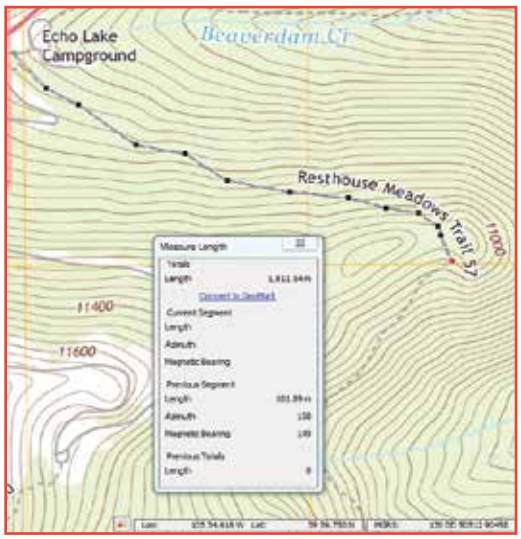
FOLLOW THAT TRAIL:
TOOLS FOR NAVIGATING YOUR NEXT HIKE

BY JOE GRIFFITH

In *Lost Person Behavior,* Robert Koester describes results from the International Search and Rescue Incident Database. The database divides wilderness travelers into two groups: climbers (or mountaineers) and hikers (including backpackers). Perhaps because climbers often venture off trail, they tend to be good navigators. Only 17% of the search and rescue incidents for climbers are caused by someone getting lost, usually in bad weather. Hikers lose their way much more frequently, though they travel mostly on-trail. Lost hikers account for 68% of their rescue incidents.

One reason for having trails is to provide guidance, but they are not free of navigational hazards. Inattentive, unprepared hikers easily get into trouble. They go the wrong way along a trail. They miss an intersection or make the wrong choice at one. They lose the trail. Many do not carry a map and compass. Those with a map sometimes unintentionally read it upside down. Even diligent navigators can go astray when disoriented by weather or darkness. Nevertheless, knowing where you are and how to get to your destination on a trail is easier than navigating off-trail. Numbers, such as compass bearings, are not as demanding on-trail. Off-trail navigators must work much harder to gauge their direction and progress. With just a little additional preparation and mental effort, hikers could navigate as reliably as climbers. The tools needed are easy to carry and easy to use.



A section of the US Topo map for the Idaho Springs quadrangle. The TerraGo Toolbar allows one to extract geospatial information from the map. The PDF file of the map and the toolbar are both free.

COMPASS

We humans depend mainly on our eyes to stay oriented. The verb "orient" comes from the Latin noun *oriens* meaning east, the direction of the rising sun. It is easy to stay oriented when the sun is visible. But when our vision is obscured by darkness, weather, or dense vegetation, we tend to walk in circles unless we have an external guide. A trail offers a guideline, but the trail by itself is not enough.

A compass needle's magical ability to sense direction makes it a priceless item in the wilderness. A compass has many virtues. It is inexpensive, rugged, small, lightweight, and exceptionally reliable. It does not need batteries. In addition to my main compass I often use a small compass built into my emergency whistle. Dangling from my pack's harness, that little compass allows me to instantly verify that I am going in approximately the right direction. You can avert many navigational mishaps by simply making sure that you are going the correct way along a trail.

Hikers often become lost by making the wrong choice at a trail junction, which is why a lot of work goes into providing clear signs at intersections. Not needing the information themselves, wilderness critters sometimes vandalize the signs. They trample and even chew on them. In addition, many junctions do not have signs, so you may need to figure out on your own which way to go. A compass can help with that. Standing at the junction, use your compass to measure the directions of the trails radiating from it. Compare those directions with those on your trail map. If the two patterns match, then it should be easy to make the right choice. If they are different, then you may not be where you think you are.

Animals sometimes destroy trail signs. Photo courtesy of Bill Manning, Executive Director of The Colorado Trail Foundation

MAPS AND GUIDEBOOKS

Good navigators pay attention to landmarks, and they use them as waypoints. A landmark does not need to be a large, prominent feature. It could be a stream crossing, a ridge, or just a distinctive bend in the trail. Each section of a trail has a signature that an alert hiker will quickly recognize. Landmarks allow a hiker to gauge progress without having to exactly measure the distance traveled. Common usage associates waypoints with GPS, but waypoints described with words or marked on a map are also valuable data.

The Colorado Trail Foundation's guidebooks describing the Colorado Trail are excellent examples of the information used by trail navigators. Both *The Colorado Trail, 8th edition,* and *The Colorado Trail Databook, 5th edition,* verbally describe waypoints associated with easily recognizable landmarks. Maps, photos, and elevation profiles help hikers to imagine the context. The guidebook includes a complete narrative while the databook condenses the essential information into a format that is easily carried. Jerry Brown's *The Colorado Trail Map Book* has 1,200 densely spaced GPS waypoints plotted on large-scale topographic maps. You can find a file listing their coordinates at ColoradoTrail.org.

These resources for the Colorado Trail are a fine model of how you can prepare for other trails. First, you will need maps. Fortunately, the Internet is opening up new ways to obtain maps, many of them completely free of charge. In 2008 the USGS began work on a series of 7.5-minute quadrangle maps called US Topo. These maps, along with their earlier quadrangle maps, are available as free PDF files at store.usgs.gov. The maps are GeoPDF® files containing geospatial information. Users of Microsoft® Windows can access this information with a free addition to Adobe Reader® called Terrago Toolbar™. The USGS describes how to use its maps and the toolbar in the *US Topo Map and Historical Topographic Map Users Guide.* You can find it at nationalmap.gov/ustopo/quickstart.pdf.

For example, the map on page 16 shows a section of the latest US Topo map for the Idaho Springs quadrangle. The overlay on the Resthouse Meadows Trail is from the TerraGo GeoMeasure tool. The trail is easy to follow up to the saddle (a landmark) at about 11,100', but just beyond it a sharp turn to the southwest is easy to miss. The last segment of the overlay shows that the turn is 102 m (335') from the saddle on a true bearing of 158°. The coordinates of the red square at the turn are in the lower right-hand corner. Forewarned by your map, you have a much better chance of successfully negotiating the turn.

Unlike the older USGS topographic maps, which are still useful, the original series of US Topo maps did not include trails. Trails are reappearing in the latest version, but it is important to supplement the topographic map with a trail map. National Geographic's Trails Illustrated Maps™ and Latitude 40° maps show trails and other information often missing from topographic maps. Parks usually provide free trail maps. Map makers strive to keep their maps up to date, but the reliability of a map depends on the feature in question. Mountains and valleys generally stay put, but trails can change. It is helpful to consult maps from more than one source. Also check the date of the map. No map is perfect, but imperfect information is far better than none at all.

GADGETS THAT NEED BATTERIES

Electronic devices have too many failure modes to be used as primary navigation tools. On long hikes battery lifetime becomes a significant limitation. If you want to summon help with your cell phone the last thing you need is a drained battery. Device complexity also invites user error. Once, at the beginning of a trip when clearing the track log on my GPS unit, I inadvertently erased all of my waypoints too. If you are depending on GPS waypoints to guide you, make sure that you have them written down and that you know how to manually load them in the field. Hikers carrying a GPS unit have become lost because they had not figured out how to use it.

On the other hand, GPS units and smartphones have become powerful (and seductive) aids for finding your way. As backups to map and compass, they can substantially reduce your chances of becoming lost. If you lose the trail a GPS unit can quickly give you the direction and distance to the nearest waypoint on your path. Many smartphones now include standalone GPS so they can determine your location while out of contact with the cell phone network. Some GPS units can carry topographic maps for all of Colorado at 1:24,000 scale. A smartphone can display map files with Adobe Reader. The camera in a smartphone can record maps posted at a trailhead. There are many new smartphone apps for hikers. For instance, The Colorado Trail Hiker is an electronic guidebook for the Colorado Trail with photos, maps, and the ability to use the phone's GPS receiver.

Resources for navigating trails are plentiful, inexpensive, and generally reliable. If you are unfamiliar with how to use them, several CMC schools offer comprehensive training. Becoming a good wilderness navigator is not difficult, and it will allow you to enjoy the outdoors with the comfort and security of knowing exactly where you are.

The Colorado Trail, 8th edition, and *The Colorado Trail Databook, 5th edition,* are available at www.cmc.org/Store.

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