

SILVICULTURE TERMINOLOGY

with Appendix of Draft Ecosystem Management Terms

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Prepared by the Silviculture Instructors Sub group

Silviculture Working Group (D2)

Society of American Foresters

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Advance Regeneration (Reproduction) syn. Advance Growth

Seedlings or saplings that develop or are present in the understory.

Afforestation

Establishment of a forest or stand in an area not recently forested.

Age Class (Cohort)

A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g. 10-year age class, as used in inventory or management.

Artificial Regeneration (Reproduction)

An age class created by direct seeding or by planting seedlings or cuttings.

Basal Area

The area of the cross section of a tree stem, including the bark, generally at breast height (4.5 feet above the ground).

Breast Height

A standard height from ground level for recording diameter, girth, or basal area of a tree, generally 4.5 feet.

Burning, Prescribed

The application of fire, usually under existing stands and under specified conditions of weather and fuel moisture, in order to attain silvicultural or other management objectives.

Canopy

The foliar cover in a forest stand consisting of one or several layers.

Canopy Closure

see Crown Cover

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 (see Improvement Cutting, Liberating, Weeding).

Clearcutting

(see Regeneration Methods)

Codominant

(see Crown Class)

Cohort

(see Age Class)

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.

Coppice

(see Regeneration Methods)

Crop Tree

Any tree that is selected to become a component of a future commercial harvest.

Crown

The part of a tree or woody plant bearing live branches and foliage.

Crown Class

A class of tree based on crown position relative to the crowns of adjacent trees.

Emergent

Trees with crowns completely above the general level of the main canopy receiving full light from above and from all sides.

Dominant

Trees with crowns extending above the general level of the main canopy of even-aged stands or, in uneven aged stands, above the crowns of the tree's immediate neighbors, and receiving full light from above and partly from the sides.

Codominant

Trees with crowns forming the general level of the main canopy in even aged stands or, in uneven aged stands, the main canopy of the tree's immediate neighbors, 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 even-aged stands or, in uneven aged stands, into the lower portion of the canopy formed by the tree's immediate neighbors, 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.

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 a percent of total ground area (syn. Canopy Cover).

Crown Density

The amount and compactness of foliage of the crowns of trees and/or shrubs.

Cutting Cycle

The planned interval between partial harvests in an uneven aged stand (see Thinning Interval).

Dominant

(see Crown Class)

Emergent

(see Crown Class)

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.

Even-Aged System

A planned sequence of treatments designed to maintain and regenerate a stand with one age class. The range of tree ages is usually less than 20 percent of the rotation. (see Clearcutting, Seed Tree, Shelterwood, Coppice).

Forest Fertilization

The addition of nutrient elements to increase growth rate or overcome a nutrient deficiency in the soil.

Genotype

The genetic constitution of an organism in terms of its hereditary characteristics as distinguished from its physical appearance or phenotype.

Green Tree Retention

(see Reserve Trees)

Group Selection

(see Regeneration Methods)

Harvesting Method

A cutting by which a stand is logged. Emphasis is on meeting logging requirements while concurrently attaining silvicultural objectives (see Regeneration Methods).

Improvement cutting

A cutting made in a stand pole sized or larger primarily to improve composition and quality by removing less desirable trees of any species (see Cleaning, Liberating, and Weeding).

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.

Intermediate

(see Crown Class)

Intermediate Treatments (Tending)

A collective term for any treatment designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest (see Tending, Stand Improvement).

Liberating

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

Monoculture

A stand of a single species, generally even aged.

Mycorrhizae

The symbiotic association between certain fungi and plant roots which enhances the uptake of water and nutrients.

Natural Regeneration

An age class created from natural seeding, sprouting, suckering, or layering.

Nurse Tree (Nurse Crop)

A tree, group or crop of trees, shrubs or other plants, either naturally occurring or introduced, used to nurture, improve survival or improve the form of a more desirable tree or crop when young by protecting it from frost, insolation, or wind.

Overstory Removal

The cutting of trees comprising an upper canopy layer in order to release trees or other vegetation in an understory (see Clearcutting).

Phenotype

The observed expression of a trait in an individual resulting from developmental interaction of the individual's genotype and its operational environment.

Pole

A tree between the size of a sapling and a mature tree.

Precommercial Thinning (PCT)

A thinning that does not yield trees of commercial value, usually designed to reduce stocking in order to concentrate growth on the more desirable trees.

Reforestation

The natural or artificial restocking of an area with trees (syn. Regeneration).

Regeneration

Seedlings or saplings existing in a stand; or the act of establishing young trees naturally or artificially (syn. Reforestation).

Regeneration (Reproduction) Method

A cutting method by which a new age class is created. The major methods are Clearcutting, Seed Tree, Shelterwood, Selection, and Coppice (see Harvesting Method).

Coppice Methods

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

Coppice

A method of regenerating a stand in which all trees in the previous stand are cut and the majority of regeneration is from sprouts or root suckers.

Coppice with Reserves

A coppice method in which reserve trees are retained to attain goals other than regeneration. The method normally creates a two aged stand.

Even Aged Methods

Methods to regenerate a stand with a single age class.

Clearcutting

A method of regenerating an even aged stand in which a new age class develops in a fully-exposed microclimate after removal, in a single cubing, of all trees in the previous stand. Regeneration is from natural seeding, direct seeding, planted seedlings, and/or advance reproduction. Cutting may be done in groups or patches

(Group or Patch Clearcutting), or in strips (Strip Clearcutting). In the Clearcutting System, the management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand (see Group Selection).

When the primary source of regeneration is advance reproduction, the preferred term is Overstory Removal.

Clearcutting with Reserves (see Two Aged Methods)**Seed Tree**

An even aged regeneration method in which a new age class develops from seeds 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.

Seed Tree with Reserves (see Two-Aged Methods)

Shelterwood

A method of regenerating an even aged stand in which a new age class develops beneath the moderated micro environment provided by the residual trees. The sequence of treatments can include three distinct types of cuttings: 1) an optional preparatory cut to enhance conditions for seed production; 2) an establishment cut to prepare the seed bed and to create a new age class; and 3) a removal cut to release established regeneration from competition with the overwood. Cutting may be done uniformly throughout the stand (Uniform Shelterwood), in groups or patches (Group Shelterwood), or in strips (Strip Shelterwood).

Shelterwood with Reserves (see Two Aged Methods)**Two-Aged Methods**

Methods designed to maintain and regenerate a stand with two age classes. In each case the resulting stand may be two aged or tend towards an uneven aged condition as a consequence of both an extended period of regeneration establishment and the retention of reserve trees that may represent one or more age classes.

Clearcutting with Reserves

A clearcutting method in which varying numbers of reserve trees are not harvested to attain goals other than regeneration.

Seed Tree with Reserves

A seed tree method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration.

Shelterwood with Reserves

A variant of the Shelterwood Method in which some or all of the shelter trees are retained, well beyond the normal period of retention, to attain goals other than regeneration.

Uneven Aged (Selection) Methods

Methods of regenerating a forest stand, and maintaining an uneven aged structure, by removing some trees in all size classes either singly, in small groups, or in steps.

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 groups is approximately twice the height of the mature trees, with small openings providing microenvironment suitable for tolerant regeneration and the larger openings providing conditions suitable for more intolerant regeneration. In the Group Selection System, the management unit or stand in which regeneration,

growth, and yield are regulated consists of a landscape containing an aggregation of groups (see Clearcutting).

Group Selection with Reserves

A variant of the Group Selection Method in which some trees within the group are not cut to attain goals other than regeneration within the group.

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.

Overtopped

(see Crown Class)

Regeneration (Reproduction) Period

The time between the initial regeneration cutting and the successful re establishment of a new age class by natural means, planting, or direct seeding.

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 (Release Operation)

A treatment designed to free young trees from undesirable, usually overtopping, competing, vegetation. Treatments include cleaning, liberating, and weeding (see Stand Improvement).

Reserve Trees (Green Tree Retention)

Trees, pole sized or larger, retained in either a dispersed or aggregated manner after the regeneration period under the Clearcutting, Seed Tree, Shelterwood, or Coppice Methods (syn. Standards).

Root Pruning

The root pruning of seedlings in a nursery bed to limit the extension of roots in depth or laterally (see Undercutting).

Rotation

In even aged systems, the period between regeneration establishment and final cutting.

Salvage Cutting

The removal of dead trees or trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost.

Sanitation Cutting

The removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insects and disease (see Stand Improvement).

Sapling

A tree, usually young, that is larger than a seedling but smaller than a pole. Size varies by region.

Scarification

Mechanical removal of competing vegetation and/or interfering debris, or disturbance of the soil surface, designed to enhance reforestation.

Seed Tree

(see Regeneration Methods)

Shelterwood

(see Regeneration Methods)

Silviculture

The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silvicultural System

A planned process whereby a stand is tended, harvested, and re established. The system name is based on the number of age classes (see Even Aged, Two-Aged, Uneven Aged), and/or the regeneration method used (see Clearcutting, Seed Tree, Shelterwood, Selection, Coppice, Coppice with Reserves).

Single Tree Selection

(see Regeneration Methods)

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 Index

A measure of actual or potential forest productivity expressed in terms of the average height of a certain number of dominants and co dominants in the stand at an index age.

Site Preparation

A hand or mechanized manipulation of a site designed to enhance the success of regeneration. Treatments may include bedding, burning, chemical spraying, chopping, disking, drainage, raking, and scarifying. All treatments are designed to modify the soil, litter, and vegetation and to create microclimate conditions conducive to the establishment and growth of desired species.

Site Quality (Productivity)

The productive capacity of a site, usually expressed as volume production of a given species.

Size Class

Tree size 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.

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 (see Mixed, Pure, Even Aged, and Uneven Aged Stands).

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 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.

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.

Structure

The horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

Succession

A series of dynamic changes by which Organisms succeed one another through a series of plant community (seral) stages leading to potential natural community or climax.

Suppressed

(see Crown Class)

Tending

See Intermediate Treatments.

Thinning

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

Crown Thinning (Thinning from Above, High Thinning)

The removal of trees from the dominant and codominant crown classes in order to favor the best trees of those same crown classes.

Free Thinning

The removal of trees to control stand spacing and favor desired trees using a combination of thinning criteria without regard to crown position.

Low Thinning (Thinning from Below)

The removal of trees from the lower crown classes to favor those in the upper crown classes.

Mechanical Thinning (Geometric Thinning)

The thinning of trees in either even or uneven aged stands involving removal of trees in rows, strips, or by using fixed spacing intervals.

Selection Thinning (Dominant Thinning)

The removal of trees in the dominant crown class in order to favor the lower crown classes.

Thinning Interval

The period of time between successive thinning events, usually used in connection with even aged stands (see Cutting Cycle).

Tolerance, Shade

The relative capacity of a plant to become established and grow beneath overtopping vegetation.

Two Aged Stand

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

Two-Aged System

A planned sequence of treatments designed to maintain and regenerate a stand with two age classes.

Undercutting

The root pruning of seedlings in a nursery bed to limit root depth extension (see Root Pruning).

Uneven Aged Stand

A stand of trees of three or more distinct age classes, either intimately mixed or in small groups.

Uneven Aged System

A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes (see Single Tree Selection, Group Selection).

Weeding

A release treatment in stands not past the sapling stage that eliminates or suppresses undesirable vegetation regardless of crown position.

Wrenching

The disturbance of seedling roots in a nursery bed (e.g. with a tractor drawn blade) with the objective of stimulating the development of a fibrous root system.

ECOSYSTEM MANAGEMENT TERMS

The Terminology Committee of SAFs D2 Working Group has become aware of a variety of publications that are introducing terms related to Ecosystem Management in glossaries and in general text. There is considerable variation in the use of these terms and standard definitions are needed in order to permit consistent communication within the profession and science of forestry.

The Committee has reviewed terms in the FEMAT Report (Forest Ecosystem Management Assessment Team, July, 1993; the Forest Health Conditions in Idaho - Executive Summary, Dec., 1993; the British Columbia Forest Practice Code. Dec., 1993; the SAF Task Force on Sustaining Long Term Forest Health and Productivity 1993; and forest ecology texts by Colinvaux (1986), Kimmins (1987), Odmn (1971), and Spurr and Barnes (1980). We recognize that time must pass before terms become accepted, however we offer the following definitions and request comments leading to their refinement and standardization as well as suggestions for additional needed terms.

When ecosystem management terms become accepted and standardized, they will be added to the Silvicultural Terminology.

Adaptive Management

A type of forest land management in which, as an ongoing process, the monitoring of results of management decisions, in relation to sustaining ecosystem characteristics and changes in societal goals, is used to modify management approach.

Biological Diversity

The variety and abundance of life forms, processes, functions, and structures including the relative complexity of species, communities, gene pools, and ecosystems at spatial scales that range from local through regional to global (syn. Biodiversity).

Ecological Approach

A type of natural resource planning, management, or treatment that ensures consideration of the relationship between all organisms (including humans) and their environment.

Ecological Classification

A multi-factor approach to categorizing and delineating, at different levels of resolution, areas of land and water having similar characteristic combinations of physical environment (such as topography, climate, geomorphic processes, geology, soil, and hydrology), biological communities (such as plants, animals, microorganisms, and/or potential natural communities), and human factors (such as social, economic, cultural, and infrastructure).

Ecological Process

A series of natural biological, physical, and social actions or events that link the growth and development of organisms (including humans) within their environments.

Ecoregion

A contiguous geographic area having similar macroclimate, possibly with several vegetation types, and used as an ecological basis for management or planning.

Ecosystem

A conceptual unit comprised of organisms interacting with each other and their environment having the major attributes of structure, function, complexity, interaction and interdependency, temporal change, and no inherent definition of spatial dimension.

Ecosystem Management

The use of an ecological approach to resource management at the landscape level that blends social, physical, economic, and biological processes to ensure the sustainability of healthy ecosystems while providing desired values, goods, and services.

Forest Health

A forest condition that has overall structure, function, and characteristics that enable it to be resilient to disturbance and to maintain normal rates of change commensurate with its stage of development.

Fragmentation

The process, through cutting or natural processes, of reducing the size and connectivity of stands that compose a forest or landscape.

Habitat

The place where an animal or plant naturally or normally lives and develops.

Habitat Type

An aggregation of units of land capable of producing similar plant communities at climax.

Landscape

A viewed area of land of generally large size and commonly a mosaic of land forms and plant communities irrespective of ownership or other artificial boundaries.

Old Growth

Forest ecosystems distinguished by old trees and related structural features characteristic of later stages of stand and successional development. Some have large trees, snags, large down woody material, multiple tree canopy layers, associated herb and shrub components and canopy gaps. Some of these attributes may also be found in stands of earlier stages of development.

Productivity

A term describing the relative capacity of an area to sustain a supply of goods and/or services in the long run.

Resiliency

The capacity of an ecosystem to maintain or regain normal development following disturbance.

Stewardship

Caring for land and associated resources in a manner that enables their passing on to future generations in a healthy condition.

Sustainability

The capacity of forests, ranging from stands to ecoregions, to maintain their health, productivity, diversity, and overall integrity, in the long run, in the context of human activity and use.

Watershed

An area of land with a single drainage network.