New Rock-Moving Method Saves Fragile Terrain
Tramway System Used by Katahdin Crew

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Katahdin, well known as the northern terminus of the Appalachian Trail, is an extremely popular hiking destination. More than 60,000 people hike its exciting ridges and table lands each year, enjoying the wide-ranging views over the forest and lake country of northern lame. All of this hiking activity has considerably injured the high mountain trails that traverse the arctic alpine zone of Katahdin. The Appalachian (Hunt) Trail is one of the most damaged trails on the mountain.

The Baxter State Park Trail Crew has been rehabilitating the upper mountain trails since 1983. It is a slow process, requiring more than 2,000 worker-hours to rebuild a one-mile segment of trail.

A loaded rock carrier has been lifted by the cable and is being moved to the Trail. Uphill worker (foreground) is using a spare strap to control the descent of the load. In this case, on the A.T. a half-mile from Baxter Peak, the carrier is a manual one with handles. We found it better to remove the handles and use two snatch blocks to center the load under the cable. (Photo by Lester C. Kenway)

This work involves gathering rocks to build the waterbars, steps, rip-rap, and scree walls used to control erosion and hiker traffic. In past season, the only methods available to us for moving rocks were carrying rocks in our arms and in wood-framed baskets called "rock carriers," or rolling them over the with crowbars. This last method can be very destructive to the fragile tundra.

In 1989, our crew developed a method for moving rock in this difficult and fragile terrain. Trail workers elsewhere may find some of these methods helpful in solving some of their own problems.

The Baxter Park crew has been using “tramways” to move construction materials for many years. A tramway is a material-handling system that involves rolling a load along a cable with pulleys. The typical set-up involved tightening a cable with a “Clydesdale” or similar winch between two sturdy trees and then sending materials down the cable with pulleys or “snatch blocks.”

Sometimes the loads are walked along. At other times, they are pulled with a rope, as would be the case if buckets of gravel were to be sent across a stream, to be used in a bridge abutment. It is even possible to move heavy rocks or logs uphill if the cable is located on a gradual inclined plane.

Tramway systems can be a tremendous labor-saving device. Often, two people can do what eight could do carrying construction materials by hand.

To adapt this system to the treeless tundra of Katahdin, we built tripods from 21/2-inch-square steel tubing. One tripod was built with ten-foot legs and the other was built with eight-foot legs, so we could always easily provide a downgrade for the cable. Each leg weighed about 30 pounds and could be carried by one or two people. Once the legs arrived at the work site, they were fastened together with a 3/4-inch by 16-inch section of threaded rod. After assembly, the rod was bent to allow the legs to spread far enough apart to form a stable base. A bit of work was involved in carrying these materials up 2,400 vertical feet and two and a half miles to the work site, but we soon discovered it was well worth it.

We were successful in using large boulders for anchors at each end of the system. A pair of industrial lifting straps worked very well. Ours were 3-inches by 25-feet and of the "eye and eye" type, so they could be locked into the system with 7/8-inch shackles. After the anchors were chosen, the wire rope was suspended from the tripods with snatch blocks. By using a 200-foot-long wire rope, we could build tramway systems up to about 150 feet long. We found we could reach more than adequate supplies of rock with this equipment.

We had two methods of moving rock using the tramway. Large rocks were moved by suspending them from a snatch block using "eye and eye" slings or "endless loop" clings. These slings were sewn from 5/16-by-2-inch or 3-inch nylon webbing. Smaller rocks were loaded into rock carriers suspended from the cable with slings. Loads were lifted and moved down the sloping cable by relaxing the cable until it touched the sling, followed by tightening the cable in order to lift the load.

We found the system to be very efficient for moving materials horizontally, but it is limited in its ability to lift materials vertically, since only about 10 percent of the cable tension acts in the upward direction. The maximum weight that could be lifted was about 400 pounds. We decided it was best to limit loads to about 200 pounds. Nonetheless, 200-pound to 400-pound rocks are BIG rocks—certainly big enough for anything we needed to build. The veterans on the crew were impressed with the relative ease of moving rocks in this environment, compared with the other ways. I noticed that people seemed less fatigued using the new method, too.

It should be noted that damage to the vegetation can be reduced if 400-pound rocks can be "flown" over tundra instead of rolled over it. Walking back and forth along the cable numerous times can damage the tundra, but this can be minimized if people are careful.

It is possible to assemble the tools and materials necessary to build a similar tramway system for about $1,600. One source for "unlimited travel" wire rope hoists is: Griphoist Inc., P.O. Box 68, Westwood, Mass. 02090. Hoists that use wire rope of 3/8-inch or larger are best suited for a tramway. The various slings, shackles, and snatch blocks can be obtained through suppliers of rigging and wire rope. The Crosby Group makes a variety of these components.

The next time you climb Katahdin via the A.T. you may see young people scurrying about with small towers and seemingly endless coils of wire rope. We are simply taking advantage of a few simple tools in order to restore a special place and a special part of the Appalachian Trail.

-- Lester C. Kenway, a former ATC Board member, is Katahdin District overseer for the Maine A.T. Club.