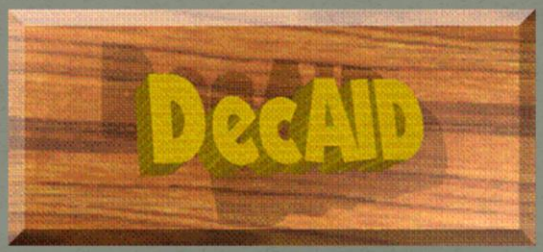
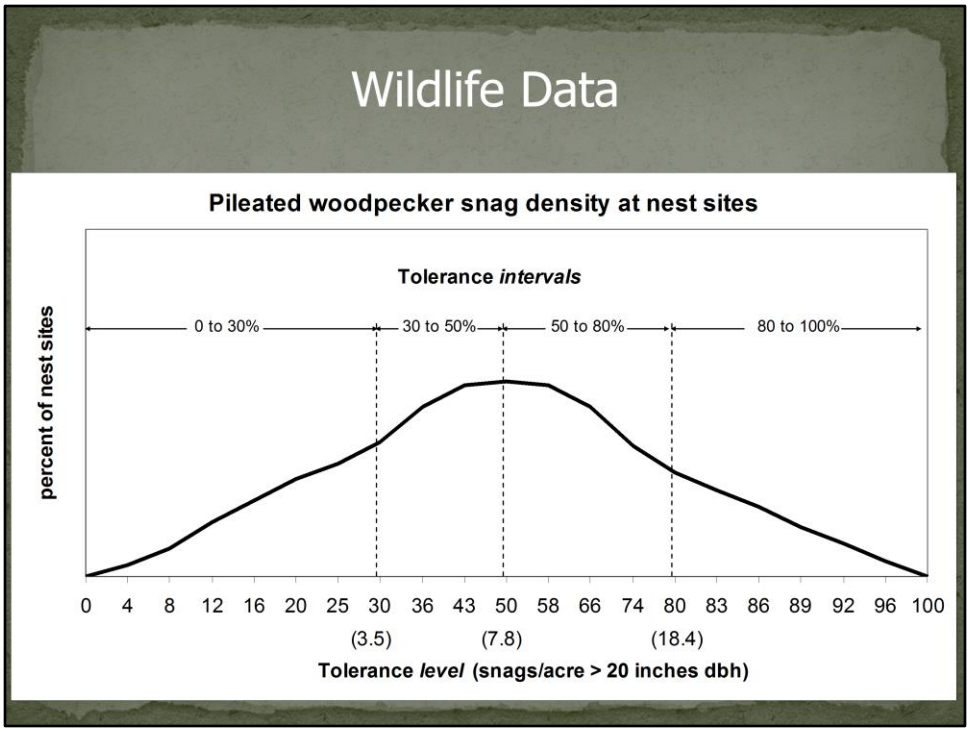
DecAID
Tolerance Levels



Objectives

- Know what a tolerance level is
- Know how to interpret tolerance levels on the DecAID website



Wildlife Data and Tolerance *Levels* and *Intervals*

The assumption is a normal distribution – this was tested by Bruce Marcot

The curve displays the **population of nest sites** and the snag densities assigned to those nest sites
The population was sampled, and based on the sample statistics tolerance levels were derived.

Tolerance intervals are similar to a confidence intervals with one major difference:
CI – the area under the curve represents expected distribution of **means from future samples**
TI – the area under the curve represents the expect distribution of the **population**

In a normally distributed population, the 50% tolerance level is equivalent to the sample mean, with 50% of the population occurring above and 50% below the 50% tolerance level.

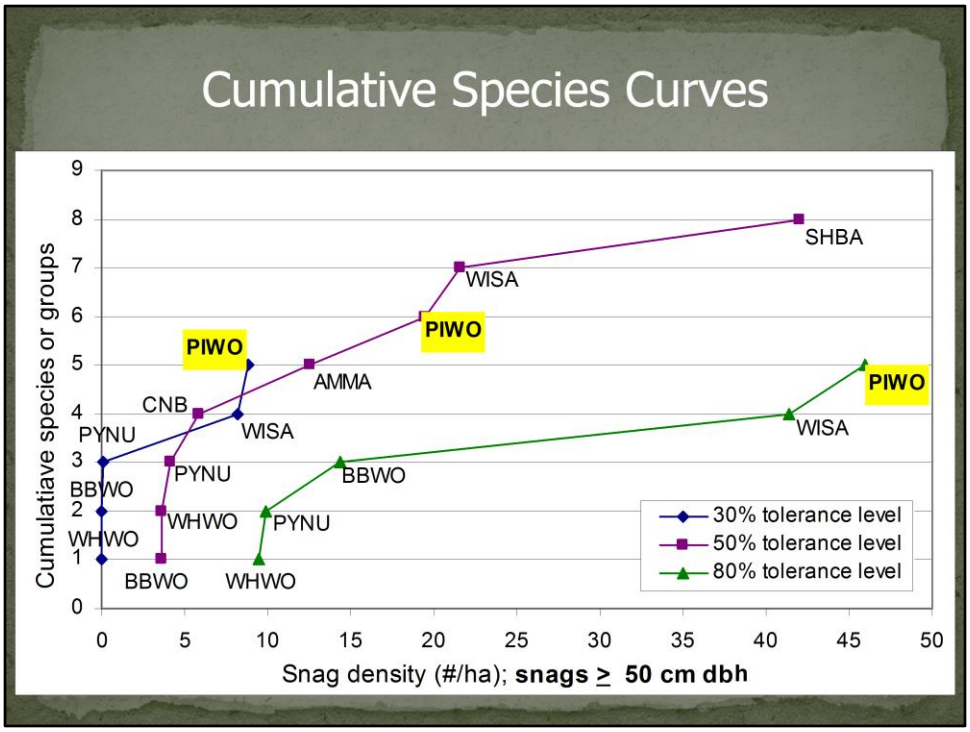
In DecAID we decided to also calculate and display the 30% and 80% tolerance levels.
•30% TL reflects the point at which 30% of the population is expected to fall below that level, and 70% of the population is expected to fall above that level
•80% TL reflects the point at which 80% of the population is expected to fall below

that level, and 20% of the population is expected to fall above that level

- **The higher the TL the larger proportion of the population that is represented.**

Tolerance Intervals describe the proportion of the population that will fall between 2 **tolerance levels.**

The 30 to 80% tolerance interval represents 20% of the population; 50 to 80% tolerance interval represents 30% of the population; and 50% of the population falls with in the 30 to 80% tolerance interval.



Cumulative species curves – how do you interpret them?

30, 50 and 80 % tolerance levels are displayed for species with enough data to calculate TLs. 50% TL is displayed for species where either sample sizes were to low to calculate TLs or no measurement of variability was available to calculate the TLs

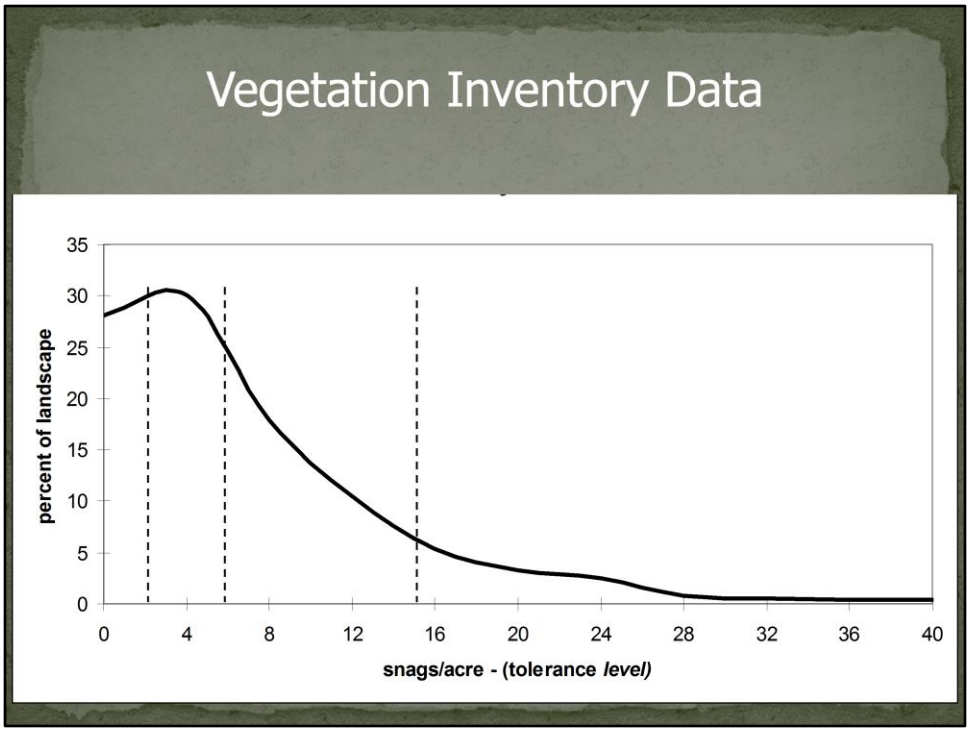
PIWO – pileated woodpecker relates back the bell curve in the last slide.

Assumption – MORE IS BETTER and BIGGER IS BETTER – you are providing for a higher percentage of the population

Cautions when looking at cumulative species curves – these cautions are addressed in the Summary Narratives

- If variability in the data is particularly high a species will be at the low end of the 30% curve and at the high end of the 80% curve. This may be due to low sample size or high variability.
- With very few exceptions, wildlife snag density data were collect in a plot centered on a nest, roost, foraging, etc. snag. Thus, in reality the 30% tolerance level, and the minimum, should be at least 1 snag/ha. Statistics can lie.
- Is there a big gap between species on the curves? This may be an indication of issues with the data. Or it may just mean that there is a big difference between the species for which we had available data.

    - SHBA is and example of where the plot size was probably too small so that snag densities are overestimated.
- For some species, the data cover more than 1 habitat type. Pileated woodpecker is a good example. Pileated data were collected in both the EMC and PPDF habitat types, but most of the data are from the EMC type where snag densities are higher. You will not be able to provide 50% or 80% TLs for pileated nest sites in most of the PPDF habitat typ. Know your data.



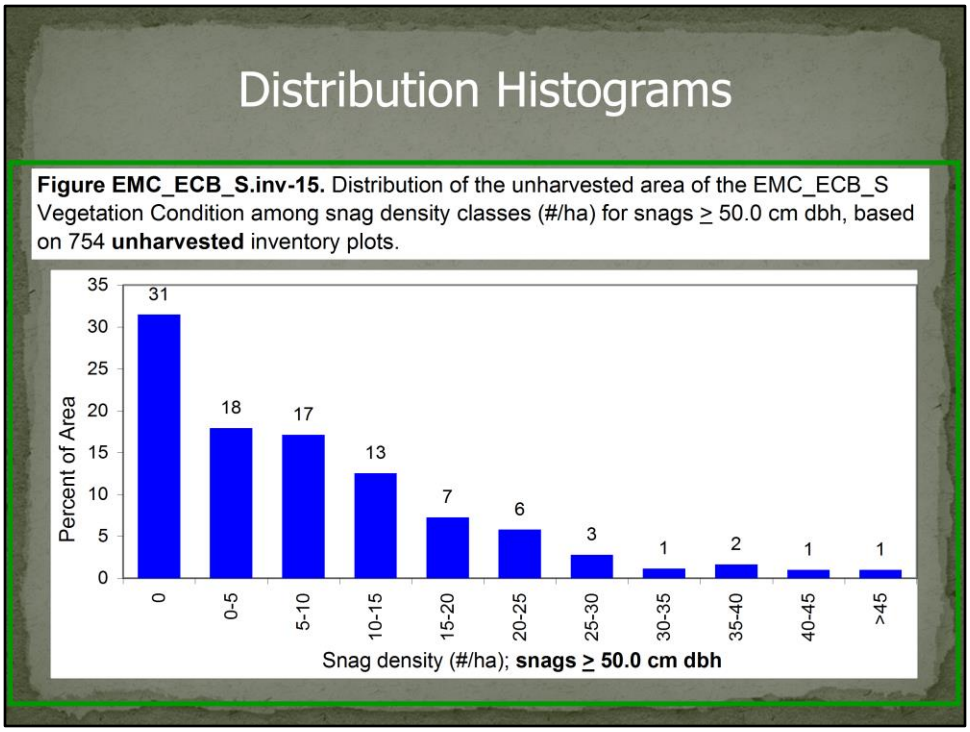
Vegetation Inventory Data and Tolerance *Levels* and *Intervals*

The vegetation data is not normally distributed, the data are highly skewed to the left, or to low snag densities.
A non-parametric tolerance level analysis was performed on the inventory data for that reason.

The population for this curve is the area of the landscape in the specific wildlife habitat type and structural condition class. The 50% TL is the **median,** with 50% of the landscape above and 50% below the median.

Tolerance intervals are similar to the wildlife data, but reflect the landscape rather than nest sites.

Snag densities in some habitat types are so skewed that the 30 and 50% TLs are 0. This would happen is snags were so rare on the landscape that over ½ the landscape (at the plot scale) had no measurable snags.

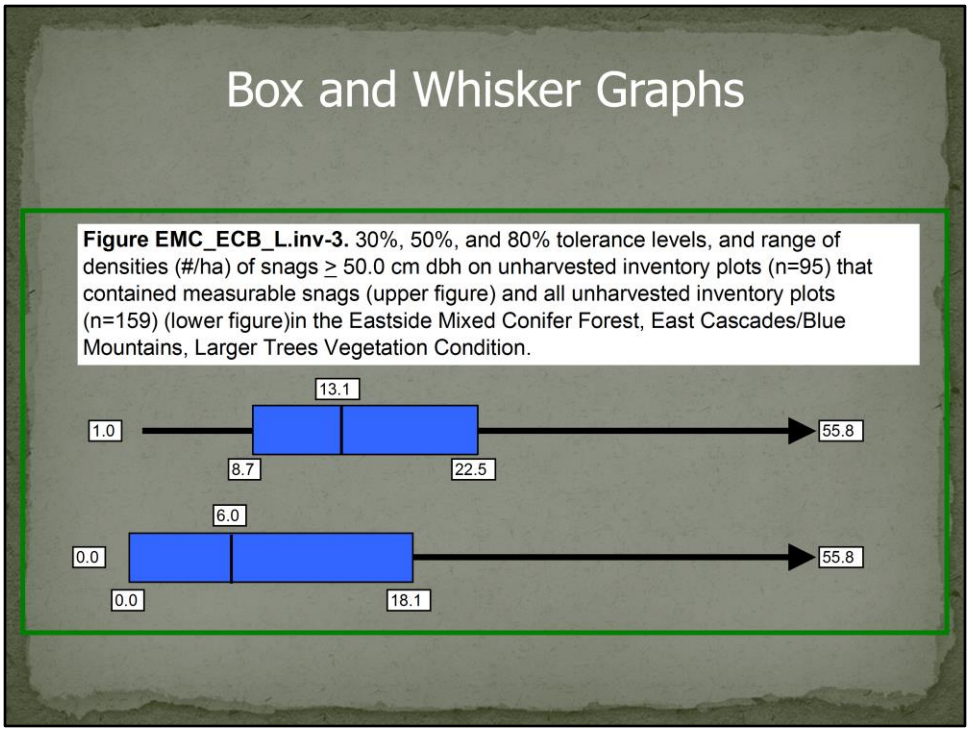


Distribution Histograms

Note the skewed, non-normal distribution

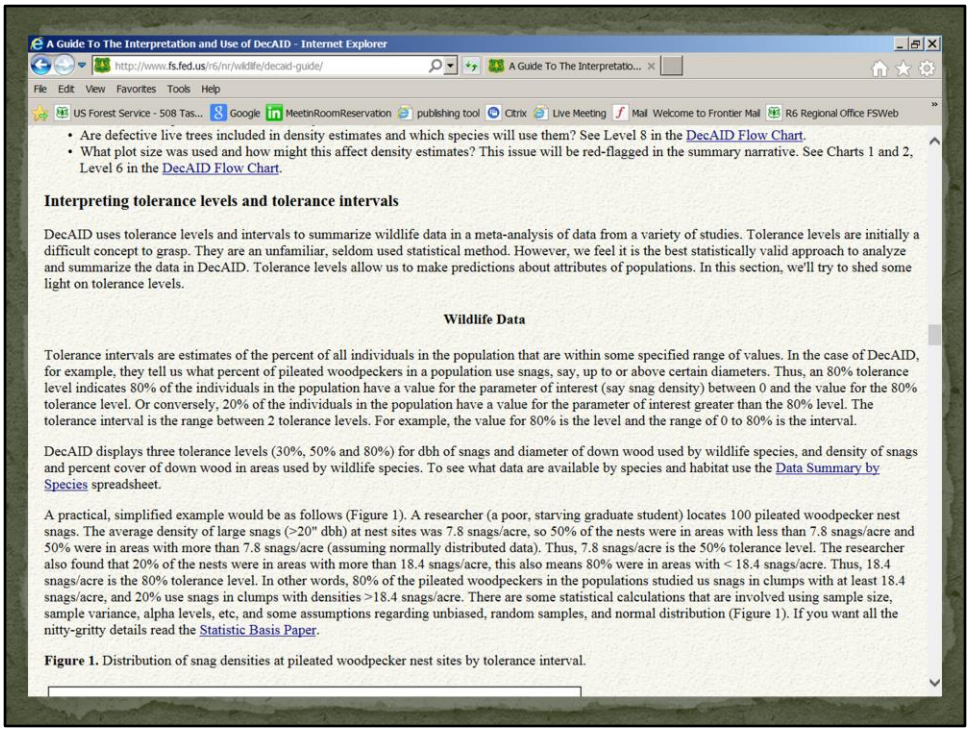
This graph is from unharvested inventory plots – it is used as a reference condition in a distribution analysis – **much more to come on that!**

- In this case 31% of the landscape is devoid of snags >50 cm (20" dbh).
- Areas with high snag densities (>25/ha (10/acre)) are very rare on the landscape
- Only 14% of the landscape provides nest sites for pileated woodpeckers above the 50% TL (20/ha). You should not expect to provide the 50% TL for pileated woodpecker nest sites on every or even most acres across the landscape.
- **Remember – these are plot sized areas**



Vegetation Inventory Data Box and Whisker Graphs

- These graphs display descriptive statistics: min, max, 30, 50, and 80% TLs.
- They are displayed below the cumulative species curves for snag density and down wood percent cover
- The top graph displays the descriptive statistics based only on those plots that had at least 1 measureable piece of dead wood – meets minimum dbh and height or diameter and length criteria.
    - This graph relates more directly to the wildlife data since wildlife only use the portion of the landscape with some dead wood
- The bottom graph displays the descriptive statistics based on all plots, including plots with no measureable dead wood.
    - This graph relates to the landscape as a whole, not just those areas used by species dependent on dead wood for live history needs.



The DecAID implementation guide (http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/) explains tolerance levels. Go about 1/3 of the way down the web sites to the section: **Interpreting tolerance levels and tolerance intervals**

Table 2. Documents in DecAID that provide information on tolerance levels.

DecAID Document	Document contents
What is DecAID?	Takes you through the steps of running a DecAID query. Also explains how to interpret wildlife species curves and vegetation inventory summaries. Includes a brief description of tolerance levels.
What is a tolerance level?	A less technical, though detailed, description of tolerance levels. Compares tolerance levels to the more commonly used confidence intervals.
Marcot et al. 2010	A published manuscript on the use of tolerance levels in DecAID. Relatively technical. Read this if you want all the details.

Table 2 of the implementation guide provides links to more information on tolerance levels.