

GLOSSARY

The terms in this glossary were taken from several sources including the “Forest Ecosystem Management Assessment Team Report” (1993),¹ “The Dictionary of Forestry” (Helms 1998)², the “Forest Resources of the United States” (Powell et al. 1993),³ and the “Forest Resources of the United States, 1997” (Smith et al. 2001).⁴

Afforestation—The establishment of a forest or stand in an area where the preceding vegetation or land use was not forest.

Age class—An interval into which the age range of trees is divided for classification or use. Ten-year intervals are used most commonly except in the South where five-year intervals are used.

Chain weighted—A form of adjusting gross domestic product (GDP) for inflation that accounts for both changes in quantities and prices from year to year. GDP series not adjusted for inflation are referred to as being in unchained dollars.

Chemical wood—Trees used as a source of various chemicals such as acetic acid, methanol, and wood alcohol. Usually, timber that is not of sufficient size and/or quality to make lumber or plywood.

¹ Forest Ecosystem Management Assessment Team [FEMAT] (1993) Forest ecosystem management: an ecological, economic, and social assessment. USDA; U.S. Department of the Interior [and others], Portland, OR

² Helms J (1998) The dictionary of forestry. Society of American Foresters, Bethesda, MD

³ Powell DS, Faulkner JL, Darr DR, Zhu Z, MacCleery DW (1993) Forest resources of the United States, 1992. Gen Tech Rep RM-234. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station. [revised, June 1994] Fort Collins, CO

⁴ Smith WB, Vissage JS, Sheffield R, Darr DR (2001) Forest resources of the United States, 1997. Gen Tech Rep NC-219. USDA Forest Service, North Central Research Station, St. Paul, MN

Cord—A traditional measure of wood volume defined as the amount of roundwood that can be stacked in a $4 \times 4 \times 8$ foot space, equivalent to roughly 75–80 cubic feet ($2.1\text{--}2.3\text{ m}^3$) of solid wood volume inside the bark for pulpwood, or about 500 board feet, log scale.

Cropland—Land used for the production of adapted crops for harvest, including row crops, small grain crops, hay crops, nursery crops, orchard crops, and other specialty crops. The land may be used continuously for these crops, or they may be grown in rotation with grasses and legumes.

Cull tree—A live tree, 5 inches (12.7 cm) in diameter at breast height (d.b.h.) or larger, that is unmerchantable for sawlogs now or prospectively because of rot, roughness, or species (See definitions for rotten and rough trees.)

Diameter class—A classification of trees based on diameter outside bark measured at breast height (4.5 feet (1.37 m) above ground). The common abbreviation for “diameter at breast height” is d.b.h. With 2-inch (5 cm) diameter classes, the 6-inch class, for example, includes trees 5.0 through 6.9 inches (17.5 cm) d.b.h.

Douglas-fir subregion—The area in the states of Oregon and Washington that is west of the crest of the Cascade Range (also called Pacific Northwest West).

Doyle Rule—A log rule or formula for estimating the board-foot volume of logs. The formula is:

$$V = [(D - 4)^2 / 4]L$$

where D is diameter inside bark at the small end in inches and L is length in feet.

Dry weight—The weight of wood and bark, oven-dry basis (excluding all moisture).

Engineered wood products—Composite wood products designed to substitute directly for dimension lumber in many building and structural applications. Includes prefabricated wood I-joists, glued laminated timber, and structural composite lumber (laminated veneer lumber, parallel strand lumber, and oriented strand lumber).

Prefabricated wood I-joists (Wood I-joists)—Structural, load-carrying members designed for roof and floor joist applications, offering long lengths with low material weights. The

I-joint flange is typically dimension lumber or structural composite lumber; the web material is oriented strand board.

Glued laminated timber (Glulam)—Engineered, stress-rated product created by adhesively bonding individual pieces of lumber having a thickness of 2 inches or less. It is versatile and can be shaped into forms ranging from straight to complex curved beams. Uses include headers, girders, purlins, beams, and arches.

Structural composite lumber (SCL)—Composite products designed to be dimension lumber substitutes. Includes laminated veneer lumber, parallel strand lumber, and oriented strand lumber.

Laminated veneer lumber (LVL)—A structural composite lumber product made by adhesively bonding thin sheets of wood veneer into a large billet. The grain of the veneers are all parallel in the “long” direction. The billet is then sawn to desired dimensions. Uses include headers, beams, rafters, scaffold planking, and flanges for prefabricated wood I-joists.

Parallel strand lumber (PSL)—A structural composite lumber product made by adhesively bonding veneer that has been chopped into strands to take out knots and other imperfections. A billet is formed with the grain of the strands in the long direction and then sawn. Uses include beams and garage door headers.

Oriented strand lumber (OSL)—A structural composite lumber product made from flaked wood strands that have a high length-to-thickness ratio. The strands are oriented with the grain in the long direction into a billet and then sawn to desired dimension. Uses include millwork parts, studs, and flanges for prefabricated wood I-joists.

Farmer-owned lands—Lands owned by a person who operates a farm, either doing the work themselves or directly supervising the work.

Fiber products—Products made with largely intact plant fibers (or wood fibers) derived primarily from pulpwood, pulpwood chips, and recovered paper, such as wood pulp, paper or paperboard products, and also (in this publication) products made primarily from pulpwood

roundwood, such as oriented strand board, but not including other panel products made primarily from fine wood residues, sawdust, or bark.

Fine materials—Wood residues not well suited for chipping or for use in fiber products because of small particle size and a large proportion of fibers that are cut or broken, such as planer shavings, and sawdust (used in panel board products such as particleboard, but not in oriented strand board, and seldom used for pulpwood because of poor fiber quality).

Forest industry (FI)—A diverse group of manufacturers that harvest, process, and use timber products in their final products. Activities include the harvesting of the timber resource; conversion of logs to primary timber products, such as lumber, plywood, and wood pulp; and the conversion of primary timber products to secondary or final products, such as pallets, furniture, and paper products.

Forestland—Land at least 10% stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forestland includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10% stocked with forest trees, and forest areas adjacent to urban and built-up lands. Also included are pinyon-juniper and chaparral areas in the West, and afforested areas. The minimum area for classification of forestland is 1 acre (.4 ha). Roadside, streamside, and shelterbelt strips of timber must have a minimum crown width of 120 feet (36.6 m) to qualify as forestland. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet in width.

Forest management type—A classification of timberland based on the species and source of trees forming a plurality of live trees present.

Forest inventory types—A classification of forestland based on the species forming a plurality of the live-tree stocking. Major forest type groups recognized in the timber assessment include:

White-red-jack pine—Forests in which eastern white pine, red pine, or jack pine, singly or in combination compose a plurality of the stocking. Common associates include hemlock, aspen, birch, and maple.

Spruce-fir—Forests in which spruce or true firs, singly or in combination compose a plurality of the stocking. Common associates include white cedar, tamarack, maple, birch, and hemlock.

Natural pine—A southern management type representing stands that (a) have not been artificially regenerated, (b) are classed as a pine or other softwood forest type, and in which 50% or more of the naturally established stand is loblolly pine, slash pine, shortleaf pine, longleaf pine, or other southern pines singly or in combination. Common associates include oak, hickory, and gum.

Planted pine—A southern management type representing forests in which 50% or more of the stand is loblolly pine, slash pine, shortleaf pine, longleaf pine, or other southern pines that have been established by planting or direct seeding.

Southern pine—A southern forest type which 50% or more of the stand is loblolly pine, slash pine, shortleaf pine, longleaf pine, singly or in combination.

Lowland hardwood—A southern management type composed of forests in which 50% or more of the stand is tupelo, blackgum, sweetgum, oak, and southern cypress, singly or in combination, and southern pine makes up less than 25%. Common associates include cottonwood, willow, oak, elm, hackberry, and maple. This type is found on the alluvial flood plains of the Mississippi and other southern rivers. May also be called bottomland hardwood.

Oak-pine—A southern management type composed of forests in which 50% or more of the stand is hardwood, usually upland oaks, and southern pines make up 25–49% of the stocking. Common associates include upland oak-shortleaf pine in the foothills and plateaus; mixed hardwood-loblolly pine on moist sites; and scrub oak-longleaf pine in the sandhills of the Carolinas, Georgia, and Florida. Other associates include gum, hickory, and yellow-poplar. May also be called mixed pine-hardwood.

Oak-gum-cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination compose a plurality of the stocking except where pines make up 25–50%, in which case the stand would be

classified as oak-pine. Common associates include cottonwood, willow, ash, elm, hackberry, and maple.

Elm-ash-cottonwood—Forests in which elm, ash, or cottonwood, singly or in combination compose a plurality of the stocking. Common associates include willow, sycamore, beech, and maple.

Maple-beech-birch—Forests in which maple, beech, or yellow birch, singly or in combination compose a plurality of the stocking. Common associates include hemlock, elm, basswood, and white pine.

Aspen-birch—Forests in which aspen, balsam poplar, paper birch, or gray birch, singly or in combination compose a plurality of the stocking. Common associates include maple and balsam fir.

Douglas-fir—Forests in which Douglas-fir composes a plurality of the stocking. Common associates include western hemlock, western redcedar, the true firs, redwood, ponderosa pine, and larch.

Hemlock-Sitka spruce—Forests in which western hemlock, Sitka spruce, or both compose a plurality of the stocking. Common associates include Douglas-fir, silver fir, and western redcedar.

Redwood—Forests in which redwood composes a plurality of the stocking. Common associates include Douglas-fir, grand fir, and tanoak.

Ponderosa pine—Forests in which ponderosa pine composes a plurality of the stocking. Common associates include Jeffrey pine, sugar pine, limber pine, Arizona pine, Apache pine, Chihuahua pine, Douglas-fir, incense cedar, and white fir.

Western white pine—Forests in which western white pine composes a plurality of the stocking. Common associates include western redcedar, larch, white fir, Douglas-fir, lodgepole pine, and Engelmann spruce.

Lodgepole pine—Forests in which lodgepole pine composes a plurality of the stocking. Common associates include alpine fir, western white pine, Engelmann spruce, aspen, and larch.

Larch—Forests in which western larch composes a plurality of the stocking. Common associates include Douglas-fir, grand fir, western redcedar, and western white pine.

Fir-spruce—Forests in which true firs, Engelmann spruce, or Colorado blue spruce, singly or in combination compose a plurality of the stocking. Common associates include mountain hemlock and lodgepole pine.

Western hardwoods—Forests in which aspen, red alder, or other western hardwoods, singly or in combination compose a plurality of the stocking.

Pinyon-juniper—Forests in which Pinyon pine and juniper singly or in combination compose a plurality of the stocking.

Upland hardwoods—A southern management type composed of stands that have at least 10% stocking and classed as an oak-hickory or maple-beech-birch forest type. Common associates include yellow-poplar, elm, maple, and black walnut.

Fuelwood—Wood used by conversion to some form of energy, primarily residential use.

Gap model—quantifies the establishment, growth and mortality of individual trees by taking into account the stochasticity both of weather and of demographic processes on small patches of land (gaps resulting from fine scale disturbance), scaled to the maximum size achievable by a single individual (after Bugman et al 1996).

Green ton—Weight measure for pulpwood roundwood or pulpwood chips that are freshly cut and have not had enough time to age or lose free moisture, generally assumed to be the weight of wood at 50% moisture content on a total weight basis (2.0 green tons = 1 bone dry ton).

Growing stock—A classification of timber inventory that includes live trees of commercial species meeting specified standards of quality or vigor. Cull trees are excluded. When associated with volume, includes only trees 5 inches d.b.h. and larger.

Hardwood—A dicotyledonous (nonconiferous) tree, usually broad leaved and deciduous.

Harvest—(a) An intermediate or final cutting that extracts salable trees, (b) The volume of roundwood harvested from both

growing-stock and nongrowing-stock sources that is extracted from harvest sites.

Highly erodible cropland—All cropland in land capability classes (classifications used by the Soil Conservation Service to rate the suitability of soils for agricultural production) 3e, 4e, 6e, and 7e.

Industrial wood—All commercial roundwood products except fuelwood.

International 1/4-inch rule—A log rule, or formula, for estimating the board-foot volume of logs. The mathematical formula is:

$$(0.22D^2 - 0.17D)(0.904762),$$

for 4-foot sections, where D = diameter inside bark at the small end of the section.

Land area—(a) Bureau of the Census: The area of dryland and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 1/8 statute mile wide 201.2; and lakes, reservoirs, and ponds less than 40 acres (16.2 ha) in area. (b) Forest Inventory and Analysis: same as (a) except that the minimum width of streams, etc. is 120 feet, and the minimum size of lakes, etc. is 1 acre. This latter definition is the one used in this publication.

Live cull—A classification that includes live, cull trees. When associated with volume, it is the net volume in live, cull trees that are 5 inches d.b.h. and larger.

Log scale—The volume contents of individual trees or logs prior to processing. In the USA the most common rules for measuring board-foot volumes for sawtimber are the Scribner log rule, International 1/4-inch log rule, and the Doyle log scale.

Logging residues—The unused portions of growing-stock trees cut or killed by logging and left in the woods.

Managed plantations—Stands of trees established by artificial means (e.g. planting or direct seeding) composed primarily of single or related species, treated to have uniform structure and age class, and projected to receive at least minimal treatment for growth enhancement.

Management intensities—Growth and yield categories developed for the aggregate timberland assessment system (ATLAS) to represent

the development of stands under various improved management practices (i.e. genetic improvement, stocking control, fertilization, commercial thins, etc.).

Marginal cropland and pasture—Cropland and pasture that would yield higher rates of return to the owner if planted to pine.

Market pulp—Mostly bleached kraft or sulfite pulp produced for sale to pulp customers.

Net annual growth—The average annual net increase in the volume of trees during the period between inventories. Components include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the minimum size class during the year, minus the volume of trees that died during the year, and minus the net volume of trees that became cull trees during the year.

Net volume in cubic feet—The gross volume in cubic feet less deductions for rot, roughness, and poor form. Volume is computed for the central stem from a 1-foot (.3 m) tall stump to a minimum 4.0-inch (10 cm) top diameter outside bark, or to the point where the central stem breaks into limbs.

Nonforest land—Land that has never supported forests and lands formerly forested where use of timber management is precluded by development for other uses. (Note: Includes area used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and clearings, etc. more than 1 acre in size, to qualify as nonforest land).

Nongrowing stock—A classification of inventory that includes all trees not meeting the standards for growing stock.

Nonindustrial private forest (NIPF)—An ownership class of private forestlands whose owner does not primarily operate wood-using plants (distinguished from land owned by forest industry).

Nonsawtimber—Timber that is not used by sawmills or veneer mills, but is used in the manufacture of pulp, paper, OSB, various nonstructural panels, or used for fuelwood.

Nonstocked areas—Timberland less than 10% stocked with growing-stock trees.

Oriented strand board (OSB)—An engineered structural-use panel made from wood strands that are cut longitudinally from small-diameter logs or pulpwood roundwood. The strands have a high length/thickness ratio and are bonded together with waterproof resin under heat and pressure. The strands are oriented along the length or width of the panel in alternating layers to take advantage of the inherent longitudinal fiber strength of wood. The panels are used in construction for roof, wall, and floor sheathing and for the web for prefabricated wood I-joists.

Other forestland—Forestland other than timberland and productive reserved forestland. It includes reserved forestland, and available land that is incapable of producing annually 20 cubic feet per acre (1.4 m³/ha) of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness. Urban forestland is also included that, owing to its location, is considered unavailable for sustained timber harvesting.

Other industrial timber products—Also called a miscellaneous products category of roundwood products that includes such items as poles; piling; posts; round mine timbers; hewn ties; bolts used for shingles; handles, and woodturnings; cooperage logs; chemical wood; and miscellaneous items.

Other land—Nonforest land less the area in streams, sloughs, estuaries, and canals between 120 and 660 feet (36.6–201.2 m) and lakes, reservoirs, and ponds between 1 and 40 acres (0.4–16.2 ha) in area (i.e. nonforest land less non-Census water area).

Other removals—Unutilized wood volume from cut or otherwise killed growing stock, from cultural operations such as precommercial thinnings, or from timberland clearing. Does not include volume removed from inventory through reclassification of timberland to productive reserved timberland.

Other sources—Sources of roundwood products that are nongrowing stock. These include salvable dead trees, rough and rotten trees, trees of noncommercial species, trees less than 5 inches d.b.h., tops, and roundwood harvested from nonforest land (e.g. fence rows).

Other white oaks—A group of species in the oak genus that includes overcup, chestnut, and post.

Overrun—The difference between the greater volume actually sawn over the lessor estimated log scale volume.

Ownership—Categories of property owners: a combination of persons; a legal entity such as a corporation, partnership, club, or trust; or a public agency. All parcels of land in the USA are assigned to one of the categories of ownership.

Plantation—See managed plantation.

Plant byproducts—Wood material (such as slabs, edgings, trimmings, miscuts, sawdust shavings, veneer cores and clippings, and pulp screenings) from primary manufacturing plants used for pulp, particleboard, fuelwood, and other products.

Poletimber—Live trees at least 5 inches in diameter, but smaller than sawtimber trees (9 inches (22.9 cm) or greater).

Ponderosa pine subregion—The area in the states of Oregon and Washington that is east of the crest of the Cascade Range (also called Pacific Northwest East).

Primary wood-using mill—A mill that converts roundwood products into other wood products. Common examples are sawmills that convert sawlogs into lumber and pulp mills that convert pulpwood roundwood into wood pulp.

Private Ownerships

Forest industry (FI)—An ownership class of private lands owned by companies that grow timber for industrial use and own wood processing facilities.

Nonindustrial private forest (NIPF)—An ownership class of private lands where the owner does not operate wood-use plants. This includes lands owned by operators of farms, lands owned by private individuals, and lands owned by private corporations.

Native American—(a) Lands held in trust by the USA or states for Native American tribes or individual Native Americans, (b) Lands owned in fee by Native American tribes whether subject to federal or state restrictions against alienation

or not. Since 1990, these lands are grouped with other private lands in the NIPF ownership group.

Productivity class—A classification of forestland in terms of potential annual cubic-foot volume growth per acre at culmination of mean annual increment in fully stocked natural stands.

Public ownerships

Federal—An ownership class of public lands owned by the US Government.

National forest—An ownership class of federal lands, designated by Executive order or statute as national forests or purchase units, and other lands under the administration of the Forest Service including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management (BLM)—An ownership class of federal lands administered by the Bureau of Land Management, US Department of the Interior.

County and municipal—An ownership class of public lands owned by counties or local public agencies, or lands leased by these governmental units for more than 50 years.

Other public—An ownership class that includes all public lands except national forest. This category generally includes federal, state, county, and municipal ownerships.

State—An ownership classification of public lands owned by states or lands leased by states for more than 50 years.

Pulpwood—Roundwood, wood chips, or wood residues that are the wood raw materials used for the production of wood pulp or (in this publication) the roundwood inputs for reconstituted panels (such as oriented strand board). In this publication, pulpwood does not include wood residues used for reconstituted panels.

Reconstituted panels—The entire family of wood panel products that are reconstituted from small wood particles, fibers, or strands, including oriented strand board, insulating board, hardboard, particleboard, and medium density fiberboard (MDF), but excluding plywood.

Recovered paper—Paper that is recovered after commercial or consumer use for recycling back into products, primarily into recycled paper or paperboard products.

Reserved timberland—Forestland withdrawn from timber use through statute, administrative regulation, or designation without regard to protective status.

Residues—Bark and woody materials that are generated in primary wood-using mills when roundwood products are converted to other products. Examples are slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and pulp screenings. Includes bark residues and wood residues (both coarse and fine materials) but excludes logging residues.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting; cultural operations, such as timber stand improvement or land clearing; or changes in land use.

Rotten tree—A live tree of commercial species that does not contain a sawlog now or prospectively, primarily because of rot (i.e. when rot accounts for more than 50% of the total cull volume).

Rough tree—(a) A live tree of commercial species that does not contain a sawlog now or prospectively, primarily because of roughness (i.e. a sound tree that is culled because of such factors as poor form, splits, or cracks affecting more than 50% of its total cull volume); or (b) a live tree of noncommercial species.

Roundwood—Logs, bolts, or other round sections cut from growing-stock and nongrowing-stock sources such as trees smaller than 5 inches d.b.h.; stumps, tops, and limbs of growing stock trees; rough and rotten trees; dead trees; and trees that grow on land other than timberland.

Roundwood equivalent—The volume of logs or other round products required to produce given quantities of lumber, plywood, wood pulp, paper, or other similar products, after deducting the proportion of wood raw material input that is obtained not from logs or roundwood but from plant by-products or recycled wood fiber (from recovered paper).

Salvable dead tree—A standing or down dead tree that is considered currently or potentially merchantable by regional standards.

Sawlog—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet (2.4 m) long, sound and straight, and with a minimum diameter inside bark of 6 inches (15.2 cm) for softwoods and 8 inches (20.3 cm) for hardwoods, or meeting other combinations of size and defect specified by regional standards. A log usually used in the manufacture of lumber and plywood.

Sawtimber—Stands at least 10% occupied with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber trees—Live trees containing at least one 12-foot (3.7 m) saw log or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches d.b.h., and hardwood trees must be at least 11 inches (27.9 cm) d.b.h.

Seral stage—A stage or recognizable condition of a plant community that occurs during its development from bare ground to climax. Forests are assumed to progress through five recognized stages: seedling; poles and saplings; young; mature; and old mature. These stages are represented by grouping age classes. The age class groupings differ by broad regions reflecting successional differences among various timber types.

Seedling stage—The stand establishment stage. Includes the first age class (average age of 5 years) in all regions for both hardwood and softwood types, except for softwood types in the North where it includes the first two (5 and 15) age classes. Grass, herbs, or brush are plentiful.

Poles and sapling stage—Young stands, crown closure occurs early in this stage; as stand density increases grass, herbs, or brush rapidly decrease. Usually considered not to be merchantable, although both precommercial and commercial thinning can occur depending on market conditions.

	Hardwood	Softwood
	Age classes	
North	15–35	25–35
South	10–20	10–15
West	15–35	15–35

Young stage—Young stands where the crown differentiation is starting to occur. These stands contain a mix of sawtimber and nonsawtimber size trees and little understory vegetation. For many private landowners, these stands are often considered to reflect typical rotation lengths.

	Hardwood	Softwood
	Age classes	
North	45–65	45–65
South	25–55	20–35
West	45–55	45–75

Mature stage—Stands composed mostly of sawtimber. For softwoods, often thought to be at or just over the age where net annual growth has peaked. For hardwoods, these stands are often considered merchantable. In some types there is gradually increasing stand diversity, hiding cover, and forage.

	Hardwood	Softwood
	Age classes	
North	75–135	75–135
South	60–75	40–75
West	65–135	85–135

Old mature—Stands considered to be overmature. Stand ages are past the point where net annual growth has peaked. For some types, stands represent the potential plant community capable of existing on a site given the frequency of natural disturbance events.

	Hardwood	Softwood
	Age classes	
North	≥ 145	≥ 145
South	≥ 80	≥ 80
West	≥ 145	≥ 145

Scribner rule—A diagram log rule that assumes 1 inch (2.5 cm) boards, is based on diameter at the small end of the log, disregards taper, and does not provide for overrun.

Site productivity class—A classification of forestlands in terms of inherent capacity to grow crops of industrial wood. The class identifies the average potential growth in cubic feet per acre per year and is based on the culmination of mean annual increment of fully stocked natural stands.

High sites—Land capable of growing at least 85 cubic feet (5.5 m³/ha) of wood per acre per year.

Medium sites—Land capable of growing 50–85 cubic feet (3.5–5.5 m³/ha) of wood per acre per year.

Low sites—Land capable of growing 20–49 cubic feet (1.4–3.5 m³/ha) of wood per acre per year.

Softwood—A coniferous tree, usually evergreen, having needles or scalelike leaves.

Southern pine—This is not a forest type but a common name for stands that are composed of loblolly, slash, shortleaf, longleaf pine, or other pines grown in the South; also called southern yellow pine.

Sound dead—The net volume in salable dead trees.

Stocking—The degree of occupancy of land by trees, measured by basal area or number of trees by size and spacing, or both, compared to a stocking standard; i.e. the basal area or number of trees, or both, required to fully use the growth potential of the land.

Stumpage—Standing timber (trees) in the forest.

Stumpage price—The price paid for standing timber (trees) in the forest. Usually expressed as dollars per thousand board feet, log scale.

Succession—A series of dynamic changes by which one community succeeds another through stages leading to potential natural community or climax. The sequence of communities is called a sere, or seral stage.

Timber supplies—The volumes of roundwood actually harvested, range of volume available for harvest at varying price levels, or future volumes estimated to be harvested at market equilibrium. Includes roundwood from growing-stock and nongrowing-stock sources.

Timberland—Forestland that is producing or is capable of producing crops of industrial wood and not withdrawn from timber use by statute or administrative regulation. Areas qualifying as timberland

have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.

Tops—The wood of a tree above the merchantable height (or above the point on the stem 4 inches diameter outside bark [dob]). It includes the usable material in the uppermost stem and branches.

Unreserved forestland—Forestland (timberland and woodland) that is not withdrawn from use by statute or administrative regulation. Includes forestlands that are not capable of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands.

Urban and other areas—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; school yards; cemeteries; roads and railroads; airports; beaches, power lines, and other rights-of-way; or other non-forest land not included in any other specified land-use class.

Veneer logs—The logs used in the manufacture of veneer. A round-wood product from which veneer is sliced or sawn and that usually meets certain standards of minimum diameter and length and maximum defect.

Wood pulp—A fibrous raw material made from plant fiber (chiefly wood fiber in the USA) and used primarily to make paper and paper-board products.

APPENDIX

Appendix A

Common and Scientific Names of Species

Common Name	Scientific Name
Alpine fir (Subalpine fir)	<i>Abies lasiocarpa</i> (Hook.) Nutt.
Apache pine	<i>Pinus engelmannii</i> Carr.
Arizona pine	<i>Pinus ponderosa</i> var. <i>arizonica</i> (Engelm.) Shaw
Ash	<i>Fraxinus</i> spp.
Aspen	<i>Populus</i> spp.
Balsam fir	<i>Abies balsamea</i> (L.) Mill.
Balsam poplar	<i>Populus balsamifera</i> L.
Basswood	<i>Tilia</i> spp.
Beech	<i>Fagus</i> spp.
Birch	<i>Betula</i> spp.
Blackgum (Black tupelo)	<i>Nyssa sylvatica</i> Marsh. Var. <i>sylvatica</i>
Black walnut	<i>Juglans nigra</i> L.
Chestnut oak	<i>Quercus muhlenbergii</i> Englem.
Chihuahua pine	<i>Pinus</i> (associates with apache pine)
Colorado blue spruce	<i>Picea pungens</i> Engelm.
Cottonwood	<i>Populus</i> spp.
Cypress	<i>Taxodium</i>
Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco
Eastern white pine	<i>Pinus strobus</i> L.
Elm	<i>Ulmus</i> spp.

Engelmann spruce	<i>Picea engelmannii</i> Parry ex Engelm
Eucalyptus	<i>Eucalyptus</i> spp.
Grand fir	<i>Abies grandis</i> (Dougl. ex D. Don) Lindl.
Gray birch (Yellow birch)	<i>Betula alleghaniensis</i> Britton
Gum	<i>Liquidambar</i> spp.
Hackberry	<i>Celtis occidentalis</i> L.
Hemlock	<i>Tsuga</i> spp.
Hickory	<i>Carya</i> spp.
Incense cedar	<i>Libocedrus decurrens</i> Torr.
Jack pine	<i>Pinus banksiana</i> Lamb.
Jeffrey pine	<i>Pinus jeffreyi</i> Grev. & Balf.
Juniper	<i>Juniperus</i> spp.
Larch	<i>Larix</i> spp.
Limber pine	<i>Pinus flexilis</i> James
Loblolly pine	<i>Pinus taeda</i> L.
Lodgepole pine	<i>Pinus contorta</i> Dougl. ex Loud.
Longleaf pine	<i>Pinus palustris</i> Mill.
Maple	<i>Acer</i> spp.
Mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Oak	<i>Quercus</i> spp.
Overcup oak	<i>Quercus lyrata</i> Walt.
Paper birch	<i>Betula papyrifera</i> Marsh.
Pinyon	<i>Pinus edulis</i> Engelm.
Ponderosa pine	<i>Pinus ponderosa</i> Dougl. ex Laws
Post oak	<i>Quercus stellata</i> Wangenh.
Radiata pine	<i>Pinus radiata</i> D. Don
Red alder	<i>Alnus rubra</i> Bong.
Red pine	<i>Pinus resinosa</i> Ait.
Redwood	<i>Sequoia sempervirens</i> (D. Don) Endl.
Scrub oak	<i>Quercus laevis</i> Walt.
Shortleaf pine	<i>Pinus echinata</i> Mill.
Silver fir (Pacific silver fir)	<i>Abies amabilis</i> Dougl. ex Forbes
Sitka spruce	<i>Picea sitchensis</i> (Bong.) Carr.
Slash pine	<i>Pinus elliottii</i> Engelm.
Sugar pine	<i>Pinus lambertiana</i> Dougl.
Sweetgum	<i>Liquidambar styraciflua</i> L.
Sycamore	<i>Platanus occidentalis</i> L.
Tamarack	<i>Larix laricina</i> (Du Roi) K. Koch
Tanoak	<i>Lithocarpus densiflorus</i> (Hook. & Arn.) Rehd.
True firs	<i>Abies</i> spp.

Tupelo	<i>Nyssa</i> spp.
Western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Western redcedar	<i>Thuja plicata</i> Donn ex D. Don
Western white pine	<i>Pinus monticola</i> Dougl. ex D. Don
White cedar	<i>Chamaecyparis thyoides</i> (L.) B.S.P.
White fir	<i>Abies concolor</i> (Gord. & Glend.) Lindl. ex Hildebr.
White pine	See western white pine
Willow	<i>Salix</i> spp.
Yellow-poplar	<i>Liriodendron tulipifera</i> L.

Source: Burns RM, Honkala BH (1990) Silvics of North America: Agricultural Handbook 654. Vol 1 Conifers; Vol 2 Hardwoods. USDA Forest Service, Washington DC

Appendix B

Acronym List

Abbreviation	Name
AAC	Annual allowable cut
AAPE	Average absolute percentage error
AF&PA	American Forest and Paper Association
AREACHANGE	Areachange model
ARIMA	Autoregressive Integrated Moving Average
ATLAS	Aggregate Timberland Assessment System
BC	British Columbia
BIOME	See Chapter 14 footnote 2 for description page 473
BIOME-BGC	Biome Biogeochemistry Model (also called BBGC)
BLM	Bureau of Land Management (U.S. Department of the Interior)
CINT	Canadian Interior Provinces
CGTM	CINTRAFOR Global Trade Model (University of Washington)
CPI	Consumer price index
CT	Commercial thinning
DF-SIM	Douglas-fir Simulator
DOLY	Dynamic Global Phytogeography Model
DPI	Disposable personal income
EFI	European Forest Institute
EPA	U.S. Environmental Protection Agency
ETA-MACRO	Energy Technology Assessment-Macroeconomic Growth Model
EU	European Union
FAO-UN	Forest and Agriculture Organization of the United Nations
FASOM	Forest and Agriculture Sector Optimization Model
FI	Forest industry
FIA	Forest Inventory and Analysis (USDA FS)
FOHOW	Austrian forest sector model
FORPLAN	FORest PLANning (model used by USDA FS)
FORTTRAN	Computer programming language
FPL	Forest Products Laboratory (USDA FS)

GB RAM	Giga bytes, random access memory
GCM	General Circulation Models
GDP	Gross domestic product
GFDL	Geophysical Dynamics Lab Model
GFPM	Global Forest Products Model
GIS	Geographic information systems
GISS	Goddard Institute for Space Science
GNP	Gross national product
GPO	Government Printing Office
GTM	Global Trade Model
IIASA	International Institute for Applied Systems Analysis
IIP	Industrial production index
IGSM	Integrated Global System Model
IPCC	International Panel on Climate Change
ISRI	Institute of Scrap Recycling Industries
LINDO	Linear Interactive Discrete Optimizer
LRF	Lumber recovery factor
MAPSS	Mapped Atmospheric-Plant Soil System Model
MDF	Medium density fiberboard
MESU	Finnish timber harvest planning model
MHA	Minimum harvest age
MIC	Management intensity class
MINOS	Linear and nonlinear optimization model
MLUS	Major Land Use Series
Mm ³	Million (M) cubic meters (m ³)
NAPAP	North American Pulp and Paper
NAWEM	National Wood Energy Model
NGO	Nongovernment organizations
NIPF	Nonindustrial private forest
NPP	Net primary productivity
NRI	Natural Resources Inventory (USDA NRCS)
NTMII	Norwegian forest sector model
OPEC	Organization of Petroleum Exporting Countries
OSB	Oriented stand board
OSU	Oregon State University
PAI	Periodic annual increment
PAPYRUS	Pulp and paper sector model
PCT	Precommercial thinning
PELPS	Price-Endogenous Linear Programming System
PLYMAP	Plywood Manufacturing Model
POLYSYS	Policy analysis model for the U.S. agriculture sector

ppm	Parts per million
PPI	Producer price index
PRF	Plywood recovery factor
RARE II	Roadless Area Review and Evaluation
REITs	Real Estate Investment Trusts
RPA	Forest and Rangeland Renewable Resources Planning Act of 1974
SAM	Southern Area Model
SE	Spatial equilibrium
SEV	Soil expectation value
SOFAC	Southern Forest Resource Assessment Consortium
SOFRA	Southern Forest Resource Assessment
SPATS	Southern Pine Age Class Timber Simulator
SRTS	Subregional Timber Supply
SRWC	Short rotation woody crops
TAMM	Timber Assessment Market Model
TAUYIELD	Thinned and unthinned loblolly pine plantations
TEM	Terrestrial Ecosystem Model
TIMOs	Timber Investment Management Organizations
TRAS	Timber Resource Analysis System
TREES	Timber Resource Economic Estimation System
TRIM	Timber Resource Inventory Model
TSM	Timber Supply Model
UKMO	United Kingdom Meteorological Office
USDA	US Department of Agriculture
USDA ERS	USDA Economic Research Service
USDA FS	USDA Forest Service
USDA NRCS	USDA Natural Resources Conservation Service
USDC BOC	US Department of Commerce Bureau of Census
USFPM	US Forest Products Model
VEMAP	Vegetation Ecosystem Modeling and Analysis Project

INDEX

A

- Aggregate Timberland Assessment System (ATLAS), 29, 84, 229–256, 568
- AREACHANGE, 31, 175, 177, 182, 183, 201, 202, 210, 249, 290, 292–294, 325, 406, 549
- Assessment System, 4, 6, 14, 17, 19, 20, 24
- Assessment System, lessons from building, 4, 555–556
- assumptions, 18, 24, 31, 42, 162, 200, 265

B

- base case, 9, 71, 165, 233, 265–284, 321–347

C

- Canada, base projection, 124
- Canada, delivered wood costs, 77
- Canada, mountain pine beetle epidemic, 339, 350
- Canada, pulp and paper production, 368

- Canada, solid wood production, 365
- capacity, projection, 67–70
- climate change, 449–484
- CO₂, 460, 526
- competitiveness, 426, 441, 443
- conditional projections, 435

D

- demand, pulp and paper, 371
- demand, solid wood, 27, 60, 89
- diffusion modeling, 489

E

- economic globalization, 102, 103, 119, 166, 169, 282, 343, 419, 421
- ecosystem productivity, 451, 454, 458, 467
- efficiency, 38, 65, 275, 468, 491, 502
- elasticity, pulp and paper demand, 115–120
- elasticity, pulp and paper supply, 126, 128
- elasticity, pulpwood supply, 121–124

elasticity, sawtimber supply,
 76–77
 elasticity, solid wood demand,
 60
 elasticity, solid wood supply,
 68
 Eu forest action plan, 546
 exchange rates, assumptions
 in base case, 71, 376, 385,
 400
 exchange rates, in models, 100

F

Forest and Rangeland
 Renewable Resources
 Planning Act of 1974, 5,
 10
 forest area change, 177
 forest area change
 projections, 176
 forest cover dynamics, 195,
 513, 516–522
 forest planning, 4, 22, 204
 forest policy, 3, 21, 349, 354,
 452, 455, 546
 forest products, consumption,
 11–12, 215, 267, 355, 474
 forest products, processing,
 491–493, 495, 497–501
 forest sector, 3, 6, 11, 20, 31
 forest sector market modeling,
 19, 469
 forest type change, 31, 177,
 182, 203, 236, 521
 forest type transitions, 182,
 183, 201, 204–209, 529
 fuelwood consumption, base
 case, 359

G

Global Forest Products Model
 (GFPM), 35, 40, 42, 257,
 409, 419, 431–433, 441,
 443
 globalization, 102, 103, 119,
 166, 169, 282, 343, 419,
 421

H

harvesting costs, solid wood,
 489

I

international trade, 25, 29,
 266, 272, 278
 international trade, Canada,
 272, 278
 international trade, off-shore
 regions, 64
 inventory projection, 27, 242,
 251, 256, 376
 investment model,
 accelerator, 266
 investment model, Tobin's
 q theory, 163
 investment, capacity, 79, 88,
 91
 investment, timber
 management, 408, 514
 iterative solution procedures
 (Gauss-Seidel), 289, 293,
 306
 iterative solution procedures
 (Jacobi), 306

L

- land allocation, 46, 184–185, 524, 534
- land base projection, 322
- land use scenarios, 213
- lumber, hardwood, 63, 281, 338, 366–367, 444, 491
- lumber, softwood, 12, 39, 56–57, 64, 70, 86

M

- macroeconomic assumptions, inflation, 200
- macroeconomic projections, 121
- Management Intensity Class (MIC), 233, 237, 248
- manufacturing costs, pulp and paper, 130
- manufacturing costs, solid wood, 65, 67, 69
- market model, 6, 20, 39, 55, 86, 235, 247, 292, 297, 469
- markets, paper and paperboard, 40, 100
- markets, pulpwood, 103, 372, 415, 428, 503–504
- markets, sawtimber, 71–77, 79
- markets, solid wood, 57, 82, 85–86, 89, 91
- model control, 302
- model development, 31, 102, 107, 266, 555
- model solution, Assessment System, 31
- model solution, NAPAP, 291
- model solution, TAMM, 79
- model structure, 11, 25, 188, 296, 428

- model validation, 168, 210, 294
- model, biogeochemical, 455, 458–459
- model, biogeographical, 454, 472
- model, pulp and paper, 82, 105
- model, solid wood, 27, 82
- model, timber growth, 29, 109, 417
- models, 3, 4, 6, 8, 11, 13–15, 17, 20
- models, policy analysis versus forecasting, 295

N

- NAPAP, 29, 31, 43, 99, 108, 114

O

- Oriented StrandBoard (OSB), 12, 43, 57, 300, 314, 318

P

- Pacific Northwest West (PNWW), 348, 496
- panels, non-structural, 16, 56, 77–78
- panels, structural, 16, 341, 367
- paper and paperboard, 27–29, 85, 100–101, 107, 109–111
- paper recycling, 101–102, 107, 344, 428
- partial cutting regimes, 259, 405
- plantations, 46, 129

plantations, South, 325–326
 plywood, softwood, 12, 57, 64,
 109, 298, 339, 341, 497
 policy analysis, 4, 21, 43, 199,
 290, 295, 450, 547, 551
 policy scenarios, 4, 303
 policy simulation, 103, 295
 population projections, 202,
 268, 361, 365, 368
 Price Endogenous Linear
 Programming System
 (PELPS), 29, 103, 110,
 124, 427, 431
 prices, pulp and paper, 84
 prices, pulpwood, 71, 102,
 107, 124, 129, 292, 378,
 519
 prices, sawtimber stumpage,
 75, 79, 84, 121, 124,
 291–292, 315–316, 325,
 347, 349, 373, 377
 prices, solid wood products,
 386
 product substitution, 10, 89
 projections, 6, 7, 11, 20,
 24–26, 33, 46, 55, 56
 public harvest and spotted
 owl, 383
 public timberlands, 20, 283,
 381

R

recovery, solid wood products,
 272
 regions, demand, 16, 43, 57,
 78, 92, 114, 116, 129, 444
 regions, supply, 43, 64, 78, 92,
 115, 120–121, 125, 552
 residues, production, 31, 291

residues, use in pulp and
 paper, 84, 121
 restoration thinning, 14,
 382–383, 390, 548
 roundwood, components, 342
 removals, definition, 285
 RPA legislation, 10–11,
 25–26, 359
 RPA Timber Assessment, 5,
 7, 9, 56, 71, 101, 106, 108
 RPA Timber Assessments,
 projection comparison,
 353–379

S

sawnwood, 56, 88, 444
 scenario planning, 19, 23, 267,
 483, 555
 scenario, 1990–1996 western
 public cut, 386
 scenario, base case, 265–284
 scenario, climate change, 449,
 466, 470, 472, 476
 scenario, fixed private
 management, 410
 scenario, fixed southern
 plantation area, 411
 scenario, private forest base,
 537
 scenario, restoration thinning
 in west, 394
 scenario, solid wood recovery,
 506–508
 silvicultural practices, 28,
 324, 410
 silvicultural systems, even-
 and uneven-aged, 17, 229
 South, 11–12, 17, 46, 73
 South's Fourth Forest study,
 177–178, 181–182, 196,
 210, 214, 238, 241, 547

spatial equilibrium, 55, 78, 80,
290, 371, 431, 551
spatial equilibrium model, 111
structural change, 188, 343,
368, 436–437, 445, 509
supply, 7, 9, 13–14
supply equations, pulpwood,
71, 121, 124, 129, 292, 304
supply equations, sawtimber,
77, 304
supply equations, solid wood,
434
sustainable forestry
framework, 546

T

TAMM, 29, 43, 56, 64, 71, 78,
90, 104, 121, 183, 307,
450, 491, 505
technical coefficients, pulp
and paper, 75, 134, 144,
151
technological change, 102,
104, 106, 489–490, 493,
495, 497, 501–502, 535
technology forecasting, 107,
113, 215
timber, 4, 6
Timber Assessment
Projection System, 3, 16,
19, 30, 84, 183, 291, 383,
405, 421, 431, 460, 468
timber harvest, definition, 368
timber harvests, national
forest, 362

Timber Resource Analysis
System (TRAS), 408,
551, 553
timber supply, 14, 34, 45,
71–72, 92, 283, 408, 451,
530
timber yield projections, 209
trade barrier, quotas, 298
trade barrier, tariffs, 298
transport costs, logs and
pulpwood, 26
transport costs, products, 26,
78

U

U.S., forest industry, 14, 93,
122
U.S., forest inventory
characteristics, 224

V

validation, 4, 168, 210, 290,
294, 296

W

welfare, producer and
consumer, 470
wood use efficiency, 65,
501–502
wood-based panels, 55
World trade. *See*
International trade

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