Survey of Trees in the Greenbelt North Woods

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Table 1: Large-Diameter Live Trees in the Greenbelt North Woods

This survey was primarily conducted in the fall of 2017 to locate all ≥30-inch diameter trees in the Greenbelt North Woods. Diameter is estimated as the measured girth (circumference) at chest height divided by Pi. Only single-trunked, living trees are listed in this table. The survey covered both the North Woods tract of the Greenbelt Forest Preserve and the woodlands owned by Greenbelt Homes, Inc., that lie north of Northway Road and east of Ridge Road. Tree positions are intended to be accurate to within 100 feet. The origin of the X,Y grid is a point on the BARC fence north of #15T Laurel Hill Road, and the positive y axis is pointed toward true north. Circumference measurements are intended to be accurate to ±1 inch. The right-most column (i.e., "Notes") contains only approximate location information, while the X,Y coordinates are more accurate and precise. The ID column lists the identifier that is plotted on the tree-location map that accompanies this table.

Species: P=tulip poplar, WhO=white oak, WiO=willow oak, SO=scarlet oak, SR=southern red oak, SG=sweetgum, CO=chestnut oak, BO=black oak, RM=red maple, H=hickory

Categories:	≥95"	≥113"	≥132"	Measured circumference at chest height (inches)
	≥30"	≥36"	≥42"	Inferred diameter at chest height, circumference/Pi (inches)
	+	□	○	Symbol plotted on tree-location map

#	Cat.	ID	Species	Measured circum-ference (inches)	Inferred diameter (inches)	X west (feet)	Y south (feet)	Notes
138	○	P-69	tulip poplar	156	49.7	290	310	★ largest tulip poplar in this survey of the North Woods; oval trunk with rotted out center; 156" = 12" longer than 144" long measuring rope; 200 feet northeast of playground at Laurel Hill terminus; next to trail and to dirt road trace
103	○	P-52	tulip poplar	148	47.1	340	750	mostly dead, except for one large side branch, high up; large fallen branches surround tree; 200 feet west of #14N Laurel Hill
72	○	SO-8	scarlet oak	147	46.8	3190	2300	★ largest scarlet oak in this survey of the North Woods; between the Baltimore-Washington Parkway fence and

								the Parkway's road surface; 600 feet northeast of mulch pile
155	O	P-80	tulip poplar	144	45.8	3130	870	in floodplain, larger of two poplars 200 feet east of Goddard Branch, trunk has 8" raised bumps along height
77	O	P-39	tulip poplar	143	45.5	3000	2370	east of Goddard Branch; 400 feet northeast of mulch pile
135	O	P-67	tulip poplar	141	44.9	360	550	eastern slope of Laurel Hill along trail; approx. 200 feet southeast of #10J Laurel Hill
4	O	SO-2	scarlet oak	139.58	44.4	2880	2270	subtracted 4" from the diameter implied by the 149" measured circumference because of the observed thick poison ivy vines; tree in small grassy clearing west of Goddard Branch. Blown down by windstorm on15 April 2019. Cored on 16 April 2019 and identified as O2019-3 in the table of dead trees, below (Table 3).
128	O	RM-34	red maple	138	43.9	2980	2650	★ largest red maple in this survey of the North Woods; 2 feet of erosion under main trunk; west of BW Parkway and east of mulch pile
157	O	P-81	tulip poplar	137	43.6	3380	940	half dead, vertical gash extends full height of trunk, 60 feet from BW Parkway fence along minor stream
95	O	P-49	tulip poplar	136	43.3	30	880	next to trail coming from #10J Laurel Hill trailhead; 200 feet southwest of #14N Laurel Hill
41	O	P-23	tulip poplar	136	43.3	2740	580	west of Goddard Branch near trail junction; approx. 600 feet south of BARC fence
14	O	P-7	tulip poplar	133	42.3	2860	2040	near trail, 20 feet north of Northway stream crossing, with small piece of barbed wire embedded on east side of trunk
1	O	RM-1	red maple	132	42	2740	2130	red maple in north woods, approx. 10 feet south of stream paralleling Northway Road, 80 feet west of Canyon Creek trail
31	□	P-18	tulip poplar	131	41.7	2840	1320	midway between Northway Field and BARC fence, west of Goddard Branch, 50 feet northwest of Goddard Branch trail
136	□	P-68	tulip poplar	129	41.1	320	600	eastern slope of Laurel Hill

78	□	P-40	tulip poplar	129	41.1	3000	2410	on east bank of Goddard Branch; 400 feet northeast of mulch pile
66	□	P-35	tulip poplar	126	40.1	3050	1970	approx. 200 feet southeast of Goddard Branch junction with Northway Stream
58	□	P-28a	tulip poplar	126	40.1	2990	1730	east of Goddard Branch; 200 feet north of junction with Northway Stream
50	□	P-26	tulip poplar	125	39.8	3060	1250	approx. 700 feet north of junction with Northway Stream
26	□	P-12	tulip poplar	124	39.5	2790	1750	next to trail Goddard Branch trail, west of Goddard Branch
80	□	P-43	tulip poplar	123	39.2	2380	770	northeast cove of Blueberry Hill
92	□	WhO-21	white oak	123	39.2	30	1140	★ largest white oak in this survey of the North Woods; on steep slope of Canyon Creek tributary; 200 feet east of #8L Laurel Hill
7	○	SO-3	scarlet oak	122	38.8	2950	2350	20 ft west of Goddard Branch
21	□	WhO-2	white oak	122	38.8	2820	1800	along Goddard Branch trail, west of Goddard Branch
64	□	P-33	tulip poplar	122	38.8	3000	1920	approx. 200 feet southeast of Goddard Branch junction with Northway Stream
153	+	RM-36	red maple	120	38.2	2650	2140	10 feet north of Northway Stream, 300 feet west of Goddard Branch
27	□	P-13	tulip poplar	120	38.2	2800	1610	20 feet south of muddy trail streamlet crossing, west of Goddard Branch
30	□	P-16	tulip poplar	120	38.2	2880	2070	just south of Northway Stream, edge of bank, 80 feet west of Goddard Branch
84	□	P-45	tulip poplar	120	38.2	2160	700	northeast cove of Blueberry Hill
125	□	WhO-40	white oak	118	37.6	1250	2190	100 feet northeast of #6X Plateau Place; southern slope of Plateau Place; in Northway stream valley
75	□	P-38	tulip poplar	118	37.6	3020	2330	3 trees near each other: SG-5b, P-38, SG-6; east of Goddard Branch; 400 feet northeast of mulch pile
134	□	P-66	tulip poplar	118	37.6	360	510	eastern slope of Laurel Hill
32	□	RM-10	red maple	117	37.2	2910	1310	10 feet west of Goddard Branch bank

158	☐	P-82	tulip poplar	117	37.2	3430	930	20 feet west of BW Parkway fence along minor stream from culvert to Goddard Branch
120	☐	P-60	tulip poplar	116	36.9	1580	2240	200 feet north of Northway Stream; approx. 1000 feet east of Goddard Branch
62	☐	P-31	tulip poplar	116	36.9	19	2150	approx. 200 feet southeast of Goddard Branch junction with Northway Stream
56	☐	P-27	tulip poplar	116	36.9	3060	1740	east of Goddard Branch; 200 feet north of junction with Northway Stream
104	☐	SO-16	scarlet oak	116	36.9	310	1270	leaf photo #101-0689, between trail and Canyon Creek; approx. 250 feet northeast of #58 Ridge Road trailhead
123	☐	WhO-38	white oak	115	36.6	1200	2100	at edge of woods near #6X Plateau Place
37	☐	P-20	tulip poplar	114	36.3	2870	1160	west of Goddard Branch
60	☐	P-29	tulip poplar	113	36	2990	1860	1 foot east of Goddard Branch bank; approx. 50 feet south of junction with Northway Stream
20	☐	WhO-1a	white oak	113	36	2820	1840	along Goddard Branch trail, west of Goddard Branch, 50 feet north of large triple-trunked tree of which one of three trunks fell over circa 2016
63	☐	P-32	tulip poplar	113	36	3020	1950	approx. 200 feet southeast of Goddard Branch junction with Northway Stream
35	+	RM-13	red maple	112	35.7	2910	1220	10 feet west of Goddard Branch, leaning trunk with wood-pecker holes
42	+	P-24	tulip poplar	112	35.7	2840	490	east of Goddard Branch opposite trail junction; approx. 500 feet south of BARC fence
39	+	P-21	tulip poplar	112	35.7	2820	800	large circular whole in trunk 5 feet above ground; west bank of Goddard Branch near Holly patch
101	+	P-51	tulip poplar	111	35.3	170	820	100 feet south of #14N Laurel Hill
107	+	WhO-25	white oak	111	35.3	460	1110	50 feet north of Canyon Creek; approx. 500 feet northeast of #58 Ridge Road trailhead
156	+	WhO-49	white oak	111	35.3	3190	950	in floodplain east of Goddard Branch
139	+	WiO-7	willow oak	111	35.3	110	430	near playground at terminus of Laurel Hill

16	+	P-9	tulip poplar	111	35.3	2720	1850	southeast slope of Blueberry Hill
119	+	WiO-7a	willow oak	111	35.3	1670	2300	★ largest willow oak in this survey of the North Woods; wide roots at ground level, twice width of trunk at chest height; 50 feet north of Northway Stream; approx. 1000 feet east of Goddard Branch
131	+	P-63	tulip poplar	110	35	435	720	eastern slope of Laurel Hill
112	+	SR-3	southern red oak	110	35	790	1030	★ largest southern red oak in this survey of the North Woods; 250 feet south of Canyon Creek on trail to #7A Plateau Place
122	+	WhO-37	white oak	109	34.7	1280	2160	100 feet northeast of #6X Plateau Place; southern slope of Plateau Place; in Northway stream valley
29	+	P-15	tulip poplar	109	34.7	2930	1980	80 feet north northwest of Goddard Branch and Northway stream junction
11	+	P-4	tulip poplar	109	34.7	2800	2375	near trail, near base of mulch pile cliff
38	+	P-20.5	tulip poplar	109	34.7	2820	1180	west of Goddard Branch
147	+	SG-7	sweetgum	109	34.7	1430	200	★ largest sweetgum in this survey of the North Woods; northern canyon creek
46	+	SG-2	sweetgum	108	34.4	2980	350	5-pointed leaves, leaf photo #101-0653; east of Goddard Branch opposite trail junction; approx. 300 feet south of BARC fence
108	+	P-54	tulip poplar	108	34.4	750	980	50 feet south of Canyon Creek; approx. 800 feet northeast of #58 Ridge Road trailhead
115	+	P-58	tulip poplar	108	34.4	1750	2380	50 feet south of Northway Stream; approx. 1000 feet east of Goddard Branch
154	+	P-79	tulip poplar	108	34.4	3110	850	in floodplain, smaller of two poplars 200 feet east of Goddard Branch, photos #101-0825 to 0827
116	+	WhO-35	white oak	108	34.4	1790	2320	on north bank of north of Northway Stream; approx. 1000 feet east of Goddard Branch
111	+	P-56	tulip poplar	108	34.4	1030	560	on south bank of Canyon Creek at trail junction; approx. 1200 feet northeast of #58 Ridge Road trailhead

19	+	P-11	tulip poplar	108	34.4	2620	1850	southeast slope of Blueberry Hill
98	+	P-50	tulip poplar	107	34.1	130	910	200 feet south of #14N Laurel Hill
44	+	WhO-8	white oak	107	34.1	2940	490	east of Goddard Branch opposite trail junction; approx. 500 feet south of BARC fence
52	+	WiO-1	willow oak	107	34.1	3020	1360	east of Goddard Branch; approx. 700 feet north of junction with Northway Stream
51	+	SO-6	scarlet oak	107	34.1	3070	1340	half dead; approx. 700 feet north of junction with Northway Stream
13	+	P-6	tulip poplar	107	34.1	2760	2350	has 3" diam. grape vine attached; north of mulch pile
12	+	P-5	tulip poplar	107	34.1	2780	2360	near trail, leaning trunk; north of mulch pile
149	+	WhO-48	white oak	107	34.1	1050	490	north bank of Canyon Creek, 900 feet southwest of creek junction with BARC fence
117	+	P-59	tulip poplar	107	34.1	1850	2275	on north bank of Northway Stream; approx. 1000 feet east of Goddard Branch
5	+	RM-3	red maple	107	34.1	2900	2250	on the edge of the west bank of Goddard Branch
6	+	P-1	tulip poplar	106	33.7	2910	2420	at bottom edge of mulch-pile north slope
68	+	WhO-8a	white oak	106	33.7	3050	1830	leaning trunk; approx. 100 feet east of Goddard Branch junction with Northway Stream
142	+	P-71	tulip poplar	106	33.7	400	110	next to trail; northeast of Laurel Hill terminus
143	+	SR-5	southern red oak	105	33.4	480	10	10 feet south of BARC fence, 50 feet west of trail and north-south dirt road trace; northeast of Laurel Hill terminus
124	+	WhO-39	white oak	105	33.4	1180	2130	at edge of woods near #6X Plateau Place
160	+	P-84	tulip poplar	105	33.4	3450	1090	near BW Parkway fence
152	+	P-77	tulip poplar	105	33.4	2680	2080	near Northway Stream, 300 feet west of Goddard Branch
106	+	P-53	tulip poplar	105	33.4	370	1270	next to Canyon Creek trail; 50 feet south of Canyon Creek; approx. 250 feet northeast of #58 Ridge Road trailhead
82	+	WhO-14	white oak	105	33.4	2330	850	northeast cove of Blueberry Hill

2	+	SO-1	scarlet oak	104	33.1	2740	2150	20 ft south of large, red maple
18	+	SG-1	sweetgum	104	33.1	2650	1850	5 long points on leaves; southeast slope of Blueberry Hill
53	+	RM-26	red maple	104	33.1	2980	1600	east of Goddard Branch; 350 feet north of junction with Northway Stream
10	+	P-3	tulip poplar	104	33.1	2870	2400	near base of mulch pile cliff
90	+	WiO-2	willow oak	104	33.1	150	1300	surrounded by dense multiflora rose; closest large-diameter tree to #58H Ridge Road trailhead of Canyon Creek trail.
86	+	SO-9	scarlet oak	103	32.8	2120	930	18" diam side stump; northeast cove of Blueberry Hill
65	+	P-34	tulip poplar	103	32.8	3040	1950	approx. 200 feet southeast of Goddard Branch junction with Northway Stream
57	+	P-28	tulip poplar	103	32.8	3080	1710	east of Goddard Branch; 200 feet north of junction with Northway Stream
129	+	P-61	tulip poplar	103	32.8	440	900	east of Laurel Hill; at trail junction 300 feet northwest from Canyon Creek
114	+	P-57	tulip poplar	103	32.8	1670	2340	on north bank of Northway Stream; approx. 1000 feet east of Goddard Branch
97	+	SO-11	scarlet oak	102	32.5	100	905	200 feet southwest of #14N Laurel Hill
74	+	SG-5b	sweetgum	102	32.5	3000	2310	3 trees near each other: SG-5b, P-38, SG-6; east of Goddard Branch; 400 feet northeast of mulch pile
71	+	P-36	tulip poplar	102	32.5	3110	2260	5 feet from parkway fence; 600 feet northeast of mulch pile
3	+	RM-2	red maple	102	32.5	2850	2200	50% dead, small branch 5ft from ground, in small, grassy clearing west of Goddard Branch, 300 feet from mulch pile
150	+	SO-23	scarlet oak	102	32.5	1850	90	along BARC fence, 300 feet east of Canyon Creek
48	+	RM-19	red maple	102	32.5	2960	890	east of Goddard Branch island; approx. 800 feet south of BARC fence
33	+	RM-11	red maple	102	32.5	2910	1250	leaning trunk; west of Goddard Branch
87	+	P-46	tulip poplar	102	32.5	2140	970	northeast cove of Blueberry Hill

144	+	P-72	tulip poplar	102	32.5	370	70	northeast of Laurel Hill terminus
88	+	BO-3	black oak	102	32.5	2040	850	★ largest black oak in this survey of the North Woods; oval trunk with 102" circumference has a hole at its base, so diameter is smaller than circumference/PI. Northeast cove of Blueberry Hill
23	+	CO-1	chestnut oak	101.72	32.4	2900	1770	★ largest chestnut oak in this survey of the North Woods; 50 feet west of Goddard Branch; subtracted 2" from diameter implied by 108 inch measured circumference because of 6" diameter poison ivy vine. leaf photo #101-0646, 0647
70	+	WhO-9	white oak	101	32.1	2980	2150	20 feet east of Goddard Branch; 600 feet northeast of mulch pile
93	+	WhO-22	white oak	101	32.1	40	1080	along Canyon Creek tributary; 200 feet east of #8L Laurel Hill
59	+	SG-5	sweetgum	101	32.1	3000	1770	east of Goddard Branch; 200 feet north of junction with Northway Stream
9	+	P-2	tulip poplar	101	32.1	2890	2410	near base of mulch pile cliff
79	+	P-41	tulip poplar	101	32.1	2470	790	northeast cove of Blueberry Hill
36	+	WhO-5	white oak	101	32.1	2880	1210	west of Goddard Branch
69	+	SO-7	scarlet oak	100	31.8	3040	2070	20 feet east of Goddard Branch; 600 feet northeast of mulch pile
24	+	RM-6	red maple	100	31.8	2950	1820	4 ft west of Goddard Branch
22	+	RM-5	red maple	100	31.8	2920	1730	50 feet west of Goddard Branch
61	+	P-30	tulip poplar	100	31.8	3010	1880	approx. 100 feet southeast of Goddard Branch junction with Northway Stream
55	+	SG-4	sweetgum	100	31.8	3040	1670	east of Goddard Branch; 300 feet north of junction with Northway Stream
73	+	P-37	tulip poplar	100	31.8	3050	2280	east of Goddard Branch; 600 feet northeast of mulch pile
133	+	P-65	tulip poplar	100	31.8	400	510	eastern slope of Laurel Hill
132	+	P-64	tulip poplar	100	31.8	450	700	eastern slope of Laurel Hill; 20 feet uphill from trail

15	+	P-8	tulip poplar	100	31.8	2790	2040	west of trail, north of Northway stream
127	+	P-60	tulip poplar	99	31.5	2990	2580	1 foot of erosion under main trunk; west of BW Parkway and east of mulch pile
126	+	WhO-45	white oak	99	31.5	3000	2530	10 feet west of Goddard Branch bank; west of BW Parkway and east of mulch pile
99	+	WiO-4	willow oak	99	31.5	180	900	200 feet south of #14N Laurel Hill; leaf photo #101-0686
96	+	SO-10	scarlet oak	99	31.5	60	900	200 feet southwest of #14N Laurel Hill
94	+	RM-33	red maple	99	31.5	-150	1050	in sunny yard/field east of #8L Laurel Hill
43	+	RM-17	red maple	99	31.5	2860	510	leaning trunk, east of Goddard Branch opposite trail junction; approx. 500 feet south of BARC fence
8	+	WhO-1	white oak	98	31.2	2940	2420	20 ft west of Goddard Branch, near base of mulch pile's cliff
67	+	WhO-4	white oak	98	31.2	3080	1900	approx. 100 feet east of Goddard Branch junction with Northway Stream
145	+	P-73	tulip poplar	98	31.2	340	80	northeast of Laurel Hill terminus
40	+	P-22	tulip poplar	98	31.2	2820	620	west of Goddard Branch near trail junction; approx. 600 feet south of BARC fence
102	+	SO-13	scarlet oak	97	30.9	210	840	100 feet south of #14N Laurel Hill
161	+	P-85	tulip poplar	97	30.9	3400	1120	near BW Parkway fence
146	+	SR-7	southern red oak	97	30.9	680	170	near trail, bumps on trunk 5 feet above ground: "defective," isolated timber tree: 250 feet east of Laurel Hill trail, the dirt-road trace, and the next >=30in diameter tree.
34	+	P-19	tulip poplar	97	30.9	2860	1240	west of Goddard Branch
105	+	WhO-24	white oak	96	30.6	270	1240	20 feet north of Canyon Creek; approx. 250 feet northeast of #58 Ridge Road trailhead
137	+	RM-35	red maple	96	30.6	280	350	200 feet northeast of playground at Laurel Hill terminus; next to trail and to dirt road trace
109	+	P-55	tulip poplar	96	30.6	960	690	50 feet south of Canyon Creek; approx. 1200 feet northeast of #58 Ridge Road trailhead

151	+	SO-24	scarlet oak	96	30.6	2070	50	along BARC fence, 700 west of Goddard Branch
54	+	SG-3	sweetgum	96	30.6	3020	1650	east of Goddard Branch; 300 feet north of junction with Northway Stream
118	+	WiO-6	willow oak	96	30.6	1820	2250	in multiflora rose patch; wide roots at ground level, twice width of trunk at chest height; 50 feet north of Northway Stream; approx. 1000 feet east of Goddard Branch
159	+	P-83	tulip poplar	96	30.6	3430	1030	near BW Parkway fence
85	+	BO-2	black oak	96	30.6	2090	790	northeast cove of Blueberry Hill
83	+	P-44	tulip poplar	96	30.6	2310	880	northeast cove of Blueberry Hill
148	+	P-74	tulip poplar	96	30.6	1190	490	south of Canyon Creek, 900 feet southwest of creek junction with BARC fence
17	+	P-10	tulip poplar	96	30.6	2680	1850	southeast slope of Blueberry Hill
91	+	H-1	hickory	96	30.6	20	1180	★ largest (only) hickory in this survey of the North Woods; 7-leaves, edge of Canyon Creek tributary; 200 feet east of #8L Laurel Hill
100	+	SR-1	southern red oak	95	30.2	140	840	100 feet south of #14N Laurel Hill; leaf photo #101-0687
113	+	SR-4	southern red oak	95	30.2	780	1200	100 feet south of Canyon Creek near trail to #7A Plateau Place
28	+	P-14	tulip poplar	95	30.2	2820	1570	20 feet north of muddy trail streamlet crossing, west of Goddard Branch
76	+	SG-6	sweetgum	95	30.2	3040	2350	3 trees near each other: SG-5b, P-38, SG-6; east of Goddard Branch; 400 feet northeast of mulch pile
110	+	WhO-31	white oak	95	30.2	960	650	50 feet south of Canyon Creek; approx. 1200 feet northeast of #58 Ridge Road trailhead
25	+	RM-7	red maple	95	30.2	2920	1850	50 feet west of Goddard Branch at edge of small clearing; leaning trunk
121	+	SO-18	scarlet oak	95	30.2	1550	2200	bug sawdust coming from holes in trunk
49	+	P-25	tulip poplar	95	30.2	2940	850	east of Goddard Branch island; approx. 800 feet south of BARC fence

45	+	SO-5	scarlet oak	95	30.2	2940	350	leaf photo #101-0651, 0652; east of Goddard Branch opposite trail junction; approx. 300 feet south of BARC fence
47	+	RM-18	red maple	95	30.2	2920	770	next to fallen tree; east of Goddard Branch island; approx. 800 feet south of BARC fence
89	+	P-47	tulip poplar	95	30.2	2160	610	northeast cove of Blueberry Hill
130		P-62	tulip poplar	94	29.9	490	750	eastern slope of Laurel Hill; 20 feet downhill from trail
140		SO-20	scarlet oak	94	29.9	25	400	near playground at terminus of Laurel Hill
81		WhO-13	white oak	94	29.9	2350	800	northeast cove of Blueberry Hill
141		P-70	tulip poplar	94	29.9	320	230	northeast of Laurel Hill terminus

Table 2: Some woody plant species with no specimen in the Greenbelt North Woods having a trunk ≥30 inches in diameter

Based on surveys conducted in 2017 to 2019 in the Greenbelt North Woods. The survey covered both the North Woods tract of the Greenbelt Forest Preserve and the woodlands owned by Greenbelt Homes, Inc., that lie north of Northway Road and east of Ridge Road. Tree positions are accurate to 200 feet. Diameter is given for only some species, and for most species no attempt has been made to located the largest diameter specimen in the North Woods. When diameter is given, the Notes column of Table 2 contains the map ID and x and y coordinates (feet), using the same coordinate system used in Table 1. Location of these <30-inch-diameter trees is plotted on the map using triangles (Δ).

Level	Species	Inferred diameter (inches)	Location, notes (map ID, x coord., y coord., original survey ID)
1. canopy	loblolly pine	27.0"	Southeast edge of Blueberry Hill summit (LP-1a, x=2100, y=1250, original=M6)
1. canopy	loblolly pine	25.5"	(LP-1b, x=2100, y=1250, original=M6)
1. canopy	loblolly pine	25.1"	(LP-1c, x=2100, y=1250, original=M6)
1. canopy	loblolly pine	24.5"	(LP-2, x=3300, y=1050, original=N"2)
1. canopy	loblolly pine	24.2"	(LP-1d, x=2100, y=1250, original=M6)
1. canopy	sycamore	25.5"	Goddard Branch floodplain (SY-1, x=3075, y=1500, original=X2019-7)
1. canopy	sycamore	21.0"	100 feet north of the astronomical observatory and the mulch pile at the end of Northway Road, at the forest edge. (SY-2, x=2720, y=2480, original=X2019-5)
1. canopy	Virginia pine	25.1"	On the trail that goes along the Blueberry Hill summit 78 feet south of junction with the trail that leads to 10 Plateau Place. (VaP-1, x=2050, y=1230, original=X2019-8)
1. canopy	Virginia pine	18.1"	Northway Road, 20 feet east of forest-preserve sign. Two Virginia pines have 57" girth (18.1" diameter) within 100 feet of each other. (VaP-2, x=1700, y=2590, original= X2019-3a&b)
1. canopy	pitch pine	NA	Pitch pines found in Northway stream valley.
1. canopy	white pine	17.2"	100 feet northwest of the astronomical observatory. May be the only large white pine in the North Woods. (WiP-1, x=2400, y=2450, original=X2019-4)

1. canopy	blackgum	NA	Blackgum leaves found on forest floor in Goddard Branch floodplain.
1. canopy	redbud	9.5"	At the forest edge on Northway Road, 500 feet west of forest-preserve sign. May be the only large redbud in the North Woods. Another redbud is at the edge of the Hamilton Woods next to the athletic field. (RB-1, x=1100, y=2650, original=X2019-2)
1. canopy	blackjack oak	NA	Northway stream valley
2. understory	beech	14.6"	North bank of Canyon Creek, midway between the two trails that lead to the terminus of Plateau Place. Much larger specimens are found in nearby woods such as the park around Greenbelt Lake, Greenbelt Park (NPS), and the state of Maryland conservation land along Indian Creek between the Greenbelt Metro Station and Greenbelt Road. The near absence of large beech trees in the Greenbelt North Woods is odd. (AB-1, x=850, y=750)
2. understory	holly	9.9"	East of 14 Laurel Hill, west of trail. (HY1, x=440 y=720)
2. understory	holly	8.6"	20 feet south of southeast corner of sample plot A, east of Goddard Branch near Northway Stream junction. [add to map.] Numerous patches of holly in the floodplain and upland oak portions of the North Woods.
2. understory	ironwood	6.7"	5 feet north of sample plot A east of Goddard Branch near Northway Stream junction. This species has numerous scattered specimens in the floodplain and to a lesser extent in upland oak portions of the North Woods. (IW-1, x=3025, y=1970)
2. understory	ironwood	4.8"	East of Goddard Branch near the parkway (IW-2, x=3125, y=2100, original=X2019-6)
2. understory	dogwood	3.2"	Northway Road between Ridge Road and the forest preserve sign. Numerous scattered specimens along lower slopes of Blueberry Hill and in the Northway stream valley, most only 1" diameter at chest height. (DG-1, x=1200, y=2550)
2. understory	chinquapin	NA	A few examples on the north slope of Blueberry Hill. Said to have been more common, generations ago, in the Greenbelt North Woods.
2. understory	sassafras	NA	A few seedlings and saplings.
2. understory	box elder	NA	Sapling on the eastern bank of Goddard Branch and in sample plot C. A few saplings just outside the Greenbelt North Woods, along the edge of the forest on the south side of Northway Road.
2. understory	devil's walking stick	NA	A few trees north of Blueberry Hill, and formerly a few trees between Blueberry Hill and Plateau Place.
3. shrub layer	mountain laurel	6.0"	Northeast of the terminus of Laurel Hill Road. The specimen that is 6.0"-diameter at a 6" height above ground is far larger than the many other mountain laurel bushes in the north

			woods. Cross sections of dead branches suggest mountain laurel typical requires 21 years to add an inch of diameter. At that growth rate, the 6"-diameter specimen would be 126 years old. (ML-1, x=950 y=150)
3. shrub layer	mountain laurel	3.8"	Two specimens northeast of the terminus of Laurel Hill Road.
3. shrub layer	pinkster azalea	NA	A few specimens on the summit of Blueberry Hill.
3. shrub layer	high bush blueberry	NA	Numerous examples on the summit of Blueberry Hill.
3. shrub layer	low bush blueberry	NA	Numerous example outside the floodplain.
3. shrub layer	strawberry bush	NA	A large specimen along the west bank of Goddard Branch. Numerous small examples are being grazed almost to death by deer elsewhere in the Greenbelt Northwoods.
3. shrub layer	arrowwood viburnum	NA	
3. shrub layer	spicebush	NA	Two large patches, one at the junction of Northway Stream and Goddard Branch, and the other where Canyon Creek enters the Beltsville Agricultural Research Center.
3.shrub layer	serviceberry	NA	Along Northway Road near Northway athletic fields.

Table 3: Empirical relationship between trunk diameter and tree age in the Greenbelt North Woods

During the past few years, the author has photographed the stumps of recently sawn trees in or near the North Woods. Very few trees are cut down in the North Woods, almost exclusively limited to trees close enough to homes to pose a risk to property. The nearby park around Greenbelt Lake has a forest with similar character to the Greenbelt North Woods, and Greenbelt public works occasionally cuts down trees near the path around the lake.

Also presented in Table 3 are cores that the authors extracted with an increment border from trees that storms had recently blown down in the Greenbelt North Woods. When cores are taken, the author gives them an identifier of the form "Xyyyy-n" where *X* stands for the type of tree (T=tulip poplar, O=oak, M=maple, P=pine, B=beech), *yyyy* stands for the 4-digit year, and *n* is a tree number.

The location of these stumps and windfallen trees are shown on the tree-location map that accompanies this data file, at least when the trees are located within the Greenbelt North Woods. Dead trees are marked with both an × symbol on the map and with an identifier in the form "dX-n" where *d* stands for "dead tree," *X* stands for the species/group (P=poplar, RO=red oak, WhO=white oak, RM=red maple, LP=loblolly pine, and VP=Virginia pine), and *n* stands for tree number.

The idea that some trees in the North Woods trees are ≥140 years old gets some additional support from the empirical formula of Teck and Hilt (1991). Teck and Hilt's formula estimates the age of trees in the canopy in the Northeast U.S. that have experienced no logging or limited logging. The applicability of the Tech and Hilt formula may be limited by the fact that much of the Northeast has a colder climate than Maryland, which might cause Maryland trees to grow more rapidly. On the other hand, the culling of some of Tech and Hilt's reference forests means that their dataset on average might grow more quickly than those the mostly unculled Greenbelt North Woods. Teck and Hill correct for site index, but there is uncertainty in the site index for specific species in the North Woods. Site index information is given in Table 4, below.

The Teck and Hilt (1991) formula for trunk basal area increase per year is of the following: initial trunk diameter at chest height, two species-dependent coefficients that Teck and Hilt provide, and the site index for that species that the user provides:

$$\frac{\Delta A}{\Delta y} = b_1 \text{ SI } (1 - e^{-b_2 D})$$

where A = basal area (ft^2), y=age in years, SI = site index (ft), b_1=coefficient (ft/yr), and b_2=coefficient (inch^{-1}). Using the formula for the area of a circle ($A=\pi r^2$), one can solve the above equation for radius r (inches) increase per year:

$$\frac{\Delta r}{\Delta y} = \sqrt{r_0^2 + \frac{\Delta A}{\Delta y}\frac{12^2}{\pi}} - r_0$$

In the above equation, the factor of 12^2 converts the units of A from square feet to square inches. Diameter D always increases twice as fast as radius:

$$\frac{\Delta D}{\Delta y} = 2\frac{\Delta r}{\Delta y}$$

Invert the preceding equation to get an approximation for the number of years for the trunk to increase one inch in diameter:

$$\frac{\Delta y}{\Delta D} = \frac{1}{2\frac{\Delta r}{\Delta y}}$$

Integrate the preceding expression to obtain the number of years y needed to reach the final diameter D_{final} (inches):

$$y = \sum_{D=0}^{D_{final}} \frac{\Delta y}{\Delta D}$$

Age, diameter, tree type	Implied 140-yr diameter [a]	Notes (map ID, x coord., y coord., original survey ID)
		Tulip Poplar
74 rings (21.6" diameter)	40.9"	Core taken in 2018 at chest height from tulip poplar blown the ground pointed east in 2017. Located southeast of Blueberry Hill cove. (dP-1, x=2500, y=750, original=T2018-3)
62 rings (19.9" diameter)	44.9"	Core taken at chest height from tulip poplar leaning with rootball pulled up due to 2 March 2018 windstorm. Located 250 feet north of observatory. (dP-2, x=2600, y=2250, original=T-2018-1)
--	45"	Hypothetical 140-year old tulip poplar in canopy of even-aged stand with site index 100 (Teck and Hilt 1990). The 2013 DNR report on the city-owned portion of the North Woods states a site index of 94 to 103 for tulip poplar.
		Red oak [b]
142 rings (30" diameter)	29.6"	Stump from red oak cut in 2018?, Greenbelt North Woods, cut 1 foot above ground. Located 100 ft from forest edge, near 8G Plateau Place. (dRO-1, x=1250, y=2050, original=$O_{2017Nov}$)
133 rings (29.6" diameter)	31.2"	Core [c] taken 10 feet above ground from red oak that blew down in an early March 2018 storm. Located ~100 feet south of Northway Road in the Hamilton Woods tract of the Greenbelt Forest Preserve, 100 feet south of Northway Road. (dRO-2, x=1200 uncertain by ±500 feet, y=2750, original=$O_{2018\text{-}1}$)
99 rings (33.4" diameter)	47.2	In clearing, so not forest conditions. Fast growing scarlet oak in a 0.6 acre clearing in the Goddard Branch Floodplain. Core taken 16.5 feet above ground. Original core #O2019-3 windfallen on 15 April 2019, formerly live tree #SO-2 in Nov 2017 large-diameter survey. (dRO-3, x=2880, y=2270)
--	32.9" to 35.7"	Hypothetical 140-year old scarlet oak in canopy of even-aged stand with assumed site index of 66 or 75 (Teck and Hilt 1990). DNR (2013b) reports for stand 1 of the city-owned portion of the North Woods a site index of 66 for red oak species. The USDA soil survey suggests a site index of 70 to 80 for soil for various oak species.

		White Oak
140 rings (38" diameter)	38"	dWhO-1: Stump from white oak cut in summer of 2017, 10 feet from shore of Greenbelt Lake, a lake that was created by flooding a stream valley in 1935. News Review article.
--	30.0" to 30.7"	Hypothetical 140-year old white oak in canopy of even-aged stand with assumed site index of 67 or 70 (Teck and Hilt 1990). DNR (2013b) reports for stand 1 of the city-owned portion of the North Woods a site index of 67 for white oak, and the DNR soil survey suggests a 70 site index for white oak.
		Red Maple
140 rings (30.6" diameter)	30.6"	Core taken at chest height from red maple that snapped 20 feet above ground on 15 April 2019 windstorm. Located in floodplain clearing west of Goddard Branch. (dRM-1, x=2900, y=2280, original=M2019-2)
97 rings (20.5" diameter)	29.6"	Core taken 20 feet above ground from red maple recently blown to the ground. Located at 50 north of BARC fence, 100 feet east of Goddard Branch. (dRM-2: x=2900, y=-50, original=M2018-1)
88 rings (18.45" diameter)	29.4"	Core taken at chest height from red maple with root ball pulled out of ground, leaning at 30" angle temporarily buttressed against another tree. Located at saddle point between Blueberry Hill and Plateau Place. (dRM-3, x=1550, y=1100, original=M2019-1)
--	26.0"	Hypothetical 140-year old red maple in canopy of even-aged stand with assumed site index of 60 (Teck and Hilt 1990). USDA soil survey suggests a site index of 60 in the Goddard Branch floodplain.
		Pine
128 rings (22" diameter)	24.1"	Core taken from loblolly pine that blew down in an early March 2018 storm. 300 feet from Baltimore Washington Parkway fence, on slope above Goddard Branch floodplain south of stream that drains from the Parkway. (dLP-1, x=3250, y=1050, original=$P_{2018\text{-}4}$)
--	39.4"	140-year old loblolly pine in canopy of even-aged stand with assumed site index of 90 (Teck and Hilt 1990). USDA soil survey suggests site index of 90 on top of Blueberry Hill.
119 rings (20" diameter)	23.5"	Core taken from Virginia pine whose trunk had recently snapped 13 meters above ground, below the lowest branches, 300 feet from Parkway on slope of hill at northeast corner of North Woods north of the stream that drains from the Parkway. (dVP-1, x=3200, y=700, original=$P_{2018\text{-}3}$)

--	24.5"	Hypothetical 140-year old Virginia pine in canopy of even-aged stand with assumed site index of 70 (Teck and Hilt 1990). USDA soil survey suggests a site index of 70 for upland oak habitat of North Woods.

[a] The diameter that would imply a 140-year age assuming that a tree grew at the lifetime average rate of this measured tree.

[b] An oak of unknown species in the red-oak group, and not white oak

[c] An increment borer was used to extract the core.

Table 4: Site index estimates for tree species in the Greenbelt North Woods

Maryland Department of Natural Resources (DNR) foresters have surveyed the North Woods and provided site indices for a few species, and these values are shown in Table 4. For each tree in the North Woods for which on measures both age and height, one can read the implied site index from the growth curves of Carmean et al. (1989, *Site Index Curves for Forest Tree Species in the Eastern United States*). Some such values are show in in Table 4. Obviously, one would want to look at more than one tree to reliably estimate the site index in this way. In the USDA soil survey (http://websoilsurvey.nrcs.usda.gov), some soil types are associated with site indices for some tree species. Table 4 includes these values. The three soil types in the North Woods happen to correspond to the three habitats that the members of the Greenbelt Biota club have informally identified in the North Woods. The USDA survey claims that the soil is of type Cc (Christiana-Downer complex) in the upland-oak forest within the North Woods, type Rc (Russett-Christiana complex) in the heath forest at the summit of Blueberry Hill, and type ZS (Zekiah and Issue soil, frequently flooded) in the floodplain of Goddard Branch and along Canyon Creek. **Abbreviations:** SI = site index which is the height of a tree or the average height of a group of trees at 50 years age, DNR = Maryland Department of Natural Resources.

Age (growth rings) and diameter (inches, = measured girth ÷π) at chest height unless otherwise indicated	Measured height of fallen tree	Stated site index or implied site index looking up observed tree on published growth curve	Notes, location, references
		tulip poplar	
74 rings, 21.6" diameter	107 ft	97 ft	tulip poplar (dP-1, x=2500, y=750, original=T2018-3)
52 rings, 20.0" diameter	98 ft	95 ft	tulip poplar (dP-3, x=2600, y=2300, original=T2018-2)
62 rings, 19.9" diameter	---	----	tulip poplar (dP-2, x=2600, y=2250, original=T-2018-1)
---	---	94, 97, or 103 ft	DNR 2013b, the two estimates are for stands 2, 1, and 4, respectively, which consist mostly of upland oak habitat with some floodplain and heath forest mixed in.
---	---	100 or 101ft	DNR 2013a, stands 2 and 1
		90 ft	USDA soil survey, soil Rc at summit of Blueberry Hill
		oak	

55 rings, 21.1" diameter	109 ft	105 ft	red oak, O2018-6
72 rings, 24.5" diameter	115ft	85? ft	scarlet oak, O2019-1
87 rings, 26.3" diameter	105 ft	75 ft	scarlet oak, O2018-8
78 rings, 21.3" diameter	98 ft	75 ft	scarlet oak, O2018-7
70 rings, 19.8" diameter	92 ft	75 ft	red oak, O2018-5
84 rings, 17.5" diameter	99 ft	70-75 ft	red oak, O2018-4
69 rings, 18.6" diameter	103 ft	65-70 ft	scarlet oak, O2018-3
133 rings, 29.6" diameter, 10 ft above ground	88 ft	65 OR <60 ft	red oak (dRO-2, x=1200 uncertain by ±500 feet, y=2750, original=$O_{2018\text{-}1}$)
90 rings, 17.5" diameter, at 10 ft aboveground	89 ft	70 ft	scarlet oak, O2019-2
est. 117 age at chest height, 44.4" diameter	112 ft	80 ft	scarlet oak, O2019-3, core taken at 16.5 ft above ground to avoid rotted heartwood seen in 4ft tall stump. The core shows that the inner (earliest) half of the trunk radius has 1/3 of rings (32 rings) and outer (most recent) half of radius has the other 2/3 of rings (64 rings). Assuming that the growth that added 11 inches to the 16.5 ft diameter (33.4" diameter) to reach the chest height 44.4" diameter occurred at the same rate as the earliest 1/3 of rings (1.9 years to add an inch of diameter), then the estimated total age of the tree at chest height is 117 years.
---	---	70 ft, 80 ft	USDA soil survey gives 70 ft SI for scarlet oak and black oak on soil DoD (Downer Hammonton complex) a few hundred feet west of the North Woods. The USDA soil survey gives an 80 ft SI for northern red oak in RuB, and a 70 ft SI for white oak in Cc soil.
---	---	66, 67 ft	DNR 2013b for red oak species or white oak, respectively
---	---	64ft	DNR 2013b for laurel hill to plateau place
		red maple	
140 rings, 30.6" diameter, chest height	---	---	red maple (dRM-1, x=3000, y=2280, original=M2019-2)

97 rings, 20.5" diameter, at 20 ft above ground	97 ft	55-60 ft (extrapolated)	red maple (dRM-2: x=2900, y=-50, original=M2018-1)
88 rings, 18.45" diameter	72 ft	52 ft	red maple (dRM-3, x=1550, y=1100, original=M2019-1)
---	---	60ft	USDA soil survey, ZS soil in floodplain
		pine	
128 rings, 21.8" diameter	82 ft	na	loblolly pine, P2018-4, Carmean (1989) use 25 yr height for site index and do not go above 25-40 yrs age! (dLP-1, x=3250, y=1050, original=$P_{2018\text{-}4}$)
---	---	90, 100ft	loblolly pine, USA soil survey, Rc soil (Blueberry Hill summit) and ZS soil (floodplain), respectively
86 rings, 19.4" diameter	113 ft	90-100 ft (extrapolated)	Virginia pine, Northway road, P2018-1. Carmean (1989) charts only go up to 70 yrs for Virginia pine.
78 rings, 16.9" diameter, 8 ft above ground	93 ft	75-80 ft	Virginia pine P2018-2.
---	---	70 ft	Virginia pine, USDA soil survey, Cc soil of upland oak habitat

Table 5: Live tree diameters in four square plots within the North Woods

Plot	Diameter at chest height in inches (observed girth ÷ π)
(a) Floodplain	39.5:P, 33.7, 26.7:P, 25.8:P, 22.0:P, 22.0, 14.3, 12.7, 12.1, 10.5, 9.5, 9.5, 9.2, 9.2, 9.2, 8.0, 7.6, 7.6, 7.6, 7.3, 7.3, 7.0, 7.0, 6.0, 6.0, 6.0, 6.0, 5.7, 5.7, 5.7, 5.4, 5.4, 5.4, 5.1, 5.1, 4.8, 4.8, 4.8, 4.8, 4.5, 4.5, 4.5, 4.5, 4.5, 4.5, 4.5, 4.1
(b) Culled	28.0, 27.7, 24.8:P, 23.2, 22.9, 22.6:P, 22.3, 22.0, 21.0, 20.4, 11.5, 11.1, 11.1, 10.5, 9.5, 9.2, 8.6, 8.6, 7.6, 7.6, 7.3, 7.3, 7.0, 6.7, 6.4, 6.0, 6.0, 6.0, 5.7, 5.4, 5.4, 5.4, 5.4, 5.1, 4.8, 4.8, 4.1
(c) Upland	34.7:P, 32.1, 31.2, 26.4, 19.1, 17.5, 16.9, 16.6, 15.9, 15.0, 12.7, 11.5, 11.1, 9.9, 8.3, 7.6, 7.3, 7.0, 6.0, 6.0, 5.4, 4.1, 4.1
(d) Cove Forest	38.2:P, 30.2, 29.3, 25.1:P, 23.9, 21.3, 20.4, 17.2, 14.3, 13.7, 11.1, 10.5, 9.9, 8.6, 8.3, 7.3, 6.7, 6.7, 6.4, 6.0, 6.0, 5.1, 4.8, 4.8, 4.1, 4.1, 4.1

Plot Locations:

(a) Floodplain: East of Goddard Branch opposite the junction of Northway stream and Goddard Branch. Five feet within the northwest corner of the plot is a 84"-girth tulip poplar. Exactly at the northeast corner stands a 50"-girth 20-foot-tall dead tree, which has a small holly tree next to it. In the middle of this plot, a narrow, intermittent stream flows west from the Baltimore Washington Parkway into Goddard Branch. The two ≥30-inch-diameter trees in this square plot are tulip poplar P-35 and scarlet oak SO-7.

(b) Culled: Upland-oak forest where the 1998 inspection by a Maryland DNR forester found evidence that had GHI had culled trees and girdled trees in 1994 pursuant to the 1990 conservation and management plan between Maryland and GHI. A trail goes along the eastern side of this plot leading from Plateau Place to Canyon Creek. There are no ≥30-inch-diameter trees within this square plot, but southern red oak SR-4 is about 10 feet north of the northern corner of the plot. Within the plot, along the trail is an 87" girth scarlet oak. The sides of this square plot are oriented 45° from Magnetic North, i.e., northeast to southwest and southwest to northeast.

(c) Upland: Upland-oak forest without any known culling by GHI. Invasives are present: English Ivy carpeting the forest floor and some smothering some tree trunks and multiflora rose forming a dense thicket in parts of this plot. A trail runs along the northern side of this plot connecting Laurel Hill Road with Canyon Creek. Near the northern side of this plot are three ≥30-inch-diameter trees, which are from west to east: scarlet oak SO-10 (5 feet from the northwest corner), scarlet oak SO-11, and tulip poplar P-50 (5 feet from the northeast corner). The sides of this square plot are oriented 300° and 30° from Magnetic North.

(d) Cove Forest: Located in the large cove on the northeast slope of Blueberry Hill. Ten feet from the northeast corner is ≥30-inch-diameter tulip poplar P-45. Five feet from this tulip poplar is a "living" tulip-poplar stump. Near the northwest corner are what look like three fox holes. Near the southwest corner is a 95" girth (30.2" diameter) white oak observed in 2019 that was not found in

the ≥30-inch-diameter North Woods survey of 2017, perhaps because it was not yet 30 inches in diameter at the time of the 2017 survey.

Table 6: Statistics related to live tree diameter in four square plots within the North Woods

Statistics calculated from the list of diameters of living trees ≥4-inch diameter in the same four square plots used in Table 5.

		Basal area, live trees ≥4 inch diameter, chest height			Percent stocking	
Plot	Living trees per acre	Total area (ft^2/acre)	% of basal area from tulip poplars	Sum of living tree diameters (inch/acre)	Relative to upland oak	Percent stocking (tulip poplar)
(a) Floodplain	165	137	51%	1568	105%	51%
(b) Culled	130	136	16%	1503	104%	48%
(c) Upland	81	124	29%	1143	91%	40%
(d) Cove Forest	95	131	95%	1219	96%	42%

Trees per acre: The number of living trees that are ≥4 inch diameter at chest height within the 111x111 ft plot, multiplied by 3.5 to convert to trees per acre.

% of basal area from tulip poplars: In some places in the Greenbelt North Woods, much of the basal area comes from a few, large, tulip poplar trees. This column shows the percent of total basal area that these tulip poplars contribute.

Sum of tree diameters: Used in the percent stocking calculation.

Percent Stocking: Using the formula of Johnson, Shifley, and Rogers (2002, Ecology and Silviculture of Oaks, pg. 242). In this formula, N ($acre^{-1}$) is the number of trees per acre, D (inches/acre) is the sum of tree diameters per acre, D_2 ($inch^2$/acre) is the sum of the squares of the tree diameters per acre, and P (percent) is the percent stocking. A percent stocking of 100% is the typical value in a forest that is not logged.

P(upland-oak forest in Ohio, Kentucky, Missouri, and Iowa) = $-0.00507N + 0.01698D + 0.00317D_2$

P(tulip-poplar forest in the Allegheny Plateau) = $0.02794N + 0.01545D + 0.000871D_2$

Table 7: Deadwood in four square plots within the North Woods

Statistics calculated from the same four square plots used in Tables 5 and 6.

Plot	Diameter of standing dead trees	Volume of fallen deadwood ≥4 inch diameter	Pit-and-mound pairs
(a) Floodplain	15.9"	976 ft^3/acre	0
(b) Culled	15.3", 11.1", 5.7"	370 ft^3/acre	1
(c) Upland	15", 15", 9", 13.4", 13", 13", 10.2"	174 ft^3/acre	0
(d) Cove Forest	15"	418 ft^3/acre	3

Volume of fallen deadwood: Volume of each large branch or trunk lying on the ground or dead and leaning against another tree. Volume is estimated by measuring the length of the piece and either the diameter or girth at both ends of the piece. The volume of each piece of deadwood is estimated from these values using the formula for a truncated cone: $V = \frac{\pi}{3} h \sqrt{r_1^2 + r_1 r_2 + r_2^2}$, where V = volume (ft^3), h = length (feet), r_1 = radius at one end of the truncated cone (feet), and r_2 = radius at the other end of the truncated cone (feet). The total volume of fallen dead wood in each 111×111 foot plot is multiplied by 3.5 to estimate the per-acre value.