Continental Divide south of Lander, Wyoming

Location: at the eastern end of the Continental Divide snowmobile trail system, on 'Trail CDA' from the South Pass Parking Area toward Grannier Meadow
Tracked OHVs Observed: 2014 Polaris RZR 570 UTV and 2014 Yamaha Grizzly 700 ATV
Elevation: trail and off-trail riding area ranged from approximately 8,800 feet up to 9,100 feet
Temperature Range: between +28 and +34 degrees F
Time of Day: 1 PM to 2:30 PM
Weather: clear and sunny with moderate winds
Trail Conditions: excellent condition, somewhat windswept
Drivers: Kim Raap, Trails Work Consulting and Ron McKinney, Wyoming Department of State Parks and Cultural Resources – Trails Program Manager
Total Distance Traveled on Tracked OHVs: 11 miles

General Trip Description and Observations

The Continental Divide snowmobile trail system is located at the south end of the Shoshone National Forest in west-central Wyoming. It is managed and groomed by the Wyoming State Trails Program. Tracked OHVs are legal on this trail system since they fit within the state's definition of a snowmobile.

This trip originated at the South Pass Parking Area which is located at the eastern end of the Continental Divide trail system. I was accompanied on this assessment trip by Ron McKinney, Trails Program Manager for the Wyoming Department of State Parks and Cultural Resources. The Wyoming Trails Program also supplied a tracked ATV for this assessment.

We traveled from the South Pass Parking Area toward the Grannier Meadow area along 'Trail CDA' while operating the tracked RZR and the tracked ATV both on and off the groomed snowmobile trail. The snowmobile trail was very firm and smooth with signs of being windswept in some areas along the route. Both vehicles performed well, leaving only one-inch deep track impressions on the groomed trail surface, as shown on Photos J4-1 through J4-5 below. Note that the RZR's track impression and the boot impression shown on the trail next to its track in Photo J4-3 have nearly identical impression depths.

Photo J4-1: Front view of the tracked Polaris RZR 570 UTV operating on the Continental Divide snowmobile trail near South Pass, Wyoming

Photo J4-2: The 1” deep track lug impression left on the firm, windswept trail by the tracked Polaris RZR UTV

Photo J4-3: The depth of the impression left on the trail by the tracked RZR is similar to the depth of the boot impressions on the trail (to left of RZR track in photo)

Photo J4-4: Front view of the tracked Yamaha Grizzly 700 ATV operating on the Continental Divide snowmobile trail near South Pass, Wyoming

Photo J4-5: The 1” deep track impressions left on the trail by the tracked Yamaha Grizzly 700 ATV

Both tracked OHVs were operated off-trail along the CDA route where snow cover generally ranged between one to three feet in depth. While the off-trail snow was generally firm from being windblown, there were also pockets of softer snow in sheltered areas. Both vehicles performed well off-trail, leaving track impressions that were generally about two inches deep in the more firm snow areas and impressions no more than four to six inches deep in the softest, deep snow areas.

Photo J4-6: The tracked Polaris RZR 570 UTV operating off-trail along the CDA trail route

Photo J4-7: The 2" deep track impressions created by the tracked RZR when off-trail in firm, windblown snow

Photo J4-8: The 4” to 6” deep track impressions created by the tracked RZR when operated off-trail in deeper, softer snow

Photo J4-9: The tracked Polaris RZR transitioning from off-trail onto the CDA trail in a windswept snow area

Photo J4-10: Front view of the tracked Yamaha Grizzly 700 ATV off-trail along the CDA trail

Photo J4-11: The 2” to 4” deep track impressions created by the tracked ATV when operated off-trail in deeper, softer snow

Photo J4-12: The 2"" deep track impression created by the tracked ATV when operated off-trail in firmer, windblown snow

The tracked RZR achieved a maximum travel speed of 31.5 miles per hour on the trail as per the GPS unit, which was displayed as 47 miles per hour on its speedometer. The tracked ATV achieved a maximum travel speed of 36 miles per hour as per the GPS unit, which was displayed as 54 miles per hour on its speedometer. Consequently a one-third speed reduction in a tracked OHV's speed was reconfirmed throughout all 2015 assessments.

While the tracked 570 cc RZR ran warm on this trip, its engine temperature did not get nearly as high as when laboring through deep, new snowfall during the Black Hills assessment or when it overheated during the long, uphill climb to Warren Peak during the Bearlodge Mountains assessment. The tracked 700 cc ATV did not experience any overheating issues, perhaps due to its smaller vehicle size coupled with its larger engine size.

General Conclusions

1. There were no adverse effects observed on the snowmobile trail surface from operation of the tracked RZR or from the tracked ATV. The track impressions left on the trail were similar to one another and no different than those created by snowmobiles being driven on the trail. It was impossible to spin the tracks of either OHV, so there were no ruts created in the trail by either vehicle.
2. The tracked RZR and tracked ATV both performed well when operated off the trail in this area. Both OHVs stayed on top of the snow when operated in the deeper, softer snow areas along the trail route.
3. There is consistently a one-third reduction in vehicle speed when a wheeled OHV is converted to a tracked OHV.
4. The 570 cc RZR's engine temperature continued to run quite high but did not overheat.

CHAPTER TWO: MANAGEMENT CONSIDERATIONS FOR

CONCURRENT TRACKED OHV USE ON GROOMED SNOWMOBILE TRAILS

All motorized recreational vehicle use, whether snowmobiles or OHVs, requires active management. Management should ensure adherence to private or public land use prescriptions, adequate resource protection, and that appropriate visitor experiences are provided. Trail management policies should be set at the local level to ensure they best fit local circumstances. This chapter uses key findings from the 2014 and 2015 Assessments to provide guidance for local trail managers to consider when dealing with existing or potential concurrent tracked 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 whether or not to allow concurrent tracked OHV use in local areas or to prescribe particular local management practices.

RECOMMENDED CONSIDERATIONS FOR CONCURRENT TRACKED OHV MANAGEMENT

It is recommended that local jurisdictions consider the following factors when deciding to either allow or prohibit concurrent tracked 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. **Maintained Trail Width:** This should be a principal decision factor when deciding whether to allow concurrent tracked OHV use on groomed snowmobile trails. OHVs become markedly wider when equipped with tracks. And all tracked ATVs and UTVs are slightly or significantly wider than a snowmobile. Therefore a snowmobile trail must have sufficient overall 'maintained' trail width to ensure two-way traffic for all allowed vehicle types is properly accommodated. A modern snowmobile's maximum width typically doesn't exceed 48 inches. Comparatively the 2014 and 2015 Assessments showed that a tracked ATV's width ranged from being four to six inches (8 to 12.5%) wider than a snowmobile's and that various tracked UTV models were thirteen inches (27%) to nearly twenty-three inches (48%) wider than a snowmobile. Photos 2-1 through 2-4 below show examples of tracked OHVs used during 2014 and 2015 assessments, along with their total respective wheeled and tracked vehicle widths:

Photo 2-1: Tracked 2014 Yamaha Grizzly 700
46.5" wheeled width; 54" tracked width

Photo 2-2: Tracked 2014 Polaris RZR 570
50" wheeled width; 61" tracked width

Photo 2-3: Tracked 2009 Polaris Ranger 700 XP
60" wheeled width; 68.5" tracked width

Photo 2-4: Tracked 2012 John Deere Gator 825i
62" wheeled width; 70.5" tracked width


Unlike other trails, a groomed snowmobile trail must be frequently reestablished after new snowfall or drifting – oftentimes daily or several times weekly, and normally no less than at least once weekly. Therefore a single pass with a grooming implement is what ultimately establishes a snowmobile trail's width at the beginning of the season and then reestablishes and maintains it between subsequent snowfall or wind events. The grooming implement (drag or tiller) used on a snowmobile trail where concurrent tracked OHV use is allowed should be a key consideration since the implement's width is a principal influencing factor of the trail's maintained width.

Wider grooming implement may be needed when tracked ATVs or UTVs are allowed on a groomed snowmobile trail, as compared to if only 48-inch wide snowmobiles are allowed on the trail. The most commonly used trail grooming drags are eight, nine, or ten feet wide, and those areas using a tiller to groom generally have about a 10 feet wide implement. While some areas use snowmobile trail grooming drags that are twelve or even fourteen feet wide, this requires significantly larger groomer tractors and considerably wider trail clearing widths. Consequently a need for wider grooming equipment could potentially also generate greater environmental resource impacts due to an accompanying need for more tree removal, brush clearing, rock removal, and wider trail grading to accommodate wider grooming equipment.

The 'maintained' trail width should generally be at least twice as wide as the widest vehicle allowed to operate on a trail, in order to best accommodate two-way traffic. Maintained trail width essentially refers to 'clearance width' which may or may not always be in a groomed condition. Table 2-1 below provides example recommended maintained trail widths for the various vehicles observed during the 2014 and 2015 Assessments:

Table 2-1: Recommended Minimum Maintained Trail Widths for Various Tracked Vehicles

Width Factor	Snowmobile	Tracked ATV	Tracked 50" 'trail model' RZR	Tracked Ranger	Tracked Gator
Tracked Vehicle Width	48"	52" to 54"	61"	67.5" to 68.5"	70.5"
Minimum Drag Width – to best provide optimum maintained trail width for 2-way traffic with a single grooming pass	8 feet	9 feet	10 feet	12 feet	12 feet

The best way to ensure a sufficient trail width is consistently maintained is to use a drag or tiller that's wide enough to provide the desired width with a single grooming pass. Otherwise two consecutive passes with a narrower drag or tiller, timed very closely together and over-lapped to widen the trail, would be needed to provide a trail width sufficient for two-way traffic on groomed snowmobile trails. It is important to recognize that the subsequent 'widening passes' may not be able to be depended upon to provide wider trails unless the second widening pass occurs almost immediately after the first pass. Photo 2-5 demonstrates how adding tracked UTV use on a narrow snowmobile trail could potentially create issues.

Photo 2-5: A tracked UTV beside a snowmobile on an 8'-6" (102") wide groomed snowmobile trail

If snowmobile trails must be maintained wider than they currently are for snowmobile use in order to accommodate tracked OHVs, operating costs could likely increase. Potential increased operating costs could be caused by: 1) a need to purchase wider grooming drags, 2) a need to purchase larger horsepower grooming tractors to pull wider grooming drags, 3) increased fuel, maintenance, repair and equipment depreciation costs due to pulling wider (and heavier) grooming drags, and/or 4) extra grooming repetitions required to provide desired trail width through 'double-pass/widening' of trails. Extra grooming repetitions may also be needed to accommodate increased traffic from added OHV use, which will also increase a trail system's operating costs.

2. **Funding Assistance:** Funding assistance from OHV riders must accompany any decision to allow concurrent tracked 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 to help share trail grooming costs.

   Snow trails must be regularly groomed to restore them to a condition where they are generally safe and enjoyable to ride. Winter trail grooming is expensive, so any increase in use may likely necessitate more trail grooming – not because tracked 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 tracked OHVs are added to trails, OHV riders 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 trail systems they've helped develop and maintain. All trail users should help pay and volunteer time for trail maintenance.

   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 a '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 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.

'Who manages OHV permit/license sales' in a jurisdiction may determine how difficult it may be to achieve joint funding support from OHV riders for concurrent snowmobile/OHV use. Attaining funding assistance may 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 winter tracked 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 desire winter access and are supportive of helping fund concurrent use.

3. **Risk Management:** Proper risk management is a critical part of managing any recreational activity. If concurrent tracked 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.

4. **Landowner/Land Manager Permission:** Private (including corporate) landowners and public land managers must be involved in any decision to allow concurrent tracked OHV use on existing snowmobile trails. 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 potentially 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 designated as a 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. 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.

5. **Trail Grooming:** Irrespective of a trail's maintained 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 lower or snowfall less frequent. Unless a trail has generally low traffic or is located in a low snowfall area, it's likely that adding new tracked OHV use on a groomed snowmobile trail may necessitate increased grooming frequencies as OHV use increases. Any additional grooming repetitions will increase overall trail operating costs.

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

   There is a definite speed differential between snowmobiles and tracked OHVs that may be an important factor in some areas. Assessments confirmed that tracked OHVs lose one-third of their top-end speed compared to when operated with wheels. Consequently tracked OHVs will typically be traveling slower than snowmobiles.

   The 2014 Assessment's 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 more effectively 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 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 about 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 is crucial to helping 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 riders are familiar with snowmobile trails because they are also either current or former snowmobile owners. Consequently OHV riders 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 trail uses or they cease to exist until the next snow season. Concurrent tracked 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.

'SNOWMOBILE' DEFINITION – A KEY CONSIDERATION

The 2014 Assessment, in Chapter Four, (available at http://www.snowmobileinfo.org/snowmobile-access-docs/Assessment-of-Tracked-OHV-Use-on-Groomed-Snowmobile-Trails.pdf) provided a compilation of all 'snowmobile' definitions used across the United States and Canada. Definitions are a key method by which tracked OHV use can be either allowed or prohibited on snowmobile trails, so it's important to understand the sometimes subtle difference between specific words and phrases within snowmobile definitions. The 2014 compilation showed a wide variance in 'snowmobile' 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':

- **To allow tracked OHV use:** 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.

- **To prohibit tracked OHV use:** 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:
    - **To allow tracked OHV use:** 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 54" 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.).

    - **To prohibit tracked OHV use:** 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.
    - **To allow tracked OHV use:** 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."

    - **To prohibit tracked OHV use:** 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.'