GLOSSARY OF FOREST HARVESTING TERMINOLOGY

1. GENERAL

FOREST INDUSTRY
- industry which uses trees as raw material, including the marketing of its products
- (= wood industry)

WOOD
- wood biomass in any form, excluding bark

TIMBER
- a term referring to roundwood assortments and trees in general

WOOD PROCUREMENT
- technical and commercial operations involved in obtaining wood for the wood industry, including tree/stand marking, stumpage and wood purchases, and harvesting

WOOD SALE
- the sale of wood based on either the delivery or stumpage sale method, the method employed depending upon the contract

STUMPAGE SALE
- a wood sale where the seller agrees to make standing trees available for harvesting by the purchaser according to the conditions agreed upon in the contract

DELIVERY SALE
- based on a delivery contract, where the seller is responsible for wood cutting and primary transport, and in many cases for long distance transport in part or in whole, depending upon the conditions agreed upon in the contract

PAYMENT RATE
- a fixed basis agreed on by authorities, associations, unions, etc., for determining the fees payable for goods or services

PIECE RATE
- payment based on amount of work done (e.g. volume produced)

HOURLY RATE
- payment based on hours worked irrespective of amount produced

INCENTIVE BONUS
- additional payment in excess of hourly rate after a minimum amount of production
2. TREE AND ITS PARTS

TREE
- the entire tree biomass (i.e. roots and stump (root stock), bole, branches, bark and foliage)
- (= COMPLETE TREE)

WHOLE TREE
- the entire tree biomass, excluding the roots (stump, bole, branches, bark and foliage)

FULL TREE
- the tree biomass above the stump (bole, branches, bark and foliage)

TOPPED FULL TREE
- full tree without top (i.e. without tree top above a minimum top diameter but still containing branches on the lower section)

PART TREE
- modified full tree where the lower bole is delimbed and the upper bole cut off without delimbing

TREE-LENGTH
- full tree delimbed and topped

LONG-LENGTH
- tree-length bucked to unspecified long log lengths

LOG
- piece of tree-length which fulfils the dimension requirements set by e.g. sawmilling and veneer peeling
- typical log lengths are 8, 10, 12, 14, 16, 18, 20 feet, etc., plus trim allowance
- trim allowance is usually 4 inches for an 8 foot log and 8 inches for a 16 foot log, however, this varies depending on the log destination
- (= sawlog)

BOLT
- piece of tree-length which fulfils the dimension requirements set by pulp and paper mills and/or wood-based panel mills (excluding veneer mills), and generally smaller diameter than logs
- usually 100 inches in length (i.e. 8 feet plus 4 inches trim allowance)
- (= pulpwood)
- (= stick which generally refers to small-size bolt)

ROUNDWOOD
- wood in round form and can include bark
SPLITWOOD
- a bolt which is split lengthwise into two or more pieces

FIREWOOD
- short dimension splitwood prepared manually or mechanically and to be used as fuel

ENERGY WOOD
- any part of tree biomass in any form to be used for fuel
- (= fuelwood)

CHIPS
- a wood assortment prepared from complete trees or any part of complete trees by slicing, chopping or crushing. Chips can be classified according to the form of wood being chipped, where chipping occurs or the intended use: e.g.
  · logging residue chips
  · full tree chips
  · roundwood chips
  · sawmill chips
  · pulpmill chips (refiner or digester)
  · fuelwood chips

WOOD RAW MATERIAL
- the biomass of a tree which is used as a raw material and can be in any form (e.g. whole tree, full tree, tree-length, logs, bolts, chips)

FOLIAGE
- leaves/needles of a tree

TECHNICAL FOLIAGE
- a special form of screened full tree or logging residue chips which contains a high percentage of foliage, and may also include wood, bark, buds, and small twigs. A special case of technical foliage is called "muka", which is a powder used for animal fodder

ROOT STOCK
- all the tree biomass left below the felling cut (i.e. stump and roots)

WASTEWOOD
- wood fibre that could be profitably utilized but is not

REFUSE
- wood fibre left in the forest or not utilized at a mill or conversion yard since it is uneconomical

RESIDUALS
- live, standing trees/stems remaining after a harvesting operation
LOGGING RESIDUES
- all wood biomass separated from the desired wood assortments during harvesting and usually left in the forest, including branches, tops, stumps, and even the under-sized trees left standing or felled in clearfellings
- includes both woodwaste and refuse
- (= slash)

MILL RESIDUE
- similar to logging residue but occurs at a wood processing mill

FOREST RESIDUES
- all wood biomass, in addition to wood assortments, which is left in the forest in connection with silvicultural or logging operations and includes trees felled in tending seedling stands and precommercial thinnings

KNOTTINESS
- the classification of the amount of knots in mechanically processed wood products

BRANCHINESS
- the classification of the amount of branches (limbs) on a tree

3. WOOD ASSORTMENTS

WOOD ASSORTMENT
- a part of a tree fulfilling the dimension and/or quality requirements specified

STANDARD LENGTH LOGS/BOLTS
- logs/bolts bucked to specified lengths which are measured
- standard lengths are generally 8, 10, 12, 14, 16, 18, 20 feet, etc., plus a minimum 4 inch trim allowance

ESTIMATE LENGTH LOGS/BOLTS
- logs/bolts bucked to specified lengths by optically estimating their length

FREE LENGTH LOGS/BOLTS
- logs/bolts freely bucked to lengths within certain limits

SURFACED DELIMBED WOOD
- trees or tree parts with branches cut off flush with the bark or wood surface

ROUGHLY DELIMBED WOOD
- trees or tree parts with branch stubs existing over the entire length or over a part of it
HALF DELIMBED WOOD
- trees or tree parts with branches existing over a part of the stem, while branch stubs may exist over the remainder
- (= PARTIALLY DELIMBED WOOD)

UNBARKED WOOD
- trees or tree parts with all or nearly all bark intact

STRIP DEBARKED WOOD
- trees or tree parts with the bark removed from at least two sides over the entire length

ROUGHLY DEBARKED WOOD
- trees or tree parts with the outer bark totally removed and the inner bark partly removed

CLEANLY DEBARKED WOOD
- debarking where all the bark is removed, including the outermost annual growth ring

4. LOGGING OPERATIONS

LOGGING
- technical operations involved in getting standing trees from the forest to the point of utilization
- (= harvesting)

DELIVERY LOGGING
- logging based on a delivery sale contract and performed by the seller

STUMPAGE LOGGING
- logging based on a stumpage sale contract and performed by the buyer

LOGGING SYSTEM
- based on the tools, equipment, machines and personnel used to harvested an area

LOGGING METHOD
- based on the form in which wood is delivered to the access road, and depends on the amount of process-ing which occurs in the cut-over

COMPLETE TREE METHOD
- logging method where the entire tree biomass, including the major roots, is extracted to roadside intact

WHOLE TREE METHOD
- logging method where the entire tree biomass (excluding the roots) is extracted to roadside intact
FULL TREE METHOD
- logging method where the entire tree biomass above the felling cut (i.e. above the stump) is extracted to roadside intact

TOPPED FULL TREE METHOD
- logging method where full trees are topped in the stump area and extracted to roadside with the remaining branches intact

PART TREE METHOD
- a modified full tree method where the lower stem suitable for logs is delimbed and bucked, and the remainder of the stem is cut-off and no delimbing is done

TREE-LENGTH METHOD
- logging method where delimbed and topped stems are extracted to at least roadside intact

LONG-LENGTH METHOD
- logging method where tree-lengths are cut into unspecified long lengths and extracted to roadside where wood assortments may be produced

CUT-TO-LENGTH METHOD
- logging method where felled trees are processed into wood assortments in the stump area and the processed wood assortments are then transported to roadside

SHORTWOOD METHOD
- similar to the cut-to-length method, except that the only wood assortment generally produced is pulpwood

5. CUTTING AREA

CUTTING AREA
- a forest area or stand delineated or marked for logging
- (= logging area, block)

MARKING
- marking of trees for felling. The marking can be referred to according to the method of marking, who is doing the marking or what is being marked; e.g.
  · colour (paint or ribbon) marking
  · axe marking
  · marking for thinnings
  · marking by cutter
  · marking of sawlogs, poles, etc.
LOGGING CHANCE
- a uniform forest area in logging and/or planning and usually includes several cutting strips
- often it refers to the cutting area description using the following factors which affect logging operations:
  · stand location
  · environmental sensitivity class
  · land use designation
  · species of trees cut
  · tree size (volume, diameter, length)
  · volume per hectare/acre
  · branchiness
  · logging area size
  · average and maximum off-road transport distance
  · distance to point of utilization
  · brush/undergrowth conditions
  · ground conditions (soil type and strength)
  · slope and position on slope
  · obstacles
  · snow depth
  · weather conditions (e.g. rain, wind, low temperature, high temperature)
- (= COUPE)
- (= COMPARTMENT)

CUTTING STRIP
- an area delineated from the cutting area for a cutter, logging machine or work crew
- (= STRIP)

STRIP ROAD
- a planned primary transport route from which the trees and other obstacles hampering transport are removed and some levelling of the ground done if required

LOGGING TRAIL
- a planned primary transport route where the trees obstructing transport are removed
- (= MACHINE TRAIL)

TECHNICAL LOGGING TRAIL/STRIP ROAD WIDTH
- the actual width of the logging trail/strip road

LOGGING TRAIL/STRIP ROAD SPACING
- the average distance between the centre-lines of the logging trails/strip roads

LOGGING ROAD/STRIP ROAD DENSITY
- the length of logging trail/strip road in the cutting area calculated as an unit length per area (e.g. m/ha or feet/acre)
6. TREE CUTTING

TREE CUTTING
- felling of trees and their conversion to wood assortments in the stump area, as well as other operations relating to stump area work (e.g. marking of piles, bunching and piling in the stump area)
- (= TIMBER CUTTING)
- (= CUTTING)

FELLING
- separating trees at the stump from their growing site

DIRECTIONAL FELLING
- planned felling of trees where the felling direction makes latter stages easier, e.g. felling trees in the direction of the forwarder trail in the assortment method to decrease the distance bolts must be moved when bunching at trail-side

DELIMBING
- removing branches from trees, trees to be felled or tree parts
- (= LIMBING)
- (= DEBRANCHING)

MEASURING
- determining the points at which the stem is to be bucked by considering the measured length, and quality and dimension requirements

BUCKING
- cutting trees or tree parts to predetermined lengths
- (= CROSS-CUTTING)

MERCHANDISING
- cross-cutting a stem to specific lengths and log grades that will maximize value

TOPPING
- separating the top part of a tree, which is smaller than the minimum merchantable diameter, from a tree

SLASHING
- mechanical cross-cutting of trees or tree parts at roadside or at a processing station
- generally capable of multiple-stem cross-cutting
- (= mechanical bucking)

SPLITTING
- splitting or cutting in direction of the wood fibers
DEBARKING
- removing the bark from trees or tree parts
- (= BARKING)

CHIPPING
- making of chips

FLAGGING LOGS/BOLTS
- marking of individual logs/bolts in the strip

FLAGGING PILES
- marking of piles in the strip or at roadside

BUNCHING
- collecting and arranging stems or stem parts into piles in the strip. According to where the wood is bunched in relation to the primary transport route, bunching can be further classified:
  e.g.
  · stump area bunching
  · trail-side bunching
  · zonal bunching

ALIGNING
- a bunching method where bolts prepared from directionally felled trees are moved beside logs according to the bunching instructions

SORTING
- moving or keeping similar wood assortments together

PILING
- arranging (stacking) wood assortments into piles

CROSS-PILING
- piling wood so that each layer is placed perpendicular to the preceding one

7. WOOD STORAGE

WOOD STORAGE
- storing wood raw material during the various phases of wood procurement. Ways to store are:
  e.g.
  · pile
  · cross-pile
  · bundle
  · load (e.g. loaded trailer)
· heap (pell mell)
· scattered stock
· standing stock

SCATTERED STOCK
- a type of storage where the wood has not been moved after wood cutting (i.e. after preparation)

STANDING STOCK
- a cutting area awaiting logging

FOREST LANDING
- an area within a forest area where wood is piled and stored directly after primary (forest) transport

ROADSIDE LANDING
- a forest landing beside a road which can be driven on by a haul truck

INTERMEDIATE LANDING
- any landing alongside a long-distance transport route between the forest/roadside landing and millyard
- an intermediate landing can be beside a road, railway or water transport route

PILE
- a formation of stacked wood usually of even lengths, uniform direction of piling and of nearly even height, and often having vertical supports at the ends

CROSS-PILE
- a pile where each layer is piled perpendicular to the preceding one
- usually used to ease scaling or to enhance drying

BUNDLE
- a bound handling unit of trees, tree parts, logs, bolts, etc.

HEAP
- wood piled where there is no arrangement

8. WOOD TRANSPORT

TARE
- a deduction from the gross weight of a substance and its container in allowance for the weight of the container
PRIMARY TRANSPORT
- transport from the stump area to beside a long-distance transport route (generally to roadside)
- (= FOREST TRANSPORT - refers to area in which transport occurs)
- (= TERRAIN TRANSPORT - refers to transport along the ground in the cutting area)
- (= SKIDING, FORWARDING, YARDING, etc., refers to the mode of primary transport)

SKIDING
- transporting trees or tree parts by dragging them partly or fully in contact with the ground

FORWARDING
- transporting trees or tree parts entirely off the ground by a terrain transport vehicle

GROUND-LEAD SKIDING
- skidding by a cable method to a bunching point with no vertical lift

YARDING
- skidding by a cable method to a bunching point in a way where the load is partly or entirely lifted off the ground by the cable (mainline)

EXTENDED PRIMARY TRANSPORT
- transport which starts in the stump area and is continued directly along a long-distance transport route by the same transport vehicle to the point of utilization or to any intermediate landing or depot along the way: e.g. forwarding continued along a road to beside a water transport route or railway
- (= SHORT HAUL)

TWO-WAY TRANSPORT
- a transport arrangement where the same vehicle is used to transport goods in both directions
- (= RETURN HAULING)
- (= BACK HAULING)

LONG-DISTANCE TRANSPORT
- transport following primary transport from the forest to the point of utilization and can be in one or more stages: e.g.
  - truck from roadside to millyard
  - truck from roadside to railside and railway to millyard
  - the transport of finished products to the market is also long-distance transport
  - major methods are road (truck) transport, railway transport and water transport
- (= secondary transport)

LOADING
- lifting trees or tree parts from the ground, water or transport vehicle and moving them onto a transport vehicle
ON-VEHICLE BUNDLING
- binding trees or tree parts into bundles in the load space of a vehicle for subsequent transport (e.g. bundle floating) or handling purposes

9. EQUIPMENT AND TERMINOLOGY

FOREST MACHINE NOMENCLATURE
- depending on the work requirements a forest machine may be named according to the work phase(s) performed, the wood assortment the work is performed on, the construction of the machine and/or the place of its use. Some examples of forest machine names are:
  • feller-buncher
  • feller-forwarder
  • delimber-bucker-buncher
  • feller-delimber-bucker-buncher
  • feller-chipper
  • shortwood harvester
  • chip forwarder
  • full tree forwarder
  • cable skidder
  • grapple skidder
  • clam-bunk skidder
  • articulated-steering wheeled forwarder
  • tracked harvester
  • forest chipper
  • mill chipper
  • one-grip harvester
  • two-grip harvester
  • chain flail-delimber-debarker-chipper

WOOD TRANSPORT MACHINES
  1  Land-borne transport machines
  1.1 Tractors
   • forest tractors may be divided
   • according to construction
   - wheeled tractors
   - tracked tractors
   • according to work method
   - forwarder
   - skidder
  1.2 Other tractors (e.g. agricultural)
  1.3 Trucks
  1.4 Railways
  1.4.1 Logging railway
1.4.2 Common-carrier railway
1.5 Cable systems
1.5.1 Ground lead
1.5.2 Yarding
1.5.2.1 High-lead
1.5.2.2 Sky-line
1.6 Other machines
2 Water-borne transport machines
3 Pipelines
4 Air-borne transport machines
4.1 Helicopter
4.2 Balloon

FELLER-BUNCHER
- a machine used to fell trees and move them into bunches or windrows

FIXED HEAD
- felling, processing or harvesting head which is mounted solid to a boom and usually the stem is moved through the air vertically to place of bunching or processing

DANGLE HEAD
- felling, processing or harvesting head which hangs from the end of a boom and directs the direction of fall and can move the stem horizontally to place of bunching or processing

FELLING HEAD
- an apparatus attached to the end of boom for felling trees and may use one of the following methods for cutting: e.g.
  · shear(s)
  · chain saw
  · circular saw
  · cone saw
  · auger

PROCESSOR
- a self-propelled or portable machine generally used in the stump area or at roadside and performs at least two processing functions (i.e. delimb, top or buck) and does not fell trees

PROCESSING HEAD
- a processing apparatus attached to the end of a knuckle-boom and may be moved in regard to trees or tree parts during the processing

MULTIPLE-TREE PROCESSING
- simultaneous processing of more than one tree or tree part: e.g.
  · multiple-tree delimming (e.g. flail delimber)
  · multiple-bolt debarking (e.g. drum debarker)
HARVESTER
- a self-propelled machine which fells trees and performs at least two processing functions
- one-grip and two-grip harvesters

ONE-GRIP HARVESTER
- a harvester which fells, delimbs, tops and usually bucks into assortments, with the same felling and processing unit (i.e. with one grab of the tree)

TWO-GRIP HARVESTER
- a harvester which fells the tree and transfers it to a separate processing unit on it for delimbing, topping and in most cases bucking into assortments

HARVESTER HEAD
- felling-processing apparatus attached to the end of a knuckle-boom and may be moved in regard to trees or tree parts during the processing
- is the felling-processing component of a single-grip harvester

FOREST TRACTOR
- self-propelled wheeled or tracked vehicle used in forestry primarily for carrying or dragging wood and if required, other work purposes

FORWARDER
- a forest tractor, usually self-loading, which carries the wood entirely free of the ground

SKIDDER
- a forest tractor which carries the wood load partly on the machine and the rest is skidded along the ground

CABLE SKIDDER
- a skidder which employs a mainline and chokers to gather and fasten the load

GRAPPLE SKIDDER
- a skidder using a large suspended grapple (opening downward) for gathering (picking up) and fastening the load

CLAM-BUNK SKIDDER
- a skidder equipped with an integral loader for lifting trees or tree parts into an inverted clam which holds the load during transport

DELIMBER
- a self-propelled or portable machine used to remove branches from trees or tree parts. For further classification the principle operating method and/or machine construction may be used: e.g.
  · chain flail delimber (flail delimber)
  · wrap-around knife delimber
· wrap-around chain delimer
· milling head delimer
· intermittent feed delimer
· continuous feed delimer
· pocket delimer
· drum delimer
· stroker delimer

SLASHER
- a self-propelled, portable or stationary machine used at roadside, intermediate landing or millyard to buck trees or tree parts to predetermined lengths

DEBARKER
- a machine for removing bark from trees or tree parts

CHIPPER
- a machine for chipping trees or tree parts. Further classification is according to the method used for chipping, place of chipping or chip type (dimension) produced: e.g.
· drum chipper
· disk chipper
· cone-screw chipper
· shear chipper
· hammermill chipper (crusher)
· mill chipper
· forest chipper
· piece chipper

CHAIN FLAIL-DELIMITER-DEBARKER CHIPPER
- a machine which uses chains to delimb and debark full trees before feeding into a chipper which is mounted on it

LOADER
- a machine, including both integral loader and base machine, used to load or unload wood onto or from transport vehicles. When further classifying a loader its principle operating function and/or its construction may be used: e.g.
· front-end loader
· knuckle-boom loader
· telescopic boom loader
· boom and cable loader
· log lift
· crane loader (crane)
YARDER
- self-propelled or portable machine consisting of a system of power-operated winches, used to skid trees or tree parts to a landing with the aid of machine mounted or separate tower to obtain cable lift

BUNDLING BARGE
- a barge of pontoon construction for transport forest machines and equipment over water and to serve as a dumping ramp where bundles are made on the barge or directly on the forest tractor

INTEGRAL LOADER
- actual lifting apparatus of a loader
- also often referred to as “loader”
- the parts of a knuckle-boom integral loader are:
  · pillar (post)
  · lifting arm
  · loader jib
  · extension arm
  · grapple rotator
  · heel boom
  · grapple

GRAPPLE
- freely movable component of a boom or arch for grasping wood, usually from above

CLAM
- grasping component for loading, unloading and/or moving wood, where the wood is grasped as an entire handling unit (organized storage formation)
- grasping occurs by clamping the wood with movable jaws onto fixed arms or a bunk

HIGH FLOTATION TIRE
- special wide tires, usually ranging in width from 107 to 127 cm (42 to 50 inches), with low ground pressure to minimize ground disturbance

10. MACHINE TIME CONCEPTS

SCHEDULED MACHINE HOURS (SMH)
- the hours a machine is scheduled to perform work

AVAILABLE MACHINE HOURS (AMH)
- the hours a machine is actually available to perform work (SMH - repair time - in shift service time)
PRODUCTIVE MACHINE HOURS (PMH)
- the hours a machine is actually performing productive work (i.e. AMH - delays - in shift moving)

MACHINE AVAILABILITY
- the percentage of the SMH when a machine is mechanically available to perform work (AMH/SMH)

MACHINE UTILIZATION
- the percentage of the SMH when a machine is actually performing productive work for which it was designed (PMH/SMH)