

**Questions and Answers from the webinar  
“Gaining 100% Confidence in Intensity Estimates”  
September 23, 2014**

**1. How do you estimate canopy on a tree that is 100+ foot tall and seeing the whole canopy is not possible?**

This is definitely tricky, but once you get comfortable with your tree, and have viewed it from different angles where possible, you can eventually learn to envision what it would look like at the top, based on what you see of the bottom. If you are uncomfortable making an estimate, you can always skip the intensity question. But keep in mind that we don't expect these estimates to be precise—just in the general ballpark.

**2. When your tree has multiple sizes of leaves at maturity, how do you choose a bin for the % of full size for the leaves? Do you report the % full size relative to the largest leaf size, or do you estimate the % full size for each size of leaf you might expect? The red maple I watch in my yard has leaves that are half the size of the largest leaves, but they're full grown at that size and will never reach the size of the larger leaves over the season. Do I say that those are not 100% full size because they're half the size of the largest leaves, or do I consider those 100% because they're as big as they're going to get?**

This phenophase was designed for deciduous trees that typically have a single flush of leaves that all come out at once early in the growing season. In this case it sounds as if those smaller leaves are “sun leaves” and you should consider them to be full size even though they are half the size of other leaves on the tree. Large trees often have both “sun leaves” that develop in full sun on the outer shell of the canopy, and “shade leaves” that develop in shade within the tree canopy. Sun leaves are typically much smaller than shade leaves when they are at 100% of their full size. Try to estimate what percent of their full potential size each set of leaves is. Generally, they will be at the same stage (for instance, sun leaves and shade leaves both at 50%) at the same time even though the shade leaves are larger.

**3. With large mature live and laurel oaks it is hard to see the flowers and young fruits even with binoculars, any recommendations without using the question mark?**

Not really! If you can't see the flowers at the top with binoculars, you will not be able to evaluate the presence or absence of the phenophase or estimate the intensity. So either use the “?” or just don't answer the phenophase question at all.

**4. Should we count flowers that occur in umbels as inflorescences?**

Yes. Flowers come in many types of inflorescences and an umbel is one of those types. Generally, if the flowers are small and tightly clustered they are probably in an inflorescence. In that case you should count the number of inflorescences, not the number of individual flowers, for the “Flowers and flower buds” phenophase. However, when estimating the percent of “Open flowers” on the plant, count the individual flowers. This is because each inflorescence usually has some unopened and some open flowers at the same time.

**5. How do you tell if there's been recent fruit drop if the ground around the plant is not really visible due to undergrowth or leaf litter, etc?**

Sometimes the fruit will not be visible so you can mark use the “?”, or perhaps not answer that phenophase question at all. This question is most useful for the species that have fruit that ripens and drops quickly, and therefore you might miss seeing the ripe fruits on the plant. This phenophase allows you to report that you knew the fruits were present on your last visit, but they have dropped since that last visit.

**6. What do I report if a fruit is in between the color of the unripe and ripe fruit?**

In cases where part of a given fruit is the ripened color and part is not, you will have to use your judgment. A good general rule might be to consider the fruit ripe when at least half of the surface is the ripened color. But as long as you are consistent with your plant over time, do not worry too much about the exact point when the fruit turns from unripe to ripe. If observing in a group, get on the same page as others in the group as to when you will call a fruit ripe or unripe. “Don’t stress, do your best,” as one webinar participant put it!

**7. Are question mark responses useful for data analysis? if so, can you explain how, and/or give an example?**

No, the “?”s that you can report if you are uncertain about a phenophase are usually ignored in data analysis. However, they are useful as a placeholder for observers who either feel like they need to record an answer, or who want to flag their uncertain observation so then go back later to change their “?” to a “yes” or “no” once they become sure what they were seeing.

**8. Could you explain how scientists and researchers use intensity data? It seems like the ranges of "right" answers are so broad that this data might not be reliable enough for research purposes.**

Reporting the numerical bins for the intensity measures is much more valuable for comparing an individual plant to itself—over a single growing season or over multiple years—than it is for comparing plants at different sites. This is because the size of the plant will determine the number of breaking leaf buds, flowers, etc., and we don’t collect information about the size of each of plant. For example, valley oak is a species that “masts” (produces very few acorns in most years and bumper crops every few years). You might have a small tree that in most years produces only 3-10 acorns, but every few years produces 101-1000 acorns. A large valley oak at a different site might regularly produce 11-

100 acorns, but every few years produces more than 10,000 acorns. Researchers won't know that the tree at your site is small relative to the tree and the other site, so the absolute number of acorns is not so important. But they will see that at both sites the acorn count went up exponentially in the same year and therefore learn that valley oaks masted across their range in that year.

Similarly, when your intensity measurements are graphed to get a curve for a single growing season, it shows when the PEAK of the phenophase occurred for the plant at your site. Comparing the timing of the peak at your site to that at another site is extremely valuable information for researchers. So as long as you are consistent in applying the intensity measurements over time at your site, and other observers are consistent at their sites, researchers can use all this data to create curves that can be compared at sites across a region to understand the timing of phenological events and peaks in phenological activity. Where you and your fellow observers might make the distinction between (for example) more than 50% vs. less than 50% is not all that important as long as everyone is judging 0% and 100% fairly accurately. An exception is where multiple people are observing the same plants. At these sites where observation responsibility is shared, it does make for better data if the observers periodically get together and to make sure they are reporting intensity measurements very similarly. Otherwise it could appear the phenophase intensity on a plant is going up and down from week to week, when actually it is just a difference in observation technique.

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