

Know Where You Stand on Your Land



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Jeremy T. Hutchins



- Over 18 years of surveying experience in SC, CO & VA
- Licensed in 2017 (VA)
- Associates in Engineering, Geomatics Technology 07'
 - Greenville, SC
- Started Elevation Surveying in 2019, providing services to local region.

What is Land Surveying?

- Defined as the science, art, and technology of determining the relative position of points above, on or beneath the earth's surface or establishing such points
- Surveying is the discipline which encompasses all methods for measuring and collecting information about the physical earth and our environment
- Recently it has been interchangeably called *Geomatics*



History of Land Surveying



- Began in Egypt ~1400 B.C
 - “Rope pullers”
- Divided land into plots for taxation
- Annual floods of the Nile River swept away portions of these plots, surveyors were appointed to replace these markers

Deuteronomy 18:14 –

“Do not move your neighbor’s boundary stone”

Early Surveying in America



- Colonial surveying (13 original states)
 - Metes and bounds
- Public Lands Survey System (PLSS)
 - Created for the expansion of the west after the Louisiana Purchase
- Popular unit of measurement was the Gunter Chain (66 ft/100 links), invented by Edmund Gunter in 1620

Importance of Land Surveying



- Do you know what you are buying or own?
 - Investment
- Tax parcels may be shown wrong on GIS
 - GIS (geographic information systems)
 - Tax lines maybe wrong on old properties
- Correct acreage
 - How old your land description?
 - Vague description
- Timber / logging
- Farming (fencing)
- Hunting and recreation
- Survey cost can easily be recouped in land sale and makes land transfer smoother

Process of Surveying

- Research and Analysis
- Field Work
- Drafting; computing and processing data obtained from field measurements
- Preparation of maps, plats, charts and reports
- Property Line Marking
 - * If requested

What You Can Do?

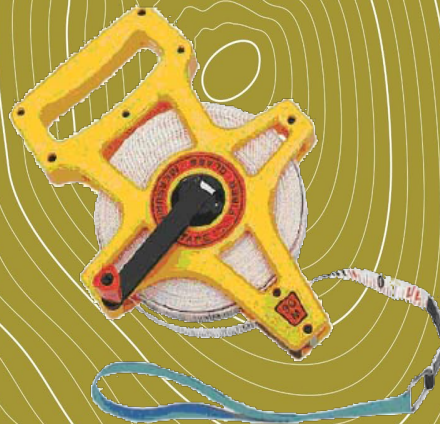


- Deeds and adjoining property deeds
 - County Courthouse
- Survey retracement
 - Compass and cloth tape (100' to 300')
 - Pacing
 - Courses and Distances
 - Poles/chains
 - Bearings (magnetic, true or grid)
- DO NOT PUT IN METAL IRONS OR BLAZE TREES!

Units of Measurement



SURVEYOR'S CHAIN



TYPICAL 100-FT SURVEYORS TAPE

- Chain = 66 feet
 - 100 links per chain
 - 7.92" per link
 - 25 links = 1 pole
 - 80 Chains = 1 mile
- Poles (rod or perch) = 16.5 feet
 - 4 poles = 1 chain
- Survey foot = 12 inches
 - .50 = 6"
 - .25 = 3"

Research



- Tax parcel information
 - GIS website
 - Taxation purposes, not a valid survey
- Deed research
 - Chain of title (100yrs plus)
 - Compilation of all title owners
 - Read the deed
 - Convert poles or chains to feet
 - Make basic sketch of bearings and distances – Do they make sense?

Chain of Title

- Chain of title follows the title owners back in time.
- Example:
 - Instrument #2017009327 (Nov. / 2017)
 - D.B. 1120, Pg. 211 (Apr. / 2000)
 - D.B. 851, Pg. 93 (Aug. / 1994)
 - D.B. 261, Pg. 282 (Aug. / 1965)
 - D.B. 125, Pg. 476 (May / 1942)
 - D.B. 103, Pg. 498 (Mar. / 1936)
 - D.B. 103, Pg. 496 (Dec. / 1934)
 - No reference to prior deed

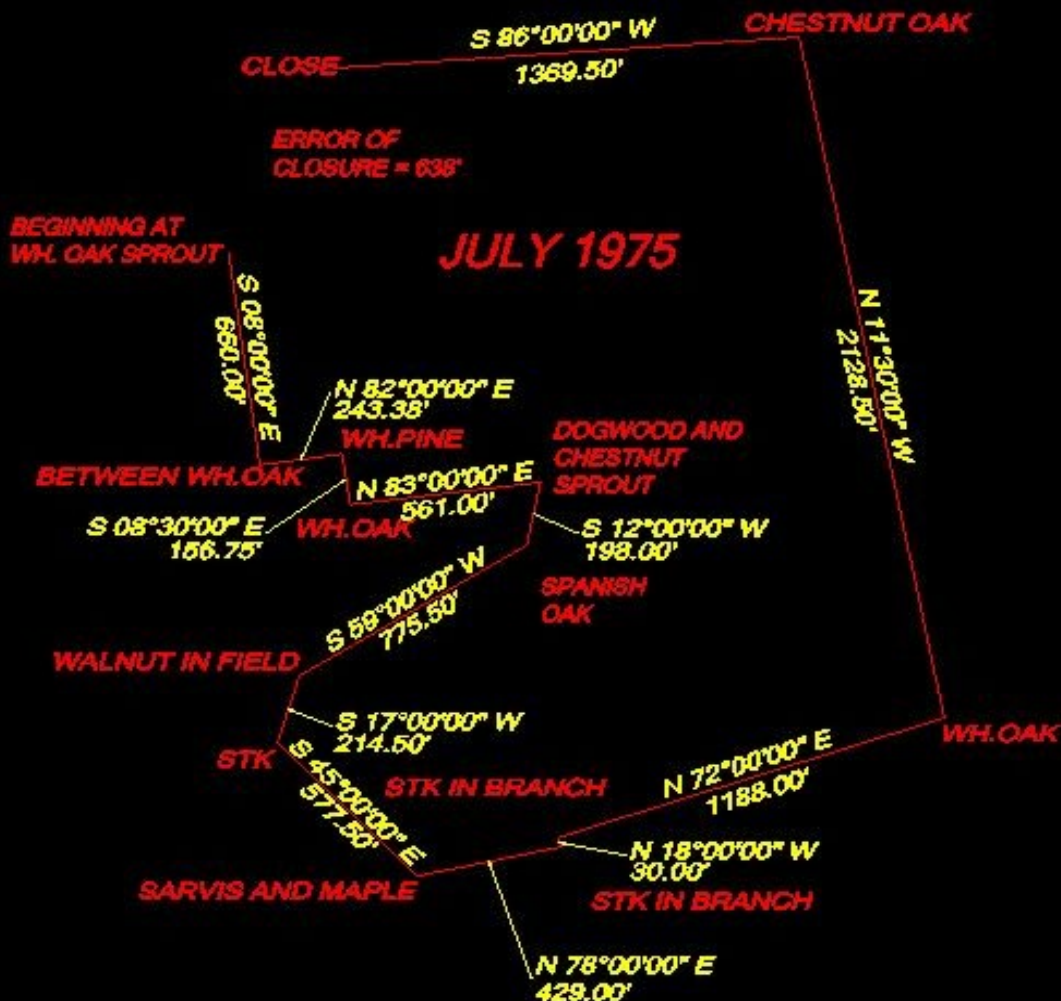
2017

BEGINNING at a stone, a corner to (now or formerly) David Reynold's land and running thence new lines N 40° W 79 rods to a large chestnut on a ridge; thence N 20° E 55 rods to a bunch of chestnut sprouts on top of the mountain; thence N 55° E 15 rods to a white oak; thence N 53° E 13 and 1/2 rods to a locust; thence N 60° E 39 rods to a chestnut on the north side of the mountain near the top; thence S 61° E 57 rods to the center of the Wirt road on top of the mountain; thence with the road S 86° W 5 and 3/4 rods; thence S 66° W 23 rods to a chestnut on the north side of the road; thence S 31° W 9 and 1/2 rods to a pine; thence S 4° E 40 and 1/2 rods to a chestnut; thence S 8° W 7 rods to a chestnut; thence due south 28 rods to a white oak on the west side of the road; thence S 29° E 37 and 1/2 rods to a stone near Ecla branch in a line of Charles Jones' land; thence with same S 37° W 31 rods to a stake; thence N 53° W 54 rods to the **BEGINNING**, containing 73 acres, more or less, but this is a conveyance by boundary and not by

1934

BEGINNING at a stone, a corner to David Reynold's land and running thence new lines N 40 W 79 rods to a large chestnut on a ridge; thence N 20 E 55 rods to a bunch of chestnut sprouts on top of the mountain; thence N 55 E 15 rods to a white oak; thence N 53 E 13-1/2 rods to locust; thence N 60 E 39 rods to a chestnut on the north side of the mountain near the top; thence S 61 E 57 rods to the center of the Wirt road on top of the mountain; thence with the road S 86 W 5-3/4 rods; thence S 31 W 9-1/2 rods to a pine; thence S 4 E 40-1/2 rods to a chestnut; thence S 8 W 7 rods to a chestnut; thence due south 28 rods to a white oak on the west side of the road; thence S 29 E 37-1/2 rods to a stone near Ecla branch in a line of Charles Jones' land; thence with same S 37 W 31 rods to a stake; thence N 53 W 54 rods to the **BEGINNING**.

DEED - JULY 1975



BEGINNING at a white oak sprout, adjoining the lands of Joseph Newby; thence S 8° E 40 poles between the white oak; N 82° E 14-3/4 poles to a white pine; thence S 8-1/2° E 9-1/2 poles to a white oak; N 83° E 34 poles to a dogwood and chestnut sprout; S 12° W 12 poles to a spanish oak; S 59° W 47 poles to a walnut in a field; S 17° W 13 poles to a stake; S 45° E 35 poles to a sarvice and maple; N 78° E 26 poles to a stake in the branch; N 18° W 30 feet to a stake in the branch; N 72° E 72 poles to a white oak; N 11-1/2° W 129 poles to a chestnut oak; S 86° W 83 poles to a white oak sprout to the BEGINNING, containing .75 acres, more or less;

DEED - JULY 1964

BEGINNING at a white oak sprout, adjoining the lands of Joseph Newby; thence S. 8 deg. E. 40 poles between the white oak; N. 82 deg. east 14 3/4 poles to a white pine; thence S. 8 1/2 deg. E. 9 1/2 poles to a white oak; N. 83 deg. E. 34 poles to a dogwood and chestnut sprout; S. 12 deg. E. 49 poles to a large white oak; N. 88 deg. W. 12 poles to a spanish oak; S. 59 deg. W. 47 poles to a walnut in a field; S. 17 deg. W. 13 poles to a stake; S. 45 deg. E. 35 poles to a sarvice and maple; N. 78 deg. East 26 poles to a stake in the branch; N. 18 deg. W. 30 feet to a stake in the branch; N. 72 deg. E. 72 poles to a white oak; N. 11 1/2 deg. W. 129 poles to a chestnut oak; S. 86 deg. W. 83 poles to a white oak sprout to the BEGINNING, containing .75 acres, more or less,

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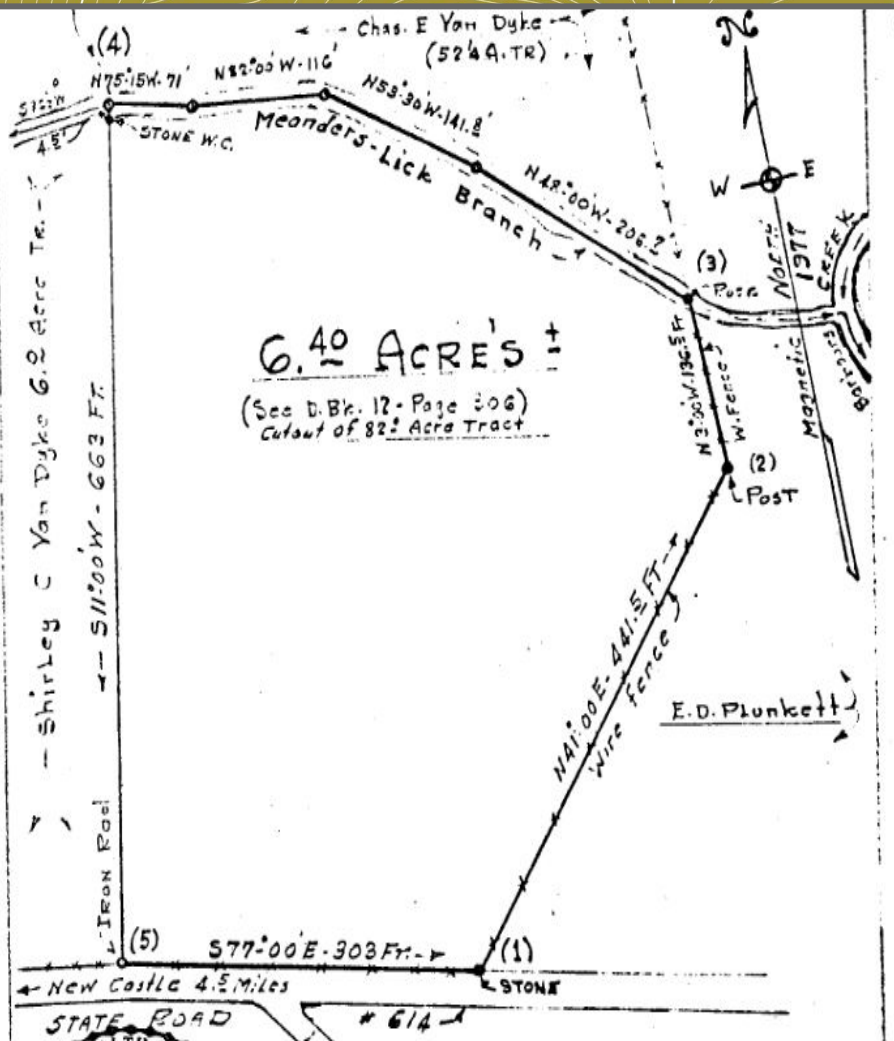
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Field Work

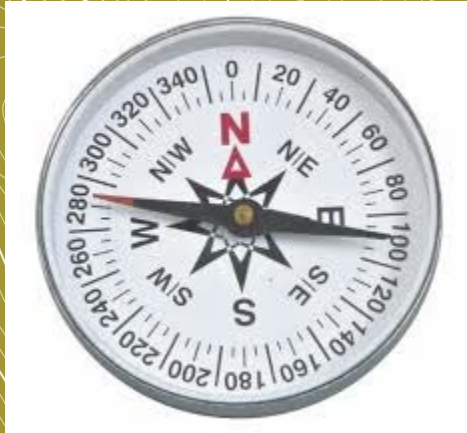


- Retracement survey
 - Find the line and then measure
- Order of Importance
 - Natural
 - Artificial
 - Adjacent boundaries
 - Course
 - Distances
 - Quantity or Acreage
- Point of Beginning



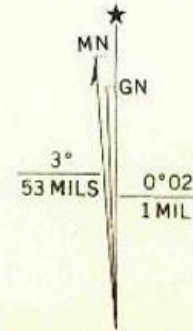
BEGINNING at (1) (see map) a set stone, on north side of State Secondary Road #614, about 17 feet from center, at angle of a wire fence, corner to E. D. Plunkett. Thence 2 lines with same north 41° 00' east 441.5 feet, leaving road and along a wire fence to (2) a post at angle of fence, near top of a steep bluff, on S. W. side of Barbour's Creek. Thence north 3° 00' west, 136.5 feet, along wire fence, to (3) a set stone, in center of Lick Branch, on line of E. D. Plunkett, and corner to Charles E. Van Dyke's 52 1/4 acre tract. Thence 4 lines with latter, up center of Lick Branch as it meanders, north 48° 00' west 206.7 feet. Thence north 53° 30' west 141.8 feet, Thence north 75° 15' west 71 feet, to (4) a point in center of Lick Branch, at intersection of a small drain, on north side. Set a stone on south bank of branch, as a witness corner which bears S. 11° W. 4.5 feet. Said point in center of branch is corner to Charles E. Van Dyke and a 6.0 acre tract of Shirley C. Van Dyke, which 6.0 acre tract is being surveyed at this time. Thence a new line with 6.0 acre tract leaving branch. South 11° 00' west, 663 feet, to (5) an iron rod, on north right of way of State Secondary Road #614, about 16 feet from center, in a wire fence. Corner to 6.0 acre tract. Thence leaving same, and along wire fence and north R/W of #614, south 77° 00' east 303 feet, to (1) the place of the BEGINNING.

Bearings

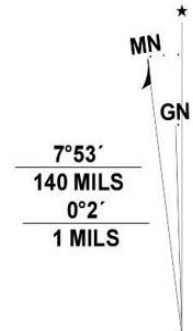


<https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination>

- What is the basis of bearing on the survey?
 - Magnetic
 - Grid
 - True
- Declination
 - Magnetic pole verse the physical location



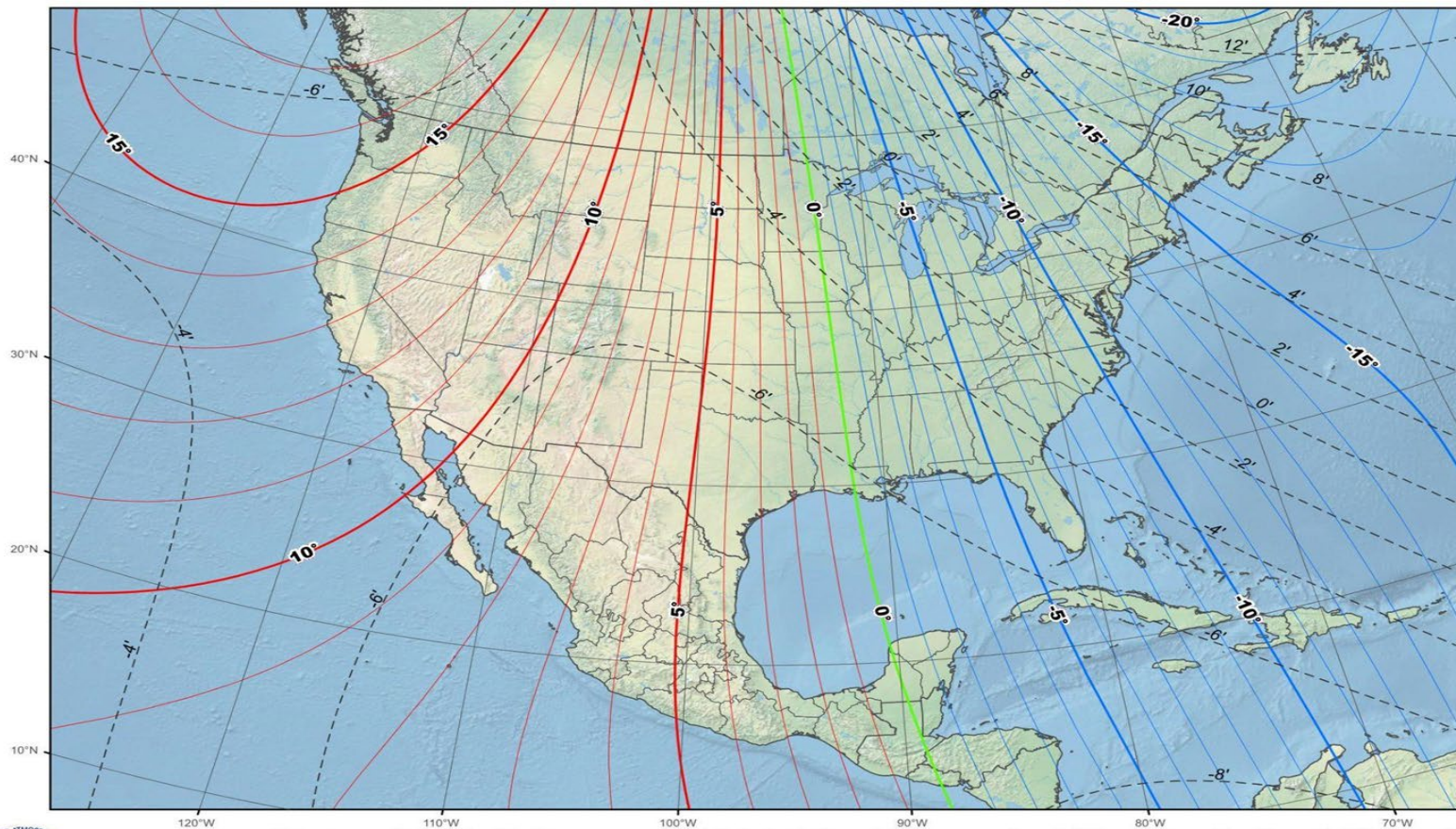
UTM GRID AND 1968 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET



UTM GRID AND 2019 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

World Magnetic Model - 2020 Magnetic Declination

NOAA National Centers for Environmental Information (NCEI)



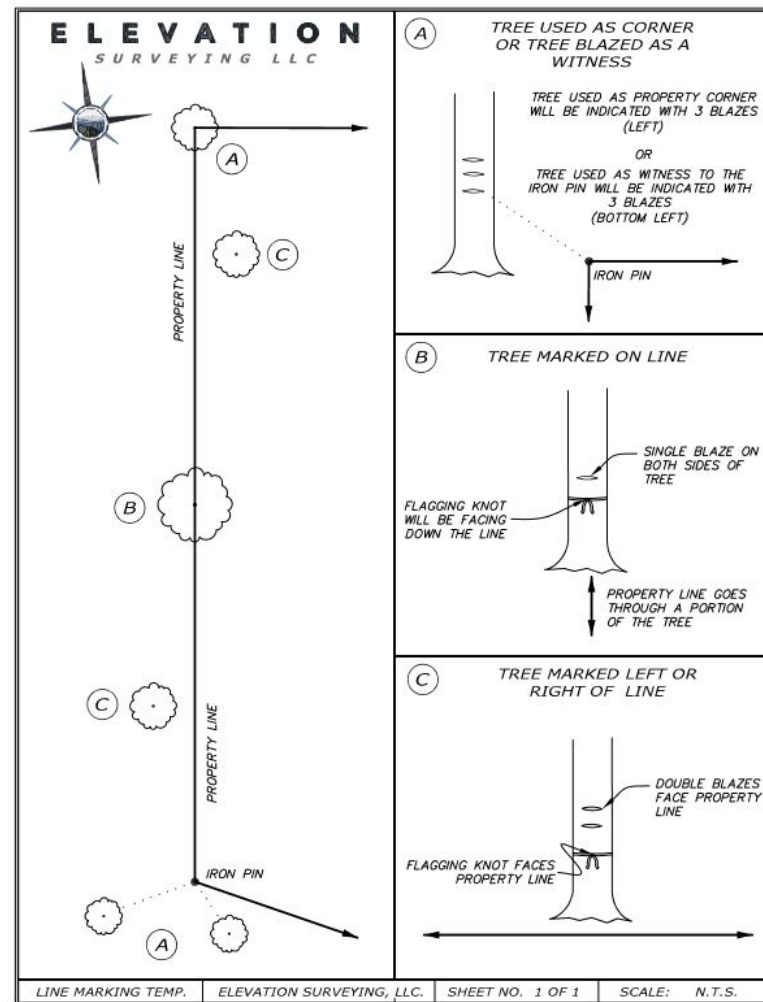
The term magnetic declination (also known as magnetic variation) refers to the angle between magnetic north (MN - compass north) and true north (TN - true north) at any given latitude/longitude. The **green** contour line shows the imaginary line along which the declination is zero (MN and TN converge). The magnetic declination increases as one moves east or west from this line. **Red lines** show positive (east) declination contours and **blue lines** show negative (west) declination contours. The degrees of declination required to orient the compass with the map are **added east** of this line and **subtracted west** of this line (e.g. 10° east would indicate that MN lies 10° degrees clockwise from TN). Magnetic declination gradually changes with time and location. The dashed gray lines show the expected annual change in the magnetic declination in arc-minutes per year (there are 60 arc-minutes per degree). The above map was produced from the World Magnetic Model (WMM 2020) for the year 2020.

Line Markings

- **Recovering line markings from previous surveys**
- **Use flagging to retrace lines with compass**
 - **Paint is ok but do not blaze trees**



Line Markings & Blazes





COUNTY
WALKER MOUNTAIN"

SAM CHUPP &
LYDIA D. CHUPP
TAX ID. 72-A-3
(BLAND CO.)

MAG NAIL W/TAG SET IN TOP
OF BIG WALKER MOUNTAIN

FOUND BLAZED TREES WERE USED TO ESTABLISH
THE EASTERLY LINE. TREES WERE BLAZED DURING
THE SURVEY BY W. A. DAVIS IN 1986.

IRS ON SOUTH SIDE OF
SOIL ROAD

36" CH. OAK FND. BLAZED AT
1347.5', 4.9' LT. OF LINE
(RE-BLAZED THIS SURVEY)

(TOTAL) 3114.86'

IRS ON SOUTH SIDE OF
ROAD AT A GATE POST

HARVEY FERDINAND, JR. &
EMILY GORE WILLIAMS TRUST
INSTR. #202105045
TAX ID. 32-1-5

N 38°14'39" W

1274.59'

REMAINDER OF TAX ID. 32-1-13
NEW AREA = 213.990 AC.
WITHIN HEAVY LINES

57.51'
24" BEECH
(USED FOR PROP. COR.)

Cost of a Boundary Survey



- Acreage
- Terrain
 - Aspect
- Pasture / woodland
 - Mature
 - Timbered
- Age of description and surveys
 - Adjoining surveys
 - Surveyors reputation
- Season
 - Summer vs. Winter
- Travel distance

The background of the slide is a topographic map with a brownish-gold color scheme. It features numerous white contour lines that form concentric, irregular loops across the entire surface, representing elevation changes. The word "Questions?" is centered in a dark blue, sans-serif font.

Questions?

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