Revised: July 14, 2020

In Search of Big Trees…
The Illinois Big Tree Register

ILLINOIS
Natural Resources &
Environmental Sciences
COLLEGE OF AGRICULTURAL, CONSUMER
& ENVIRONMENTAL SCIENCES

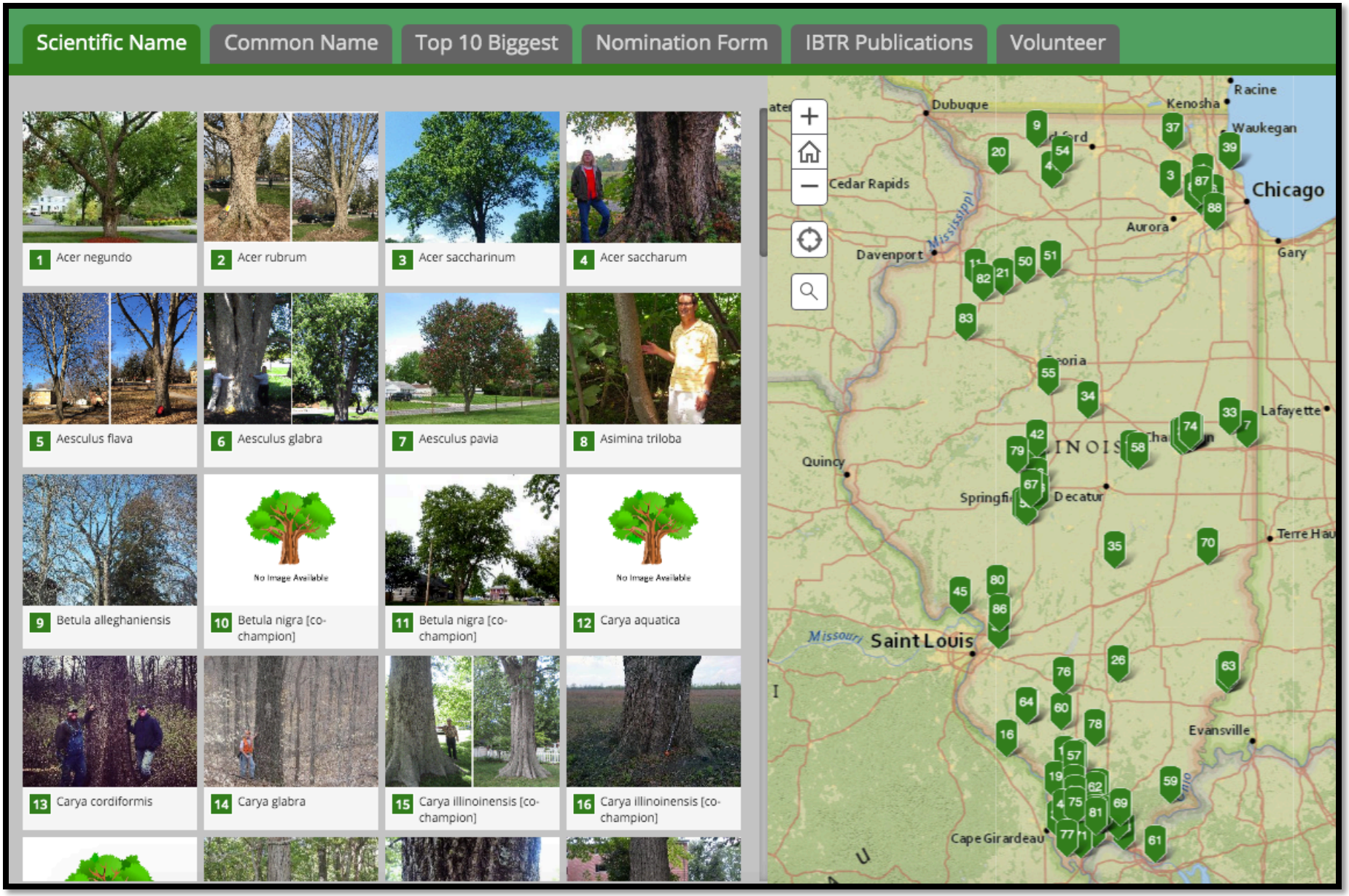
Illinois
Big Tree
Register

By Jay C. Hayek

Extension Forestry Specialist
Coordinator of the IL Big Tree Register

Today's Objectives!

- Knowledge of the *Illinois Big Tree Register*
- Examine the Nomination process
- Knowledge of Big Tree measurements
- The tools and confidence to accurately measure and certify Big Trees ☺



https://go.Illinois.edu/championtrees

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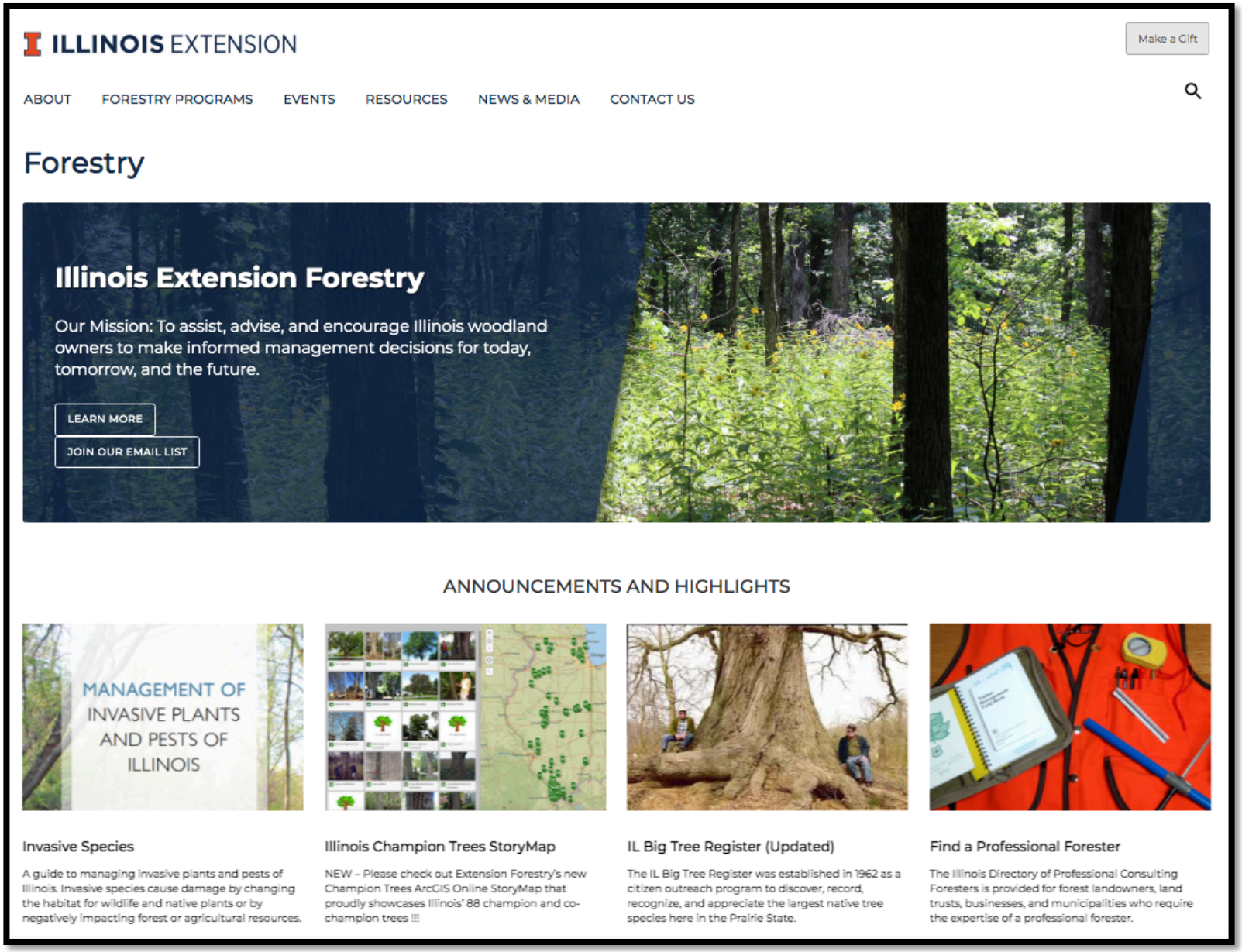

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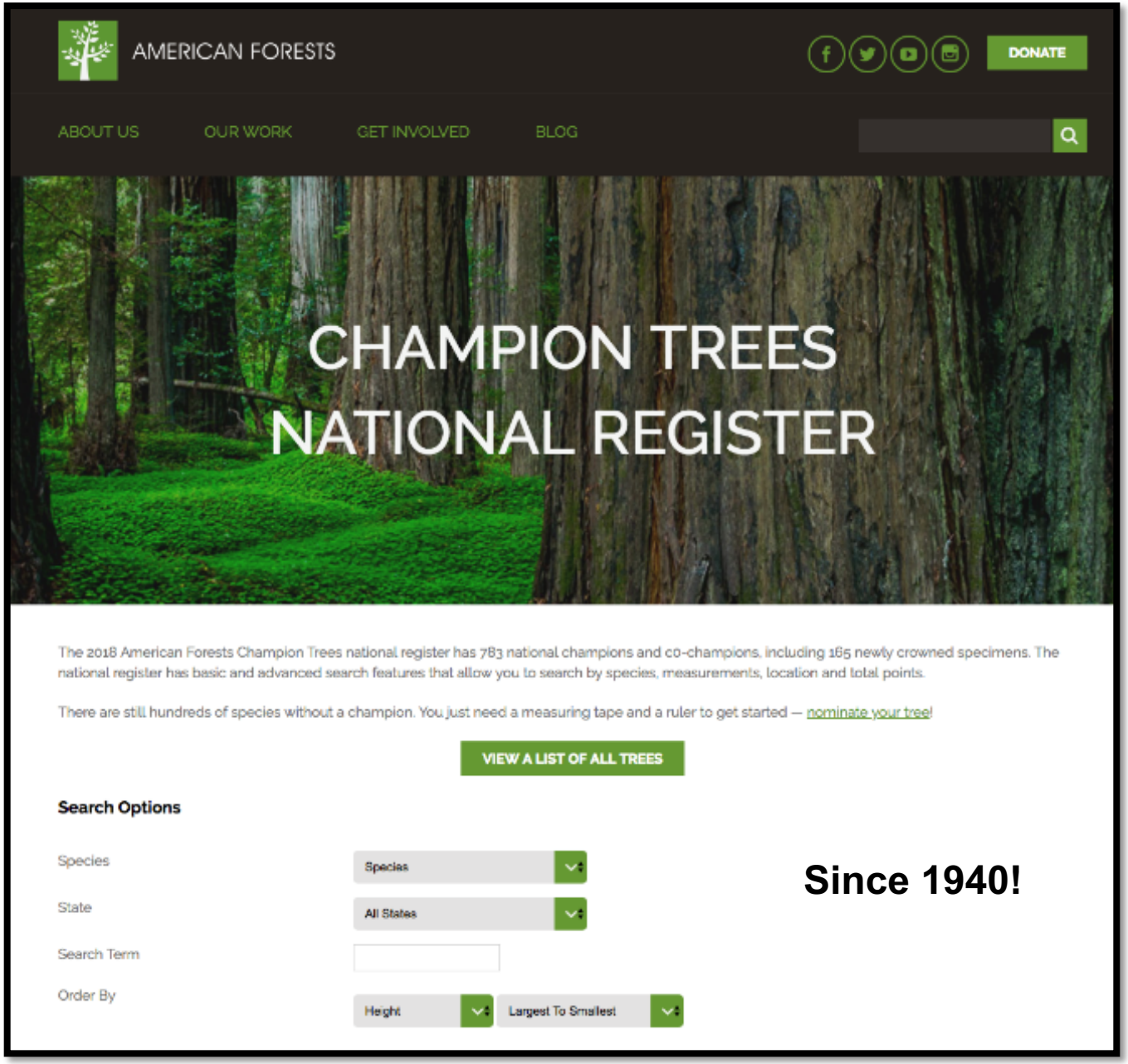

AMERICAN FORESTS
DONATE
ABOUT US
OUR WORK
GET INVOLVED
BLOG
CHAMPION TREES
NATIONAL REGISTER
The 2018 American Forests Champion Trees national register has 783 national champions and co-champions, including 165 newly crowned specimens. The national register has basic and advanced search features that allow you to search by species, measurements, location and total points.
There are still hundreds of species without a champion. You just need a measuring tape and a ruler to get started — nominate your tree!
VIEW A LIST OF ALL TREES
Search Options
Species
Species
State
All States
Search Term
Order By
Height
Largest To Smallest

Since 1940!

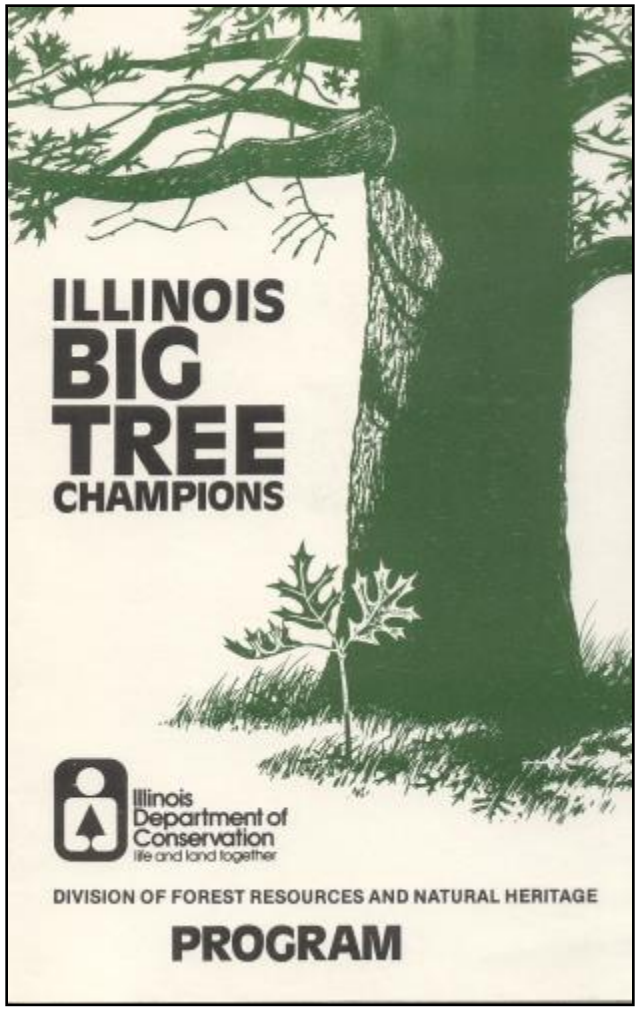
2020 Illinois National Champions

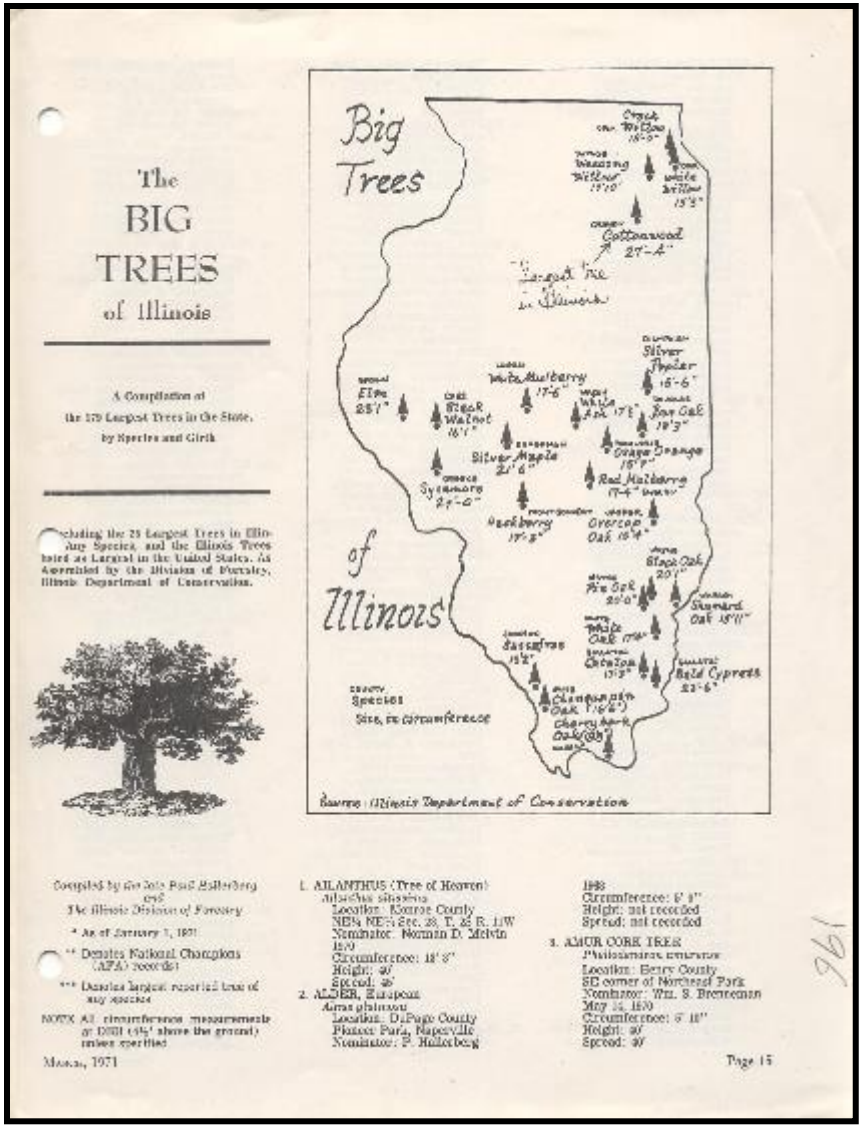
Species	County	Nominator	Circ.	Height	A.C.W.	Total Points
Ohio buckeye* (*Aesculus glabra*)	DuPage	Lane, Sagen, and Green	15.2’	75’	71’	275
Shumard oak (*Quercus shumardii*)	Union	L. Mahan	27.7’	96’	96’	452

https://www.americanforests.org

History of the IBTR Program

- Established in 1962 by IL Dept. of Conservation
  - Transferred to U of I Extension Forestry in Jan. 2006
- Recognition of the state's largest ***native*** tree species!





The
BIG
TREES
of Illinois

A Compilation of
the 179 Largest Trees in the State,
by Species and Girth

cluding the 25 Largest Trees in Illi-
Any Species, and the Illinois Trees
isted as Largest in the United States. As
Assembled by the Division of Forestry,
Illinois Department of Conservation.

Big Trees of Illinois

Source: Illinois Department of Conservation

Compiled by Gordon Paul Hallenberg
and
The Illinois Division of Forestry

* As of January 1, 1971

** Denotes National Champions
(AFA) records)

*** Denotes largest reported tree of
any species

NOTE All circumference measurements
at DBH (4½' above the ground)
unless specified

March, 1971

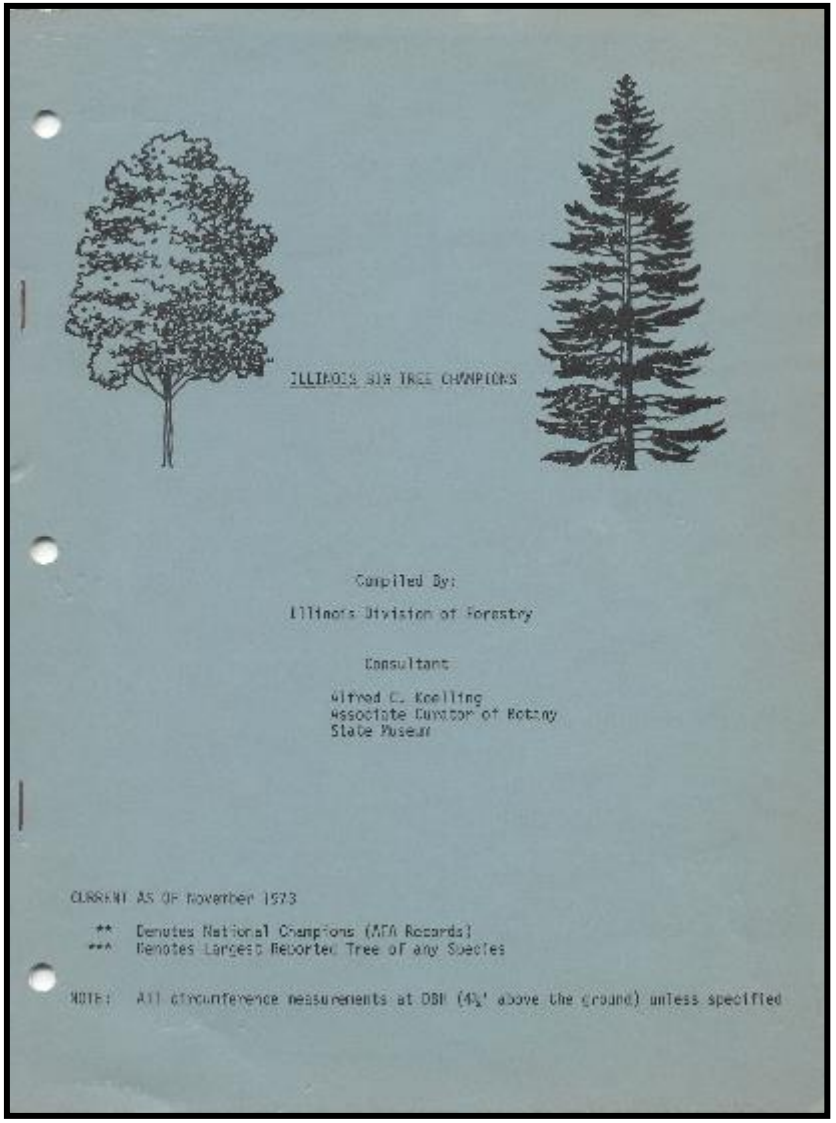
1. AILANTHUS (Tree of Heaven)
Ailanthus altissima
Location: Monroe County
NE¼ NE¼ Sec. 28, T. 3S R. 11W
Nominator: Norman D. Melvin
1970
Circumference: 12' 8"
Height: 90'
Spread: 90'

2. ALDER, European
Alnus glutinosa
Location: DuPage County
Picture: Park, Naperville
Nominator: P. Hallenberg
1968
Circumference: 6' 9"
Height: not recorded
Spread: not recorded

3. AMUR CORK TREE
Phellodendron amurense
Location: Henry County
SE corner of Northeast Park
Nominator: Wm. S. Brenneman
May 15, 1970
Circumference: 6' 10"
Height: 90'
Spread: 90'

Page 15

In 1971, there were 179 State Champion trees along with 25 National Champions



ILLINOIS BIG TREE CHAMPIONS

Compiled By:

Illinois Division of Forestry

Consultant

Alfred C. Koelling
Associate Curator of Botany
State Museum

CURRENT AS OF November 1973

** Denotes National Champions (AFA Records)
*** Denotes Largest Reported Tree of any Species

NOTE: All circumference measurements at DBH (4½' above the ground) unless specified

In 1973, there were 198 State Champion trees along with 13 National Champions

More than a Contest…

- More than just a contest to find the biggest tree…The *Illinois Big Tree Register* is really a "**Tree Awareness Campaign**"
    - Promotes enthusiasm for trees, forests, nature, and conservation.
    - Encourages people to get out, travel, and enjoy the great outdoors!

More than a Contest…

- Who am I kidding…it's definitely about **BRAGGING RIGHTS**!

Recent Initiatives

- **2008-2020: Recertification Campaign**
- **A.K.A., The 10-year Remeasurement Rule**
  - Relocate, remeasure, photograph, and georeference (GPS) all state champion trees whose residency on the IBTR exceeds 10 years.
  - Retire and purge champion trees that cannot be remeasured due to mortality, removal, or due to the simple fact that many could not be relocated.

Vision

- To build an expansive volunteer network of *Citizen Big Tree Inspectors,* covering all 102 counties.

- These volunteers will help inspect, measure, and certify all Big Tree nominations and current champions

Certified Big Tree Inspector

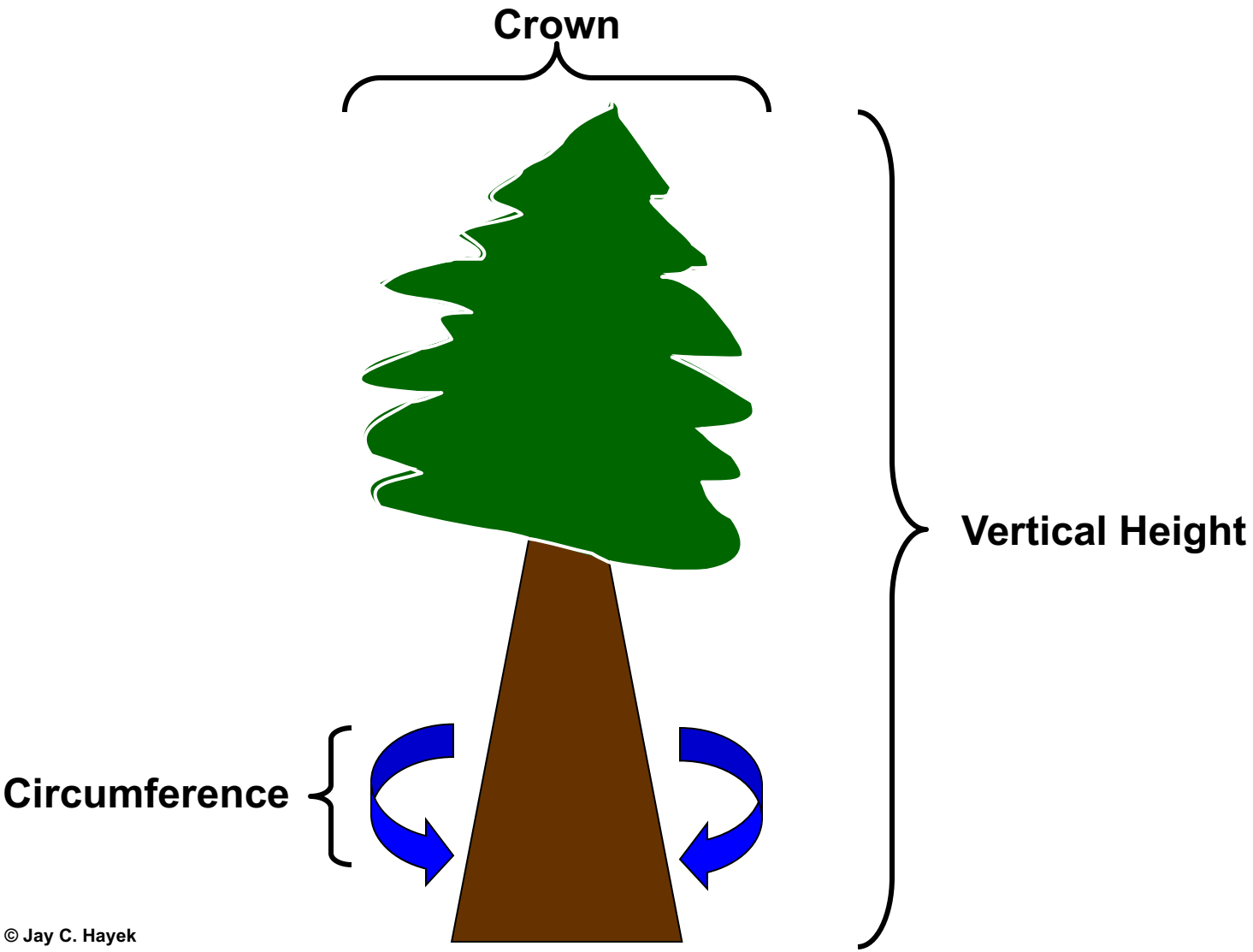
- **Question: What's involved?**
  - Volunteer your time to the IL Big Tree Register by certifying several big tree nominations every year
  - All we ask is that you certify trees within your technical limits ☺

Illinois Big Tree Register

The Nomination Process

Extension Forestry, © Jay C. Hayek

Definition of a Tree



Extension Forestry, © Jay C. Hayek

Definition of a Tree

- A ***TREE*** is a woody plant with…

    1. A stem circumference ≥ *9.5 inches* at a point 4.5 feet above ground level

    1. A *well-defined crown* of foliage

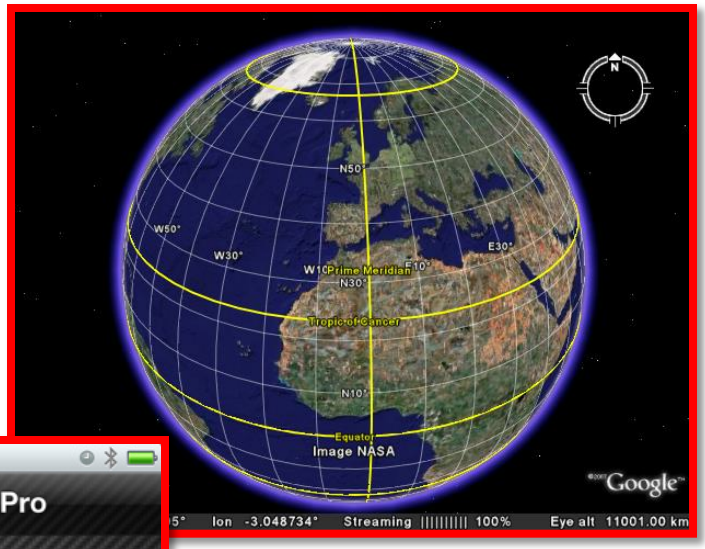
    1. A total vertical height of at least *13 feet*

To Nominate a Big Tree…

- **On the nomination form, please record:**
  - Common name (e.g., northern red oak)
    - *Forest Trees of Illinois*, 10th Edition, 2009
  - Scientific name (e.g., *Quercus rubra*)
    - www.itis.gov
  - Measured circumference, total height, and average crown spread

GPS Coordinates

- **Difficulty Level:**
  - *Easy*
  - Use "*Decimal Degrees*"
- **# People:** *1*
- **Tools:**
  - Handheld GPS unit
  - Smartphones
  - Google Earth (free)



Extension Forestry, © Jay C. Hayek

Record/Report GPS Coordinates

- **This is "*decimal degrees*" format**
  - Lat: 40.102850°
  - Lon: -88.224050°

Yes

- **This is "*degrees minutes seconds*" format**
  - Lat: 40° 6'10.26" N
  - Lon: 88° 13'26.58" W

No

Extension Forestry, © Jay C. Hayek

High-Resolution Photos (> 1.5 MB)

- **Difficulty Level:**
  - *Easy*
- **# People:** *1*
- **Tools:**
  - Digital camera
  - Smartphones

Use Image Size > 1.5 MB

Extension Forestry, © Jay C. Hayek

High-Resolution Photos (> 1.5 MB)

- **Email 5-10 high-resolution pictures**
  - **use .JPGs > 1.5 MB in size**

- **Photos serve three key purposes:**

1. **Eligibility (fused-stem, multistem, anomalous, etc.)**

1. **Proper Species Identification**
   - **Some trees are easy to misidentify**

2. **Aesthetic Beauty and Bragging Rights**
   - **Photos will be posted to new Website**

Extension Forestry, © Jay C. Hayek

How to Calculate Total Points

Total Points = Circumference (in.) + Height (ft) + ¼ Ave. Crown Spread (ft)

Circumference = **21.7’** Height = **46’** Ave. Crown Spread = **88’**

Total Points = (21.7 x 12) + 46 + (0.25 x 88)

Total Points = 260 + 46 + 22

Total Score = 328

Extension Forestry, © Jay C. Hayek

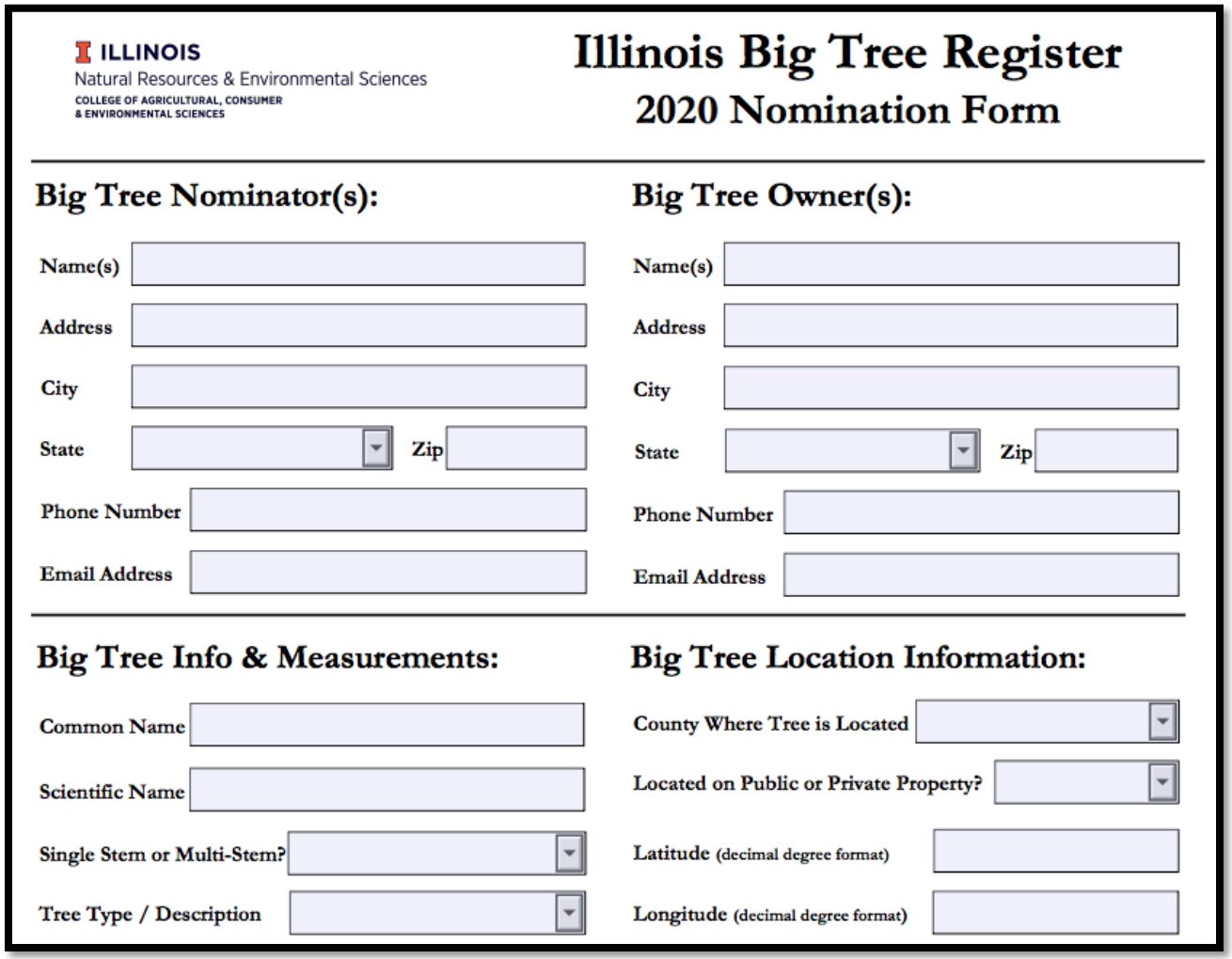
IBTR Scoring System

- **Champion** – a nomination with the greatest confirmed point total for an individual species.

- **Co-champion** – a nomination within **3%** or **3** points of the reigning champion; only one co-champion per species.

- **Contender** – nominations within **25** points of the current champion; contenders are kept on file.

Complete Nomination Form



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Illinois Big Tree Register
2020 Nomination Form

Big Tree Nominator(s):

Name(s)
Address
City
State
Zip
Phone Number
Email Address

Big Tree Owner(s):

Name(s)
Address
City
State
Zip
Phone Number
Email Address

Big Tree Info & Measurements:

Common Name
Scientific Name
Single Stem or Multi-Stem?
Tree Type / Description

Big Tree Location Information:

County Where Tree is Located
Located on Public or Private Property?
Latitude (decimal degree format)
Longitude (decimal degree format)

https://extension.illinois.edu/forestry/resources

The Illinois Big Tree Register

Proudly Presents this 2018 Illinois Big Tree Champion Certificate to

Cypress Creek National Wildlife Refuge

the Owner(s) of the Recently Crowned State Champion

swamp chestnut oak (Quercus michauxii)

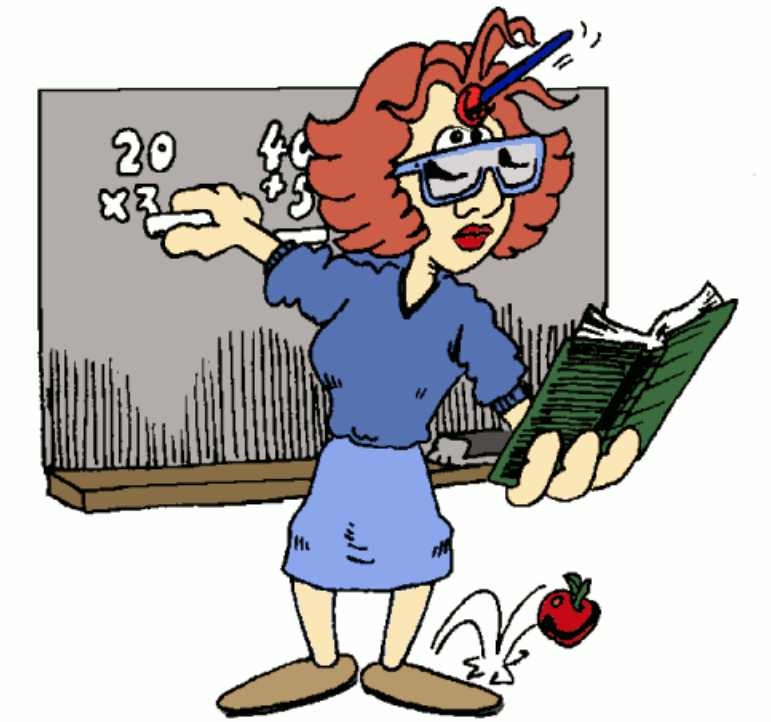
General Location: 37.316572, -89.067376 | Wood Duck Slough Access, Cypress Creek NWR

Circumference: 18.58' *Height:* 83' *Ave. Crown Spread:* 102.1' *Total Points:* 331.5

Jay C. Hayek, Coordinator | Illinois Big Tree Register | April 3, 2018
Sponsored by: Extension Forestry – Dept. of Natural Resources and Environmental Sciences – University of Illinois

How to Measure Big Trees

Essential Measurements & Your Big Tree Inspector's Toolkit



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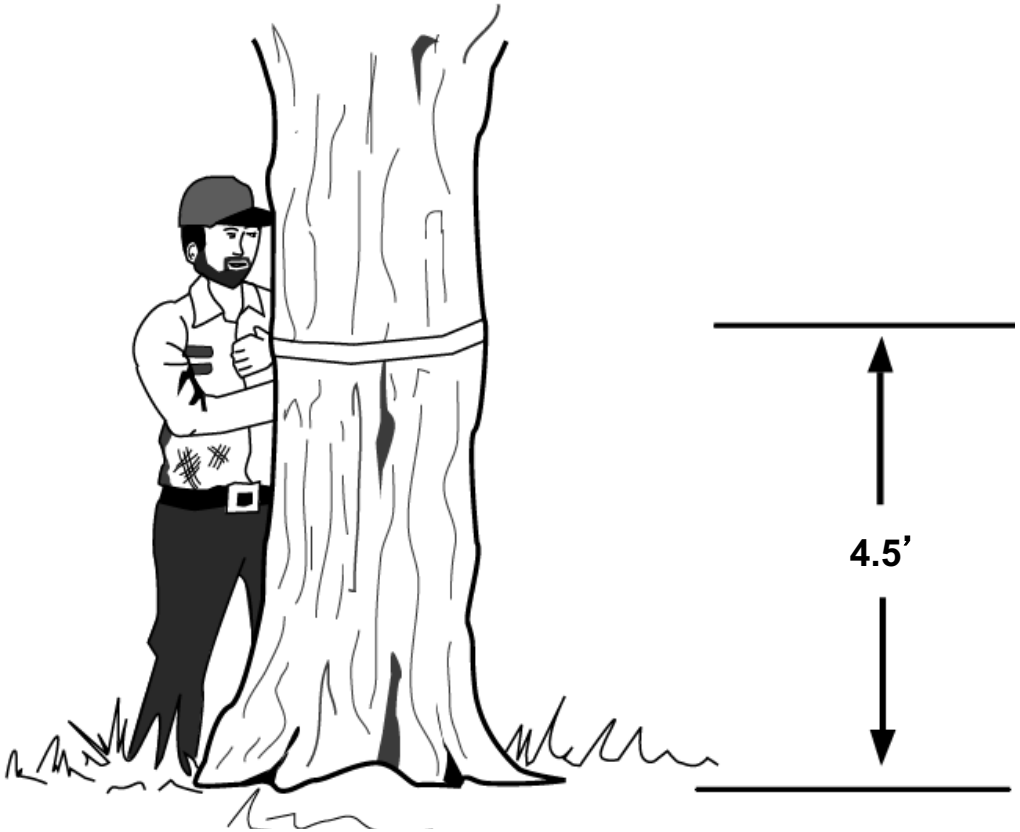
Tree Measurements

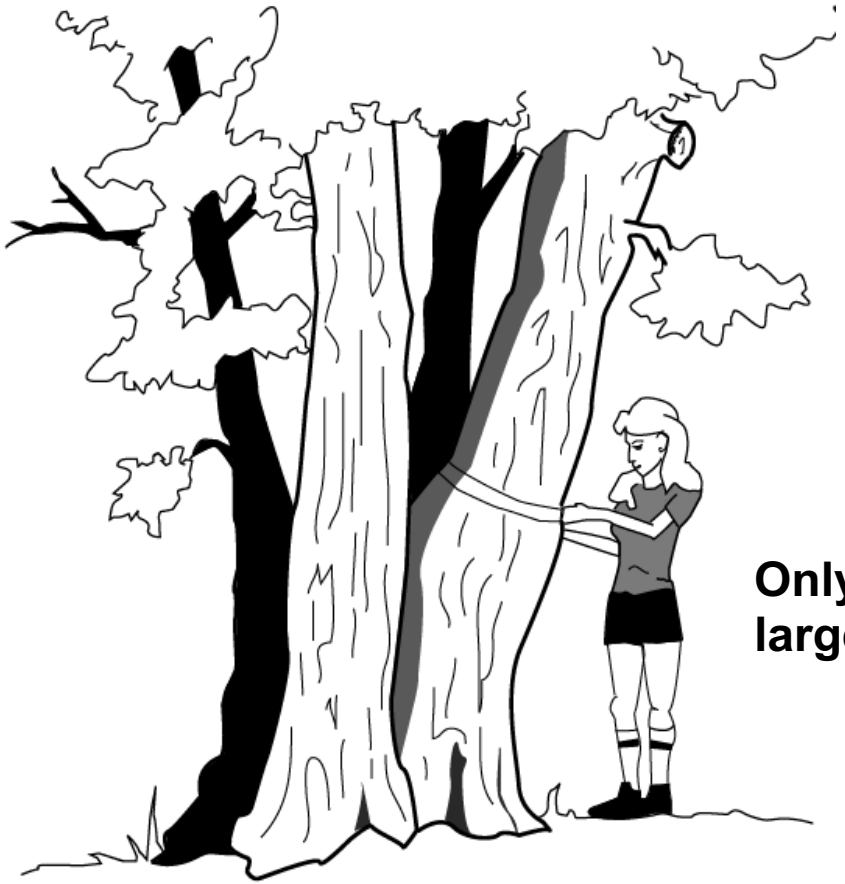
Circumference

Circumference: Single stem



IL Big Tree Register ©

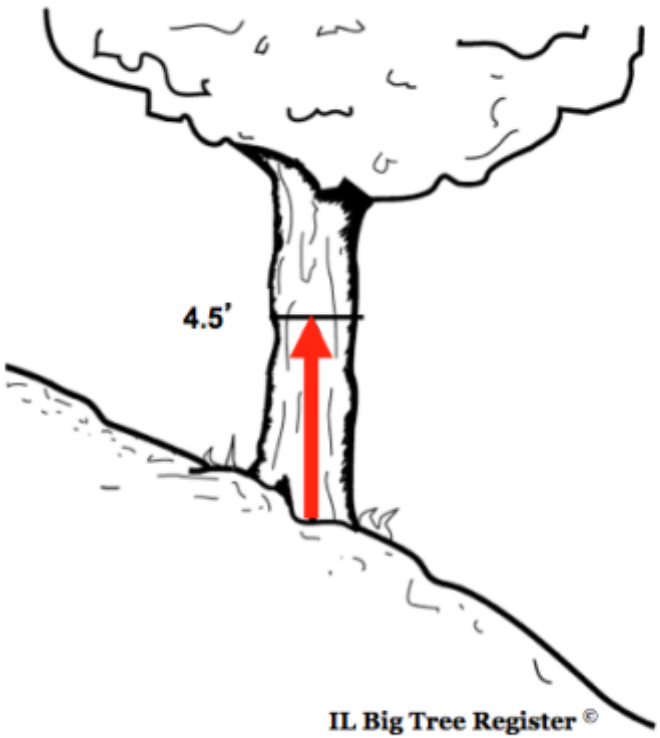
Circumference: Multi-stem Trees

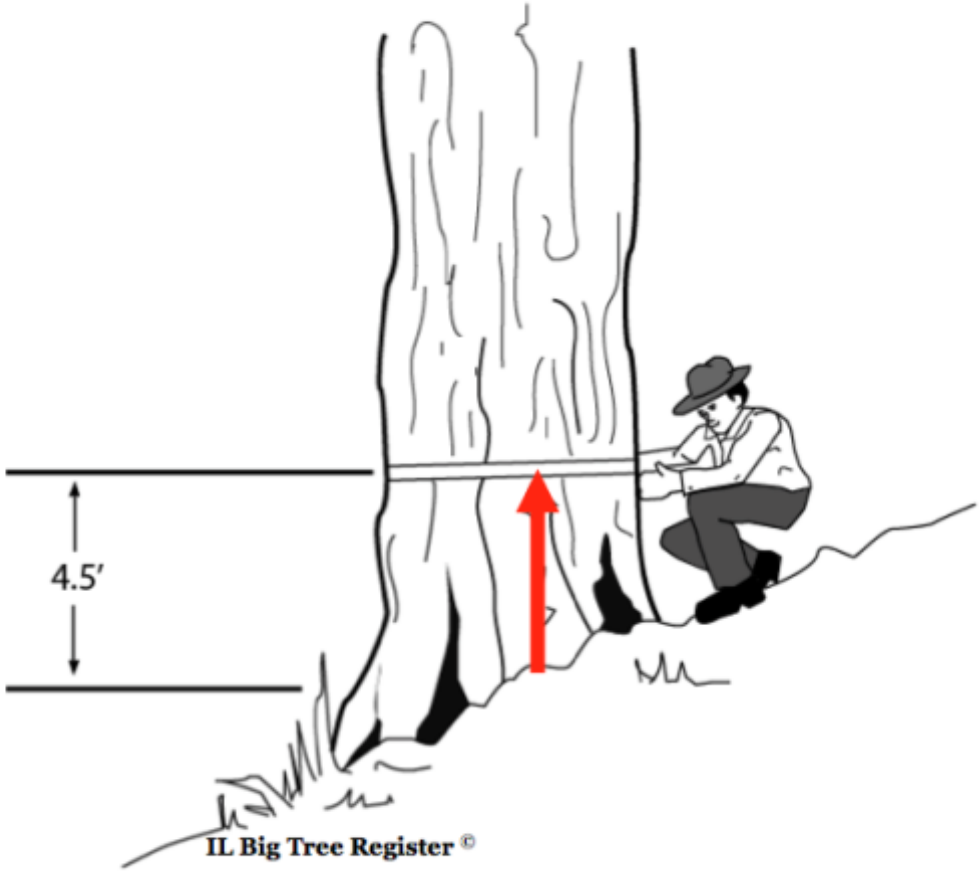


IL Big Tree Register ©

Only measure the largest stem!

Circumference: Tree on Slope



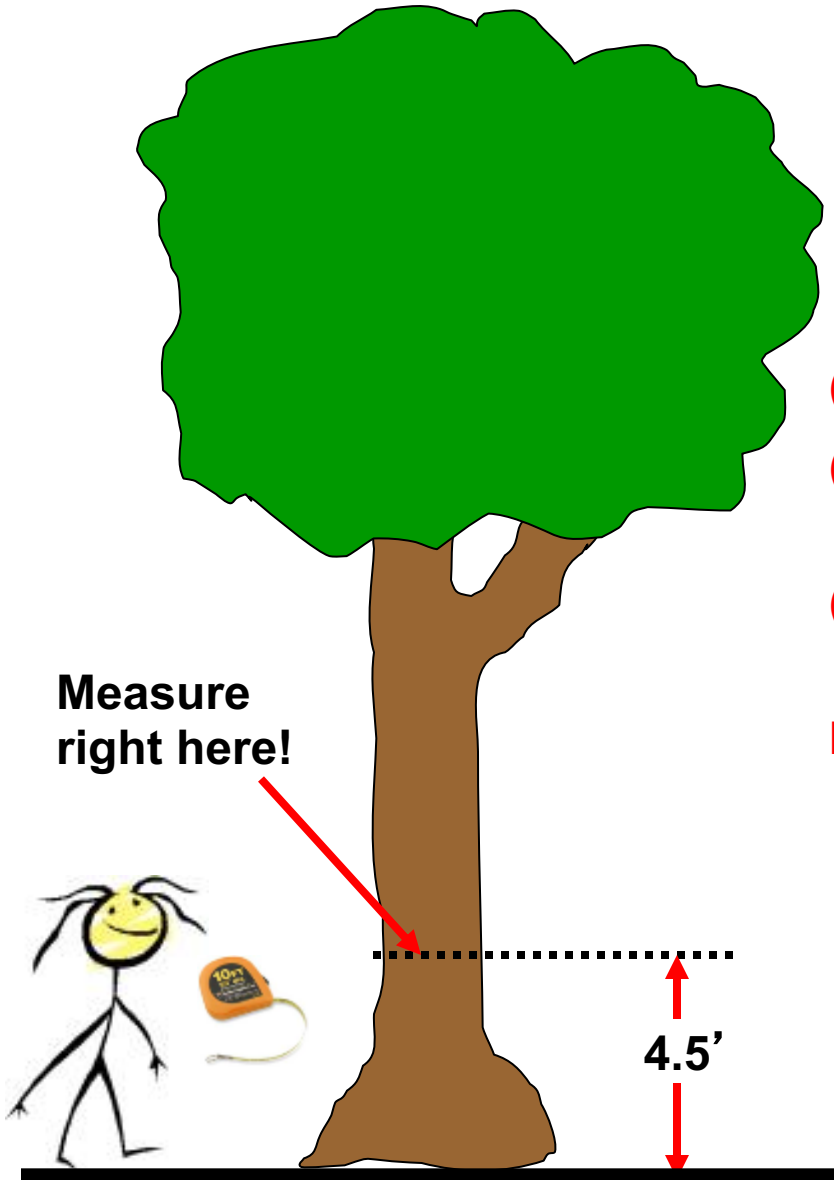


Measuring Circumference

- **Difficulty Level:**
  - Easy
- **# People Required:**
  - 1
- **Equipment & Cost:**
  - Flexible measuring tape ($1-3)
    - Sewing tapes w/ push pins also work well

Extension Forestry, © Jay C. Hayek

Circumference



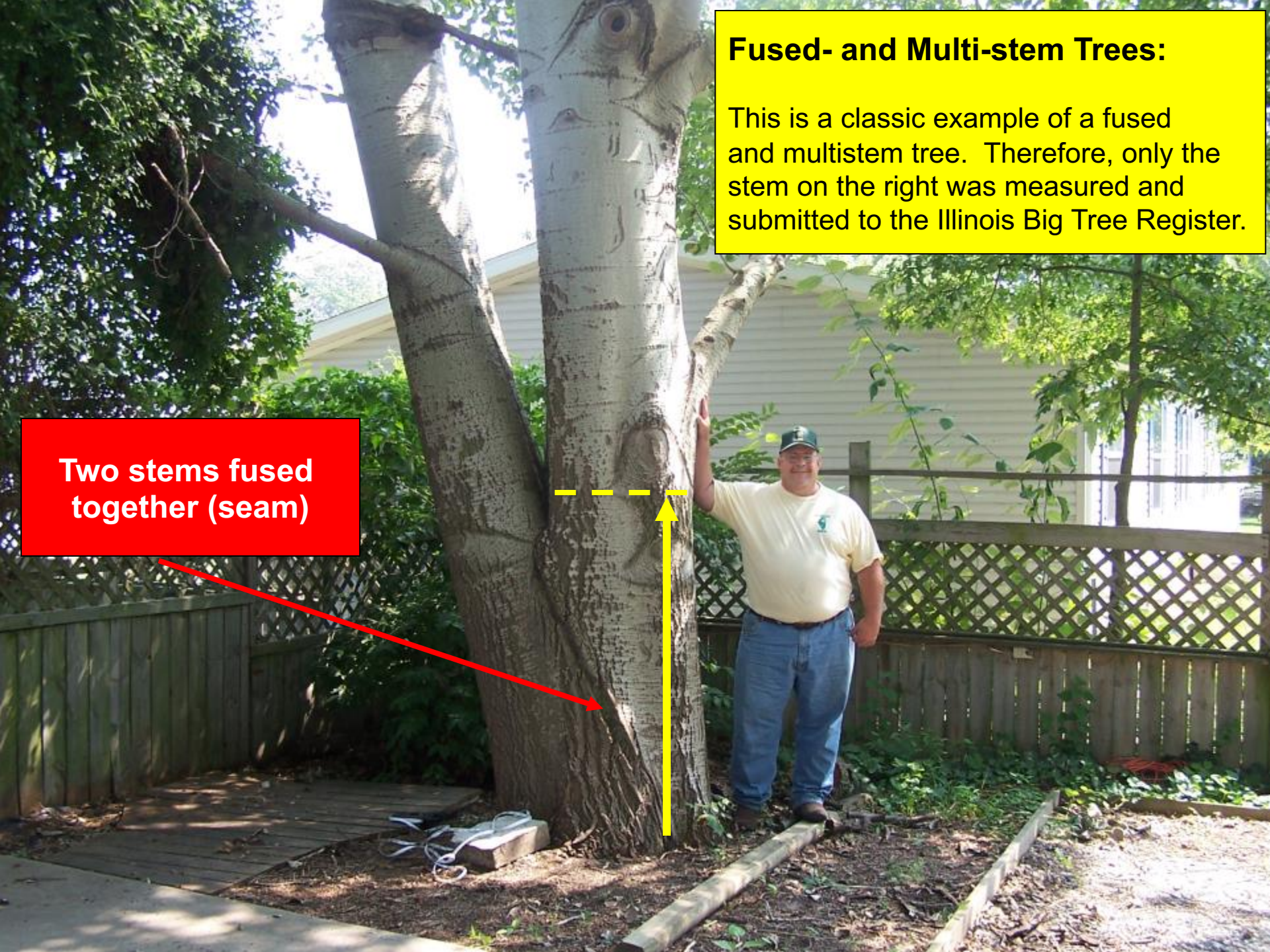
(1) Determine if one tree or two trees.

(2) Look for any abnormalities than may interfere with measurement at 4.5’

(3) Measure and record circumference at 4.5’ above ground level…it’s that easy!

Note: ***If measurement did not occur at 4.5’, simply indicate at which point on the tree the circumference was recorded and why.***

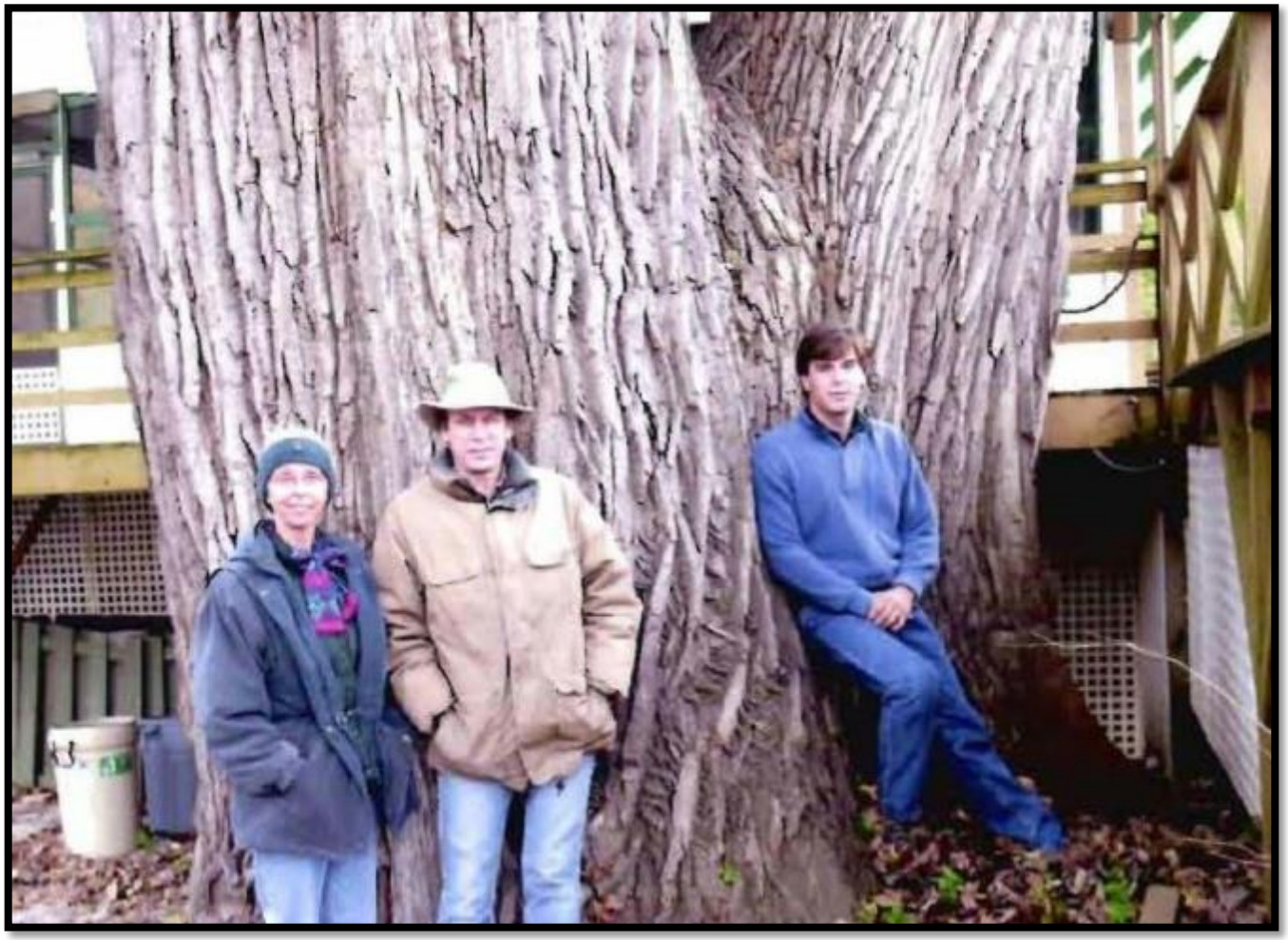
Extension Forestry, © Jay C. Hayek


Fused- and Multi-stem Trees:
This is a classic example of a fused and multistem tree. Therefore, only the stem on the right was measured and submitted to the Illinois Big Tree Register.
Two stems fused together (seam)

Fused and Multi-stem Trees

Fused and multi-stem tree…only measure the circumference of the largest stem!

Fused and Multi-stem Trees



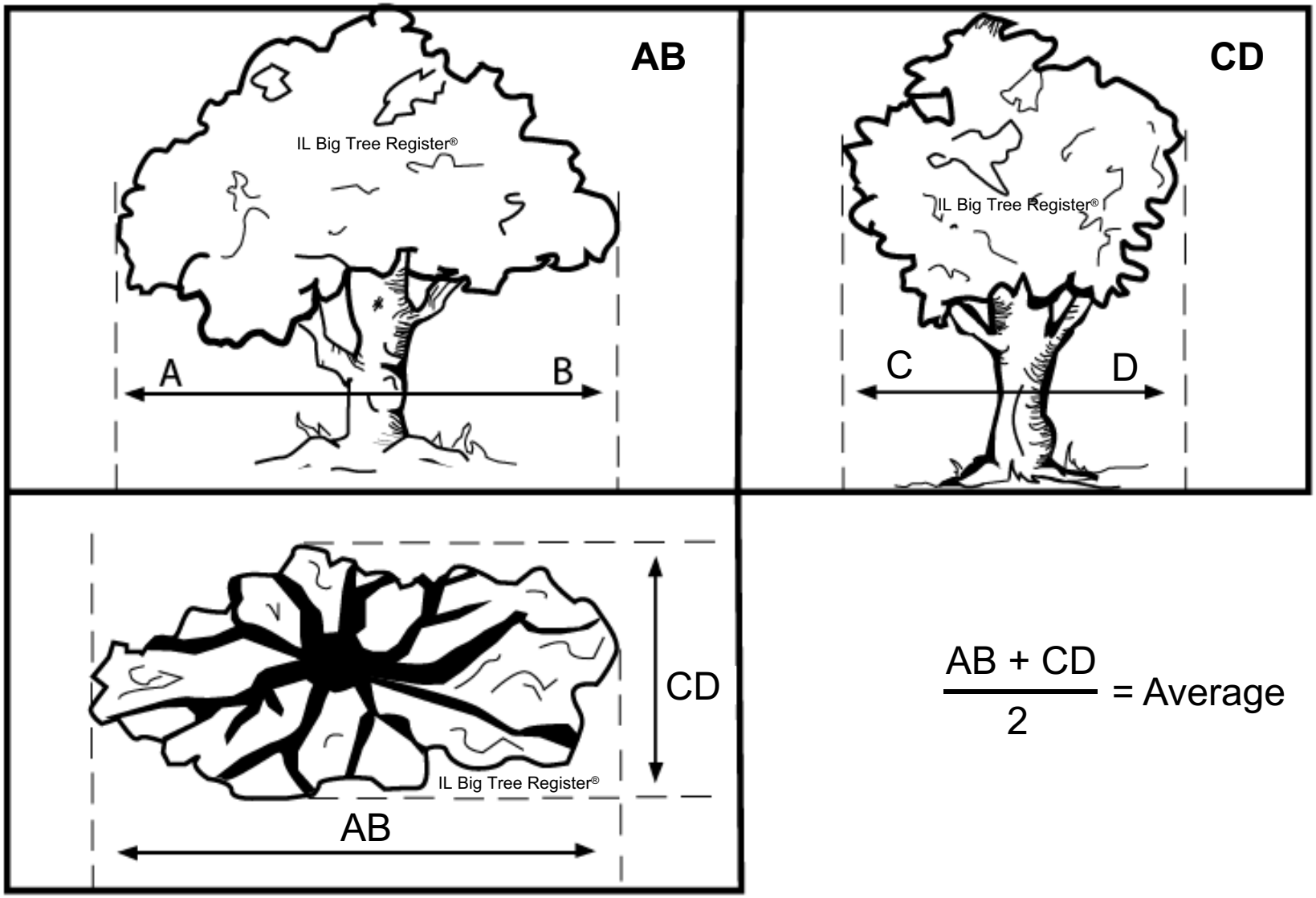
Classic example of a fused-stem cottonwood – only the largest single stem can be nominated!

Tree Measurements

Average Crown Spread

Extension Forestry, © Jay C. Hayek

Average Crown Spread



$$\frac{AB + CD}{2} = \text{Average}$$

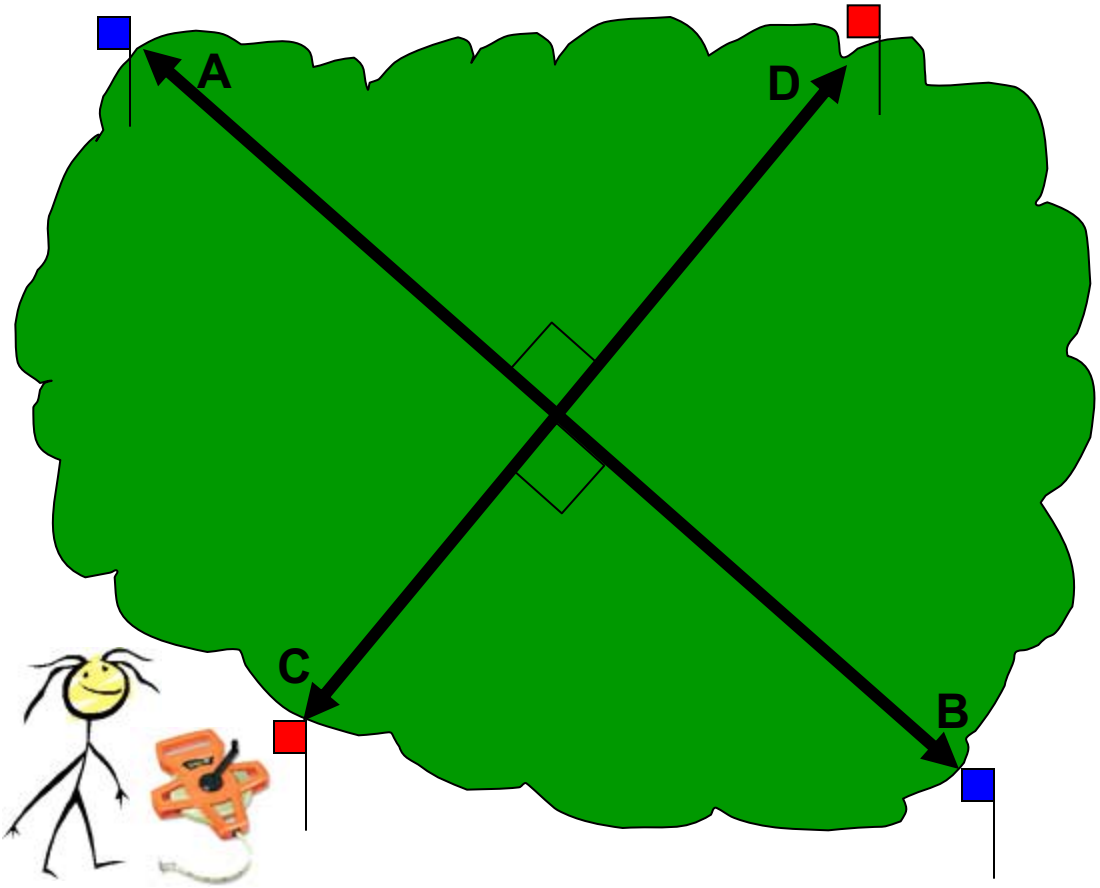
Ex

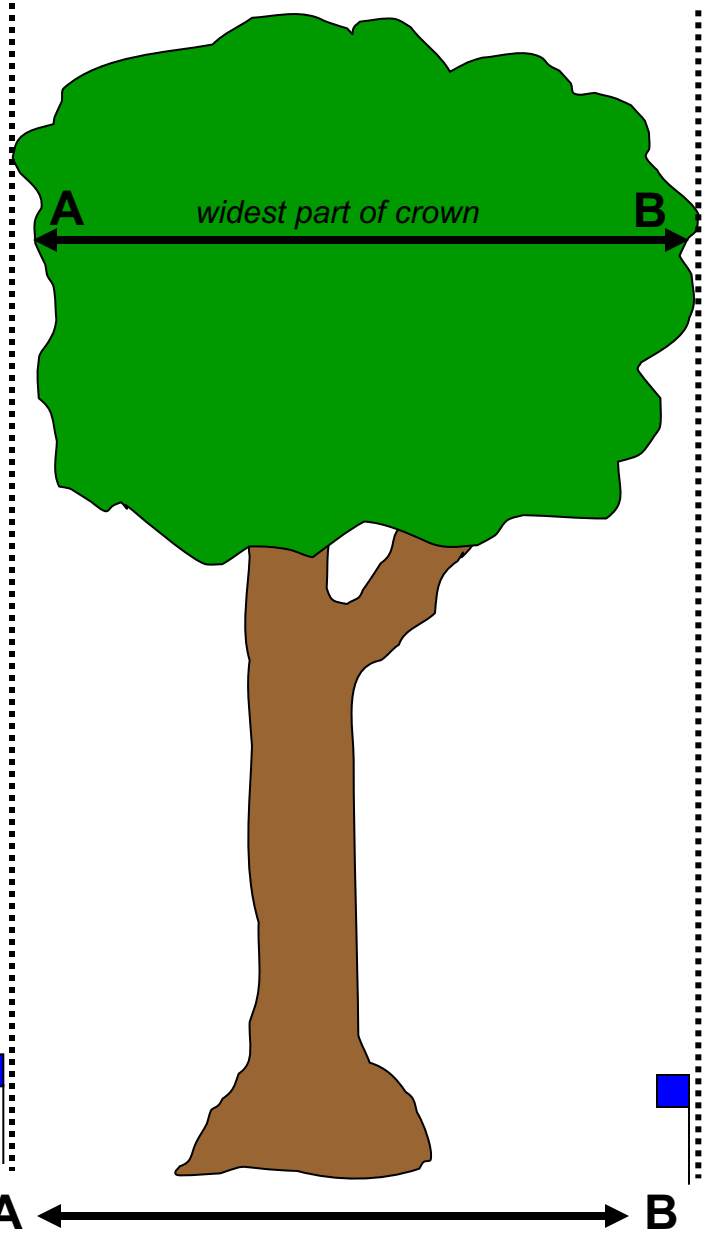
Average Crown Spread

- **Difficulty Level:**
  - Easy
- **# People Required:**
  - 1*; however, 2 people makes this job much easier!*
- **Equipment & Cost:**
  - Measuring Tape ~ $5-40
  - Wire Vinyl Flagging ~ $3-5

Extension Forestry, © Jay C. Hayek

Average Crown Spread





(1) Determine the *Widest Crown Spread* and label it "AB". Measure this linear distance in feet.

(2) Perpendicular to "AB" is our second measurement, "CD". Measure this distance in feet. Add "AB + CD" and divide by two … easy!

Extension Forestry, © Jay C. Hayek

Tree Measurements

Total “Vertical” Height

Extension Forestry, © Jay C. Hayek

Measuring Total Height

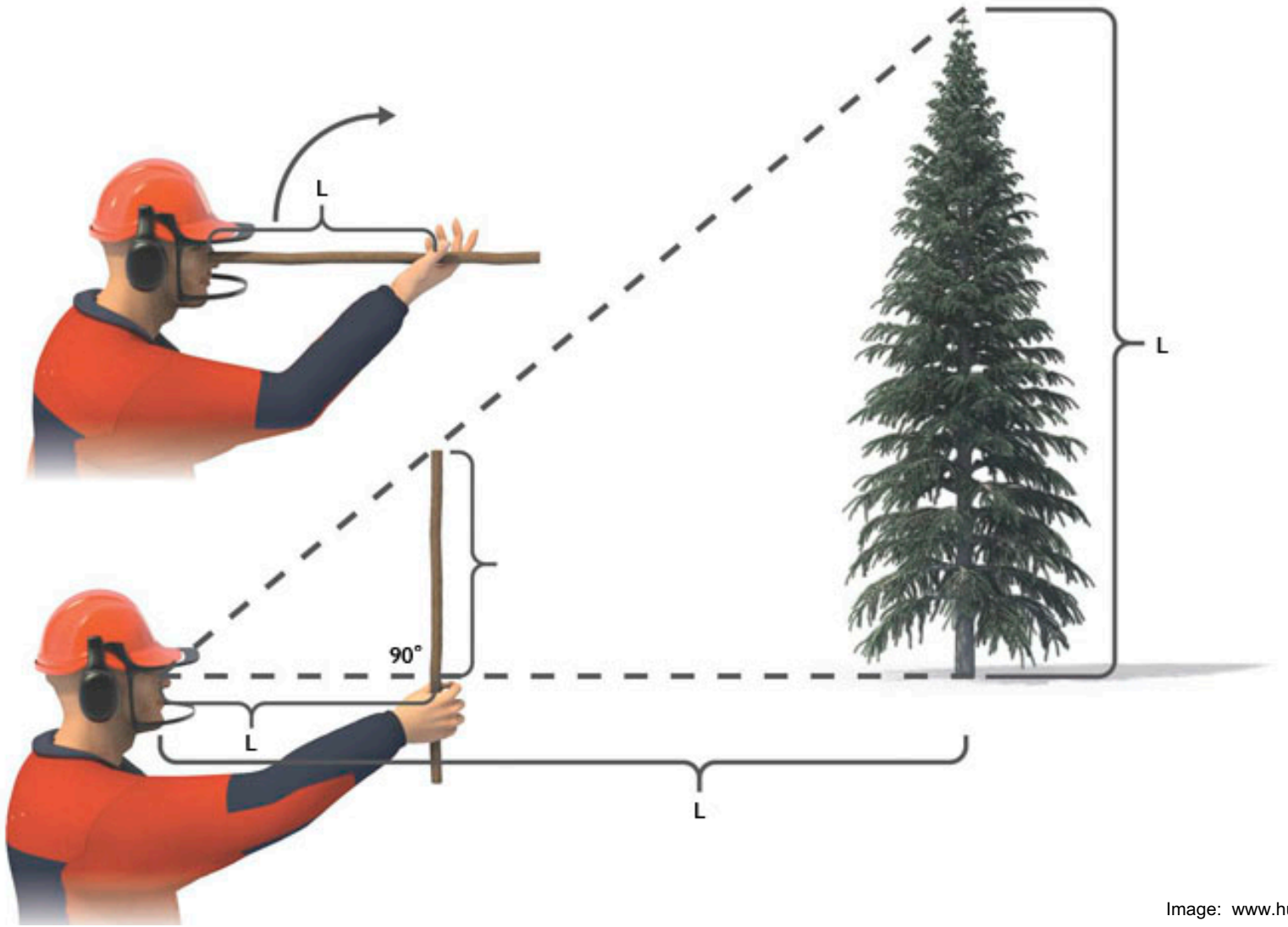
- **Difficulty Level:**
  - *Easy:* straight trees on flat ground
  - *Moderate:* leaning trees on flat ground
  - *Difficult:* leaning trees on sloping topography

- **# People Required:**
  - 1

- **Equipment:** clinometer, laser rangefinder, yardstick, smartphone Apps.

- **Cost:** $1 yardstick
  - $120 Suunto clinometer
  - $100-300 laser rangefinder

Stick Method



Extens

Image: www.husqvarna.com

Total Tree Height: Percent Baseline Method

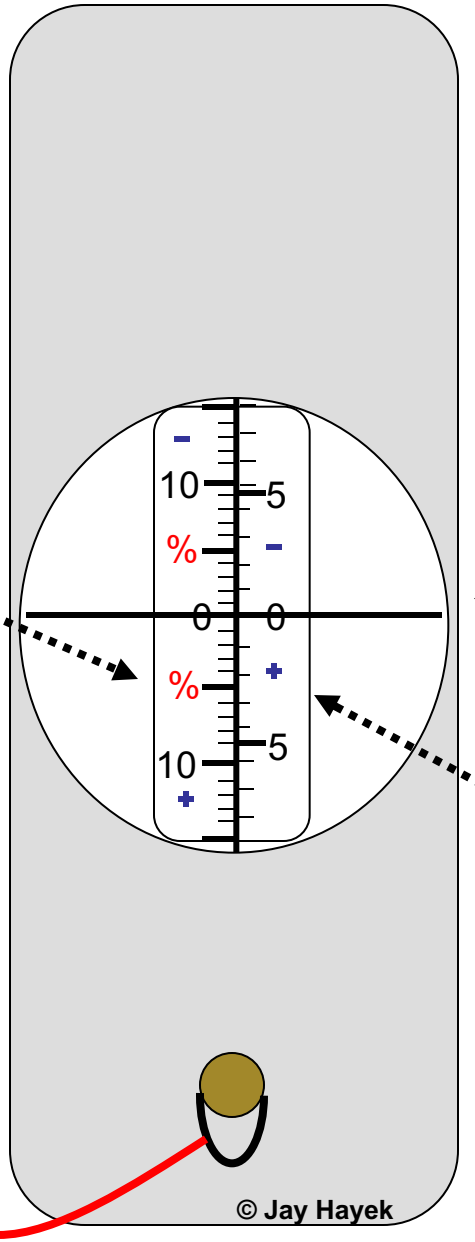
Tape Measure

&

Clinometer

Extension Forestry, © Jay C. Hayek

Suunto Clinometer



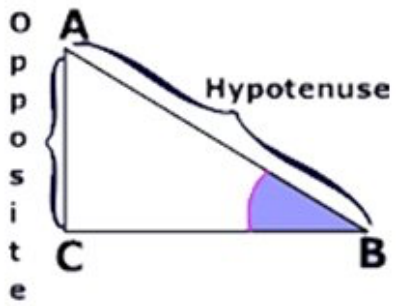
Percent Scale

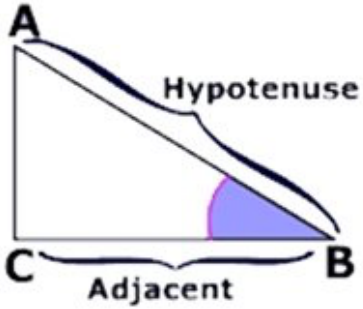
View Finder
Cross-Hair

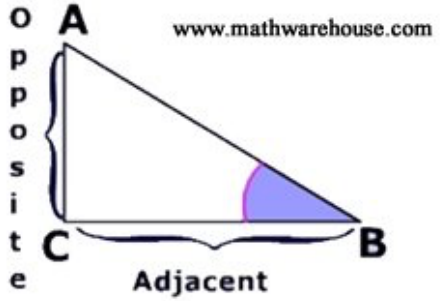
Degree Scale

SOH-CAH-TOA

$$\sin(B) = \frac{opposite}{hypotenuse} \qquad \cos(B) = \frac{adjacent}{hypotenuse} \qquad \tan(B) = \frac{opposite}{adjacent}$$







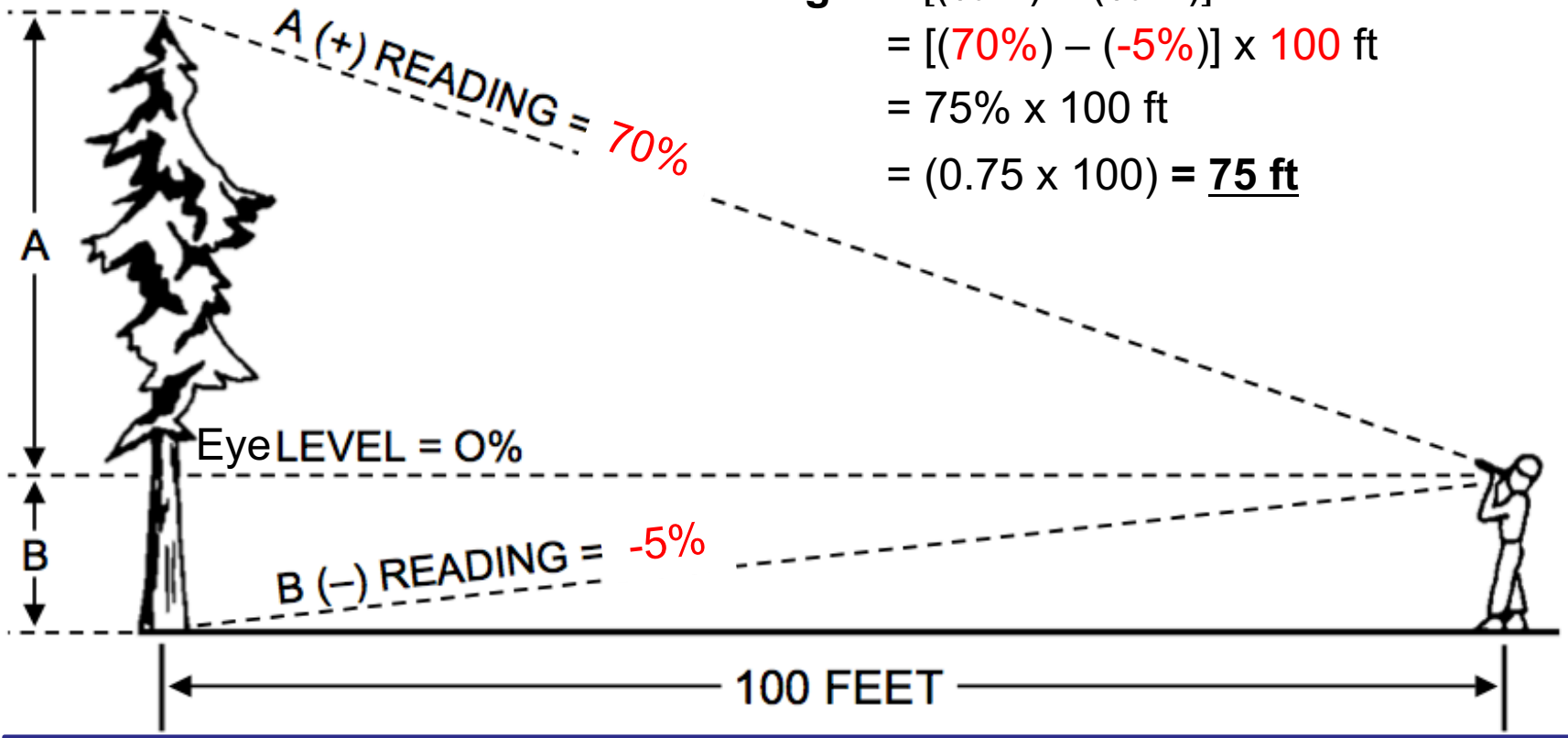
Extension Forestry, © Jay C. Hayek

Percent Baseline Method

- **The "% Baseline" method has its limitations**
  - Must make slope adjustments > 2%
    - Easy "online" tools
  - Suitable for trees < 70-ft tall (if standing 100' away)
  - Significant errors occur when measuring taller trees at baseline distances less than 150-ft away from the tree you're measuring!
    - Why? Because you're not able to see, and thus measure, to the very top of the tree!

Percent Baseline Method

Total Tree Height = [(% A) – (% B)] x Baseline Dist.
= [(70%) – (-5%)] x 100 ft
= 75% x 100 ft
= (0.75 x 100) **= <u>75 ft</u>**



Measuring tree height on flat ground using a percent-clinometer and a 100-foot baseline distance.

Extension Forestry, © Jay C. Hayek

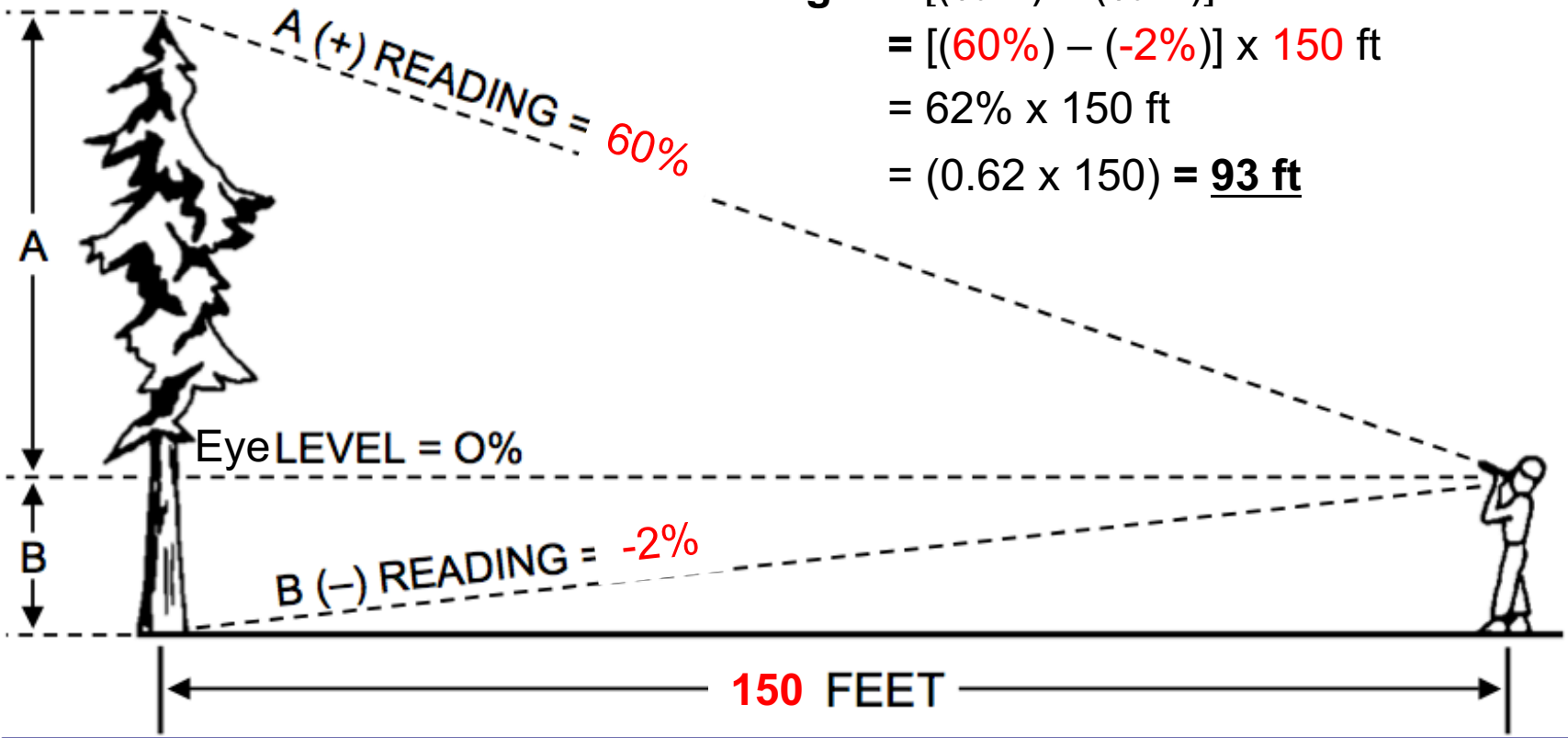
Percent Baseline Method

Total Tree Height = [(% A) – (% B)] x Baseline Dist.

= [(60%) – (-2%)] x 150 ft

= 62% x 150 ft

= (0.62 x 150) **= <u>93 ft</u>**

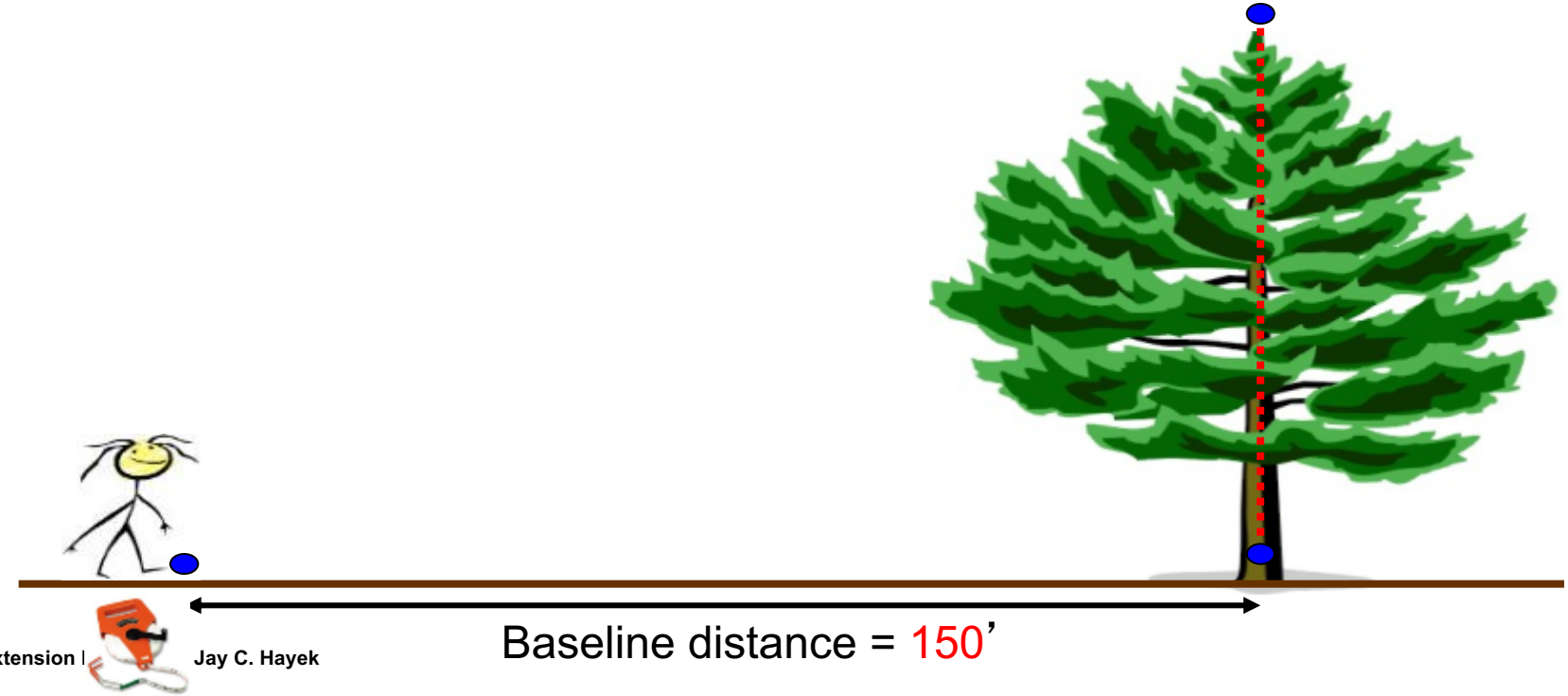


Measuring tree height on flat ground using a percent-clinometer and a 150-foot baseline distance.

Extension Forestry, © Jay C. Hayek

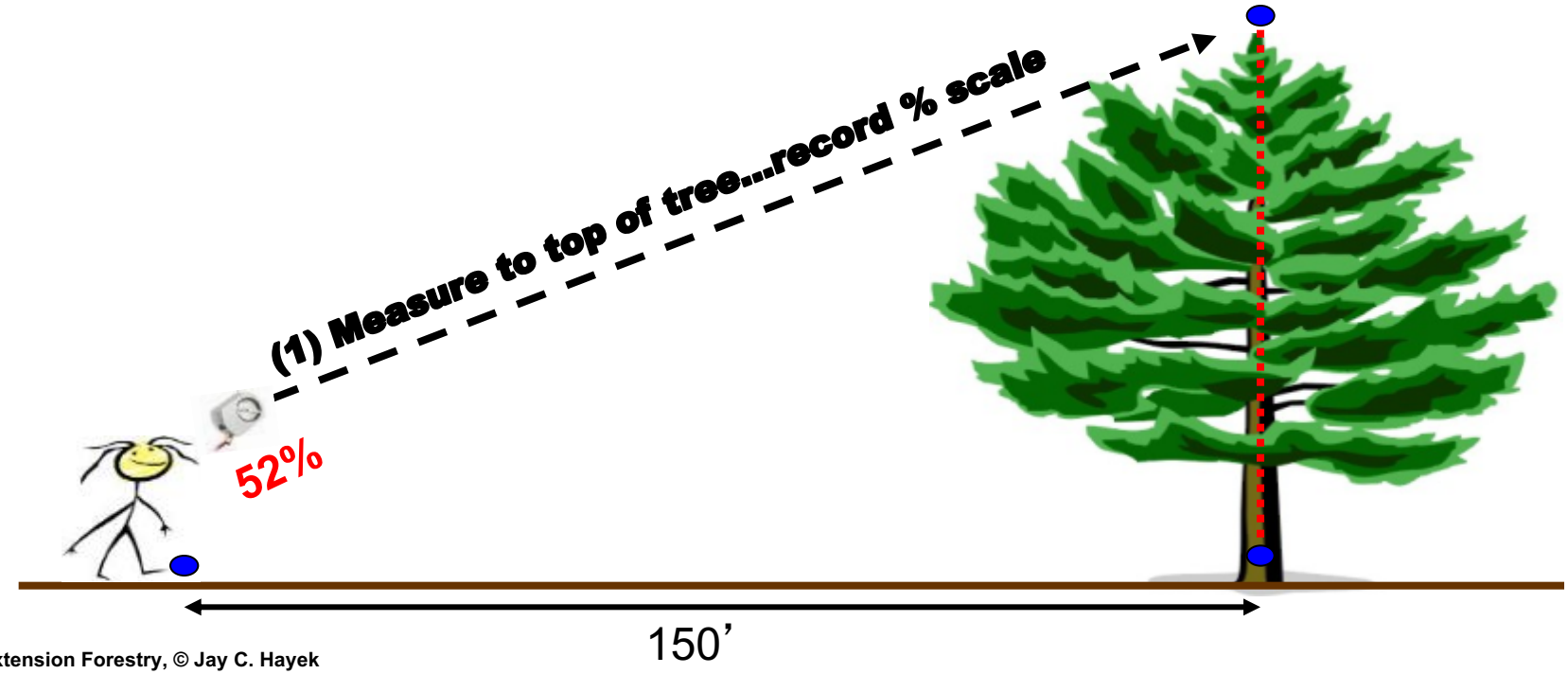
Step 1: % Baseline Method

- Stand a convenient distance away from the base of the tree to get an unobstructed view of the topmost part of the tree's crown…this measured distance is your horizontal baseline distance.
  - Very seldom does the topmost part of the tree occur directly above the base of the tree!
  - Remember to correct your baseline distance if the tallest part of the tree is not directly overtop the base of the tree!



Step 2

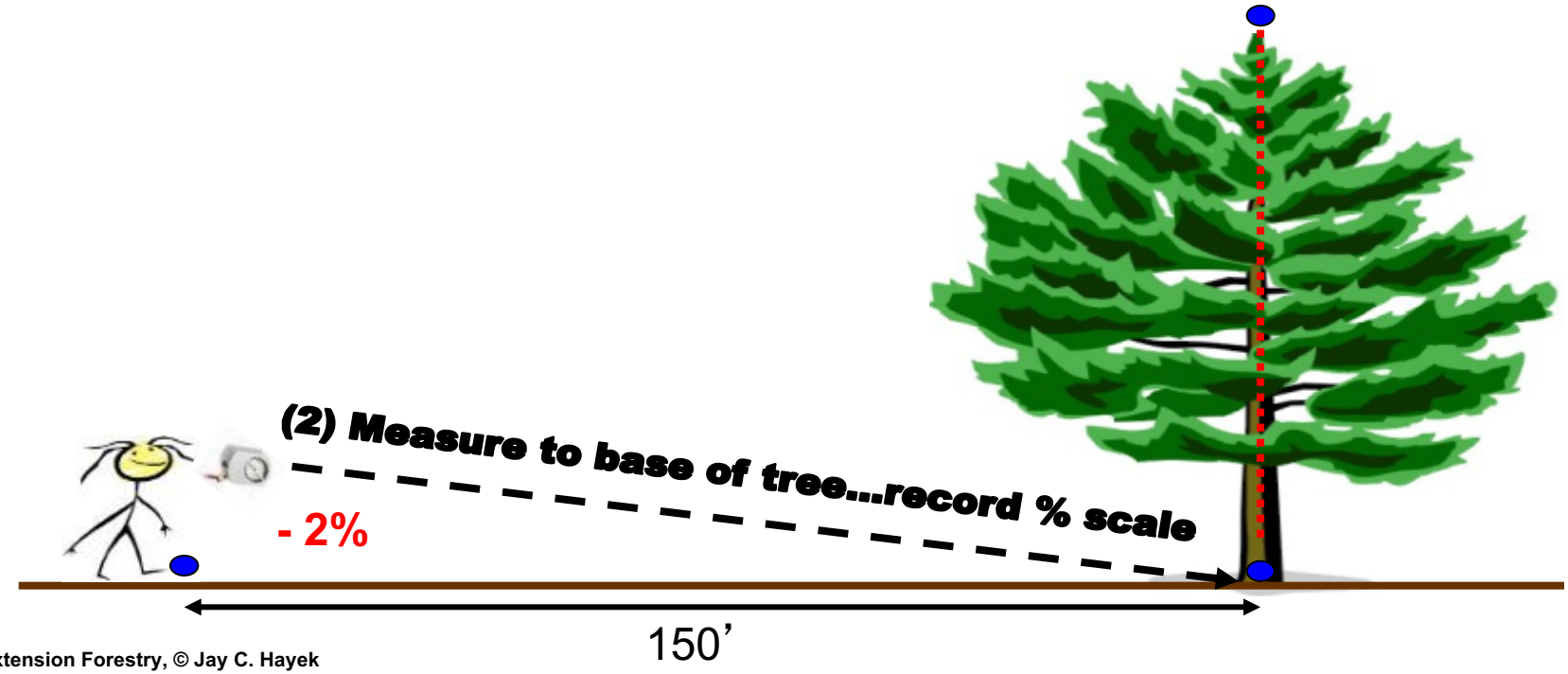
- Take a "% clinometer" reading to the tallest point on the tree. This will be called "*% top*"



Extension Forestry, © Jay C. Hayek

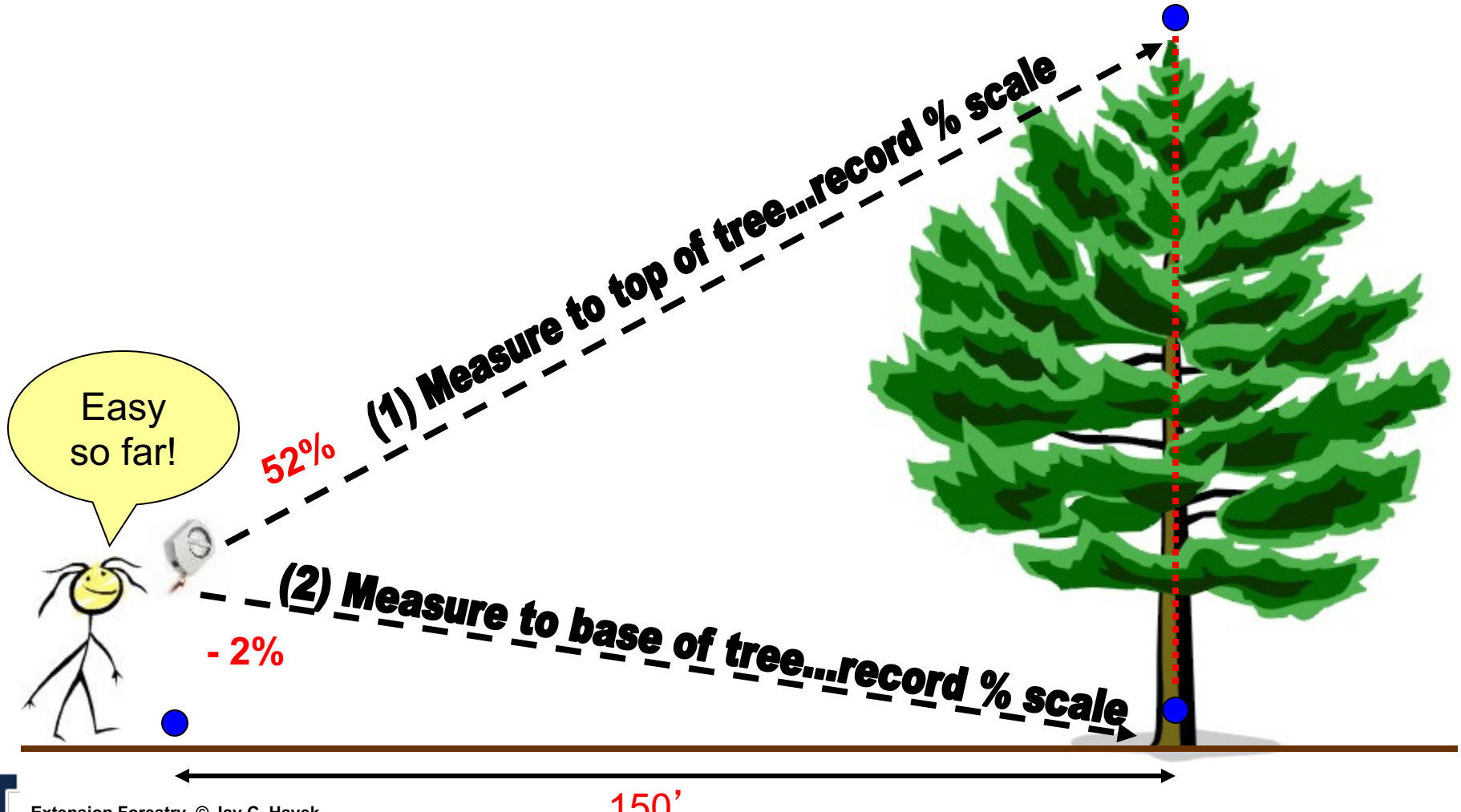
Step 3

- Take a "% clinometer" reading to the base of the tree. This will be called "*% base*"



Extension Forestry, © Jay C. Hayek

Summary: Steps 1-3



Extension Forestry, © Jay C. Hayek

Step 4

- Subtract (*% base*) reading from the (*% top*) reading. This number becomes your "*% Total Height*"
  - i.e., (*% top* - *% base* = ***% total height***)
  - Example: (52% - -2% = 54%)

Step 5

- Multiply (*% total height*) by the horizontal baseline distance.

- The product of these two numbers is the tree's **Total Vertical Height**.

    - i.e., (*% total height* x *baseline distance*)

    - Example: (0.54 x 150' = 68 feet)

FINISHED!

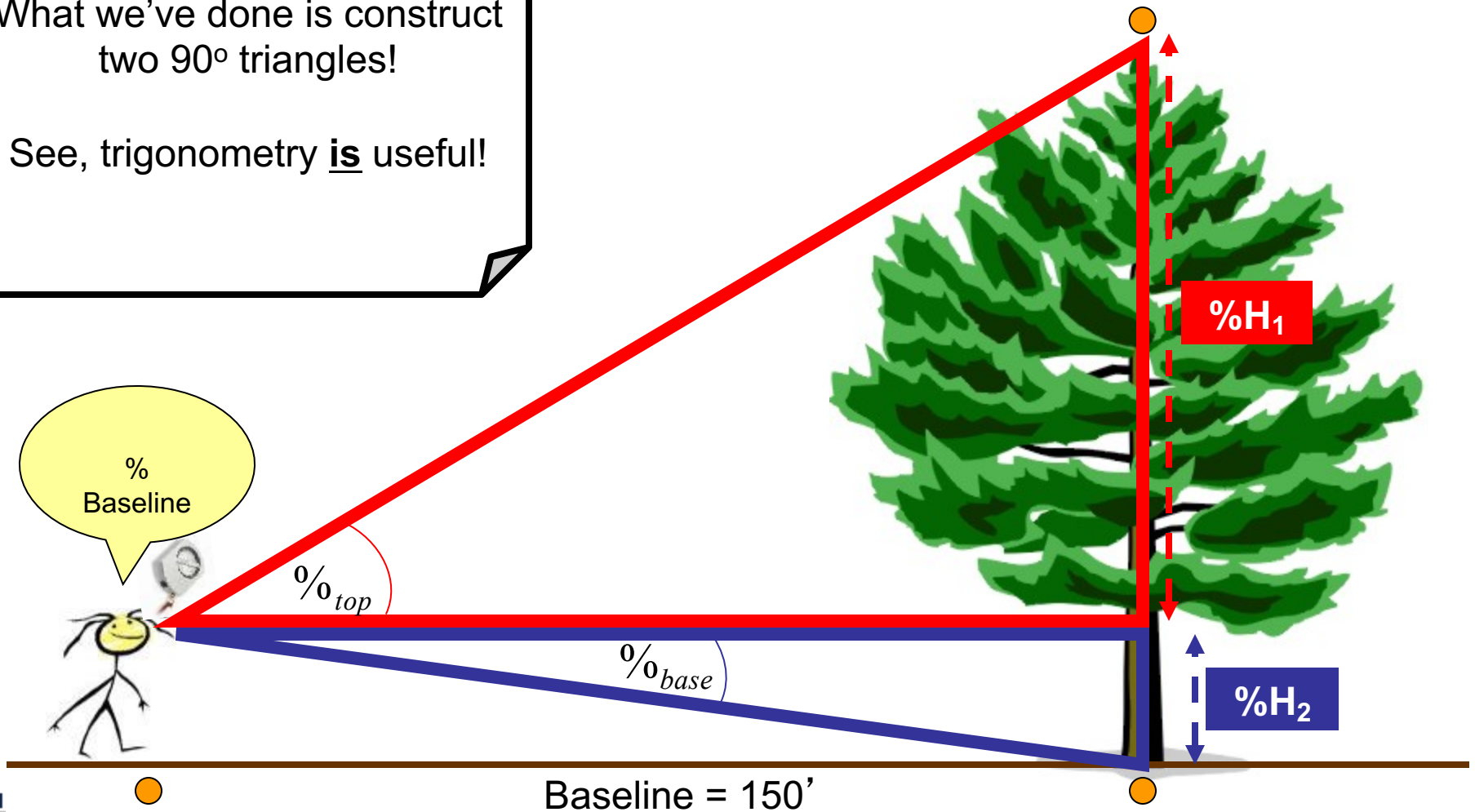
Total Vertical Height is 68 feet!

Extension Forestry, © Jay C. Hayek

Summary: Steps 1-5

What we've done is construct two 90° triangles!

See, trigonometry **is** useful!



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Percent Baseline Method

Key Points to Remember / Consider!

Remember to…

1. Choose a baseline distance that allows you to ***easily see the topmost part of the tree***, whether it is 100 feet or 200 feet away from the tree!

    - Your measurements will be more precise the further you stand away from the tree!

        - **Jay's TIP: Stand ≥ 150' away from the tree!**

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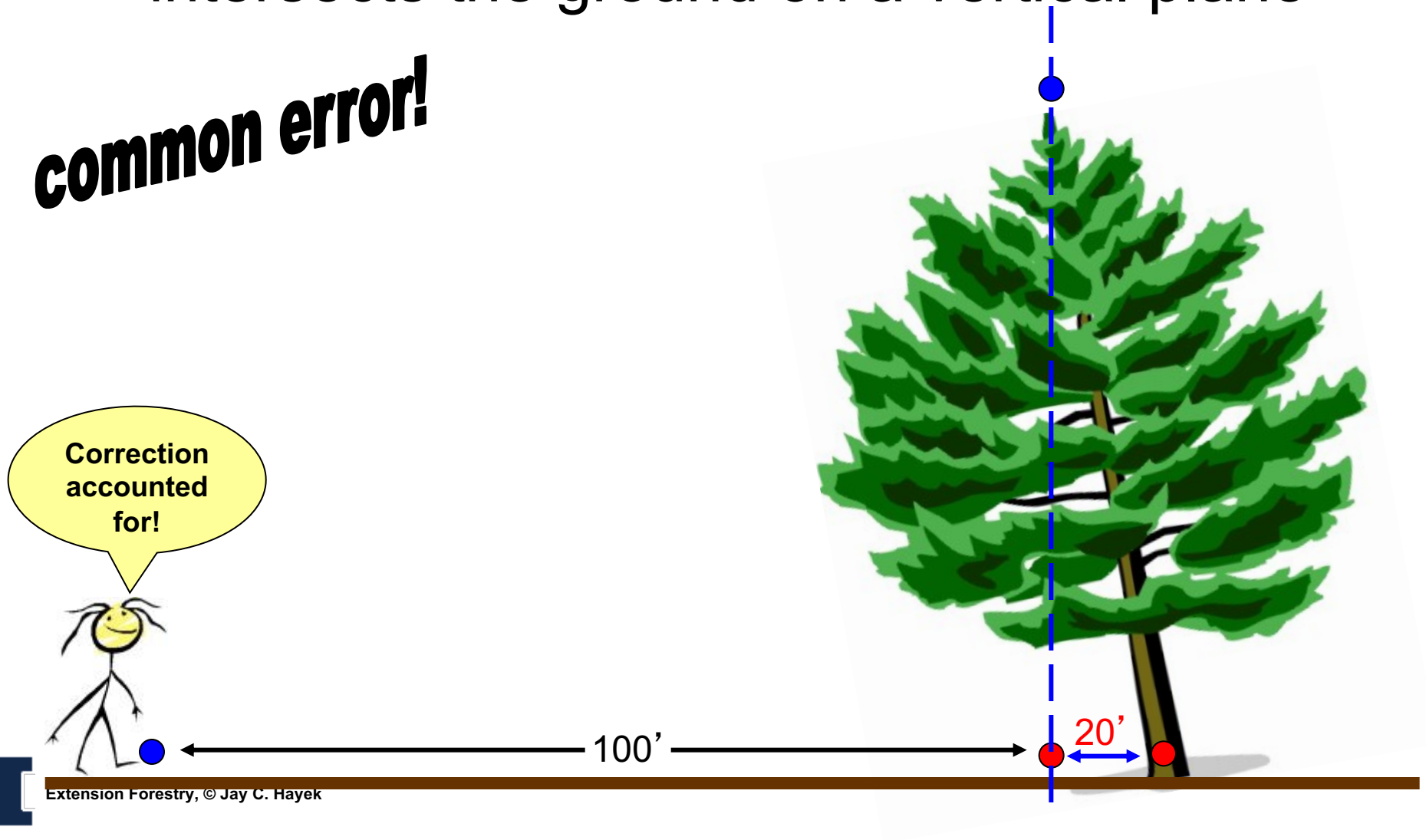
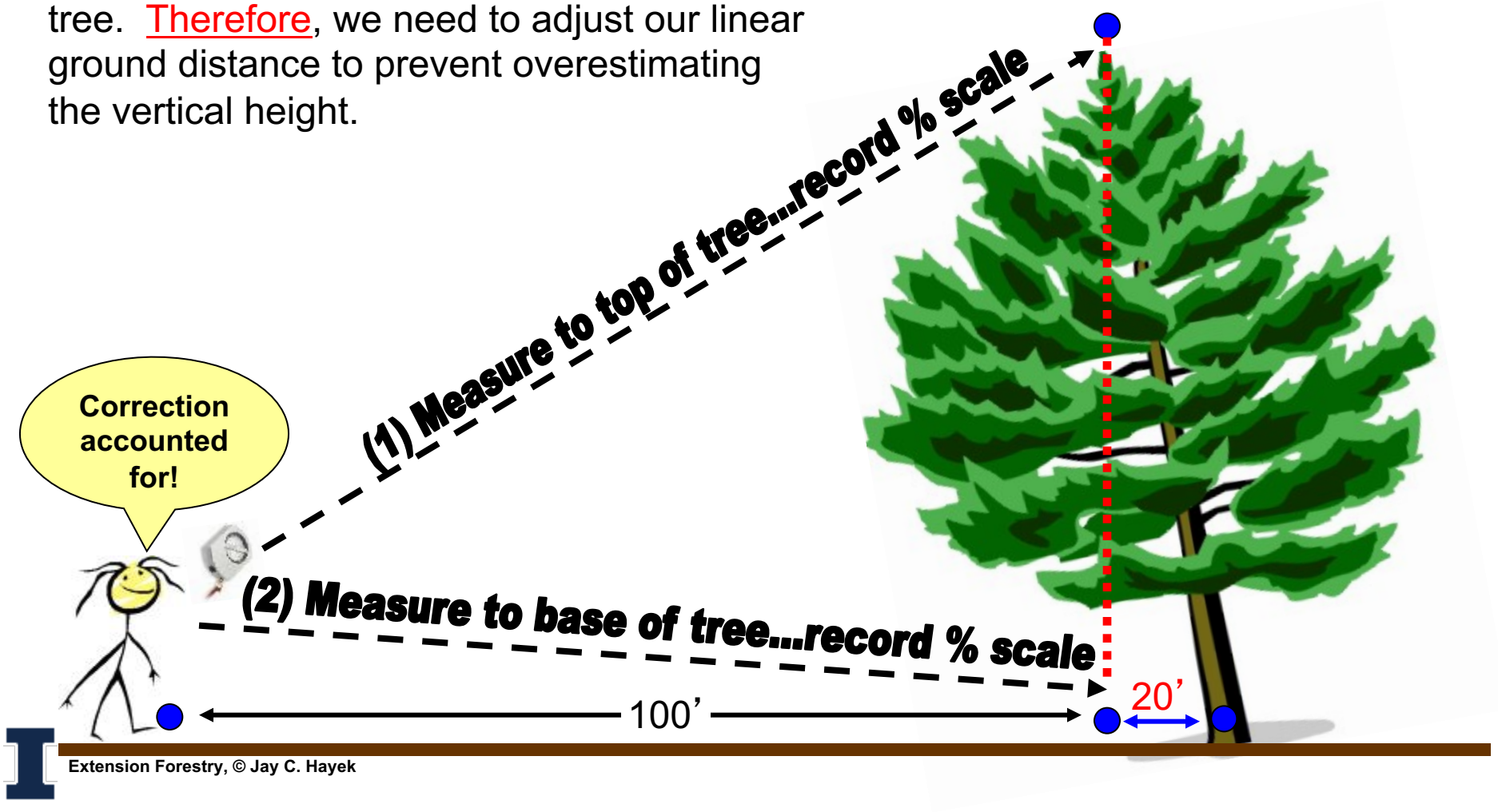
2. Adjust your baseline distance accordingly to where the topmost branch intersects the ground on a vertical plane

common error!



The "Leaner" Scenario

1. The "Leaner": The top-most part of this tree is leaning 20 feet over the base of the tree. Therefore, we need to adjust our linear ground distance to prevent overestimating the vertical height.



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Remember to…

- Correct horizontal baseline distance for trees growing on a slope!

- Measuring tree height is an art, as much as it is a science!

Constant practice is needed to claim the title: "Tree Height Guru"

ILLINOIS EXTENSION Technical Forestry Bulletin · NRES-102

Checklist of Illinois Native Trees

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Updated May 2019

This Technical Forestry Bulletin serves as a checklist of Illinois native trees, both angiosperms (hardwoods) and gymnosperms (conifers). Nearly every species listed in the following tables† attains tree-sized stature, which is generally defined as having a *(i)* single stem with a trunk diameter greater than or equal to 3 inches, measured at 4.5 feet above ground level, *(ii)* well-defined crown of foliage, and *(iii)* total vertical height greater than or equal to 13 feet (Little 1979). Based on currently accepted nomenclature and excluding most minor varieties and all nothospecies, or hybrids, there are approximately 184± known native trees and tree-sized shrubs found in Illinois (Table 1).

Nomenclature used throughout this bulletin follows the *Integrated Taxonomic Information System* —the ITIS database utilizes real-time access to the most current and accepted taxonomy based on scientific consensus. Preferred common names and spelling, withstanding several obligatory changes, adhere to Little (1979). State threatened and endangered species status corresponds to data published by the Illinois Endangered Species Protection Board (2015).

Tree species prevalence (Table 2), or commonness, and county distribution generally follows Iverson et al. (1989) and Mohlenbrock (2002). Additional sources of data with respect to species prevalence and county distribution include Mohlenbrock and Ladd (1978), INHS (2011), and USDA's *The Plant Database* (2012).

Table 2. Species prevalence (*Source:* Iverson et al. 1989).

Common — widely distributed with high abundance.
Occasional — common in localized patches.
Uncommon — localized distribution or sparse.
Rare — rarely found and sparse.

Basic highlights of this tree checklist include the listing of 29 native hawthorns (*Crataegus*), 21 native oaks (*Quercus*), 11 native willows (*Salix*), 10 native hickories (*Carya*), eight native conifers, and seven native maples (*Acer*). As of May 2015, there are seventeen native tree species in Illinois listed as "endangered" and six native species listed as "threatened" (IESPB 2015).

Table 1. List of native trees and tree-sized shrubs, arranged alphabetically by genus, found in Illinois.

Scientific Name (Accepted Binomial)	Preferred Common Name & Spelling	Plant Family / Synonym	Prevalence in Illinois	County Distribution	Threatened & Endangered *(state status)*
Acer floridanum	Florida maple	Sapindaceae (syn: Aceraceae)	uncommon	4	—
Acer negundo	boxelder	Sapindaceae (syn: Aceraceae)	common	102	—
Acer nigrum	black maple	Sapindaceae (syn: Aceraceae)	common	40	—

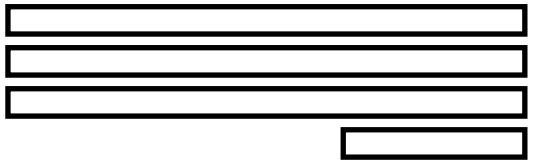
https://extension.illinois.edu/forestry/resources

Resources

- U of I Extension Forestry website
- Illinois Champion Trees StoryMap
- Champion Trees National Register website

Citation: Hayek, J.C. 2020. In Search of Big Trees: The IL Big Tree Register. Univ. of Illinois Extension Tech. Forestry Bull. NRES-1105. 64 p.

Questions / Contact Us



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