**Glossary for Forests and Forestry Practices**

 (18 November 2022)

**Adaptation** - the changes in policies, the changes in behavior and the responses and solutions used to deal with the changing climate. It includes building structures more robustly in order to better withstand storms, moving structures out of areas prone to increased flooding or fire, and changing where trees are planted to better take advantage of the weather and climate.

**Afforestation** - Planting trees in an area that has not been forested in many years. Usually this means many decades but could be longer. One example is turning converted pastureland “back” to forestland. Afforestation might even be attempted on lands that have no known history of forest cover. The success of afforestation depends on the assessment of many variables.

**Biochar** – also called charcoal. Produced by heating organic material (manure or plant leaves, stalks, roots, husks, shells, seeds) in a low oxygen environment. The biochar can be put into soil to increase its fertility and to allow it to hold water.

**Biomass** - the amount of living matter in a unit area or volume of habitat; plant material and animal waste used as a source of fuel.

**Biodiversity** - the variety of life in the world or in a particular habitat or ecosystem. Biodiversity is usually studied at three levels - genetic diversity, species diversity, and ecosystem diversity. Loss of biodiversity is as detrimental as climate change and the two are entwined.

**Biotech plants** – plants that have been grown from genetically modified seeds (GMO).

**Biotic community** – a group of organisms that interact with each other, depend on each other, and inhabit an area.

**Carbon footprint** – the amount of carbon dioxide and other carbon compounds emitted due to the consumption of fossil fuels by an individual, group, organization, event, service, product, etc.

**Carbon sequestration** – the process where airborne carbon dioxide is removed from the air and stored in trees or plants as leaves, stems, trunks, roots, and soils. This is also called terrestrial carbon sequestration or bio-sequestration.

**Carbon sink** – a long-term storage reservoir for carbon, such as forests, soil, wetlands, and prairies.

**Carbon smart wood use** – a term coined by the Climate Leadership Forum to define the criteria designers should consider when using wood. Design criteria include:

1. Reduce the building footprint and only build what is needed.

2. Re-use and/or recycle buildings and materials.

3. Use materials efficiently.

4. Select the low carbon option - Forest management matters; move to carbon-positive solutions.

**Certified forestry** - Forest certification is a mechanism for forest monitoring, tracing and labeling of timber, wood and pulp products and non-timber forest products where the quality of forest management is judged against a series of agreed standards. The certification refers to an independent third-party evaluation of the management of a particular forest against a certain standard. A logo or tag on a wood-based product alerts consumers that wood used to produce that product is from a certified forest. There are two main certification systems in use in North America.

The **Forest Stewardship Council (FSC)** is the most rigorous forest certification system. It is composed of three chambers, having equal voting rights. The three chambers cover environmental, social, and economic standards. Sierra Club is a voting member in the environmental chamber.

The **Sustainable Forestry Initiative (SFI)** is a timber-industry sponsored certification system that accommodates business-as-usual forestry practices and requires little more than the law allows in the state where the timber is grown and harvested.

**Clean Water Act** - Federal legislation authorizing the Environmental Protection Agency primary responsibility for regulating the release of pollutants into U.S. waterways. State agencies may have assumed responsibility for enforcing Clean Water Act regulations.

**Clearcutting** – a method of tree removal where all trees in an area are cut down and removed. It is an ecologically harmful form of logging that disturbs soils, waterways, wetlands, and peatlands, creating water runoff and releasing vast carbon stores and diminishing a forest's ability to sequester carbon from the atmosphere. Public agencies use euphemisms for forest clearcutting including: "active forest management", "even-aged management", "forest restoration", "fuel reduction", "regeneration harvest", "rehabilitate a forest", "temporary wildlife opening", "thinning", "timber type conversion", "wildfire risk reduction", etc. For more, see <https://peer.org>

**Climate-smart forestry** – (CSF) is an evolving concept of forest management practices originating in efforts to reduce GHG emissions from actively managed forests. It also includes consideration of climate change on forest ecosystems to create more resilience. Forest management in this context usually includes commercial logging and other actions designed to extract forest products.  CSF is not a well-defined term with universally agreed upon principles of practice and measurement, thus it is sometimes used by the timber industry as a label to claim climate and forest protection benefits when none are apparent.  There are efforts to create more specific criteria for CSF that may provide benefits when applied responsibly. See for example: [https://us.fsc.org/en-us/newsroom/newsletter/id/1223](https://us.fsc.org/en-us/newsroom/newsletter/id/1223%22%20%5Ct%20%22_blank)

**Compacted soil** – soils where the air pockets between soil particles have been reduced to such an extent that water can no longer infiltrate the soil, air is not held in the soil and plant roots are unable to be established in the soil. Compaction results from driving vehicles or equipment over the soil and from walking over the soil.

**Compost** - organic material, such as leaves, stalks and roots, that has decomposed and is being added to soil as a fertilizer and to rejuvenate soil.

**Deforestation** - the destruction of trees and forests for human and commercial uses; the clearing of trees, transforming a wooded area into cleared land.

**Degraded soil, Exhausted soil** - soil that is no longer able to support plant life due to loss of nutrients in the soil.

**Endangered Species** - species whose prospects for survival are in immediate danger and thus need assistance to prevent future extinction. Species can be listed at the Federal level, State level, or both.

**Engineered wood (also called mass timber, composite wood, man-made wood, or manufactured board)**, includes a range of derivative wood products that are manufactured by binding or fixing the strands, particles, fibers, veneers, or boards of wood together with adhesives or other methods to form a composite material.

**Environmental Assessment (EA)** - a short report detailing a proposed development plan, the site, and potential environmental impacts. There are three outcomes: a Finding of No Significant Impact (FONSI); a Mitigated FONSI (in which the project can go forward provided some changes are made); and the need for an Environmental Impact Statement (EIS).

**Environmental Impact Statement (EIS)** - a detailed document, required under the federal National Environmental Policy Act (NEPA), describing the proposed project, environmental, demographic and economic impacts, and all possible alternatives. An EIS requires public hearings after the draft (DEIS) is released. All questions asked by the public and by private agencies during the comment period must be answered in writing before the final EIS (FEIS) is released.

**Evapotranspiration** - the combined process of water surface evaporation, soil moisture evaporation, and plant transpiration.

**Forest** - a complex ecosystem consisting mainly of trees that buffer the earth and support a myriad of life forms; a large area covered chiefly with trees and undergrowth.

 The Food and Agriculture Organization (FAO) of the United Nations defines a forest as land with tree crown cover (or equivalent stocking level) of more than 10% and area of more than 0.5 hectare. The trees should be able to reach a minimum height of 5 meters at maturity in situ. Forests are further subdivided by the FAO into natural forests and plantations:

**Natural forests** are forest areas with many of the principal characteristics and key elements of native ecosystems, such as complexity, structure and biological diversity, including soil characteristics, flora and fauna, in which all or almost all the trees are native species.

**Plantations** are forest stands established by planting or seeding, or both, in the process of afforestation or reforestation.

**Forest Carbon Pool** - Forests store carbon (biomass) in what is called a Carbon Pool that accumulates or loses carbon over time. There are two basic aspects to a carbon pool: how much it contains at any given time, and how much it is changing. These aspects are referred to as carbon sequestration and carbon storage.

**Carbon Sequestration** - The process of removing carbon from the atmosphere by photosynthesis, resulting in the maintenance and growth of trees and plants. The rate (or amount and speed) at which a forest sequesters carbon changes over time, beginning slowly and increasing over time. Trees continue to sequester carbon through their entire life span.

**Carbon Storage** - The amount of carbon that is retained in a carbon pool within a forest. Storage levels increase with age and typically peak in the United States when the forests are over 200 years old. About half the carbon in a typical tree is stored above ground and half below ground. Carbon in a forest is stored in five pools:

* **Live aboveground** - trees, shrubs, and other plants
* **Live belowground** - roots
* **Deadwood** - standing trees (snags) and downed logs
* **Litter** - leaves, needles, and small branches
* **Soil organic matter** - organic material in the soil, such as dead and decayed biomass, plant material, insects, fungi, and microbes.

**Forest Degradation** - While the international community still needs to align around a formal definition of forest degradation, it is generally understood to refer to land use impacts on forest ecosystems that significantly and negatively affect their species composition, structure, and function; deplete forest ecosystem carbon stocks; and reduce the quality of ecosystem services such as the provision of clean water.

Unfortunately, governments and industry actors have used the lack of consensus around a single definition of "degradation" to weaken and arbitrarily narrow its meaning in a way that divorces it from scientific reality. At the extreme of this are attempts to essentially conflate "forest degradation" with "deforestation," applying the term only to forest impacts that are practically indistinguishable from forest conversion.

The term, more accurately applied, encompasses a range of industrial activities, particularly within the logging and mining sectors, that may not permanently remove tree cover but leave the forest deprived of many of its original values, for example, through industrial logging that: promotes commercially valuable canopy trees species; converts the forest to even-aged, young stands; eliminates habitat for old-growth-dependent wildlife; reduces the ecosystem carbon stock; and increases erosion and poor water quality.

**Forestry** - the science or practice of planting, growing, and taking care of trees in forests, especially in order to obtain wood. See also silviculture.

**Genetically Modified Organisms (GMO)** – seeds, plants or animals whose DNA was modified by insertion of genetic materials from another species. The goal is to create organisms with traits that are unnatural to the species.

**Geographic Information Systems (GIS)** - a mapping technology that allows the user to create and interact with a variety of maps and data sources.

**Greenhouse gases** – a group of gases that hover in the atmosphere and that trap heat near the earth’s surface; among them are carbon dioxide, methane, nitrous oxide, hydrofluorcarbons, perfluorcarbons and sulfur hexafluoride.

**High Conservation Value Forest (HCVF)** - a Forest Stewardship Council (FSC) forest management designation used to describe those forests that meet criteria defined by the FSC Principles and Criteria of Forest Stewardship. Specifically HCVFs are those that possess one or more of the following attributes:

1. Forest areas containing globally, regionally or nationally significant: concentrations of biodiversity values (e.g. endemic, endangered species, refugia); and/or large landscape-level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

2. Forest areas that are in or contain rare, threatened or endangered ecosystems.

3. Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control.)

4. Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

**IMAP** - a brand of GIS mapping software.

**Life Cycle Assessment (LCA)** - a cradle-to-grave or cradle-to-cradle analysis technique to assess the environmental impacts associated with all the stages of a product's life, from raw material extraction through material processing, manufacture, distribution, use and disposal. The rules for deciding what should be measured and what can be omitted from a particular Life Cycle Assessment are established in a document called a Product Category Rule. The results of an LCA are presented in a document called an Environmental Product Declaration.

**LCAs for wood** - For almost all softwood products, Life Cycle Assessments are unreliable because the Product Category Rule that determines what impacts should be measured and what can be ignored starts when a tree is cut down and removed from the forest. It omits all the environmental, ecological and water impacts to the forest and the forest management practices before, during, and after harvest. This critical omission is because the rule was developed by a consortium of Canadian timber industry groups without any input from environmental groups.

**Logging** - the activity or business of cutting and transporting trees to prepare them to be processed into lumber.

**Lumber (also known as timber)** - wood that has been processed into beams and planks, a stage in the process of wood production. Lumber is mainly used for structural purposes but has many other uses as well.

**Mass timber** - a generic term that encompasses products of various sizes and functions, like glue-laminated (glulam) beams, laminated veneer lumber (LVL), nail-laminated timber (NLT), dowel-laminated timber (DLT), and cross-laminated timber (CLT).

**Mature forest** - The current FAO 2020 definition of a forest is "Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ." The age of a "mature" forest can vary greatly based on circumstances, (at least 80 years by one definition), but generally means the forest exhibits more ecological species and characteristics. The FAO states that a mature forest of mainly coniferous trees is generally more than 60 years of age. Some forests that appear mature may actually be old forests growing on poor sites, where trees never grow very large.

**Methane** - a component of natural gas. It is also a greenhouse gas. Methane is 20 times more effective in trapping heat in the atmosphere than carbon dioxide. It remains in the atmosphere for nine to fifteen years.

**Mitigation** – mitigation involves strategies, processes and technologies that reduce greenhouse gases.

**Monoculture** – growing the same plant over a large area.

**Mycorrhiza** - (from the Greek "fungus" and "root") is a mutual symbiotic association between a fungus and a plant. The term mycorrhiza refers to the role of the fungus in the plant's rhizosphere, its root system. Mycorrhizae play important roles in plant nutrition, soil biology, and soil chemistry.

**Old-growth Forest** - An old-growth forest (also termed a primary forest, a virgin forest, a late seral forest, or a primeval forest) is a forest that has attained great age (at least 120 years by one definition) without significant disturbance and thereby exhibits unique ecological features and might be classified as a "climax community." An old-growth forest is characterized by the presence of large old trees, numerous snags and woody debris, and a multilayered canopy, and that is usually in a late stage of ecological succession. According to the Food and Agriculture Organization (FAO) of the United Nations, old-growth forests are more efficient at sequestering carbon than newly planted forests and fast-growing timber plantations. The FAO further defines old-growth forests as:

**Primary Forests** are naturally regenerated forests of native tree species where there are no clearly visible indications of human activity and the ecological processes are not significantly disturbed.

**Virgin Forests** are old-growth forests that have never been logged.

**Other definitions** of 'Old-growth forests" include a "Stand age" definition, a "Forest dynamics" definition, "Social and cultural" definitions, "Economic" definitions, and other definitions proposed by special interest groups based on structural features, compositional features, or process features.

**Open Space** - Land in a predominantly open and undeveloped condition that is suitable for use as a natural area, wildlife and native plant habitat, or for passive or active recreation. Open space can include wetlands, watersheds, and stream corridors.

**Organic Matter** – particles of once-living plants and animals, including soil or animal manure. When organic matter is found in streams or rivers, it is often seen as brown water or what appears to be foam or soap bubbles on the surface of the water.

**Proforestation** - the process of encouraging forests to become more mature by allowing an existing forest to grow intact towards its full ecological potential. It is a nature-based solution whereby existing forests are protected as intact ecosystems to foster continuous growth for maximum carbon storage and ecological and structural complexity.

**Reclamation (sometimes called Rewilding)** - to return an ecosystem or landscape to its previous state before humans became involved. Often applies to land that was previously mined.

**Reforestation (occasionally called Reafforestation)** - the process of replanting an area with trees, where trees have previously been removed; the natural or intentional restocking of existing forests and woodlands (forestation) that have been depleted, usually through deforestation, but also after clearcutting.

**Refugia** - habitats that convey special and temporal resistance and/or resilience to biotic communities affected by disturbances. Refugia habitats are areas within the landscape that are naturally buffered from extreme variation in environmental conditions, such as protected slopes on mountains, valleys, or forests with extensive shading canopy.

**Resilience** – the ability of nature and mankind to adapt and survive in the face of change.

**Silviculture** - the science and art of growing and cultivating forest crops; the practice of controlling the growth, composition/structure, and quality of forests to meet values and needs, specifically of timber production. The distinction between forestry and silviculture is that silviculture is applied at the stand-level, while forestry is a broader concept. Adaptive management is common in silviculture, while forestry can include natural/conserved land without stand-level management and treatments being applied.

**Soil amendment** – materials added to the soil to make it more fertile such as compost, biochar, manure and artificial fertilizer.

**Soil Map** - A map showing distribution of soil types and/or soil properties (soil pH, textures, organic matter, etc.)

**Soil rejuvenation** – returning carbon to the soil, especially when it has been significantly reduced.

**Sustainable forestry** - "Sustainable" means to maintain, continue, and keep, while "forestry" is the science and art of managing forests. Thus, sustainable forestry is about maintaining and managing forests to provide resources, such as wood and clean water, now and in the future. It ideally means sustaining other things we value from the forest like wildlife habitat, ecological diversity, and carbon sequestration. It may also involve protecting forests from wildfire, pests, and diseases.

**Threatened Species** - those species that may become endangered if conditions surrounding them begin to or continue to deteriorate.

**Timber Harvest Plan (THP)** - a document which details planned logging operations and the steps that will be taken to minimize environmental impacts of these operations. In many regions of the world, a timber harvest plan is required before logging can proceed, and these documents are open to public comment before they are approved. The open public comment period allows concerned individuals to protest the timber harvest plan before it is finalized, and it can result in a blockage of the plan or substantial changes to it.

**Urban Forestry** - the care and management of single trees and tree populations in urban settings for the purpose of improving the urban environment.

**Wetlands** - land having a high water table, waterlogged soil, and vegetation that can survive frequent inundation. Wetlands are protected by the Federal Clean Water Act and include marshes, swamps, bogs, and forests where repeated flooding is common.