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**IDAPA 20
TITLE 06
CHAPTER 03**

**20.06.03 - MEASUREMENT RULES FOR FOREST PRODUCTS OF THE
IDAHO BOARD OF SCALING PRACTICES**

000. LEGAL AUTHORITY.

In accordance with Section 38-1208, Idaho Code, the Board has the power to adopt and amend rules. (4-15-98)

001. TITLE AND SCOPE.

01. Title. These rules shall be cited as IDAPA 20.06.03, "Measurement Rules for Forest Products of the Idaho Board of Scaling Practices," IDAPA 20.06.03. (4-15-98)

02. Scope. These rules constitute the measurement criteria for scaling within the state of Idaho. (4-15-98)

002. WRITTEN INTERPRETATIONS.

The Board has no written interpretive statements pertaining to the interpretation of rules in this chapter. (4-15-98)

003. ADMINISTRATIVE APPEALS.

There is no provision for administrative appeals before the Idaho Board of Scaling Practices under this chapter. (4-15-98)

004 -- 009. (RESERVED).

010. DEFINITIONS.

01. Cubic Volume. A log rule that uses cubic feet as its basic unit of measure. As described in the National Forest Cubic Scaling Handbook, FSH 2409.11a, Amendment No. 2409.11a-91-1. (4-15-98)

02. Decimal "C". A log rule that uses tens of board feet as its basic unit of measure; one (1) decimal "C" equals ten (10) board feet. The standard Scribner Coconino decimal "C" volumes as listed in the Appendix, Table I. (4-15-98)

03. Gross Scale. The log rule volume of timber products before deductions are made for defects. (4-15-98)

04. Gross Weight. Gross weight means the actual weight of the products hauled. (4-15-98)

05. National Forest Log Scaling Handbook. The National Forest Log Scaling Handbook, FSH 2409.11, Amendment No. 6. Regional supplements to the National Forest Log Scaling Handbook, unless specifically adopted by the Board, are only applicable to the United States Forest Service. (4-15-98)

06. Net Scale. The remaining log rule volume of timber products after deductions are made for defects, based on the product classification rules that are used. (4-15-98)

011. -- 049. (RESERVED).

050. SCALER REQUIREMENTS.

01. Written Scaling Specifications. (4-15-98)

a. At all scaling sites, all licensed scalers shall have immediately available a written document that states the information necessary to scale logs in accordance with a contractual scaling agreement. (4-15-98)

b. Where written scaling specifications omit items of specific information necessary to scale logs,

scalers shall use the appropriate criteria contained in these rules. (4-15-98)

02. Gross Scale Determination. All licensed scalers shall determine a gross scale volume in accordance with these rules. (4-15-98)

03. Net Scale Determination. All licensed scalers shall determine a net scale volume in accordance with these rules in the absence of written scaling specifications to the contrary. (4-15-98)

04. Recording Measurements On Scale Tickets. For each log scaled, all scalers shall record a combination of data from which both gross and net volume can be derived. This data shall include scaling length and scaling diameter(s). (4-15-98)

05. Load Identification. Scalers shall ensure that all loads are readily identified upon completion of scaling. (4-15-98)

051. -- 099. (RESERVED).

100. UNITS OF MEASURE.

01. Gross Weight. (4-15-98)

02. Decimal "C". (4-15-98)

03. Cubic Volume. (4-15-98)

04. Other Gross Volume Measurements. Other gross volume measurements converted to decimal "C" or cubic volume in accordance with Section 280. (4-15-98)

05. Standards For Poles. Manufacturing and grading specifications based on standards for poles as established by the American National Standards Institute, Inc. (4-15-98)

101. -- 199. (RESERVED).

200. GROSS DECIMAL "C" SCALE DETERMINATION FOR LOGS IN ROUND FORM.

01. Volumes. The gross scale shall be determined by measuring and applying the scaling length and scaling diameter, in accordance with the decimal "C" volume table, as listed in the Appendix, Table I, of these rules. (4-15-98)

02. Scaling Length. The scaling length shall be determined by the length of the scaling cylinder as explained in the National Forest Log Scaling Handbook. Refer to the Appendix, Table III, of these rules for scaling length determination. (4-15-98)

03. Scaling Diameters. The scaling diameter shall be determined by the methods outlined in the National Forest Log Scaling Handbook and the following provisions: (4-15-98)

a. Scaling diameters are measured from a minimum top diameter of five and fifty-one hundredths inches (5.51") actual measure -- the six-inch (6") class. (4-15-98)

b. Topwood that is smaller than the minimum top diameter of five and fifty-one hundredths inches (5.51") actual measure shall be disregarded, except when a written agreement specifies a smaller minimum top diameter. (4-15-98)

c. Midpoint diameters on second-cut, multi-segment logs are determined on the basis of calculated taper. (4-15-98)

d. Midpoint diameters on butt-cut, multi-segment logs shall be determined by the methods stated in

the Appendix, Table II of these rules. (4-15-98)

201. -- 219. (RESERVED).

220. GROSS DECIMAL "C" SCALE DETERMINATION FOR LOGS IN FRACTIONAL OR SLAB FORM.

01. Definitions. (4-15-98)

a. Fractional Form. Fractional form means portions of logs greater than or equal to one-half (1/2) original diameter with a merchantable slab missing. For cedar species logs, the minimum top diameter is fifteen (15) inches as measured using the Coconino-type scalestick. For all other species of logs, the minimum top diameter is twenty-one (21) inches as measured using the Coconino-type scalestick. (4-15-98)

b. Slab Form. Slab form means portions of logs less than one-half (1/2) original diameter. For cedar species logs, a minimum merchantable slab is four (4) inches shell thickness by five (5) inches width as measured using a Coconino-type scalestick. For all other species of logs, a minimum merchantable slab is six (6) inches height by six (6) inches width as measured using a Coconino-type scalestick. (4-15-98)

02. Volumes. Gross scale volumes shall be determined in accordance with the decimal "C" volume table, Appendix, Table I, and in accordance with the measurement criteria hereinafter described. (4-15-98)

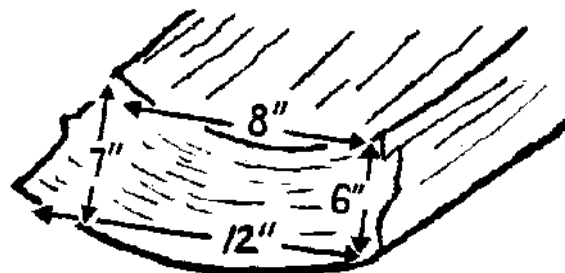
03. Scaling Length. Scaling length determination shall be the same as used for logs in round form. (4-15-98)

04. Scaling Diameters. (4-15-98)

a. Fractional Form. Diameter determination shall be the same as used for logs in round form. (4-15-98)

b. Slab Form. Mentally "square-up" the sound wood within the slab; figure an approximate square or rectangle that can be shaped on the small end of the slab.

DIAGRAM I
(For illustration only)

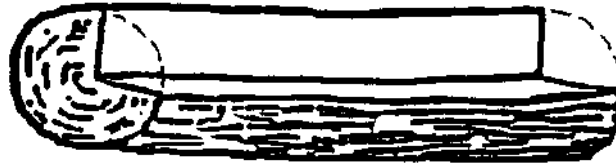


- the average width is ten inches (10")
 - the average shell thickness is six inches (6")
 - this approximates a rectangle of six inches (6") by ten inches (10")
- (4-15-98)

05. Volume Determination. (4-15-98)

a. Fractional form logs shall be gross scaled according to the portion that exists.

DIAGRAM II
(For illustration only)



- sixteen feet (16') scaling length
- twenty-inch (20") scaling diameter

If this were an entire log intact with no slab missing, it would gross scale twenty-eight (28) decimal "C". However, since one-fourth (1/4) of the log is missing, the gross scale would be one-fourth (1/4) less or twenty-one (21) decimal "C". This is determined by figuring:

$$1/4 \times 16' = 4' \quad 16' - 4' = 12'$$

The volume for twelve feet (12') with a twenty-inch (20") scaling diameter is twenty-one (21) decimal "C". Estimates for the merchantable slab missing are the same as those used for pie-cut deductions -- one-sixteenth (1/16), one-eighth (1/8), one-sixth (1/6), one-fourth (1/4), one-third (1/3).

(4-15-98)

b. Slab form logs use the following formula to determine volume:

$W \times H \times (L/16) =$ volume in board feet -- round this to the nearest ten (10) board feet to arrive at Scribner decimal "C" volume; five (5) board feet or more rounds up.

W	=	the width of the slab in inches as measured using a Coconino-type scalestick
H	=	the shell thickness of the slab in inches as measured using a Coconino-type scalestick
L	=	the scaling length of the slab in feet

If we use the "DIAGRAM I" illustration: $10 \times 6 \times 16/16 = 60$

This slab would gross scale sixty (60) board feet or six (6) decimal "C".

(4-15-98)

221. -- 279. (RESERVED).

280. CONVERSION FACTORS FOR OTHER GROSS VOLUME MEASUREMENTS.

01. Conversion To Gross Decimal "C" Or Gross Cubic Volume. All gross volume measurement determined in a manner other than decimal "C" or cubic volume shall be converted to an equivalent decimal "C" or cubic volume gross scale. (4-15-98)

02. Conversion Factors. Standard converting factors as listed in the Appendix, Table XV, of the National Forest Log Scaling Handbook shall be considered acceptable (see Appendix, Table IV, of these rules). (4-15-98)

03. Other Conversion Factors. Conversion factors not listed in the National Forest Log Scaling Handbook shall be considered and determined by the Board of Scaling Practices upon written request. (4-15-98)

04. Truckload Volume Formula. The cordwood, or cube, formula for measuring truckload volumes:

$$(L \times W \times H) \div 0.256 = \text{Volume in board feet}$$

Length (L), width (W), and height (H) are measured and expressed to the nearest one-tenth (1/10) of a foot. (4-15-98)

281. -- 299. (RESERVED).

300. PRODUCT CLASSIFICATION FOR NET SCALE.

01. Definition. Identification and usage of a general class of scaling applications to reflect the net scale of a log segment. A combination log is any multiple-segment log involving more than one (1) product classification. (4-15-98)

02. Product Class Identification. The general classes are identified by their common applications in recognition of scaling defects and associated defect deduction methods. (4-15-98)

a. Sawlogs. (4-15-98)

b. Pulp logs. (4-15-98)

c. Cedar products logs. (4-15-98)

03. Product Class Usage. (4-15-98)

a. Written scaling specifications dictate the product classification for scaling. (4-15-98)

b. In the absence of written scaling specifications, all logs shall be scaled for sawlog product classification. (4-15-98)

301. -- 319. (RESERVED).

320. NET DECIMAL "C" SCALE DETERMINATION FOR SAWLOGS.

01. Definition. Sawlogs are those logs which are suitable for the manufacture of lumber, beams, or veneer. Classification as "sawlog" requires a log segment(s) to meet minimum merchantability specifications. (4-15-98)

02. Species Identification. Species differentiation for check scaling purposes shall be made according to normal commercial species. Written scaling specifications may establish further species differentiation or identification. For illustration only:

WP	Western or Idaho White Pine (<i>Pinus monticola</i>)
PP	Ponderosa Pine (<i>Pinus ponderosa</i>)
LP	Lodgepole Pine (<i>Pinus contorta</i>)
WB	Whitebark Pine or Limber Pine (<i>Pinus albicaulis</i> , <i>Pinus flexilis</i>)
DF	Douglas Fir or Red Fir (<i>Pseudotsuga menziesii</i>)
L	Western Larch or Tamarack (<i>Larix occidentalis</i>)
GF	Grand Fir or White Fir (<i>Abies grandis</i> , <i>Abies concolor</i>)
AF	Subalpine Fir (<i>Abies lasiocarpa</i>)
H	Western Hemlock (<i>Tsuga heterophylla</i>)

MH	Mountain Hemlock (<i>Tsuga mertensiana</i>)
S	Engelmann Spruce (<i>Picea engelmanni</i>)
C	Western Redcedar (<i>Thuja plicata</i>)
CW	Black Cottonwood (<i>Populus trichocarpa</i>)
O	All other tree or shrub species shall be classified as "other"

(4-15-98)

03. Defect Deductions.

(4-15-98)

a. The net scale of a sawlog is the usable scale volume, after deductions have been made for scaling defects; it is subject to minimum merchantability specifications. (4-15-98)

b. Types of defects and methods of deduction for sawlogs shall be made according to the National Forest Log Scaling Handbook and as described in these rules. (4-15-98)

c. Rot defects require thorough inspection of a log to determine the extent of loss. This includes deciding if rot is in initial or advanced stages, recognition of external indicators to judge extent of decay, and knowledge of rot characteristics in specific stands of timber. (4-15-98)

d. When nothing is evident to determine the overall extent of decay to the contrary, for "Fomes rot" and "Indian Paint rot," the following shall be used as guidelines: (4-15-98)

i. Except in White Pine species, from the "punk" or indicator of decay, rot shall be estimated to extend four feet (4') up the log and six feet (6') down the log and affect the entire heartwood. (4-15-98)

ii. In White Pine species, from the "punk" or indicator of decay, rot shall be estimated to extend two feet (2') up the log and four feet (4') down the log and affect one-half (1/2) of the scaling cylinder. (4-15-98)

04. Net Scale Specifications.

(4-15-98)

a. Minimum merchantability of net scale in relation to gross scale shall be thirty-three and one-third percent (33-1/3%). (4-15-98)

b. Minimum diameter shall be five and fifty-one hundredths inches (5.51") actual measure -- the six-inch (6") class -- and also applies as the minimum sound core recovery within a defect. (4-15-98)

c. Minimum log length shall be eight feet (8') and one inch (1"). (4-15-98)

d. Scaling length usage shall be the same as used for gross scaling length (see Appendix, Table III). (4-15-98)

e. Minimum lumber length recovery shall be six feet (6') and a one-inch (1") by four-inch (4") board, nominal measurement. (4-15-98)

f. On multi-segment logs, each segment shall be judged individually in order to determine if it meets merchantability minimums. (4-15-98)

g. There are no "combination logs" on multi-segment pieces. (4-15-98)

05. Net Scale Contractual Agreement. Contractual scaling agreements relating to determination of net scale may establish scaling requirements that vary from Section 320 of these rules. (4-15-98)

321. -- 329. (RESERVED).

330. NET DECIMAL “C” SCALE DETERMINATION FOR PULP LOGS.

01. Definition. Pulp logs are logs, or log segments, that are suitable for the manufacture of “wood chips”. (4-15-98)

02. Species Identification. Normally, no species differentiation shall be made for pulp logs; classification shall be “pulp”. A contractual scaling agreement may provide otherwise, including limitations as to species acceptable or the differentiation of species. (4-15-98)

03. Defect Deductions. The net scale of a pulp log shall be determined by deducting defects which reduce the pulp log volume, subject to minimum merchantability. Deduction procedures and deductible defects are as follows: (4-15-98)

a. Diameter cut. Use a diameter reduction for rotten sapwood extending around or part-way around the circumference of the log. The deduction procedure is the same as in sawlogs. Only wood that has deteriorated to a degree severe enough to reduce chip volume shall be deductible. (4-15-98)

b. Pie-cut. Use this method when the pulp defect can be confined to a sector of a circle for the length affected. It applies to V-shaped rot pockets sometimes found in conjunction with sap rot or surface scars. The deduction procedure is the same as in sawlogs. (4-15-98)

c. Interior defects. Usually caused by various fungi which have decayed the wood to the point where it becomes unsuitable for pulp manufacture, soft rot is probably the most common and extensive type of defect in pulp logs. Not all stages of decay cause loss of volume. The usual field test to determine usability shall be to chop into the defect with a sharp ax, removing a “chip” of wood. If the “chip” holds together it is usable; if the “chip” crumbles or falls apart it is not usable. After determining that a defect is deductible, the deduction procedure shall be to take out “a log within a log” for the length affected. This is accomplished by measuring the size of the defect to approximate an equivalent “log” diameter and deducting the “log” volume, or percentage of this volume if there is some pulp recovery within the defect measured, for the length affected. (4-15-98)

04. Net Scale Specifications. (4-15-98)

a. Minimum merchantability of net scale in relation to gross scale shall be fifty percent (50%). (4-15-98)

b. Minimum diameter shall be five and fifty-one hundredths inches (5.51”) actual measure -- the six-inch (6”) class. (4-15-98)

c. Minimum log length shall be eight feet (8’) and one inch (1”). (4-15-98)

d. Scaling length usage shall be the same as used for gross scaling length (see Appendix, Table III). (4-15-98)

e. A log segment must be mechanically debarkable. (4-15-98)

f. A log segment must be free of char. (4-15-98)

g. On multi-segment logs, each segment shall be judged individually in order to determine if it meets merchantability minimums. (4-15-98)

h. There are no “combination logs” on multi-segment pieces. (4-15-98)

05. Net Scale Contractual Agreement. Contractual scaling agreements relating to determination of net scale may establish scaling requirements that vary from Section 330 of these rules. (4-15-98)

331. -- 339. (RESERVED).

340. NET DECIMAL “C” SCALE DETERMINATION FOR CEDAR PRODUCTS LOGS.

01. Definition. Cedar products are usually derived from logs that do not meet minimum merchantability specifications for sawlogs classification. (4-15-98)

02. Defect Deductions. (4-15-98)

a. The Scribner decimal “C” method of determining volume for cedar products shall be to measure the scaling diameter and scaling length to compute a gross volume, subtract the deductible defect, and arrive at a net volume. The concept of a “scaling cylinder” is modified when scaling cedar products logs. Taper is not actually considered, but recognized, because shell thickness reflects volume. (4-15-98)

b. Deductible defects in the scaling of cedar products are those defects which reduce the usable quantity of cedar products that can be derived. They do not include such things as heart checks and straight splits. For cedar products scaling there are four (4) types of defect deduction methods. (4-15-98)

c. Interior Defect Deduction Method. (4-15-98)

i. The deduction procedure for interior rot is to deduct a round cylinder with dimensions equal to the average rot diameter on the small end of each segment. When the averaged diameter falls on the half-inch (1/2”), it is rounded up. The resulting diameter is used to find the corresponding “log volume” from the scale rule. This volume is the defect deduction. (4-15-98)

ii. On multi-segment, second-cut logs the midpoint diameter of the rot is determined by averaging the sizes of the rots showing on the ends of the log. When this average falls on the half-inch (1/2”) it is rounded up. (4-15-98)

iii. On multi-segment, butt-cut logs the rot is first measured on the top end. The mid-point diameter of the rot is then increased according to the taper of the log, unless there are definite indications to the contrary. (4-15-98)

iv. If sound wood exists within any interior defect, as is sometimes the case with “ring rot,” it must have a diameter of at least ten (10) inches, Scribner class measure, on the small end. Careful examination of the log must be made to ensure that there is indeed recoverable sound material. (4-15-98)

d. Diameter Reduction Method. (4-15-98)

i. Defects such as sap rot, large massed wormholes, and shallow catfaces affect only the outer circumference of a cedar products log. The diameter reduction method is used to determine defect volume. (4-15-98)

ii. The procedure is to reduce the diameter to obtain a “new” diameter for the resulting sound core. The difference of these corresponding volumes is the defect deduction. If only a portion of the circumference is affected the defect is a fraction of the volume difference. (4-15-98)

e. Length-Cut Method. (4-15-98)

i. Defects such as crook and sweep, fluted butts, abrupt flare, twisted grain, and some types of “thin shells” usually can be confined or reduced to an equivalent loss of length. The length-cut method is used to determine defect volume. (4-15-98)

ii. The procedure is to determine the length affected and make a length-cut deduction that provides a net scale length which is in a multiple of two-feet (2’). (4-15-98)

f. Pie-Cut Method. (4-15-98)

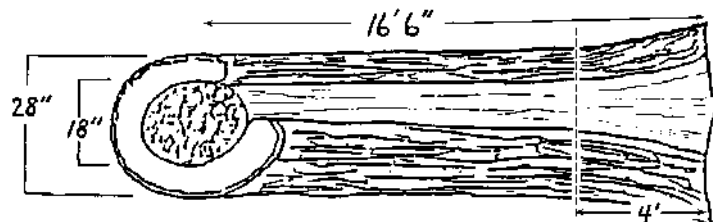
i. Defects such as large knots, burls, deep catfaces, scars, twisted grain, and portions of “thin shells”

can be deducted using the pie-cut method. (4-15-98)

ii. Based on the fraction of the length affected, the procedure shall be to compute the volume of the length affected, then reduce by the affected fraction. All defect computations ending in five (5) board feet are rounded up for a deduction of ten (10) board feet or one (1) decimal "C". (4-15-98)

03. Sequence Of Defect Deduction Methods. One (1) or more of these defect deduction methods may be applied to any particular log, provided that the order of application shall be: (1) length-cut method, (2) interior defect deduction method, (3) diameter reduction method, (4) pie-cut method.

DIAGRAM III
(For illustration only)



(4-15-98)

a. This is a cedar product log with a sixteen-foot (16') scaling length and a twenty-eight inch (28") scaling diameter. The defects are:

- a flared "thin shell" estimated to affect the butt end for a length of four feet (4'),
 - interior rot measuring eighteen inches (18") on the small end,
 - sap rot affecting the collar to a one-inch (1") depth,
 - a catface affecting one-fourth (1/4) of the shell.
- (4-15-98)

b. After determining that the shell thickness meets merchantability requirements -- four inches (4") of sound shell wood thickness in this example -- the next step is the determination of gross scale:

- twenty-eight inches (28") on sixteen feet (16') = fifty-eight (58) decimal "C".

The next step is defect deductions, in the order of application. (4-15-98)

c. Length-Cut Method. The butt end of this log requires a four-foot (4') length cut; sixteen feet (16') minus four feet (4') equals twelve feet (12'); the difference between the volumes of a sixteen-foot (16') log and a twelve-foot (12') log is fourteen (14) decimal "C".

$$\begin{array}{r}
 58 \text{ (total gross scale)} \\
 -14 \text{ (length-cut defect)} \\
 \hline
 44
 \end{array}$$

(4-15-98)

d. Interior Defect Deduction Method. This log has eighteen inches (18") of rot which will be deducted for a twelve-foot (12') length, since four feet (4') has already been deducted; eighteen inches (18") on twelve feet (12') equals sixteen (16) decimal "C".

$$\begin{array}{r}
 44 \text{ (total scale remaining after step \#1)} \\
 -16 \text{ (interior defect deduction)} \\
 \hline
 28
 \end{array}$$

(4-15-98)

e. Diameter Reduction Method. This log has rotten sapwood affecting the collar to a one-inch (1") depth which requires a two-inch (2") diameter drop; the difference between the gross scale, twenty-eight inches (28")

for twelve feet (12'), and the core scale twenty-six inches (26") for twelve feet (12') is seven (7) decimal "C".

28 (total scale remaining after step #2)
- 7 (diameter reduction defect)
21 (4-15-98)

f. Pie-Cut Method. The catface causes a loss of one-fourth (1/4) of the remaining volume (the shell thickness); one-fourth (1/4) of twenty-one (21) equals five (5) decimal "C".

21 (total scale remaining after step #3)
- 5 (pie-cut defect)
16 (4-15-98)

g. This cedar products log has a gross scale of fifty-eight (58) decimal "C", a net scale of sixteen (16) decimal "C", and a defect of forty-two (42) decimal "C". (4-15-98)

04. Net Scale Specifications. (4-15-98)

a. Minimum merchantability of net scale in relation to gross scale shall be ten percent (10%). (4-15-98)

b. Minimum diameter shall be eight and zero-tenths inches (8.0") actual measure. (4-15-98)

c. Minimum log length shall be eight feet (8') and one inch (1"). (4-15-98)

d. Scaling length usage shall be the same as used for gross scaling length (See Appendix, Table III). (4-15-98)

e. Minimum product recovery shall be six feet (6') long and a four inches (4") by five inches (5") product, Scribner class measurement. (4-15-98)

f. Minimum shell thickness shall be four and zero-tenths inches (4.0") actual measure. (4-15-98)

g. Minimum slab size is four and zero-tenths inches (4.0") shell thickness by four and fifty-one hundredths inches (4.51") width, actual measure. (4-15-98)

h. On multi-segment logs, each segment shall be judged individually in order to determine if it meets merchantability minimums. (4-15-98)

i. There are no "combination logs" on multi-segment pieces. (4-15-98)

05. Net Scale Contractual Agreement. Contractual scaling agreements relating to determination of net scale may establish scaling requirements that vary from Section 340 of these rules. (4-15-98)

06. Cord Measurement And Piece Count. Cord measurement may be used on material shorter than eight feet (8') and one inch (1") in length; a piece count measure may be used on posts, rails, and shake bolts. (4-15-98)

341. -- 999. (RESERVED).

APPENDIX

Table I -- Volume Table
Table II -- Midpoint Taper on Multi-Segment Butt Logs
Table III -- Log Length Table
Table IV -- Standard Converting Factors

TABLE I - VOLUME TABLE*																	
Log Length (in feet)																	
Diameter (in inches)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3										1	1	1	1	1	1	1	1
4					1	1	1	1	1	1	1	1	1	1	1	1	1
5		1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
6		1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
7	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3
8	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3
9	1	1	1	2	2	2	3	3	3	3	3	3	4	4	4	4	4
10	1	1	2	2	3	3	3	3	3	4	4	5	6	6	6	6	7
11	1	2	2	2	3	3	4	4	4	5	5	6	7	7	8	8	8
12	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	10	10
13	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	12	12
14	3	4	4	5	6	6	7	8	9	9	10	11	11	12	13	14	14
15	4	4	5	6	7	8	9	10	11	12	12	13	14	15	16	17	18
16	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
17	5	6	7	8	9	10	12	13	14	15	16	17	18	20	21	22	23
18	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	26	27
19	6	8	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30
20	7	9	11	12	14	16	17	19	21	23	24	26	28	30	31	33	35
21	8	10	12	13	15	17	19	21	23	25	27	28	30	32	34	36	38
22	8	10	13	15	17	19	21	23	25	27	29	31	33	35	38	40	42
23	9	12	14	16	19	21	23	26	28	31	33	35	38	40	42	44	47
24	10	13	15	18	21	23	25	28	30	33	35	38	40	43	45	48	50
25	11	14	17	20	23	26	29	31	34	37	40	43	46	49	52	54	57
26	12	16	19	22	25	28	31	34	37	41	44	47	50	53	56	59	62
27	14	17	21	24	27	31	34	38	41	44	48	51	55	58	62	65	68
28	15	18	22	25	29	33	36	40	44	47	51	54	58	62	65	69	73
29	15	19	23	27	31	35	38	42	46	49	53	57	61	65	68	72	76
30	16	21	25	29	33	37	41	45	49	53	57	62	66	70	74	78	82
31	18	22	27	31	36	40	44	49	53	58	62	67	71	75	80	84	89
32	18	23	28	32	37	41	46	51	55	60	64	69	74	78	83	88	92
33	20	24	29	34	39	44	49	54	59	64	69	73	78	83	88	93	98
34	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
35	22	27	33	38	44	49	55	60	66	71	77	82	88	93	98	104	109

TABLE I - VOLUME TABLE*																	
Log Length (in feet)																	
Diameter (in inches)	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
36	23	29	35	40	46	52	58	63	69	75	81	86	92	98	104	110	115
37	26	32	39	45	51	58	64	71	77	84	90	96	103	109	116	122	129
38	27	33	40	47	54	60	67	73	80	87	93	100	107	113	120	126	133
39	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
40	30	38	45	53	60	68	75	83	90	98	105	113	120	128	135	142	150
41	32	39	48	56	64	72	79	87	95	103	111	119	127	135	143	151	159
42	33	42	50	59	67	76	84	92	101	109	117	126	134	143	151	160	168
43	35	43	52	61	70	79	87	96	105	113	122	131	140	148	157	166	174
44	37	46	56	65	74	83	93	102	111	120	129	139	148	157	166	176	185
45	38	47	57	66	76	85	95	104	114	123	133	143	152	161	171	180	190
46	39	49	59	69	79	89	99	109	119	129	139	149	159	169	178	188	198
47	41	52	62	72	83	93	104	114	124	134	145	155	166	176	186	196	207
48	43	54	65	76	86	97	108	119	130	140	151	162	173	184	194	205	216
49	45	56	67	79	90	101	112	124	135	146	157	168	180	191	202	214	225
50	47	58	70	82	94	105	117	129	140	152	164	175	187	199	211	222	234
51	48	61	73	85	97	110	122	134	146	158	170	183	195	207	219	231	243
52	50	63	76	89	101	114	127	139	152	165	177	190	202	215	228	240	253
53	52	66	79	92	105	118	132	145	158	171	184	197	210	224	237	250	263
54	54	68	82	96	109	123	137	150	164	177	191	205	218	232	246	260	273
55	56	71	85	99	113	127	142	156	170	184	198	212	227	241	255	269	283
56	59	73	88	103	118	132	147	162	176	191	206	220	235	250	264	279	294
57	61	76	91	107	122	137	152	167	183	198	213	228	244	259	274	289	304
58	63	79	95	110	126	142	158	174	189	205	221	237	252	268	284	300	315
59	65	81	98	114	131	147	163	180	196	212	229	245	261	278	294	310	327
60	67	84	101	118	135	152	169	186	203	220	237	253	270	287	304	321	338
61	70	87	105	123	140	158	175	193	210	228	245	263	280	298	315	332	350
62	72	90	108	127	145	163	181	199	217	235	253	271	289	307	325	344	362
63	74	93	112	131	149	168	187	205	224	243	261	280	299	317	336	354	373
64	77	96	116	135	154	174	193	213	232	251	270	290	309	329	348	368	387
65	79	99	119	139	159	179	199	219	239	259	279	299	319	339	358	378	398
66	82	103	123	144	164	185	206	226	247	268	288	309	329	350	370	391	412
67	85	106	127	148	170	191	212	233	254	275	297	318	339	360	381	402	423
68	87	109	131	153	175	197	219	240	262	284	306	328	350	371	393	415	437
69	90	113	135	158	180	203	226	248	271	294	316	339	361	384	406	429	452
70	93	116	139	163	186	209	232	256	279	302	325	349	372	395	419	442	465
71	96	120	144	167	192	215	240	263	287	311	335	359	383	407	430	454	478
72	98	123	148	173	197	222	247	271	296	321	345	370	395	419	444	468	493
73	101	127	152	178	203	229	254	280	305	330	356	381	406	432	457	482	508
74	104	130	157	183	209	236	261	288	314	340	366	393	418	445	471	497	523
75	107	134	161	188	215	242	269	296	323	350	377	404	430	458	484	511	538

TABLE II -- MIDPOINT TAPER ON MULTI-SEGMENT BUTT LOGS		
1. North Idaho Area (north of the Salmon River, and including the northeastern Washington area bounded by the Snake River on the south, to the Columbia River, north to the Okanogan River, north to Canada) --- midpoint taper shall be a standard taper as follows:		
		Shall be 1-inch per segment.
Larch & Lodgepole Pine	21' - 48'	Shall be 2-inch top segment, 1-inch remaining segment.
Larch & Lodgepole Pine	49' - 60'	Shall be 2-inches per segment.
Cedar	21' - 40'	Allow 1-inch taper on pieces with an odd top diameter; allow 2-inch taper on pieces with an even top diameter (Odd-Even Rule).
All Other Species	21' - 40'	
All Species (except Larch & Lodgepole Pine)	41' - 60'	Take two measurements, small end and 16' up from the butt. The diameter at the 16' measurement point shall be determined by actual measure. Apply calculated taper distribution to determine scaling diameter of the second segment.
All Species	61' and longer	Take two measurements, small end and top of the second segment up from the butt. The top diameter of the second segment shall be determined by actual measure. Apply calculated taper distribution to top segment(s) and standard taper rule for the appropriate species to bottom segment.
2. Southwest Idaho Area --- midpoint taper shall be a standard taper as follows:		
Larch	21' - 40'	Shall be 1-inch taper.
All Other Species	21' - 40'	Shall be 2-inch taper.
Multiple segment butt logs not addressed shall be determined with actual taper applied.		
3. Southeast Idaho Area ---		
a. Targhee National Forest Area -- midpoint taper shall be a standard taper as follows:		
Douglas Fir, Alpine Fir, & Engelmann Spruce	21' - 40'	Shall be 2-inch taper.
Lodgepole Pine	21' - 31'	Shall be 1-inch taper.
Lodgepole Pine	32' - 40'	Shall be 2-inch taper.
b. Other Southeast Areas -- midpoint taper(s) shall be determined with actual taper applied.		
c. Multiple segment butt logs not addressed shall be determined with actual taper applied.		
4. Except as previously addressed, the butt-log taper tables developed by the USFS at the point of origin of the forest products shall be utilized on all forest products scaled within the state of Idaho. Multiple-segment butt logs not addressed shall be determined with actual taper applied.		

TABLE III - LOG LENGTH TABLE							
Log Length	Scaling Length	Butt Segment	Segment Length	Segment Length	Segment Length	Segment Length	Segment Length
8'1" - 8'8"	8						
8'9" - 9'8"	9						
9'9" - 10'8"	10						
10'9" - 11'8"	11						
11'9" - 12'8"	12						
12'9" - 13'8"	13						
13'9" - 14'8"	14						
14'9" - 15'8"	15						
15'9" - 16'8"	16						
16'9" - 17'8"	17						
17'9" - 18'8"	18						
18'9" - 19'8"	19						
19'9" - 20'8"	20						
20'9" - 22'2"	21	11	10				
22'3" - 23'2"	22	12	10				
23'3" - 24'2"	23	12	11				
24'3" - 25'2"	24	12	12				
25'3" - 26'2"	25	13	12				
26'3" - 27'2"	26	14	12				
27'3" - 28'2"	27	14	13				
28'3" - 29'2"	28	14	14				
29'3" - 30'2"	29	15	14				
30'3" - 31'2"	30	16	14				
31'3" - 32'2"	31	16	15				
32'3" - 33'2"	32	16	16				
33'3" - 34'2"	33	17	16				
34'3" - 35'2"	34	18	16				
35'3" - 36'2"	35	18	17				
36'3" - 37'2"	36	18	18				
37'3" - 38'2"	37	19	18				
38'3" - 39'2"	38	20	18				
39'3" - 40'2"	39	20	19				

TABLE III - LOG LENGTH TABLE							
Log Length	Scaling Length	Butt Segment	Segment Length	Segment Length	Segment Length	Segment Length	Segment Length
40'3" - 41'2"	40	20	20				
41'3" - 42'8"	41	14	14	13			
42'9" - 43'8"	42	14	14	14			
43'9" - 44'8"	43	15	14	14			
44'9" - 45'8"	44	16	14	14			
45'9" - 46'8"	45	16	15	14			
46'9" - 47'8"	46	16	16	14			
47'9" - 48'8"	47	16	16	15			
48'9" - 49'8"	48	16	16	16			
49'9" - 50'8"	49	17	16	16			
50'9" - 51'8"	50	18	16	16			
51'9" - 52'8"	51	18	17	16			
52'9" - 53'8"	52	18	18	16			
53'9" - 54'8"	53	18	18	17			
54'9" - 55'8"	54	18	18	18			
55'9" - 56'8"	55	19	18	18			
56'9" - 57'8"	56	20	18	18			
57'9" - 58'8"	57	20	19	18			
58'9" - 59'8"	58	20	20	18			
59'9" - 60'8"	59	20	20	19			
60'9" - 61'8"	60	20	20	20			
61'9" - 63'2"	61	16	16	15	14		
63'3" - 64'2"	62	16	16	16	14		
64'3" - 65'2"	63	16	16	16	15		
65'3" - 66'2"	64	16	16	16	16		
66'3"-67'2"	65	17	16	16	16		
67'3"-68'2"	66	18	16	16	16		
68'3"-69'2"	67	18	17	16	16		
69'3"-70'2"	68	18	18	16	16		
70'3"-71'2"	69	18	18	17	16		
71'3"-72'2"	70	18	18	18	16		
72'3"-73'2"	71	18	18	18	17		

TABLE III - LOG LENGTH TABLE							
Log Length	Scaling Length	Butt Segment	Segment Length	Segment Length	Segment Length	Segment Length	Segment Length
73'3"-74'2"	72	18	18	18	18		
74'3"-75'2"	73	19	18	18	18		
75'3"-76'2"	74	20	18	18	18		
76'3"-77'2"	75	20	19	18	18		
77'3"-78'2"	76	20	20	18	18		
78'3"-79'2"	77	20	20	19	18		
79'3"-80'2"	78	20	20	20	18		
80'3"-81'2"	79	20	20	20	19		
81'3"-82'2"	80	20	20	20	20		
82'3"-83'8"	81	17	16	16	16	16	
83'9"-84'8"	82	18	16	16	16	16	
84'9"-85'8"	83	18	17	16	16	16	
85'9"-86'8"	84	18	18	16	16	16	
86'9"-87'8"	85	18	18	17	16	16	
87'9"-88'8"	86	18	18	18	16	16	
88'9"-89'8"	87	18	18	18	17	16	
89'9"-90'8"	88	18	18	18	18	16	
90'9"-91'8"	89	18	18	18	18	17	
91'9"-92'8"	90	18	18	18	18	18	
92'9"-93'8"	91	19	18	18	18	18	
93'9"-94'8"	92	20	18	18	18	18	
94'9"-95'8"	93	20	19	18	18	18	
95'9"-96'8"	94	20	20	18	18	18	
96'9"-97'8"	95	20	20	19	18	18	
97'9"-98'8"	96	20	20	20	18	18	
98'9"-99'8"	97	20	20	20	19	18	
99'9"-100'8"	98	20	20	20	20	18	
100'9"-101'8"	99	20	20	20	20	19	
101'9"-102'8"	100	20	20	20	20	20	
102'9"-104'2"	101	18	18	17	16	16	16
104'3"-105'2"	102	18	18	18	16	16	16
105'3"-106'2"	103	18	18	18	17	16	16

TABLE III - LOG LENGTH TABLE							
Log Length	Scaling Length	Butt Segment	Segment Length	Segment Length	Segment Length	Segment Length	Segment Length
106'3"-107'2"	104	18	18	18	18	16	16
107'3"-108'2"	105	18	18	18	18	17	16
108'3"-109'2"	106	18	18	18	18	18	16
109'3"-110'2"	107	18	18	18	18	18	17
110'3"-111'2"	108	18	18	18	18	18	18
111'3"-112'2"	109	19	18	18	18	18	18
112'3"-113'2"	110	20	18	18	18	18	18
113'3"-114'2"	111	20	19	18	18	18	18
114'3"-115'2"	112	20	20	18	18	18	18
115'3"-116'2"	113	20	20	19	18	18	18
116'3"-117'2"	114	20	20	20	18	18	18
117'3"-118'2"	115	20	20	20	19	18	18
118'3"-119'2"	116	20	20	20	20	18	18
119'3"-120'2"	117	20	20	20	20	19	18
120'3"-121'2"	118	20	20	20	20	20	18
121'3"-122'2"	119	20	20	20	20	20	19
122'3"-123'2"	120	20	20	20	20	20	20

In the above Table, the butt segment is the longest.

(4-15-98)

TABLE IV		
Standard Converting Factors-- USFS Log Scaling Handbook, Appendix XV		
Product	Assumed Dimensions	Equivalent in Board Feet
Cord, standard	4 by 4 by 8 feet	500
Cord, long	4 by 4 by 8 feet	625
Cord, shingle bolts	4 by 4 by 8 feet	600
Cord, small material (averaging less than 5" middle diameter in the round)	do	333-1/3
Cord, short	4 by 3 by 8 feet	375
Cord, short, small material	do	250
Load (small, irregular pieces that cannot be ricked)	4 by 4 by 8 feet	333-1/3
Tie, standard	7 by 9 inches by 8 feet	35
Do	7 by 8 inches by 8 feet	30
Do	6 by 6 inches by 8 feet	20
Tie, narrow gage	7 by 8 inches by 6-1/2 feet	25
Do	6 by 7 inches by 6-1/2 feet	20
Do	6 by 6 inches by 6-1/2 feet	15
Pole (telephone) or piling	8 inches by 45 feet	200
Do	8 inches by 40 feet	150
Do	8 inches by 35 feet	100
Do	7 inches by 60 feet	280
Do	7 inches by 50 feet	200
Do	7 inches by 40 feet	100
Do	7 inches by 35 feet	80
Do	7 inches by 30 feet	60
Do	7 inches by 25 feet	50
Do	5 inches by 25 feet	30
Cubic foot	13.6 inches by 1 foot	6
Linear foot	10 inches by 1 foot	3
Linear foot (long piling)	80 to 125 feet by 6 inches	5-1/2
Derrick pole	7 inches by 30 feet	60
Derrick set (11 pieces)		480
Post, fence	6 inches by 7 feet	7
Do	5 inches by 7 feet	5
Post, split	18 inches circumference by 7 feet	6
Brace, fence	4 inches by 6 feet	2
Stake, fence	3 inches by 5 feet	1
Stay, fence	2 inches by 6 feet	1/2
Rail, fence (split)	20 inches circumference by 16 feet	15
Pole, fence	4 inches by 20 feet	10
Pole (12 pieces)	4 inches by 16 feet	100
Pole, converter	4 inches by 20 feet	10
Prop	6 inches by 10 feet	10
Lagging (6 pieces)	3 inches by 6 feet	10

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