



FOREST RESEARCH NOTES

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
CALIFORNIA FOREST AND RANGE
EXPERIMENT STATION *

M.W. TALBOT, Acting Director



No. 42

February 13, 1945

DIAMETER-CLASS VOLUME TABLES FOR CALIFORNIA

OLD-GROWTH TIMBER

By

Duncan Dunning, Senior Silviculturist

Tables giving average tree volumes by breast-height diameter classes frequently may be used in timber cruising to save money, time, and men. Such tables may be appropriate in cruises of large areas having many trees, in low-intensity cruises warranting the sacrifice in accuracy that results from omission of individual tree height measurements, during wartime when men are scarce or when inexperienced cruisers have difficulty in estimating heights. In response to numerous recent requests from cruisers and forest land agencies, nine of the more important tables used by the Forest Service in California are here presented in diameter class form.

These tables are derived from the standard Region 5 (California) site class tables (separately identified in footnotes) by reading the volume for the tree of average height in each diameter class. The average heights, also given in the tables, were read from D.B.H. - merchantable height curves drawn from the original tree measurements used in constructing the site-class tables. The log rule used is the Scribner Decimal "C". The trees were scaled in 16-foot logs with 0.3 ft. trimming and 1.5 ft. stump allowances to a top diameter inside bark of 8 inches.

The only tables thus far converted to the diameter class form are for ponderosa pine, sugar pine, and white fir. From records in the California Forest and Range Experiment Station tables for several other species can be similarly converted if this first series proves to be satisfactory.

* MAINTAINED AT BERKELEY, CALIFORNIA, IN COOPERATION WITH THE UNIVERSITY OF CALIFORNIA.

VOLUME TABLES FOR CALIFORNIA OLD-GROWTH TIMBER

PONDEROSA PINE^{1/}

Board Feet - Scribner Decimal "C" Rule

: Site I - 175 ^{2/} : Site II - 150 ^{2/} : Site III - 125 ^{2/} : Site IV - 100 ^{2/} : Height ^{3/} : Volume : Height ^{3/} : Volume : Height ^{3/} : Volume : Height ^{3/} : Volume								
Inches	16' logs	10 B.f.	16' logs	10 B.f.	16' logs	10 B.f.	16' logs	10 B.f.
12	1.7	5	2.1	7	1.8	7	1.1	3
14	2.4	10	2.9	13	2.6	14	1.9	8
16	3.0	15	3.5	20	3.2	21	2.6	14
18	3.6	23	4.0	29	3.7	30	3.2	22
20	4.2	33	4.5	39	4.1	40	3.7	32
22	4.8	48	4.9	54	4.4	53	4.1	44
24	5.3	64	5.3	69	4.7	68	4.4	59
26	5.8	83	5.7	90	5.0	87	4.6	75
28	6.3	106	6.1	114	5.2	108	4.8	98
30	6.7	136	6.4	142	5.4	133	5.0	115
32	7.1	173	6.7	174	5.6	163	5.2	144
34	7.5	213	7.0	210	5.8	193	5.4	172
36	7.9	256	7.3	250	6.0	226	5.6	206
38	8.3	303	7.6	293	6.2	261	5.8	237
40	8.7	355	7.8	336	6.4	302	5.9	268
42	9.0	406	8.0	382	6.6	345	6.0	309
44	9.3	464	8.2	434	6.8	393	6.1	349
46	9.6	527	8.4	492	7.0	446	6.2	400
48	9.8	588	8.6	554	7.2	504	6.3	446
50	10.0	653	8.8	621	7.3	556	6.4	492
52	10.2	722	9.0	692	7.4	613	6.5	531
54	10.4	796	9.2	769	7.5	675	6.6	582
56	10.5	870	9.4	856	7.6	742	6.7	627
58	10.6	948	9.5	938	7.7	813	6.8	677
60	10.7	1031	9.6	1025	7.8	888	6.8	729
62	10.8	1118	9.7	1117				
64	10.9	1206	9.8	1217				
66	11.0	1300	9.9	1324				
68	11.1	1394	10.0	1440				
70	11.2	1499	10.1	1562				
72	11.2	1590						

1/ Volumes for Sites I-175, II-150, and III-125 are from USFS site-class tables for Region 5 prepared by Duncan Dunning in 1922. Volumes for Site IV-100 are from Research Note No. 32, Calif. Forest and Range Exp. Sta., Taper and Volume Tables for Ponderosa Pine on Site IV-100 in California, by R. F. Keniston and V. A. Clements, Berkeley, Calif., May 10, 1943.

2/ Total height in feet of average dominant trees at 300 years. For description of site classes see Research Note No. 28, Calif. Forest and Range Exp. Sta., A Site Classification for the Mixed-Conifer Selection Forests of the Sierra Nevada, by Duncan Dunning, Berkeley, Calif., Dec. 1, 1942.

3/ To 8 inches top diameter, inside bark. To convert to height of top section above ground in feet, multiply the number of logs by 16.3 and add 1.5. Thus the average merchantable height of the 20-inch trees on Site I-175 is:

$$4.2 (16.3) + 1.5 = 70 \text{ feet.}$$

VOLUME TABLES FOR CALIFORNIA OLD-GROWTH TIMBER

SUGAR PINE^{1/}

Board Feet - Scribner Decimal "C" Rule

: Site I - 175 ^{2/}			: Site II - 150 ^{2/}		
D.b.h.	: Height ^{3/}	: Volume	: Height ^{3/}	: Volume	
Inches	16' logs	10 B.f.	16' logs	10 B.f.	
12	1.6	5	1.3	4	
14	2.2	9	2.1	10	
16	2.8	14	2.8	16	
18	3.4	21	3.5	24	
20	3.9	29	4.1	34	
22	4.4	41	4.7	48	
24	4.9	55	5.2	64	
26	5.4	73	5.6	81	
28	5.8	92	5.9	100	
30	6.2	113	6.2	121	
32	6.6	140	6.4	142	
34	7.0	170	6.6	167	
36	7.4	206	6.8	195	
38	7.8	245	7.0	225	
40	8.2	287	7.2	258	
42	8.5	330	7.35	292	
44	8.8	380	7.5	330	
46	9.1	434	7.65	375	
48	9.4	494	7.8	422	
50	9.6	552	7.95	478	
52	9.8	614	8.1	533	
54	10.0	677	8.25	595	
56	10.2	745	8.4	663	
58	10.3	810	8.55	737	
60	10.4	872	8.7	804	
62	10.5	940	8.85	863	
64	10.6	1014	9.0	918	
66	10.7	1080	9.15	969	
68	10.8	1150	9.3	1016	
70	10.8	1210	9.4	1063	
72	10.9	1277	9.5	1122	
74	10.9	1337	9.6	1188	
76	11.0	1409	9.7	1256	
78	11.0	1473	9.8	1330	
80	11.0	1540	9.9	1410	
82	11.1	1622	10.0	1492	
84	11.1	1690	10.1	1578	
86	11.1	1758	10.2	1666	
88	11.1	1823	10.3	1754	
90	11.1	1892	10.4	1845	
92	11.1	1962			
94	11.2	2052			
96	11.2	2123			
98	11.2	2199			
100	11.2	2275			

^{1/} Volumes are derived from USFS, Region 5, tables for Sites I and II, prepared by Duncan Dunning in 1925.

^{2/}, ^{3/} See footnotes 2 and 3, ponderosa pine table, p. 2.

VOLUME TABLES FOR CALIFORNIA OLD-GROWTH TIMBER

WHITE FIR^{1/}

Board Feet - Scribner Decimal "C" Rule

	: Site I - 175 ^{2/}		: Site II - 150 ^{2/}		: Site III - 125 ^{2/}	
D.b.h.	: Height ^{3/} : Volume		: Height ^{3/} : Volume		: Height ^{3/} : Volume	
<u>Inches</u>	<u>16' logs</u>	<u>10 B.f.</u>	<u>16' logs</u>	<u>10 B.f.</u>	<u>16' logs</u>	<u>10 B.f.</u>
12	1.8	6	1.0	5	1.0	4
14	2.5	10	1.9	9	1.6	8
16	3.2	17	2.7	16	2.2	12
18	3.9	27	3.4	24	2.8	18
20	4.5	39	4.0	35	3.4	27
22	5.1	57	4.6	50	4.0	40
24	5.6	76	5.1	66	4.5	55
26	6.1	99	5.5	84	4.9	71
28	6.5	124	5.9	105	5.3	88
30	6.9	151	6.3	127	5.6	104
32	7.3	183	6.6	151	5.9	122
34	7.7	217	6.9	176	6.2	154
36	8.0	253	7.2	204	6.5	181
38	8.3	291	7.5	237	6.7	212
40	8.6	334	7.8	273	6.9	242
42	8.9	379	8.0	308	7.1	275
44	9.2	429	8.2	345	7.3	311
46	9.5	480	8.4	386	7.5	349
48	9.7	532	8.6	431	7.7	390
50	9.9	585	8.8	478	7.9	435
52	10.1	639	9.0	528	8.1	481
54	10.3	695	9.2	580	8.2	525
56	10.5	750	9.4	633	8.3	572
58	10.7	810	9.5	685	8.4	621
60	10.8	867	9.6	740	8.5	674
62	10.9	930	9.7	804		
64	11.0	990	9.8	861		
66	11.1	1051	9.9	934		
68	11.2	1108				
70	11.3	1158				
72	11.4	1220				

^{1/} Volumes for Sites I-175 and II-150 are from USFS, Region 5, site-class tables prepared by Donald Bruce in 1921. Volumes for Site III-125 are from the Region 5 Site III table prepared by Duncan Dunning in 1921.
^{2/}, ^{3/} See footnotes 2 and 3, ponderosa pine table, p. 2.