

## How To Determine Your Property Boundaries

Many landowners have only a vague idea of where their property boundaries lie or unwisely assume that existing fence lines or walls accurately define their property boundaries. When land is not being managed, unclear boundaries may not be a problem; however, they can become important when timber cutting or improvement cutting begins. Accurately marked property boundaries also are needed to find exact acreage when calculating land value and property taxes. Well-marked boundaries also can prevent timber theft. The Annotated Code of Maryland, Natural Resources Section 5-409, protects landowners from pilfering of merchantable trees and timber. It reads as follows:

Any person who willfully, negligently, recklessly, wrongfully, or maliciously enters upon lands or premises of another without written permission of the owner... in order to cut, burn, or otherwise injure or destroy, or cause to be cut, burned, or otherwise injured or destroyed, any merchantable trees or timber on the land is liable to the party injured or aggrieved in an amount triple the value of the trees or timber cut, burned, or otherwise injured or destroyed. The damages are recoverable in a civil action.

In Maryland, if someone cuts your trees without your written consent for any reason, the law makes it possible to recover triple the value of the timber cut, even if the boundaries are unmarked. This high level of protection is greater than that of many other states. However, the time, money, frustration, and conflict with your management objectives for the land affected are difficult to compensate. Clearly marked boundaries can help minimize such problems.

A professional survey can be costly, and often the cost of the survey only covers the location of corners—locating and marking boundaries can be an added expense. This fact sheet provides the basic information needed to locate and mark property boundaries from a deed description. However, if there is any dispute about property boundaries between neighbors, only a licensed surveyor can legally establish boundaries in Maryland.

### Deed Descriptions

The only way to locate your legal boundaries is to obtain a deed description or a registered survey map that accurately includes angles and distances for each boundary line. Many deeds, however, contain only vague descriptions of corner markers and abutting lands. This type of deed, referred to as a metes

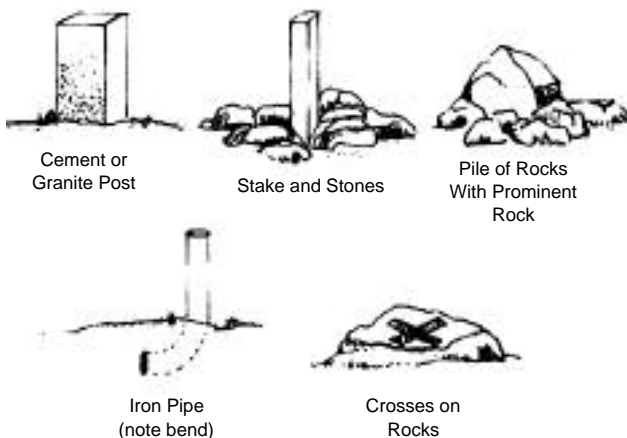
and bounds survey, may give boundary descriptions according to streams, old trees, rock walls, and roads that have changed over the years.

On some properties, the corners may be clearly marked or long-time residents may be able to help determine corner locations. A variety of corner markers have been used in Maryland, such as multiple blazes on trees, an iron pipe or pin, a rock pile topped by a pointed rock, a drill hole or other unnatural mark on a rock, a concrete or granite post, or the corner or crossing of two stone walls (Figure 1). Surveyors often plant wooden stakes for reference purposes during a survey; however, a surveyor's wooden stake does not necessarily mark a corner.

If the corners of your land are known and your abutters agree on their location, nothing else may be needed to establish your property boundaries. In other cases, a deed search may be required. You can conduct this search yourself or hire a licensed surveyor or consulting forester to do the search. Once a deed description is obtained, you can draft a map of your land with a protractor and a scale and transfer the information to your land.

## Reading a Compass

A compass sets direction based on standard dial graduations of 360 degrees. Zero degrees

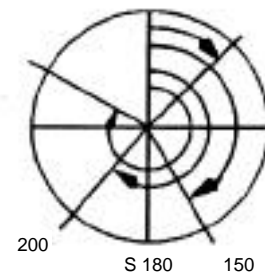


**Figure 1.** Examples of typical boundary corner markers in Maryland.

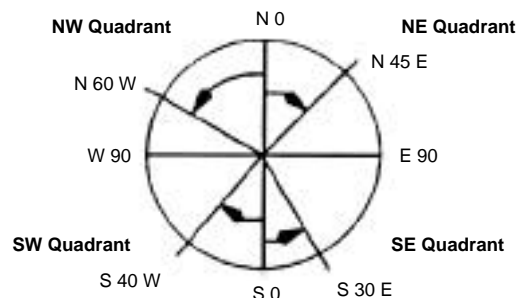
and/or 360° is north; 90° is east; 180° is south; and 270° is west. These are called azimuths and are found on most standard compasses (Figure 2a). In most surveying work, the compass is divided into four quadrants—NE, NW, SE, and SW—and bearings are described by the number of degrees and the direction in which they depart from north or south (Figure 2b). Thus, 60° is the same as N60° E; 110° is the same as S70° E; 220° is the same as S40° W; and 300° is the same as N60° W. Compasses can be purchased with these quadrant readings.

It is important to understand that a compass needle points to magnetic north, which is not the true north. The angle between true north and magnetic north is called magnetic declination. In Maryland, we have westerly declination: a compass points west of true north by a number of degrees, depending on your location. Here are examples of varying declinations in Maryland:

- Deep Creek Lake, Garrett County—6° W
- Clear Spring, Washington County—7½° W
- Frederick City, Frederick County—8½° W
- Olney, Montgomery County—8° W



**Figure 2a.** Azimuths as read from a standard compass.



**Figure 2b.** Bearings as read from a quadrant compass.

- LaPlata, Charles County—7° W
- Elkton, Cecil County—10° W
- Easton, Talbot County—8° W
- Salisbury, Wicomico County—9½° W

To establish the declination for your area, call your local project forester, a local surveyor, or consult a recent U.S. Geological Survey quadrangle map for your area. These maps are available at survey supply stores, outfitter stores, or your local Natural Resources Conservation Service office. A simple and reliable technique to adjust for declination is to set the allowance directly on the compass itself. In doing this, you can read true bearings or azimuths directly. If you purchase a compass, select one with this feature to aid in your surveying efforts. (For more information on compasses, request a copy of Fact Sheet 629 “Measuring Your Forest” from your local Extension office.)

Before you can use deed or survey map bearings in the field, you must determine whether they are true or magnetic bearings. If the deed or map does not say, the bearings are likely magnetic. The best way to determine whether they are true or magnetic is to take a field bearing on a known boundary line and compare it to the recorded bearing. Avoid car hoods, railroad tracks, fences, and other metal objects that may cause local magnetic interference with the compass.

## Adjusting Deed and Map Bearings for Declination

If your map or deed bearings are true and your compass can set the declination internally, no adjustment is necessary to establish your true field bearing. If your compass reads only the magnetic bearing, the declination angle must be added in the NE and SW quadrants and subtracted in the SE and NW quadrants to obtain the magnetic bearing that is to be shot in the field (Figure 3a). Here are some examples:

- The true map bearing is N60° E (60° into the NE quadrant). If you are in Charles County, add 7° and shoot N67° E (67°) in the field.

- The true map bearing is S40° E (140° into the SE quadrant). In Garrett County, subtract 6° and shoot S34° E (146°) in the field.

If your map bearings are magnetic, no adjustment is necessary. Be aware, however, that magnetic declination changes slightly over time. If your deed or map description is old, you may need to calculate the change in declination by comparing the current bearings of some known lines to the deed or map bearings. Adjust the difference to the other lines.

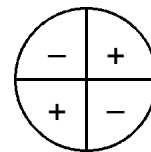
## Adjusting Field Bearings for Declination

If you are taking a magnetic bearing in the field and using a map with true bearings, you will need to convert the magnetic bearing to a true bearing. To determine the true bearing from a bearing shot in the field, the declination angle must be subtracted in the NE and SW quadrants and added in the NW and SE quadrants (Figure 3b). Here are some examples:

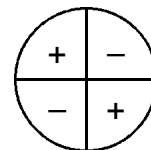
- The field bearing is N60° E (60° in the NE quadrant). In Charles County, subtract 7 and record N53° E (53°) as the true bearing.
- The field bearing is S40° E (140° in the SE quadrant). In Garrett County, add 6° and record S46° E (134°) as the true bearing.

## Measuring Distance

All maps and land surveys express the distance between two points as a horizontal dis-



**Figure 3a.** Algebraic signs for changing a true bearing or azimuth to a magnetic angle.



**Figure 3b.** Algebraic signs for changing a magnetic bearing or azimuth to a true angle.

tance, which is the distance measured over a level area. When establishing horizontal distance on the ground, it is necessary to correct for the slope. To measure land distances, a measuring tape (typically 50 or 100 feet long), the length of a step, the length of a pace, or the length of a chain can be used.

Measurements that require a high degree of accuracy should be made with a tape and should be conducted over horizontal, not sloped, distances.

The length of your step can be determined by walking with a normal, comfortable stride for 20 steps in a straight line, measuring the distance, and dividing that distance by the number of steps. Do this three times to determine your average step. An example of a step calculation is 55 feet covered by 20 steps or 55 feet/20 steps, which equals 2.75 feet per step.

Foresters typically use the pace to measure distance because of its ease of use. A pace is equal to two steps and is counted each time the right or left foot strikes the ground (Figure 4). The method used to determine the length of a pace is similar to that used to determine the length of step. Using the same information from our previous sample, 55 feet covered by 10 paces equals 5.5 feet covered per pace.

With practice, pacing on level, open ground can be fairly accurate. However, on slopes or in brushy or rocky areas, pacing's accuracy decreases (Figure 5). The following suggestions for adjusting for slope are from the *Forestry Handbook* (1989) published by Wiley-Interscience:

In difficult terrain, no attempt should be made to maintain a standard pace. Instead, allow for its inevitable shortening (downhill as well as uphill) by repeating the count at intervals. For example,

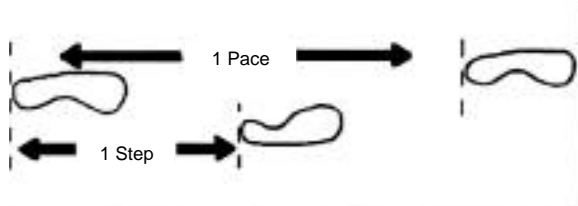


Figure 4. Example of a step and a pace.

on moderate slopes count every tenth pace twice: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 10, 11, etc. On steeper slopes it may be found necessary to repeat every fifth count: 1, 2, 3, 4, 5, 5, 6, etc. On the steepest slopes in very heavy brush, in swamps, or among boulders, every count may have to be repeated. Consistent accuracy in pacing under such conditions is attained only by constant checking.

The following units of measure are commonly found in Maryland deeds:

- link = 7.92 inches
- foot = 12 inches
- yard = 3 feet (36 inches)
- pole, rod, or perch = 16.5 feet
- chain = 66 feet (composed of 100 links)
- square perch = 272 square feet
- mile = 5,280 feet
- acre = 43,560 square feet
- rood = one-fourth of an acre

## Locating Boundary Lines

Some boundary lines have been marked permanently with such landmarks as stone walls or fences. Although these boundaries are obvious, the actual boundary may be some distance to one side of the landmark. Therefore, do not assume that the landmark is the actual boundary until you locate it as such. In other instances, portions of walls or fences may have been removed, or the wall or fence may never have been completed to the corner of the property. Occasionally, properties have been divided, and corner points must be located. Often, no conclusive evidence of a boundary line exists. The following technique may be helpful in locating bound-

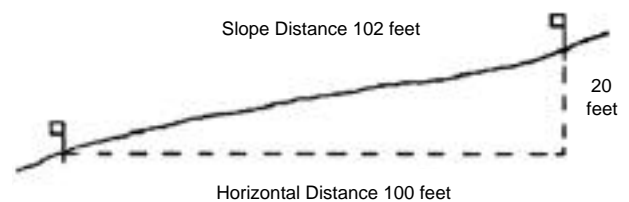
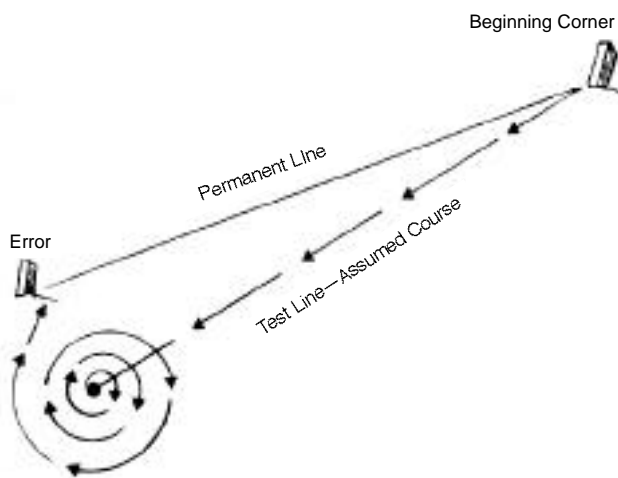


Figure 5. Estimating horizontal distance on a 20-percent slope.

ary lines. Note that boundary work is easier when the foliage is off the trees.

Locate a beginning-point corner that you are sure is accurately marked. Run a test line from this corner to the next corner by pacing or taping along the appropriate bearing for the distance indicated on the deed or survey map. Mark the test line occasionally with plastic flagging, strips of cloth, or other nonpermanent markings. When you reach the end of the measured distance, you should be in the vicinity of the corner you are seeking. Search for evidence of a corner marker by walking in an ever-enlarging series of circles (Figure 6). Such evidence could be very meager, no more than a pile of stones, rusted pipe, rotted stake, slight irregularity in the terrain where the corner was, or wire in trees where fence lines were run. When you locate what you believe is a corner, mark a line from this corner back to your beginning point. Do not mark any boundary line permanently until you are certain the lines are located correctly.

There are several ways to locate the permanent line using the test line as a reference. If the terrain allows you to sight between two points, mark the line directly. If this is not possible, a series of offsets from your test line to the permanent boundary line can be calculated (Figure 7).

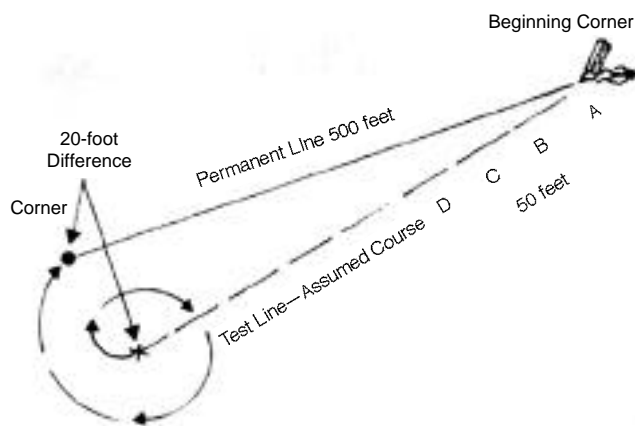


**Figure 6.** Using ever-enlarging circles to locate actual corner marker.

## Marking the Boundaries

Once you are satisfied that the boundary line and corners have been located, notify the adjacent property owners and obtain mutual agreement on the boundary location. Then the boundary lines may be permanently marked by blazing trees or erecting mounts of stones or a fence along the boundary lines.

If you decide to mark the boundary lines by blazing trees, select healthy, vigorous trees with at least a 4-inch diameter. With an ax, remove a 4- to 6-inch square sector of bark down to the live wood (Figure 8). Blazes can be painted for easier identification. A bright-red, oil-based paint is suggested. Wait until the blaze is dry before painting. The blaze can be identified as a boundary mark by cutting one slash mark 3 to 4 inches above the blaze and another 3 to 4 inches below it. Some common marking combinations used by surveyors are one slash mark for a straight line, two slash marks for an angle, and three slash marks for a corner.



Station to Station	Distance	Cumulative Distance	Offset
A to B	50 feet	50 ft x .04	2 feet
B to C	50 feet	100 ft x .04	4 feet
C to D	50 feet	150 ft x .04	6 feet

$$20 \text{ feet}/500 \text{ feet} = .04$$

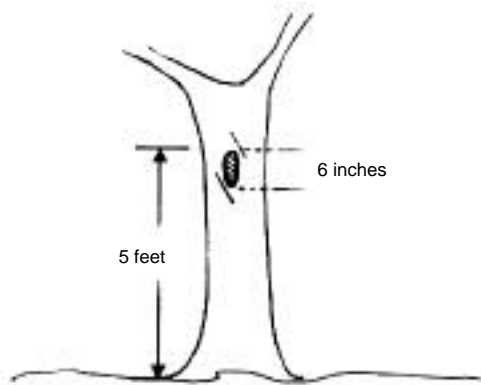
**Figure 7.** Using a series of offsets from a test line to locate the permanent boundary line.

Trees that are on the line should be blazed front and back about 5 feet above ground level. Because few trees are actually on the boundary line, it is acceptable to blaze trees within 5 feet of the line with the blaze marks face the line (Figure 9). Be sure you are still in sight of the previous blaze when you cut the next one. In some instances, acceptable trees cannot be found on or near the line. In these situations, erect mounds of stones or a fence.

Corners of property need to be marked differently than the boundary lines, using such markers as pipe or another permanent item. To make the corner more evident, two or three trees near the corner can be marked as “witness trees” by cutting three blazes at 4-inch intervals, one above the other. Record these trees by taking bearings and distances from the trees to the corner (Figure 10). Maintain corner marks every few years to avoid location problems and costly surveying expenses.

## Conclusion

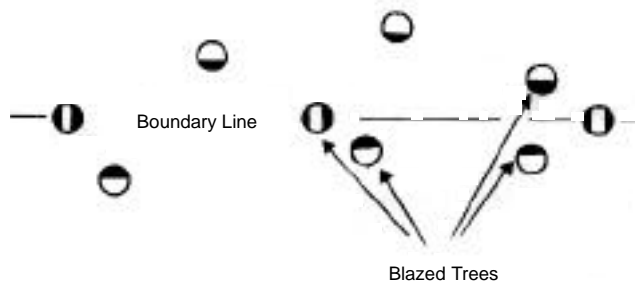
With an accurate deed description or survey map, the appropriate measuring equipment, and the information in this fact sheet, you may be able to satisfactorily locate your property boundaries. However, locating property boundaries can be difficult. Complicated deed searches, errors in past surveys, or improperly placed existing markers can result in hours of fruitless and frustrating labor. In some cases, a



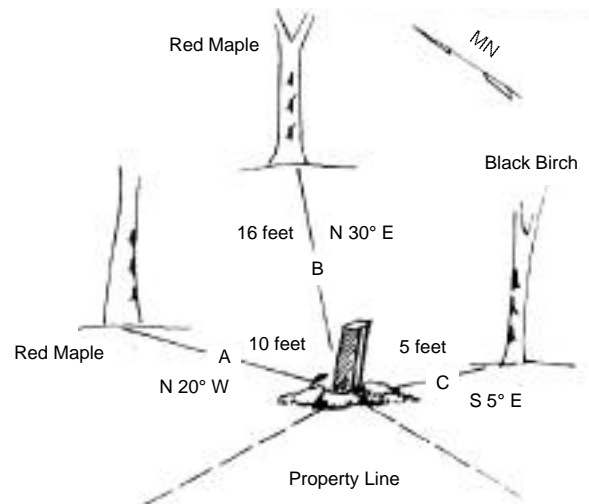
**Figure 8.** An example of where on a tree to place a blaze and what size the blaze should be.

survey conducted by a licensed surveyor is the only answer.

A landowner can request various levels of survey work from a surveyor. At a minimum, all corners should be located and marked. Flagging the boundaries is an additional expense, and permanently marking the boundaries is the most expensive option. When survey work is done by a surveyor, request a copy of the field notes for your records.



**Figure 9.** An example of how trees within 5 feet of a property line can be blazed to mark the line.



**Figure 10.** Witness trees.

## References

Portions of this material were reprinted with permission from the following sources:

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This fact sheet is part of a series on woodland management. If you would like information on additional topics in the series, contact your county Extension office.

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