Forest Inventory

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Objectives of Course

- **Participants will understand the concepts of forest inventory.**
- **Participants will understand the use of common forest inventory tools.**

What is Forest Inventory?

Forest Inventory is a systematic approach to finding out about all the forest resources in a forest stand. It helps you to discover how large the forest is, what kinds of trees grow there, how many trees per hectare, what the soil is like, what wildlife species use the forest, and many other things that you need to know.

Why do Forest Inventory?

You must know all available information about a forest before you can manage the forest in a knowledgeable way. You cannot teach the local people about the forest if you do not fully understand all the parts of it.

What do We Inventory?

Tools for Forest Inventory

How do We Measure the Forest?

There are many tools that we can use to measure distances, size of the trees, and other things that we need to know.

Logging Tape

A logging tape is used to measure distances during the inventory process. The two sides of the tape show different scales. One side has a distance measurement in meters, and the other side has a tree diameter scale in centimeters. You must be careful to use the proper side of the tape for each kind of measurement.

Logging Tape

You can measure up to 30.5 meters in distance with the tape and up to 500 centimeters in tree diameter.

Logging Tape

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Diameter Tape

The diameter side of the logging tape is used to measure the diameter of a tree trunk at 1.37 meters from the ground. It is very easy to use and is also very accurate.

Diameter Tape

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Diameter Tape

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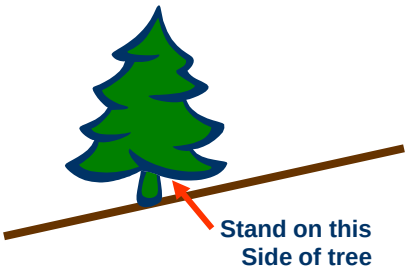
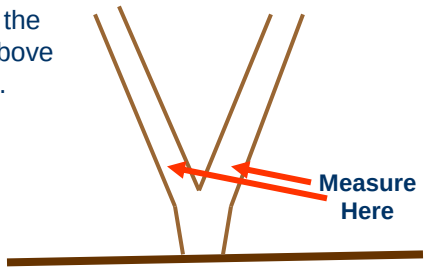


Diameter Tape

If the tree is forked (grown into 2 trunks), measure the diameter of each fork above the place where it forks.



Diameter Tape

Clinometer

A clinometer can be used to measure tree height. It can also be used to measure slopes when conducting soil and water conservation evaluations, so it is a multi-purpose tool. It is more difficult to learn to use, but it is a very accurate tool once you have learned.

Clinometer

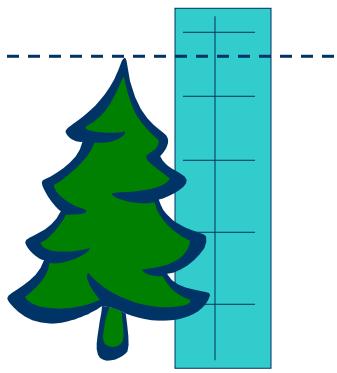
Clinometer

To use the clinometer, hold it to your eye with both eyes open. Look through the lens and along the outside of the instrument at the same time. Raise or lower the clinometer (by tilting your head) to place the sighting line at the top or base of each tree.

Clinometer

To measure tree height, stand at the baseline distance of 30.5 meters from the tree, sight the top of the tree and read the scale; sight the base of the tree and read the scale.

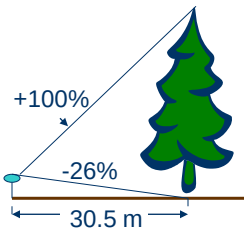
Clinometer



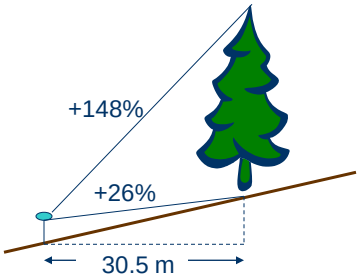
Clinometer

To compute tree height, add the 2 scale readings if you looked up to the top of the tree and down to the base, or subtract the height to the base of the tree from the height to top if you had to look up to both the top and the base of the tree. Divide this number by 3.2808 to get the height of the tree in meters.

Clinometer



Tree Height
100+26/3.2808=38.4m



Tree Height
148-26/3.2808=37.2m

Clinometer

It is much easier to measure height of trees on slopes if you stand on the same slope contour as the tree. Sometimes this is not possible because you cannot find a place on the same contour where you can see both the bottom and the top of the tree.

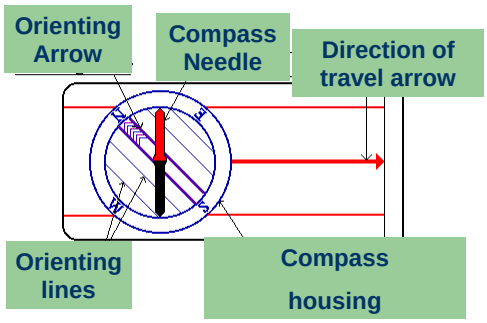
Clinometer

You will need to clean the clinometer sometimes to remove the dust. You may just wipe it with a soft, clean cloth to do this. Do not open the clinometer housing.

Compass

A compass is used in the inventory process to lay out the lines of measurements to be made. It is a useful tool to help prevent getting lost in the forest as well.

Compass



Compass

When using the compass, you must be careful to hold it level in front of you so that the compass needle can swing freely. The red end of the needle will point north.

Compass

A bearing is a measurement of travel direction between two points. It is expressed as the degrees of the angle of the travel direction. You must orient the compass to the bearing that you will travel. You do this by turning the compass housing to the bearing of the direction you want to go.

Compass

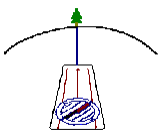
After taking the bearing, hold the compass level and in front of you, so that the direction of travel arrow points to the destination.

Compass

Rotate your whole body until the magnetic needle lies directly over the orienting arrow. Make sure the north end of the magnetic needle points to N on the compass housing. The direction of travel arrow points to the destination.

Compass

Sight a prominent feature like a tree or a rock to which your direction of travel arrow points. Walk to that feature. Continue to sight on other features along the bearing and walk to them, until you reach your destination.



Compass

The north-seeking arrow on your compass points to north, but it can also point to local magnetic disturbances. Your metal clipboard might be one, as might your rifle, vehicle, wristwatch, sunglass frames, radio, or knife. Be careful not to hold your compass over metal objects. Iron ore deposits can also be a natural source of magnetism which will disturb the compass.

Compass

Be careful not to drop the compass because the mirror or the liquid-filled dial will break.

The compass may be cleaned by wiping it with a clean, soft cloth. Take care not to drop the compass as this can damage it.

Inventory Methods

Samples

We cannot count and measure every tree in the forest. It would take much too long. But we can count and measure enough of them to give us a sample of what the average conditions in the forest are like.

Samples

There are several ways of taking samples of the forest:

1. Systematic Method
2. Randomized Method
3. Selection Method

Samples

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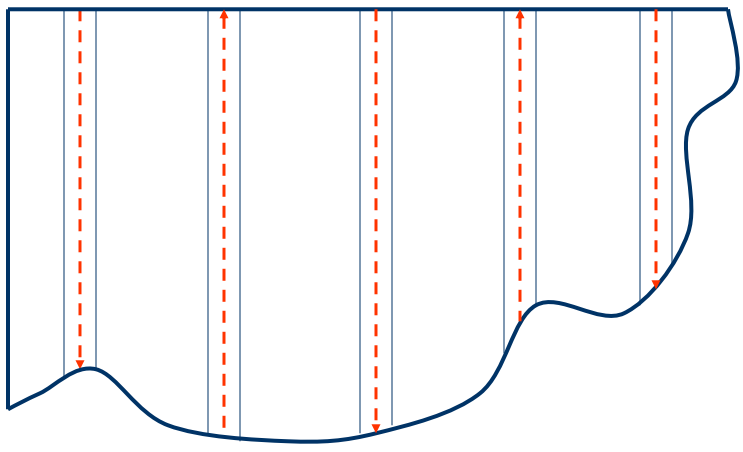
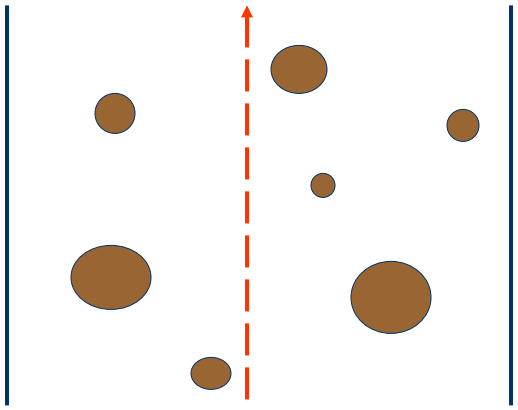
Strip Sampling

In strip sampling, the sample units are continuous strips of uniform width spaced at a predetermined distance apart. The width of the strips and the distance between the centerline of the strips determines the percentage of the area sampled.

Strip Sampling



Strip Sampling



Plot Sampling

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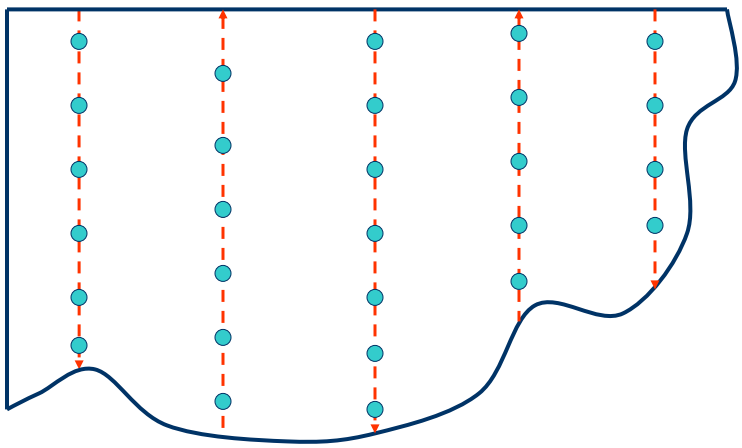
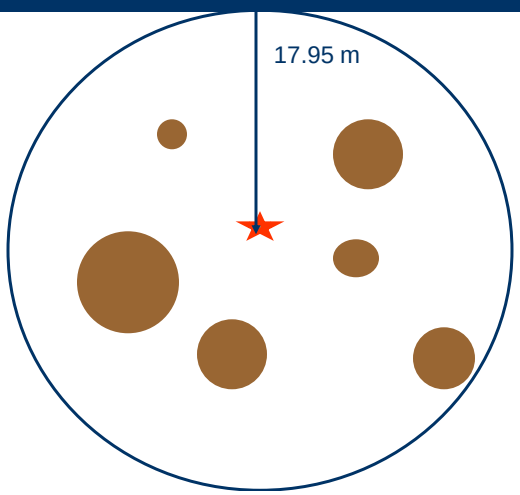
Plot Sampling



Plot Sampling



Maps

Maps

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Topographical Maps

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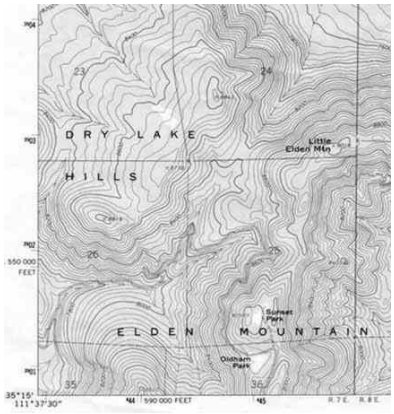
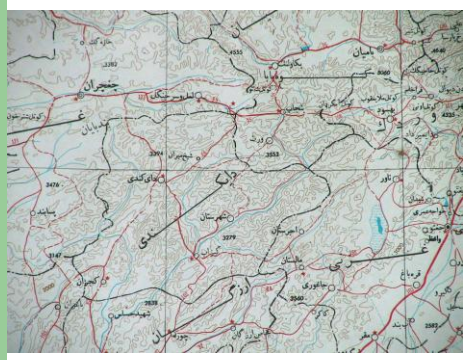


How do we use the map?



Interpreting the colored lines, areas, and other symbols on the map is the first step in using topographic maps.

What do the colors mean?

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Map Scale

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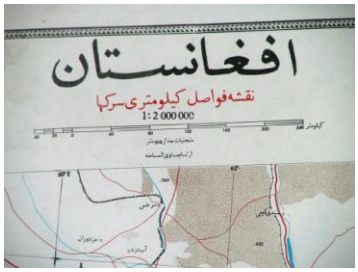

Map Scale

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North Arrow

Each map should have an arrow that indicates which direction north is on the map. You can use this arrow to orient yourself with the compass.

Contour Lines

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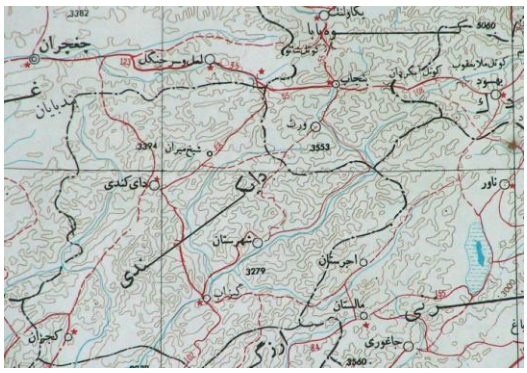
Contour Lines



Contour Lines

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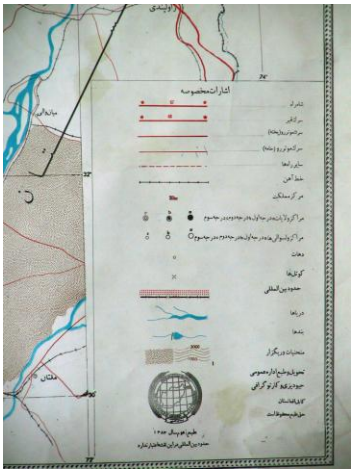
Map Legend:



The map legend tells you what the symbols on the map mean.