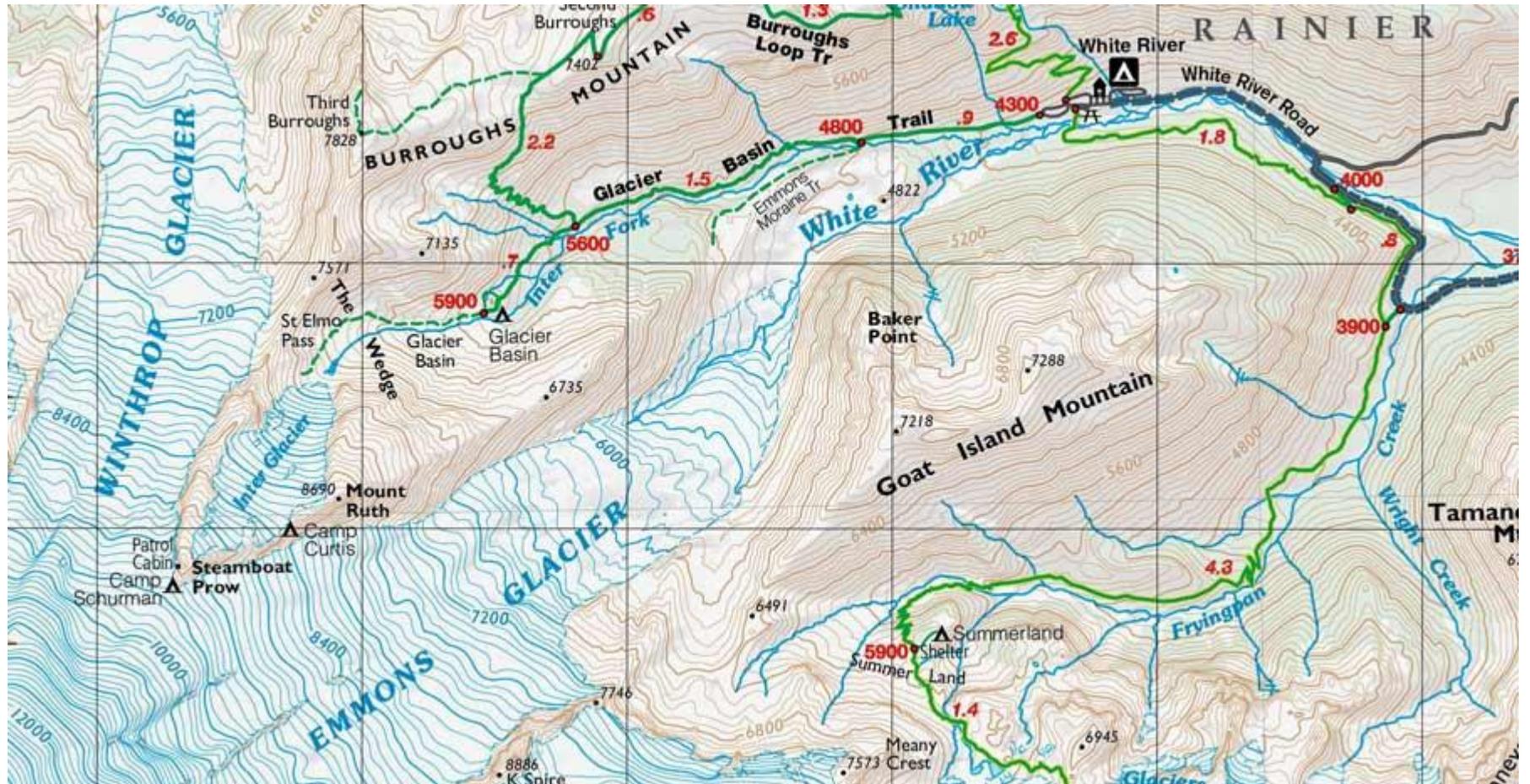


How to Read a Topo Map



You probably know that a magnetized compass and a paper map are part of the [Ten Essentials](#). Learning to read that paper topo map (short for topographic map) is every bit as essential. Your map will then be able to tell you a richly detailed tale about the terrain you'll be exploring.

This article covers these concepts:

- How contour lines let you visualize your terrain
- How map scales work
- Other useful map details
- Where to find topo maps

Also read our companion article, [How to Use a Compass](#). Then take a class with the [REI Outdoor School](#) or another outdoor organization and practice these skills until you master them.

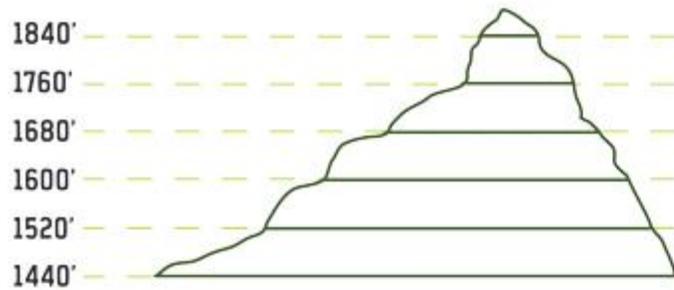
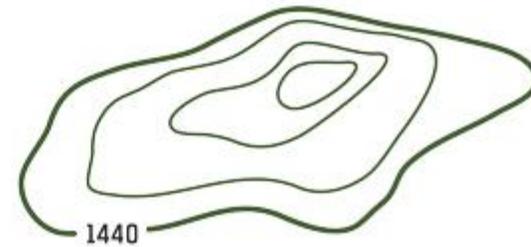
How Contour Lines Describe Terrain

Simple trail maps are useful for trip planning but NOT for navigation in the field. Topographic maps go further, giving you the power to visualize three-dimensional terrain from a flat piece of paper. The feature that makes this possible is contour lines:

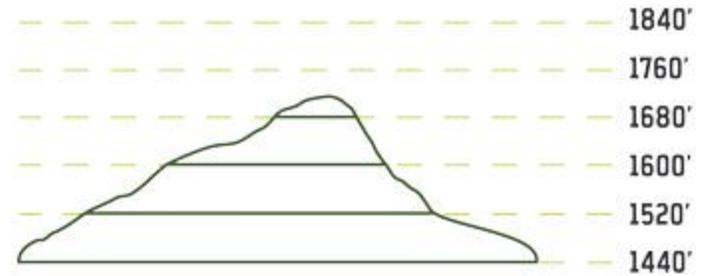
Contour lines indicate the steepness of terrain. Contour lines connect points that share the same elevation: Where they're close together (they never intersect), elevation is changing rapidly in short distance and the terrain is steep. Where contour lines are wide apart, elevation is changing slowly, indicating a gentle slope.



WHAT YOU SEE
ON YOUR MAP



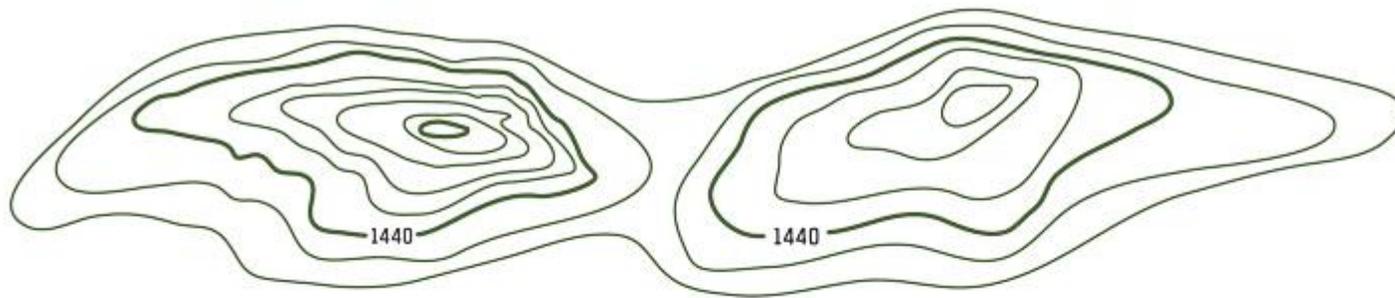
SIDE VIEW
OF LANDMARK



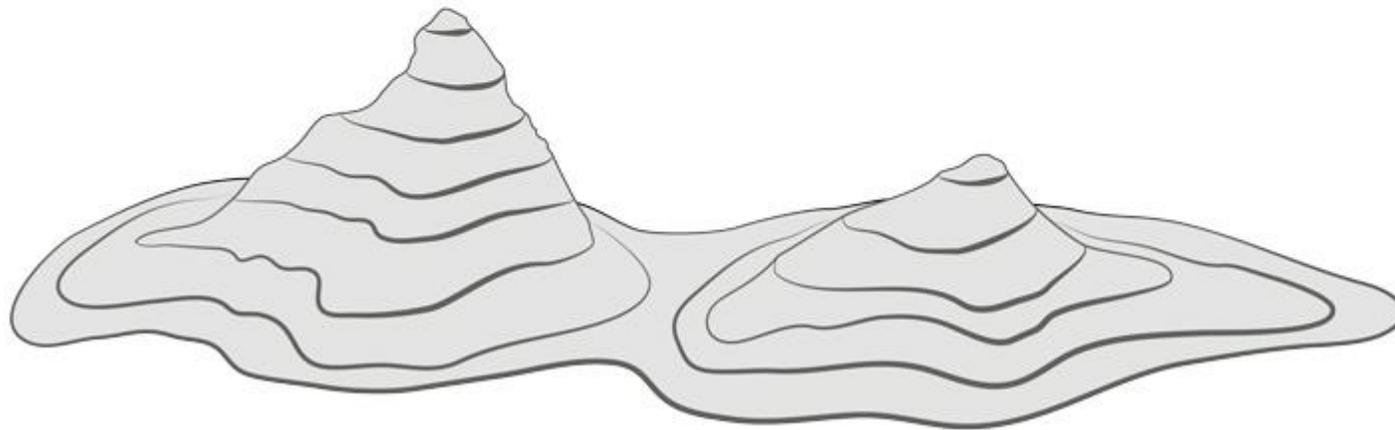
STEEP SLOPE

GENTLE SLOPE

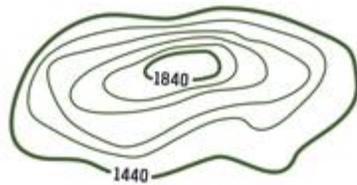
Contour lines also indicate the shape of the terrain. Roughly concentric circles are probably showing you a peak, and areas between peaks are passes. Studying a topo map of a familiar area is a great way to learn how to match terrain features with the contour lines on a map.



**WHAT YOU SEE
ON YOUR MAP**



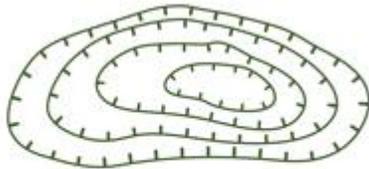
**3-D VIEW
OF LANDMARK**



CONTOUR INTERVAL, 80ft

Index contour lines: Every fifth contour line is a thicker, “index” line. At some point along that line, its exact elevation is listed.

Contour interval: The change in elevation from one contour line to the next is always the same within the same map. Many maps have either a 40- or 80-foot contour interval: An 80-foot interval simply means that each contour line is 80 vertical feet away from the next closest line. You find the contour interval for your map in its legend.



DEPRESSION

Every once in a while, a circle indicates a depression rather than a peak. A circle with tick marks inside it indicates a depression, rather than a peak. You should also see elevations decreasing as you get near the depression.

Map Scales

The map's scale tells you how detailed your map is. A 1:24000 scale, for example, means one inch equals 24,000 inches in reality. A larger scale, like 1:65,000, means that a map covers a larger area, but that it will have less detail.

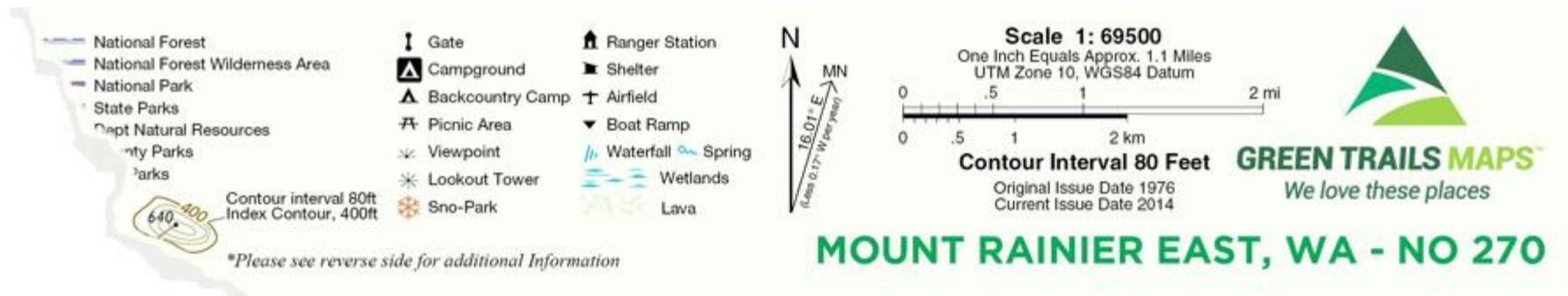
SCALE 1:24000
ONE INCH EQUALS APPROX. 0.38 MILES
DATUM IS MEAN SEA LEVEL



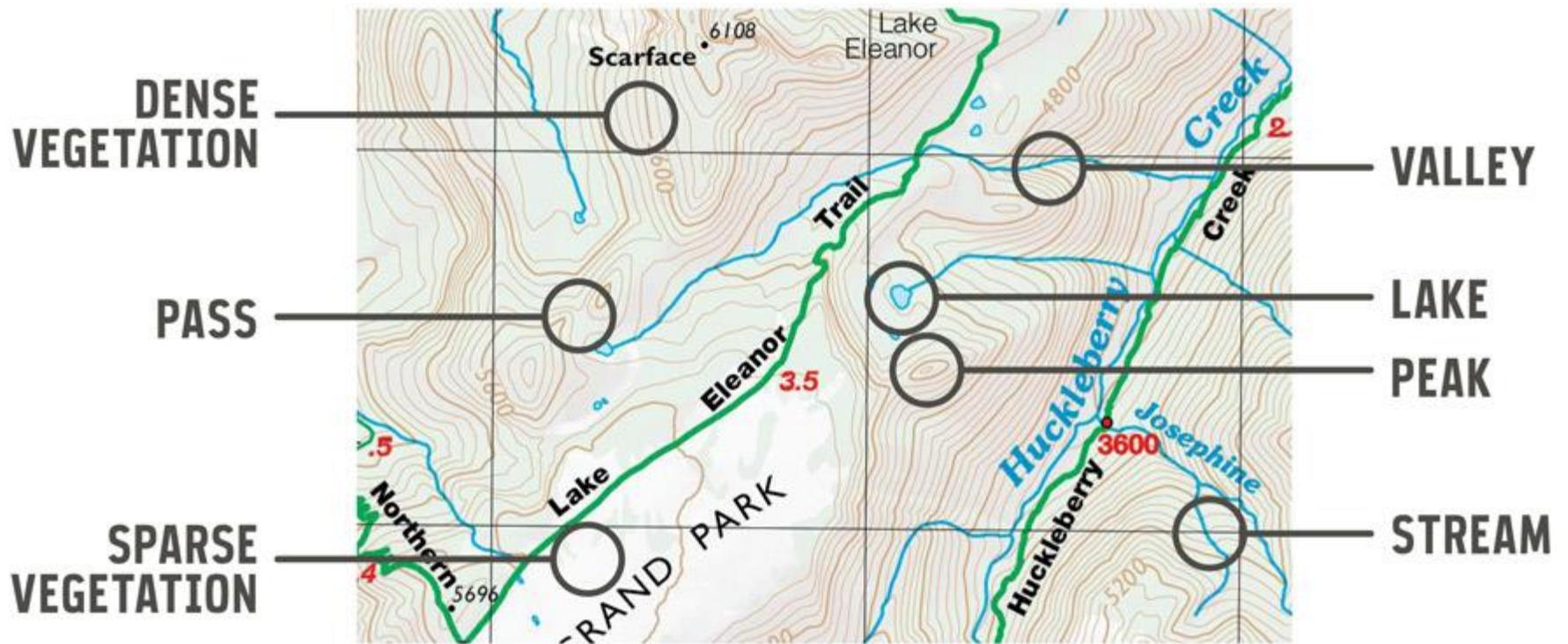
Maps also have a representative scale to help you visualize real-world distances. You can use this scale and a string or the edge of your compass to get a rough estimate about hiking distances on your map.

Other Useful Map Details

Look closely at the map legend. It's loaded with map-reading clues and navigational data. Start by studying what each line, symbol and color means. Generally, darker colors mean denser vegetation, while light or colorless areas suggest open terrain. And, as you'd expect, streams and lakes are shown in blue.



The legend also lists key data like the map's scale, contour- and index-line intervals, grid systems (used for more advanced navigation) and magnetic declination (needed to set up your compass).



Practice reading features from a map of a familiar area. Visualize how the terrain on the major landmarks relates to the contour lines on your map. Pick out features like peaks and passes. Identify subtler features like valleys: They'll have a series of U- or V-shaped contour lines pointing toward a higher elevation. This is easier to spot if a valley has a stream because its blue line bisects those contour lines.

Hone your map-reading skills on every trip. Pull it out at the trailhead, orient it correctly (see [How to Use a Compass](#) for details) and mentally check off landmarks as you hike. Regular map readers rarely get lost.