

## Forest Field Trip in the White River Valley --- Field Information and Questions

Name \_\_\_\_\_ Name \_\_\_\_\_

**Both students hand in this packet at the end of the day at the Cage.**

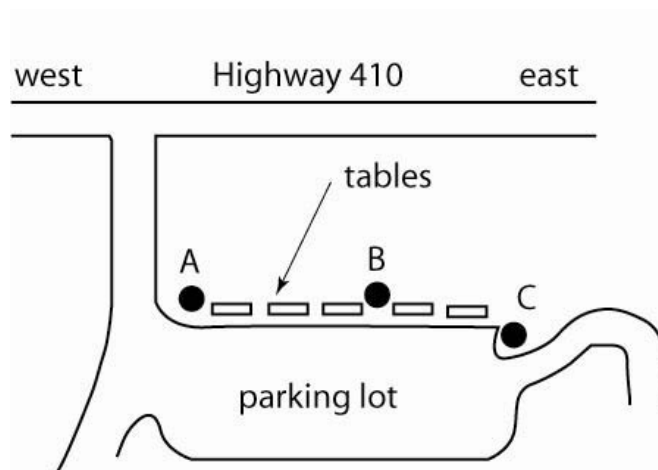
This field trip will visit several localities along the White River, which flows west from Mt. Rainier towards Enumclaw. We will be examining old growth and second growth forests along the White River, and measuring the sizes of Douglas fir trees (both height and circumference). You will use the height versus circumference data in next Wednesday's project. We will also make some observations about the other vegetation associated with these forests, that will also be part of next Wednesday's project. If time permits, we will be discussing the history of volcanic mudflows (lahars) that have come down from Mt. Rainier and how biometric data on Douglas fir trees can help determine the ages of Mt. Rainier lahars.

### **Stop # 1: Recent Clear Cut Along Highway 410**

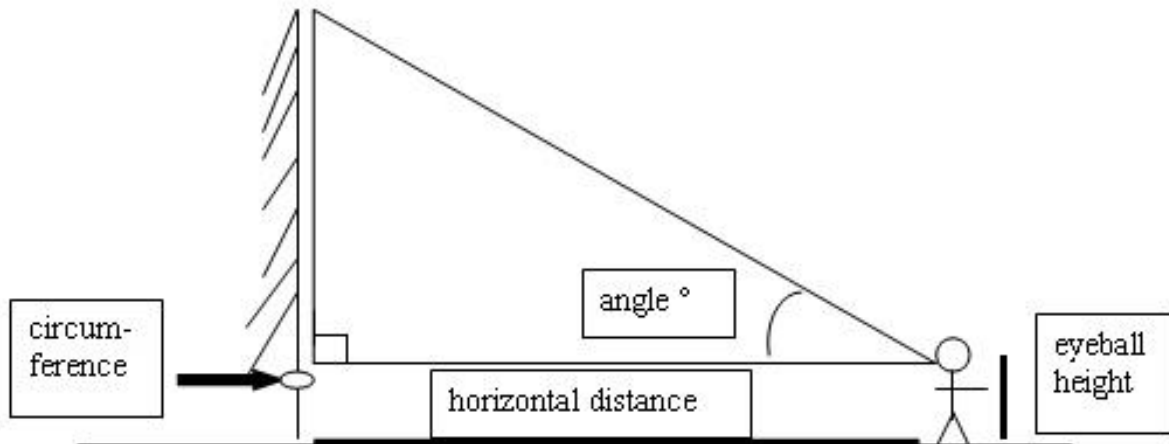
Private land owned by Weyerhaeuser (?) has been clearcut within the last month or so. Notice old partially rotten stumps from the original clearcut around 1890-1900 (just guessing). The Washington Forests and Fish Law, promoted by former Gov. Gary Locke and enacted in 1999 by the Legislature, required stream-side buffers of trees; once such buffer is right in front of you. In theory, this belt of trees is supposed to (1) shade the small stream from overheating in direct sunlight, (2) prevent erosion of stream banks and siltation of streams, and (3) help maintain the natural chemistry and nutrient load of this small stream. In return for not logging this stream-side buffer, timber companies were shielded from the Endangered Species Act for 50 years and could not be held accountable for any environmental damage to endangered salmon.

### **Stop # 2: Federation Forest and Procedural Validation**

After using the restrooms and getting organized, you will measure the height and circumference of three trees (A, B and C) around the parking lot (see map below). BE CAREFUL in the parking lot; watch for incoming cars, and don't walk on/walk over other people's tapes. Fill in the labeled columns on your pre-printed data sheets.



The measuring procedure is shown below. For each tree, enter the Stop #, the eyeball height (in meters), the horizontal distance to the tree (in meters), the angle from the horizontal to the top of the tree, and the circumference of the tree (in meters) measured approximately at chest height.



You should step back away from the tree far enough so that your angle is roughly between  $30^\circ$  and  $45^\circ$ . This range of angles will give you the best results. We will check your results to make sure you are on track.

We will take a short walk along the nature trail and look at some of the vegetation. Take notes on the different species/types of vegetation that are found in this mature forest. At the end of the walk, rank the top 5 types of understory vegetation in terms of their abundance (# of plants).

1.

2.

3.

4.

5.

### **Stop 3: Dalles Campground Restrooms and Lunch Stop**

You can eat your lunch anytime you want but we will take a short break here, especially if it's raining. There is a small toilet facility.

**Stop 3A:** Walk down the main campground road. There are many Douglas fir approximately 350 years old growing atop this flat area (a geologic *terrace*). Each pair/group should measure the height and circumference of at least several of these big trees growing on this terrace.

The terrace is a *depositional* feature (not an erosional feature) built up layer by layer. Two kinds of layers or deposits are present. Some layers are made of *lahars*, an Indonesian word for *volcanic mudflow* or *volcanic debris flow*. Lahars are NOT lava flows. Lahars are formed when big hunks of Mt. Rainier give way and travel first down the volcano and then down valley. Lahars contain old volcano rock, soil, sand, gravel, trees and other vegetation, all mixed together and lubricated by melted snow and ice and river water. Lahars are flows of debris, not lava, and are often very rich in clay material from rotten volcano rock. The last monster lahar from Mt. Rainier was the Osceola lahar, which came down about 5,800 years ago, and traveled all the way to Auburn. The volume of the Osceola lahar was about 4 billion cubic meters.

The second kind of layer or deposit is caused by flooding of the White River during heavy rains and/or snowmelt or when water backs up under the glaciers on Mt. Rainier and then releases quickly as a *glacial outburst flood*. These *river flood deposits* are mostly sand, gravel and boulders.

How could we determine the age of the most recent deposit that makes up this terrace?

**Stop 3b:** Big tree at end of walk. This tree is how many years old? \_\_\_\_\_  
This tree is approximately 84.1 meters tall and is approximately 9.45 meters in circumference.

**Stop 3C:** Trees were buried by a *debris flow* along Minnehaha Creek. NOT a lahar, but a non-volcanic debris flow that came down from the hills on the opposite side of 410 and partially filled the creek valley. The buried trees have partially rotted away but are still partially preserved; some of them were buried in growth position. Sketch the buried trees in cross section, a vertical slice down through the Earth. Extend the cross section underground to the river level (approximately). Label/indicate the thickness of this debris flow.

**Stop # 4: Young Second or Third Growth Forest**

Between the Dalles and Federation Forest along US Forest Service Road # 72/7260 is a former clearcut that has been planted in Douglas fir trees. We will spend about 30-45 minutes here measuring Douglas fir heights and circumferences, using the same technique as before.

- A. Try to keep the ground horizontal; measure along a horizontal trajectory
- B. Try to measure a **range** of Douglas firs, from small to large.
- C. Try to measure the **largest** of the 2nd/3rd growth Douglas firs in this clearcut.
- D. Try to measure as **many** as you can in the time allowed. A dozen would be reasonable.

This clearcut was probably planted, and was probably planted all at the same time, yet the trees are not all the same size. Why not? Give at least two **different** explanations why the trees differ in size.

a.

b.

Look around this planted clearcut. Which tree size (circumference, height) is most representative of this planting? In other words, how big is the most typical tree?

We will take a short walk together into this 2nd or 3rd growth forest, and make a simple census of the variety and density of understory vegetation growing in the forest (other than the Douglas firs). Take notes.

How does the understory in a planted second growth forest compare with the understory at the older forest at the Federation Forest nature trail (stop 2)?