A Tree:

Defining Concepts In Use

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Trees represent great public and private values in a community. Trees comprise an appreciating asset base as well as a risk component in managing landscapes. Trees remains symbols, icons, pillars, ceilings, and centerpieces of communities. Trees seem to be more than pets but less than off-spring to humans. But, in all the values associated with trees, tree-filled landscapes, and tree lined streets, what is a tree? How can we define the living entity which generates the values we find alluring, essential, and an integral part of our culture and quality of life?

Defining Methods

There are two methods of defining a tree. One is a realization of what the term "tree" symbolizes in language. The second method is examining descriptive definitions in dictionaries, or in regulatory definitions found in a variety of tree protection and tree management ordinances. Before developing a regulatory means to advance or management trees, you should be able to define what you are trying to defend and management. Beware of cloning tree definitions which have been developed in situations which do not represent your circumstances.

Language Foundations

The language we speak is comprised of mental images of understandings. We then render a mental image or construct into a written word. Words, whether spoken or written, do not fully represent and transfer everything in our mental image to another person. Usually, all the subtleties, nuances and assessaries we attach to a word, based upon our personal experiences and knowledge, are stripped away from the core meaning of a word. We then feel compelled to modify the word with other terms in order to more fully communicate our ideas. A definition is both a description of an object, image, or concept, as well as an agreement about how a number of humans with similar cultural background will describe something.

To arrive at our most current definition of "tree," it is important to go back to the root concepts we have used over time to describe and symbolize a tree. One of the first decernable word concepts leading to the modern word tree was from ancient Sanskrit where "dru" represented a tree and any derived wood. The Indo-European language base used "derw" or "deru" to symbolize a tree, specifically an oak tree. Greeks carried forward this word concept to "drus" or "drys" meaning oak and "dendreon" meaning tree.

Roadway To Tree

From the Greek, the tree concept exploded into many European languages. The Vikings and their predecessors used and spread word usage which included "tre" in old Norwegian and Icelandic, and "trae" in Danish. The Swiss used the word concept of "tra" or "trad." The Druids used "tray" or "trough." The Irish word base for tree was "darag" or "darog," while the Welsh used "derw." The

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DANIEL B. WARNELL SCHOOL OF FOREST RESOURCES
PUBLICATION SFR04-11

Russian base word for tree was “drevo.” The major pathway to our term “tree” is most directly derived from old Saxon “treo” or “trio” meaning an oak tree. This led to the Anglo-Saxon “treow,” “treo,” or “tre” for a tree or its wood. Old French also used a word “tre” for a tree or its wood. Finally the word-journey to our modern English word “tree” came through the old English “treow,” “tre,” or “treo” and middle English word “tree.”

Understanding our past is important to understanding current concepts and usage of the word “tree.” Through this word history, trees were conceptualized to be relatively large, massive, branched, upright oaks (and sometimes ash) from which can be derived valuable wood. It is interesting to note how the deciduous hardwood trees were granted a significant word concept which other peoples carried forward. The common pine, spruce, and fir trees in the forests of central and northern Europe were described with highly variable and non-conserved terms primarily attached to forest concepts, not as individual trees.

Name That Tree

The next step in defining a tree is to consolidate dictionary, general knowledge encyclopedias, botanical glossaries, and ordinance definitions. The best way to accomplish this task is to record the use of specific descriptors in each definition. Table 1 provides the relative frequency of words used in describing a tree from among 45 different definitions. For example, 20 percent of all definitions specifically state a tree is a plant. Of course this is implied in all the others, but for a significant number of definitions the authors felt the term “plant” must be used in defining a tree.

In Table 1 50% of all descriptors for trees are three terms: plant, woody, and single stem. The single stem concept does contain problems when defining trees with multiple trunks, trees from multiple stump sprouts, and clump plantings. As more terms are added to a definition, a clearer concept or image of a tree appears. Dividing the descriptors in Table 1 into natural breaks within the percentages, a tall, woody, single stemmed plant accounts for a 63% fit in definition. If broad diameter, branched, and perennial ideas are added, 87% of the descriptors are represented. An elevated and distinct crown adds another 7% in tree definition, with the last 6% composed of minor descriptors of self-supporting, erect stem, and a clear lower trunk.

Form & Function

At its most basic level a tree definition is not species based, but is a structural definition. It represents a type of plant architecture recognizable by non-technical people. The structure and architecture define the appearance and continued growth of a tree which includes mass, height, and longevity. Care must always be taken to use “tree and tree-like” structures to define traditional tree concepts and tree-like palms, tree ferns, and bamboo. One way to differentiate trees from tree-like plants is the relative position and growth of the vascular components and buds in a tree. A true tree form has secondary vascular tissue and generates structural expansion in diameter through a vascular cambium. I addition, a tree form would contain true xylem and phloem built of cellulose fibrils and lignin.

Big & Tall

The height and girth / diameter are important in defining trees, especially in regulatory situations. In examining many ordinance definitions of trees, many height and diameter thresholds were delimited. Figure 1 provides a distribution of the heights a cited plant must exceed in order to be considered a tree (assuming other tree characters are present). Eight to twelve feet tall above the ground is a critical height range where a plant stops being a shrub and enters a tree form.

Figure 2 shows the distribution of diameters a plant stem must exceed in order to be considered a tree. It is clear when diameters equal or exceed three inches a tree definition is reached. The diameter distribution peak in Table 2 is much less distinct and broader than is the height distribution peak in Table 1. This suggests height is more easily appreciated when defining a tree.

One means of describing a tree is to use time effects on tree maturity. For example, if a woody plant belongs to a species which will exceed a certain height and diameter when it is mature, then it can be considered a tree. This does suggest problems associated with tree maturity concepts. Another form of defining a tree by time is the capability now or in the future of a woody plant being pruned using a crown raising to produce a clear stem distance from the ground of some given length (like 10 feet).

Referral Cheating

One interesting idea on defining a tree comes from secondary references within different ordinances. The definition of a tree here would be any species, variety, race, or cultivar listed by some widely recognized or professional reference. The four forms of references used to define a tree are: listing in the **Checklist of United States Trees** (Native & Naturalized) by E.L. Little, USDA-Forest Service Agricultural Handbook #541; **Atlas of United States Trees** (multiple volumes on various regions and tree types) by E.L. Little, USDA-Forest Service Miscellaneous Publications, or similar state derived product; appearing on a locally viable lists used by professional tree appraisers (CTLA recommended methods) with a cited species value; or, listing as an accepted landscape reference as a tree -- which can be a reference text, a tree selection booklet usually from an educational or government organization, or NOT listed in a reference on shrubs, vines, and perennials.

Ultimate Definition

There is no single definition for a tree. Definitions are to assist people understand the limits and constraints on word concepts. Definitions are usually targeted for specific uses and assume the user knows and understands the context of any word use, as well as the definitions of any descriptors used. Advancing to more intricate and complex definitions leads to greater confusion and more differences of opinion. A complete definition covering all likelihoods may be more of a problems than too simple of a definition, especially among non-technical people.

The most basic concepts for defining a tree are -- a large, tall, woody, perennial plant with a single, unbranched, erect, self-supporting stem holding an elevated and distinct crown of branches greater than 10 feet in height and greater than 3 inches in diameter.

Table 1: Relative frequency of descriptors defining a tree.
(155 descriptors in 45 definitions)

descriptor	percent	cumulative percent
PLANT	20%	
WOODY	16	
SINGLE STEM	14	
TALL / HEIGHT	13	
		63%
BRANCHED	9	
PERENNIAL	8	
GIRTH / DIAMETER	7	
		87%
ELEVATED CROWN	4	
DISTINCT CROWN	3	
		94%
SELF-SUPPORTING	3	
LOWER STEM WITHOUT BRANCHES	2	
ERECT STEM	1	
		100%

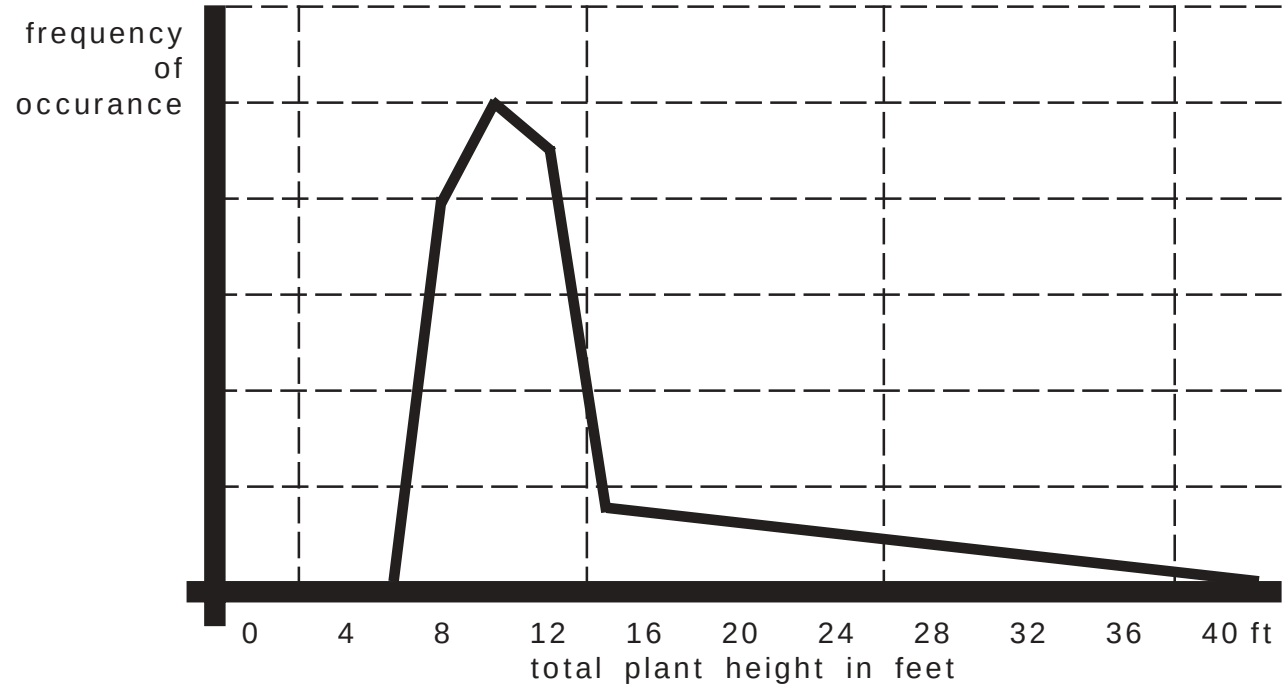

Figure 1: General distribution of heights a plant must exceed in order to be considered a tree.

Note: Larger height values may be from defining specimen, large, or street trees at maturity.

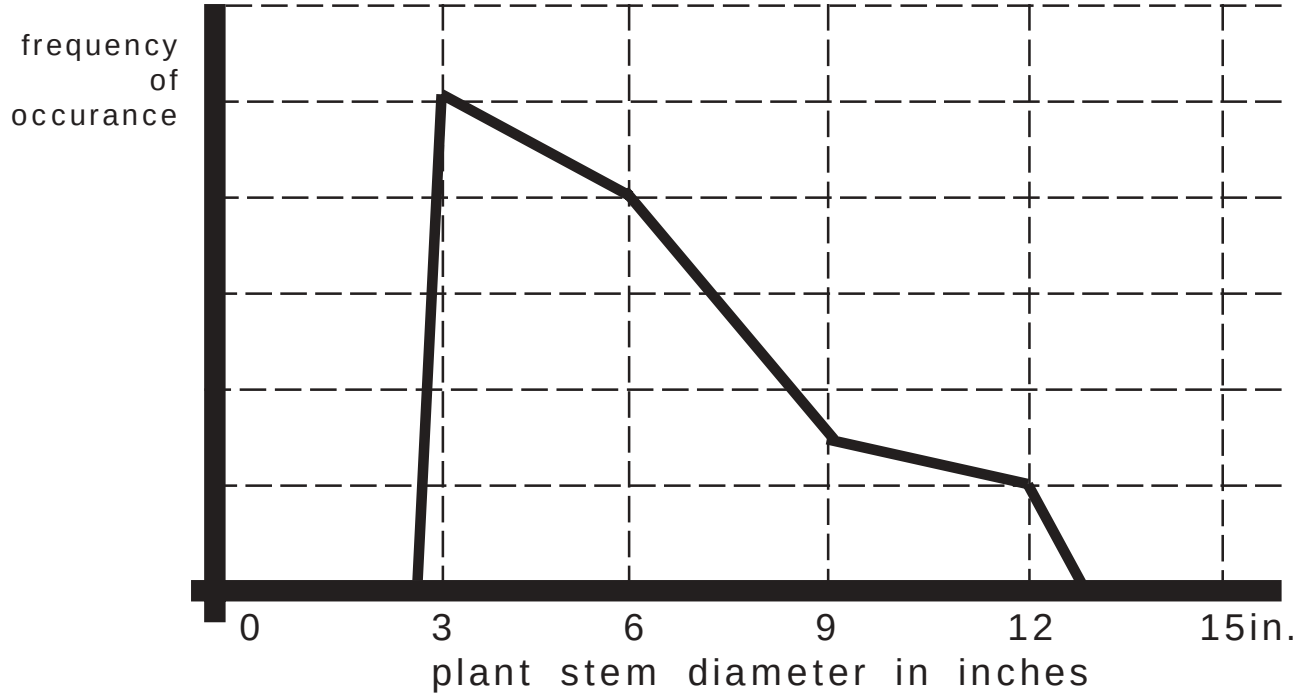

Figure 2: General distribution of diameters a plant stem must exceed in order to be considered a tree.

Note the height above the ground for the diameter measure varies from a 6 inch calipher to 5 feet, with 4.5 feet above the ground being most common.