Texas Forest Service, 3/2000

Basal Area Determination

Step 1. **Choose plot**: the plot is 1/25 acre (or 0.04 acre) in size (equivalent to a circle area with a 23'6.0" radius). The plot should be representative of the tract.

Step 2. **Measure the diameters of the trees within the plot**: measure the **d**iameter (in inches) at **b**reast **h**eight (or DBH, at 4 1/2 feet above the ground). Write down the number of trees found for different diameters. For example:

DBH	Number of Trees Found
4 inch	2
6 inch	1
8 inch	3
10 inch	5
12 inch	1
14 inch	1

Step 3. **Calculate basal area (BA) for the plot:** find the basal area factor from the Basal Area Factor Table below and calculate the basal area for the plot. Continue with the example:

DBH (inches)	**Number of Trees Found**	**Basal Area Per Tree** (sq. ft.)	**Total Basal Area for the plot** (sq. ft.)
<**1**>	<**2**>	<**3**>	<**4**>=<**2**>x<**3**>
4 inch	2	0.087	0.174
6 inch	1	0.196	0.196
8 inch	3	0.349	1.047
9 inch	5	0.442	2.21
12 inch	1	0.785	0.785
14 inch	1	1.069	1.069
			Sum: 5.418

Step 4. **Repeat Step 1 to 3 for several more plots and calculate an average BA per acre.**

Continue with the example, assuming two more plots are measured with the following results:

	BA for plots (sq. ft.)
Plot 1:	5.418
Plot 2:	6.233
Plot 3:	4.589

Average BA (sq. ft.) per plot: (5.418 + 6.233+ 4.589)/3 = 5.413

Average BA (sq. ft.) ***per acre*** : 5.413 x **25** = **135.33** (where **25** times 1/25 acre (plot size) is 1 acre.)

So, your tract has an average 135.33 square feet per acre of basal area.

Basal Area Factor Table

DBH (inches)	BA per tree (sq. ft.)	DBH (inches)	BA per tree (sq. ft.)	DBH (inches)	BA per tree (sq. ft.)
4"	0.087266	10"	0.54542	16"	1.39626
5"	0.136354	11"	0.65995	17"	1.57625
6"	0.19635	12"	0.78540	18"	1.76715
7"	0.267254	13"	0.92175	19"	1.96895
8"	0.349066	14"	1.06901	20"	2.18166
9"	0.441786	15"	1.22718		

BA per tree (in sq. ft.) = 3.1415926 $(DBH)^2$/(4x144) where DBH is in inches.

Trees Per Acre by Basal Area and DBH

	Basal Area (Square Feet)									
	20	30	40	50	60	70	80	90	100	110
DBH	**Trees Per Acre**									
4"	229	344	458	573	688	802	917	1031	1146	1261
5"	146	220	293	367	440	513	587	660	733	806
6"	102	153	204	255	306	357	408	458	509	560
7"	75	112	150	187	224	262	299	337	374	412
8"	57	86	115	143	172	201	229	258	286	315
9"	45	68	91	113	136	158	181	204	226	250
10"	37	55	73	92	110	128	147	165	183	202
11"	30	45	61	76	91	106	121	136	152	167
12"	25	38	51	64	76	89	102	115	127	140
13"	22	33	43	54	65	76	97	98	108	119
14"	19	28	37	47	56	65	75	84	94	103
15"	16	24	33	41	49	57	65	73	81	90
16"	14	21	29	36	43	50	57	64	72	79
17"	13	19	25	32	38	44	51	57	63	70
18"	11	17	23	28	34	10	45	51	57	62
19"	10	15	20	25	30	36	41	46	51	56
20"	9	14	18	23	28	32	37	41	46	50
21"	8	12	17	21	25	29	33	37	42	46
22"	8	11	15	19	23	27	30	34	38	42
23"	7	10	14	17	21	24	28	31	35	38
24"	6	10	13	16	19	22	25	29	32	35
25"	6	9	12	15	18	21	23	26	29	32
26"	5	8	11	14	16	19	22	24	27	30
27"	5	8	10	13	15	18	20	23	25	28

* Exact value for number of trees per acre may vary slightly due to rounding.

A Guide for Determining the Number of Plots for Basal Area Estimation

Zone Length	Number of Plots	One Plot for Approx. Every:	Approx. Percentage of Area Sampled
(ft)		(ft)	
below 500	4	n.a.	n.a.
501-1500	5--6	n.a.	n.a.
1501-2000	6--8	475	7.3%
2001-2500	8--10	500	7.0%
2501-3500	9--12	600	5.8%
3501-4500	10--12	750	4.6%
4501-6000	11--14	850	4.1%
6001-7000	12--15	950	3.7%
7001-8500	14--17	1000	3.5%
8501-10000	15--18	1100	3.2%
above 10000	17 and up	1200	2.9%