

SILVICULTURAL TREATMENTS

Silviculture is the theory and practice 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.

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 which 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 incremental 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 DNR), 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 ten. 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% 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 which 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-sized 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 continuing the nutrient cycle of the forest.

Sometimes markets exist for some of the thinned material, or 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% 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.

GLOSSARY

These definitions reflect the use of these terms in this plan.

ACRE - A unit of area used in land measurement equal to 160 square poles, 4,800 square yards or 43,560 square feet.

ADVANCE REGENERATION - Seedlings or saplings that are present in the understory prior to removal of any overstory.

AGE CLASS - A group of trees in a stand that are at or nearly the same age.

ARTIFICIAL REGENERATION (reproduction) - Creation of a new age class by direct seedling, or by planting seedlings or cuttings.

AESTHETICS - The perception of beauty conveyed by a natural scene, a pleasant sight.

BASAL AREA - Total area of cross section of stems measured at breast height (4 2 feet above the ground), usually expressed in square feet per acre.

BEST MANAGEMENT PRACTICES - Guidelines establishing standards for all aspects of logging which have been developed to reduce sedimentation of streams.

BIOLOGICAL DIVERSITY - The distribution and abundance of different plant and animal communities.

BURNING, PRESCRIBED - The application of fire, usually under existing stands and under specific conditions of weather and fuel moisture, in order to control vegetation to meet goals of silviculture or hazard or disease reduction.

CLEANING - A release treatment made in an age class not past the sapling stage in order to free the favored trees from less desirable individuals of the same age class which overtop them or are likely to do so.

CLEAR-CUT - An even-age method of regenerating a stand through the removal, in a single cut, of all trees larger than seedlings. The new age class develops in a fully-exposed microclimate. In some situations, small numbers of trees may be left within the clear-cut opening for some special purpose.

CLIMAX FOREST - The final stage of succession, that is relatively stable and self-perpetuating.

COMPETITION - the constant demand of each organism for more growing space, light, nutrients and water.

COMPOSITION, STAND - The proportion of each tree species in a stand expressed as a percentage of either the total number, basal area, or volume of all tree species in the stand.

CONDITIONING CUT - A harvest cut which is used to improve the overall health of the stand by removing mature, overmature, low vigor and poor quality trees. The result is a stand of better stocking, more vigorous and desirable species, increased diversity, quality and growth potential.

CONSERVATION - The wise-use of natural resources. The management of a resource which retains the basic character of that resource over time.

CROP TREE - Any tree that is selected to become a component of a future final harvest.

CROWN CLASS - A class of tree based on crown position relative to crowns of adjacent trees.

Dominant - Trees with crowns extending above the general level of the main canopy of groups of trees, and receiving full light from above and comparatively little from the sides.

Codominant - Trees with crowns forming the general level of the main canopy in groups of trees, receiving full light from above and comparatively little from the sides.

Intermediate - Trees with crowns extending into the lower portion of the main canopy of groups of trees, but shorter in height than the codominants. They receive little direct light from above and none from the sides.

Overtopped (suppressed) - Trees of varying levels of vigor that have their crowns completely covered by the crowns of one or more neighboring trees. These trees receive little if any direct light.

CROWN COVER - The ground area covered by the crowns of trees or woody vegetation as delimited by the vertical projection of crown perimeters and commonly expressed as percent of total ground area (syn. Canopy Cover).

CROWN DENSITY - The compactness, or depth of foliage of the crowns of trees and/or shrubs.

CULL TREES - Any tree in which 50% or more of the total volume is defective.

CUTTING CYCLE - The planned interval between partial harvests in an uneven-aged stand.

DEFERMENT CUT - A regeneration practice during which, up to 20% 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. This practice creates a two-aged stand.

DEN TREE - Any tree with one or more cavities that afford shelter or protection to wildlife.

DIAMETER AT BREAST HEIGHT (DBH) - A measuring point on a tree made at 4.2 feet above the ground on the uphill side.

DIAMETER CLASSES - A group of trees or logs of similar sizes at a common point. Usually in two-inch increments at DBH for trees and one-inch increments, inside the bark on the small end for logs.

ECOLOGICAL APPROACH - Natural resource planning and management activities that assure consideration of the relationship between all organisms (including humans) and their environment.

ECOLOGICAL PROCESSES - The actions or events that link organisms (including humans) and their environment, such as disturbance, successional development, nutrient cycling, carbon sequestration, productivity, and decay.

ECOREGION - A continuous geographic area over which the macroclimate is sufficiently uniform to permit development of similar ecosystems on sites with similar properties. Ecoregions contain multiple landscapes with different spatial patterns of ecosystems.

ECOSYSTEM - The natural complex of plant and animal populations and the particular sets of physical conditions under which they exist.

EMERGENT (aquatic plant beds) - A site covered by water populated by plant species whose roots are below the surface and which extend some part of the plant above the surface. An indicator of wetlands.

ENDANGERED SPECIES - Any life form which is in danger of extinction throughout all or a significant portion of its range. Its population level is so critically low and/or its habitat is so degraded that immediate action must be taken to avoid the loss of the species.

ENVIRONMENT - All the conditions, circumstances, and influences surrounding, and affecting the development of, an organism or group of organisms.

EVEN-AGED STAND - A stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of rotation.

EXCLUDED AREA - A specifically designated area segregated from the predominant activity. An area set aside from specific management regimes.

FAUNA - Of or related to animals, the animals of a specified region or time, a descriptive list of such animals.

FLORA - Of or relating to plants, the plants of a particular region or time, a descriptive list of such plants.

FOREST HEALTH - Forest can be considered healthy when there is a balance between growth and mortality, and the forest has the resiliency to react and overcome various forest impacts. Potential forest stressors include insects, pathogens, weather, climate, pollution, and others.

FOREST PRODUCT - Something produced during the natural processes in a forest.

FOREST PRODUCTIVITY - The ability of tree species to grow on a particular site; influenced by internal (tree physiology) and external (soil, climate) factors.

FOREST RESOURCES - Natural resources associated with forested ecosystems, included but not limited to; fish, air, clean water, wildlife, vegetation, soil, recreation and aesthetics.

FORESTRY - A profession embracing the science, business, and art of creating, conserving, and managing forests and forest lands for the benefit of society.

FRAGMENTATION - The breaking up of contiguous areas into smaller patches of increasing degrees of dissimilarity.

FULLY STOCKED STANDS - Any stand containing a combination of basal area and stems per acre sufficient to indicate optimum use of the available growing space.

GROUP SELECTION - A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of the group is approximately twice the height of the mature trees, with these small openings providing micro-environments suitable to regenerate shade intolerant tree species (requiring direct sunlight for growth). These areas are generally not more than one-quarter acre in size.

HABITAT - The specific combination of food, shelter, and water that is required to accommodate a species.

HARDWOOD STAND - Any forest stand in which the number of stems, basal area or volume consists of a majority of broad-leaf tree species.

IMPROVEMENT CUTTING - A cutting made in a stand past the sapling stage primarily to improve composition and quality by removing less desirable trees.

INGROWTH - Trees that, during a specified period, have grown past an arbitrary lower limit of (usually) diameter or height. Ingrowth is usually measured as basal area or volume per unit area.

INTERMITTENT STREAMS - Any water course which carries a visible flow of water periodically, usually depending on the season of the year, or the current and recent

weather condition.

INTERMEDIATE TREATMENTS - A collective term for any treatment designed to enhance growth, quality, vigor, and composition of the stand after establishment of regeneration and prior to final harvest.

INVENTORY (forest) - The gathering of information such as the forest condition, land area, tree volumes, growth and mortality to provide for effective management planning.

LANDSCAPE - An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, biota and human influences throughout the area. Landscapes are generally of a size, shape and pattern which is determined by interacting ecosystems.

LIBERATION - A release treatment made to a stand not past the sapling stage in order to free the favored trees from competition of older, overtopping trees.

MATURE FOREST - Generally used in an economic sense to indicate that a forest has attained harvest age.

MULTIPLE-USE - The act of satisfying more than one need with a single resource.

NATURAL REGENERATION - A stand of trees created from natural seeding, sprouting, suckering, or layering.

NURSE TREE (Nurse Crop) - A tree, group of trees, shrubs, or other plants, either naturally occurring or introduced, used to nurture or improve the form of a more important tree or crop during youth by protecting it from frost, sun scald or wind.

NUTRIENT CYCLE - The movement of soluble chemicals from the soil to the roots of plants into the stems and foliage; back to the surface of the ground in the form of leaves, fruits and twigs; and into soluble compounds again by the decomposition of this litter through the combined action of bacteria, fungi and soil animals.

OLD-GROWTH FOREST - Forests that contain a wide range of tree sizes and ages, a deep, multilayered crown canopy, diverse shrub and forb layers, and significant accumulations of coarse woody debris including snags and fallen logs. Stands typically appear all-aged rather than even-aged. Large trees can be evidence that the old growth ecosystem has had sufficient time to develop diverse structure, although not all old growth stands have large trees, particularly on less productive sites. Large trees can exist in relatively young stands on very productive sites.

OVERSTORY REMOVAL - The cutting of trees comprising an upper canopy layer in order to release trees or other vegetation in an understory.

PARTIAL CUTTING - The removal of a specific segment or component of a stand in a single operation, followed by a series of operations which remove other components until a specific goal is attained.

PERENNIAL STREAMS - Any stream channel containing a visible volume of water

throughout the year with the exception of drought periods.

PERMISSIBLE CUT - The volume of timber that can be removed from a fully stocked stand without adversely affecting the stands ability to fully utilize the available growing space within the stand.

PINE STAND - Any forest stand whose composition, based on number of stems, volume, or basal area, consists of a majority of pine species (trees with needles in bundles).

PRECOMMERCIAL THINNING - A thinning that does not yield trees of commercial value, usually designed to improve crop spacing.

PRESCRIPTIONS - The written instructions by a forester for the preparation and administration of a resource management practice.

PRESERVATION - The act of guarding, securing, or sustaining an item so as to retain its character and quality.

PROPAGATION - To breed or multiply by regeneration, seed or cuttings.

PRUNING - To cut off or remove dead or living tree branches to improve tree growth, quality and commercial value of the tree.

RARE (species) - Species of a given region that are found in unusual habitats where local edaphic, topographic or biotic factors provide conditions unfavorable for those species having a more widespread distribution. Examples of such areas in WV are; rock cliffs, rocky water splashed river banks, sphagnum bogs (or glades) and shale barrens.

REGENERATION (reproduction) METHOD - A cutting method by which a new age class is created. The major methods are clear cutting, seed tree, shelterwood, selection, and coppice.

Coppice Methods - Methods of regenerating a stand in which the majority of regeneration is from stump sprouts or root suckers.

REGULAR UNEVEN-AGED (balanced) STAND - A stand in which three or more distinct age classes occupy approximately equal areas and provide a balanced distribution of diameter classes.

RELEASE - A treatment designed to free young trees from undesirable, usually overtopping, competing vegetation. Treatments include cleaning, liberation and weeding.

RESIDUAL STAND - The aggregate of trees remaining in a stand following a silvicultural practice or natural disturbance.

RIPARIAN ZONE - The immediate area influenced by the presence of a concentration of water. The banks of streams, lakes or marshes.

ROTATION - The planned number of years between the regeneration of a forest stand and its final cutting.

SALVAGE CUTTING - The removal of dead trees or trees being damaged or killed by

injurious agents other than competition, to recover value that would otherwise be lost.

SANITATION CUTTING - The removal of trees to improve stand health and to reduce actual or anticipated spread of insects and disease.

SAPLING - A tree, usually young, that is larger than a seedling but smaller than a pole, generally between 1" and 5" in diameter.

SECONDARY GROWTH FOREST - The forest subsequent to a harvest or other disturbance.

SECONDARY SUCCESSION - The succession or progression of plant communities that occurs on a site that previously contained a plant community that was removed by natural or man-caused disturbance. Primary succession is a term applied to vegetational changes that occur on sites where no vegetation has grown before (e.g., a new island, newly exposed rock).

SEDIMENTATION - The process of depositing a solid after being transported by a liquid. The act or process of depositing soil particles onto the stream bed.

SEED TREE METHOD - An even-aged regeneration method in which a new age class develops from seedlings that germinate in fully exposed micro-environments after removal of all the previous stand except a small number of trees left to provide seed. Seed trees are removed after regeneration is established.

SHADE INTOLERANT - A description assigned to any tree species whose seedlings are incapable of sustained development in low light.

SHADE TOLERANT - Plants that are more competitive in shaded environments through selection for low respiration rates, they also tend to have lower photosynthetic rates and hence grow slowly in all environments.

SHRUB - A woody plant of relatively low height, distinguished from a tree by having several stems rather than a single trunk.

SHELTERWOOD METHOD - A method of regenerating an even-aged stand in which a new age class develops beneath the partially-shaded micro-environment provided by the residual trees. In one or more succeeding harvests the residual stand is removed to fully release the established regeneration.

SILVICULTURE - The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

SILVICULTURE SYSTEM - A planned process whereby a stand is tended, harvested, and re-established. The system name is based on the number of age classes and/or the regeneration method used.

SINGLE TREE SELECTION - A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more or less uniformly throughout the stand to achieve desired stand structural characteristics.

SITE CLASS - A classification of site quality, usually expressed in terms of ranges of dominant tree height at a given age or potential mean annual increment at culmination.

SITE QUALITY (productivity) - The productive capacity of a site, usually expressed as volume production of a given species.

SITE PREPARATION - Reduction of competing vegetation, the removal of physical obstacles to planting and the drainage of water toward or away from the planted trees - to insure successful establishment of new trees.

SITES - Areas considered by ecological factors with reference to capacity to produce forests or other vegetation; the combination of biotic, climatic, and soil conditions of an area.

SIZE CLASSES - Tree sizes recognized by distinct ranges, usually of diameter or height.

SNAG - A standing dead tree from which the leaves and most of the branches have fallen.

SPECIAL TREATMENT AREAS - Any site within an area under a prescription which requires a modification to that prescription in order to suitably address the needs of the site.

SPECIES DIVERSITY - The amount of variety of life forms associated with an area. Often used as an indicator of the health of an ecosystem.

STAND - A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

Mixed Stand - A stand in which there is a mixture of species.

Pure Stand - A stand composed of essentially a single species.

Stratified Mixture - A stand in which different species occupy different strata of the total crown canopy.

STAND CONVERSION - A prescription advocating the removal of a dominant existing species in order to favor another species better suited to the site which may be either currently absent or suppressed.

STAND DENSITY - A quantitative, absolute measure of tree occupancy per unit of land area in such terms as numbers of trees, basal area, or volume.

STAND IMPROVEMENT - A term comprising all intermediate cuttings made to improve the composition, structure, condition, health and growth of even or uneven-aged stands.

STAND PRESCRIPTIONS - A written evaluation of a forest stand including directions and guidelines to be applied in order to change the condition of the stand to some desired condition as expressed in the management plan.

STEM - The main ascending axis of a plant, a stalk or trunk.

STEWARDSHIP - The integration of managing, growing, nurturing and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat and aesthetics. A management ethic advocating practices designed to improve a resource.

STOCKING - An indication of growing-space occupancy relative to a pre-established standard. Common indices of stocking are based on percent occupancy, basal area, relative density and crown competition factor.

STRATUM (canopy layer) - A distinct layer of vegetation within a forest community.

SUBCLIMAX FOREST - The stage in forest succession immediately preceding the climax forest.

SUCCESSION (ecological) - A process of community development that involves changes in species structure and community processes over time.

SUCCESSIONAL STAGE - One in a series of usually transitory communities or developmental stages that occur on a particular site or area over a period of time. Eventually, on most sites, a relatively stable, self-perpetuating stage, called a climax, is attained.

SUSTAINABLE - To produce a steady predictable quantity of all resources over time.

THREATENED SPECIES - One which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. This species may be rare but relatively stable in its population size, or it may be fairly common but declining rapidly.

THINNING - A cutting made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

TIMBER COVER TYPES - A descriptive classification of forest land based on present occupancy of an area by commonly recognizable combinations of tree species.

TIMBER SIZE CLASS - A descriptive classification grouping a broad range of tree sizes together based on the common utility of trees within that range.

TOLERANCE, SHADE - The relative capacity of a plant to become established and grow in the shade.

TREE - A usually tall, woody plant, distinguished from a shrub by having comparatively greater height and characteristically, a single trunk rather than several stems.

TREE SHELTERS - A translucent plastic tube supported by a stake, placed around tree seedlings. Shelters protect seedlings from deer and small mammal damage and extremes in environmental conditions, thereby boosting the seedlings chances of survival and usually enhancing the growth rate.

TWO-AGED STAND - A stand composed of two distinct age classes that are separated in age by more than 20 percent of rotation.

UNEVEN-AGED STAND - A stand of trees of three or more distinct age classes, either intimately mixed or in small groups, separated in age by more than 20% of the rotation.

UNDERSTOCKED - A stand with any combination of basal area and stems per acre insufficient to optimally utilize the available growing space by the trees present.

VEGETATIVE COVER - The composite of all plant life on a given site.

VERTICAL STRUCTURE - The layering effect of plants in a stand, determined by different growth forms; trees, vines, shrubs, herbs, mosses and lichens and by the distribution of different tree species having different heights and crown characteristics and different ages of the same species. Multiple vegetative layers; overstories with rich species composition and well developed herbaceous shrub understory and woody mid-story layer.

WATERSHED - The entire area contributing to the supply of a river or lake; a drainage area. The entire area of land upon which the excess water (runoff) enters a common stream.

WETLANDS - Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered with shallow and sometimes temporary waters, at least part of the year.

WILDLIFE RESOURCES - Wild animals, wild birds and wildlife as defined in WV Code '20-1-2.

WORKING FOREST - Any boundary of forest land managed as a unit which is subject to active management including the use of silvicultural practices designed to manipulate the vegetative cover to create conditions desirable or not otherwise found on the forest.