IDAHO STATE FORESTRY CONTEST

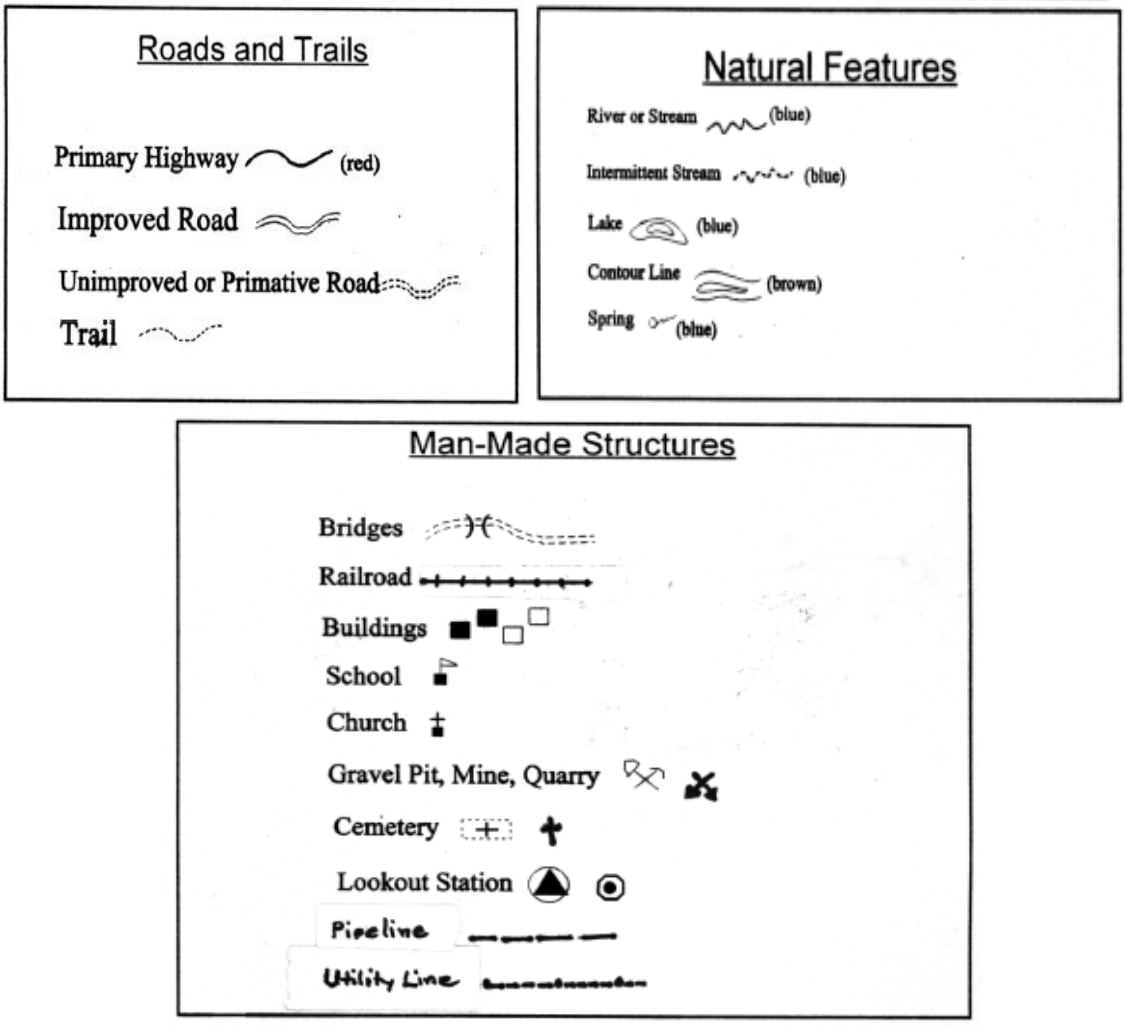
MAP READING

Foresters use various maps while planning and carrying out their daily activities. The map reading portion of the Forestry Contest will involve learning the following map skills:

- Identifying standard map symbols
- Finding your location from locations markers and legal descriptions
- Identifying features on a topographic map
- Giving legal descriptions of map features

MAP SYMBOLS

The student will be expected to identify standard map symbols on a United States Geological map. The symbols will be selected from the following list:



TYPES OF MAPS

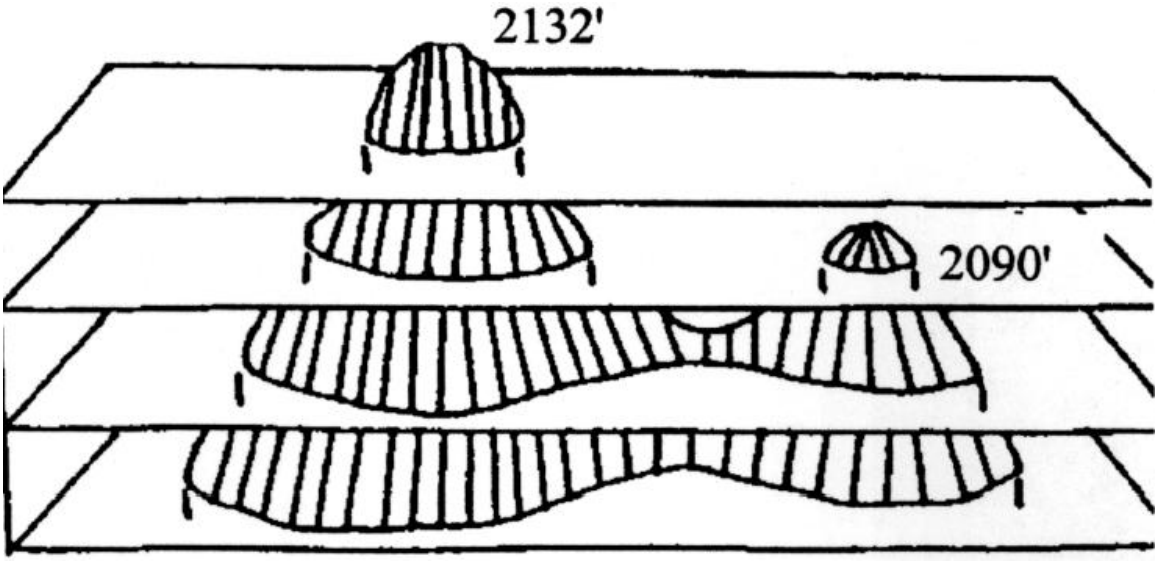
The two types of maps most frequently used by foresters are ***planimetric maps*** and ***topographic maps***. Planimetric maps show detail in a flat, 2-dimensional plane. The United States Forest Service Visitors Map is a good example of a planimetric map. It is scaled at ½ inch per mile and shows features such as streams, mountain peaks, roads and trails. It is usually color-coded to show various ownerships.

The **United States Geological Survey (USGS) maps** are topographic maps. The usual scale is 2½ inches per mile. They show the third dimension (3-D), or depth, as well as showing a high degree of detail in the flat (2-D) plane. Differences in ***elevation*** are shown by the use of contour lines.

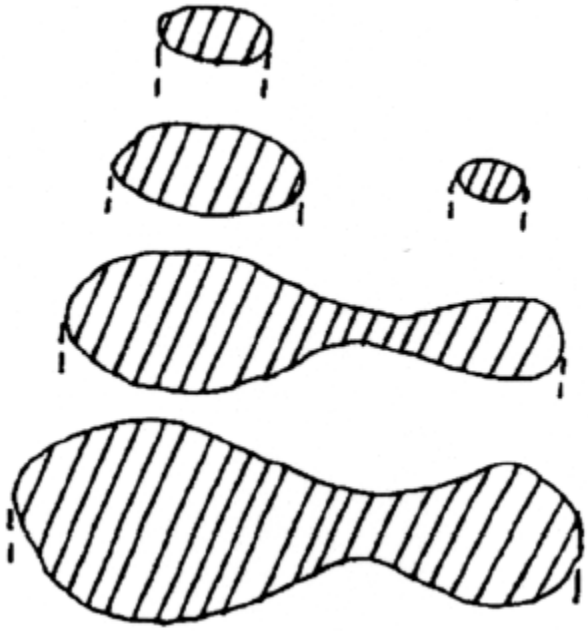
A ***contour line*** is an imaginary level line on the ground that connects all points of equal elevation. A contour line on a map indicates the elevation of that line above sea level. The *vertical* distance between two adjacent contours is known as the ***contour interval***. Contour intervals that are commonly used on maps are 20, 40, 80, or 100 feet.

A contour map is made by drawing around the edges of sections of the ground where those edges intersect with imaginary parallel planes at a given contour interval. The drawings below illustrate how this works:

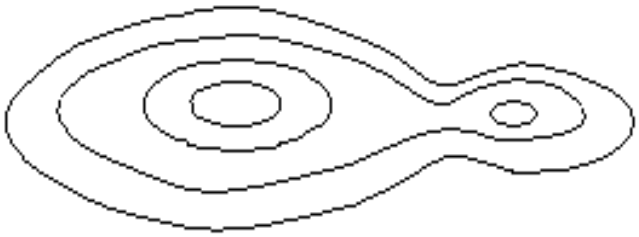
1) Parallel planes intersecting terrain at a 40 ft. contour interval



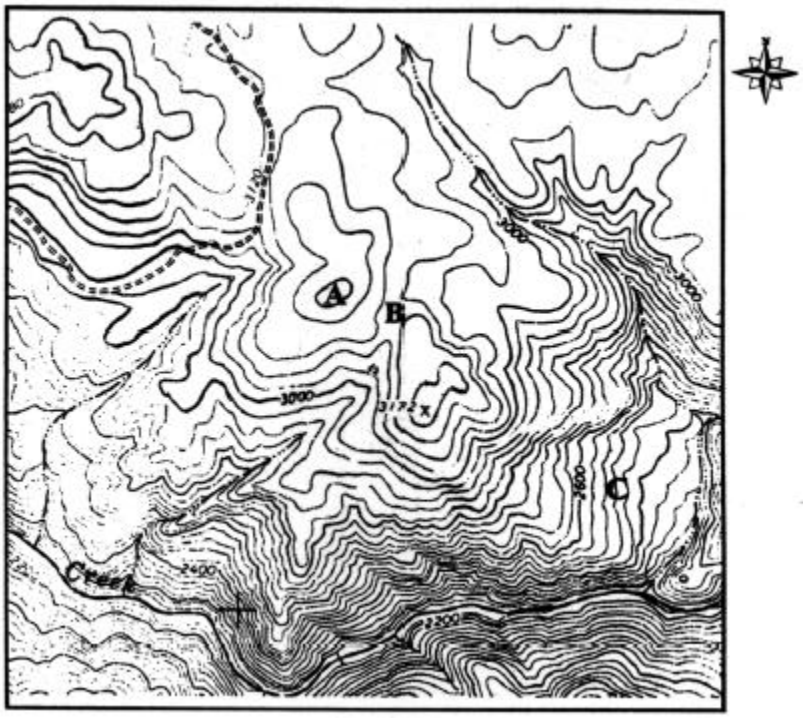
2) Sections cut by parallel planes, as seen from the top



3) Contour map of terrain (the sections are overlying each other)



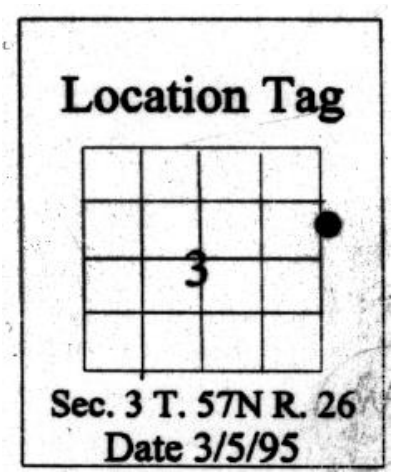
Characteristics of Contours: The following map illustration gives examples of the characteristics of contours described below.

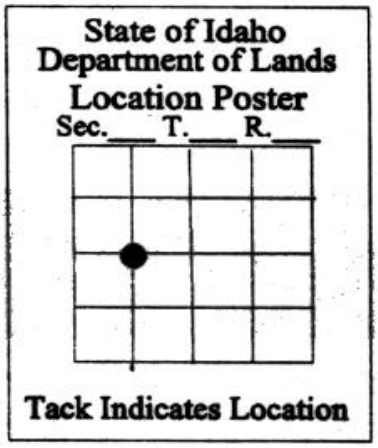


- All points on any contour line have the same elevation.
- Summits are indicated by closed contours, with no contour lines inside. Point **A** on the map is a summit.
- The depressions between summits are called saddles. Point **B** on the map is a saddle.
- In valleys and draws, the contour lines point uphill.
- On ridges, the contour lines point downhill.
- Contours never split or branch.
- The closer together the contour lines are to each other, the steeper the slope. The further apart the contours are, the flatter the slope.
- ***Aspect*** is the compass direction a slope is facing. Point **C** is on a slope with an east-facing aspect.

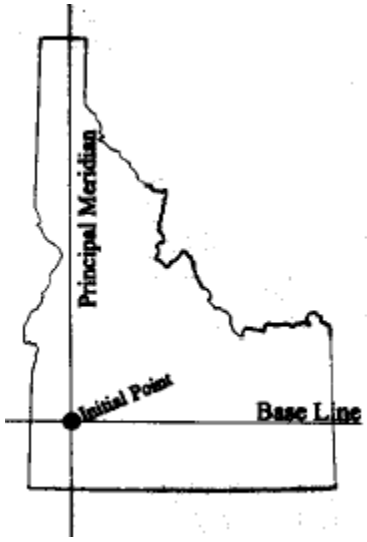
FINDING YOUR LOCATION

Foresters and surveyors establish location markers in the forest to help them locate exact position quickly and easily. Location markers are usually four- to six-inch metal signs, painted yellow, showing a simple map. These markers or "***tags***" are often situated alongside roads and are nailed to a tree or post. A small nail or tack indicates the exact location of the marker. Therefore, it is easy to pinpoint your exact position by comparing the tag location to a map of the area. The following illustrations show two typical location tags:

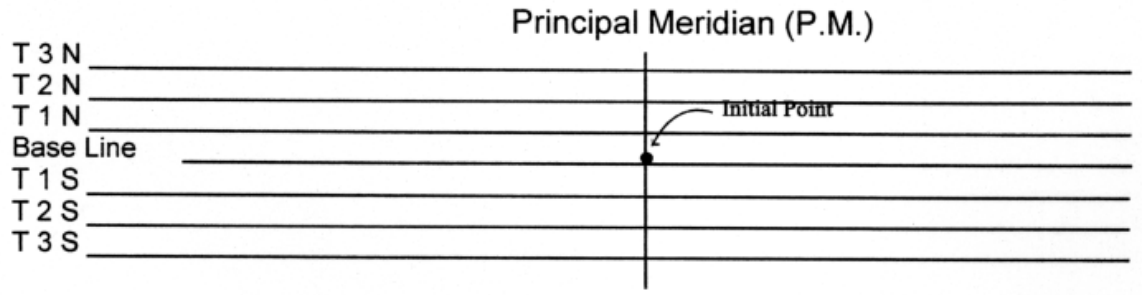




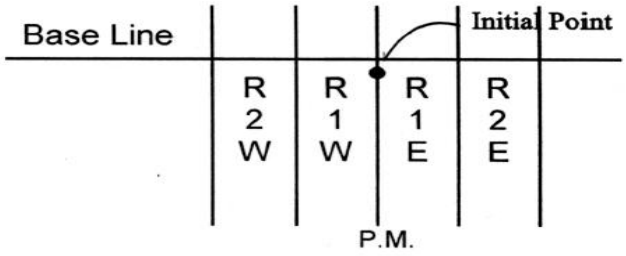
To better understand the use of location tags, a brief explanation of land surveying is necessary. A land survey consists of a series of parallel lines that form a grid over the state. The land survey starts at a point called the "initial point." An east-west line is established from this point and is called the "***Base Line***." The north-south line is established and is called the "***Principal Meridian***." The illustration below shows the initial point, the Base Line, the Principal Meridian and their relative position in the State of Idaho.



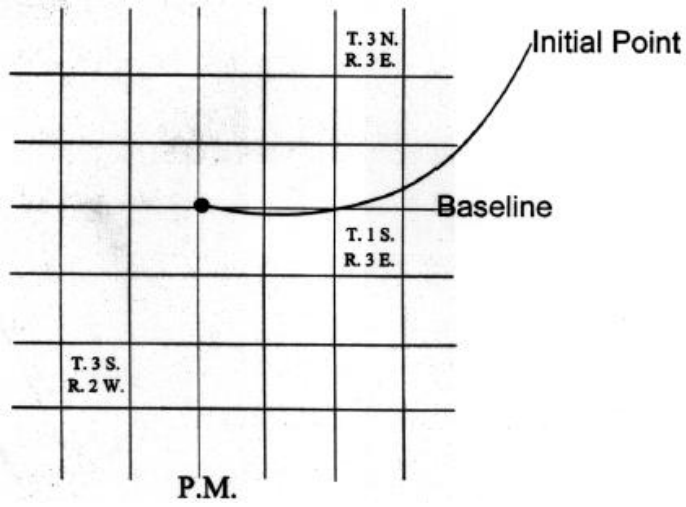
The state is subdivided by lines running at six-mile intervals, both parallel to the Base Line and to the Principal Meridian. The lines running east-west are called ***Township (T)*** lines and are numbered consecutively ***North (N)*** and ***South (S)*** of the Base Line. The first line north of the Base Line is *Township 1 North (T. 1 N.)* and the first line south of the Base Line is *Township 1 South (T. 1 S.)*, as illustrated below:



The lines running north-south at six-mile intervals are called ***Range (R)*** lines and are numbered consecutively ***East (E)*** and ***West (W)*** of the Principal Meridian (PM). *Range 1 East* is the first column to the right (east) of the PM. *Range 1 West* is the first column to the left of the PM, as illustrated below:



When you combine township lines and range lines on the same map, it makes a grid of squares that are each six miles square. Each square is called a ***township*** and its position can be identified as shown in the examples below:



Townships (which have 6 miles per side) are further subdivided into 36 square miles called ***sections***. Each section is one square mile and contains 640 acres. The following system is used to number the individual sections in a township:

R. 3 W.

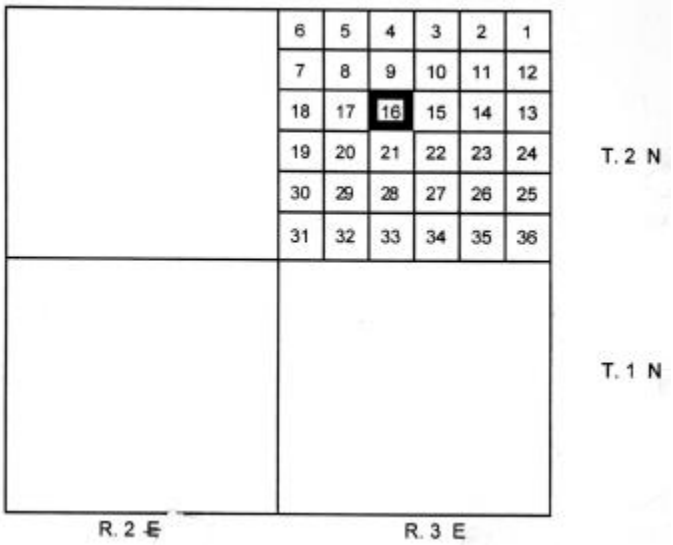
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

T. 3 S.

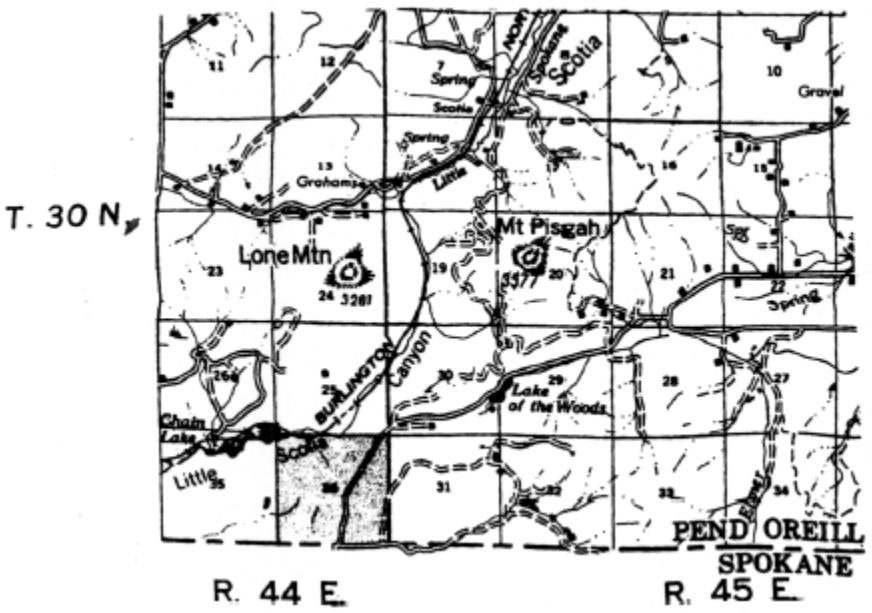
Legal descriptions are used to describe the exact location of townships, sections and even features such as mountain peaks or roads. The example below gives the legal description for a section of land as shown on the accompanying map:

Example:

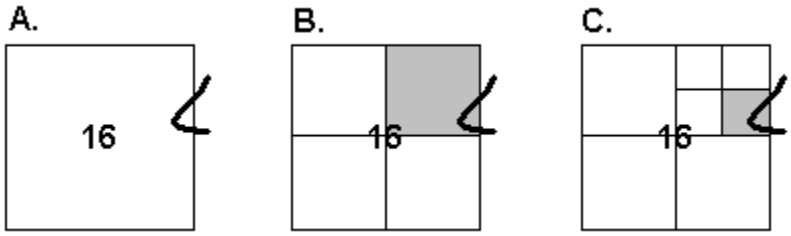
Section 16, Township 2 North, Range 3 East



If you look closely at either a U.S. Forest Service map or a USGS map, you will notice a superimposed grid of sections and townships. (It is sometimes difficult to see these lines due to physical features, names, and ownership lines.) Section numbers (1 through 36) are usually found in the middle of a section, while township numbers are listed vertically along the map's margin and range numbers are listed horizontally across the top and bottom margins of the map.



To give a legal description of the location of a feature within a section, you can subdivide the section into halves or quarters. For example, suppose you want to pinpoint the location of a loop of road in **Section 16, T. 2 N., R. 3 E.** (Diagram A).



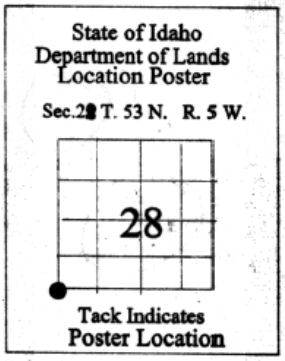
If you divide Section 16 into quarters, you will see that the road is located in the *northeast quarter* of the section (Diagram B). Next, if you divide that northeast quarter into quarters, you will see that the road is located in the *southeast quarter of the northeast quarter* of the section (Diagram C). The legal description of the road loop would be written:

Southeast quarter of the Northeast quarter, Section 16,
Township 2 North, Range 3 East

This can be abbreviated to: **SE1/4 NE1/4 Sec. 16 T2N R3E**

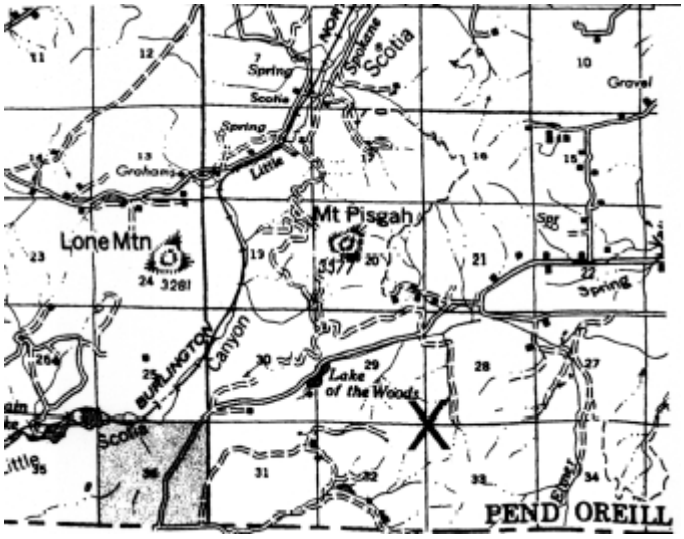
Now, let's return to the location marker and see how we can use it to determine our exact location in the forest.

EXAMPLE:
Suppose you are driving along a forest road and see a location tag like this:



Next, by looking at your map, you can determine that your location is on the section corner between sections 28, 29, 32, and 33 (see **X** on the map below).

T 53 N



R 4 W **R 5 W**

With practice, you will easily be able to determine your exact location if you have a map of the area and find a location marker. It is suggested that you obtain a U.S. Forest Service Visitor Map and familiarize yourself with the layout of the sections and townships, and practice writing legal descriptions for map features.