2023 SHASTA FORESTRY CHALLENGE
FIELD TRAINING WORKSHEET
TRACK A

Introduction:

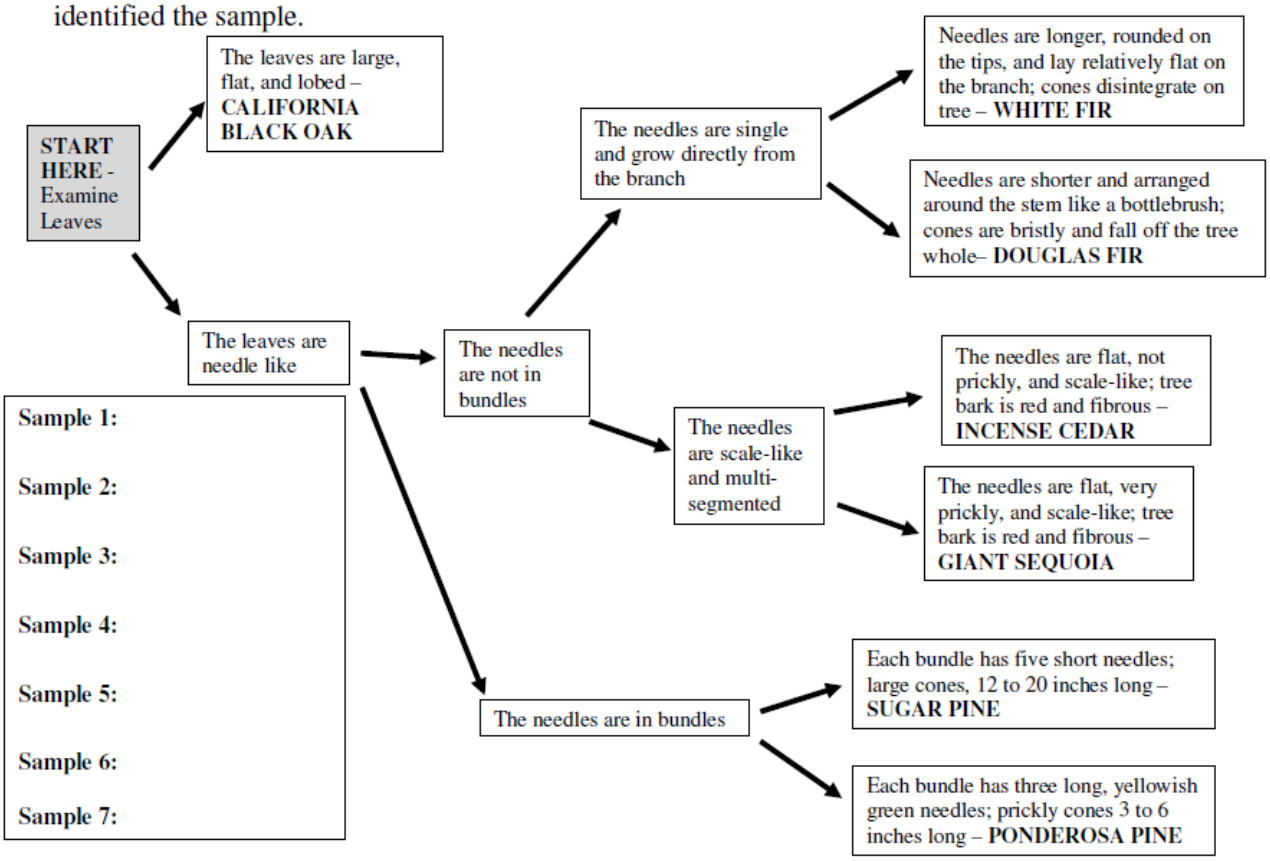
Foresters must be able to gather and interpret data in order to make sound management decisions. This morning you will be trained in several skills necessary to be a forester. Be sure to pay attention and ask lots of questions, because your team will be tested on these skills in the Field Test tomorrow.

Training Track A	Time	Training Track B
Tree ID, Species Comp Surveys, Canopy Position	**9:05 – 9:45**	Dichotomous Plant Keys
Angle Gauge, Limiting Distance Table	**9:50 – 10:30**	Diameter Tape, Clinometer, Biltmore Stick, Pacing
Volume Tables, Market Values	**10:35 – 11:15**	Compass, Densitometer
Maps	**11:20 – 12:00**	Tech – Plot Hound

Note to Trainers: Please give a brief introduction to each group, telling them your title, employer, years of experience, education, and reason for your career choice.

Forestry Challenge Tree ID Using a Key

Directions: Using a foliage sample (and cone, if available) of the tree you want to identify, start at the gray box and answer each question, which will move you to another box until you have identified the sample.



Important Tree Species	Characteristics – leaf, cone, form, where it grows
ponderosa pine	
sugar pine	
Douglas-fir	
white fir	
incense-cedar	
giant sequoia	
California black oak	

Field Training Exercise: Species Composition Survey

Flagging marks the corners and sides of a 1/10-acre square plot. Conduct a Species Composition Survey on this plot by identifying and counting by species all trees with a DBH of 10 inches or more.

Species: _____ # trees: _____

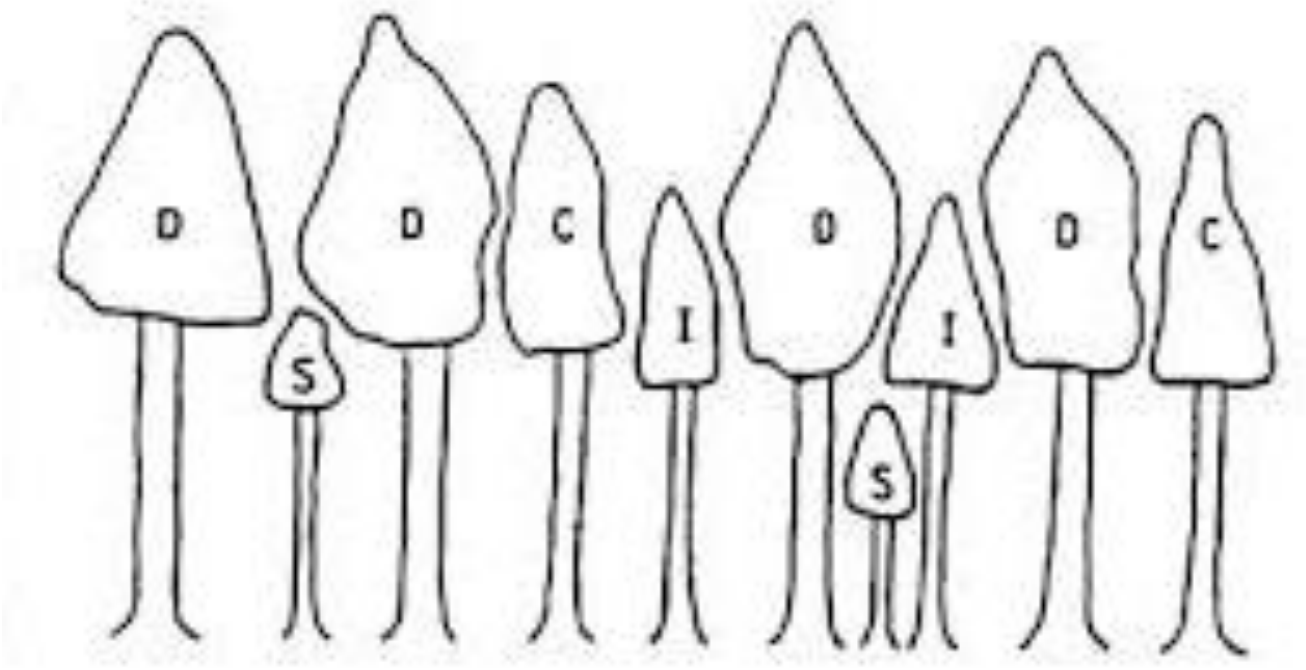
Species: _____ # trees: _____

Species: _____ # trees: _____

Species: _____ # trees: _____

Species: _____ # trees: _____

Canopy Position



D = Dominant **C = Co Dominant**

I = Intermediate **S = Suppressed**

Field Training Exercise:
Using an Angle Gauge to Determine Basal Area

Use the angle gauge provided. Standing over the plot center, and sighting past the angle gauge, determine the number of trees that are "IN", or should be counted

Number of Trees "In" _____ Compute the basal area of this plot.

Number of Trees "In" _____ Compute the basal area of this plot.

Note – Use the Limiting Distance Table provided to determine if borderline trees should be counted. Also, dead trees are not counted.

Determining Board Feet and Market Value
Using a Volume Table and Market Prices

Measure two trees and determine the DBH and height **classes**. Next, choose the species-correct volume table in the set provided to determine the board feet in the tree, and the market prices listed below to determine the total value of the timber.

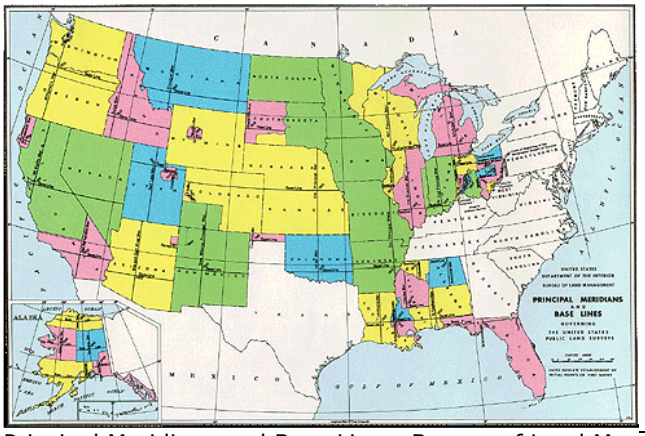
Tree #	DBH Class	Height Class	Board Feet	Value
1	___ **inches**	___ **feet**		
2	___ **inches**	___ **feet**		

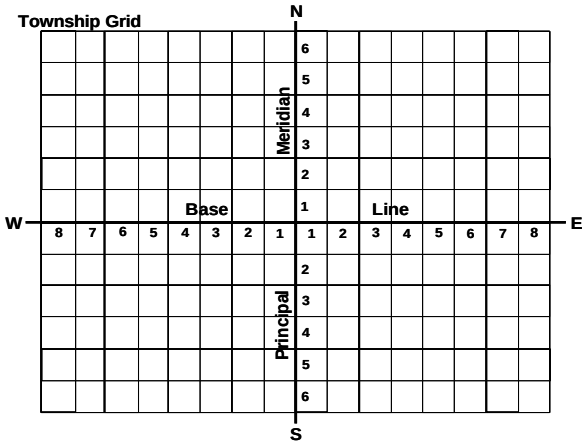
CURRENT MARKET PRICES (Delivered to the Sawmill):

ponderosa pine:	$400 per 1,000 board feet
sugar pine:	$375 per 1,000 board feet
white fir:	$400 per 1,000 board feet
Douglas-fir:	$650 per 1,000 board feet
incense cedar:	$575 per 1,000 board feet

Field Training Exercise: Map Interpretation

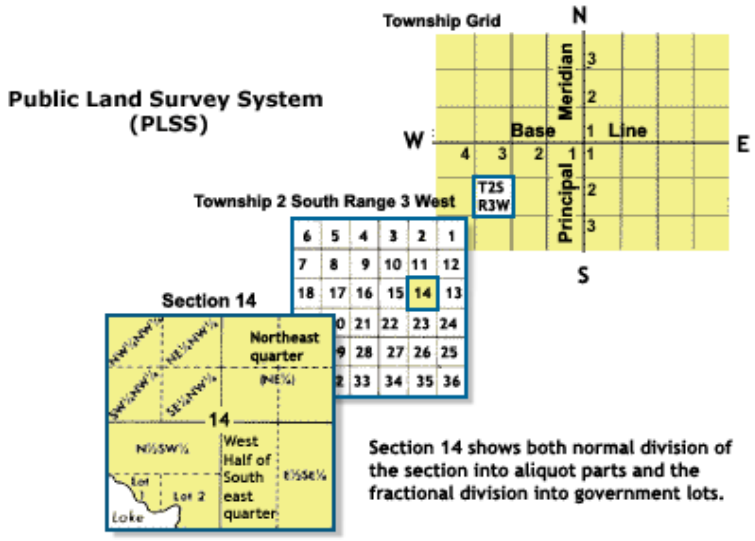
The Public Land Survey System (PLSS) is a way of subdividing and describing land in the United States. All lands in the public domain are subject to subdivision by this rectangular system of surveys, which is regulated by the U.S. Department of the Interior, Bureau of Land Management.

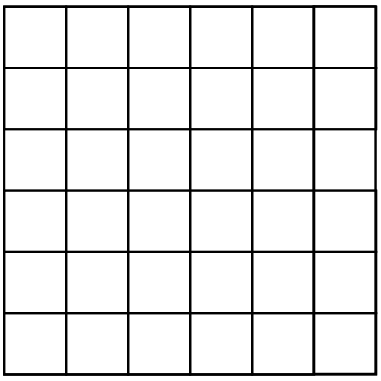




Principal Meridians and Base Lines, Bureau of Land Management

The PLSS typically divides land into 6-mile square townships. Townships are divided into 36 one-mile square sections.





Practice filling in the section numbers on this township grid

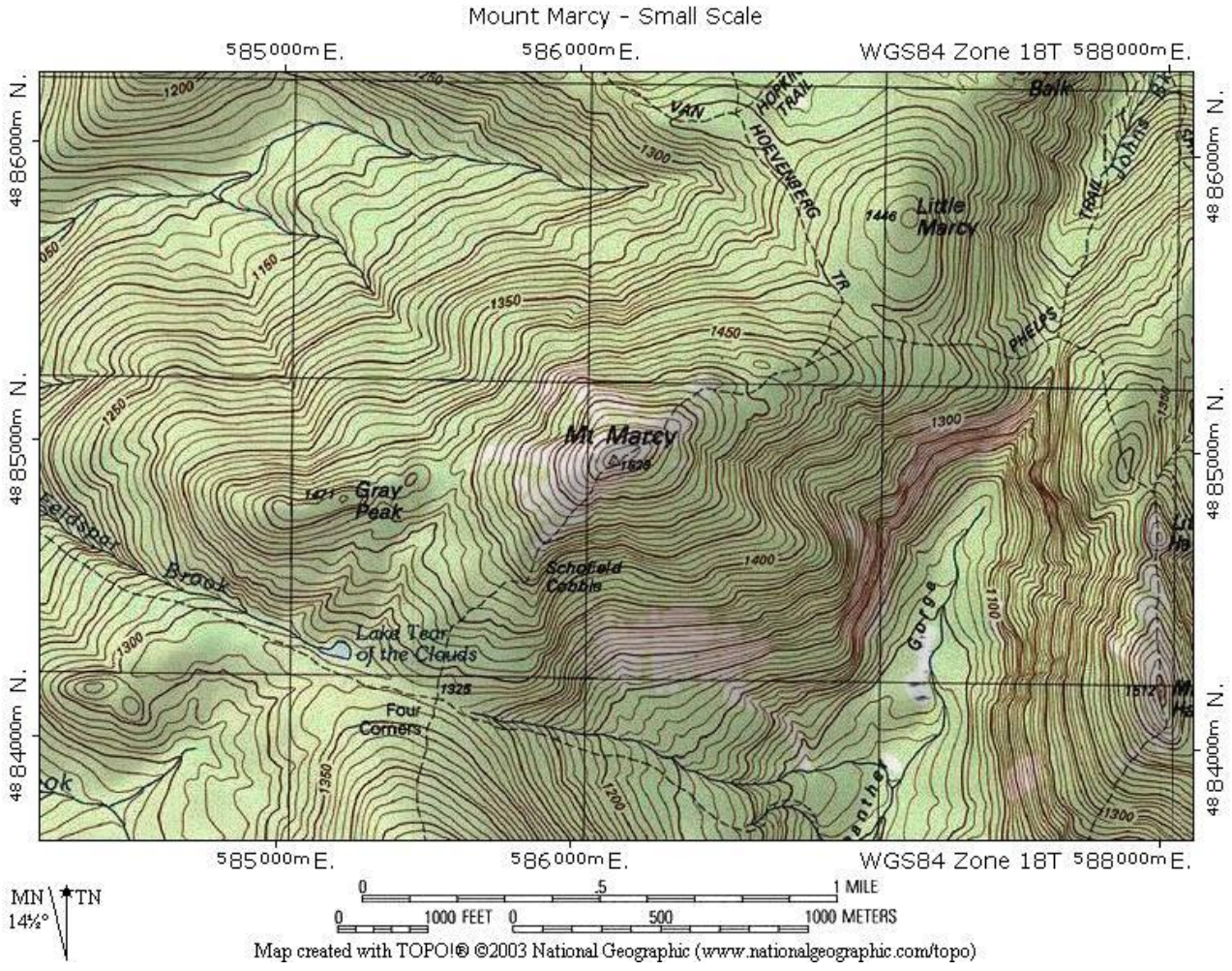
Legal land descriptions include the section, township and range numbers, and the name of the principal meridian. For example, Green Valley Lake Christian Camp is located in Sections 28 and 33, Township 2 North, Range 2 West, of the San Bernardino Base and Meridian.

Topographic Maps: Key Components

Contour Lines: Contour lines indicate a constant elevation as they follow the shape of the landscape. Generally, every fifth contour line is printed on the map in a darker color and marked with the elevation. The contour interval, which is the difference in elevation between one contour line and the one next to it, varies for different maps, so look at the map's key or in its margin to read what it lists as the contour interval for the particular map you're using.

Hilly areas are depicted by closely spaced contour lines, and flat areas have few--or no--contour lines. To determine whether a potential route of travel ascends or descends, look at the elevation numbers. If the route crosses contour lines marked with increasing elevations, the route goes uphill; conversely, if the elevation markers decrease, the route goes downhill.

Scale: Look to the margins of a map or to the map's key for its scale, which gives you information about the ratio between measurements on the map and the landscape's actual measurements. For example, one inch of map space may represent one mile across the land.



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Note to Trainers: Please give a brief introduction to each group, telling them your title, employer, years of experience, education, and reason for your career choice.

Field Training Exercise: How to Use a Dichotomous Key to Identify a Plant

Using the plant key provided, identify the three flagged plants. Write the page number of each step you complete so you can get partial credit. If there are two steps on the same page, write that page number twice. Hint: The key starts on Page 6, so write the number 6 in the first blank.

Plant A: Pages: _____,_____,_____,_____,_____,_____,_____,_____

Plant A's Common Name: _____

Plant B: Pages: _____,_____,_____,_____,_____,_____,_____,_____

Plant B's Common Name: _____

Plant C: Pages: _____,_____,_____,_____,_____,_____,_____,_____

Plant C's Common Name: _____

Field Training Exercise: Determining DBH and Height Using a Diameter / Logger's Tape and Clinometer

Select two trees to measure. Name the species of two trees. Measure the trees using a diameter tape and a clinometer. Use a 100 foot tape to measure the distance from the tree.

Tree #	Species	DBH (nearest tenth inch)	Total Height (nearest ft)
1			
2			

Determining DBH Class and Logs Using a Biltmore Stick

Select two trees to measure. Name the species. Use the Biltmore Stick to measure the dbh class. Pace out either 66 feet (1 chain) or 99 feet (1 ½ chain) and determine the total height in logs. You must be able to accurately pace the distance without the use of a measuring tape.

Tree #	Species	DBH Class	Height in # Logs
1			
2			

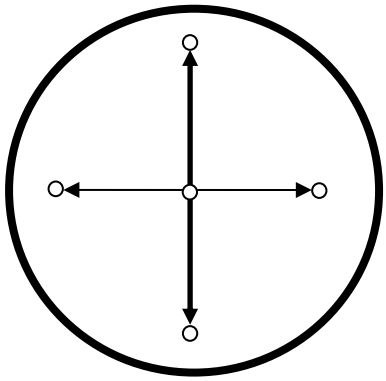
Pacing

The most basic forest measurement is pacing or counting your number of steps to determine how far you've traveled in the woods. A compass helps you determine which direction you are walking, but pacing allows you to determine distance. In forestry, the standard unit of distance measurement is a chain, which equals 66 feet. Years ago, surveyors literally dragged a 66-foot-long chain around with them to measure properties, which were measured in chains and links. It may seem like an awkward number to use, but the number 66 divides evenly into 5,280, which is the number of feet in a mile. There are exactly 80 chains in a mile. In addition, one square chain is one-tenth of an acre. These numbers are easy to remember. Today, foresters measure chains by knowing how many paces they take in 66 feet. A pace is equal to two steps. To determine your pace, measure out 66 feet using a 100-foot measuring tape, and count every other step (for example, every time your left foot hits the ground). People range between 10-17 paces per chain.

- 1 pace = 2 relaxed steps
- 80 chains = 1 mile
- 1 square chain = 1/10 acre
- Several forestry tools are calibrated to be accurate from a distance of one chain.

Reading a Compass to Get a Directional Heading

Following a bearing refers to setting a bearing on the compass and then following that bearing along a line to the destination.



Turn the dial of the compass to the direction you want to go (for example, east is 90 degrees.) Turn your body until the red arrow lines up with the white outline underneath. Use the mirror to see the arrows. Sight over the top of the compass through the notch and find an object in the distance to walk towards to go in the desired direction.

Field Training Exercise: How to Use a Densitometer

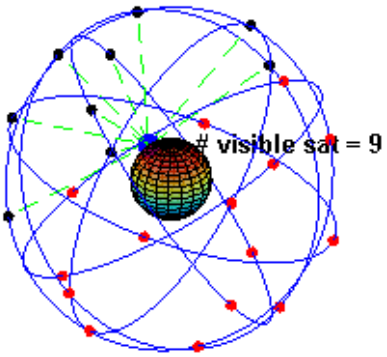
Look through the glass with the black circle. Use the levels inside the tool to make the long section perfectly upright (level in both planes). While holding the tool still, look into the tool at the cross hatches (there are mirrors inside it so you can see around the corner) and determine whether or not the intersection of the black lines has sky or vegetation behind it. If there is sky, it is a negative for canopy cover. If there is vegetation, it is a positive for canopy cover.

Use this tool over the 10 designated points marked with pin flags, and record positive or negative (+ or -) readings in the spaces below:

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____

Multiply the number of positive readings by 10 to get the percent canopy cover.

Tech – Plot Hound



GPS receivers use a constellation of satellites and ground stations to compute position and time almost anywhere on earth. At any given time, there are at least 24 active satellites orbiting over 12,000 miles above earth. The positions of the satellites are constructed so that the sky above your location will always contain at most 12 satellites. The primary purpose of the 12 visible satellites is to transmit information back to earth over radio frequency. With this information and some math, a ground-based receiver or GPS module can calculate its position and time.