



United States Department of Agriculture

# Understanding Maps

## Eldorado National Forest



There are basically two types of maps which cover the National Forest lands, recreation maps and topographic maps. The recreational map shows detail in a flat two-dimensional way. The topographic map, on the other hand, adds the third dimension of depth by means of contour lines.

### Recreation Maps (includes OHV map)

The most widely used map is probably the Forest Recreation Map. It shows locations of land features, roads, and streams.

Two kinds of coordinate systems can be found on this map. The most commonly used system is the township grid. The 36 square mile townships are placed in a grid pattern which uses a base meridian as a main orientation line. The townships are numbered north-south and east-west of the base meridian.

In the case of the Eldorado National Forest, the base meridian is the Mount Diablo Meridian. The north-south orientation is noted in the right hand (east) and left hand (west) margins of the map by T8N, T9N, T10N etc. The east-west orientation is noted at the top (north) and bottom (south) margins by R10E, R11E, R12E etc.

Carrying the breakdown one step further, each of the townships is divided into 36 one square mile sections. These sections are numbered in the following manner:

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Thus the location of Bassi Falls can be given as T12N, R15E, section 17.

Occasionally, forest visitors may encounter "location posters" or "K tags". These yellow metal signs show one's location by section, township and range.

The second coordinate system shown on the Forest Recreation Map is longitude and latitude. Longitude is expressed in degrees, minutes, and seconds west from Greenwich, England; latitude is expressed in the same increments north of the equator. This system is rarely used in forestry applications. It is, however, the basis of measurement for 7.5 minute and 15 minute topographic maps. Therefore, on Forest Service maps the breakdown of longitude and latitude is in 7.5 minute increments.



### Topographic Maps

The topographic map is commonly referred to as a quad map or topo map. The most notable feature of this map is the contour lines. Contour lines are shown as thin brown lines that connect points of equal elevation on the ground. By studying the relationship of contour lines a map reader can determine the general shape or form of the land.

The vertical distance between contour lines is known as the contour interval. Most maps have the contour interval printed in the map legend or immediately under the map scale. The 7.5 minute quad maps use a 40 foot interval and the 15 minute quads use 80 foot intervals.

Forest Service Pacific Southwest Region



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The topo map, like the recreation map, has the township grid and longitude and latitude noted. Additionally, the quad map includes a Universal Transverse Mercator (UTM) grid. This is a metric coordinate system which is rarely used by Forest visitors.

Besides using one of the coordinate systems, an exact location can be determined on a topo map by using the contour lines or a compass. When a compass is being used it is important to understand the angle of declination. Declination is defined as the angle between magnetic north and true north. Two things are important to remember:

- 1) The compass needle always points to magnetic north.
- 2) The difference between magnetic north and true north varies according to your geographic location.

Example: The declination angle in New Hampshire can be 15 degrees West while here on the Eldorado National Forest it is approximately 17 degrees East.

The declination of a given area is generally printed on the map margin adjacent to the north arrow. It should be noted that some maps also include a grid north, or GN notation. The grid north refers to the orientation of the map in reference to magnetic or true north.

There are several simple methods of compensating for the effects of declination.

**Method 1** involves projecting parallel magnetic arrows across the map and using these lines for reference each time a compass reading is made.

**Method 2** involves use of a compass which has a declination setting device built in.

**Method 3** involves adding or subtracting the angle of declination each time a compass reading is made.

## Travel By Map and Compass

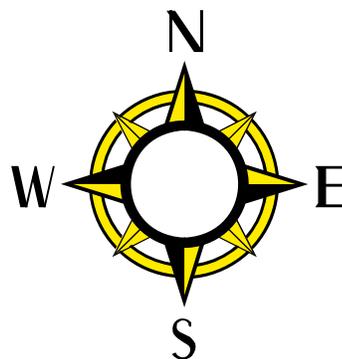
The following method of travel by map and compass can be used if you have a compass which does not have a declination setting device built in:

**Step One** - Orient your map to the terrain. The magnetic north arrow on your map should point in the same direction as the magnetic needle on the compass.

**Step Two** - Place the compass on the map with one long edge of the base plate touching a line between the starting point and the destination. The direction-of-travel arrow on the compass should be pointing in the direction of the destination point. Holding the base firmly, rotate the compass housing until the orienting arrow is in line with the north portion of the compass needle.

**Step Three** - Look up to see where your direction-of-travel arrow is taking you. Look for a landmark, as far away as the terrain will allow, which is in a direct line with the direction-of-travel arrow.

**Step Four** - Travel towards your chosen landmark object, then repeat steps one through four.



## Location With A Map and Compass

With a map and compass it is possible to locate yourself by taking compass readings from your location to various prominent land features that you can positively identify. It is best to take these readings of features located at least 45 degrees apart. The readings are then plotted on the map mindful of the declination. The point at which the lines intersect is your location. Location takes time, practice, and... patience.

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