Figure 13—The Ultra Light Terrain Grader was designed for roads and parking lots. It works best there.

available when you need them, or on narrow roads, driveways, and in campgrounds, the Ultra Light Terrain Grader may be a good choice.

Summary of South Carolina Field Evaluations

All three graders effectively graded parts of the Wambaw Cycle Trail. None of the graders completed the task in a single pass. Graders required three or four passes to completely remove whoop-de-doos.

All three graders were too wide for this particular trail, and would be too wide for most motorcycle trails and some ATV trails in forested settings. The equipment is also too wide for hiking and equestrian trails. The problem was that the graders had a hard time negotiating corners and avoiding trailside trees. The graders tended to track the *inside* corner of turns, but the tread material that need-ed to be brought back onto the trail was bermed along the *outside* edge. The graders worked best on straight sections of trail and on trails with gradual curves.

Frequent curves are designed into these trails to differentiate them from roads and to make them fun to ride. Straightening or widening trails to make them easier to maintain could reduce user satisfaction. Trails would become B-O-R-I-N-G.

Although the graders are designed to pull tread material back onto the trail from the edges, none of the three graders could reach more than a few inches beyond the edges of the trail to pull in bermed material. The Trail Rake was a little better than the others. Depending on the amount of tread that had been eroded or cast off the trail, the graded trailbed was lower than surrounding terrain. Although this wasn't a problem in the porous, sandy soil of coastal South Carolina, creating such a trench in the heavier soils or in erosion-prone areas would cause water to run down the trail or to pool.

The best solution for severely eroded trails is to bring in additional clean, structural fill material (from the berms or somewhere else), raising the tread surface to grade. Effective drainage structures would need to be installed to move water off the trail. You will want to assess whether such a solution, with regular maintenance, is going to be permanent. If not, consider closing and restoring that trail segment if a better route can be found.

In soft soils, it's best to keep users off the trail after grooming. The longer, the better. One day is better than none, and a week is better yet. "Setting up" depends on soil moisture. Some of the loops on the South Carolina cycle trail are closed for an entire season to allow rainfall to "set up" the trail, forming a hard, compacted surface.

An unexpected surprise! Although the graders we evaluated were a little too wide for the Wambaw Cycle Trail, the Trail Rake and the Ultra Light Terrain Grader were the cat's meow when it came to grading roads and parking lots (Figure 14, next page). Your nearest full-size grader may be 50 miles or 2 months away, but your cooperating OHV club can be there tomorrow and get the job done before the Big Event. These ATV-pulled graders are reasonable alternatives for light-duty road work at campground roads and spurs and at parking lots. They also have good potential for roads-to-trails conversions and in rails-to-trails programs.

ATV Power Requirements

Pulling these graders is tough on ATV's, especially when rocks or roots are encountered. We noticed a direct correlation between happiness and horsepower when it comes to trail grading. More horsepower means fewer overheated engines, less cussing, more work getting done.

For the South Carolina evaluations, The Shop Industrial brought a 500-cc Polaris Sportsman to test their grader (Figure 14).

At the East Fort Rock OHV areas on the Deschutes National Forest, 500-cc Polaris machines are also used. They are four stroke, four-wheel drive, and liquid cooled. The vehicles are always operated in low 4-by-4 range. The graders perform best at slow speeds, 5 to 7 mph (8 to 11 k/hr)—they cut better and bounce less. Appendix A includes an equipment checklist, and Appendix B shows the trail-grooming procedures for the East Fort Rock OHV trails.

Figure 14—The trail rake and Ultra Light Terrain Grader worked great on campgound roads and parking lots.

Other Trail Grading Equipment You Can Pull With an ATV

Our field contacts provided information about several other techniques and equipment they had tried or were using for OHV trail maintenance. Here are some grading accessories you can tow with an ATV.

Tine Harrow

The tine harrow (Figure 15) is best used for finish work, smoothing the trail surface once it has been leveled by other means. It has smoothing power but not much cutting power. It does not provide any compaction.

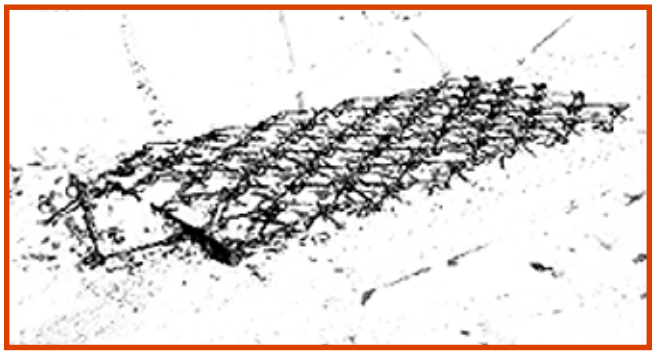

Figure 15—The tine harrow or pasture drag can be pulled with the tines down for scarification, or the harrow can be flipped over for final smoothing.

Tire Drags

Old truck tires (Figure 16) can be filled with concrete for added weight. Large truck tires are heavy enough without extra weight. Tires, sometimes one behind another, are inexpensive and help to smooth the trail surface. They have little cutting ability to remove whoop-de-doos, and also push tread-surfacing material to the sides of the trail—a disadvantage.

We also heard about using three tire halves (cut like you would slice a bagel, using a reciprocating saw), bolted together in a triangle and dragged with the cut face down.

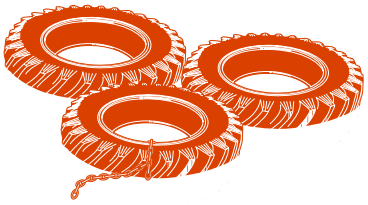

Figure 16—Tire drags with various configurations of one, two, or three tires help to provide a smooth, finished surface to the trail.

Dixie National Forest Drags

Ralph Rawlinson sent information of good success with two inexpensive drags used on the Dixie National Forest in Utah. Both can be pulled with ATV's. The base of the rectangular drag (Figure 17) is 5 feet 8 inches (1.8 m) long, and 4 feet (1.2 m) wide. The perimeter is 3-inch (7.6-cm) angle iron, the middle bar is 3-inch (7.6-cm) channel iron.

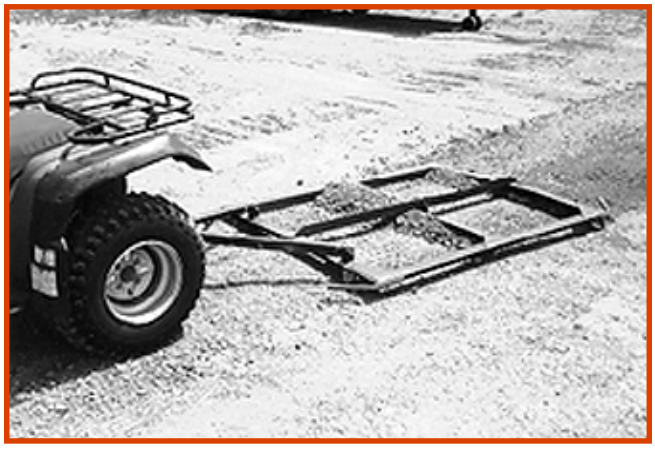

Figure 17—This rectangular drag from the Dixie National Forest is inexpensive and effective.