

DISTRICT ASSISTANT

GUARD HANDBOOK



REGION 6

PACIFIC NORTHWEST REGION

RECEIVED FROM SALAMON, DALLAS

Suggestion: (1) Township and range lines on smokechaser's maps can be traced with a different color ink or made heavier so they can be readily distinguished from other lines on the map. This procedure may serve as an aid to the smokechaser and prevent errors in reading the wrong township, range, or section.

(2) As a further aid to the smokechaser in reading the proper section and subdivision, a sample township may be laid out on his map in which the correct section numbering of a standard township is shown with one section properly subdivided into forties.

Field Markings

It is necessary for the smokechaser to know how to find and interpret field markings. Study of the following illustrations will help him to become familiar with common ones.

Section Line Blazes: Section lines are designated by blazes or hacks on trees. Due to sparsity of trees in some localities it may have been necessary to blaze some standing as far as 33 feet on either side of the line. Trees standing on line were blazed on directly opposite sides of the trees where the line intersects it (see Figure 14(a)). As trees were selected farther from the line, the blazes were placed closer together on the side facing the line. Thus, trees close to the line will have blazes almost opposite each other, while trees approaching 33 feet from the line will have blazes side by side (see Figure 14(b) and (c)). (Some survey parties placed two hacks, one above the other, on opposite sides of trees standing directly on line.)

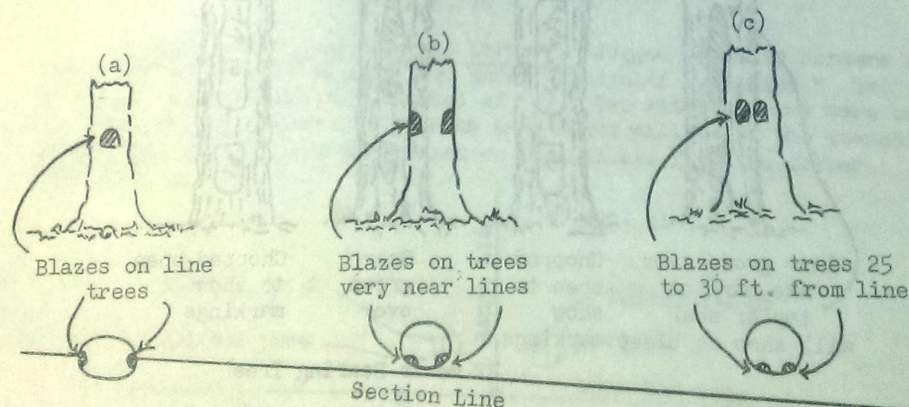


Fig. 14

Section Corners and Quarter ($\frac{1}{4}$) Corners: Several methods are used to mark section and $\frac{1}{4}$ corners. Frequently either a rock, a pile of rock, or a wood post is found, but recent surveyors have used an iron pipe with brass head (see Figure 15).

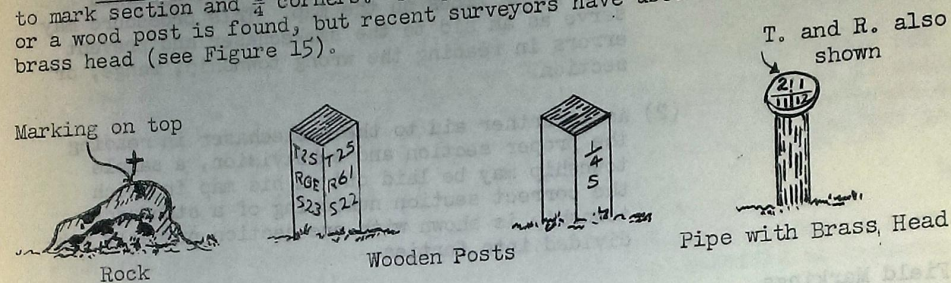


Fig. 15

Witness Trees: Where sufficient trees were available, section corners were referenced by four, and $\frac{1}{4}$ corners by two, witness trees. They were scribed as shown in Figure 16. A small blaze scribed with "BT" (Bearing tree) was placed approximately 18" from the ground and above that a long blaze was scribed with the description of the corner. Where blazes have grown over, care should be used in chopping them open to prevent destruction of the scribing.

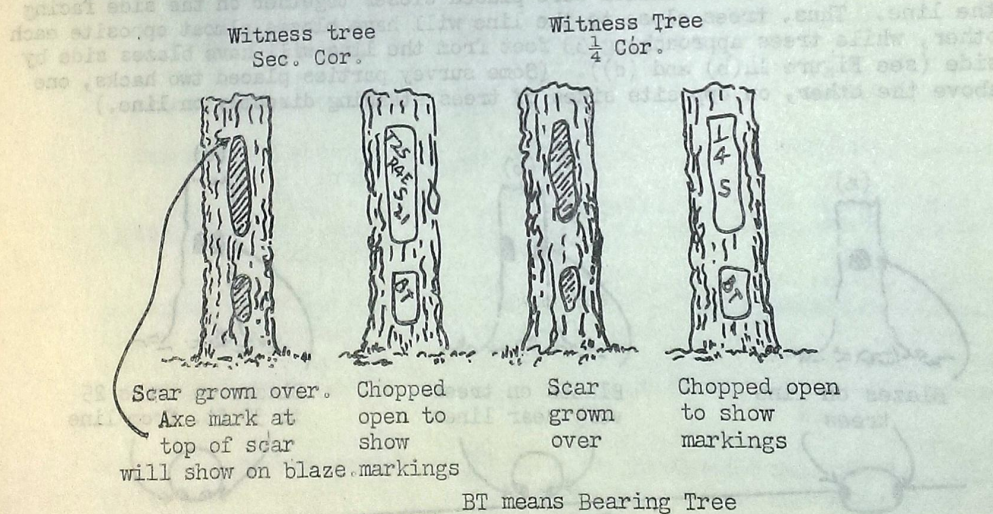


Fig. 16

Location at Section Corners: A bearing is scribed with the section number corresponding to the section in which the tree is located. Blazes face the corner (see Figure 17).

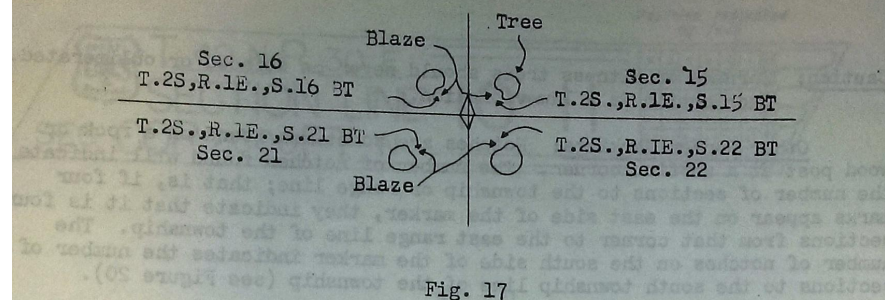


Fig. 17

Location at Quarter ($\frac{1}{4}$) Corners: See Figure 18.

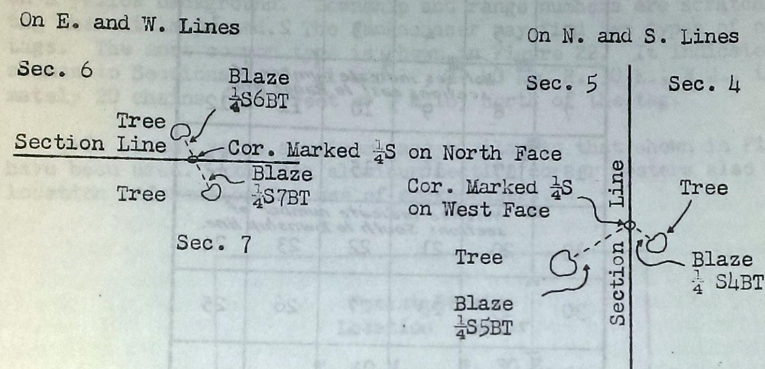


Fig. 18

Location at Jogged Township Corners: Jogged township corners sometimes occur for reasons described under "Irregular Townships." Two corners had to be established instead of one. Two witness trees were used to describe each corner. Each such tree found will be in the township, range, and section that are marked on it. Blazes face the corner. (See Fig. 19.)

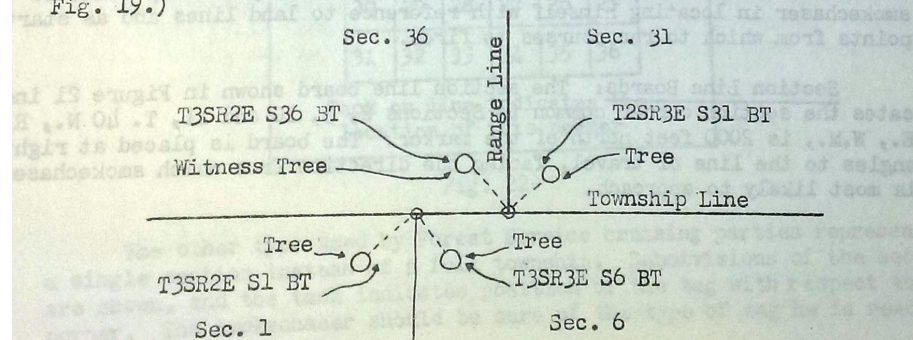


Fig. 19

Caution: Corners or witness trees should never be defaced or obliterated. Such action is a law violation.

Other Corner Markings: Notches are sometimes found on a rock or wood post at a section corner. The number of notches found will indicate the number of sections to the township or range line; that is, if four marks appear on the east side of the marker, they indicate that it is four sections from that corner to the east range line of the township. The number of notches on the south side of the marker indicates the number of sections to the south township line of the township (see Figure 20).

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

Fig. 20

Section Line Crossing Markers

Section line crossings on a road or trail frequently are marked by section line boards, surveyor's tags, or crosses. They are important to the smokechaser in locating himself with reference to land lines and as starting points from which to run courses to fires.

Section line boards: The section line board shown in Figure 21 indicates the section corner common to Sections 2, 3, 10 and 11, T. 40 N., R. 30 E., W. 2., is 2000 feet north of the marker. The board is placed at right angles to the line of travel, facing the direction from which smokechaser is most likely to approach.

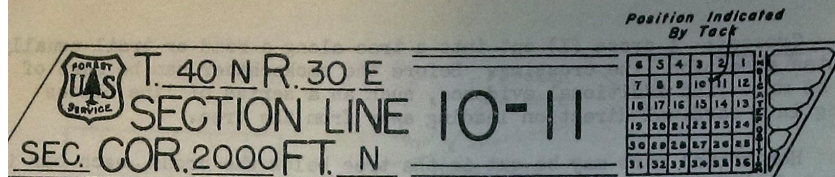


Fig. 21

Cruiser's Tags: These markers usually are metal, with black lines on a yellow background. Township and range numbers are scratched on the tag when it is posted. The smokechaser may find two types of cruiser's tags. The most common type is shown in Figure 22. It indicates the corner common to Sections 1, 2, 11 and 12, T. 40 N., R. 30 E., W.M., is approximately 20 chains (1320 feet or $\frac{1}{4}$ mile) north of the tag.

-In recent years aluminum tags similar to that shown in Figure 22 have been used. 4x6-inch aluminum section corner posters also provide location information for use of smokechasers.--

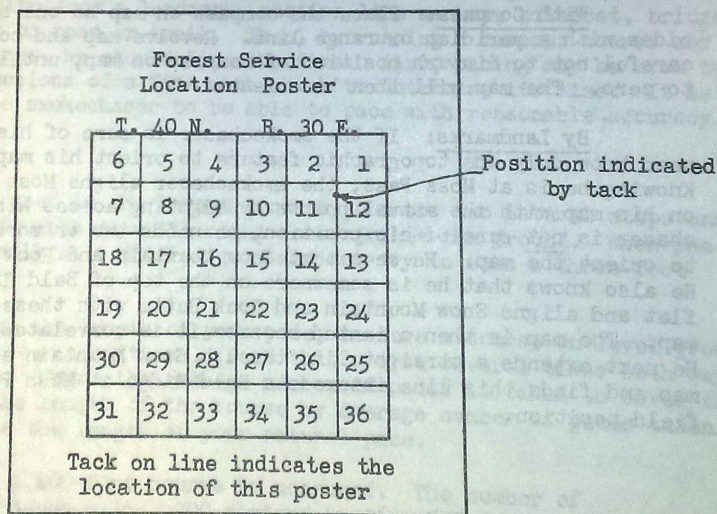


Fig. 22

The other type used by Forest Service cruising parties represents single section instead of a full township. Subdivisions of the section are shown, and the tack indicates position of the tag with respect to the corner. The smokechaser should be sure of the type of tag he is reading to avoid possible error.

Crosses: A cross (X) cut into a tree along a road or trail usually indicates a section line crossing. Before the smokechaser can be sure of this, he must find additional evidence, such as a series of line blazes running in a cardinal direction leading away from the tree.

Horizontal bars may be cut in the tree below the cross, each bar indicating a distance of 5 chains (330 feet) to the section corner. Sometimes a blaze about 6" long is placed on the side of the tree facing in the direction of the corner.

Mileposts and Signs

Mileposts or signs along roads or trails are valuable aids in finding fires. A milepost along a road indicates the distance from the post to a main highway, town, or other prominent starting place. The posts are usually white, about three feet high, and have a black number on each face near the top. A mile sign on a trail indicates the distance from the sign to a road, guard station, or other starting place. ***

Orient Map

Frequently the smokechaser has occasion to orient his map in the field. This can be accomplished either with the compass or by use of visible landmarks.

With Compass: Place the compass on map so one side of compass coincides with a meridian or range line. Revolve map and compass together, being careful not to disturb position of compass on map, until the needle points to zero. The map will then be oriented.

By Landmarks: If the smokechaser is sure of his field position, he need know only one topographic feature to orient his map (see Figure 23). Knowing he is at Moss Pass, the smokechaser aligns Moss Pass and Rock Butte on his map with the actual points by sighting across his map. If the smokechaser is not sure of his position, he needs two or more topographic features to orient the map. He sees that Snow Mountain and Rock Butte are in line. He also knows that he is somewhere on the top of Bald Ridge. He lays the map flat and aligns Snow Mountain and Rock Butte with these same features on his map. The map is then oriented because it is correlated with the topography. He next extends a straight line through Snow Mountain and Rock Butte on his map and finds this line intersects Bald Ridge at Moss Pass, which is his field position.

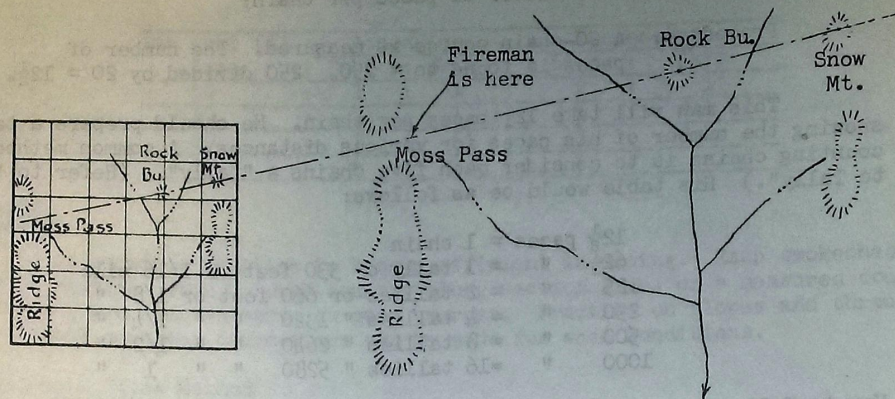


Fig. 23

Pacing

Pacing is the means by which smokechasers measure distance in traveling to a fire. The smokechaser can determine from his map the distance and direction to a fire from a landmark, section line marker, milepost, bridge, corner, or point on road or trail. Then, by running a compass course and pacing the distance, he should find the fire. Also, pacing may be used to measure the dimensions of a fire with which to determine its size. It is important for the smokechaser to be able to pace with reasonable accuracy.

Natural Pace

A pace, as used in the Forest Service, denotes two natural steps and usually is counted each time the right foot strikes the ground. When pacing, one should walk at a natural gait and not try to take a three-foot step.

To determine the length of your pace, measure a course on level ground through average cover conditions. Pace this course several times both ways at a natural gait. Count the average number of paces it takes to cover the course. Divide the length of the course by average number of paces taken. The result will be the length of your natural pace.

Procedure: A 200-foot course is measured. The number of paces = 36. $200 \text{ divided by } 36 = 5.5 \text{ feet}$, the length of this man's natural pace.

Pacing by Chains or Tallies (Optional)

The "chain" (66 ft.) unit sometimes is used to compute areas and measure distance, such as length of control line around fires.

To determine the number of paces per chain:

Procedure: A 20-chain course is measured. The number of paces is found to = 250. 250 divided by 20 = $12\frac{1}{2}$.

This man will take $12\frac{1}{2}$ paces per chain. He should prepare a table showing the number of his paces for various distances. A common method of counting chains is to consider each five chains a "tally". (Refer to "How to Tally".) His table would be as follows:

12 $\frac{1}{2}$	paces	=	1 chain
62 $\frac{1}{2}$	"	=	1 tally or 330 feet or 1/16 mile
125	"	=	2 tallies or 660 feet or 1/8 "
250	"	=	4 tallies " 1320 " " 1/4 "
500	"	=	8 tallies " 2640 " " 1/2 "
1000	"	=	16 tallies " 5280 " " 1 "

How to Tally

Considering each five chains as a "tally", distance and area can easily be divided into convenient units as follows:

1 mile	=	80 chains	or	16 tallies		80 chains square	=	640 acres
$\frac{1}{2}$ "	=	40 "	"	8 "		40 "	"	= 160 "
$\frac{1}{4}$ "	=	20 "	"	4 "		20 "	"	= 40 "
$\frac{1}{8}$ "	=	10 "	"	2 "		5 "	"	= 2 $\frac{1}{2}$ "
$\frac{1}{16}$ "	=	5 "	"	1 "		(10 square chains	=	1 ")

Paces can be counted by use of a pebble for each tally and a twig for each mile, or the smokechaser can score each tally in his notebook. It is essential to count paces accurately regardless of the method used.

Horizontal Distance

All distances shown on maps are horizontal distances. In traveling up and down slopes, one actually travels a greater distance than is shown on the map (see Figure 10). The slope of the ground, if it is considerable, affects the length of the step. The horizontal distance covered by each step is shortened whether one goes up or down hill. Similarly, rough bottomland or brush affect the length of step.

Correction for Slope by Dropping Paces

The difference between horizontal distance and slope distance varies with the steepness of slope; the steeper the slope the greater the difference. On a steep slope the smokechaser may take two paces to cover a horizontal distance equal to one pace. For this reason he should learn to discount or drop a pace at regular intervals so his tally will be correct for horizontal distance. Practice and checking are essential to reach satisfactory performance. The following table has been compiled from actual tests. It should be used as a guide.

Per cent (%) :	Ascending		Descending	
	Slope	Step : Skip	Step : Skip	Step : Skip
60	:	1 : 1	:	2 : 1
30	:	2 : 1	:	6 : 1
20	:	3 : 1	:	11 : 1
10	:	6 : 1	:	- : -

Practice

It requires practice to become efficient in pacing. Each smokechaser should practice often. Rough country along section lines or a measured course near the guard station serve as good courses. Practice on slopes and through brush until accurate corrections can be made for such conditions.

*-Pace-Length Stick Method

An inexperienced smokechaser, who has not had time to become proficient in the method described above, will attain greater accuracy in measuring horizontal distance in steep or very brushy country by use of the pace-length-stick method.

Cut a stick the length of your natural pace--one step or $\frac{1}{2}$ length of pace may be marked off on pulaski handle for measuring. Hold one end of stick against the body and the other end on ground in front of you. Make a mark on the ground and proceed to this mark. Repeat operation until top of hill is reached. Don't forget to count paces.-*

Care of Smokechaser Outfit

Every smokechaser is equipped with a standard smokechaser outfit. These outfits, within certain minimum standards, may vary somewhat to meet individual forest needs.

When the smokechaser receives his outfit at the beginning of the fire season, it is complete and each item is in good condition. It must be kept so throughout the entire season. This means:

- (1) It will be used on fires only.
- (2) After use it must be immediately restored to standard.
- (3) It must be assembled and kept in the handiest place for quick getaway.
- (4) Except for normal wear, it must be returned to the ranger, or stored for winter, in as good condition as when received.

The smokechaser should have an intimate knowledge of the care and use of his fire fighting equipment. He should take apart, inspect, and re-assemble his outfit at frequent intervals. The following reminder list will help him keep the outfit in good condition:

- (1) Keep compass in pack, away from tools (which demagnetize the needle), in a place where it can be obtained readily. Lid should be firmly closed to prevent wearing of needle on pivot. If lid will not remain closed, put a heavy rubber band around compass.