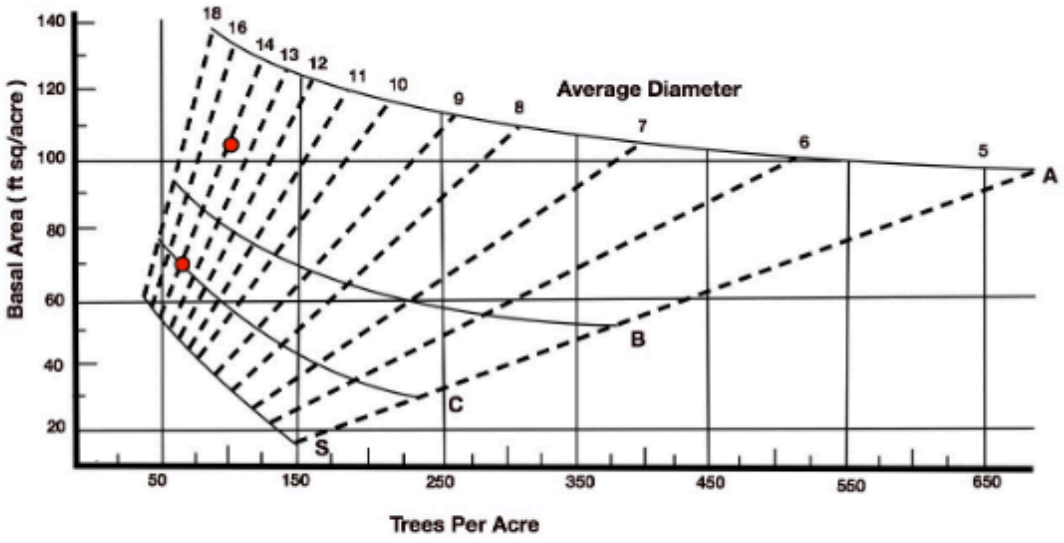
Sugar Stand Evaluation

Background: Every maple producer must first find out if they have a viable maple stand for their sugaring operation. To find out if your maple stand could be a profitable resource in a sugaring operation, you must look at your density of tappable maple trees. In general, you need approximately 40 taps per acre. In this process you can also determine if your wood lot needs to be thinned or left to grow. **Stocking charts** are a resource used by most foresters to determine if you are overstocked or under stocked for timber production. Understanding what your stand of woods is suitable for can indicate what you may want to use it for and also give indication of how you want to manage your land.

Stocking Charts:



Above the A line, a stand is overstocked, meaning there is not adequate space for trees to grow fully. Between the A and B line is ideal stocking for timber production. Trees have enough space to grow tall, but are tight enough together that they will grow straight with few branches below the crown, ideal for timber value. Between the B and C line is suboptimal stocking for timber production. Here, trees have more space, so they will grow large, wide crowns, which diminishes the timber value. However, this is ideal for syrup production because these trees' large crowns have a greater capacity for photosynthesis, so they produce and store more sugar, increasing the sugar content in their sap. Below the C line, a stand is under stocked, meaning there are not enough trees for any kind of profitable commercial production, timber or syrup.

References and Resources:

Rechlin, M. *Maple Syrup: An Introduction to the Science of a Forest Treasure*. McDonald & Woodward Publishing Company. January 15, 2016.

Activity:

Forest Inventory:

Goal: This activity is designed to have students think about what resources are actually available with in tree stand, why some stands are commercially viable for timber or maple production, and why selective cutting may be advantageous.

Supplies:

- Wooded Area
- 5-37.2 foot long strings
- 5 Biltmore sticks, DBH tapes, or tape measures

Procedure:

1. Split class into 5 groups
2. Give each group a 37.2 ft long string. (This is the radius of a circle that is $1/10^{th}$ of an acre in area.)
3. Each group should pick a random spot within the woods.
4. Have one group member stand in this spot and hold one end of the string.
5. Have another student hold the far end of the string taught.
6. As the outer student moves in a circle, have the group record the **DBH** and species of each tree they encounter within their circle.

   DBH: Diameter at breast height, about four feet off the ground. This can be done with a Biltmore stick, a specific DBH tape, or a regular tape measure. If using a regular tape measure, wrap around the tree and record the full circumference then divide by pi because circumference is equal to the diameter multiplied by pi.
7. Calculate **Basal Area.**

   Basal Area: Basal area is the area of the tree trunk at breast height. We assume that all tree are circular, and the area of a circle is πr^2, where r is the radius of the circle. Therefore,

   $$Basal\ Area\ (sq\ ft) = \left[\left(\frac{DBH}{2}\right)^2 * \pi\right]/144$$

   The 144 accounts for the conversion from inches in DBH to square feet in Basal Area. Simplified, the formula becomes

   $$Basal\ Area\ (sq\ ft) = DBH^2 * 0.005454$$
8. Determine if the tree is tappable. If it is a maple over 10 inches in diameter it is tappable.
9. Have each group present their plot data to the class.
10. Have each student record all of the data, and work through the worksheet.