

Trekking Poles: Can Save Your Knees and the Environment?

By Jeffrey L. Marion, Teresa Martinez and Robert D. Proudman

Introduction

In his 1968 classic “The Complete Walker,” Colin Fletcher sang accolades to his trusted walking staff, noting that it transformed him “from an insecure biped into a confident triped.” He used his staff for balance and assistance in walking, something to lean on during breaks, reconnoitering for rattlesnakes, as a fishing rod substitute, and to knock rainwater from overhanging branches. Today’s technologically advanced trekking poles have been replacing such traditional hiking sticks and their use has dramatically expanded. Leki, the leading pole manufacturer, reports that while originally designed for older hikers, 70% of current purchases are by individuals 25 to 45 years old. Sales data and use statistics are unavailable but their use has increased dramatically in the U.S. over the past five years, trends which many expect will continue. Trekking poles have a longer history of use in European countries. Our informal polling (pun intended) within the Appalachian Trail (AT) community suggests that trekking poles are currently used by 90-95% of thru-hikers, 30-50% of short-term backpackers, and 10-15% of day hikers.

The increasing use of trekking poles has stimulated a growing awareness of some environmental and social impacts associated with their use. This awareness is reflected by an increasing number of “letters to editors” in magazines and e-mail traffic within the AT community. These impacts have not been documented or described in the existing literature. Therefore, this paper seeks to provide an objective review of the potential environmental and social impacts of trekking pole use to provide a basis for further dialogue regarding their use and how they may be altered or used in ways that will minimize future impact. As background for this review we also briefly describe trekking pole features and the pros and cons of their use for hikers.

Trekking Pole Features

Modern trekking poles consist of hollow, aluminum alloy tubes, which often telescope to allow compact storage and length adjustments for different users and changing terrain. At the top are ergonomic grips with adjustable wrist straps, at the base most have pointed tips of long-wearing tungsten carbide and plastic baskets to prevent deep penetration in snow or soft soil. The baskets are removable and are often available in different sizes and shapes. A rubber foot cap also comes with or can be purchased for most poles. Current literature suggests these are intended for hard surfaces, like pavement. Finally, some poles incorporate springs in the poles providing an anti-shock feature to reduce jarring when poles hit rocks or hard terrain.

Pros and Cons for Pole Users

Trekking poles provide stability in difficult terrain and stream crossings. One study found that balance was significantly enhanced by their use, suggesting that poles could help avoid injuries from falls. Some weight is also transferred from your legs to the poles, relieving stress and possible injury to your lower back, knees and ankles. They are a particular aid when climbing and descending hills. For example, another study reported that a typical hiker would transfer 13 tons per hour with two poles in flat terrain, 28 tons when ascending and 34 tons when descending. However, trekking poles do not reduce your energy expenditures while hiking. A treadmill study showed that metabolic energy expenditures were merely shifted from leg to arm muscles with no net change overall. Cardiovascular demands

increased but subjects perceived their level of exertion to be lower. Poles also allowed backpackers to adopt more normal walking postures and stride lengths.

Disadvantages include their financial cost, ranging from \$40 to \$250 per pair. Trekking poles can also get in the way or be a nuisance when you need to use your hands to get something out of a pack, scramble over large rocks, or ascend a steep pitch. Finally, their added weight when not in use and required vigilance in guarding against theft are other considerations.

Potential Environmental and Social Impacts

Before considering the environmental and social impacts of trekking poles, it is important to note that despite thorough searches of the scientific literature and Internet websites, we were unable to locate any research that has investigated these issues. Furthermore, despite numerous website reviews of trekking poles, very few mention the issues of environmental or social impacts and none provide more than a cursory comment. We did locate some published "Letters to the Editor" of *Appalachian Trailway News* (ATN), and there has been some e-mail traffic on these topics - both of which we share in this section. It is therefore important to note that our descriptions are based on personal observations, extrapolations from other visitor impact studies, and speculation regarding the "potential" impacts of trekking pole use.

Vegetation Impacts - Trailside vegetation can be damaged from the swinging action of trekking poles, particularly from contact with the baskets, which can get caught in low-growing plants. One North Carolina hiker noted in an e-mail to the ATC that "the ground was becoming "torn up" by spiked walking poles. On the uphill side of the trail, moss and wild flowers were torn from their bedding. On the downside of the trail, parts of the trail were also torn away." The potential consequences of such damage include a reduction or loss of vegetation cover, change in vegetation composition, and trail widening. We also note that trail maintainers generally trim only higher, overhanging vegetation, that is unaffected by trekking pole use.

Soil Impacts - A number of soil impacts could result from repeated contact and penetration by trekking pole tips. In wet or loose soils, pole tips can penetrate up to two inches and leave holes one-half inch in diameter. These holes are often V-shaped, wider at the top due to the swing of the upper pole once the tip is embedded in soil. Under some conditions we have also seen soil lifted by pole tips and dropped on the ground surface. In a letter to the editor of ATN, a Virginia hiker observed that trekking pole use has become nearly universal and that "These things are tearing up the trail on each side of the footpath. Some places look like they have been freshly plowed."

Potential soil impacts from such disturbance include the loss of organic litter and exposure of soil and increased erosional rates and muddiness. Research is needed to document if, or to what extent, pole use could increase erosional rates. Muddiness could develop following rainfall, when surface water runoff fills the holes created by pole tips. The increased water and soil contact in areas with high densities of holes could turn trailsides to mud, as often occurs on horse trails when water fills hoof prints. Trails that are outsloped for water drainage would not prevent such muddiness, water bars and drainage dips would prevent muddiness only on the downhill sides of trails.

Rock Impacts - The carbide tips on trekking poles leave visually obvious white scratch marks on rock surfaces and also damage lichens. A hiker in Maine related in an ATN letter that "the scratching is so pronounced on granite surfaces that it is sometimes easier to follow where the poles have been than to locate a white blaze. ...the scratching is something I vividly remember from my hike, so remarking about it is justified." In an opinion letter to Backpacker magazine's website, a hiker in the Adirondack's reported that "I was upset to see all the rocks had little white marks on them. Not just a rock here or there, but ALL the rocks on the trail were chipped by hundreds of people ... It got to the point where I could not concentrate on anything else but these thousands of little white gashes in the rocks I was stepping on. It really left a bad taste in my mouth and a grim look to the future."

Aesthetic/Social Impacts - As demonstrated by the previous quotes from hikers, the environmental impacts of trekking poles can also be visually obtrusive to trail users. For some hikers this new form of visual impact "takes away from my "experience" because I feel like someone just walked by there a few

minutes ago....bye, by wilderness.” Significant impacts from heavy pole use could even make the trail more difficult to use or increase maintenance work and costs. The audible scraping noises that trekking poles make when used on hard surfaces can also be an irritant to fellow hikers. One Internet Newsgroup correspondent likened the sound to “fingernails on a chalkboard” when crossing rock surfaces.” Collectively, these impacts have the potential to trigger conflict between trail users, much the same as conflicts between different types of trail users (e.g., hikers, horseback riders, and mountain bike riders).

Discussion and Leave No Trace Practices

The objective of this paper was to objectively describe and call attention to some of the potential negative environmental and social impacts associated with growing trekking pole use. A problem must be identified and understood before it can be resolved. We also emphasize that some amount of resource impact is an inevitable consequence of nearly every form of recreational activity, including hiking without poles. Trekking poles may be viewed as essential by older hikers or those with weaker knees or other health limitations: without poles they might be unable to visit some protected areas. For visitors in good health and condition, trekking poles can provide greater stability and safety in rough terrain, permit longer hikes or reduce strain and soreness of the lower extremities.

Trekking pole users can help minimize resource and social impacts by adopting the *Leave No Trace* (LNT) pole use practices we propose in the adjacent text box. You may consider trekking poles to be indispensable for some hikes or portions of hikes but consider stowing them in flat terrain or when their use causes obvious environmental impacts. We expect that vegetation, soil, and rock damage could be substantially reduced by removing pole baskets and using blunt rubber tips. We question the true need for baskets in conditions other than snow. Although rubber tips will wear off and may become trail litter, we consider this an acceptable cost for the benefits achieved in reducing resource impacts.

Pole manufacturers can also help. Alternative “environment friendly” designs could be investigated and developed. In particular, designs with blunted tips that limit ground penetration, avoid marring rocks, and preserve the natural quiet are needed. Many poles are already sold with rubber tips attached and baskets unattached - product literature should stress that basket use is optional and rubber tips are recommended for standard use. Tip wear should be monitored so they can be replaced before falling off in use. Finally, we emphasize the need for more research to investigate trekking pole impacts and the potential reduction in impact by alternative product designs and use practices.

Jeff Marion, Ph.D., is a Research Biologist with the U.S. Geological Survey who studies visitor impacts to National Parks and other protected areas; Teresa Martinez is an Assistant Regional Representative with the Appalachian Trail Conference; and Bob Proudman is Director of Field Operations, Appalachian Trail Conference.

