

Trail Tending Guidelines For Volunteers Revised December 2007

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Thanks for volunteering to help keep our Nordic Ski Trails in good condition. Our work may involve posting diamonds, brushing, clearing pathways, and removing small downed trees. Below are **Guidelines**. **Always confirm with the Forest Ranger for specific directions for your Trail Tending Party.** The general guidelines and what happens on the ground will vary depending on terrain, trail type, vegetation, and maximum snow depths for the area.

Installing Diamonds

The ultimate goal of installing blue winter trail diamonds is to provide a winter trail that is relatively easy and safe to follow and identified either as a snowmobile (orange diamonds) or Nordic ski trail (blue diamonds). There is a safety issue when using the trail at night and/or under moderate to extreme winter conditions. Can you follow the trail in moderate to heavy snowfall with no evidence of snowmobile, ski, or groomer tracks?

Diamond installation is an art and a science. The art is to mark it in a way that the diamonds detract minimally from the natural setting; in other words avoiding sign pollution. The science is understanding and considering tree growth, snow depth and build up, how to provide good sight distance for each diamond, and to minimize future maintenance. A little extra effort during installation will provide effective trail designation for years to come.

Diamond Frequencies:

- Road junctions- Trail users can get turned around and possibly head in the wrong direction at junctions unless provided with reassurance diamonds. Recommend at medium to larger cross roads a single diamond 50-100 feet either side of junction.
- Hiking or Skiing Trail junctions – A single diamond ~ 50 feet in each trail direction.
- Trail located on wider main roads: 10-20 pairs (2 diamonds back to back on a tree or on a bracket) per mile depending on curves, junctions, and open areas. (250-500 feet spacing)
- On narrow secondary roads: 15-25 pairs per mile. (200 to 300 feet spacing)
- On non-road trails: Since these are typically narrower and contain more curves the blue diamonds should be visible from diamond to diamond, in both directions, going and returning.
- Special considerations:
 - Curves: depending on how tight a curve is and if it is on a slope or not will reflect how it is diamonded. Tighter curves may also involve installing “arrowed” diamonds at the two entry points.
 - Clearings: larger open areas in a trail may require diamonds at either end of the opening. The larger “arrowed” diamonds may be necessary to help catch the attention of trail users as they enter the opening. Installation of “snowpoles” may be necessary if the clearing is so large and there are no accommodating trees in the opening on which to attach diamonds.
 - Arrowed diamond use should be restricted only to situations where the trail direction takes an obvious turn or used in case of clearings. Arrows may be used for left or right directions, or for straight ahead.

Tree Selection and Diamond Placement:

When possible, select trees which provide for good front and back visibility; typically trees that stand out from a distance and are close to the trail edge are best. Look down the trail from a distance to see which trees stand out and will make for clearest placement.

Unless there is no other choice, avoid installing diamonds on dead trees. Many of these trees, especially smaller ones, are likely to fall over in the near future. If you have a choice between a tree with a lot of low branches or one with fewer low branches, the later will probably involve less maintenance, provided it is healthy. When installing a diamond, leave at least one inch space between diamond and the tree. If possible, remove branches above or near diamond so that they will not obscure diamond or become weighted by snow and cover view of diamond.

Diamond height depends on snow depth in the particular area. Specs call for installing diamonds 40 inches above the average maximum snow depth.

On already established diamonds, the trees may have grown around the nails. Volunteers should pull nails out, if possible, to leave a 1 inch space for tree growth. If nail heads are flush or into the bark, remove diamond and re-nail or replace diamond. Damaged diamonds should be removed and replaced. Remove the nails only if you can do so without harming the tree.

Limbing and Brushing

Next to tree location, brushing is the single most critical factor in providing good diamond visibility. It is better to over brush than under brush.

- Consider brushing small trees and limbs in front and behind the diamond perhaps 30 feet or more.
- Volunteers should brush on groomed routes 12 feet wide, and 8 feet wide on ungroomed trails. Volunteers should brush all trails 10 feet high. If possible cut limbs on side away from trail to provide a balanced, more aesthetic appearance of the tree.
- Prune limbs just below the diamond to account for snow stacking on lower branches. Try to avoid leaving a “skirt” effect of low branches below the diamond.
- Prune above the diamond, taking into account snow load on higher branches bending downward and covering the diamond from view. This could mean removing limbs several feet above the diamond.
- Consider future limb growth and prune extra as necessary.
- Prune no more than 1/3 to 1/2 of the branches off a particular tree.
- Prune back to the branch collar, but not into the collar. Disperse the cuttings off the trail into the trailside brush. Don’t leave on trail or beside the tree.
- No one is allowed to use a chain saw without Forest Service training and certification. Participants will provide their own saws. Chain saw use may be limited in August and September due to fire risks.
- If volunteers find trees that are too big to cut, report the diameter and location to the FS, and they will take care of the trees.

Nailing

Use the specific 3" aluminum nails only. (May make exception if trail is not in area where trees will be harvested. Check with Forest Service.) Avoid driving the nail "home". Live trees grow outward putting a new layer of wood on each year. If nails are placed too deep, the diamond may be pushed right off the head of the nail in just a few years. Young lodgepole pines and white fir bark is quite thin and nailing 1/2" deep is adequate for these trees. Ponderosa pine bark can vary from 1/2 to 2" thick and requires deeper nailing. The objective is for 1" to 2 1/2 inches of the nail to be exposed beyond the diamond to allow for tree growth. Only one nail is required for each diamond, and two for arrow directional markers.

Usually the Forest Service will provide diamonds and nails. If needed, one vendor of aluminum nails is <http://www.vossigns.com/index.htm> The FS will also usually provide ladders.

Remember the goal is to provide for a marked trail that can be followed under less than ideal conditions and yet avoid heavily over marking it. In addition, volunteers should strive to provide marking that requires minimal future maintenance.

Again, thank you for volunteering to help maintain our ski trails, improve skiing opportunities, and to make the sport safer for all.