

APPENDIX TABLE I

UNITS OF MEASURE FOR DECLARATION OF QUANTITY

<u>System of Measure</u>	<u>Gross Scale</u>	<u>Net Scale</u>
A. Butt Measure		
Diameter count:	Stems	
Cumulative sum:	Stem units	
B. Count	Pieces	
C. Butt scale	Cunits or standard cords	Net cunits or net standard cords
D. Stick cord scale	Standard cords or face cords	Net standard cords or net face cords
E. Log scale	Board feet, indicating the log rule used	Net board feet, indicating the log rule used
F. Linear measure	Linear feet	Net linear feet
G. Cubic foot measure	Cunits	Net cunits
H. Chip volume scale	Chipcords	
I. Thrown cord scale	Standard cords	
J. Weight scale	Thousand pounds (Tholbs) or tons	Net Tholbs, or Net tons

APPENDIX TABLE II

SYSTEMS OF MEASUREMENT

<u>System of Measure</u>	<u>Summary of What Is Measured</u>	<u>Declaration of Quantity</u> <u>Gross Scale</u> <u>[Net scale in brackets]</u>	<u>Wood Production Forms</u> <u>[State Standard in brackets as S.S.]</u>
A. Butt measure	a. Lineal measure of of butt diameters represented by stem count for each diameter class, or	Stems for diameter class	Tree length [S.S.] Semi-tree length and chunkwood (S.S.)
	b. Lineal measure of butt diameters represented by cumulative sum of stem diameters	Stem units: 100 inches = 1 stem unit	Log length Polewood
B. Count	Number of stems	Pieces	Tree length Log length Polewood Unstacked fuelwood length Semi-tree length and Chunkwood
C. Butt scale (prohibited after March 31, 1986 in payment for services)	a. Lineal measure of butt diameters computed in cubic feet	Cunits [Net cunits]	Tree length
	b. Lineal measure of butt diameters computed in cubic feet, and then represented in standard cords	Standard cords [Net standard cords]	
D. Stick cord scale	a. Cubic content of stack	Standard cords [Net standard cords]	Stacked wood [S.S.]
	b. Square foot measure of face of stack	Face cords [Net face cords]	

Appendix Table II (con't)

E. Log scale	Apparent saw timber volume by log rule	Board feet, indicating the log rule used [Net board feet, indicating the log rule used]	Log length [S.S.]
F. Linear measure	Linear measurement of stem length	Linear feet [Net linear feet]	Polewood [S.S.]
G. Cubic foot measure	Cubic content of individual stem or piece	Cunits [Net cunits]	Tree length Log length Polewood Semi-tree length and chunkwood
H. Chip volume scale	Cubic content of load	Chippcords (128 cubic feet of chipped material)	Chipped wood [S.S.]
I. Thrown cord scale	Cubic content of container of unstacked fuelwood lengths	Standard cords	Unstacked fuelwood lengths [S.S.]
J. Weight scale	a. Weight of load	Thousand pound units (Tholbs), tons	Tree length Log length Stacked wood Polewood Chunkwood
	b. dry weight of the load	Thousand pounds (Tholbs) dry weight; or tons dry weight	Chipped Wood Unstacked fuelwood lengths Semi-tree length

THE INTERNATIONAL LOG RULE FOR SAWS CUTTING A 1/8 INCH KERF
 Standard scale for seasoned lumber with 1/16-inch shrinkage per 1-inch board, and saws
 cutting a 1/8-inch kerf, or for green lumber, for saws cutting a 3/16-inch kerf

Diam- eter, Inches	Length of Log in Feet													Diam- eter, Inches
	8	9	10	11	12	13	14	15	16	17	18	19	20	
3	....	....	....	....	....	....	....	....	....	5	5	5	5	3
4	....	....	5	5	5	5	5	5	5	10	10	10	10	4
5	5	5	5	5	10	10	10	10	15	15	15	15	20	5
6	10	10	10	15	15	15	20	20	20	25	25	30	30	6
7	15	15	15	20	20	25	25	30	30	35	35	40	45	7
8	20	20	25	25	30	35	35	40	45	45	50	55	60	8
9	25	30	30	35	40	45	50	50	55	60	65	70	75	9
10	30	35	40	45	50	55	60	65	70	75	85	90	95	10
11	40	45	50	55	65	70	75	80	90	95	105	110	115	11
12	50	55	65	70	75	85	90	100	105	115	125	130	140	12
13	60	65	75	85	90	100	110	120	130	140	145	155	165	13
14	70	80	90	100	110	120	130	140	150	160	175	185	195	14
15	80	90	105	115	125	140	150	160	175	185	200	215	225	15
16	95	105	120	130	145	160	170	185	200	215	230	245	260	16
17	105	120	135	150	165	180	195	210	225	245	260	275	295	17
18	120	135	155	170	185	205	220	240	255	275	295	310	330	18
19	135	155	175	190	210	230	250	270	290	310	330	350	370	19
20	150	170	195	215	235	255	275	300	320	345	365	390	410	20
21	170	190	215	235	260	285	305	330	355	380	405	430	455	21
22	185	210	235	260	285	315	340	365	390	420	445	475	500	22
23	205	230	260	285	315	345	370	400	430	460	490	520	550	23
24	225	255	285	315	345	375	405	440	470	500	535	565	600	24
25	245	275	310	345	375	410	445	475	510	545	580	615	650	25
26	265	300	335	370	405	445	480	520	555	595	630	670	705	26
27	290	325	365	405	440	480	520	560	600	640	680	725	765	27
28	310	350	395	435	475	520	560	605	645	690	735	780	825	28
29	335	380	425	470	510	560	605	650	695	740	790	835	885	29
30	360	405	455	500	550	600	645	695	745	795	845	895	950	30
31	385	435	485	540	590	640	695	745	800	850	905	960	1015	31
32	410	465	520	575	630	685	740	795	850	910	965	1025	1080	32
33	440	495	555	610	670	730	790	850	905	970	1030	1090	1150	33
34	470	530	590	650	715	775	840	900	965	1030	1095	1160	1225	34
35	495	560	625	690	755	825	890	955	1025	1095	1160	1230	1300	35
36	525	595	665	735	800	875	945	1015	1085	1160	1230	1305	1375	36
37	560	630	705	775	850	925	1000	1075	1150	1225	1300	1380	1455	37
38	590	665	745	820	895	975	1055	1135	1210	1295	1375	1455	1535	38
39	620	705	785	865	945	1030	1110	1195	1280	1365	1450	1535	1620	39
40	655	740	825	910	995	1085	1170	1260	1345	1435	1525	1615	1705	40
41	690	780	870	960	1050	1140	1230	1325	1415	1510	1605	1700	1795	41
42	725	820	915	1010	1100	1200	1295	1390	1490	1585	1685	1785	1885	42
43	760	860	960	1060	1155	1260	1360	1460	1560	1665	1770	1870	1975	43
44	800	900	1005	1110	1215	1320	1425	1530	1635	1745	1855	1960	2070	44
45	835	945	1055	1160	1270	1380	1490	1600	1715	1825	1940	2050	2165	45

BANGOR LOG RULE

Log Volume In Board Feet

Dia. in Inches	Length in Feet															Dia. in Inches
	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	
8	33	36	39	41	43	46	49	51	53	56	59	61	64	66	69	8
9	44	48	51	54	58	61	65	68	71	75	78	82	85	88	92	9
10	56	60	65	69	73	77	82	86	90	95	99	103	108	112	116	10
11	68	73	79	84	89	94	100	105	110	115	121	126	131	136	142	11
12	81	87	94*	100	106	112	119	125	131	137	144	150	156	162	169	12
13	96	103	110	118	125	132	139	147	154	162	169	176	184	192	199	13
14	111	120	129	137	145	154	162	171	180	188	197	205	214	222	231	14
15	129	139	149*	158	168	178	188	198	208	218	228	238	248	258	268	15
16	148	160	171	182	194	205	217	228	239	251	262	273	285	296	308	16
17	170	183	196	209	222	235	248	261	274	287	300	313	326	340	353	17
18	193	208	223	238	252	267	282	297	312	327	342	356	371	386	401	18
19	218	235	251	268	285	301	318	335	352	369	385	402	419	436	452	19
20	244	262	281	300	319	338	356	376*	394	412	431	450	469	488	507	20
21	271	292	313	334	354	375	396	417	438	459	480	500	521	542	563	21
22	300	323	346	369	392	415	438	461	484	507	530	553	576	600	623	22
23	330	355	380	406	431	456	482	507	532	558	583	608	634	660	685	23
24	364	388	416	444	472	500	527*	555*	583	611	638	666	694	722	749	24
25	393	423	454	484	514	544	575	605	635	666	696	726	756	786	817	25
26	426	459	492	525	558	590	623	666	689	722	752*	787	820	852	885	26
27	460	496	531	566	602	637	673	708	743	779	812*	850	885	920	956	27
28	495	533	571	609	647	685	723	761	799	837	875	913	951	990	1028	28
29	530	571	611	652	693	734	775	815	856	896	937	978	1019	1060	1101	29
30	566	610	653	697	740	784	827	871	914	958	1002	1045	1089	1132	1176	30
31	604	650	697	743	790	837	883	929	975	1022	1068	1115	1161	1208	1254	31
32	644	693	743	792	842	891	941	990	1040	1089	1139	1188	1238	1288	1337	32
33	684	736	789	842	894	947	999	1052	1105	1157	1210	1262	1315	1368	1420	33
34	725	781	836	892	948	1004	1059	1115	1171	1227	1282	1338	1394	1450	1505	34
35	767	826	885	944	1003	1062	1121	1180	1239	1298	1357	1416	1475	1534	1593	35
36	811	873	935	998	1060	1122	1185	1247	1309	1371	1434*	1496	1559	1622	1684	36
37	855	921	987	1053	1118	1184	1250	1316	1382	1448	1513	1589	1645	1710	1777	37
38	901	971	1040	1110	1179	1248	1318	1387	1456	1526	1595	1664	1734	1803	1872	38
39	949	1022	1095	1168	1241	1314	1387	1460	1533	1606	1679	1752	1825	1898	1971	39
40	998	1074	1151	1228	1305	1381	1458	1535	1612	1689	1765	1842	1919	1996	2072	40
41	1049	1130	1211	1291	1372	1453	1533	1614	1695	1775	1856	1937	2018	2098	2179	41
42	1102	1187	1272	1357	1442	1527	1611	1696	1781	1866	1950*	2035	2120	2204	2289	42

MAINE OR HOLLAND, LOG RULE 1/

Diameter in Inches

length in feet	Diameter in Inches																				length in feet		
	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	25"		26"	
8'	10	16	22	26	34	41	52	60	71	81	89	102	116	136	151	168	182	200	220	238	254	8'	
9'	12	17	25	30	38	46	59	72	80	90	100	116	130	152	170	189	204	225	247				10'
10'	12	19	27	32	42	51	65	75	89	101	111	128	145	169	189	210	227	250	274	298	317		10'
11'	14	21	30	36	46	57	70	81	98	111	123	142	160	187	209	232	250	274	298	328	350		11'
12'	15	23	33	39	51	62	78	90	107	121	134	154	174	203	227	252	272	300	327	358	380		12'
13'	17	25	36	43	55	67	85	98	115	131	145	167	189	220	246	273	295	326	357	388	412		13'
14'	18	27	39	46	59	72	92	105	124	141	157	179	203	237	265	294	318	351	384	417	444		14'
15'	19	29	41	49	64	78	98	113	133	151	168	192	218	254	284	315	340	376	412	447	475		15'
16'	20	31	44	52	68	83	105	120	142	161	179	205	232	271	302	336	363	401	439	477	507		16'
17'	22	33	47	56	72	88	111	128	151	171	190	213	247	288	321	357	386	426	466	507	539		17'
18'	23	35	50	59	76	93	118	135	160	181	201	231	261	305	340	378	408	451	494	537	570		18'
19'	24	37	52	62	81	98	124	143	169	192	212	243	276	322	359	399	431	476	521	566	602		19'
20'	25	39	55	65	85	103	131	150	178	202	223	256	290	339	378	420	454	501	549	596	634		20'
21'	27	41	58	69	89	109	137	158	186	212	235	269	305	356	397	441	476	526	576	626	665		21'
22'	28	43	61	72	94	114	144	165	195	222	246	282	319	373	415	462	499	551	604	656	697		22'
23'	29	45	63	75	98	119	150	173	204	232	257	295	334	390	435	483	522	576	631	686	729		23'
24'	30	47	66	78	102	124	157	180	213	242	268	307	348	407	454	504	545	601	659	715	761		24'
25'	32	49	69	82	106	129	164	188	222	252	279	320	363	424	473	525	567	626	686	745	792		25'
26'	33	50	72	85	111	134	170	195	231	262	291	333	378	441	491	545	590	651	713	775	824		26'
27'	34	52	74	88	115	140	177	203	240	272	302	346	392	458	510	566	613	676	741	805	856		27'
28'	36	21	76	92	119	145	183	210	249	282	313	359	407	475	529	587	635	701	768	835	887		28'
29'	37	56	79	95	123	150	190	218	258	292	324	371	421	492	548	608	658	726	796	864	919		29'
30'	38	58	82	98	128	155	196	225	266	302	335	384	436	509	567	629	681	751	823	894	951		30'

1/ Also commonly called the "Bangor" Rule, but this is a misnomer.

Maine Forest Service 1/4/61 (200)

INTERNATIONAL 1/4" LOG RULE 1/

Log Volume in Board Feet

Diameter in Inches

length in feet	Diameter in Inches																			length in feet		
	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		25"	26"
8'	10	10	15	20	30	35	45	55	65	75	85	95	110	125	135	155	170	185	205	220	240	8'
9'	10	15	20	25	35	40	50	60	70	85	95	110	125	140	155	170	190	210	230	250	275	9'
10'	10	15	20	30	35	45	55	70	80	95	110	125	140	155	175	195	215	235	255	280	305	10'
11'	10	15	25	30	40	50	65	75	90	105	120	135	155	175	195	215	235	260	285	310	335	11'
12'	15	20	25	35	45	55	70	85	100	115	130	150	170	190	210	235	260	285	310	340	370	12'
13'	15	20	30	40	50	65	75	90	105	125	145	165	185	205	230	255	285	310	340	370	400	13'
14'	15	25	35	45	55	70	85	100	115	135	155	180	200	225	250	280	305	335	370	400	433	14'
15'	20	25	35	45	60	75	90	105	125	145	170	190	215	245	270	300	330	360	395	430	470	15'
16'	20	30	40	50	65	80	95	115	125	160	180	205	230	260	290	320	355	390	425	460	500	16'
17'	20	30	40	55	70	85	105	125	145	170	195	220	250	280	310	345	380	415	455	495	533	17'
18'	25	35	45	60	75	95	110	135	155	180	205	235	265	300	330	365	405	445	485	525	570	18'
19'	25	35	50	65	80	100	120	140	165	195	220	250	280	315	350	390	430	470	515	560	603	19'
20'	25	40	50	70	885	105	125	150	175	205	235	265	300	335	370	410	455	495	545	590	640	20'

1/ Vaules as published by H. H. Chapman, extended by formula: $V = (0.22 - 0.71D) \times .905$ for 4-foot section. Taper Allowance: 1/2 inch per 4 feet lineal. Sum total of sections rounded off to nearest 5 board feet.

2/ The board foot totals set forth above are the official board foot totals, notwithstanding any variance from the rounding off procedures set forth in Chapter 382.

Maine Forest Service 5/18/65 (200)

BUTT DIAMETER MEASUREMENTS - CHECK SCALE PROCEDURES

When Butt Measure or Butt Scale is used the butt diameter measurement is made the short way across the butt end, from the outside surface of the bark to the opposite outside bark surface, disregarding crevices and cracks.

To determine the proper place to measure the butt diameter, first locate the geometric center of the butt end. This is where a thick slice off the butt would balance on a marking pencil. Passing through this point, find the shortest distance across the butt disregarding crevices and cracks. "Crevices and cracks" include any indentations in the stem regardless of how they are labeled or how they were caused. "Crevices and cracks" are distinguished from "rounded depressions". (The idea is to fairly represent the diameter of the stem, without requiring additions for bulges or subtractions for irregularities.) For general examples of butt diameter measurements, see Attachment 1.

The following explains how the butt diameter measurements are made under particular circumstances.

A. Distinguishing indentations from rounded depressions in border-line cases.

1. Rounded depression: Where one-half the chord length (c) is equal to or longer than the depth (d), as measured from and perpendicular to the chord line.
2. Indentation: Where one-half the chord length (c) is shorter than the depth (d), as measured from and perpendicular to the chord line.

For an illustration of how to distinguish rounded depressions from indentations, see Attachment 2.

B. Breaks and cracked butts

1. Breaks (slab missing): In the case of breakage where a portion of the stem has split off at the butt end, the edge of the break is considered the outside surface of the stem.
2. Cracked butts (slab not missing): Whether naturally occurring or caused in the process of harvesting, cracks or seams in the butt end must be disregarded in determining the short way across the butt diameter.

For an illustration of butt diameter measurements in the case of breaks or cracked butts, see Attachment 3.

C. Bias cuts, undercuts or otherwise angled butt surfaces

Where the saw cut is angled, the diameter measurement is taken across the butt end from the outside surface of the stem disregarding the uneven surface or angles; taking the measurement perpendicular to the growing axis of the tree as if calipers were used.

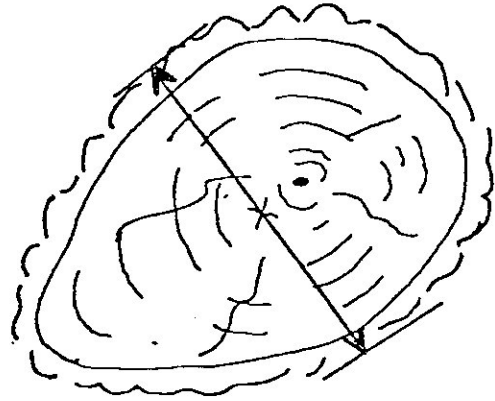
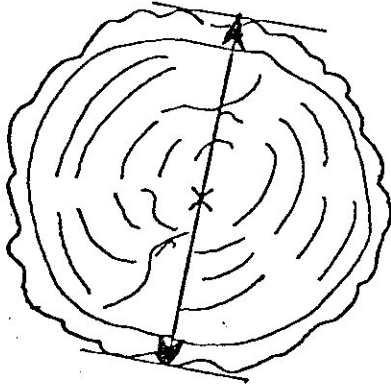
For an illustration of butt diameter measurements in the case of bias cuts and undercuts, see Attachment 4.

D. Missing bark

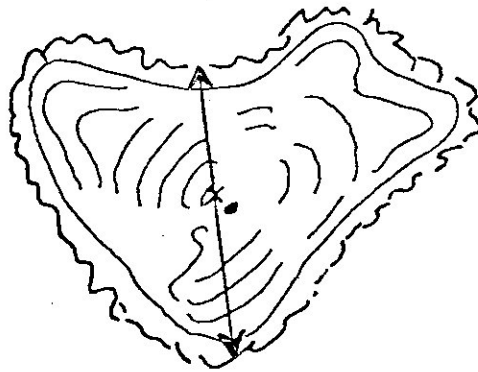
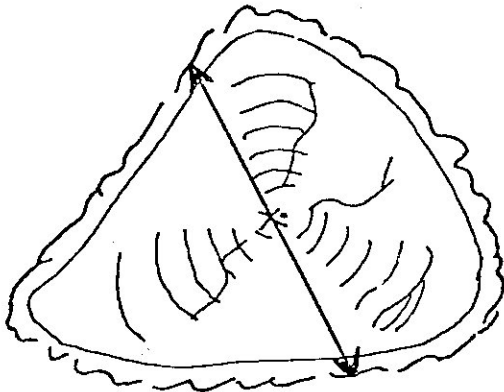
When bark is missing, or the edge of the butt surface is chipped, an appropriate allowance should be made, as if calipers were being used to take the measurement. In the event there is no bark by which to determine the appropriate bark allowance, then the measurement may be taken absent bark.

BUTT DIAMETER MEASUREMENTS

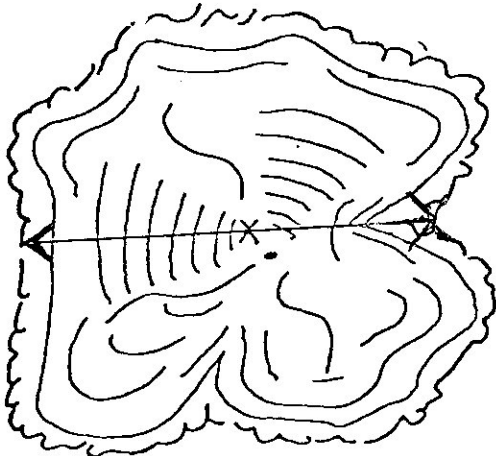
ROUND OR OVAL



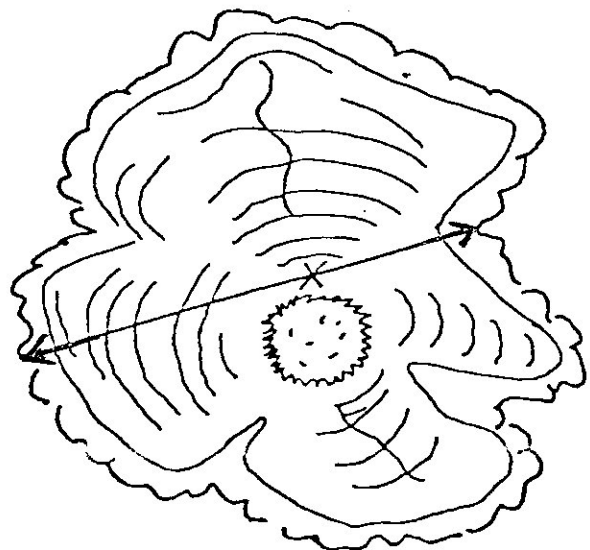
TRIANGULAR



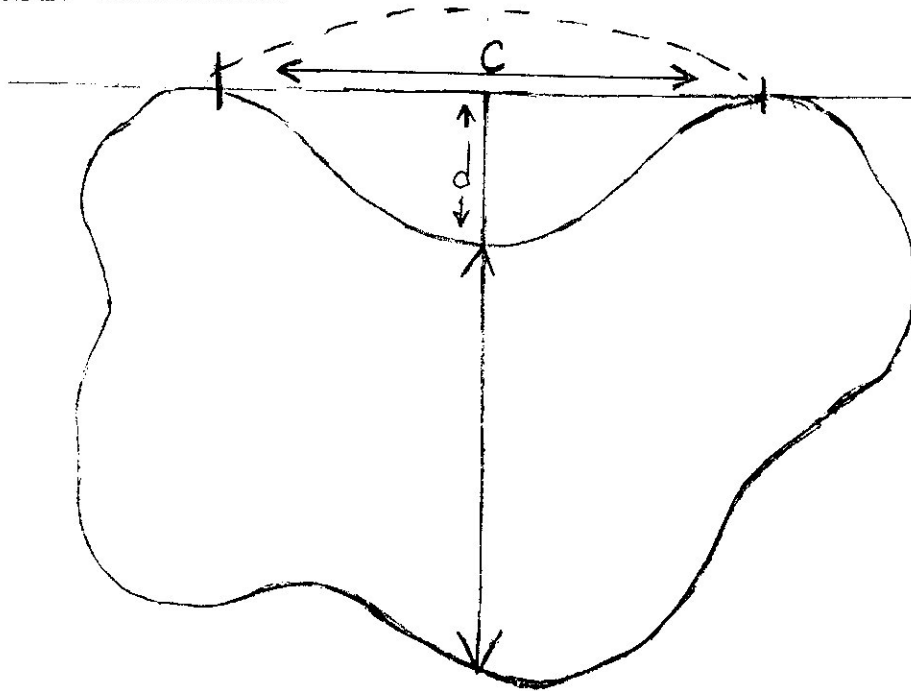
RECTANGULAR



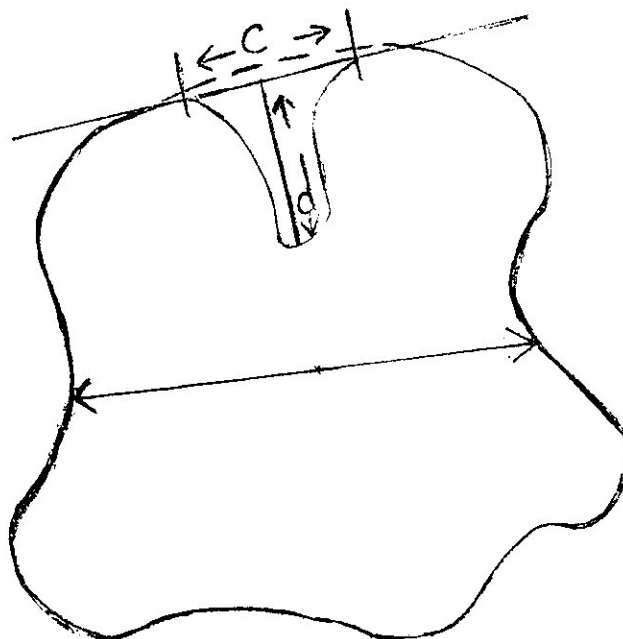
IRREGULAR



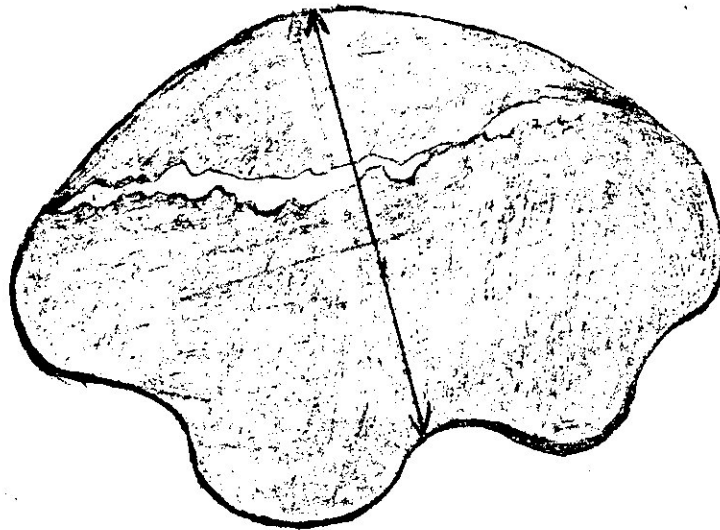
ROUNDED DEPRESSION



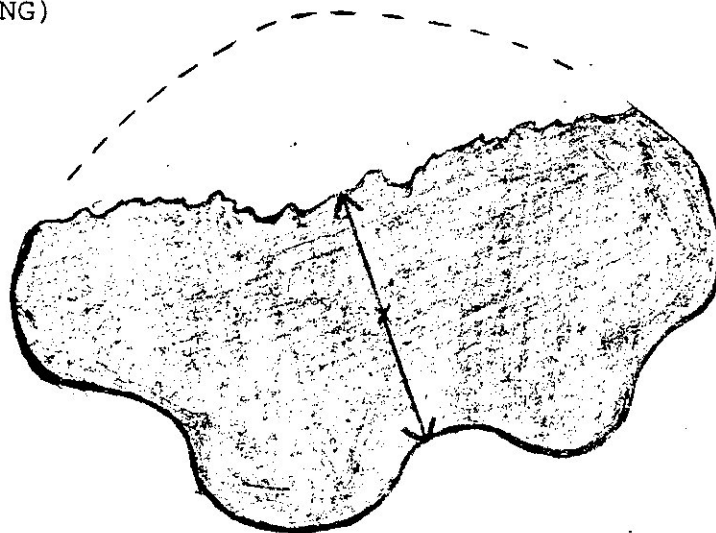
INDENTATION



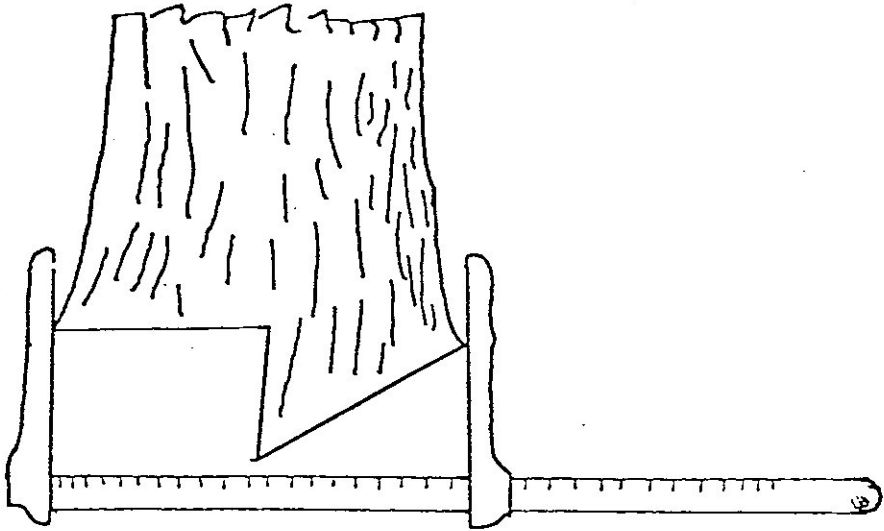
CRACKED BUTTS



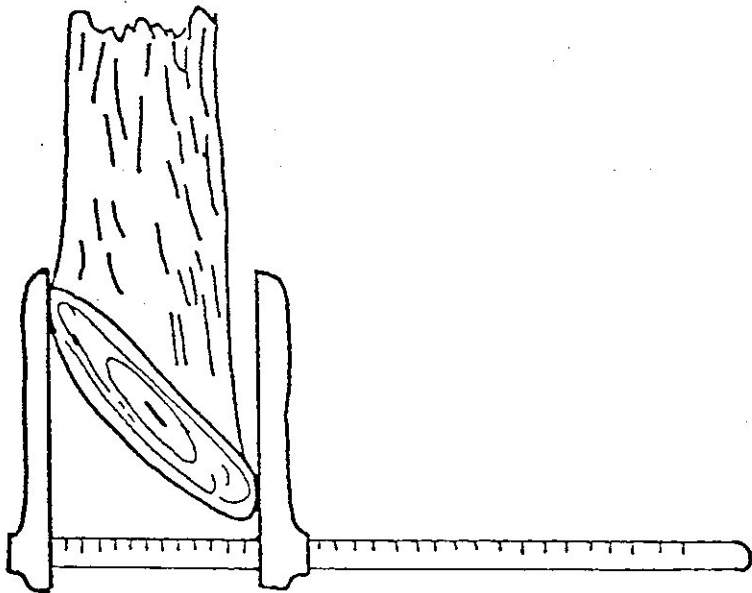
BREAKS (SLAB MISSING)



UNDERCUTS AND BARBER CHAIRS



BIAS CUTS



From National Forest Log Scaling Handbook, 1973 ed.

Chapter 82: Cubic Foot Measurement
Code 82.3 - "Defect Deduction"

Make defect deductions in cubic feet in accordance with the general saw timber deduction methods for defects that reduce the cubic volume of the log. Deduct from the total log cubic volume the volume in cubic feet of ... [the portion of the log not meeting the wood quality specifications].

There is no allowance for saw kerf in cubic measurement. Thus the deductible volume by formula is $(H'' \times W'' \times L')/144$. Following is a suggested way to apply this formula:

1. Always consider every defect as extending through a 12-foot log.
2. Convert the defect height figure from inches to tenths of feet.
3. Multiply those tenths of feet by the width in inches for the defect extending through a 12-foot log.
4. Calculate the actual deductions in relation to the 12-foot length.

EXAMPLE: A log 24 feet long with a 14-inch diameter contains 26 cubic feet gross. Rot defect in this log measures 4 inches high x 9 inches wide. Four inches is equivalent to 0.3 feet. Multiply $0.3 \times 9 = 2.7$ or 3 cubic feet for a 12-foot length. If the defect extends into the log only 6 feet, the deduction then would be half of 3 or 1.5 or 2. For a defect extending into the log 18 feet, deduction is $1.5 \times 3 = 5$ cubic feet. The gross scale of 26 minus 5 = 21 cubic feet, the net volume of the log.

Unless...[provided for in the wood quality specifications] make no deductions for sweep, shake, break, crotches, or knots. Deduct for unsound material affecting the merchantability of the end product of the sale...[where provided for in the wood quality specifications.]

Chapter 70: Use of International Log Rules
Code 72 - "Scaling Cylinder In International Rule"

The International 1/4 Inch Rule is based on a formula applied to each 4 foot section of the log and an assumed taper of 1/2 inch in each 4 feet (2 inches in 16 feet).... For practical purposes, assume that the scaling cylinder becomes a frustrum of a cone with a taper of 2 inches in 16 feet. See figures 61, 62, and 63....

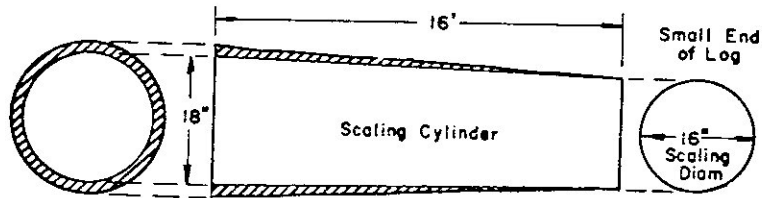


Figure 61. -Scaling cylinder for International rule.

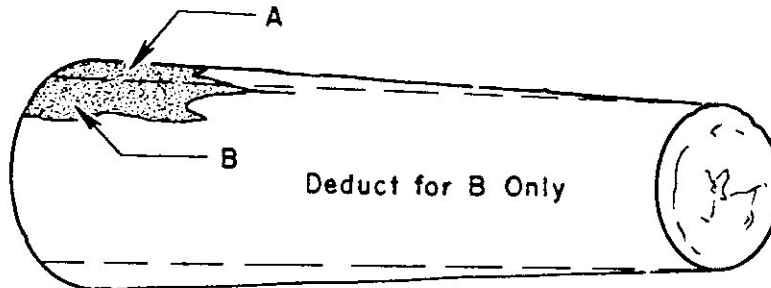


Figure 62. -Defect both inside and outside the scale cylinder.

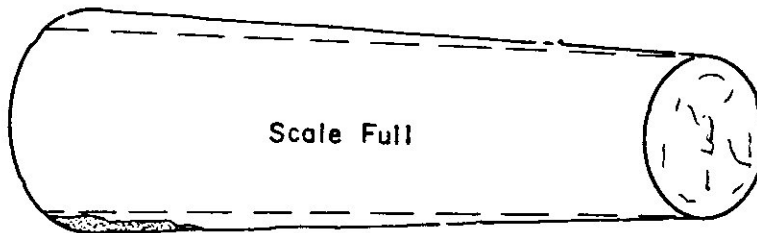


Figure 63. - Defect outside the scaling cylinder.

From National Forest Log Scaling Handbook, 1973 Edt.

Chapter 30: Log Defect Deductions
Code 33 - "Defect Types and Deductions Procedures"

Breaks and Splits. Breaks and splits are mechanical defects which require special consideration. Modern-day logging, much of it in steep country, will generally result in some damage to the logs when felled, bucked, transported, and handled by various mechanical devices. In many instances this damage may result in a considerable loss of sound timber... Broken-end logs (shatter breaks) caused by falling, split or slabbed ends caused by poor bucking or falling, and slivers (stump pull) pulled from logs in falling are the most common types.

Breakage may occur regardless of what precautions are taken; or may result from improper bedding, felling trees across stumps, logs, rocks, or ridges. Accurate determination of the extent of lengthwise shattering is often difficult as it may be hidden by bark. Remove enough bark to ensure inclusion of all of the defect in the deduction.

Buckers should usually leave some breakage in a log to avoid waste.

Lengths of broken-end logs are determined as follows:

1. Where the broken end is wholly or partly bucked, measure the log from saw cut to saw cut and make any required deduction (fig. 15).

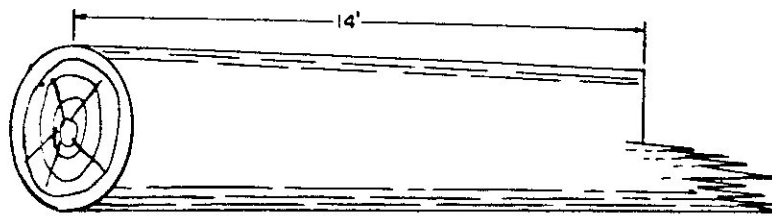


Figure 15. -Broken end partly bucked.

2. When only one end is bucked, determine the most applicable scaling length and make the required deduction (fig. 16)

3. When neither end is bucked, determine the applicable scaling length and make any required deduction for defect (fig. 17)

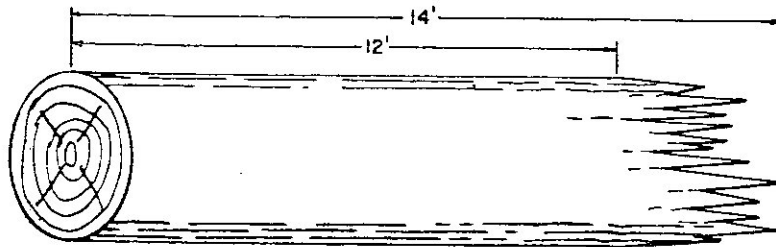


Figure 16. -Broken end not bucked.

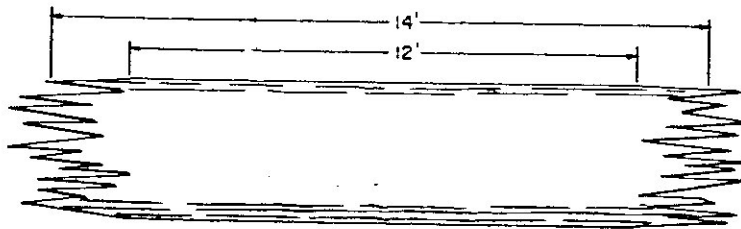


Figure 17. -Broken both ends, neither bucked.

The following deduction procedure should be used to simplify and standardize treatment of broken-end logs:

1. Logs under 16 inches. If a quarter to a half of the end section within the scaling cylinder is gone, deduct half the length affected (fig. 18). If more than half the end section is gone, consider the entire end lost and deduct for the full length affected (fig. 19).

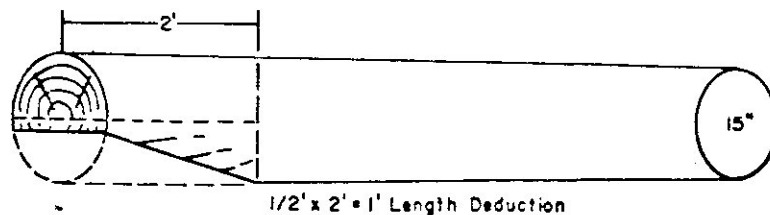


Figure 18. -End break. Small log deduction when half or less of log end is broken ($\frac{1}{2} \times 2' = 1'$ length deduction).

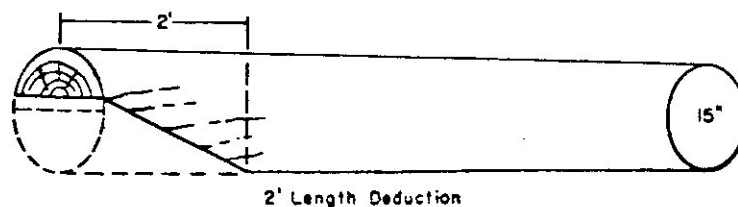


Figure 19. -End break. Small log deduction when over half of log end is broken (2' length deduction).

2. Logs 16 inches and over. When any portion of the end section is broken, use a combination or pie-cut and length deduction. See figures 20 and 21.

Falling and bucking breaks are generally avoidable, but may be caused by rot, by heavy leaning trees on steep slopes, or by some factor not readily apparent to the scaler. Deductions for these defects are generally made by the squared-defect method (fig. 22).

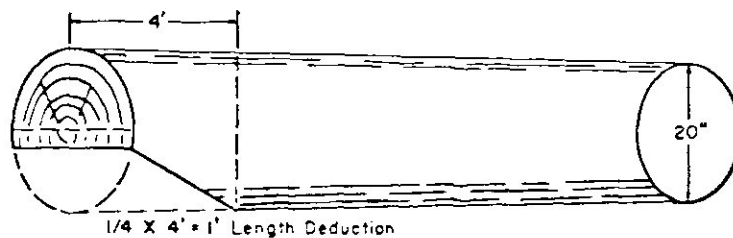


Figure 20. -End break. Large log deduction when half or less of log end is broken.

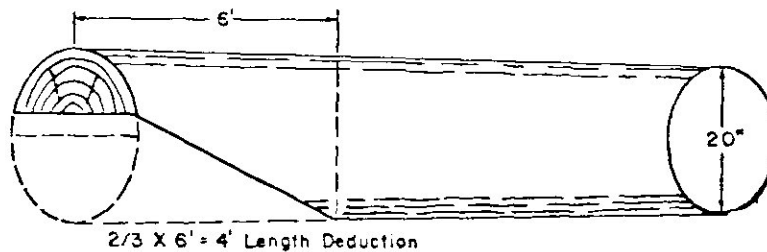


Figure 21. -End break. Large log deduction when over half of log end is broken.

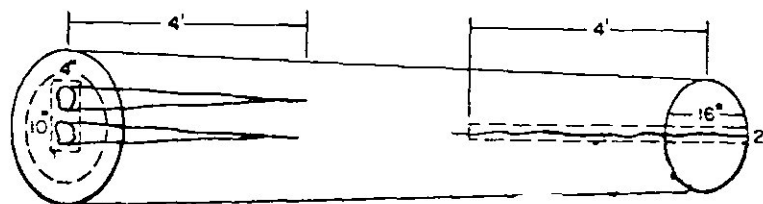


Figure 22. -Left, stump pull-squared-defect method. Right, bucked break (straight)-squared-defect method.

WOOD MEASUREMENT
SAMPLE COMPLAINT FORM

1. Name of Complainant(s): _____
Address: _____
City/Town: _____ State: _____
Zip Code: _____ Telephone # _____
Best Time to Call: _____

2. Brief statement of the facts surrounding the violation: what happened? when? where? who was involved? (if relevant, attach a copy of written specifications or measurement tally sheet)

(If more space is needed for statement attach separate sheet)

3. If known, include the following information:

a) Name/address of other party to transaction:

b) Name/address of person who measured the wood:

c) Name/address of any other person whose conduct complained of: _____

d) Name/address/phone of stumpage owner:

4. The location and a description of the wood involved (indicate whether or not the complaint is limited to inaccurate measurement of one particular load, pile, or specific pieces).

5. If the complaint only involves inaccurate measurement of a particular load, pile, or specific piles; state the date the problem was discovered:

6. If you gave a notice to hold wood to the person in possession of the wood, on what date was that notice given:

Date: _____

7. Does the person whose conduct is complained about know you filed this complaint? _____ Yes _____ No

If the answer is no and we find it may not be possible to pursue the investigation without revealing your name we will obtain your permission to reveal your name before we continue the investigation.