Figures

None

Photos

Chapter 10. Non-Motorized Snow Trails

Non-motorized snow trails can be single use or shared routes used for cross country skiing, skate skiing, snowshoeing, fat tire bikes, or other types of over-the-snow devices. (See Photo 10.1.) The routes may be traditional hiking trails, roads closed in the winter season, or open terrain with a deep winter snow pack. Snow routes can be packed and tracked by the user, snowmobile, or snow cat.

Monitoring over-the-snow trails is important to prevent damage to vegetation and soil from usage when the snow pack is insufficient to cover and protect these resources.

Specific design criteria, such as tread width, grade, and clearing and brushing guidelines, are dependent on the corridor, the type of over-the-snow use, and the grooming to be performed. Over-the-snow trails can be an important part of a trail system and must be included in the trail planning process.

Photo 10.1 - Non-Motorized Snow Trail Users

10.1.   User Packed Trail Design

Over-the-snow trail routes for snowshoeing and backcountry skiing require the fewest design guidelines. Adventurous winter users who desire minimal amenities use these routes. Typically, they follow established hiking trails or primitive roads that lead to the most remote sections of a park.

The depth of the snow pack must be factored into the clearing and brushing maintenance. In locations with shallow snow pack, clearing and brushing can usually be accomplished during the summer months. In locations where the snow pack is deep, clearing and brushing is accomplished during the winter months when fallen trees and vegetation can be more easily reached due to the elevated snowpack. Brushing will define the trail and help keep the backcountry snow traveler on the trail, as well as protect vegetation from being broken by trail users. Once the snow has melted, trees and brush that are cut during the winter need to be stashed out of sight of the trail.

Snow routes should be marked when the snow is deepest. Trail markers need to be at a location and height where they can be easily observed by trail users. In more dynamic snow conditions, it is important to monitor winter trails and adjust route markings to the changing snow depth.   (See Photo 10.2.)

Photo 10.2 - Over the Snow Trail Marker

10.2.   Snowmobile Packed Trail Design

Trails packed by snowmobiles must be wide enough to accommodate both traditional cross-country skiing and snowshoeing. The minimum recommended trail width for these trails is 4 feet. If there are not two paths of travel, there is the potential for user conflict, with tracked ski trails being destroyed by the snowshoe user. When providing two paths of travel side by side, the width and turning radius of the snow mobile must be factored into the width of the trail. If a narrow opening between trees or large rock outcrops is encountered, it may be necessary to narrow the tread width to avoid the removal of these features.

Bridges must be engineered for the live load requirements of a snowmobile, plus the dead load weight of the anticipated snow pack.

10.3.   Snow Cat Packed Trail Design

Routes packed by snow cats with trail groomers primarily use roadbeds or over the snow routes that are open only during the winter. Maintenance and design requirements are the same as for roads, but the design requirements for snow cat packed trails are quite different from those of user or snow mobile packed trails. To

accommodate the large equipment necessary, a wider and higher corridor must be established for the trail route.

10.4.   Watercourse Crossings

Small watercourse crossings need to be protected prior to the onset of winter conditions by installing appropriately sized plastic culverts at these crossings. Often plastic culverts cut in half and placed open-side down are sufficient for this purpose. Without these temporary structures, trail users can break through the snow covering these watercourses and trample and damage the channel and banks. These culverts must be removed prior to the onset of the spring snowmelt. Culverts should never be left in place during spring runoff because they are not designed to withstand the high flow of snowmelt and could become channel-blocking devices that will adversely affect the stream channel.

10.5.   Design Considerations

To protect natural and cultural resources, over the snow routes that occupy corridors only used in winter must be closed earlier in the season than roads and trails that provide year-round routes. Year-round roads and trails are designed for use when there is no snow present, whereas over the snow routes are not.

With routes that occupy corridors only used in the winter, large vegetation, such as trees and tall brush, should be removed to create a corridor appropriate to the height of the snowpack. Low growing brush and vegetation should be left to discourage use in summer. Prior to opening for use, adequate snow pack depth is required to protect the vegetation from compaction and trampling. These routes should be brushed in winter, and seasonal route signage is required. Additionally, these routes should be recorded using a GPS to ensure that the winter route of travel is not migrating into new areas.

10.6.   Additional References

The Minnesota Snowmobile Trails Assistance Program may provide additional useful information for the design and management of snow trails (http://files.dnr.state.mn.us/assistance/grants/recreation/giasnowmobile_manual.pdf).