# EVALUATING TIMBER STANDS

## FOREST STEWARDSHIP MANAGEMENT NOTE #15

The question amazing, in timber appraising,
Is what amount the prices rise.
But how to procure this number obscure?
A devious task indeed.
And who would volunteer, the answer is clear,
Is surely a fool indeed.

From: Ode to the Timber Appraiser
Author unknown

## INTRODUCTION

For landowners to manage their woodlands in accordance with their objectives, they must start out with accurate information about the existing condition and future potential of each stand. In most cases, it makes sense for landowners to have a professional natural resource planner (usually a forester) conduct an evaluation to obtain and interpret the necessary information for them (FSMN #18). Depending on the landowners' objectives, such an evaluation could include information of the wildlife, recreational, and other non-market values, but the economic value of the timber is almost always a key consideration, even for landowners who give higher priority to other values.

The purpose of this Note is to outline the components that should be included in initial land evaluations. Sources of further information are listed, including publications for landowners who want to conduct their own timber evaluations.

## COMPONENTS OF INITIAL STAND EVALUATIONS

1. LANDOWNER GOALS - It is essential that the resource planner have the landowners' goals firmly in mind when conducting an initial land evaluation. As a minimum, the resource planner should study a completed Forest Stewardship Assessment Form. Ideally, the resource planner would discuss objectives to address goals with the landowners while walking the land together (FSMN #34).

2. DELINEATION OF TIMBER STANDS AND MANAGEMENT UNITS - A timber "stand" is a wooded area that is relatively uniform in terms of trees species, tree size (age), and density of trees. For timber management purposes, very small stands may not be differentiated from larger stands unless they will be managed differently.

   Within the Stewardship Incentive Program, the land areas used for planning are called "management units". In some cases, timber stands may constitute management units. However, where landowner objectives dictate, a single timber stand may be subdivided into two or more management units. For example, a hardwood stand might be divided into a selectively logged management unit adjacent to the owners' home and a shelterwood management unit elsewhere (FSMN #17). Conversely, it is also possible to combine more than one stand into a single management when the whole area will be treated the same.

   Thus, stand evaluations should be done based on the smallest practical land areas, be they stands or management units. This allows the most flexibility in the planning process. Management unit boundaries are often changed on the basis of initial evaluations, so it is best to keep an open mind until the nature of the existing stands is known.

3. TIMBER QUALITY - Timber quality is determined by tree or log grading, a process that considers the species, the size of the logs, the presence of defects in the wood, and, sometimes, the presence of special types of wood grain. The highest quality logs are used for veneer (peeled or sliced into thin sheets), medium quality logs (sawlogs) are used for lumber, and low quality logs are used for pulp or fuelwood.

4. TIMBER VOLUME

HIGH-VALUE PRODUCTS - Timber quantity, usually referred to as timber volume, is measured in different units for different products. Veneer logs and sawlogs are measured in "board feet", where one board foot is 1/12 of a cubic foot of solid wood, such as a piece of lumber measuring 12" x 12" x 1". The number of board feet in a log is determined from the length of the log and the diameter of its smaller end with the use of tables, formulas, or measuring tools that account for the wood wasted in manufacturing lumber.

LOW-VALUE PRODUCTS - Pulpwood is commonly purchased from landowners based on standard cords, where one cord is 128 cubic feet of stacked logs, such as a stack of 8-foot logs 4 feet wide and 4 feet high. Mills commonly buy pulpwood on the basis of tons as weight is a more accurate way to measure the actual amount of wood. Firewood is commonly bought and sold on the basis of face cords, an indefinite unit, usually considered to be a stack 4 feet high, 8 feet long, and as wide as the pieces are cut.

VOLUME PER ACRE - The economic value of the timber to be removed from a stand depends not only on the total volume to be removed but also on the volume per acre. This is because it costs a logger more to remove the same volume from widely scattered trees than from the same number of trees in a smaller area.

5. TIMBER OPERABILITY AND LOCATION - Loggers only make money if the difference between the price they pay the landowner (the stumpage price) and the price they get from the company they deliver the wood to (the mill price) is more than enough to cover their costs to cut the trees, haul them out of the woods, and truck them to the mill. Thus, the more difficult it is to get the logs out of the woods (i.e., the lower the operability), and the farther the land is from the mill, the less loggers will be willing to pay for stumpage.

6. TIMBER VALUE - Timber value can be estimated based on the four main factors discussed above: quality, quantity, operability, and location. Unfortunately, even when these factors are known, an accurate value is difficult to determine. One reason is that the prices mills will pay for wood varies greatly from mill to mill and from time to time (#5). Another reason, is that even within the same area at the same time, different loggers commonly offer very different stumpage prices for the same timber because of unique factors involved in their individual operations. Some states periodically report statistics on stumpage and mill prices paid for various timber products in different zones on a regular basis, but Michigan does not.

Because of the many factors involved, it is necessary to obtain firm bids from buyers before the true market value of timber can be reliably determined (FSMN #18). Landowners should consider other estimates of timber value to be only rough indications of the prices their timber might bring in an actual sale.

7. OTHER TIMBER MANAGEMENT FACTORS - In addition to obtaining the information needed to estimate the economic value of standing timber, initial evaluations should assess the general health of the trees, including the need for timber stand improvement (FSMN #16) and the presence of any insect or disease problems. For long-range planning, it is also very useful to obtain information about the potential timber productivity of each stand or management unit. Throughout the state, soil surveys provide some information on timber productivity, and in the Upper Peninsula, indicator plants can used to assess expected wood production (#2, FSMN #4,).

**DO-IT-YOURSELF TIMBER EVALUATION**

1. TIMBER QUALITY - Judging timber quality is a very involved process that takes considerable training and experience to master. Nevertheless, landowners can determine whether they might have higher value products by measuring tree diameters. Specifications vary somewhat in different parts of the state, but in general pulpwood must be at least at least 5" DBH (diameter at breast height, meaning 4.5 feet above the ground), and sawlogs must be at least 10" DBH. Specifications for veneer are not standardized, but in general veneer logs must be larger than sawlogs and be very straight with no irregularities on the bark (#3).

2. TIMBER VOLUME - Measuring timber volume where accuracy is critical should generally be left to professionals, but landowners can estimate the amount of wood they have with relatively simple methods (#7). Reference #1 gives simple procedures for measuring diameter, height, and board-foot volume of individual trees. Reference #6 gives simple procedures for estimating board-foot and cord volumes of individual trees and of whole stands.

3. TIMBER PRODUCTIVITY - Landowners who want to measure the growth rates of their trees for comparative purposes or for investment analysis can do so with the simple methods described in Reference #4.

**REFERENCES**

FSMN #'s refer to other Forest Stewardship Management Notes in this series.

#1 Bell, L.E. 1983. How much limber in that tree? Michigan State University Extension Bulletin 461.
#2 Coffman, M.S., et al. 1984. Field guide. Habitat classification system. For Upper Peninsula of Michigan and Northeastern Wisconsin. Cooperative Research on Forest Soils (CROFS), School of Forestry and Wood Products, Michigan Technological University.
#3 Michigan Department of Natural Resources, Forest Management Division. 1986. Selling Veneer. Forestry Information Bulletin No. 6-3.
#4 Perkey, A.W., et al. 1993. Crop tree management in eastern hardwoods. USDA Forest Service NA-TP-19-93.
#5 Potter-Witter, K. 1989. How much are my hardwoods worth? Michigan State University Extension Forestry Fact Sheet 10.
#6 Wiant, H.V., Jr. 1989. How to estimate the value of timber in your woodlot. West Virginia University Agricultural and Forestry Experiment Station Circular 148.
#7 Wickman, A. (ed.). 1982. The forest management digest. Forestree Farmers of Minnesota, Inc. Box 363, Park RApids MN 56470.

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