

Homework No. 7 – Stand Inventory

Stand Level Structure Summaries

Timber and non-timber resource values are related to stand structure. Clearly, the value of a stand for timber products is related to the distribution of trees or basal area by diameter class. More big trees, all else equal, equals more money when the trees are cut. Also, for many non-timber values, big trees or many trees or a diversity of trees by size might be very valuable. So describing stand structure is a key task that you will do many times in the future. You'll do this very soon in multi-resource assessment and capstone. You'll probably do this in the future, whether you go to work as a timber cruiser or as an ecologist for the Parks Service, Nature Conservancy, or as a consultant.

Foresters and forest ecologists often argue that stands with a “reverse-J” or “inverse-J” diameter distribution are probably uneven-aged stands. You can describe a “reverse-J” distribution with a “class ratio”, in forestry often called “ q ”. If $q = 1.3$, then the number of trees per acre in diameter class i is 1.3 times the number of trees in diameter class $i + 1$. With 2 in. diameter classes, a value of 1.3 for q is often expected in northern hardwoods. Foresters try to return stands to this distribution during a partial harvest. Is this natural?

Objective

In this assignment, you practice generating stand level summaries from plot level data. You need to use pivot tables, and remember some basics of forest measurement.

Instructions

There are two historic research projects, Study 75 and Study 76, on Section 30 of the School Forest and that were harvested in the winter of 2003-04. Prior to harvest, the continuous forest inventory plots in the area were re-measured. Your job is to generate some pre-harvest stand statistics using the CFI data.

Download the CFI data from the class website. Note that these were 1/5 ac. fixed area plots. A copy of the CFI field data sheet is also on the class website to help you make sense of the raw data.

Generate the following summaries at the stand level, for live trees only.

- 1) two-way cross tabulations
 - a. trees per acre by species and diameter class
 - b. basal area per acre by species diameter class

- 2) one way cross tabulations
 - a. trees per acre by diameter class and the 95% confidence intervals
 - b. basal area per acre by diameter class and the 95% confidence intervals

Then plot these last two frequency tables as histograms and include error bars to show the confidence intervals.

Product

Submit your answers in professional memo format.

Due Date

This assignment is due at the beginning of class on Monday March 23, 2009.