

Selected from
Section I of a
1993 Report to
the GSMCA

OLD-GROWTH FOREST PLOT
FOR LONG-TERM VEGETATION MONITORING
AT ALBRIGHT GROVE,
GREAT SMOKY MOUNTAINS NATIONAL PARK

1992 DATA SUMMARY

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Great Smoky Mountains Conservation Association

pertinent files:

dcLIV92.xls - live trees

dcSNAGS92.xls - standing dead trees

Note: A's of 2017, I
refer to this site as
"DC" for Dunn Crk.

-R. Busing, 2017

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INTRODUCTION

A 1-acre (0.4 ha) vegetation plot, established in Albright Grove in 1962, was sampled in March 1992. The plot contained approximately 300 trees in 1962, including large red maples, hemlocks, tulip poplars and birches. *Rhododendron* was moderately abundant throughout the understory of the stand. The 1962 data (on file ^{now with R. Busing} at Univ. Tenn.) include species and diameters of live and standing dead trees in 10 subplots. Comparison of the 1992 data with that of 1962 will provide information on tree growth and mortality in this stand. This report summarizes the 1992 data taken from a 0.6 ha plot placed around the 1962 plot. The permanently marked plot (1992) is 50% larger than the 1962 plot and it covers all of the old plot area. Trees were mapped and tagged in 1992 providing a basis for further long-term study.

THE PLOT SITE

The plot is located in a primeval stand just E of Dunn Creek at 3200' elev. (Fig. 1). This site is approximately 100 m NW of the giant tulip poplars along the Albright Grove loop trail. The site is N facing with a gentle slope and a slightly concave topography. A small stream runs through the plot, as does the loop trail. Several large standing dead chestnut trees were recorded in 1962. The stand has an understory shrub layer of *Rhododendron maximum*.

METHODS

In March of 1992, a 0.6 ha plot was established in the old-growth forest of the Dunn Creek watershed (Fig. 1). All live trees over 1.37 m tall were sampled in the plot, and trees ≥ 4 cm

DBH were tagged and mapped in 10x10 m contiguous quadrats.

Future Work

A censusing interval of one to five years and a resampling interval of ten years are recommended. The tags must be examined and refurbished in 2002. At that time a census should be taken by evaluating the condition of all tagged trees. If information on direct causes of tree mortality is sought, an annual censusing interval is recommended. However, an annual recensus may disturb or damage the Rhododendron layer. In 2002 the plot should be intensively resampled.

Plot layout and marking

Plot dimensions are shown in Fig. 2. The maximum dimension of the plot is 100 m (E-W axis). Stakes (<0.5 m tall) were placed at the corners of each 20x20 m block; the 0,0 stake was located in the SW corner. Numbered aluminum tags were placed on all live trees ≥ 4 cm DBH. The plot contains the entire area sampled in 1962 (Fig. 3). Detailed information on plot relocation from landmarks is presented in the Appendix.

Vegetation sampling

Trees > 2 cm DBH. Vegetation sampling was done in 10x10 m quadrats (4 per 20x20 m block). A number (1-60) was assigned to each of the 60 quadrats (Fig. 2). Each live tree was tagged 10 cm below BH, measured for DBH, and assigned dominance and crown condition classes. Data were entered on a data logger, one data line per tagged tree. Quadrat number, tag number, species code, DBH (cm), dominance class, and crown class were recorded for each live tree. Species code numbers are provided in the Appendix.

Dominance values (1-5) were:

- 1=emergent canopy
- 2=average canopy height
- 3=below average canopy height
- 4=overtopped and well shaded (receiving no gap light)
- 5=dead

Crown values (1-5) were:

- 1=large, full crown
- 2=somewhat smaller or thinner crown
- 3=smaller than average crown, damaged foliage or branches obvious
- 4=very small or thin crown
- 5=dead (bole ht in m may be recorded here)

Standing dead trees >10cm DBH without broken boles were also recorded; they were assigned a tag number of 0. Similarly, live basal sprouts <4 cm DBH were not tagged (tag=0). If a tree branched below BH, only the largest stem was tagged unless both stems exceeded 10 cm DBH; in that case both were tagged. All tagged trees were mapped and later assigned Cartesian coordinates (m). In each quadrat, an increment core (ca. 2 cm long) was extracted from the tree with the largest DBH, and from the tree (>10 cm DBH) closest to the 0,0 corner of the plot. This was not done in quadrats >43 because of equipment failure (the increment hammer broke).

Dead trees >10 cm DBH. Snags, stumps and logs were assigned a species, decay class, and a diameter (cm). Decay values ranged from 1-4:

- 1=recent (hard with bark)
- 2=hard, no bark or slightly soft with bark

3=soft or pliable

4=very soft.

Logs raised off the ground were noted as "aerial". Each item was drawn on the original plot map (see Appendix).

Tree saplings BH to 2 cm DBH. Each 10x10 m quadrat was divided into four 5x5 m areas for sapling tallies. The canopy cover of each of the four areas was recorded as:

1=emergent or very dense canopy

2=average canopy

G=open canopy.

The number of saplings was tallied by species in each 5x5 m area. Substrate (forest floor, rock or log) was noted for each individual.

RESULTS AND DISCUSSION

Species composition

Live trees >2 cm DBH. Three species, Tsuga canadensis, Acer rubrum and Halesia carolina, had total basal area values exceeding 8 m²/ha (Table 1). These species also had high total biomass (>95 Mg/ha). Tsuga was the most important species by basal area (27%) and biomass (26%). The stand can therefore be classified as hemlock-hardwood. Acer rubrum and Halesia were the most important deciduous species with 24% and 17% relative basal areas, respectively. Other deciduous species, with basal area values exceeding 1 m²/ha, included Liriodendron (11%), Betula lutea (9%), Fagus (4%), and Fraxinus (3%).

High stem densities were exhibited by Tsuga and Halesia (Table 1). The abundance of basal sprouts is a major reason for

high density of Halesia stems, while the extreme shade-tolerance of Tsuga explains its high stem density. Other species were considerably less abundant than these two dominants.

Size-class distributions of the dominant species indicate abundant regeneration of Tsuga and Halesia (Fig. 4). Acer rubrum, Betula lutea and Fagus have moderately low regeneration levels. Liriodendron had very low regeneration in the plot although several large individuals were encountered. The largest trees in the plot were maples and hemlocks.

The importance of Acer rubrum is notable and it appears to be related to the Rhododendron understory. This species is not abundant in old-growth stands without a Rhododendron understory. Data from Roaring Fork plots with and without Rhododendron also demonstrate that Acer rubrum is often associated with this shrub in primeval cove forests. Although the importance of Acer rubrum may have increased following the decline of Castanea, the large maple trees in this plot are more than a century old and they became established well before the chestnut blight (ca. 1930). Why this maple is more important in stands with a Rhododendron understory deserves further attention.

Tree saplings. Halesia had the highest sapling density (Table 2). The majority of these were vegetative basal sprouts. Moderately low sapling densities were observed for Betula lutea, Fagus, Magnolia, Tsuga, and Acer saccharum. Betula lutea often regenerated on logs rather than the forest floor. No Acer rubrum saplings were encountered.

Stand attributes

Live trees. Total stand basal area was 53 m²/ha and total stand biomass was 410 Mg/ha (Table 3). These values are typical of old-growth stands in southern Appalachian coves. Mineral nutrient mass values were typical as well. Total tree density was low (600 stems/ha), however. This is attributed to the abundance of Rhododendron in the plot.

Dead trees. Total basal area of standing dead trees was typical of old-growth cove forests (Table 4). The contribution of standing truncated boles is lower than average in this case, however. One large Tsuga snag (114 cm DBH) contributed a substantial fraction of the dead basal area.

The total volume of coarse woody debris was 208 m³/ha. Eighteen percent of the debris was in the form of standing dead wood, the remainder had fallen and it tended to be moderately decayed (Fig. 5). Few lightly decayed trees were observed on the ground.

Canopy cover. Canopy structure was not uniform (Fig. 6). Cover was high over 15% of the plot area, and canopy gaps covered 14% of the plot area. The remaining 71% of the area had average canopy cover. The canopy gaps were small and the distribution of gaps was patchy. The fraction of area in gaps is typical of old-growth cove forests.

SUMMARY

The long-term monitoring plot at Albright Grove is representative of old-growth Tsuga-deciduous forests of the southern Appalachians with a Rhododendron understory. The tree layer is

species rich, and basal area and biomass values approach the maximum estimates for temperate forests of eastern North America. Acer rubrum, a species associated with Rhododendron in mature cove forests, is a dominant. Understory tree density is low because of the pervasive shrub layer. Very large individuals of Tsuga and Acer occur in the stand.

The stand appears healthy. Recent radial growth trends do not indicate sharply declining growth rates, and standing dead tree basal area is typical of old-growth cove forests. The volume of woody debris is high, but not unreasonable for such stands. Some of the debris comes from fallen Castanea trees killed in the 1930's. Canopy openings created by the death of Castanea are now closed and the total area of canopy openings falls within the range reported for other old-growth cove forests in the region.

The sampling design is fine-grained (tree layer resolution to 0.01 ha) and extensive (maximum extent 0.6 ha), allowing the study of long-term dynamics at a variety of scales of observation. The large size of the intensive plot should provide valuable information on old-growth forest dynamics at the stand level. A one to five year censusing interval (1997), and a ten-year intensive resampling interval (2002) are recommended for the assessment of change in this forest.

ACKNOWLEDGMENTS

Thanks to Ed Clebsch for providing general information and raw data from the 1962 plot sampling. Field equipment loaned by Peter White and Bob Peet is greatly appreciated. Field assist-

ants Ben Hafer and Alex Sloan were great help in the 1992 sampling effort. This project was supported by a C.C. Campbell Research Fellowship from the Great Smoky Mountains Conservation Association.

Table 1. Density, basal area and biomass summary for the 0.6 ha plot at Albright Grove (1992). All live trees >2 cm DBH are included.

SPECIES	N	BA(sq. m)	LEAF MASS(kg)	BRANCH MASS	BOLE MASS	TREE MASS
BELU	28	2.692	287.044	10915.850	4952.771	16155.660
ACRU	30 ²⁹	~~7.674~~	~~460.822~~	~~2898.854~~	~~56576.650~~	~~259936.320~~
FAGR	13	1.184	48.174	2840.360	7600.441	10488.970
FRAM	3	.822	54.628	542.705	4895.424	5492.757
ACSA	16	.293	16.808	573.482	42.710	633.000
LITU	8 ⁹	~~3.647~~	~~303.272~~	~~1832.850~~	~~17974.060~~	~~120110.180~~
BELE	4	.278	70.277	1764.023	1804.492	3638.792
TSCA	169	8.455	1729.337	10921.270	50669.920	63320.520
HACA	69	5.366	620.935	18661.170	38557.510	57839.620
AEOC	2	.023	.341	11.034	57.256	68.631
TIHE	4 ^{+2?}	.473	34.390	551.167	1988.515	2574.072
MAFR	12	.217	21.073	346.150	1059.603	1426.827
PRSE	1	.483	32.154	993.900	3171.851	4197.905
ILOP	1	.006	.975	5.770	16.069	22.814

PLOT TOTALS (0.6 HA)

360	31.6	3679	52858	189368	245908
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362

1997 corrections re tree TAGNO 41
- changed
940 to 13

Table 2. Tree sapling densities in the 0.6 ha Albright Grove plot (1992). Individuals >BH to 2 cm DBH are included.

Species	Density	On log (%)
MAFR	7	0
HACA	41	0
ACSA	4	0
BELU	12	6 (50%)
TSCA	6	0
PRSE	1	0
FAGR	11	0

Table 3. Biomass and mineral nutrient mass summary for the 0.6 ha plot at Albright Grove (1992). Mass is kg/ha above-ground material.

	Leaf	Branch	Bole	Total
Biomass	6132	88097	315613	409847
P	7	22	28	57
K	36	93	214	342
Ca	42	177	467	685
Mg	9	26	49	83

Table 4. Basal area of standing dead trees (>10 cm DBH) in the 1992 Albright Grove plot (0.6 ha). Percentages of the total live and dead basal area (56.5 sq. m/ha) are provided in parentheses.

Dead Basal Area (sq. m/ha)	
Snags	2.1 (3.7%)
Truncated boles (>BH)	1.8 (3.1%)
Total	3.8 (6.8%)

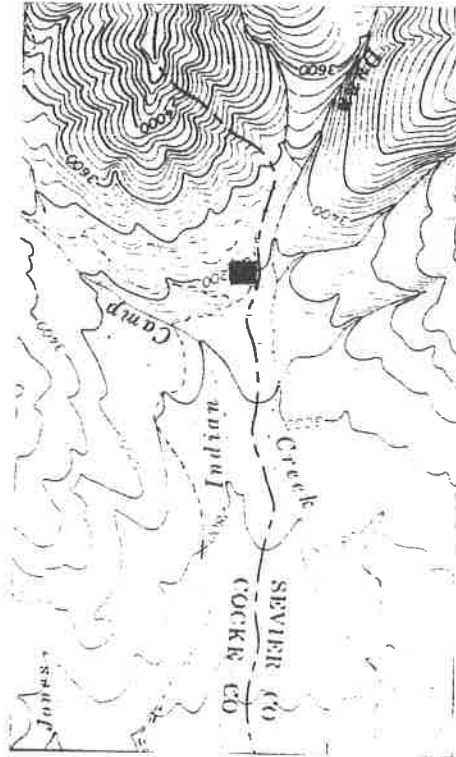
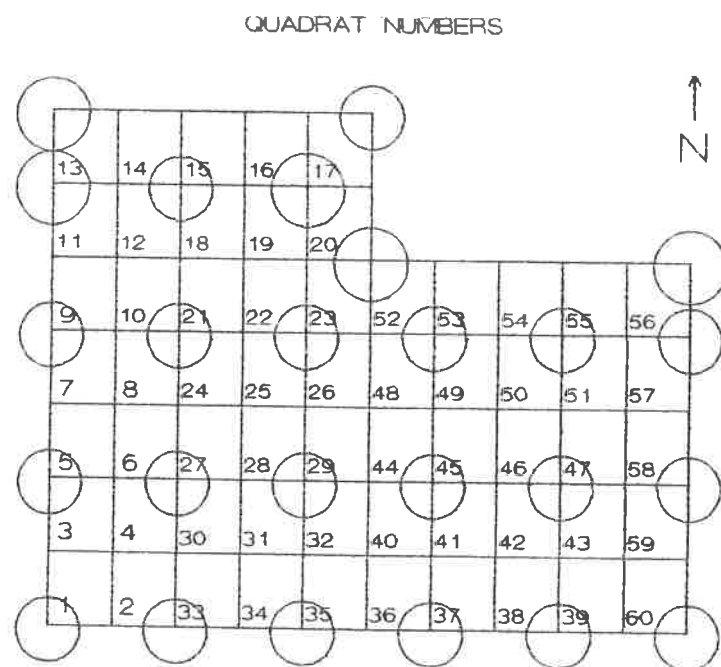
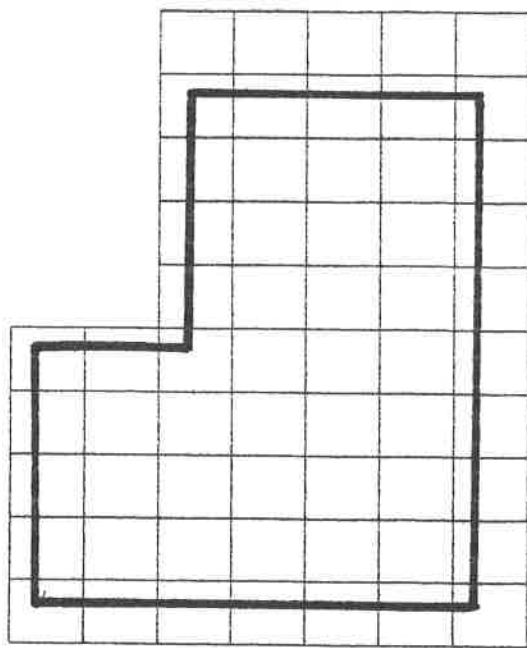


Fig. 1. Plot location on USGS Mt. Guyot 7.5' quadrangle.



Albright Grove Plot
1992 (0.6 ha)
PLOT LAYOUT
0.01 ha subplot numbers
Staked corners are circled

Fig. 2. Plot layout and marking diagram.



Albright Grove Plots
Thick line - 1962 (0.4 ha)
Thin lines - 1992 (0.6 ha)

Fig. 3. Plot boundaries in 1962 and in 1992.

Albright Grove 0.6 ha plot (1992)

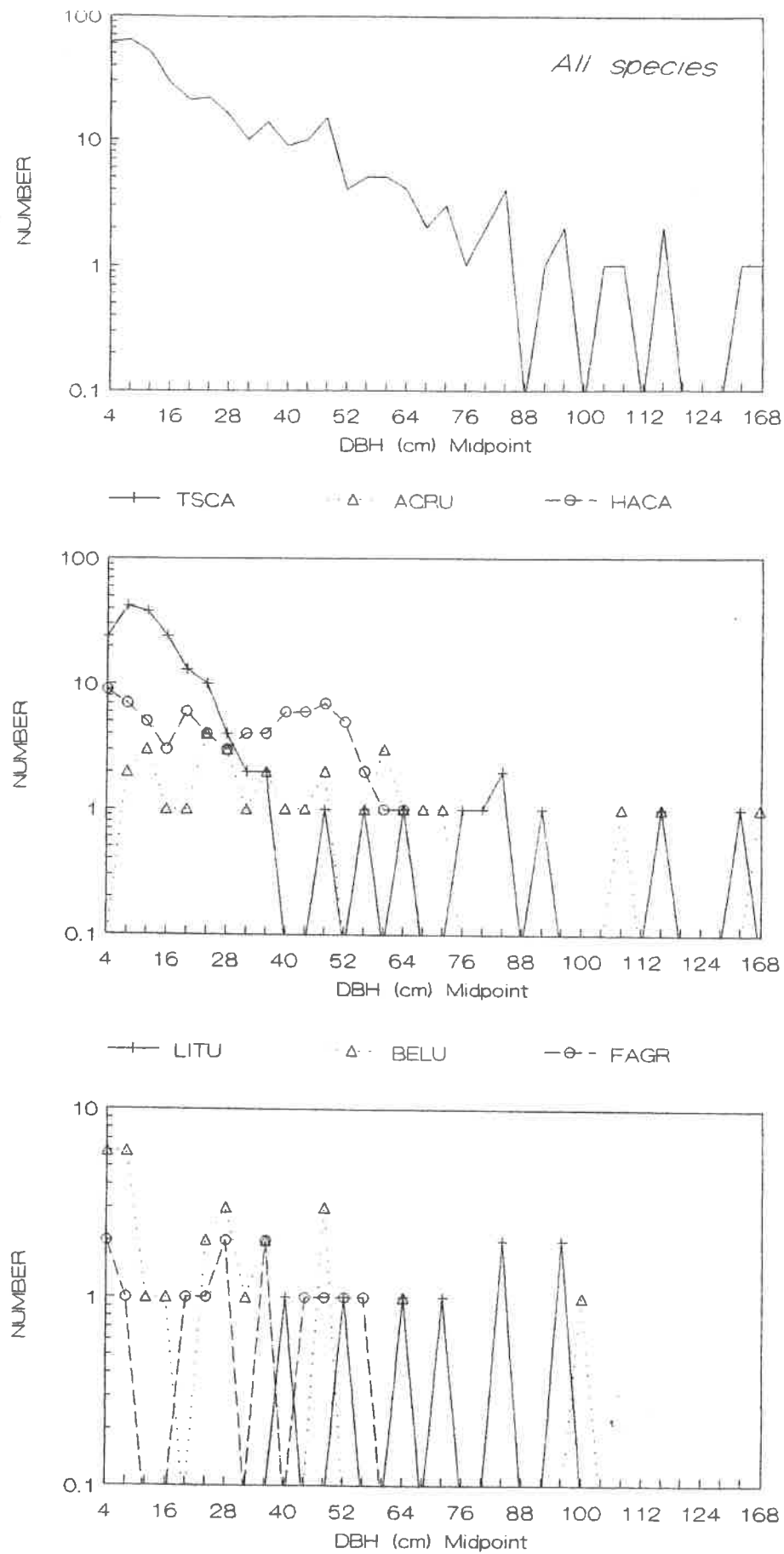


Fig. 4. Size-class distribution diagrams.

COARSE WOODY DEBRIS

Albright Grove 1992

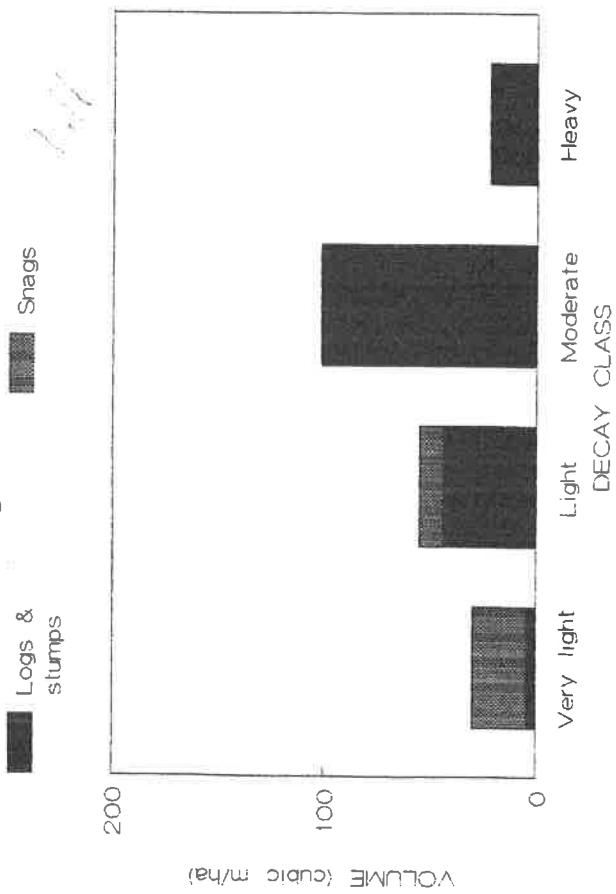
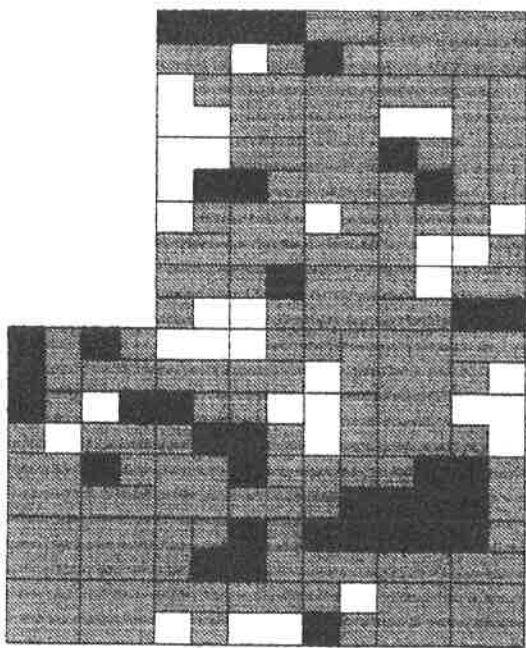


Fig. 5. Summary of coarse woody debris and decay classes.



Albright Grove Plot

1992

CANOPY COVER

Dark - heavy cover

Medium - moderate cover

Light - open canopy

Fig. 6. Canopy cover diagram.

APPENDIX

GREAT SMOKY MOUNTAINS COVE FOREST PLOT GENERAL INFORMATION

Albright Grove Plot Sampling
March 25, 1992

Samplers: R. Busing (UNC), B. Hafer (UTK) & A. Sloan (UTK)

Location: Dunn Creek, 3200' elev., Mount Guyot USGS 7.5' Quad.

Plot size: 0.6 ha in 60 contiguous 0.01 ha subplots

Long axis 90°

Slope: 5-10°

Slope aspect ca. 340°

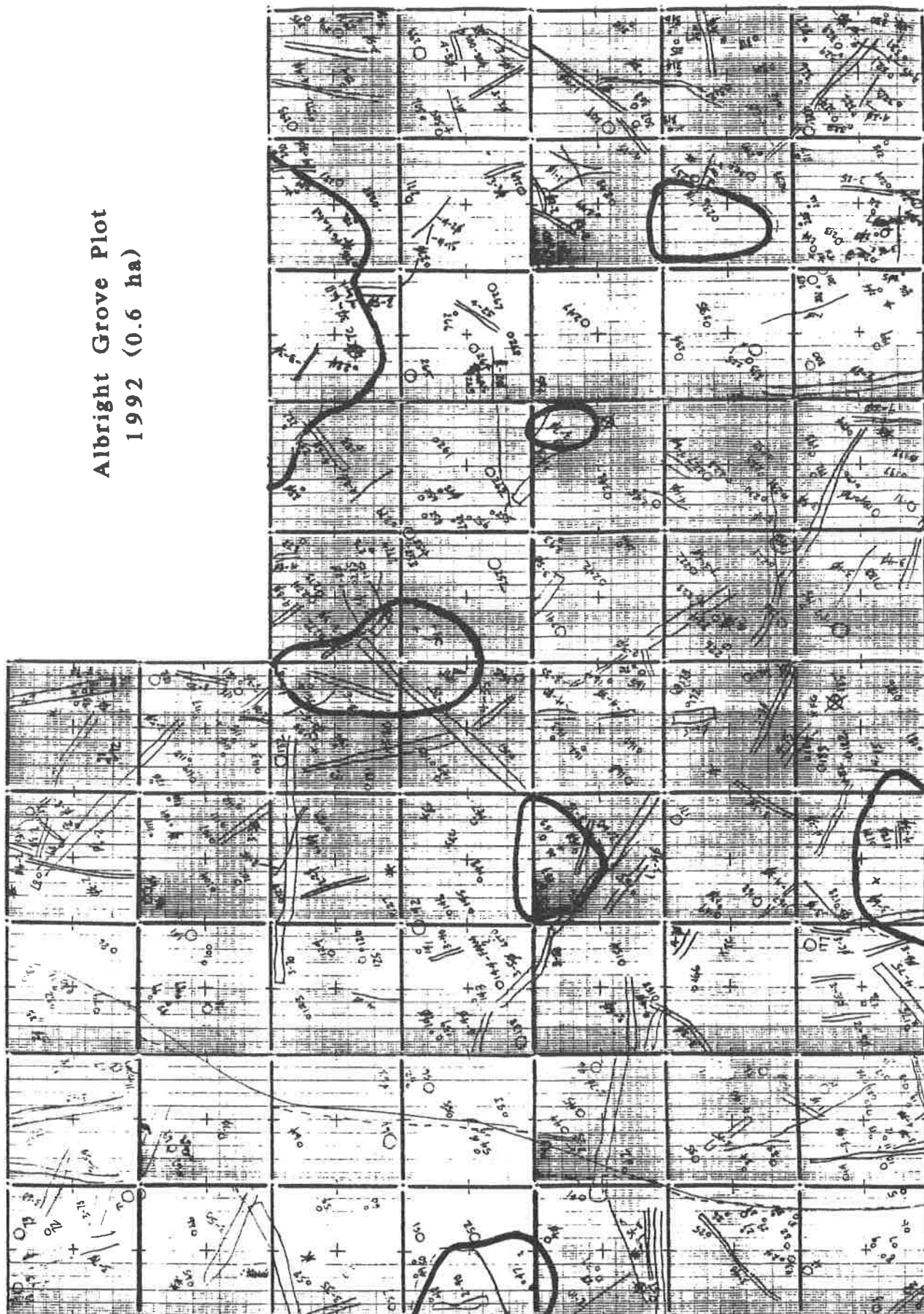
Topography: slightly concave with small stream through plot

Notes: Remains of chestnut in SW corner. Small canopy gaps

²
(<400 m) are the only form of disturbance. Rhododendron occurs throughout the plot. It is moderately thick in several areas of the plot.

Plot marking: The SW corner of the 1992 plot is 7.7 m at 320°
from the center of a 4-m wide rock just W of the loop trail (the W branch of the trail). The rock is 200-250 m from the loop trail intersection and it has a white streak on its N end. A plastic stake (<0.3 m tall) marks the corner. Additional stakes occur at 20-m intervals throughout the plot. All 5 major plot corners are staked as well.

Albright Grove Plot 1992 (0.6 ha)



trail

SPECIES ID CODES
Albright Grove Data, 1992

Acer saccharum ACSA 10
 Aesculus octandra AEOC 21
 Betula lutea BELU 3
 Fagus grandifolia FAGR 6
 Fraxinus americana FRAM 9
 Halesia carolina HACA 20
 Liriodendron tulipifera LITU 13
 Prunus serotina PRSE 36
 Tilia heterophylla TIHE 22
 Tsuga canadensis TSCA 19
 Acer rubrum ACRU 4
 Betula lenta BELE 16
 Ilex opaca ILOP 240
 Magnolia fraseri MAFR 23

ALBRIGHT GROVE PLOT--0.6 ha, 1992
 TREE DATA--LIVE (>2cmDBH) & STANDING DEAD (>10cmDBH)
 14:08 Monday, March 30, 1992

OBS	QUADNO	TAGNO	SPNO	DBHCM	DOM	CRWN
1	1	1	4	24.1	3	3
2	1	2	4	47.1	2	2
3	1	3	4	54.4	2	2
4	1	4	4	69.6	1	2
5	1	5	19	22.7	3	2
6	1	6	19	12.0	3	3
7	1	7	19	10.5	3	3
8	1	8	4	19.3	3	2

incomplete
 live see files
 dc LIV 92.xls
 dc SNAGS 92.xls
 has standing
 dead

ALBRIGHT GROVE 0.6 HA, 1992
WOODY DEBRIS: LOGS & STUMPS

15:56 Wednesday, April 1, 1992

OBS	DECAY	DIAM	LENGTH	LOGSTUMP	VOL	CUMVOL
1	1	15	3	L	0.05299	0.0530
2	1	10	3	L	0.02355	0.0765
3	1	10	5	L	0.03925	0.1158
4	1	10	3	L	0.02355	0.1393
5	1	10	4	L	0.03140	0.1707
6	1	40	9	L	1.13040	1.3011
7	1	30	10	L	0.70650	2.0076
8	1	30	7	L	0.49455	2.5022
9	1	10	3	L	0.02355	2.5257
10	1	10	7	L	0.05495	2.5807
11	2	40	4	L	0.50240	3.0831
12	2	30	8	L	0.56520	3.6483
13	2	90	10	L	6.35850	10.0068
14	2	30	3	L	0.21195	10.2187
15	2	20	2	L	0.06280	10.2815
16	2	20	5	L	0.15700	10.4385
17	2	75	17	L	7.50656	17.9451
18	2	20	12	L	0.37680	18.3219
19	2	60	13	L	3.67380	21.9957
20	2	30	2	L	0.14130	22.1370
21	2	30	2	L	0.14130	22.2783
22	2	30	4	L	0.28260	22.5609
23	2	20	3	L	0.09420	22.6551
24	2	15	3	L	0.05299	22.7081
25	2	30	3	L	0.21195	22.9200
26	2	80	12	L	6.02880	28.9488
27	3	30	3	L	0.21195	29.1608
28	3	40	9	L	1.13040	30.2912
29	3	80	9	L	4.52160	34.8128
30	3	30	5	L	0.35325	35.1660
31	3	15	8	L	0.14130	35.3073
32	3	35	4	L	0.38465	35.6920
33	3	60	10	L	2.82600	38.5180
34	3	50	7	L	1.37375	39.8917
35	3	70	3	L	1.15395	41.0457
36	3	70	7	L	2.69255	43.7382
37	3	60	9	L	2.54340	46.2816
38	3	50	8	L	1.57000	47.8516
39	3	60	8	L	2.26080	50.1124
40	3	30	8	L	0.56520	50.6776
41	3	90	8	L	5.08680	55.7644
42	3	30	5	L	0.35325	56.1177
43	3	35	2	L	0.19233	56.3100
44	3	35	4	L	0.38465	56.6947
45	3	70	18	L	6.92370	63.6184
46	3	15	6	L	0.10598	63.7243
47	3	30	4	L	0.28260	64.0069
48	3	40	6	L	0.75360	64.7605
49	3	60	12	L	3.39120	68.1517
50	3	30	2	L	0.14130	68.2930
51	3	50	2	L	0.39250	68.6855
52	3	30	3	L	0.21195	68.8975
53	3	50	3	L	0.58875	69.4862
54	3	50	6	L	1.17750	70.6637

15:56 Wednesday, April 1, 1992

OBS	DECAY	DIAM	LENGTH	LOGSTUMP	VOL	CUMVOL
55	3	40	2	L	0.25120	70.9149
56	3	70	5	L	1.92325	72.8382
57	3	30	3	L	0.21195	73.0501
58	3	50	3	L	0.58875	73.6389
59	3	50	1	S	0.19625	73.8351
60	3	50	6	L	1.17750	75.0126
61	3	40	5	L	0.62800	75.6406
62	3	15	4	L	0.07065	75.7113
63	3	50	3	L	0.58875	76.3000
64	3	35	1	L	0.09616	76.3962
65	3	50	3	L	0.58875	76.9850
66	3	50	1	S	0.19625	77.1812
67	3	30	6	L	0.42390	77.6051
68	3	30	5	L	0.35325	77.9584
69	3	90	3	L	1.90755	79.8659
70	3	60	7	L	1.97820	81.8441
71	3	50	18	L	3.53250	85.3766
72	3	30	8	L	0.56520	85.9418
73	3	30	3	L	0.21195	86.1538
74	3	40	4	L	0.50240	86.6562
75	3	30	3	L	0.21195	86.8681
76	3	10	4	L	0.03140	86.8995
77	3	60	6	L	1.69560	88.5951
78	3	50	1	S	0.19625	88.7914
79	3	50	1	S	0.19625	88.9876
80	3	40	4	L	0.50240	89.4900
81	3	10	5	L	0.03925	89.5293
82	3	15	4	L	0.07065	89.5999
83	3	25	4	L	0.19625	89.7962
84	4	50	1	S	0.19625	89.9924
85	4	50	1	S	0.19625	90.1887
86	4	10	3	L	0.02355	90.2122
87	4	30	2	L	0.14130	90.3535
88	4	40	1	L	0.12560	90.4791
89	4	20	4	L	0.12560	90.6047
90	4	50	4	L	0.78500	91.3897
91	4	30	3	L	0.21195	91.6017
92	4	40	8	L	1.00480	92.6065
93	4	30	2	L	0.14130	92.7478
94	4	40	3	L	0.37680	93.1246
95	4	35	3	L	0.28849	93.4130
96	4	25	4	L	0.19625	93.6093
97	4	15	5	L	0.08831	93.6976
98	4	20	4	L	0.12560	93.8232
99	4	30	2	L	0.14130	93.9645
100	4	40	3	L	0.37680	94.3413
101	4	80	2	L	1.00480	95.3461
102	4	30	3	L	0.21195	95.5581
103	4	70	2	L	0.76930	96.3274
104	4	30	3	L	0.21195	96.5393
105	4	75	3	L	1.32469	97.8640
106	4	10	4	L	0.03140	97.8954
107	4	60	2	L	0.56520	98.4606
108	4	20	3	L	0.09420	98.5548

ALBRIGHT GROVE 0.6 HA, 1992
WOODY DEBRIS: LOGS & STUMPS

15:56 Wednesday, April 1, 1992

OBS	DECAY	DIAM	LENGTH	LOGSTUMP	VOL	CUMVOL
109	4	40	5	L	0.62800	99.183
110	4	75	5	L	2.20781	101.391
111	4	30	2	L	0.14130	101.532
112	4	30	6	L	0.42390	101.956
113	4	20	5	L	0.15700	102.113
114	4	30	7	L	0.49455	102.607
115	4	15	4	L	0.07065	102.678
116	4	20	6	L	0.18840	102.866

ALBRIGHT GROVE 0.6 HA, 1992
WOODY DEBRIS: SNAGS

15:56 Wednesday, April 1, 1992

OBS	DECAY	HT	DIAM	VOL	CUMVOL
1	1	30	114	15.3028	15.3028
2	2	18	21	0.3116	15.6144
3	2	15	21	0.2596	15.8740
4	2	8	11	0.0380	15.9120
5	2	6	30	0.2120	16.1239
6	2	4	19	0.0567	16.1806
7	2	3	19	0.0425	16.2231
8	2	4	61	0.5842	16.8073
9	2	20	43	1.4515	18.2588
10	2	4	32	0.1608	18.4196
11	2	5	27	0.1431	18.5626
12	2	13	31	0.4904	19.0530
13	2	9	21	0.1558	19.2088
14	2	15	58	1.9806	21.1893
15	2	14	39	0.8358	22.0251

↑
ht in m; some of
these values
may not match
those in the
computer file.
I'd use this
hardcopy value
in those cases.

-RTB, 2017

ALBRIGHT GROVE PLOT--0.6 ha, 1992

ANNUAL RADIAL GROWTH INCREMENTS

12:16 Saturday, April 4, 1992

OBS	TAG	SP	MM	RINGS	INCR
1	1	ACRU	9.4	9	1.04444
2	4	ACRU	16.2	5	3.24000
3	5	TSCA	8.7	10	0.87000
4	15	PRSE	8.2	6	1.36667
5	23	ACRU	11.7	9	1.30000
6	33	ACRU	7.2	10	0.72000
7	36	TSCA	6.0	6	1.00000
8	37	HACA	10.6	10	1.06000
9	42	TSCA	10.3	9	1.14444
10	46	TSCA	6.1	4	1.52500
11	51	BELU	4.6	10	0.46000
12	52	MAFR	18.2	10	1.82000
13	53	TSCA	3.8	10	0.38000
14	56	TSCA	9.4	9	1.04444
15	57	LITU	6.9	10	0.69000
16	61	ACRU	9.2	8	1.15000
17	66	BELU	4.2	10	0.42000
18	65	TSCA	9.1	6	1.51667
19	68	TSCA	4.4	4	1.10000
20	69	BELU	5.4	10	0.54000
21	71	BELU	4.3	5	0.86000
22	74	BELU	9.2	8	1.15000
23	75	TSCA	11.8	10	1.18000
24	79	TSCA	9.7	10	0.97000
25	84	ACRU	11.6	10	1.16000
26	88	LITU	7.1	5	1.42000
27	87	TSCA	7.4	5	1.48000
28	96	TSCA	7.1	6	1.18333
29	101	ACRU	7.2	5	1.44000
30	102	ACRU	8.5	8	1.06250
31	113	BELU	6.3	10	0.63000
32	122	LITU	9.6	10	0.96000
33	123	BELU	3.7	5	0.74000
34	124	BELE	7.6	7	1.08571
35	127	TSCA	6.3	10	0.63000
36	131	HACA	9.6	10	0.96000
37	132	LITU	12.0	4	3.00000
38	138	TSCA	9.8	10	0.98000
39	142	ACRU	12.0	8	1.50000
40	148	TSCA	9.5	10	0.95000
41	147	HACA	8.0	8	1.00000
42	149	ACRU	11.0	10	1.10000
43	152	FRAM	12.7	7	1.81429
44	153	TSCA	11.8	10	1.18000
45	154	BELU	2.5	10	0.25000
46	157	TSCA	11.7	10	1.17000
47	160	FAGR	3.0	5	0.60000
48	167	FRAM	10.4	4	2.60000
49	174	HACA	14.3	10	1.43000
50	177	ACRU	10.1	10	1.01000
51	175	HACA	13.0	7	1.85714
52	183	HACA	6.6	10	0.66000
53	182	HACA	6.6	10	0.66000
54	187	TSCA	9.5	10	0.95000

ALBRIGHT GROVE PLOT--0.6 ha, 1992

ANNUAL RADIAL GROWTH INCREMENTS

12:16 Saturday, April 4, 1992

OBS	TAG	SP	MM	RINGS	INCR
55	191	HACA	12.2	10	1.22000
56	189	HACA	12.7	10	1.27000
57	200	ACSA	10.0	10	1.00000
58	199	HACA	13.2	10	1.32000
59	220	HACA	7.6	10	0.76000
60	222	FAGR	6.2	7	0.88571
61	227	HACA	15.3	10	1.53000
62	225	BELU	4.8	5	0.96000
63	233	TSCA	6.4	10	0.64000
64	236	FAGR	10.1	10	1.01000

ALBRIGHT GROVE PLOT--0.6 ha, 1992

TREE HEIGHTS (m) 12:16 Saturday, April 4, 1992

OBS	TAG	SP	HT
1	15	PRSE	31
2	36	TSCA	35
3	61	ACRU	37
4	56	TSCA	39
5	142	ACRU	33
6	132	LITU	42
7	187	TSCA	41
8	160	FAGR	29
9	171	LITU	45
10	168	ACRU	39
11	131	HACA	25

ALBRIGHT GROVE PLOT--0.6 ha, 1992
ANNUAL RADIAL GROWTH INCREMENTS

12:16 Saturday, April 4, 1992

Analysis Variable : INCR

SP=ACRU

N Obs	N	Minimum	Maximum	Mean	Std Dev
11	11	0.7200000	3.2400000	1.3388131	0.6656534

SP=ACSA

N Obs	N	Minimum	Maximum	Mean	Std Dev
1	1	1.0000000	1.0000000	1.0000000	.

SP=BELE

N Obs	N	Minimum	Maximum	Mean	Std Dev
1	1	1.0857143	1.0857143	1.0857143	.

SP=BELU

N Obs	N	Minimum	Maximum	Mean	Std Dev
9	9	0.2500000	1.1500000	0.6677778	0.2865649

SP=FAGR

N Obs	N	Minimum	Maximum	Mean	Std Dev
3	3	0.6000000	1.0100000	0.8319048	0.2102299

SP=FRAM

N Obs	N	Minimum	Maximum	Mean	Std Dev
2	2	1.8142857	2.6000000	2.2071429	0.5555839

Analysis Variable : INCR

----- SP=HACA -----

N Obs	N	Minimum	Maximum	Mean	Std Dev
12	12	0.6600000	1.8571429	1.1439286	0.3655144

----- SP=LITU -----

N Obs	N	Minimum	Maximum	Mean	Std Dev
4	4	0.6900000	3.0000000	1.5175000	1.0332594

----- SP=MAFR -----

N Obs	N	Minimum	Maximum	Mean	Std Dev
1	1	1.8200000	1.8200000	1.8200000	.

----- SP=PRSE -----

N Obs	N	Minimum	Maximum	Mean	Std Dev
1	1	1.3666667	1.3666667	1.3666667	.

----- SP=TSCA -----

N Obs	N	Minimum	Maximum	Mean	Std Dev
19	19	0.3800000	1.5250000	1.0470468	0.2948790



Site # 416. right
Name Busing
Team _____
Date 3-22-72
Page 1

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P. 1029-166-3

[illegible]

page 40

17
17

14

109-26
109-27

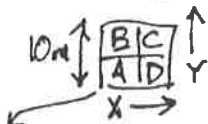
[illegible]



Site # Ailbriant
Name _____
Team _____
Date 2-9-92
Page 3

866-
999-
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999-

ID	IOxIDm	SXSm	HACA	BELU	FAGR	TSCA	TIME							CAN CL
27	A B C D	I												1
28	A B C D			I*										2
29	A B C D				I									2
30	A B C D					II								2
31	A B C D			I*										2
32	A B C D				II									2
33	A B C D													2
34	A B C D			I*										2
35	A B C D			I										2
36	A B C D	I												2
37	A B C D													2
38	A B C D													2
39	A B C D	I			I									2
		q	5	4	3	-	page totals							2



Great Smoky Mtns.
Cove Forest
TREE SAPLINGS
>BH to 2cm DBH
in 5x5m subplots

Site # Albright
Name _____
Team _____
Date 3-92
Page 4

ROAD NO. / SUBPLOT / SPECIES:

10x10m	5x5m	FAGR	HACA	MAFR															CANO CLA
40	A B C D	11	11																2 2 2 6
41	A B C D																		2 2 2 2
42	A B C D		1																1 2 1 2
43	A B C D																		2 2 2 2
44	A B C D	1																	2 2 2 2
45	A B C D																		2 2 2 2
46	A B C D	1																	2 2 2 2
47	A B C D		1																2 2 2 2
51	A B C D																		2 2 2 2
50	A B C D		1																2 2 2 2
48	A B C D																		2 2 2 2
49	A B C D																		2 2 2 2
52	A B C D																		2 2 2 2

page totals

6 5 1



Page

10x10m	SXSm	MAFR	HACA	ACSA								CANC CLA
53	A B C D											2 2 2 2
54	A B C D											6 6 6 6
55	A E F D											2 2 2 2
56	A B V A											1 1 1 1
57	B C D A	JH I										G I T 2 2 2 2 2 2 2 2
58	B C D A	I										
59	A B C D											
60	A B C D	(5)	(8)	(1)								
plot tots		7	41	4	BELO 12	TSCA 6	PRSE 1	FAGR 11				
					bon logs*							