Lab: Forestry and Conservation

Background: To develop a sensible approach to conservation of trees, it is helpful to get an idea of the amount of wood in a tree. It is also important to know the amount harvestable per acre and the size of the area that must be logged to provide the lumber for a specific purpose, such as building a house. The amount of lumber that can be harvested from a tree depends upon the height and diameter (dbh) of the tree. A useful measure of tree volume is a unit called the board foot. One board foot has a volume equal to that of a block of wood that is 12 inches long, 12 inches wide, and 1 inch thick. The Biltmore Stick, which originated in the mid 18th century, is one way to easily measure the height and dbh of a tree. The Biltmore Stick is pre-marked for determination of the number of 16 foot logs in a tree while standing at a distance of one chain (66 feet). The first step, therefore, is to determine your pace – how many normal steps it takes you to travel 66 feet. Walk the 66 foot distance twice and calculate your average pace.

Activity: 1. Steps needed to travel 66 feet: _____

Now walk one chain away from a tree and use the Biltmore Stick to calculate the height. Hold the stick 25 inches away from one eye, at shoulder height, lining the stump of the tree with the bottom left side of the stick. Record the height of the tree to the marketable height. The dbh is measured 4.5 feet off the ground. Center the tree on the Biltmore Stick, now horizontal, and subtract the measurement on each end to determine the diameter. Use the table on the Biltmore Stick to estimate the number of usable board feet from the tree.

2. Measure four trees using the Biltmore Stick. Record your measurements below.

Tree Species	DBH (in)	Height (16 ft lengths)	Height (ft)	Board Feet

3. Estimate the number of harvestable trees in the Green Hope Forest Research Area: _____

Analysis:

4. Based on the trees you measured, estimate the total board feet available from the Area: _____

5. A 2,000 square foot home framed would contain about 20,000 board feet of lumber. Including cabinets would add another 3,000 board feet to the estimate. Based on the average number of board feet in your four trees, how many trees would be necessary to build a home? _____

6. How many trees would be needed to build an average 100-home development? _____

7. Discuss how periods of major housing construction affect the forests used for lumber.

8. What could be done to reduce the number of trees needed for construction? (stop building homes is NOT an option)

9. What could be done to reduce the effects of tree harvesting on the forest ecosystem? (think types of harvesting)

10. Compare and contrast the effects of harvesting trees from a tree farm, a secondary growth forest and an old growth forest.