

---

Professional Degree Theses

Student Theses and Dissertations

---

1935

## U.S. Forest Service acquisition surveys in the Ozark region of Missouri

Booker Hall Rucker

Follow this and additional works at: [https://scholarsmine.mst.edu/professional\\_theses](https://scholarsmine.mst.edu/professional_theses)



Part of the [Civil Engineering Commons](#)

Department:

---

### Recommended Citation

Rucker, Booker Hall, "U.S. Forest Service acquisition surveys in the Ozark region of Missouri" (1935).  
*Professional Degree Theses*. 119.  
[https://scholarsmine.mst.edu/professional\\_theses/119](https://scholarsmine.mst.edu/professional_theses/119)

This Thesis - Open Access is brought to you for free and open access by Scholars' Mine. It has been accepted for inclusion in Professional Degree Theses by an authorized administrator of Scholars' Mine. This work is protected by U. S. Copyright Law. Unauthorized use including reproduction for redistribution requires the permission of the copyright holder. For more information, please contact [scholarsmine@mst.edu](mailto:scholarsmine@mst.edu).

U.S. FOREST SERVICE ACQUISITION SURVEYS IN THE  
OZARK REGION OF MISSOURI

by

Booker Hall Rucker, Jr.

---

A

T H E S I S

submitted to the faculty of the  
SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI  
in partial fulfillment of the work required for the

D E G R E E O F

CIVIL ENGINEER

Rolla, Mo.

1935

--0--

Approved by Joe B Butler  
Professor of Civil Engineering

44973

TABLE OF CONTENTS

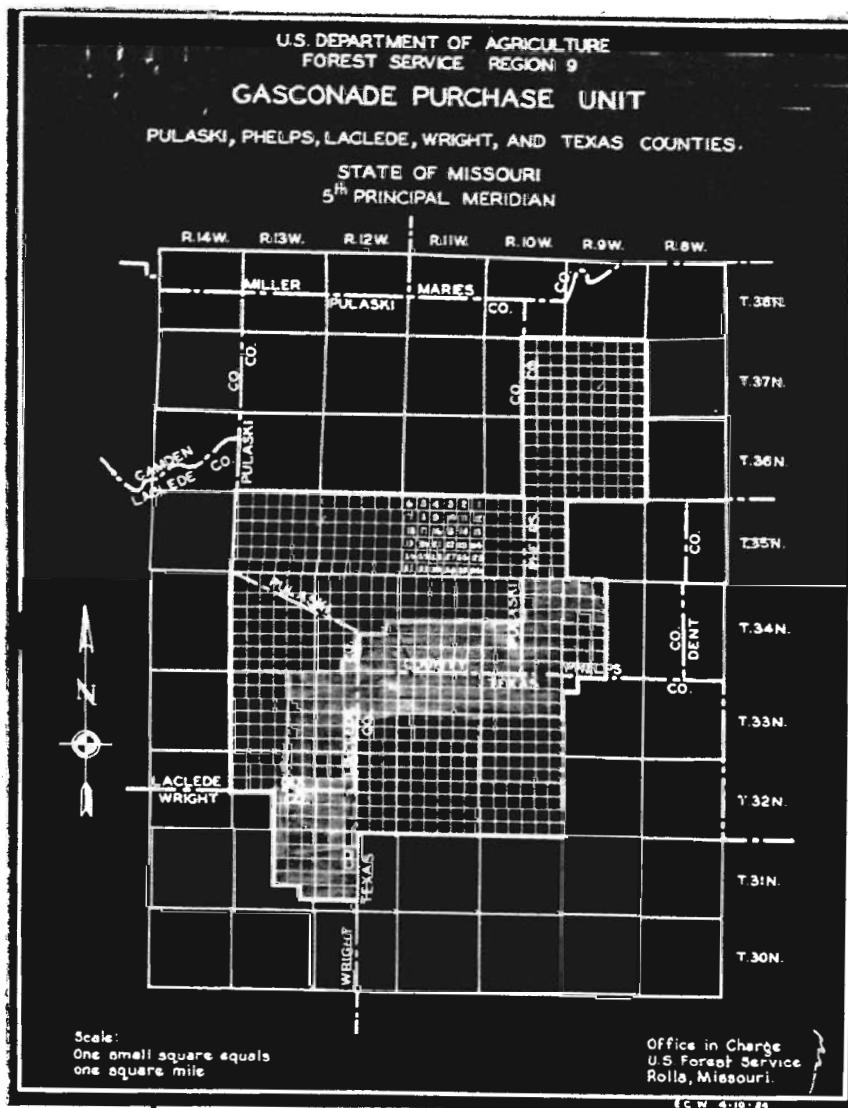
	Page
I. Introduction . . . . .	
II. Instruments and Forms Used . . . . .	
III. Acquisition Cruise Day's Work . . . . .	
IV. Summary . . . . .	



## LIST OF ILLUSTRATIONS

	Page
1. Frontispiece, Gasconade Purchase Unit . . . . .	5
2. Compassman's Equipment . . . . .	11
3. Estimator's Equipment . . . . .	13
4. Showing Use of Biltmore Stick . . . . .	14
5. Abney Hand Level . . . . .	14
6,7. The Compassman's Tally Sheet . . . . .	15
8. The Estimator's Map Sheet . . . . .	17
9. The Forest Service Location Poster. . . . .	20
10, 11. Corner Description Poster. . . . .	22
12. Adverse Possession Sheets . . . . .	24
13. Soil Types and Values for Missouri and Illinois, 26	
13-A. Fields . . . . .	27
14. Standard Stocking for Soil Types . . . . .	28
15. Height Growth of Southern Upland Hardwoods, Mixed Oaks. . . . .	30
16. Standard Cover Type Symbol Legend and Diameter Class Symbols . . . . .	31
17. Topographical symbols . . . . .	33
18-a, 18-B, 18-C, Board Feet Tables. . . . .	35,36
19. Riley Gladden tacking a Location Poster on an original Government witness tree,. . . . .	38
20. Cover Type Summary Sheet, Form No. 53 . . . . .	39
21. Soil and Volume Summary Sheet, Form No. 54 . . . . .	41
22. Tract Summary Sheet, Form 52 . . . . .	43

	Page
23. Blanks used by land owners in offering their property for lease or sale to the U.S.F.S. . . .	46
24. Instructions for Acquisition Fieldwork, North Central Region,. . . . .	49
25. Completed Acquisition Map, . . . . .	54
26. "O to Kb" picture . . . . .	62
27, 28, "K" and "Kb" Tally Sheets . . . . .	64
29. "K" Stand . . . . .	65
30. 'Kc' Tally Sheet . . . . .	67
31. Adverse Possession. Sec.20,T.35N.R.11W . . . .	69
32. Adverse Possession Sheet of the SW $\frac{1}{4}$ -NE $\frac{1}{4}$ , Sec.20, T.35N. R.11W. . . . .	71
33. Cover Type Sheet,. . . . .	73
35. Form 54 (R-9) Soil and Volume Summary Sheet. .	75
36. Copy of Completed Field Map. . . . .	82



- No. 1. Gasconade Purchase Unit, showing the original Unit as it was before the extension was accepted. The original part shaded.

Some idea as to how the plans of the United States Forest Service will tie in with other national plans in establishing their various forests will be given in the following paragraphs.

First, and of most interest to the engineers,- the United States Forest Service plans to tie in very securely with those of the United States Engineers Corps work of flood control in the Mississippi drainage area. The general set up of the various Federal Forests, as to management, operation, and so on, are all on the same general lines. This discussion, however, will be only of the Missouri Forest, as the writer's knowledge is limited entirely to that particular forest. There have been suggested at various times, three, or possibly four big plans for flood control in this area; the damming of tributary streams, erosion control, watershed protection, and the planting of trees. As the last named, planting trees, falls under two of the previous headings, only three will be discussed.

First,- is the discussion of the damming of tributary streams. This method has long been under discussion

by engineers as possibly the quickest method of controlling flood waters, but it would probably prove the most expensive, too. The United States Forest Service plans to build dams all along the various water courses lying within the boundaries of the various Units. Now these dams will not be concrete structures, but a much more practicable type of structure,- being composed of a series of dams along all water courses to be built, not necessarily with the idea of flood control, although serving the purpose, but built to form, as nearly as possible, natural holes for the native fish to thrive in. These dams may not be over four or five feet in height, if that high. They will be built by driving locally cut wooden piling, throwing logs across some riffle, felling a tree into the bed of a stream, and any such inexpensive way of bottling up the stream so that it will form these fish pools by Mother Nature's own methods, as running water, partially checked, will do. All of this will have a tendency to slow up the water run off of the stream, as can readily be seen.

Second,- erosion control, one of the largest factors of fast water run off to the engineer, as well as to the forester; and especially to the forester when it is remembered the excessive amount of soil removed when noth-



ing hinders its flow. Now, that brings up another phase of the foresters' work that chimes in nicely with this particular topic of flood control. The general conception of Forestry, as has been publicly demonstrated, is that all they want the land for is to raise trees on. That is an entirely mistaken idea. Their one purpose is to use the land for the thing for which it is best suited, i.e., if the land happens to be good bottom land, it is to be used for tillable purposes; if it is hill land and the soil is thin, and, if when tilled it would be easily washed, use it for pasture or raising trees; if it is ridge land, rough and of no particular value other than raising trees, why of course plant and raise trees on it. That gives a very general idea of the theory behind Forestry. It also shows how they will work toward erosion control, for if they allow erosion, they will not have any soil for the raising of trees, let alone crops of any other kind. The forester considers trees as a crop too, you know.

Third,- and the last of the engineers' big plans for flood control, is the watershed protection. You have already gathered how this will be done in the previous discussion; although something might be added that is essential to erosion control, as well as watershed protect-

tion. That something is the prevention of fires. Erosion of soils cannot be prevented if their protective mat of leaves, brush, and trees are burned; Neither can there be watershed protection without the soil on which to raise these trees, which in turn drop their leaves and seeds to protect the soil. So when one of these subjects is mentioned, the other just naturally butts in and cannot be ignored.

From this very general and hazy discussion it can be observed that regardless of what is being done by the Forest Service, the ultimate results will be towards the goal that the engineers are striving for,- flood control. Especially flood control for the Mississippi River. The results of the Mississippi floods can readily be visualized. In view of all this, and from this phase of the problem, the trees planted by the United States Forest Service will be, and are, of what they classify as merchantable stock. That is, after they have matured to saw timber size, a tree, with a butt at least ten inches in diameter and with a clear length of at least sixteen feet, are of those particular species that can be used for merchantable purposes, such as lumber, staves, axe handles, and so on. As these mature to cutting size, the Forest Service, with controlled cutting, can realize

something on their investment; and in time, besides bringing back the timber industry, the natural industry of this country, add more lands to their holdings and increase the area over which they partially control floods. Another wonderful thing about these Forests, over and above their engineering, forestry, and other status, is the fact that twenty-five per cent of all moneys taken in by them goes to that county in which the particular transaction took place, i.e., twenty-five per cent of taxes and so on, go to that county.

A discussion of the instruments that are generally used in this particular type of work would be worthy of mention, and be of particular value at this point in the discussion.

Beginning with the instruments used by the compassman, he being always in the lead of this particular type of survey party while in the field. On control line surveys, or surveys made use of in locating land corners the compassman uses a Forester's Compass. This compass is a smaller type of the Jacob Staff Compass. The box is about six inches in diameter, and the whole instrument is, naturally, much lighter in weight. On the regular timber cruise survey, the compassman usually

uses a pocket-type box compass, although many times the Forester's Compass is used.

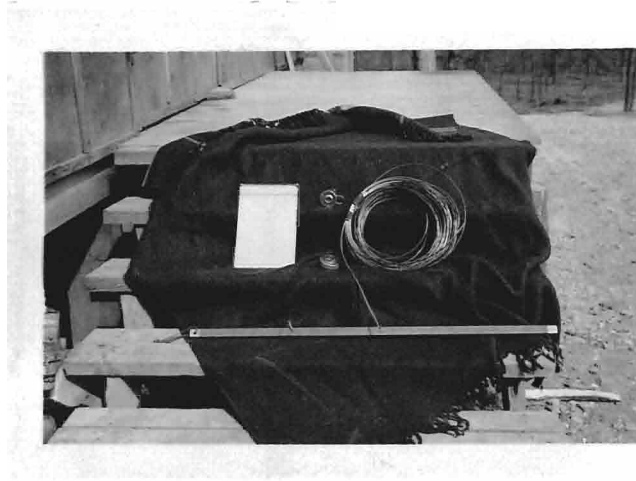


## No. 2. Compassman's Equipment

A little more time is required when using the larger type instrument and lines are more accurately run. But, when the allowable error is considered, it will be seen that it is not necessary. The compassman is allowed an error of two chains in a mile, or one hundred thirty-two feet in five thousand two hundred eighty feet. There is seldom, if ever, an error made over approximately fifty links, (thirty-three feet), even when using a pocket compass. In addition when we consider that the estimator, or mapper, is estimating distances up to one-eighth of a

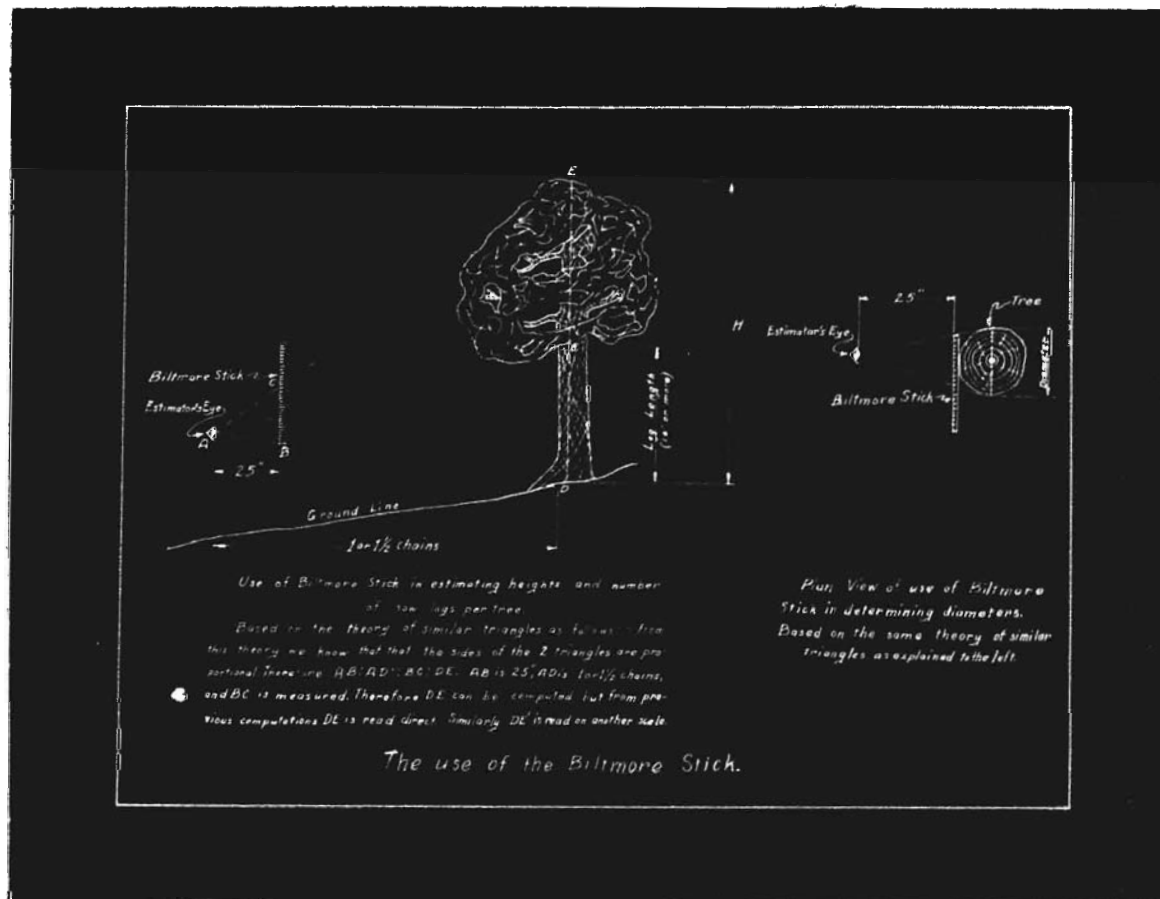
a mile, in most cases, on each side of the strip, or cruise, or compass lines, there is no reason whatever for making any one part of this work any more accurate than any other part. This is especially true when it is recalled that the requirement is to cruise and tally one full section, sixteen forty-acre tracts, in eight hours, and time, as you know, is always a very important factor in any work. The compassman has the small, or zero end, of a double chain tape, or one hundred thirty-two foot tape tied to his belt. all distances are measured with this tape tied securely to his belt, so the accuracy of measurements can be imagined. He also carries a metal paper holder, or 'tatum', as they are called, filled with tally sheets on which he records the timber tally as the estimator calls it out to him. (These sheets will be described later on). Usually, especially in warm to hot weather, the compassman carries a canteen. You will also always notice a bulge in the back of his shirt, at least until. After noon it will have completely disappeared. In this particular type of work a bait bucket, or lunch pail, is only in the way of all kinds of brush and other obstacles, so instead, a dry lunch of some kind is always carried. The lunch is carried, tied up, usually in the back of his shirt, being out of the way there, and by

noon they are mashed to just about the right thickness to offer a subject for discussion as they are eaten.

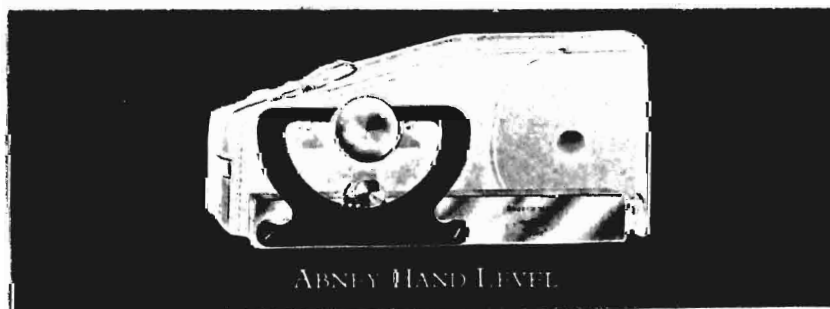


### No. 3. Estimator's Equipment

Next are the instruments used by the estimator. He carries a 'tally-counter', or 'tally-whacker', to keep track of the number of chains tallied; A Biltmore stick, used in estimating heights and diameters of trees, and based on the theory of similar triangles; a diameter tape, used as a check against the Biltmore stick in case of odd-shaped trees; an Abney hand level, used on slopes for horizontal distance corrections, a tatum with map sheets, a small belt axe for blazing and posting, and a canteen.



#### No. 4. Showing Use of Biltmore Stick



#### No.5. Abney Hand Level

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

Form 494-1 D-2

Logging Unit: T. R. S. P.M.

CHAINS TALLIED

Tree Species

Diagrams showing a grid for logging unit layout and a diagram for chains tallied.

Table with columns for Tree Species and Total chains tallied.

Form fields at the bottom:

- Area of type
- Volume on Strip
- Cost Per Cent
- Net Volume on Strip
- Net Volume For Area
- Net Volume on Type
- Compassman
- Name
- Tree
- Plot
- Page
- Estimator
- Date

Cascade T. R. S. P.M.

CHAINS TALLIED

Tree Species

Diagrams showing a grid for logging unit layout and a diagram for chains tallied.

Table with columns for Tree Species and Total chains tallied.

Handwritten notes and data on the form:

- 1-0 2-0 3-0 4-0 1-30 2-40 3-50 4-60 1-30 2-40 3-50 4-60
- Number on Strip
- Trees
- D.S. trees
- Poles

No. 6. Form 494-1 D-2, Tally Sheet

No. 7. Tally Sheet

The first mentioned form is the tally sheet used by the compassman. This sheet is shown in the two different set ups as they were used and shown in picture Nos. 6 and 7 above. The one on the left shows this particular form, Form 494-1 D-2, as numbered by the U.S.F.S., the way it was meant to be used, i.e., only one specie



of timber per sheet. One will notice that the set up of the "Logging Unit, Township, Range, Section, and Principal Meridian," are the same for both sheets. Also, the diagram for the Section showing what forty acre tract was cruised, and the direction of the cruise are the same. The chains tallied and a ringed letter designating the direction of the cruise, are the same in both sheets. The total chains tallied are the same. The chains tallied and the ringed letter designating the direction of the cruise are the same in both sheets. The total chains tallied are the same and the numerical designation of the D.B.H., diameter at breast height, in the left hand column, are the same in both sheets. It is seen that both sheets are headed, "1-20, 2-30, 3-40, and 4-50", these figures are used in reference with the D.B.H. of the trees tallied. To be a little more explicit, the "1, 2, 3, and 4" refer to the number of logs of sixteen foot clear length and ten inch or greater diameter, as a recording under "1-20" and opposite "12" shows a tree twelve inches in D.B.H. with only one clear sixteen foot log in it. The "20, 30, 40, and 50" refer to the heights of poles. They are tallied by diameters against heights, such as, a tally recorded opposite the "8" D.B.H. and under the "3-40" means a pole eight inches in diameter

and forty feet in height. That is the way the forms are intended to be used, but after orders were received to cruise and map sixteen forty acre tracts per day, the Ranger was unable to keep them supplied with sufficient forms. The Ranger then gave the order to use them as shown by the sheet on the right.

This sheet is the same as the other, excepting that three species of trees are tallied on the same sheet in the manner illustrated in the picture. It is readily seen that the information as recorded on the bottom of the sheet, shown on the right, between the printed space prepared for it and the recorded tally could not be recorded there, as there is not room for it. The proper way to use this space, as well as these sheets is shown by the completed sheet on the left.

No. 8. U.S.F.S. Form 10-D.2

The estimator has a sheet on which to draw his estimated map U.S.F.S. Form 10-D2. This sheet shows, as illustrated in Picture No. 8, at the bottom of the previous page, the person's name sketching the map, the forest, a space provided for the Case number (if it is land offered to the Government, it is listed by Case numbers and not by names), the percentage the project or area is cruised, the date or dates, and the Section, Township, Range and Meridian numbers. It is seen that these sheets are made up of a number of squares, and that each square has five dots to a side. It can readily be seen that each sheet can accommodate two true Sections, if it is remembered that the dimension of a true Section is one mile square, or five thousand two hundred eighty feet, or eighty chains, and that there are sixty-six feet to a chain, to a side. After counting, vertically, the number of dots on each side, it can be seen that these sheets are drawn up so that there are eighty dots vertically, and one hundred sixty dots horizontally, or that maps of two true Sections can be drawn on each sheet. We find that a section of land, which is six hundred forty acres, is bounded on these map sheets by a square containing eighty dots or chains to the side, or an area of sixty-four hundred square chains, or the

number of square chains is ten times that of the number of acres. Now, coming down to the smaller squares it is found that they are bounded by five dots or chains, which gives us twenty-five square chains. By counting the number of these small squares per section of land as shown by the map, or by simple arithmetic, it is found that each small square contains two and one half acres of ground. Remembering these two things, approximate areas to the nearest acre, and that shows the accuracy of these maps can readily be determined, either by counting the dots or by adding acres.

A better understanding of this determining of areas will come later on when areas from a completed map will actually be figured up.



No. 9. Form 458. Forest Service Location  
Poster

All of our surveys are started from established known section corners and at each of the corners are posted U.S.F.S. tin location posters. These posters are also posted on other corners than section corners, such as sixteenth and one quarter corners, if they are known to be actually established corners, but most of them will be found on section corners. The names of the posting party are scratched at the top of these posters with the Date, Township, and Range scratched in the place provided for them. These posters are tacked up in a prominent place near the particular corner with a tack driven in the specified corner on the poster representing the actual corner on the ground.

The poster shows a complete Township printed on it. As an example,- Posting the northwest corner of Section 7, a tack would be driven through the poster at the intersection of the lines at the northwest corner of this Section on the poster, assuming the top of the poster as North. If this poster was placed on a road ten chains south of this particular corner, that information would be scratched on the bottom of it. These posters are of enamel covered tin and any sharp piece of metal, such as a knife or nail, can be used in scratching them. One can understand this better by referring to the picture of the poster shown on the previous page.

Form 874-9—Revised May, 1918  
 U. S. Department of Agriculture  
 FOREST SERVICE

NATIONAL FOREST  
**CORNERS OF THE PUBLIC SURVEY**

T. \_\_\_\_\_ R. \_\_\_\_\_ Mer. \_\_\_\_\_  
 Corner common to Sections \_\_\_\_\_ and \_\_\_\_\_

Corner consists of a \_\_\_\_\_ (not in place)  
 State condition \_\_\_\_\_

Dimensions above ground \_\_\_\_\_ inches  
 Sketch groove, seton, figure, or notch, on proper face or edge.

CARDINAL POSITION		DIAGONAL POSITION	
N	W	SE	E
NW	SW	SE	NE

Mound of \_\_\_\_\_ is located \_\_\_\_\_

Pits are located \_\_\_\_\_  
 Sketch markings of bearing trees or rocks in proper box and fill blanks below, giving bearings from Corner to Trees and Distances in Links.


Species \_\_\_\_\_  
 Diameter \_\_\_\_\_  
 Bearing \_\_\_\_\_  
 Distance \_\_\_\_\_

Do you believe this to be a genuine Land Office Corner?  
 If not, why? \_\_\_\_\_

(Signature) \_\_\_\_\_

(Date) \_\_\_\_\_

T. \_\_\_\_\_ R. \_\_\_\_\_ Mer. \_\_\_\_\_  
 (Make sketch of topography near Corner)


Metal Location Poster is on a  
 tree \_\_\_\_\_ inches diameter, on the \_\_\_\_\_  
 side of \_\_\_\_\_  
 from which this Corner bears \_\_\_\_\_  
 chains distant \_\_\_\_\_

Give any further facts which will aid in finding this  
 Corner again. \_\_\_\_\_

Nos. 10 and 11, U.S.F.S. FORM 874-9.

Corner Description Poster

When a corner has been located and posted, there should be some way to make up some kind of an office record so that it will be possible to locate this corner again. There is - the United States Forest Service Form 874-9 as illustrated above. You will notice that this Form, when filled out, is actually a description of the corner itself; a stone, a pile or rocks, or whatever it may be; its legal bearing trees, and their scribings or markings, if they have been cut out, as well as a de-

scription of where the poster is posted and where it is located in reference to the actual land corner. A completed poster description as turned in to the Ranger, has the Township, Range, and Meridian, as well as the type of corner, regardless of whether it is a section, quarter, or sixteenth corner, recorded in their proper spaces. With these figures you will find a description of the actual corner. We seldom ever cut out the scribbings, only when it is necessary to identify the corner positively, for fear of damaging the tree. The type of corner it will be noticed, is also required. That is, whether or not it is a G.L.O. or a County Survey corner. At the bottom of this first page the date, signature and title are the factors necessary for its completion. On page two, or rather the back of the described page, is a space for making a sketch of various topographic features, so as to make it as simple as possible for the next fellow to follow these sheets and find this corner. Below the sketch is provided space for data for locating the poster, and then the corner from this poster. Any additional information deemed helpful is added at the bottom of this page. Now, if you will again inspect the illustrated two sides of this poster form, it will be much clearer.



Acquisition \_\_\_\_\_ (Unit) \_\_\_\_\_

Certification Regarding Rights of Way and Adverse Possession

I hereby certify that I have examined \_\_\_\_\_ acres, and that there is no evidence of past or present occupancy of any part of the lands in question for any purpose by any person or persons other than the vendor, his tenants, employees or agents, or by railroads with rails in place, or by highways maintained by the State, County, Township or other agency, except as specifically described below:

Nature of Occupancy (State if past or present)	Name of Occupant	Description of Land Occupied

Date of Examination: \_\_\_\_\_ 193\_\_

Official Title of Examiner \_\_\_\_\_

No. 12. Certification Regarding Rights of Way and Adverse Possession

With the completion of the previously described map sheets, and after inking them, the estimator must make up what is called "Adverse Possession" sheets for each forty acre tract. If the area being cruised and mapped is an offered area, offered for lease and purchase to the Federal Forest Service, or case, as they are called, they must be made out for each case as a whole. These sheets as can be seen from the picture are "Certification Regarding Rights of Way and Adverse Possession" in 'such and such( a case, if case it be, or in just a forty acre tract with no case number listed. In the field all cases are carried as numbers and not as names. The "Forest Unit" is desig-

nated at the top of the sheet, with a space below it in which to list the name if the area cruised is a case. If a case, the name is usually added after the field work is finished and when the office work is done. The number of acres in the tract is filled in in the proper place provided for it. Under the "Nature of the Occupancy," such things as fences, telephone lines, roads and lanes, buildings and various other adverse possessions are listed. The "Name of the Occupant" is filled in, if we are able to obtain it, otherwise it is listed as a squatter, owner, county road, or whatever explanation is obtained. The "Description of the Land" is filled in as the legal description of whatever the particular tract happens to be, whether or not it is an offered case or just a forty acre tract. It will also be noticed that the date the land was examined as well as the name and official title of the examiner are also required to be recorded. If the reader will turn further into this article, he will find a picture of one of these forms as completed and ready to be turned in to the Ranger, and it will probably assist in a better understanding of how these forms are used, although the blank form shown here will help.

One of the most important sheets used in the field is that listed in the illustration as "Soil Types and Values, Missouri and Illinois." This sheet is a compilation of how the determination of soil types, as drawn on the maps, are made.

No. 13. SOIL TYPES AND VALUES, MISSOURI AND ILLINOIS

	WELL STOCKED	PARTI- ALLY STOCKED	BURNED NOT RE- STOCKED
	A	B	C
(4) Bottoms Low Benchs, Coves Hardwoods, 3 logs plus Yellow Pine, 4 logs plus			
(3) Lower Slopes, Hardwoods, 2-3 logs Yellow pine, 3 logs			
(2) Upper Slopes, Hardwoods, 1-2 logs Yellow Pine, 2 logs			
(1) Ridge Hardwoods, 1 log Yellow Pine, 1-2 logs			

Stocking determined by presence of following specie:  
White, Post, Red, and Black Oaks, Shag and Shellbark,  
Hickories, Ash, Pine, White Elm, Locust, and other specie  
of commercial value.

Weed species not used in determining stocking;  
Black Jack Oak, Black Hickory, Black Gum, Sourwood, Maple,  
Persimmon, and Sassafras.

No. 13-A. FIELDS

1. Productive arable land.
2. Sodded pastures (bluegrass or clover).
3. Eroded and impoverished fields.

<u>TYPE</u>	<u>SYMBOL</u>
(4) Bottom and Coves,	
Wellstocked	4 A
Burn. partially stocked	4 B
Burn. not restocked	4 C
(3) Lower Slopes	
Well stocked	3 A
Burn. partially stocked	3 B
Burn. not restocked	3 C
(2) Upper Slopes	
Well stocked	2 A
Burn. partially stocked	2 B
Burn. not restocked	2 C
(1) Ridge	
Well stocked	1 A
Burn. partially stocked	1 B
Burn. not restocked	1 C

These symbols are marked on the maps in red, using upper case letters as follows (compare this explanation against the illustrated sheet): if they happen to be locating on the map an area of soil that will raise two log trees, thirty-two feet of trunk capable of producing lumber, and the area is partially stocked, and has a stem count (explained later) of about one hundred fifty, it will be recorded as '2B' in red. If that area was a plowed field, listed as productive arable

land, it will be shown with a '1' in red. In the cases of the three types of fields, no stocking symbol is used, stocking symbols being the upper case letter designating the proportion of stocking; and the numeral designating the number of sixteen foot logs of ten inch or greater D.B.H. that can be raised on that soil. This figure is easily determined by the stand on the ground at the time. This last statement will be better understood after reading the two following paragraphs, especially the one describing the illustrated height growth table.

When in the field, it is often difficult to determine what soil stocking symbol to give a certain area of land on the maps. The table listed below is very helpful in these instances.

No.14.STANDARD STOCKING FOR SOIL TYPES

	A Well Stocked	B Partially Stocked	C Poorly Stocked
Reproduction (From the ground up)	600 plus	240 to 600	less than 240
Saplings (6' tall to 4.5" D.B.H.)	400 plus	160 to 400	less than 160
Poles (4.5" to 9.5" D.B.H.)			
(large)	250 plus	100 to 250	less than 100
(small)	300 plus	120 to 300	less than 120

Include only desirable species. Divide above figures by

10 and the result will be the equivalent of an acre to be found in one chain of the strip.

For instance, when a particular part of a strip which is covered principally (say seventy-five percent) with oak brush up to about six feet in height is cruised, the cruising party takes a careful count of the stems of the desirable species. The desirable species are shown in the Soil Type Table above. On this strip, the strip is one chain, surveyor's chain, wide, and for a length of strip of one chain in this particular area, it is found that there are about 330 stems on this particular piece. Referring to the above table of Standard Stocking for Soil Types, it was found that the 330 stem count falls in the 'b' column of reproduction.

The stocking symbol has now been determined for the illustration. But what about the numerical symbol, is it to be a "1, 2, 3, or 4"? If there are not enough larger trees by which to estimate this, pick out one of average size and cut it down, leaving either the butt of the tree or the stump smoothly enough cut so as to count the annual growth rings. Then count these annual rings, there are twenty-seven. This is nearer twenty-five than thirty, so it will be called "twenty-five years old."

After measuring the height of the tree it was found to be thirty-one feet high. Referring to the "Height Growth of Southern Upland Hardwoods, Mixed Oaks," table listed below, it was found that the red soil symbol is for upper slopes.

No.15. HEIGHT GROWTH OF SOUTHERN UPLAND HARDWOODS  
MIXED OAKS

<u>AGE</u>	<u>BOTTOM</u>		<u>LOWER SLOPES</u>		<u>UPPER SLOPES</u>		<u>RIDGE</u>	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
20	45	55	35	45	25	35	15	25
30	60	73	47	60	34	47	21	34
40	70	85	55	70	40	55	25	40
50	78	95	62	78	46	62	30	46
60	85	103	67	85	50	67	32	50
70	90	108	72	90	54	72	36	54
80	94	113	75	94	57	75	38	57
90	97	117	78	97	58	78	39	58
100	100	120	80	100	60	80	40	60

This data from studies of E.H.Frothingham, et.al.

Basis of classification is height growth at the end of 100 years.

To be applied directly in determining types in Illinois and Missouri, when merchantable timber, indicating site by log lengths, is not present for site determination.

For inclusion in reconnaissance instructions.

From the table for "Soil Types and Values for Missouri and Illinois, No. 13 and 13A, we find that it is a '2' in red. Combine this result with that obtained in the first of the example and we see that our full soil symbol is a red "2B".

Symbols for cover types, still cruising the above example, such as, - how to show on the map that the cover is oak brush six feet in height and under, and of what specie is the majority of timber. Again there is a table, listed below, telling what to do.

TABLE NO. 16.

STANDARD COVER TYPE SYMBOL LEGEND

K-Oak  
 P-Pine  
 M-Mixed hardwoods-Sycamore, Maple, Elm,  
     Hickory, Walnut, etc.  
 J-Black Jack Oak - Classified as weed  
     specie, although mapped.  
 Q-Grasslands, pastures, etc.  
 C-Cultivated, plowed, or has been within the  
     past year.

DIAMETER CLASS SYMBOLS
























a-Reproduction, trees up to six feet in height.  
 b-Saplings, trees from six feet in height to  
     4.5" D.B.H.  
 c-Poles, trees from 4.5" D.B.H. to 9.5" D.B.H.  
 K-P-M-etc.(without the small letters O -  
     Saw timber-(trees over 9.5" D.B.H.)  
 O-C-Diameter class symbols are never used with  
     these two symbols.

When in oak brush up to six feet in height, referring to the table, it is found that the cover type symbol to use is "Ka", in black letters, as all cover symbols are black. If it had been a pine pole stand the cover symbol would have been "Pc".

The topographical symbols used are the same as are commonly used, excepting possibly those designating



various land corners and the control lines that oftentimes will have to be run in locating a starting corner. Those lines are drawn in red. A partial list, as used, is shown on the following page: They do not need any description.

No. 17. Road - first class - hard surface	
Road - fair or good	
Road - minor or very poor	
Trail	
Railroad	
Telephone	
Telephone along road	
Fence	
Occupied house, cabin, etc	
Abandoned building	
School	
Church	
Dam	
Village or settlement	
Lake or pond	
Supply of water suitable for pumping in case of fire, in blue	
Permanent stream	
Pronounced hill	
Rocky ledge or bluff	
G.L.O. General Land Office, positively identified	
Probable, not positively identified	
Corner searched for and not found	
Control line run, drawn in red	

These symbols are self-explanatory as indicated in the table.

It is sometimes rather difficult for an estimator to determine correctly whether or not a stand of timber is a saw timber stand or not. As a general rule, if he tallies at least three twelve inch D.B.H. one log trees, or their equivalent, in one chain of the strip, it will be a saw timber stand. If the estimator is lucky enough to have the illustrated table in his head, he is very lucky indeed. Otherwise, it means either he must memorize this table, or carry a copy of it with him. Even though he does have the table memorized, it is a very good practice to carry a copy of the table in the tatum holder while in the field. It is correctly speaking, three tables. They all refer to various types of saw timber and are, self explanatory. The tabulated figures are board feet that can be sawed from the given saw logs.

TABLE 18-A

RED OAK, MIXED OAK, BLACK GUM, BASS WOOD  
MAPLE, BIRCH, BLACK JACK

D.B.H.	NUMBER OF 16 FOOT LOGS			
	1	2	3	4
10-----	30-----	50-----		
12-----	50-----	70-----		
14-----	70-----	110-----	140-----	
16-----	90-----	160-----	190-----	
18-----	120-----	210-----	270-----	310-----
20-----	150-----	220-----	360-----	400-----
22-----	190-----	340-----	450-----	500-----
24-----	230-----	420-----	550-----	630-----
26-----	270-----	500-----	670-----	770-----
28-----	320-----	600-----	800-----	920-----
30-----	380-----	700-----	940-----	1100-----
32-----	440-----	810-----	1100-----	1300-----
34-----	510-----	930-----	1270-----	1510-----
36-----	580-----	1060-----	1450-----	1740-----

TABLE 18-B.

2nd GROWTH YELLOW POPLAR, WHITE, POST, COW,  
AND BURR OAK, RED GUM, WALNUT, WHITE  
ASH, BEECH, HICKORY, AND ELM

D.B.H.	NUMBER OF 16 FOOT LOGS				
	1	2	3	4	5
10-----	30-----	50-----			
12-----	50-----	80-----			
14-----	70-----	120-----	140-----		
16-----	100-----	170-----	210-----		
18-----	130-----	230-----	290-----	320-----	
20-----	160-----	290-----	380-----	420-----	
22-----	200-----	360-----	480-----	540-----	
24-----	240-----	440-----	590-----	700-----	
26-----	290-----	520-----	720-----	840-----	
28-----	340-----	630-----	850-----	1030-----	1100-----
30-----	400-----	740-----	1000-----	1200-----	1320-----
32-----	470-----	850-----	1150-----	1400-----	1560-----
34-----	540-----	980-----	1300-----	1610-----	1800-----
36-----	620-----	1100-----	1470-----	1840-----	2070-----

TABLE 18-C. 2ND.GROWTH SHORT LEAF YELLOW PINE

D.B.H.	NUMBER OF 16 FOOT LOGS			
	1	2	3	4
10-----	30-----	60		
12-----	50-----	90-----	130	
14-----	80-----	140-----	180	
16-----	110-----	190-----	240-----	270
18-----	140-----	240-----	320-----	360
20-----	170-----	310-----	400-----	450
22-----	210-----	370-----	490-----	560
24-----	250-----	450-----	600-----	700
26-----	300-----	550-----	720-----	840

This completes the various forms and tables used in the field, and this seems a suitable place to describe the forms used in the office work. First there are the General Land Office plats, called "G.L.O's." These plats are photostatic copies of the plats drawn by the General Land Office in Washington, D.C., by Townships, from the original field survey notes for these Townships. These notes are those as turned in to the Government by the surveyors hired by them when they made the original surveys establishing the Section and other necessary corners in this part of the United States. These original surveys, and therefore plats, were made for the area included in the Gasconade Unit of the Missouri Forest for the General Land Office about 1820. It is surprising, after one compares the

instruments used then and now, how accurately their original work checks with the surprisingly large number of original corners, which were located while on this work. These plats give the dimensions, bearings, and areas, as well as section numbers and other valuable information necessary in locating specified tracts of land. The values required in this field work are recorded on the map sheets before going into the field; Thus, giving positive proofs of corners, which were actually found while in the field.

These plats, of course, are never carried into the field. They are too valuable from the expense viewpoint; but they are used in the office before going out after whatever information they may give us to be used later in the field.



No. 19. Riley Gladden tacking a Location Poster on an original Government witness tree.

After coming from the field work, the estimators are now yet through for awhile. There is the office work to make out on what has been completed that day in the field. There is Form 54(R-9), "Soil and Volume Section Summary Sheet," Form 53(R-9) "Cover Type Section Summary Sheet," and Form 52(R-9), "Tract Summary Sheet", to be filled out, and, the saw timber, chords, ties, and poles are yet to be computed from the results of the timber tally taken in the field.

Form 53 (R-9)

ACQUISITION - ILLINOIS AND MISSOURI  
SECTION SUMMARY SHEET - COVER TYPES

Sec. \_\_\_\_\_ T. \_\_\_\_\_ R. \_\_\_\_\_ Forest. *Forested Pasture*

Deser- iption.	Acre- age	O	l-h	l-s	K	K-a	K-b	K-c	P	P-a	P-b	P-c								
NE NE																				
NW																				
SW																				
SE																				
NE NW																				
NW																				
SW																				
SE																				
NE SW																				
NW																				
SW																				
SE																				
NE SE																				
NW																				
SW																				
SE																				
TOTAL																				

No. 20. FORM 53 (R-9). COVER SUMMARY.

The first summary usually filled out is the Cover Summary, or "53" as it is called. The Section, Township and Range are first filled in, in the upper right hand corner of the sheet. Then the symbols for Black Jack Oak, Mixed Hardwoods, Cultivated and Pasture Lands are added in the blank spaces provided for such additions, at the heads of the required number of columns. The acreages are then recorded in the column so designated,



and after the proper description of the various tracts cruised that day in the field. These acreages are taken from the C.L.O. plats. The various acreages of the cover types are then computed from the maps as drawn in the field that day and recorded in their proper places on the sheet. The total acreage of these various types are recorded at the bottom of the sheet and they, in turn, are totaled as a check against the total as recorded under the "Acreage" column. This particular Form is illustrated on the preceding sheet.

Form 54 (B-9)

ACQUISITION - ILLINOIS AND MISSOURI  
SECTION SUMMARY SHEET - SOIL AND VOLUMESec. 70 T. 75N R. 11W

Fcrest. \_\_\_\_\_

Description	Acreage	SOIL - ACRES												VOLUME						TIES	FOOTING							
														SAWTIMBER			CORDS											
		1-A	1-B	1-C	2-A	2-B	2-C	3-A	3-B	3-C	4-A	4-B	4-C	1	2	3	4	5	6									
NE NE	40.85				2.5	5																						
NW	40.85				2.5	5																						
SE	40.85				2.5	5								1.5	1.5	1.5												
NE NW	40.85				2.5	5																						
NW	40.85				2.5	5																						
SW	40.85				2.5	5																						
SE	40.85				2.5	5																						
NE SW	—																											
NW	—																											
SW	40.85				2.5	5																						
SE	—																											
NE SE	40.85				2.5	5																						
NW	40.85				2.5	5																						
SW	—																											
SE	40.85				2.5	5																						
TOTALS	40.85				2.5	5																						

## No. 21. FORM 54. SOIL AND VOLUME SUMMARY.

This has as can be seen by referring to the illustration shown above, headings at the top of the sheet similar to those on the 53. The "Acreage" column is filled in with the same figures used on the 53 for that particular section, or case, that is being worked on. From here on the sheets are different. On this sheet the acreages recorded are for Soil Types and not for

Cover Types. The reader will note that headings for the last three symbols have been scratched out, and the symbols "1,2,and 3" have been written in their stead. This had to be done to show acreage of cultivated fields, pastures, and severely eroded lands, and, as there was no "4" type of soil, these columns were used. These acreages were totaled and checked against the Total Acreage column, as in the previously explained 53's. Under the columns for "Volume", will have to be added in the spaces provided of course, the kinds of saw timber - White, Red, and Post Oak, Pine, or any other specie that has been tallied while in the field, so as to have the proper columns in which to record the thousands of board feet this tally will give us after computation. One of these "Volume" columns will be marked "Total" so as to have the summerized number of "M" thousands of board feet on each soil tract. There is no requirement to tally cords or ties, so these columns are left blank. For a while when this work first started in this part of the United States, it was required to tally handle-bolts of Hickory and Walnut. This practice was very soon discontinued due to the lack of suitable quantities of these particular species of trees. The heading of the last column was changed

from "Posts" to read "Poles", as poles were tallied not posts.

Form 52 (B-9)  
Tract Name and No. \_\_\_\_\_  
Unit \_\_\_\_\_

ACQUISITION - ILLINOIS AND MISSOURI  
TRACT SUMMARY SHEET

T. N. SEC.	Acres	SOILS - ACRES									CONDITION OF TRACT - ACRES													
		1-A	1-B	1-C	2-A	2-B	2-C	3-A	3-B	3-C	4-A	4-B	4-C	Fert. P.M.	Light Soil	Heavy Soil	Pastor-ing	Out-Over	Field Burn	Un-Prod.				

**NO. 22. FORM 52. TRACT SUMMARY SHEET**

Now for the description of the Form 52, or Tract Summary Sheet. This sheet is made up to be used in connection with offered cases. If a proposal for sale of a tract of land is received by the government containing lands scattered among various Sections, or Townships, the totals of our field results of all the lands offered

can be recorded on the same sheet. With these results so listed, it is a great help to the various offices that may have any dealings with these lands, to refer to this one sheet and see listed there in black and white just exactly what was found on that land when it was cruised. By that is meant, they can see right there the conditions existing on the property, and they can very readily approximate what will be necessary to have done to bring that land up to specified standards. Columns designating the "4" types of soil are scratched out and the numerals "1,2,and 3" are written in in their stead. The reader, with this knowledge of the two Forms 53 and 54, can readily understand this sheet, so it will not be necessary to go into any further detail about it.

There is one more duty to perform before the day's office work, which includes mailing the completed forms to the Ranger, is over, and that is bringing the progress map up to date. This "Progress Map" is drawn on regular red line cross section paper and to the same scale as the field maps are drawn, one inch being equal to one quarter mile. In other words, it is just an assembled tracing of the inked field maps. As a township of this map is completed, it is mailed to the Ranger for his use, or files. There is also smaller township forms which

are used as date progress maps. From what has been said before, you know that one Section is cruised per day, so at the end of each day's work, the date is written across that particular Section, which was cruised that day. These date progress maps also carry the Township and Range written on them to keep check on what has already been worked.

There is one more set of Forms usually carried in the field, although it is usually in the car, as there is seldom a chance to use it. In fact, the writer had only one opportunity to use it in all the time he was with the U.S.Forest Service. That set of Forms are the blanks required to be filled in by the owner of the land if he desires to offer that land to the Federal Forest Service for lease or purchase. They are shown in the illustration below, and are self explanatory.

NO. 23.

U.S. Department of Agriculture  
Forest Service

L.  
Purchase  
Missouri

PROPOSAL FOR SALE OF LAND

\_\_\_\_\_  
(Town or City) (State)

\_\_\_\_\_  
(Street)

\_\_\_\_\_  
(Date) 193

Forest Supervisor,  
Forest Service  
U.S. Department of Agriculture,  
Rolla, Missouri

Dear Sir:

(I or We) \_\_\_\_\_ (Name )

\_\_\_\_\_ of \_\_\_\_\_ County

State of \_\_\_\_\_, hereby propose to sell to  
the United States all that certain tract or parcel of  
land situate, lying and being on the watershed of

tributor \_\_\_\_\_ of \_\_\_\_\_ in the Township of

\_\_\_\_\_ in \_\_\_\_\_ County and

State of \_\_\_\_\_ and (bounded) and described as  
(known )

follows: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

A map of this tract \_\_\_\_\_

This tract contains \_\_\_\_\_ acres, more or less, and consists approximately of the following classes of land:

- (a) Merchantable forest \_\_\_\_\_ acres.
- (b) Cut-over land \_\_\_\_\_ acres.
- (c) Brush or burned land \_\_\_\_\_ acres.
- (d) Abandoned farm land \_\_\_\_\_ acres.
- (e) Agricultural land \_\_\_\_\_ acres.

Said land contains approximately \_\_\_\_\_ feet B.M. of merchantable timber of the following kinds: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

At any time within six months from the date hereof, and thereafter until this proposal shall be withdrawn \_\_\_\_\_ will sell said land at a price of \$\_\_\_\_\_ per acre subject to the following reservations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

or subject to rights outstanding in third parties as follows: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



\_\_\_\_\_  
\_\_\_\_\_  
All timber reservations to be in accordance with such rules and regulations as may be agreed upon at time of sale. The acreage to be determined by an accurate survey by horizontal measurements.

The following statement is submitted with regard to condition of title, with especial reference to litigation, lappage and possession: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

On the date hereof \_\_\_\_\_ have, as \_\_\_\_\_ the right, full power, and lawful authority to grant, bargain, sell and lawful authority to grant, bargain, sell, and convey said land. \_\_\_\_\_ hereby grant to the officers of the United States Government unrestricted right and privilege to examine as fully as they may see fit said land and the timber standing thereon, with a view to said purchase, during the period for which this offer is valid.

Very respectfully,

(Signature) \_\_\_\_\_

Do you have an abstract to land being offered?

\_\_\_\_\_  
(Yes - No)

(Name of Wife) \_\_\_\_\_

-----

That completes the descriptions of the various Forms, and it would probably be a good thing to add a little description of the work as it is carried on in the field here. The best way to do this would be to quote the orders on this subject as they were received. The following are these orders, with a few explanatory remarks of various points which may otherwise be difficult to understand:

No. 24.

12/13/33

"INSTRUCTIONS FOR ACQUISITION FIELDWORK, N.C. REGION"

1. Intensity

A. Per cent of Estimates.

1. 2 $\frac{1}{2}$ % for tracts of more than twenty-five hundred acres cut-over and burned land with little or no merchantable timber.
2. 5% cut-over tracts with stand below the following volume per acre:
  - 2 M B.M.-White or Norway Pine.
  - 3 M B.M.-Hemlock, Hardwood, or Oak
  - 4 M B.M.-Jack Pine

These stands do not include pulpwood. Intensity of 5% for tracts of less than the above volume will not be exceeded unless the total offering is less than one-half section.

3. 10% tracts of one hundred sixty acres or larger with more timber than listed under the above paragraph, but less than 10 M B.M. of saw timber per acre.
 

In the event of a small area of six hundred forty acres or less of very high valued timber, 10 M B.M. per acre, or more exclusive of pulpwood or cordwood, the Forest Supervisor may in his discretion decide upon a 20% cruise, or if unusually high values are involved

on a very small tract, a 100% tally on all merchantable timber.

In mentioning tracts, the term "tract" is taken to cover the entire offering and not the sub-divisions of forty acres, one quarter section, or sections.

## II. Methods.

Strips will be run with a box pocket compass whenever such instruments are available. Unless specific approval is given in individual cases by the Regional Forester, the box-pocket compass will be used. The standard compass may continue to be used in such cases when there are not sufficient box-pocket compasses available to furnish all men with these instruments.

All strips will be chained except open areas of burned or large expanses of non-productive swamp or muskeg. Such areas may be covered by pacing, a one-man examination. Care should be exercised to tie in areas to well run strips or corners.

## III. Accuracy Required.

A. Type boundaries will be checked by pacing out at right angles from the strip when the joining types are of greatly different values. Representative areas are water joining productive swamps, timbered areas joining open burns, or productive swamps, timbered, joining muskeg. It is considered unnecessary to pace out the boundaries of type when the adjacent types do not vary more than forty per cent or more in value. If all types are cut-over and burned and a 5% cruise is being made, there is no need whatsoever for pacing out any type other than those making great difference in value.

The following will be the size of the type areas to be recognized:

2½% cruise	-----	10 acre type patches.
5% cruise	-----	5 acre type patches.
10% cruise	-----	5 acre type patches.

Unless the type areas are heavy timber, intermingled with cut-over land or non-productive lands, or ponds or fields, the following limits are large enough. However, ponds, fields, muskeg, and non-productive types will be typed at two and one half acres and smaller.

#### B. Detailed Instructions for Estimating.

All tallies will be by two inch classes regardless of species, diameters, and heights. Species of no commercial value, such as Black Jack Oak and Persimmon, and in all cases scrubby Aspen, or Birch where unmerchantable, will not be tallied.

#### IV. General Instructions for Field Work.

When a reconnaissance is 5% or less, the tie stripping tie-in requirement is G.L.O. or other accepted corner at two mile intervals. It will not be necessary to tie to quarter or section corners along the strip line unless extremely high timber values are present, and even in such cases, the practice is of questionable value. It is well, however, to require green crews to make frequent ties. Experienced crews who have proved their ability to check closely should not be required to make ties except at the beginning or end of strip.

It is not desired to have sloppy or inaccurate reconnaissance work, but it is desirable to have the methods conform with the type of land to be examined.

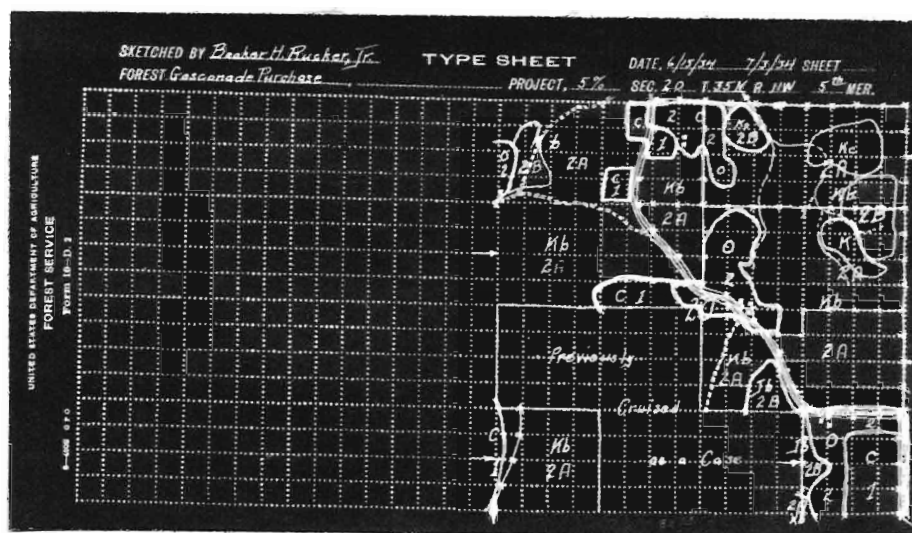
We will continue to make every possible use of land economic and other State surveys. These undoubtedly are unsatisfactory for many forty and sixty acre tracts when they differ in character from the adjacent land, but such cases can be examined separately if it appears that the land economic survey data is not accurate.

Land economic survey data, and other similar surveys, are not sufficiently accurate for the valuation of timbered areas. These must continue to be examined by acquisition reconnaissance men."

All through the above quotation mention was made of "2½%, 5%, 10%," and various other percent cruises. What does this mean? This will be explained as follows: The percent of a timber cruise is determined by actual percentage of an area that is actually cruised, timber tallied. Remember that this cruise strip goes through the middle of a piece of property, a forty acre tract for an example, and not along its boundary lines. In other words, they start at a known section corner and chain north. In this example they will go north ten chains, or one-half the length of one side of the forty acre example. From that point they turn west, still in this example, through the middle of the forty acre tract. Again remembering that a forty acre tract of land is twenty chains on a side, they see that it contains four hundred square chains in area. Now back to the strip. After crossing the forty, twenty chains of strip have been traveled, have they not? The strip is one chain wide and twenty chains long, so the area of this strip is twenty square chains, is it not? Therefore, the strip area is twenty square chains divided by four hundred square chains, or five per cent of the area of the whole forty acre tract of land. Now to get this straight, everything of merchantable

species that falls within the strip is actually tallied. Therefore, when it is looked at from that point of view, 5% of the forty acre tract is actually tallied. A 10% cruise is two strips through a forty, a  $2\frac{1}{2}\%$  cruise is right on a forty acre line, or one half of the cruise strip is in one forty and the other half is in the adjacent forty acre tract of land.

A little broader idea of the work had better be given, as it is carried on in the field, and perhaps the best way to do this is to tell the story of a typical day's work in the field, or rather to include as much as possible in that particular day's work that was cruised, the greatest variety of cover and soil types, and that also include the greatest number of topographic symbols. In other words, this particular land that was cruised comprised the greatest number of cover and soil types of all others. This work is actually work that the writer did with Walter E. Carlson as compassman, when they cruised Section 20, in Township 35 North, and Range 11 West of the 5th Principal Meridian on June 15, 1934 and July 3, 1934. The illustrations shown are actual copies made of those particular reports that the writer turned in to Ranger H.A.Svenson of the Gasconade Forest Unit of the Missouri National Forest.



No. 25. Completed Acquisition Map of  
 Sec. 20, T. 35 N. R. 11 W, 5th Mer.

Before they left for the field they had to get out the G.L.O. for Section 20 in Township 35 North and Range 11 West of the 5th Principal Meridian and get all the information they could about it. They see at once that the only corner of their Section that is known to them is the southwest corner. They will use that corner as their starting point in the field. The G.L.O. gave the dimension of this Section as eighty-two and three hundredths chains for the north and south sides and eighty chains on the east and west sides; the areas are three hundred twenty-seven and seventy-six hundredths acres in the north half of the Section, and three hundred twenty-seven and four hundredths acres in the south half.

From these results they found that each forty is actually forty and eighty-eight hundredths acres in the south half of the Section, and forty and ninety-seven hundredths acres in the north half; with twenty and fifty-seven hundredths chains as the chainage east and west and twenty chains north and south. Then from the progress maps they found that the  $N\frac{1}{2}$ - $SW\frac{1}{4}$ ;  $SE\frac{1}{4}$ - $SW\frac{1}{4}$ ; and the  $SW\frac{1}{4}$ - $SE\frac{1}{4}$  had been previously cruised and reported on as a case. They will get the type and soil lines and various topographic features from the progress map to draw around the edges of their blank map form so they can connect similar lines correctly as they hit them in the field.

They check up on equipment to see whether or not they have sufficient forms for field work, and all the necessary instruments.

They gather up their lunches and start. Before they can leave though they will have to check up the pick-up for gas, oil, and record the speedometer reading in the book provided. All set! They are off to the SW corner of Sec.20, T.35N, R.11W. of the 5th P.M.

They are now at the corner which they proved the day before. They forgot to post it before they left the day before, so they will have to do it now. Where are



some nails? Here? Fine! They will scratch, "B.H.Rucker, Jr., W.E.Carlson" just above the printed township in the provided blanks. Then to tack it up on this tree where it can be seen from the corner and now to drive that tack in the SW corner of the illustrated Section 20.

After the job of posting and writing the description is done, they are ready to start out with their cruise. The question arose as to what directions to cruise that section, that is, whether to run the strip lines on east and west bearings or on north and south bearings. From their knowledge of the country and from previous studies of the County map, they know that the road as illustrated in their finished map, is close to the quarter section line between the  $SW\frac{1}{4}$ - $NE\frac{1}{4}$  and the  $SE\frac{1}{4}$ - $NW\frac{1}{4}$ , so why not end there? That way they have only forty some odd chains as dead chainage. How do they figure that way? Follow them through the section and they will try to explain.

They will start at the SW corner and chain ten chains north, (one quarter of a mile is the side of a forty), and they only want to go half way. This puts them on their cruise line starting east. They will go along this bearing line through the bottom tier of

forties to the east section line, then north twenty chains of dead chainage to the next cruise line west. They will follow this line to the quarter section line and there turn north to the east cruise line, and then east. This line will be followed to the east section line and from there they will go north to their last west strip line, which carries them west through the top tier of forties in the section to the west section line. There they will turn south their twenty dead chains to their previously partially run east strip line. At the end of forty chains on this strip line they hit the starting point of that part of that strip that they had already run. From that point it seemed that they will be at their nearest point to the previously mentioned county road where the other crew could pick them up after their day's field work has been completed. Was that way of running cruise all right with you all? Fine, they will run it that way.--

With reference to the illustrated completed map for this section, they will run hurriedly through this field work, and in so doing, will try to show this end of the field work.

They have chained their ten chains north from the SW corner of the section along the section line, so they

are ready to start mapping and tallying. They know from their inspection of the progress map that this point should be in a cultivated field. Well, they were standing in one - so it must be all right. The compassman had his shot, and they start east. They stop while the writer drew some lines on his map at the end of these first two chains, as in about a chain and a half the plowed field ended. Looking to their right and left, which was south and north respectively, they see that this line is not on a true bearing, but curved and, estimating seemed to strike the edge of their forty just as their progress map showed. So they just join them up, drawing this line as nearly similar as possible to the way it is on the ground. This is a solid red line, as can be seen from the map for a soil change. (From cultivated to cover is always a soil change). The cultivated is a "1" type so the red "1" is drawn in and the cover symbol is a black "C". They were also chaining from "C" to some timber cover type so they will have to draw a black line with the red line across the forty.

They will have to go into this cover a way before they can determine what type of cover it is. So they go ahead and take some tally. Wait, there is a fence

at three chains that will have to be drawn in. After tallying only about two trees of saw timber size and only very few poles in five or six chains, they see it is only an Oak sapling stand, so they put a black 'Kb' symbol on the map. The average stand of mature timber is about two log stand with full stocking, which gives us "2A" soil symbol. At the end of this forty, checking over the tally, they find that it was all low and about the same throughout. From these results these color and soil symbols hold good for the entire forty. Those results check exactly with the information they had from the progress map.

Here is forty chains of dead chainage to go through, and the sooner they get it over with, the better they will like it, so in the words of the writer - "Let's get it over with."

At 61.53 chains is a fence, this was shown on the progress map for this forty acre line, confirming their work as far as they have gone. They next are going into a Black Jack sapling stand, and that checked with their map, and in five chains they ran out of this sapling stand and into pasture or "0" in black and red "2" type soil. Here they stop for awhile and get their type lines in.

Down south of them was some 'Kb' - the progress map showed that the 'Kb' was there. This was paced and located properly. Seven chains south the 'Kb' began and that was the way they drew it in. Back up on the strip line and looking north there was a couple of buildings about eight and nine chains up and three chains in back of them. These estimations were used to plot them in with. A road, the County Road too, with fences on each side was running along the north side of this forty and that had to be plotted in in that manner. Five more chains they hit a break in type from '0' to 'C' and from '2' to a '1' soil and so on to the end of the strip in the middle of the road. These various features were plotted in as they appeared.

Now they go north ten chains to see if they can locate that 1/16 corner on the section line. They have no luck and will have to go on to their cruise line. Having forgotten to get adverse possession on the buildings, one of them will have to go back and get them.

The owner lives there, so they will not need his name, and he owns the forty they just completed. So they advance on north to the strip line west. There they find some luck, a fence on the section line on

the part of this line so it must go on north to the 1/4 corner, at least they draw it that way and find out how true this assumption is when they get back to this line farther north.

Now they are back at the starting point for their cruise back west. Referring to their 'dope' as they drew it on their map sheet from the progress map, they find that they have only two forties on this strip because of the previously cruised case as was shown. For the first forty chains it was all a typical 'Kb' stand and with '2A' soil with little or no tally, so they hurried on to the next forty.

The fence on their north side dropped down south at this point, about five chains and then turns west again parallel to their strip line. That was drawn in and then they go on. Four more chains and there was the County Road again. This was sketched in. North of them the road bore a little to the north and then curved a little westerly. South, it ran just about east of a little south straight to the 1/16 corner about like they had drawn it in. There was a fence on the east side of the road and none on the west. From here on ahead and south their cover type changed along that road to 'Jb' and the soil to

'2B', the soil was not so good in 'Jb'. They usually find that true, as Black Jack Oak is usually found on southerly and westerly slopes as well as on eroded, slashed, or generally burned and poor soils. They find that they are still OK, their 'Jb' joining with their original 'dope' all right. They go on in this 'Kb' until at thirtysix chains they hit an old logging trail as shown on the map and 'Kb' to the end of the forty.

There they turn north again for another twenty chains to their cruise line east in the next tier of forties. At ten chains north they ran out of 'Kb' and into 'O'; and at 13 chains they came to the road



No. 26, "O to Kb"

again. Another fence at fifteen chains and the type lines seem to run right along the north line, and at twenty chains they turned east still in 'O' type. As it was all open, there was no need to pace out to the type changes as the distances were easily estimated. That was especially true as this was all of 'O' there was in this one forty, excepting that part in the extreme southeast corner. That will be paced out when they get a little further along.

At fifty chains counting from the west line of the section, they go back into the 'Kb'. The writer paced south here and found the 'O' as shown. At the forty line there is a clear lane through the stand and he could see the fence corner where they guessed it to be; so their drawing the fence that way was all right.



UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Form 494-1 D-2

Logging Unit Gasconada T 35 N R 11 W S 20-5<sup>th</sup> P. M.

CHAINS TALLIED

Check off which the above represents, place in log column

20

69.53  
75.88  
Factor = 15  
Total chains tallied 54

Type **K** Species

Poles	Red Oak	White Oak	Pst Oak
DB.H.	1-20 2-30 3-40 4-50	1-20 2-30 3-40 4-50	1-20 2-30 3-40 4-50
6	100		
8			
10	100		
12	150	50	
14	70		
16	100		
18			
20			
22			

320 ft. B.M. - Vol. on Strip - 50 ft. B.M.  
25% Gull - 20%  
390 ft. B.M. - Net Vol. on Strip - 40 ft. B.M.  
5850 ft. B.M. - Net Vol. on Type - 600 ft. B.M.

Acreeage of Type	Number	On Strip	Per Acre
Volume on Strip	Trees		
Cull Per Cent	Dis Trees		
Net Volume on Strip	Poles	5	8
Net Volume Per Acre	Logs		
Net Volume on Type			

Compassman W. G. Carhart Estimator B. H. Baker Jr Date 7/3/34

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
Form 494-1 D-2

Logging Unit Gasconada T 34 N R 11 W S 20-5<sup>th</sup> P. M.

CHAINS TALLIED

Check off which the above represents, place in log column

20

73.87  
87.85  
67.82  
Factor = 21.5  
Total chains tallied 1600

Type **M** Species

Poles	Red Oak	White Oak	Pst Oak
DB.H.	1-20 2-30 3-40 4-50	1-20 2-30 3-40 4-50	1-20 2-30 3-40 4-50
6	100		
8			
10	100		
12	100		
14	70		
16			
18			
20			
22			

320 ft. B.M. - Vol. on Strip - 50 ft. B.M.  
25% Gull - 20%  
240 ft. B.M. - Net Vol. on Strip - 40 ft. B.M.  
5088 ft. B.M. - Net Vol. on Type - 848 ft. B.M.

Acreeage of Type	Number	On Strip	Per Acre
Volume on Strip	Trees		
Cull Per Cent	Dis Trees		
Net Volume on Strip	Poles	21	15
Net Volume Per Acre	Logs		
Net Volume on Type			

Compassman W. G. Carhart Estimator B. H. Baker Jr Date 7/3/34

NO.27 FORM 494-1 D-2

NO.28 FORM 494-1 D-2

Going on east on this strip line, they came into a 'K' stand of timber of 69.53 chains. That is an Oak saw timber stand, you remember. They tallied two chains. Rather the writer did in his mind before he called a change of type. He found in these first two chains a tally of two 10-1 and two 12-1 Red Oak logs,

and one 12-1 White Oak log which gave a saw timber stand of approximately two thousand feet Board Measure per acre, or two hundred feet Board Measure per two chains. This tally actually gave him two hundred ten feet Board Measure according to their tables.



No. 29. 'K' Stand of Timber.

They went back into 'Kb' at 73.53 chains, but also found a soil change north, changing to '2B'. While they were still in 'K' Mr. Rucker drew in the type lines and he saw that the '2B' soil line followed the east edge of 'K', so he drew it in that way then. The red '2B' line extended on into the forty acres north, so he did not try to close the line, but waited until he got up there and could see what happened. On with the cruise! It was the same old

Stuff, as can be seen by the tally sheet that is illustrated - not worth much. At the section line they found their fence again, so they chained the twenty chains north along that fence to their next strip line.

At twenty chains the writer blazed a mark, and they went on up to see if they could find the section corner in another ten chains. All that was found was the fence corner and no evidence of a corner of any kind. Now they were reasonably sure that that was the corner all right, but there was no positive evidence of that statement, so it could not be posted as such.

So going back to their blazed point, checking the ten chains as they go, they find that their point is all right. So on with the cruise! They are still in 'Kb' stand and a '2A' soil. At five chains it looked as if they have a 'Kc' stand, and, after tallying a couple of chains they found that it was. In go their type lines changing from 'Kb' to 'Kc'.

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

Form 494-1 D-2

Logging Unit *Gasconade* T *JUN* R *11W* S *20-5<sup>th</sup>* P *M*

Check 40 which the  
chain was tallied

CHAINS TALLIED

10	to	20
10	to	30
10	to	40
10	to	50
10	to	60
10	to	70
10	to	80
10	to	90
10	to	100

Factor = *7.8*

Total chains tallied *14.52*

Poles	Red Oak		White Oak		Post Oak	
	D.B.H.	1-20	20-30	30-40	40-50	50-60
6						
8						
10						
12						
14						
16						
18						
20						
22						

Acres of Type	<i>11</i>	Number	On Strip	Per Acre
Volume on Strip		Trees		
Cull Per Cent		Distances		
Net Volume on Strip		Poles	<i>32</i>	<i>50</i>
Net Volume Per Acre		Logs		
Net Volume on Type				
Compassman <i>W.E. Carlson</i> Estimator <i>B.H. Decker</i> Date <i>7/13/59</i>				

### NO.30.'Kc' Tally Sheet.

The writer took a stem count and found about two hundred fifty stems of the four and a half to nine and a half inch classification for a typical 'Kc' stand. He will have to pace south here to find out what happened to that '2B' soil they left hanging in the air in the forty south. Four chains south he ran into it again, and, as he could see it all from where he was standing, he just estimated it and mapped it from where

he was standing, he just estimated it and mapped it from where he stood, connecting the lines extended up from the forty south. Back on the strip, they start on west through the 'Kc'. Referring to the tally sheet for this type as they actually tallied it, you see their tally is not up to the actual stem count for a 'Kc' stand, but remember, they were only tallying the sound timber.

The 'Kc' ends with the forty, and having paced out to the north and south edges, they can close their 'Kc' type lines at the end of the type and on the forty line, too, then on into the next forty. At thirty chains west of the section line they noticed a different type north of them. Upon investigation, pacing as they investigated, they found a 'Ka' stand, brush, you know, and a '2B' soil type. This particular stand is only about three or four feet high, so it could be estimated and mapped in without pacing clear through it. Going back to the strip and on west about thirty-six chains they came into 'O'. Then 'Kb' again in one more chain before the fence and the end of the forty.

Over the fence and into the next forty two chains and they have another chain of 'O'. Sit down and rest awhile, Walt! There are some buildings the writer will

L  
Acquisition  
Cession Unit

No. \_\_\_\_\_

Certification Regarding Rights of Way and Adverse Possession

I hereby certify that I have been upon, and examined the lands included in the above designated case, embracing 4 1/2 acres, and that there is no evidence of past or present occupancy of any part of the lands in question for any purpose by any person or persons other than the vendor, his tenants, employees or agents, or by railroads with rails in place, or by highways maintained by the State, County, Township or other agency, except as specifically described below:

Nature of Occupancy (State if past or present)	Name of Occupant	Description of Lands Occupied
<u>Adverse Possession</u>	<u>J.S. Williams</u>	<u>NE 1/4 of NW 1/4 Sec 20, T.35N. R.11W.</u>

Date of Examination: 7/3 1934.

Richard W. [Signature]  
Official Title of Examiner

No. 31. Adverse Possession. Sec.20, T.35N.R.11W.

have to find out about "Adverse Possession", you know. This was the NE $\frac{1}{4}$  of the NW $\frac{1}{4}$  of the section and J.S. Williams, the occupant was a "Squatter" as he informed the writer, and the sheet is filled in as shown in the illustration. Back to Walt and on with the cruise! Three more chains and they get out of the 'Kb' and into 'C', cultivated. With five more chains they left 'C', hit the fence, road, and back into 'Kb' again. At this point the writer had to hold up the details in order that he could map the various features and types north of their line, and south, too for that matter. A few more chains, three to be exact, and looking south, there is a break in the timber. This may be a field, and it had better be looked into. It was lucky

that the writer noticed that break, as it was a cultivated field, 'C', of about three acres as shown on the map. Back to the strip and on west!

There was no change in either cover or soil types until they came to the patch of '2B' soil as shown; and then the pasture, also shown. The road, rather trail, was mapped in when crossed. Here was the forty and section line, so they blazed the point and chained north to hunt for the corner. There was no sign of a corner there; so back they go twenty chains south of their blazed point to the starting point of their cruise line back east. It is all 'Kb' and '2A' until they hit the road. Hold everything while the writer maps in this road and fence! Walt may sit down and rest awhile, as the writer is going south to see about that open stuff they crossed coming north when they cruised east along the same line only further east, before. The results of that trip may be seen on the map. On with the cruise, on to the fence and the end of the forty! This also completed the day's work as well as the section excepting for one thing.

There are some buildings on the south side of the SW $\frac{1}{4}$  of the NE $\frac{1}{4}$  of the section, and the writer will have to get "Adverse Possessions" on them. They are Brown's

Store, and that is where they are to meet the pick up. So they will put up the chain and other equipment and go on down there. The writer can get his 'dope' then as it is illustrated in this article.

Acquisition  
Cascade Unit  
No. \_\_\_\_\_

Certification Regarding Rights of Way and Adverse Possession

I hereby certify that I have been upon and examined the lands included in the above designated case, embracing \_\_\_\_\_ acres, and that there is no evidence of past or present occupancy of any part of the lands in question for any purpose by any person or persons other than the vendor, his tenants, employees or agents, or by railroads with rails in place, or by highways maintained by the State, County, Township or other agency, except as specifically described below:

Nature of Occupancy (State if past or present) :	Name of Occupant :	Description of Lands Occupied :
2 1/2 Acres of Forest Land	George W. ...	...
:	:	:
:	:	:
:	:	:
:	:	:
:	:	:

Date of Examination: \_\_\_\_\_ 1934. \_\_\_\_\_  
Official Title of Examiner

No. 32. Adverse Possession Sheet of the  
SW $\frac{1}{4}$ -NE $\frac{1}{4}$ , Sec.20, T.35N. R.11W.

(There is the pick-up coming now, let's load in and get back to the room and finish up our office work on this section)

-----

This was, of course the proper time to do the office work while it was still fresh in their minds. The map, as drawn in the field, was inked and traced on the progress map, the assembled tracings. This sec-



tion must be colored in on the date progress map and the date inked in. With those minor things completed, they settle down to the filling in of the forms, the Estimator filling in the Summary Forms, Forms 53 and 54, and the Compassman computing the tally sheets.

Walt figured up the tally sheets as shown in the illustrations, the explanation follows. They will use the illustrated form for 'K', or saw timber sheet for this explanation. Referring to the saw timber tables for Oak, No. 18A, the board feet for each size is computed and recorded as shown in the illustrations.

These values are totaled, giving the total volume of Board Measure on the strip, and the percentage cull is deducted, giving the net volume on the strip. This net volume on the strip is multiplied by the computed factor, listed at the top of the page, giving the net volume of type in that particular forty. This factor is computed by dividing the number of acres of type by the total chainage of type and multiplying by ten, giving in this case, a factor of 15.

The writer as estimator, computed the number of acres of soil and cover types for the Forms 53 and 54. As the illustrated tally sheets for the  $SE\frac{1}{4}$  of the  $NE\frac{1}{4}$  included the whole of that forty, he used that particu-

lar forty, rather 40.97 acres as that was the actual acreage, as his illustration of filling in these forms.

Form 53 (R-9)

ACQUISITION - ILLINOIS AND MISSOURI  
SECTION SUMMARY SHEET - COVER TYPES

Sec. 20 T. 35N. R. 11W Forest.

Description.	Acreage	O	l-h	l-s	K	K-a	K-b	K-c	P	P-a	P-b	P-c							
NE NE																			
NW																			
SW																			
SE																			
NE NW																			
NW																			
SW																			
SE																			
NE SW																			
NW																			
SW																			
SE																			
NE SE																			
NW																			
SW																			
SE																			
TOTAL																			

No. 33. Cover Type Sheet. Sec. 20, T.35N.,R.11W.  
Form 53 (R-9)

He filled in the Form 53 first, the Cover Type Summary Form. Referring to the illustrated map, they considered the acreage of 'K' first. First, consider the area of one of the small squares having five dots to a side, and remember that this area is two and one-half acres. If one-fifty of this area is taken, there

will be one half of an acre, will it not? This showed that a strip five dots long and one high was one-fifth of one of those small squares, or one-half acre. This result could also be obtained by counting the number of dots on a side, five in number, and dividing by two, which gives two and one half, or two and one half acres. Now if the method of computing areas is understood, they will go back to the aforementioned forty and compute the area of 'K'. The writer preferred the last mentioned method, and by a more or less comparative counting he got twelve strips. Dividing this by two, he had six acres of 'K' which he recorded in the proper column on the sheet. The acreage of 'Kb' is computed in the same way. The sum of the two should equal the total for the forty, or 40.97 acres. It does, so therefor the computations were all correct.

The "Acreage" column was filled in from G.L.O. plat. The computed acreages were recorded and totaled and checked against the total of the Acreage column.

Form 54 (R-9)

ACQUISITION - ILLINOIS AND MISSOURI  
SECTION SUMMARY SHEET - SOIL AND VOLUMESec. 20 T. 33N R. 11W

Forest. \_\_\_\_\_

Description	Acreage	SOIL - ACRES												VOLUME			TIES	POSTS	
		1-A	1-B	1-C	2-A	2-B	2-C	3-A	3-B	3-C	4-A	4-B	4-C	SAW TIMBER	CORDS				
NE NE	40.00				7.5	2													
NW	40.00				17.5	2													
SE	40.00				12.5	2													
SW	40.00				12.5	2													
NE SW	40.00				12.5	2													
NW	40.00				12.5	2													
SE	40.00				12.5	2													
NW	40.00				12.5	2													
SE	40.00				12.5	2													
NE SE	40.00				12.5	2													
NW	40.00				12.5	2													
SE	40.00				12.5	2													
TOTALS	171.00				100.0	12													

## No. 35. Form 54 (R-9) Soil and Volume Summary Sheet.

Now for the Soil Summary or Form 54. The acreage of '2B' was computed in a similar fashion to that used in computing the 'K' for the Form 53, and recorded in its proper position on the sheet. Then the '2A' and so on for all of the section. Again the sum of the totals was checked against the total acreage. Now, on this sheet, will have to be written in - "Red, White, and Post Oak" under the "Volume and Saw Timber", as was shown. The volumes recorded were those taken

from Walt's computed tally sheets. In the last column the word "Posts" was scratched out and the word "Poles" substituted, as they had never tallied posts but did tally poles. These values were also taken from the tally sheets.

As there were no cases cruised in this day's work, they did not have to fill in a Form 52. This had been done previously when the case, or offered land, had been cruised.

The rest of the "Adverse Possessions" were made out, i.e., one for each forty. Examples of these have been illustrated, so it will not be necessary to show how that is done at this point.

These completed Forms were all assembled and mailed to the Ranger, who in turn makes out his reports and sends them in.

- - - - -

An original copy of the completed map of this section showing the use of the black cover type lines and the red soil type lines can be found at the close of this paper.

- - - - -

This completed the end of the work as far as a cruising party was concerned. The writer thinks this is a good opportunity to explain to you what happens before a piece of property comes into the hands of the U.S.F.S., to use as they see fit.-

The land owner fills out the "Proposal for Sale," previously illustrated, and mails it to the Rolla Office. They in turn send it to the Regional Office in Milwaukee. From there it goes to Washington, D.C., where it is accepted or rejected. If accepted, it is mailed back to the Milwaukee Office, which sends it on to Rolla. From there it goes to the Ranger in charge of the Unit in which the property is located. In this particular case it went to Ranger H.A.Svensen at Houston, Missouri. He sends a description to the ones who are cruising it and they cruise it as has been illustrated above. The results of this cruise are sent to Ranger H.A.Svenson at Houston, Missouri, and from them he sets the price the Government will pay on it and mails it to Rolla. At Rolla they make a report on it and send it to the Milwaukee Office. This office makes a report on it and sends it on to Washington, D.C. where the Forestry Commission decides whether or not they will buy; and then on around back

to Rolla. If the Commission's report is favorable, the Rolla Office options the land and Ranger Svensen is notified of the fact.

From here they branch out in two ways. The Ranger refers back to the copies of the maps he has of the property and determines what to do to that property; whether to spot plant, plow plant, clear, thin, or whatever else he may decide on. The other branch now: The property is turned over to the Forestry Title Office at Rolla where the abstracts and titles are examined and cleared up at the expense of the property owner. Then the Government will probably buy it.

Going back again to the Ranger's plans for this property,- whatever he does to it, he will in one way or another advance some one, or possibly all of the methods of flood control as advanced by engineers. The clearing and planting will tend towards erosion control and slow up the run off.

This is also watershed protection. Fire control will have similar effects. For game and fish preservation the Forester will build the dams previously mentioned, prevent fires, and through the construction of fire trails and roads, will also help eliminate and control these fires. In other words, his prevention

of fires and his fight along those lines is the greatest help towards flood control that is known anywhere.

All of these things will enhance our Ozark country as far as pleasure facilities are concerned. Another way to express this, is that it is a more or less "Back to Nature" movement and the results are the same.

\* \* \* \* \*



## B I B L I O G R A P H Y

"Instructions for Acquisition Fieldwork,  
N.C.Region," Supplement to the U.S.F.S.  
Acquisition Manual. Mimeographed in  
Washington,D.C. and each Ranger has  
a copy for his Acquisition Crews to  
follow.

--0--

## I N D E X

	Page
Abney Hand Level . . . . .	14
Adverse Possession Sheet, blank . . . . .	24
"                    "                    "                    filled in . . . . .	69,71
Biltmore Stick, use of . . . . .	14
Board Ft. Table . . . . .	35,36
Compassman's Equipment . . . . .	11
Corner Description Poster . . . . .	22
Diameter Class Symbols . . . . .	31
Estimator's Equipment . . . . .	13
Field, soil table . . . . .	27
Height Growth Tables . . . . .	30
Instructions for field work . . . . .	49
Land Owners Blanks, offering sale to government . . . . .	14,46
Map Sheet . . . . .	17
Map Completed . . . . .	54,80
Poster, location . . . . .	20
Poster, description form . . . . .	22
Soil Types and Values . . . . .	26
Standard Stocking for Soil Types . . . . .	28
Summary Sheet, Soil & Volume . . . . .	41
Summary Sheet, Cover Type . . . . .	39
Summary Sheet, Tract . . . . .	43
Typographical symbols . . . . .	33

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

8-1002 GPO

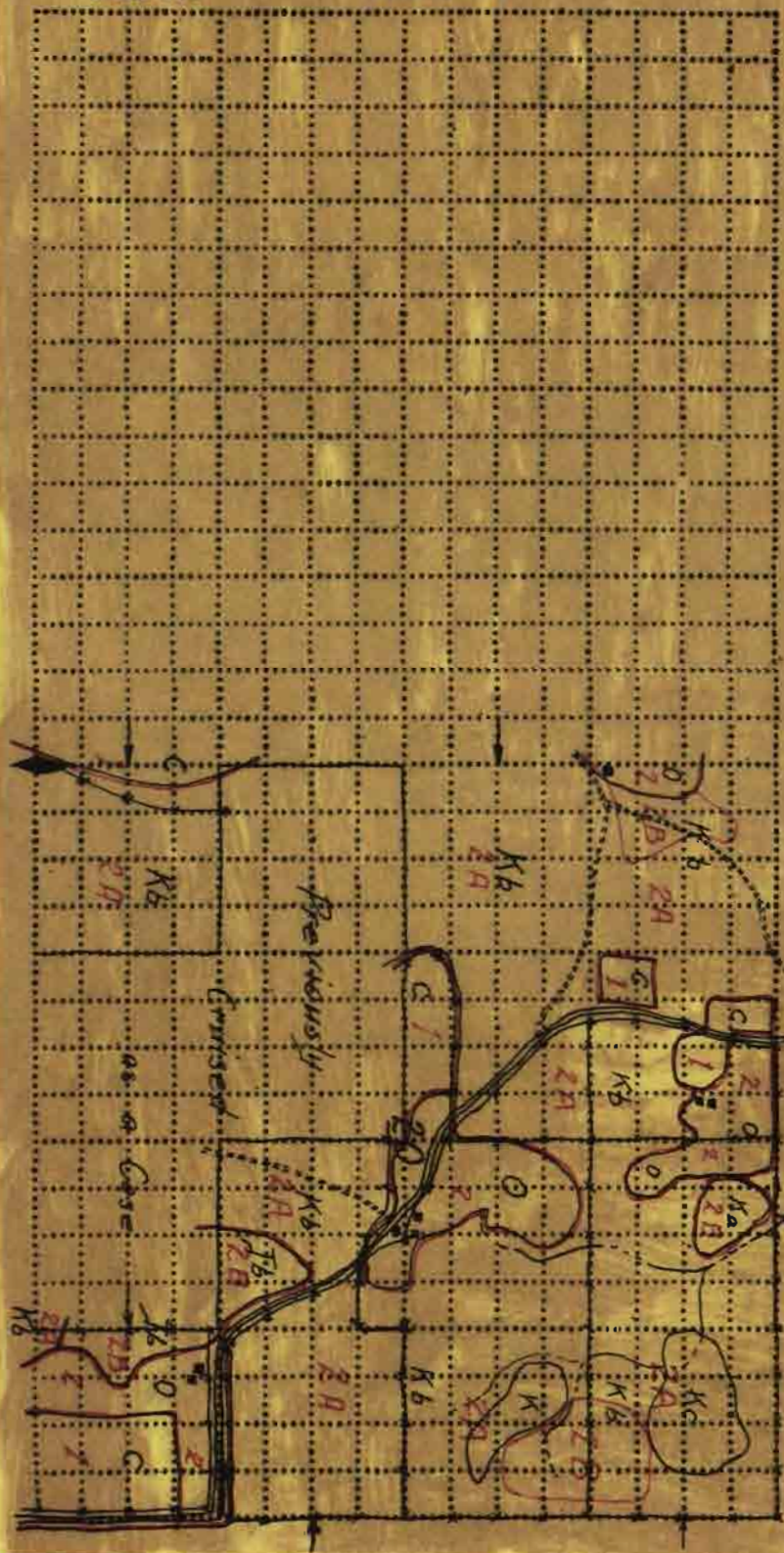
Form 10-D. 2

SKETCHED BY Booker H. Rucker, Jr.  
FOREST Gasconade Purchase

TYPE SHEET

PROJECT, 5%

DATE 6/13/34 7/3/34 SHEET  
SEC. 20 T. 35N R. 14W S. 5th MER.



No.36. Copy of Completed Field Map

44973