

These definitions reflect the use of these terms in  
West Virginia State Forest Management Plans and Prescriptions

## **X. SILVICULTURAL TREATMENTS**

Silviculture is the art and science of controlling forest establishment, composition and growth.

### **Single-Tree Selection**

This treatment is the most commonly used practice currently employed on the forest. Each tree is examined and a judgment is made on the basis of established guidelines as to whether to remove that tree. The guidelines are based on the silvicultural and wildlife-benefit characteristics of that tree and adjacent trees and how the diversity of the area will be affected. This method favors an uneven-aged character. Single-tree selection is often the primary practice used in a harvest, but may also be used in combination with other treatments. The primary benefit of single-tree selection is the retention of mature trees for economic, wildlife and aesthetic reasons.

### **Crop Tree Release Management**

This is a type of timber stand improvement where trees that are designated to be left to grow and develop for a future timber harvest receive a crown touching release on at least three sides. The trees chosen as crop trees can have one or more benefits. The chosen crop trees can be for timber, wildlife or aesthetics or any combination of these.

### **Shelterwood (Two- or Three-Cut Method):**

This practice is most useful where stand maturity has been reached and biological or environmental factors cause the successful establishment of desirable regeneration to be questionable using other silvicultural treatments. The shelterwood method involves the gradual removal of the entire stand in a series of partial cuttings that extend over a fraction of the rotation. The purpose is to encourage seedlings of shade intolerant species. Retaining a suitable portion of the mature stand preserves the character of the stand. If the intended regeneration of the stand fails, the source of renewal is still present. Once regeneration is considered successful, further removal can occur. The transition from a mature stand to a young stand takes place incrementally and is therefore less traumatic to the forest community than if a clear-cut had been employed.

### **Group Selection:**

This treatment is usually not employed as the sole practice during a timber harvest. Group selection can best be described as removing an entire group of mature stems, generally covering no more than one-fourth acre. Intolerant tree species (those intolerant to shade requiring direct sunlight for growth) are best regenerated by this practice.

### **Even-Age Management:**

This silvicultural practice has become commonly known as clear-cutting. When

used, all trees on a designated area are cut, allowing the entire area to regenerate. Even-aged management produces a site suitable for intolerant tree species, which generally are among the most valuable species for timber and for wildlife. This also creates habitat for those species (both flora and fauna) tolerant of disturbance and desiring early stages of succession. However, even-aged management on State Forests may only be used to develop wildlife food plots or habitat (as recommended by the Wildlife Resources Section of the Division of Natural Resources), for research, or for the salvage of trees damaged by storm, fire, insects or disease.

#### **Seedtree:**

This practice is best suited for use where the benefits of a clear-cut are desired, but the lack of desired regeneration precludes its use. On these occasions, the best seed-bearing stems of the desired species are left to provide seed for the area. Trees left per acre range from two to 10. The need for this practice is determined by an analysis of the data collected during the inventory performed prior to writing the prescription for the area.

#### **Deferment Cut:**

This practice combines the advantages of clear-cutting with those of shelterwood cutting, while striving to produce higher quality logs by the end of the second rotation. Up to 20 percent of the basal area of the stand is carefully selected for retention. These trees are meant to remain through the end of the succeeding rotation. A deferment cut is useful when an area needs to be regenerated to intolerant tree species and where trees with a potential for long life and high quality development can make up the residual stand. At the same time, den trees, snags and vertical structure for wildlife can be maintained.

#### **Timber Stand Improvement:**

In addition to the previously discussed harvest practices, the need to improve conditions in younger stands is often desirable. As a result we sometimes engage in activities collectively called "timber stand improvement" or "TSI." Any cultural practice conducted in immature stands that serves to improve the quality of the stand or speed the maturing process is considered to be a TSI practice.

Most often, TSI consists of thinning pole-size stands to reduce the number of stems on the area and concentrate future growth on stems of high potential. This practice has been proven effective in a wide variety of stand conditions and guidelines exist for its implementation. Most often the trees cut have very little economic value and are therefore left on the ground. This material provides coarse woody debris, habitat for salamanders, snakes and other vertebrates, invertebrates, fungi and plants that decompose this material, thereby continuing the nutrient cycle of the forest.

Sometimes markets exist for some of the thinned material and firewood is another potential use for some of these excess stems. When a rustic fence, mine material or similar market exists, stands slightly larger than pole size can be thinned with some of the larger trees of poor quality being removed along with the small

diameter trees.

Grapevine control is also considered a TSI practice. On occasion, the proliferation of grapevines in an area becomes damaging when the vines overtop younger trees and when the vines wrap around tree trunks strangling the tree. Grapevine control can limit this. The practice is limited by labor costs and wildlife management recommendations, and only considered in stands of potential high quality and value.

Stands containing a high percentage of cull trees (those containing less than 50 percent usable wood) should have the majority of these culls removed to improve the quality and vigor of the stand. Some cull trees are left as den trees, usually three to five per acre. The reduction of competition increases the stand quality and allows for the establishment of additional regeneration.

Pruning is a TSI practice useful in pine stands and hardwood stands of very high value.

### **Variable Retention**

An approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives.

In variable retention, trees that will provide homes and food for wildlife, roosts for birds, seed sources for future tree seedlings, and those with other desirable features will be left standing. The variable part comes into play when determining how much light is needed on the forest floor or how many residual trees to leave to attain the desired results. For instance, if regenerating oak, more trees would be left standing initially than for regenerating yellow poplar or black cherry because of their differing light requirements.