

Chapter 10 Sustaining Terrestrial Biodiversity: Forests, Public Lands, Grasslands, Wetlands & Cities

Forestry & Ecosystem Services

Trees are a vital resource to humans providing everything from paper to building materials, but how can we manage forests in a sustainable manner? In some cases, trees can be harvested in a low impact fashion, while in other cases, entire forests should be left alone. Some key forestry principles include:

** Some of the methods for mitigating deforestation include reforestation, using and buying wood harvested by ecologically sustainable forestry techniques, and reusing wood.*

** Methods to protect forests from pathogens and insects include integrated pest management (IPM) and the removal of affected trees.*

** Prescribed burn is a method by which forests are set on fire under controlled conditions in order to reduce the occurrence of natural fires.*

** Clearcutting can be economically advantageous but leads to soil erosion, increased soil and stream temperatures, and flooding. Trees absorb pollutants and CO₂. The cutting and burning of trees releases CO₂ and contributes to climate change.*

Your task today is to calculate the value of an area of forest in terms of the monetary value of lumber as well as the social cost of removing the same trees. Our forest today is the EGHS courtyard. In order to calculate the value of the trees, you need to learn how to use a *Biltmore Stick*

How to use a Biltmore Stick:

1. At a distance of 25" from your eye, hold horizontally and against the tree trunk at chest height (approx.. 4.5 feet above the ground record the diameter of the tree. (You may want to make ave. of 2 measurements by making 45 degree turn around the tree & repeat.)
2. Pace 66 feet from the tree trunk and hold stick vertically, 25" from your eye. Line the end of the stick with stump height to the point where major branches begin (called merchantable height) and read the number to the nearest half log

1. Calculate area of courtyard in square feet and then convert to acres (to one decimal place. 1 acre = 43,560 square feet)
 - a. basic calculation with the courtyard as parallelogram (lazy version)

_____ acres

- b. advanced calculation that incorporates the jut out from the library (precise, thorough version)

_____ acres

2. Using Biltmore Sticks*, calculate the amount of wood in the courtyard.*

** To simply things, we will average some of the numbers*

- a. The total number of trees in the courtyard: _____ trees

- b. Calculate the number of board feet for 5 trees and average the total number:

_____ ave. board feet per tree

- c. Multiply the number of board feet calculated above by the number of trees in the courtyard

_____ total number of board feet in courtyard

3. Calculate the value of this timber. Current rates for prime oak are \$0.50 per board foot for red oak are \$0.75 per board foot for white oak. Once again, to simplify things assume half the timber from question 2a is red oak and the other half white oak.

\$_____ value of red oak timber

\$_____ value of white oak timber

\$_____ total value of all timber

4. If you chose not to harvest the trees in the courtyard, they would offer another form of value in terms of absorbing and storing carbon. A fifty-year old oak forest in RI can sequester on average, 88 tons of carbon per acre per year. With about 400,000 acres of forest in the state, that is 35 million tons of carbon sequestered annually for free – the emission equivalent of 6 million cars. With this information, calculate the amount of carbon that is sequestered each year in the courtyard and discuss any addition ecosystem services the courtyard provides.

_____ tons of carbon per year

5. What other ways does the courtyard offer value to us if the trees were not harvested or the area not developed?

6. Create a chart that summarizes the major ways in which trees are harvested, as well indicating the economic and environmental pros and cons of each method. For example, one particular way is 'clear-cutting'.

7. What are some things that can be done to mitigate deforestation?

8. Identify 5 reasons why we need to harvest timber.

9. Describe the practice of 'sustainable forestry' and some of its key ideas.