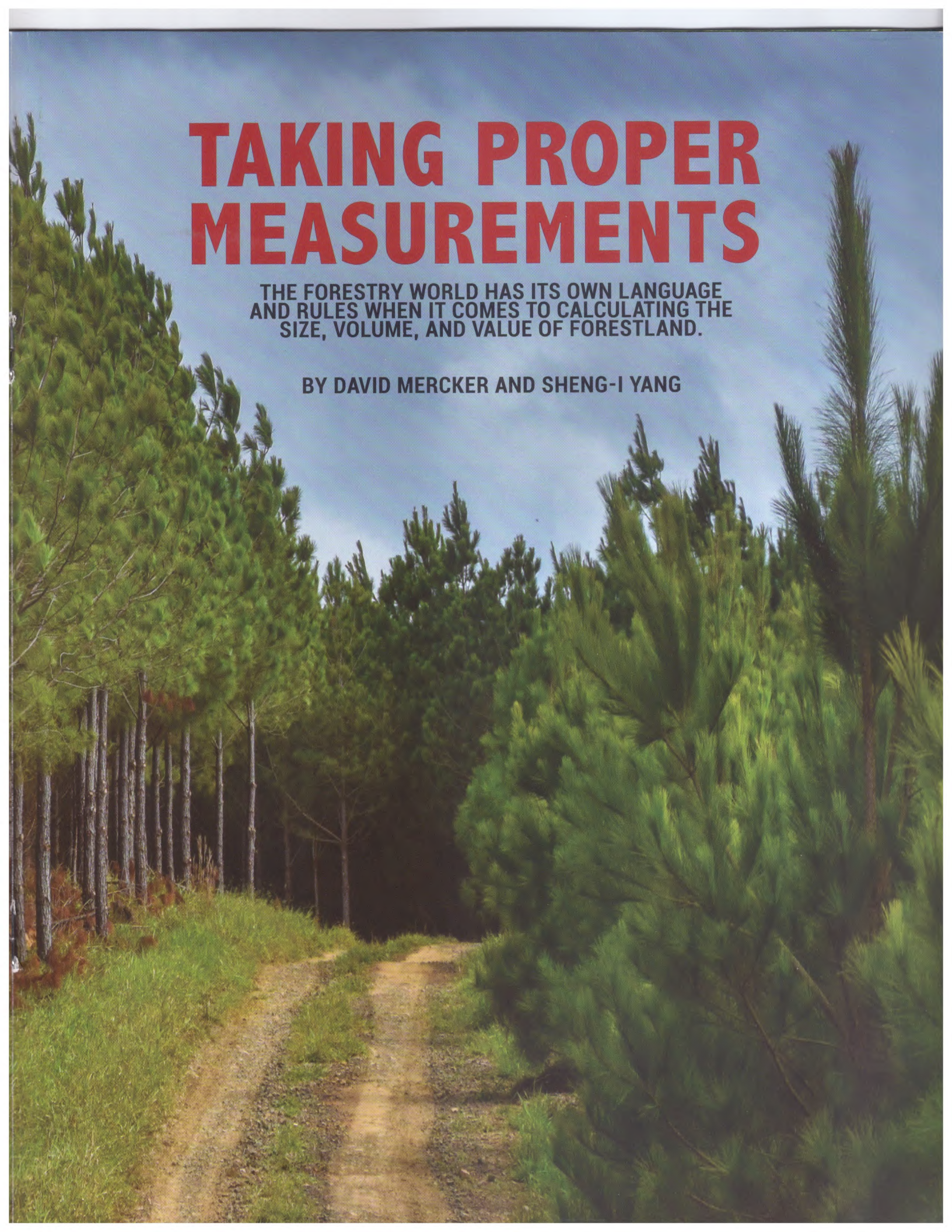


TAKING PROPER MEASUREMENTS

THE FORESTRY WORLD HAS ITS OWN LANGUAGE AND RULES WHEN IT COMES TO CALCULATING THE SIZE, VOLUME, AND VALUE OF FORESTLAND.

BY DAVID MERCKER AND SHENG-I YANG





Diameter at breast height is the diameter of a tree measured outside of the bark at breast height, 4.5 feet above the ground. (Photo: Getty Images).

How does your forest measure up? Forest landowners routinely have their property measured to make natural resource decisions, whether they be financial, wildlife, or forest health-related. Financial decisions can include the sale of timber, carbon credits, easements, or the land itself.

The forestry world seems to have its own language when it comes to measurements that seem part real estate, part silviculture, and part wood products. To understand the value of your forests, it's important to understand the terminology so you can make informed decisions. Here's a brief glossary of common forest measurements.

DIAMETER AT BREAST HEIGHT (DBH)

Diameter at breast height (DBH) is an important tree measurement. DBH is the diameter of a tree measured outside of the bark at breast height (4.5 feet above the ground). DBH is useful to characterize forest stands and estimate wood volume. DBH is also closely tied to tree value. DBH is usually measured with a diameter tape that is wrapped around the circumference, or with a Biltmore stick.

Some landowners joke that it's in their best interest to have a short forester since his or her "breast height" will be closer to the ground and thus to a fatter part of the tree. But 4.5 feet above the ground is the generally accepted standard.

TREES PER ACRE (TPA)

Outside the forestry world, TPA stands for Tampa International Airport, but for our purposes, it's "trees per acre," another important stand parameter often needed to make decisions. TPA is the total count of all standing trees on a per-acre basis. For example, if there are 200 trees on a two-acre stand, the TPA of the stand is 100.

Because it is not practical to count all the trees in a forest, estimates are made with plot samples. To ensure the sample represents the target population, multiple "fixed radius plots"

are taken and evenly spaced across the forest. With this method, a plot center is first established. Then, all trees within the radius of the plot circle are tallied and multiplied by that "portion" of an acre sampled to provide per-acre values.

For instance, a 1/10-acre plot has a plot radius of 37.2 feet. All trees within the 37.2-foot radius circle are tallied. Therefore, each tallied tree within the circle represents 10 trees per acre. If a 1/20-acre plot is used, then use a 26.4-foot radius plot and multiply each tree tallied by 20, and so on. The accuracy in estimating the number of trees increases as plot size increases, but so too does the number of trees to be tallied.

MORE OR LESS (MOL)

Many people upon learning this phrase for the first time don't believe it's an official real estate term, but it is. Admittedly, it seems awkward, as in "1,000 acres more or less (MOL)." So, are you buying 950 or 1,075 acres? For what other consumer purchase would such vagueness be acceptable? You wouldn't agree to pay for a steak that was 10 ounces more or less? Or purchase a home that was 2,000 square feet more or less. So, why would anyone make a major land purchase without knowing the exact acreage?

MOL is used to acknowledge the fact that sometimes the exact acreage of a property is not easily determinable, for example, if part of the property is on a slope. Still, it's incumbent upon the buyer to have a survey done to determine the actual acreage, which ultimately will be recorded by the county for tax purposes (if it hasn't been already).

After all, governments do not give citizens the option of paying the amount of their taxes "more or less."

TREE AGE

Tree age provides a measure that reflects stand productivity and is useful in making forest management recommendations. Tree age can be known based on history and previous land uses, or

it can be determined by counting tree rings using an increment borer. A borer has a hollow center that is penetrated (screwed) into a tree to the center (or pith) of the tree from which a core of wood is extracted and then the growth rings are counted to estimate tree age. The outermost rings reflect the most recent growth.

TREE HEIGHT (TOTAL, CROWN, AND MERCHANTABLE)

There are several measurements of tree height that can be taken. Three are considered here, and each provides useful information.

Total height – a measure from the groundline to the highest point of the tree crown. Tree height, when combined with tree age, provides an estimate of site index (explained later).

Crown length – a measure of that portion of the total tree height having living branches. Sometimes called live crown ratio (defined as the ratio of crown length to the total tree height), it is useful in determining when forest stands are ready to be thinned. Small crown length can imply slow growth and poor health.

Merchantable height – the height above the ground level to which the tree bole can be cut and sold for commercial products. Merchantable height is normally reached when the diameter inside the bark at the small end of the log reaches 10 inches.

CROWN CLASS

Tree crowns make up the canopy (or uppermost layer) of a forest. Crown classes cannot be measured precisely. Crown classes are broken into distinct layers. Four crown classes are generally recognized.

Dominant – trees much taller than the general level of the canopy, receiving direct sunlight on all sides of their crown.

Codominant – trees that form the general level of the canopy, but below the dominants, receiving sunlight from above their crown and some from the side.

Intermediate – trees with crowns that fall below the general level of the canopy, receiving sunlight only from above at midday.

Suppressed – trees much shorter than the general level of



A board foot (BF) is a measure of wood volume totaling 144 cubic inches that is commonly used for estimating wood volume in trees, sawlogs, or individual pieces of lumber. (Photo: Getty Images)

the canopy, receiving only filtered sunlight.


SITE INDEX

The site index (SI) of a forest is an expression of the forest site quality. It is based on the average height of the dominant and codominant trees at a specified age, usually 50 years for hardwood trees and 25 years for planted pine. Site index curves are used to estimate the SI for each species. For instance, when white oak trees are 85 feet tall at 50 years of age, the SI for that group of trees is 85 (ft). If the white oak trees are only 65 feet tall at 50 years of age, the SI is 65 (ft). The higher the SI, the better trees grow and produce wood volume.

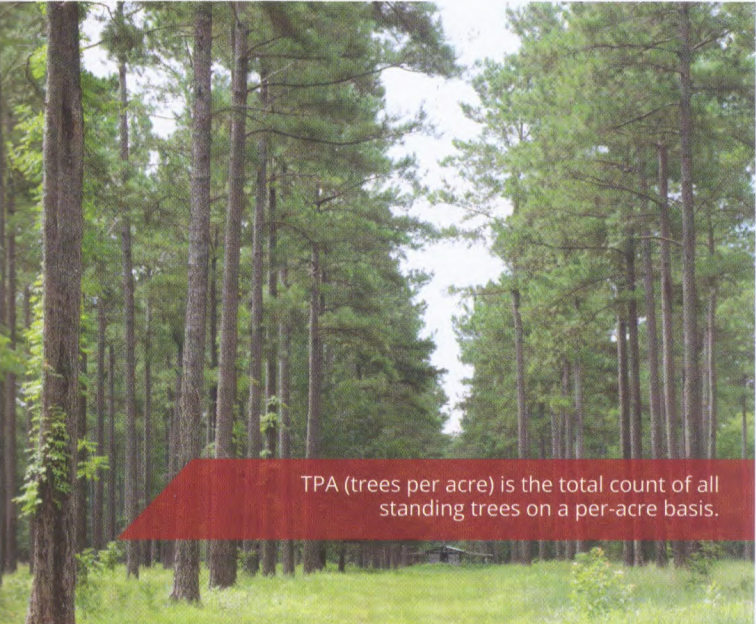
BOARD-FOOT VOLUME

A board foot (BF) is a measure of wood volume totaling 144 cubic inches that is commonly used for estimating wood volume in trees, sawlogs, or individual pieces of lumber. For instance, a piece of wood measuring 1 foot long x 1 foot wide x 1 inch thick, or a piece of wood measuring 1 foot x 2 inches x 6 inches, each contains 1 BF of wood. Tables have been developed for both felled logs and standing trees, called log rules, whereby estimates of BF can be quickly made. The log diameter and length are needed to use these rules.

Increasingly, board foot volume measurement is being replaced by log weight as a measurement. Although not as accurate (weight varies by species, size of trees, the season of the year, and location), many mills prefer this method of wood measurement due to the ease of business transactions.

Measuring trees and forests is important for assessing the present condition and for developing strategies to achieve future goals. Foresters and natural resource professionals use several techniques to measure trees and forests. With the information presented here, you'll be better prepared when engaging the services of professionals. 

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