Appendix E Forest Management

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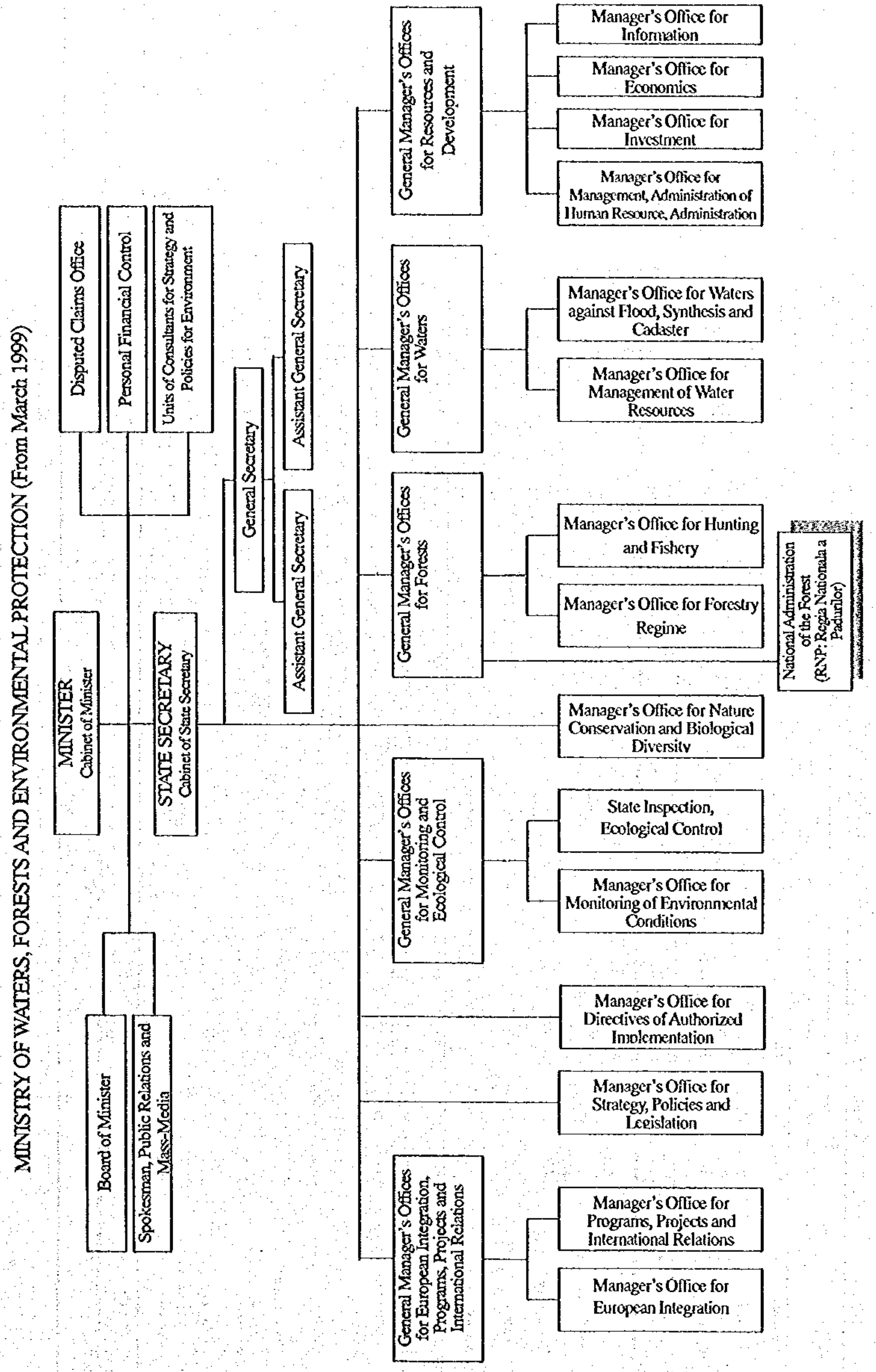


Appendix E-1 Organization Chart of Ministry of Waters, Forests and Environmental Protection from March, 1999

Appendix E-2 Area of the entire forests and damaged forests by site index and forest range office

Area	Forest Range	Entire Forests Total(ha)/(%) I	II	III	IV	V	Total	Damaged Forests Total(ha)/(%) I	II	III	IV	V	Total	Ratio(%) Total I	II	III	IV	V	Total
North Part	Vulturesti	44.2	1,138.4	6,227.7	2,196.1	396.6	10,003.0	0.0	2.8	5.8	17.4	1.2	27.3						
		0.4	11.4	62.3	22.0	4.0	100.0	0.0	10.3	21.3	63.9	4.5	100.0	0.0	0.2	0.1	0.8	0.3	0.3
	Amaradia	3.9	82.1	7,287.7	2,718.4	568.7	10,660.8	0.0	1.8	276.9	129.0	55.3	463.0						
		0.0	0.8	68.4	25.5	5.3	100.0	0.0	0.4	59.8	27.9	11.9	100.0	0.0	2.2	3.8	4.7	9.7	4.3
	Filiasi	29.7	795.4	5,269.0	2,021.4	713.2	8,828.7	0.2	6.8	194.0	166.8	89.5	457.4						
		0.3	9.0	59.7	22.9	8.1	100.0	0.1	1.5	42.4	36.5	19.6	100.0	0.8	0.9	3.7	8.3	12.5	5.2
North Part Total (ha)		77.8	2,015.9	18,784.4	6,935.9	1,678.5	29,492.5	0.2	11.4	476.7	313.3	146.0	947.7						
North Part Total (%)		0.3	6.8	63.7	23.5	5.7	100.0	0.0	1.2	50.3	33.1	15.4	100.0	0.3	0.6	2.5	4.5	8.7	3.2
Middle Part	Bals	4.3	684.0	7,198.7	2,536.2	1,009.4	11,432.6	1.3	54.7	756.8	651.5	211.7	1,676.1						
		0.0	6.0	63.0	22.2	8.8	100.0	0.1	3.3	45.2	38.9	12.6	100.0	30.7	8.0	10.5	25.7	21.0	14.7
	Slatina	293.9	1,499.1	5,452.3	1,567.7	483.6	9,296.6	0.0	5.9	449.0	188.1	94.7	737.7						
		3.2	16.1	58.6	16.9	5.2	100.0	0.0	0.8	60.9	25.5	12.8	100.0	0.0	0.4	8.2	12.0	19.6	7.9
	(Draganesti-Olt)	134.7	454.0	2,523.6	767.6	182.6	4,062.5	0.0	35.4	133.6	22.7	5.3	196.9						
		3.3	11.2	62.1	18.9	4.5	100.0	0.0	18.0	67.8	11.5	2.7	100.0	0.0	7.8	5.3	3.0	2.9	4.8
	Craiova	57.0	649.6	5,364.9	3,859.0	1,229.6	11,160.1	0.0	6.6	506.3	587.3	220.5	1,320.7						
		0.5	5.8	48.1	34.6	11.0	100.0	0.0	0.5	38.3	44.5	16.7	100.0	0.0	1.0	9.4	15.2	17.9	11.8
	Perisor	25.1	432.9	4,698.2	2,854.9	1,191.1	9,202.2	0.2	99.9	1,113.3	1,179.5	580.1	2,972.9						
		0.3	4.7	51.1	31.0	12.9	100.0	0.0	3.4	37.4	39.7	19.5	100.0	0.6	23.1	23.7	41.3	48.7	32.3
Middle Part Total (ha)		515.0	3,719.6	25,237.7	11,585.4	4,096.3	45,154.0	1.5	202.6	2,958.9	2,629.1	1,112.3	6,904.3						
Middle Part Total (%)		1.1	8.2	55.9	25.7	9.1	100.0	0.0	2.9	42.9	38.1	16.1	100.0	0.3	5.4	11.7	22.7	27.2	15.3
South Part	Caracal	108.6	278.8	1,843.5	2,312.3	1,069.3	5,612.5	0.6	2.7	36.3	92.1	87.9	219.6						
		1.9	5.0	32.8	41.2	19.1	100.0	0.3	1.2	16.5	41.9	40.0	100.0	0.6	1.0	2.0	4.0	8.2	3.9
	(Corabia)	265.1	538.9	2,037.0	560.5	195.3	3,596.8	0.8	2.5	4.9	0.0	0.0	8.2						
		7.4	15.0	56.6	15.6	5.4	100.0	9.8	30.5	59.8	0.0	0.0	100.0	0.3	0.5	0.2	0.0	0.0	0.2
	Calafat	3.2	385.2	3,221.6	1,801.2	745.3	6,156.5	0.0	0.7	45.3	57.2	17.3	120.5						
		0.1	6.3	52.3	29.3	12.1	100.0	0.0	0.6	37.6	47.5	14.4	100.0	0.0	0.2	1.4	3.2	2.3	2.0
	(Poiana Mare)	11.5	463.1	4,051.4	1,276.8	515.0	6,317.8	0.0	0.0	3.2	0.5	0.0	3.7						
		0.2	7.3	64.1	20.2	8.2	100.0	0.0	0.0	86.5	13.5	0.0	100.0	0.0	0.0	0.1	0.0	0.0	0.1
	Sadova	102.7	534.9	3,064.6	1,471.9	452.0	5,626.1	0.0	0.0	0.0	27.8	12.8	40.6						
		1.8	9.5	54.5	26.2	8.0	100.0	0.0	0.0	0.0	68.5	31.5	100.0	0.0	0.0	0.0	1.9	2.8	0.7
	(Apele Vii)	43.8	821.4	3,091.1	1,610.4	380.1	5,946.8	1.7	48.0	292.6	150.7	32.9	525.9						
		0.7	13.8	52.0	27.1	6.4	100.0	0.3	9.1	55.6	28.7	6.3	100.0	3.9	5.8	9.5	9.4	8.7	8.8
	Segarcea	138.1	710.5	3,939.4	1,662.3	691.4	7,141.7	12.9	14.4	115.5	177.7	113.1	433.5						
		1.9	9.9	55.2	23.3	9.7	100.0	3.0	3.3	26.6	41.0	26.1	100.0	9.3	2.0	2.9	10.7	16.4	6.1
South Part Total (ha)		673.0	3,732.8	21,248.6	10,695.4	4,048.4	40,398.2	16.0	68.2	497.8	506.0	264.1	1,352.0						
South Part Total (%)		1.7	9.2	52.6	26.5	10.0	100.0	1.2	5.0	36.8	37.4	19.5	100.0	2.4	1.8	2.3	4.7	6.5	3.3
Total (ha)		1,265.8	9,468.3	65,270.7	29,216.7	9,823.2	115,044.7	17.7	282.1	3,933.5	3,448.4	1,522.4	9,204.0						
Total (%)		1.1	8.2	56.7	25.4	8.5	100.0	0.2	3.1	42.7	37.5	16.5	100.0	1.4	3.0	6.0	11.8	15.5	8.0

Appendix E-3 Yield Tables

(1) Relationship between Crown Coverage Ratio and Yield Tables

Past studies in Japan have disclosed the following relationship between the crown coverage ratio and yield tables.

$\Delta Vi = f(\Delta Hi, Cci) = K(\Delta Hi + Ch)Cci$

Where,

V	:	annual increment of stand volume (m^3/ha)
ΔH	:	tree height increment (differential in tree height curves) (m)
Cci	:	crown coverage ratio at stand age of i (%)
K (m^2), Ch(m)	:	constants

Using the above relationship and yield tables prepared in Romania, the relationship between the crown coverage ratio and stand increment was established. Firstly, the values for ΔH, ΔV and Δv at different stand ages were established based on the yield tables and $\Delta V/(\Delta H + C)$ and $\Delta(V + v)/(\Delta H + C)$ which correspond to K and Cc respectively were calculated.

Value of C (through trial and error)	:	0.3 m for *Q. robur* with high leafing density 0.2 m for *Q. frainetto* with low leafing density
Value of K	:	0.3125 for *Q. robur* (seed) 0.275 for *Q. robur* (coppice), *Q. frainetto* (coppice) and *Q. cerris*

$Sr = (1/N)^{0.5}/H \cdot 10^4 (\%)$ Sr: relative distance between trees

Table 1(1)

Quercus robur (from Seed) Site 1 Cc/(ΔV/ΔH3)=80/25 ΔH3:ΔH+0.3 (m)

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	11.8	2.2	10.5	2113	18.4	22.8	0.577	118	14	5.6	1817	9	127	23	11.2	18-36
40	21.5	1.9	21.8	818	16.3	30.5	0.543	356	44	20.0	128	28	386	46	20.9	64-67
60	27.2	1.2	30.6	529	16.0	38.9	0.519	545	43	28.7	47	29	558	42	28.0	92-90
80	32.0	0.8	38.0	399	15.6	45.2	0.495	693	33	30.0	27	25	728	33	30.0	96-96
100	33.3	0.5	44.2	321	16.8	49.3	0.480	788	20	25.0	16	23	811	19	23.6	75-76
120	34.7	0.3	48.8	278	17.3	52.0	0.473	853	14	23.3	8	14	867	12	20.0	75-64
140	35.5	0.1	51.8	254	17.3	53.5	0.468	889	6	15.0	5	12	901	3	8.0	48-26

Table 1(2)

Q. robur (seed) Site 3

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	8.3	2.1	8.9	3100	21.6	17.0	0.594	91	22	9.2	3200	6	97	22	9.2	29-29
40	15.8	1.6	16.6	1088	23.7	23.5	0.565	210	34	17.9	217	16	226	35	18.4	57-59
60	20.9	1.2	24.0	657	18.7	29.7	0.545	338	32	21.3	72	20	358	32	21.3	68-68
80	24.7	0.8	30.8	478	18.5	35.1	0.528	458	27	24.5	35	17	474	27	24.5	78-78
100	27.0	0.5	26.6	368	19.3	38.7	0.515	538	17	21.3	19	15	553	16	20.0	68-64
120	28.2	0.2	40.6	313	20.0	40.5	0.511	584	8	16.0	12	12	696	7	14.0	51-45
140	28.9	0.1	43.5	280	20.7	41.6	0.507	610	6	15.0	2	5	615	3	8.0	48-26

Table 2(1)

Quercus robur (Coppice) Site 1b Cc/(ΔV/ΔH3)=80%/22 ΔH3:ΔH+0.3 (m)

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	13.6	2.4	12.4	1669	18.0	20.2	0.568	156	37	13.7	635	22	178	42	17.7	50-64
40	20.4	1.5	19.9	896	16.4	27.6	0.546	307	38	21.1	108	24	331	38	21.1	77-77
60	24.8	0.9	25.1	641	16.1	33.5	0.527	438	28	23.3	55	22	460	27	22.5	85-82
80	27.1	0.5	30.5	505	16.4	36.9	0.516	516	17	21.3	25	16	532	14	17.5	77-64
100	28.3	0.2	33.9	426	17.1	38.5	0.508	553	8	16.0	15	12	565	10	20.0	58-73

Table 2(1)

Quercus robur (Coppice) Site 2

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	11.6	2.1	11.2	1869	19.8	18.5	0.579	124	29	12.1	759	17	141	34	14.2	44-52
40	17.9	1.3	18.3	938	17.8	24.7	0.554	245	30	18.8	135	19	264	30	18.9	68-68
60	22.1	0.9	24.1	651	17.7	29.7	0.539	354	25	20.8	55	17	371	25	20.8	76-76
80	24.4	0.5	28.7	510	18.1	33.0	0.529	425	15	18.8	30	14	439	14	17.5	68-64
100	25.6	0.2	32.0	432	20.3	34.7	0.520	462	6	12.0	15	10	472	5	10.0	44-36

Table 2(3)

Quercus robur (Coppice) Site 3

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	9.6	1.9	10.2	2061	22.7	16.9	0.605	98	23	10.5	1059	12	110	29	13.2	38-48
40	15.5	1.3	16.8	991	20.4	22.0	0.562	192	25	15.6	152	16	208	24	15.0	57-55
60	19.3	0.8	22.3	675	19.7	26.4	0.550	280	21	19.1	59	13	339	20	18.2	70-66
80	21.5	0.4	26.6	523	20.3	29.1	0.542	339	11	15.7	32	11	350	11	15.7	57-57
100	22.7	0.2	29.5	448	20.8	30.6	0.539	375	7	14.0	14	6	371	6	12.0	51-44

Table 2(4)

Quercus robur (Coppice) Site 4

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	7.0	1.1	8.9	2600	28.0	15.5	0.620	73	17	12.1	1342	8	81	21	15.0	44-55
40	12.9	0.9	15.9	1066	23.7	19.6	0.572	145	19	15.8	175	13	158	19	15.8	58-57
60	16.7	0.8	20.4	712	22.4	23.3	0.558	217	17	15.5	60	10	227	15	13.6	56-49
80	18.8	0.4	24.5	547	22.7	25.8	0.552	268	10	14.3	32	8	276	9	12.9	52-47
100	19.8	0.2	27.1	468	24.3	27.0	0.550	294	5	10.0	15	5	309	5	10.0	36-36

Table 2(5)

Quercus robur Site 5

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH3	n	v	V+v	ΔVt	/ΔH3	Cc
20	5.9	1.7	8.0	2840	31.8	14.2	0.635	50	13	9.5	1483	4	54	16	8.0	35-29
40	10.4	1.1	13.8	1167	28.1	17.5	0.587	107	15	10.7	211	11	118	16	11.4	39-41
60	14.0	0.8	18.5	766	25.8	20.6	0.569	164	14	12.7	70	8	172	13	11.8	46-43
80	16.1	0.4	22.2	581	25.8	22.6	0.560	204	7	10.0	25	8	229	7	10.0	36-36
100	16.9	0.1	24.6	497	26.5	23.6	0.556	222	3	8.0	16	4	226	2	5.0	29-18

Table 3 (1)

Quercus frainetto Site 1 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	5.5	2.7	5.0	6000	23.5	-	-	41	38	13.1	-	-	41	38	13.1	48-48
15	7.3	1.8	6.4	4312	21.9	13.8	0.615	62	21	10.5	-	10	72	31	15.5	38-56
20	9.9	1.6	7.8	3228	17.8	15.5	0.594	82	20	11.1	1083	12	94	22	12.2	40-44
25	10.4	1.5	9.1	2546	18.7	17.2	0.581	104	22	12.9	683	15	119	25	14.7	47-53
30	11.9	1.5	10.5	2161	18.1	18.8	0.572	128	24	14.1	435	17	145	26	15.3	51-56
35	13.3	1.4	11.9	1838	17.5	20.4	0.578	154	26	16.3	323	18	172	27	16.7	59-61
40	14.7	1.4	13.4	1553	17.3	21.9	0.565	182	28	17.5	285	18	200	28	17.5	64-64
45	16.1	1.4	16.0	1322	17.1	23.4	0.565	213	31	19.4	231	18	231	31	19.4	71-71
50	17.4	1.3	16.5	1163	16.9	24.9	0.561	243	30	20.0	159	19	262	31	20.7	73-75
55	18.7	1.3	17.9	1051	16.4	26.5	0.555	275	32	21.3	112	15	292	30	20.0	77-73
60	19.8	1.2	19.3	956	16.3	28.0	0.552	306	31	22.1	95	17	323	31	22.1	80-80
65	20.9	1.1	20.6	883	16.1	29.4	0.548	337	31	23.8	73	16	353	31	23.8	87-87
70	21.9	1.0	21.9	814	16.0	30.7	0.544	366	29	24.1	69	16	382	29	24.1	88-88
75	22.7	0.8	13.2	751	16.1	31.8	0.542	391	25	25.0	63	15	407	25	25.0	91-91
80	23.4	0.7	24.4	699	16.2	32.7	0.540	413	22	24.4	52	15	428	21	23.3	89-85
85	24.0	0.6	25.5	657	16.2	33.6	0.534	432	19	23.8	42	15	447	19	23.8	87-87
90	24.5	0.5	26.5	622	16.3	34.3	0.532	449	17	24.3	35	15	464	17	24.3	88-88
95	25.0	0.5	27.3	595	16.4	34.8	0.531	463	14	20.0	27	15	478	14	20.0	73-73
100	25.4	0.4	28.0	573	16.4	35.3	0.529	574	11	18.3	22	15	487	11	18.3	67-67
105	25.7	0.3	28.7	552	16.6	35.8	0.525	483	9	18.0	21	14	497	8	16.0	65-58
110	25.9	0.2	29.4	532	16.7	36.8	0.524	490	7	17.5	20	13	503	6	15.0	64-55
115	26.1	0.2	30.0	513	16.9	36.3	0.522	495	5	12.5	19	12	507	4	10.0	45-36
120	26.2	0.1	30.6	496	17.1	36.5	0.521	498	3	10.0	17	11	509	2	6.7	36-24

Table 3(2)

Q. frainetto Site 2

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	4.8	2.4	4.4	6000	26.9	11.1	-	30	26	10.0	-	0	30	26	10.0	36-36
15	6.5	1.7	5.9	4600	22.7	12.9	0.644	51	21	11.6	1000	3	54	24	12.6	42-46
20	8.0	1.5	7.3	3476	21.2	14.6	0.616	72	21	12.4	1100	9	80	26	15.3	45-56
25	9.4	1.4	8.6	2776	20.2	16.1	0.595	90	18	11.3	700	14	104	24	15.0	41-55
30	10.7	1.3	10.0	2215	19.9	17.5	0.581	109	19	12.7	561	16	125	21	14.0	46-51
35	12.0	1.3	11.4	1833	19.5	18.9	0.574	130	21	14.0	362	16	146	21	14.0	51-51
40	13.3	1.3	12.7	1598	18.8	20.3	0.570	154	24	16.0	255	15	169	24	16.0	58-58
45	14.5	1.2	14.2	1373	18.6	21.7	0.566	178	24	17.1	225	16	194	25	17.9	62-65
50	15.7	1.2	15.7	1191	18.5	23.1	0.560	203	25	17.9	182	17	220	26	18.6	65-68
55	16.8	1.1	17.0	1070	18.2	24.3	0.558	228	25	19.2	121	16	244	24	18.5	70-67
60	17.8	1.0	18.3	969	18.0	25.5	0.556	253	25	20.8	101	16	269	25	20.8	76-76
65	18.7	0.9	19.6	884	18.0	26.7	0.553	277	24	21.8	85	16	293	24	21.8	79-79
70	19.5	0.8	20.9	810	18.0	27.8	0.551	300	23	23.0	74	15	315	22	22.0	84-80
75	20.3	0.8	22.1	750	18.0	28.8	0.548	322	22	22.0	60	14	336	21	21.0	80-76
80	21.0	0.7	23.3	697	18.0	29.7	0.546	342	20	22.2	53	14	356	20	22.2	81-81
85	21.6	0.6	24.3	654	18.1	30.4	0.545	359	17	21.3	43	14	373	17	21.3	77-77
90	22.1	0.5	25.3	616	18.2	31.0	0.544	373	14	20.0	38	14	387	14	20.0	73-73
95	22.5	0.4	26.1	588	18.3	31.5	0.543	385	12	20.0	28	13	398	11	18.3	73-67
100	22.8	0.3	25.9	562	18.5	31.9	0.543	395	10	20.0	25	13	408	10	20.0	73-73
105	23.1	0.3	27.6	540	18.6	32.3	0.540	403	8	16.0	22	12	415	7	14.0	58-51
110	23.3	0.2	28.3	518	18.9	32.6	0.540	410	7	17.5	22	11	421	6	15.0	64-55
115	23.5	0.2	29.0	496	19.1	32.8	0.538	415	5	12.5	22	11	426	5	12.5	40-45
120	23.6	0.1	29.6	478	19.4	32.9	0.538	418	3	10.0	18	10	428	2	6.7	36-24

Table 3(3)

Q. frainetto Site 3

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
5	2.3	2.3	2.0	6000	56.1	-		2	2	0.8	-	-	2	2	0.8	3-3
10	4.2	1.9	4.0	6000	30.7	-	-	17	15	7.1	0	0	17	15	7.1	26-26
15	5.7	1.5	5.3	5500	23.7	12.2	-	42	25	14.7	0	0	42	25	14.7	53-53
20	7.1	1.4	6.4	3914	36.0	13.7	0.648	63	21	13.1	1500	7	70	25	15.6	48-57
25	8.4	1.3	8.1	2904	22.1	15.1	0.615	78	15	10.0	1010	12	90	20	13.3	37-48
30	9.6	1.2	9.5	2296	21.7	16.3	0.594	93	15	10.7	608	14	107	17	12.1	39-44
35	10.7	1.1	10.8	1902	21.4	17.5	0.582	109	16	12.3	394	17	124	17	13.0	45-47
40	11.8	1.1	12.1	1626	21.8	18.7	0.571	126	17	13.0	276	15	131	17	13.0	47-47
45	12.9	1.1	13.4	1411	29.6	19.9	0.569	146	20	15.4	215	14	160	19	14.6	56-53
50	13.9	1.0	14.9	1227	20.5	21.1	0.568	167	21	17.5	184	14	181	21	17.5	64-64
55	14.9	1.0	16.1	1092	20.3	22.1	0.568	187	20	16.7	144	15	202	21	17.5	61-64
60	15.8	0.9	17.4	970	20.5	23.1	0.567	207	20	18.2	113	14	221	19	17.3	68-63
65	16.7	0.9	18.6	886	20.1	24.1	0.564	226	19	17.3	84	14	240	19	17.3	63-63
70	17.5	0.8	19.8	811	20.1	25.0	0.560	244	18	18.0	75	13	257	17	17.0	65-62
75	18.2	0.7	21.0	746	20.2	25.8	0.557	260	16	17.8	65	13	273	16	17.8	65-65
80	18.8	0.6	22.1	691	20.3	26.5	0.555	275	15	18.8	55	13	288	14	17.5	68-64
85	19.2	0.4	23.2	643	20.5	27.2	0.552	288	13	20.0	48	13	301	13	20.0	72-72
90	19.6	0.4	24.1	607	20.7	27.7	0.552	300	12	20.0	36	12	312	11	18.3	72-67
95	20.0	0.4	24.9	579	20.8	28.2	0.551	311	11	18.3	28	11	322	10	16.6	67-60
100	20.3	0.3	25.6	556	20.9	28.6	0.551	320	9	18.0	24	11	331	9	18.0	66-66
105	20.5	0.2	26.3	534	21.1	29.0	0.550	327	7	17.5	21	11	338	7	17.5	64-64
110	20.7	0.2	27.0	513	21.3	29.2	0.550	332	5	12.5	21	11	343	5	12.5	45-45
115	20.8	0.1	27.7	502	21.5	29.4	0.548	335	3	10.0	21	11	346	3	10.0	36-36
120	20.9	0.1	28.4	492	21.6	29.6	0.545	337	2	5.0	20	10	348	2	5.0	18-18

Table 3(4)

Q. frainetto Site 4

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	3.6	1.6	3.4	6000	35.8	-	-	9	9	5.0	0	-	9	9	5.0	18-18
15	5.0	1.4	4.9	5600	26.7	-	-	29	20	12.5	400	1	30	21	13.1	45-48
20	6.3	1.3	6.3	4097	24.8	12.7	0.637	51	22	14.7	1500	6	57	27	18.0	53-65
25	7.4	1.1	7.6	3088	24.3	13.9	0.622	64	13	10.0	1008	9	73	16	12.3	36-45
30	8.5	1.1	8.8	2459	24.0	15.0	0.611	77	13	10.0	630	11	88	15	11.5	36-42
35	9.5	1.0	10.0	2038	23.3	16.1	0.596	92	13	10.0	421	11	103	15	11.7	36-43
40	10.4	0.9	11.2	1737	23.1	17.2	0.587	105	13	11.8	301	12	117	14	12.7	43-46
45	11.3	0.9	12.5	1480	23.0	18.2	0.578	119	14	12.7	257	13	132	15	13.6	46-49
50	12.2	0.9	13.8	1273	23.0	19.1	0.571	133	14	12.7	207	13	146	14	12.7	46-46
55	13.0	0.8	15.0	1130	22.9	20.0	0.569	148	15	15.0	143	13	161	15	15.0	55-55
60	13.8	0.8	16.2	1015	22.7	20.9	0.569	164	16	15.5	115	12	176	15	15.0	56-55
65	14.5	0.7	17.3	928	22.5	21.8	0.564	179	15	15.0	97	12	191	15	15.0	55-55
70	15.2	0.7	18.4	845	22.5	22.5	0.564	193	14	14.6	83	12	205	14	14.6	61-61
75	15.8	0.6	19.5	775	22.8	23.2	0.564	206	13	16.3	70	12	218	13	16.3	68-68
80	16.3	0.5	20.6	712	23.0	23.7	0.564	217	11	15.7	63	12	229	11	15.7	50-50
85	16.7	0.4	21.6	661	23.2	24.2	0.562	227	10	16.7	51	12	239	10	16.7	61-61
90	17.1	0.4	22.4	624	23.4	24.6	0.559	236	9	15.0	37	11	247	8	13.3	55-48
95	17.4	0.3	23.2	591	23.6	25.0	0.558	243	8	16.0	33	10	253	7	14.0	58-51
100	17.7	0.3	23.9	568	23.7	24.3	0.550	250	7	14.0	28	10	260	7	14.0	51-51
105	18.0	0.3	24.6	541	23.7	25.7	0.556	256	6	12.0	22	9	265	5	10.0	44-36
110	18.2	0.2	25.2	519	24.1	26.0	0.554	261	5	12.5	22	9	270	5	12.5	45-45
115	18.3	0.1	25.8	499	24.5	26.2	0.553	265	4	13.3	20	9	274	4	13.3	48-48
120	18.4	0.1	26.4	479	24.6	26.4	0.550	267	2	5.0	20	8	275	1	3.0	18-11

Table 3(5)

Quercus frainetto Site 5

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	2.9	1.5	3.0	6000	44.5	-	-	7	6	3.5	-	-	7	6	3.5	13-13
15	4.2	1.3	4.7	5500	32.1	10.5	0.680	27	20	13.3	-	3	30	23	15.3	48-56
20	5.3	1.1	5.7	4259	28.7	11.5	0.673	41	14	10.8	1200	4	45	15	11.5	39-42
25	6.3	1.0	7.0	3316	27.6	12.6	0.642	51	10	8.3	949	7	58	13	10.8	30-39
30	7.2	0.9	8.1	2615	27.2	13.6	0.623	61	10	9.0	701	8	69	11	10.0	33-36
35	8.1	0.9	9.2	2212	26.3	14.6	0.609	72	11	10.9	403	9	81	12	10.9	40-40
40	8.9	0.8	10.3	1889	25.9	15.5	0.602	83	11	11.0	333	10	93	12	12.0	40-44
45	9.7	0.8	11.6	1621	25.6	16.4	0.591	94	11	11.0	268	10	104	11	11.0	40-40
50	10.4	0.7	12.8	1407	25.6	17.2	0.587	105	11	12.2	214	10	115	11	12.2	44-44
55	11.1	0.7	13.9	1238	25.6	18.0	0.581	116	11	12.2	169	10	126	11	12.2	44-44
60	11.8	0.7	15.0	1100	25.6	18.7	0.576	127	11	12.2	138	10	137	11	12.2	44-44
65	12.4	0.6	16.0	988	25.7	19.4	0.572	138	11	13.8	112	10	148	11	13.8	50-50
70	13.0	0.6	16.7	893	25.7	20.0	0.569	148	11	13.8	90	10	158	10	12.5	50-45
75	13.5	0.5	17.9	819	25.9	20.6	0.568	158	10	14.3	74	9	167	9	12.9	52-47
80	13.9	0.4	18.9	757	26.1	21.0	0.568	168	10	15.3	62	8	176	9	13.8	56-50
85	14.3	0.4	19.8	705	26.3	21.4	0.568	177	9	15.0	52	7	184	8	13.3	55-48
90	14.6	0.3	20.7	662	26.6	21.8	0.568	185	8	14.7	44	6	191	7	12.7	53-46
95	14.9	0.3	21.4	625	26.8	22.1	0.568	192	7	14.0	37	6	198	6	12.0	51-44
100	15.2	0.3	22.1	594	27.0	22.4	0.568	198	6	12.0	31	5	203	5	10.0	44-36
105	15.4	0.2	22.7	569	27.2	22.6	0.568	203	5	12.5	25	4	207	4	10.5	45-38
110	15.6	0.2	23.3	549	27.4	22.8	0.568	207	4	10.0	20	4	211	4	10.0	36-36
115	15.8	0.2	23.9	534	27.4	23.0	0.567	210	3	10.0	15	4	214	3	7.5	36-27
120	15.9	0.1	24.5	524	27.5	23.2	0.567	213	3	10.0	10	3	216	2	6.7	36-24

Table 4(1)

Quercus Cerris Site 1

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	7.4	3.7	6.2	6000	17.4	22.5	0.580	72	32	8.2	0	-	72	32	8.2	30-30
15	10.4	3.0	8.7	3000	17.6	16.5	0.566	97	25	7.8	1960	13	110	38	11.9	28-43
20	12.5	2.1	10.9	2032	17.7	18.9	0.520	123	26	11.3	960	25	148	38	16.5	41-60
25	14.3	1.8	12.8	1643	17.3	21.2	0.498	152	29	14.5	389	27	179	31	15.5	53-56
30	16.1	1.8	14.7	1382	16.7	23.5	0.484	183	31	15.5	261	28	211	32	16.0	56-58
35	17.7	1.6	16.5	1196	16.3	25.6	0.472	214	31	17.2	186	28	242	31	17.2	63-63
40	19.1	1.4	18.2	1054	16.1	27.4	0.466	245	31	19.4	142	27	272	30	18.8	71-68
45	20.4	1.3	20.0	927	16.1	29.1	0.461	275	30	20.0	127	25	300	28	18.7	73-68
50	21.6	1.2	21.7	830	16.1	30.7	0.456	305	30	20.5	97	22	327	27	18.6	75-68
55	22.7	1.1	23.3	753	16.1	32.2	0.456	334	29	22.3	77	21	355	28	21.5	81-78
60	23.7	1.0	24.9	686	16.1	33.4	0.458	362	28	23.3	67	21	383	28	23.3	85-85
65	24.6	0.9	26.5	626	16.2	34.5	0.459	389	27	24.5	60	19	408	25	22.7	89-83
70	25.4	0.8	28.0	576	16.4	35.5	0.459	314	25	25.0	50	18	332	24	24.0	91-87
75	26.1	0.7	29.4	536	16.5	36.4	0.459	437	23	24.5	40	16	453	21	23.3	89-85
80	26.7	0.6	30.8	501	16.7	37.3	0.459	458	21	25.0	35	14	472	19	22.8	91-83
85	27.3	0.6	32.1	470	16.9	38.0	0.459	477	19	23.8	31	13	490	18	22.5	87-82
90	27.8	0.5	33.3	443	17.1	38.6	0.459	494	17	24.3	27	12	506	16	22.9	88-83
95	28.2	0.4	34.3	421	17.3	39.1	0.459	509	15	23.6	22	11	520	14	21.5	87-78
100	28.6	0.4	35.1	403	17.4	39.5	0.459	522	13	21.7	18	10	532	12	20.0	78-73
105	28.9	0.3	35.9	389	17.5	39.9	0.458	533	11	22.0	14	8	541	9	18.0	80-65
110	29.1	0.2	36.8	379	17.6	40.3	0.456	542	9	21.5	9	6	548	7	16.3	78-59

Table 4(2)

Quercus Cerris Site 2

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	6.1	3.0	5.0	6000	21.2	-	-	58	30	9.0	0	0	58	30	9.0	33-33
15	8.7	2.6	7.6	3400	19.7	14.6	0.572	78	20	7.1	2500	11	89	30	10.7	26-39
20	11.0	2.3	9.9	2195	19.4	16.9	0.542	100	22	8.8	1300	21	121	32	12.8	32-47
25	12.6	1.6	11.7	1759	18.9	19.0	0.518	124	24	13.3	436	23	147	26	14.5	48-53
30	14.1	1.5	13.6	1455	18.6	21.1	0.498	148	24	14.1	304	24	172	25	14.7	51-53
35	15.5	1.4	15.2	1253	18.2	22.8	0.486	172	24	15.0	202	25	197	25	15.6	55-57
40	16.8	1.3	15.9	1099	18.0	24.4	0.478	196	24	16.0	154	25	221	24	16.0	58-58
45	18.0	1.2	18.5	967	17.9	26.0	0.470	220	24	17.1	132	23	243	23	16.4	62-60
50	19.2	1.2	20.1	867	17.7	27.5	0.464	245	25	17.9	100	21	266	23	16.4	65-60
55	20.3	1.1	21.6	791	17.5	29.0	0.458	270	25	19.2	76	19	289	23	17.7	70-64
60	21.3	1.0	23.1	721	17.5	30.2	0.457	294	24	20.0	70	17	311	22	18.3	73-67
65	22.1	0.8	24.6	657	17.7	31.2	0.458	316	22	21.2	64	17	333	22	21.2	77-77
70	22.9	0.8	26.1	602	17.8	32.2	0.458	338	22	22.0	55	15	353	20	20.0	80-73
75	23.6	0.7	27.4	559	17.9	33.1	0.459	359	21	23.3	43	14	373	20	22.2	85-81
80	24.2	0.6	28.7	524	18.1	33.9	0.459	377	18	22.5	35	14	391	18	22.5	82-82
85	24.7	0.5	29.8	494	18.2	34.5	0.460	393	16	22.9	30	13	406	15	21.4	83-78
90	25.1	0.4	30.9	469	18.4	35.1	0.460	407	14	23.3	25	11	418	12	20.0	85-73
95	25.4	0.3	31.8	449	18.6	35.5	0.460	419	12	22.2	20	9	428	10	18.4	81-67
100	25.7	0.3	32.6	433	18.7	35.8	0.460	429	10	20.0	17	7	436	8	16.0	73-58
105	25.9	0.2	33.5	419	18.9	36.1	0.460	437	8	18.2	14	6	443	7	15.9	67-58
110	26.1	0.2	34.3	408	19.0	36.4	0.459	443	6	15.0	11	5	448	5	12.5	55-45

Table 4(3)

Quercus Cerris Site 3

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	4.9	2.4	4.5	6000	26.3	-	-	43	23	8.8	0	0	43	23	8.8	32-32
15	7.1	2.2	6.8	3600	23.5	-	0.610	60	17	7.1	1400	8	68	25	10.4	26-38
20	9.2	2.1	8.8	2393	23.2	14.6	0.581	78	18	7.8	1200	15	93	25	10.9	28-40
25	10.7	1.5	10.6	1880	21.6	16.6	0.546	97	19	11.2	513	17	115	22	12.9	41-47
30	12.1	1.4	12.3	1546	21.0	18.4	0.521	116	19	11.9	334	19	135	20	12.5	43-45
35	13.3	1.2	13.9	1316	20.7	20.0	0.507	136	20	14.0	230	20	156	21	14.6	51-53
40	14.5	1.2	14.5	1156	20.3	21.5	0.497	156	20	14.3	160	20	176	20	14.3	51-52
45	15.6	1.1	16.9	1022	20.0	22.9	0.489	176	20	14.8	134	19	195	19	14.1	54-51
50	16.7	1.1	18.3	924	19.7	24.3	0.480	196	20	15.4	98	18	214	19	14.6	56-53
55	17.7	1.0	19.8	838	19.5	25.8	0.470	216	20	16.1	86	16	232	18	14.4	59-51
60	18.7	1.0	21.2	765	19.3	27.0	0.464	235	19	15.6	73	15	250	18	15.0	57-55
65	19.6	0.9	22.6	701	19.3	28.1	0.461	253	18	16.4	64	15	268	18	16.4	60-60
70	20.4	0.8	24.0	641	19.4	29.0	0.458	271	18	18.0	60	14	285	17	17.0	65-62
75	21.0	0.6	25.2	597	19.5	29.8	0.458	287	16	19.8	44	13	300	15	18.2	72-66
80	21.5	0.5	26.4	559	19.7	30.6	0.456	301	14	20.0	38	12	313	13	18.6	73-68
85	21.9	0.4	27.4	527	19.9	31.1	0.457	313	12	18.8	32	10	323	10	15.6	68-57
90	22.3	0.4	28.4	498	20.0	31.5	0.457	325	11	18.3	29	8	333	10	16.7	67-61
95	22.6	0.3	29.3	470	20.4	31.9	0.458	334	10	18.5	28	7	341	8	14.8	67-54
100	22.9	0.3	30.1	450	20.6	32.2	0.458	342	8	16.5	20	6	348	7	14.0	60-51
105	23.1	0.2	30.9	433	20.8	32.5	0.458	349	7	17.5	17	5	354	6	15.0	64-55
110	23.2	0.1	31.6	418	21.1	32.7	0.459	354	5	16.7	15	4	358	4	13.3	61-48

Table 4(4)
Quercus Cerris Site 4

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	3.8	1.9	3.2	6000	34.0	-	-	30	16	7.6	0	0	30	16	7.6	28-28
15	5.6	1.8	5.4	4200	27.6	-	-	44	14	7.0	1800	6	50	20	10.0	25-36
20	7.4	1.8	7.6	2733	25.8	12.3	0.648	59	15	7.5	1400	10	69	19	9.5	27-35
25	8.8	1.4	9.2	2136	24.6	14.1	0.596	74	15	9.4	597	12	86	17	10.6	34-39
30	10.1	1.3	10.7	1755	23.6	15.8	0.558	89	15	10.0	381	14	103	17	11.3	36-41
35	11.3	1.2	12.2	1478	23.0	17.3	0.536	104	15	10.7	277	16	120	17	12.1	39-44
40	12.4	1.1	13.7	1272	22.6	18.7	0.521	120	16	12.3	206	16	136	16	12.3	45-45
45	13.4	1.0	15.1	1117	22.3	20.1	0.505	136	16	12.8	155	16	152	16	12.8	47-47
50	14.4	1.0	16.6	1000	22.0	21.4	0.497	153	17	14.2	117	14	167	15	12.5	52-46
55	15.4	1.0	17.9	901	21.6	22.7	0.486	170	17	14.2	99	13	183	16	13.3	52-48
60	16.3	0.9	19.2	821	21.4	23.8	0.479	186	16	14.5	80	12	198	15	13.6	53-49
65	17.1	0.8	20.5	753	21.3	24.9	0.474	202	16	16.0	68	11	213	15	15.0	58-55
70	17.8	0.7	21.8	692	21.4	25.8	0.468	215	13	14.5	61	11	226	13	14.5	53-53
75	18.3	0.5	22.9	641	21.6	26.4	0.468	227	12	16.3	51	10	237	11	15.9	59-58
80	18.8	0.5	24.0	597	21.8	27.0	0.465	237	10	14.3	44	10	247	10	14.3	52-52
85	19.2	0.4	24.9	564	21.9	27.5	0.464	246	9	15.0	33	10	256	9	15.0	55-55
90	19.6	0.4	25.7	541	21.9	28.0	0.462	256	8	13.3	23	8	264	8	13.3	48-48
95	19.9	0.3	26.4	521	22.0	28.4	0.460	263	7	14.0	20	7	270	6	12.0	51-44
100	20.1	0.2	27.2	503	22.2	28.7	0.460	269	6	15.0	18	6	275	5	12.5	55-45
105	20.3	0.2	27.8	487	22.4	28.9	0.460	274	5	12.5	16	5	279	4	10.0	45-36
110	20.4	0.1	28.5	473	22.5	29.1	0.450	278	4	13.3	14	3	281	2	6.6	48-24

Table 4(5)
Quercus Cerris Site 5

Y	H	ΔH	D	N	Sr	G	f	V	ΔV	/ΔH2	n	v	V+v	ΔVt	/ΔH2	Cc
10	2.7	1.4	1.2	6000	47.8	-	-	18	11	6.9	0	0	18	11	6.9	25-25
15	4.2	1.5	4.8	5000	33.7	8.0	-	29	11	6.5	800	3	32	14	8.2	24-30
20	5.5	1.3	6.3	3161	32.3	9.8	0.760	41	12	8.0	1800	7	48	16	10.7	29-39
25	6.8	1.3	7.7	2500	29.4	11.5	0.677	53	12	8.0	661	9	62	14	9.3	29-34
30	8.0	1.2	9.1	2015	27.8	13.1	0.620	66	13	9.3	485	10	76	14	10.0	34-36
35	9.1	1.1	10.6	1648	27.0	14.5	0.584	79	13	10.0	367	11	90	14	10.8	36-39
40	10.1	1.0	12.0	1398	26.5	15.8	0.558	92	13	10.8	250	11	103	13	10.8	39-39
45	11.1	1.0	13.3	1230	25.7	17.1	0.537	105	13	10.8	168	11	116	13	10.8	39-39
50	12.1	1.0	14.5	1102	24.9	18.4	0.521	118	13	10.8	128	11	129	13	10.8	39-39
55	13.0	0.9	15.8	1000	24.3	19.6	0.510	131	13	11.8	102	10	141	12	10.9	43-40
60	13.8	0.8	17.0	907	24.0	20.0	0.503	143	12	12.0	93	10	153	12	12.0	44-44
65	14.5	0.7	18.2	831	23.9	21.6	0.490	155	12	13.3	76	9	164	11	12.2	48-44
70	15.2	0.7	19.3	764	23.8	22.4	0.487	166	11	12.9	67	8	174	10	11.8	47-43
75	15.7	0.5	20.4	708	23.9	23.1	0.483	176	10	14.3	56	7	183	9	12.9	52-47
80	16.1	0.4	21.3	670	24.0	23.0	0.481	185	9	15.0	38	6	191	8	13.3	55-48
85	16.5	0.4	22.1	636	24.0	24.1	0.480	193	8	13.3	24	5	198	7	11.7	48-43
90	16.8	0.3	22.8	614	24.0	24.5	0.478	200	7	14.0	22	5	205	7	14.0	51-51
95	17.1	0.3	23.4	594	24.0	24.8	0.478	206	6	12.0	20	4	210	5	11.0	44-40
100	17.3	0.2	24.0	576	24.1	25.1	0.477	211	5	12.5	18	3	214	4	10.0	45-36
105	17.5	0.2	24.6	562	24.1	25.3	0.474	215	4	10.0	14	2	217	3	8.0	36-29
110	17.6	0.1	25.2	556	24.2	25.5	0.472	217	2	6.7	6	1	219	1	3.3	12-24

(2) Yield Tables for Declined *Q. frainetto* and *Q. cerris* stands

Declined forests found in the Study Area are mainly distributed at middle and high terraces. As the site suitability conditions at these terraces are typically represented by *Q. frainetto* stands, a yield table for declined stands (unhealthy) stands was prepared, focusing on this species.

Unhealthy stands tend to show a reduced upper-story crown area of single trees, being replaced by the appearance of leafed adventitious branches at the side of the stem. As a result, the crown form has slimmed down. As only the upper-story crown contributes to the volume increment of the stem, side leafing is ignored. It is then assumed that the assimilation volume related to the increment is approximately in proportion to the projected crown area. A closed stand with a well-developed umbrella or dome-shaped upper crown has a large crown coverage ratio per unit area and its volume increment is also large. In contrast, a stand with a slim crown form has a small crown coverage ratio and its volume increment is also small.

At declined stands, the occurrence of dead trees has reduced the standing tree density, resulting in an open crown and reducing the stand increment. Stand decline can be indexed to the decline of the current and future increment. Meanwhile, the increment of the stand volume should theoretically be approximately proportional to the crown coverage ratio. It was, therefore, decided to infer the yield table for a declined stand (unhealthy stand) using the state of the crown coverage ratio as a parameter.

Annual increment of stand volume

= f (crown coverage ratio, annual tree height increment)

$$\Delta V = f(Cc, \ \Delta H + Ch)$$

$$= K \cdot Cc\,(\Delta H + Ch)$$

Where,

ΔV : increment of stand volume (m^3/ha)

Cc : crown coverage ratio (%)

Ch : constant (0.2 m for Q. frainetto)

K = 22/80 = 0.275

Decline Grade (Category of Health) and Crown Coverage Ratio

Healthy Forest : normal forest

Declined Forest (Weak) : slightly unhealthy; crown density: roughly 60%; Cc = 50%

Declined Forest (Moderate) : unhealthy; crown density: roughly 50%; Cc = 40%

Declined Forest (Strong) : very unhealthy; crown density: roughly 25-40%; Cc = 20, 30%

Cc = 0.8 (Crown density)

- The unhealthiness of declined stands is caused by the loss of air permeability due to compaction of the top soil. When rainwater is supplied to the top layer which lacks medium and large pores, a stagnant water layer lacking oxygen is formed, damaging fine roots. The occurrence of such damage at the time of rain makes forest trees unhealthy and hampers development of the crown.

- At Site Class 5, healthy stands and slightly unhealthy stands show similar values. Under the condition of poor site quality, the crown usually tends to become open because of increased competition for water between root systems in the ground rather than competition for light between trees on the ground. In the case of Site Class 5, the constant existence of a stagnant water environment due to the above-mentioned compacting of the top soil or density control to achieve an extremely low density due to emphasis on a dry environment may have made a negative contribution. It can be assumed that the root system of *Quercus* spp. growing on tableland uses water stored in fine pores in the deep base formation and it may be an idea to make the standing tree density increase towards the normal density.

Table 1(1)

Quercus frainetto Site 1 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest / Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%
															13.75		11.00		8.25		5.50
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V
10	5.5	2.7	5.0	6000	23.5	-	41	38	13.1	-	41	38	13.1	48-48	40	0	38	0	34	0	32
15	7.3	1.8	6.4	4312	21.9	0.615	62	21	10.5	10	72	31	15.5	38-56	61	8	60	6	52	4	46
20	9.9	1.6	7.8	3228	17.8	0.594	82	20	11.1	12	94	22	12.2	40-44	82	11	80	8	62	5	56
25	10.4	1.5	9.1	2546	18.7	0.581	104	22	12.9	15	119	25	14.7	47-53	104	13	100	9	76	6	66
30	11.9	1.5	10.5	2161	18.1	0.572	128	24	14.1	17	145	26	15.3	51-56	127	14	119	10	90	7	75
35	13.3	1.4	11.9	1838	17.5	0.578	154	26	16.3	18	172	27	16.7	59-60	149	16	137	11	104	8	84
40	14.7	1.4	13.4	1553	17.3	0.565	182	28	17.5	18	200	28	17.5	64-64	171	16	155	12	117	8	93
45	16.1	1.4	16.0	1322	17.1	0.565	213	31	19.4	18	231	31	19.4	71-71	193	16	172	12	130	8	101
50	17.4	1.3	16.5	1163	16.9	0.561	243	30	20.0	19	262	31	20.7	73-75	214	16	189	12	142	8	109
55	18.7	1.3	17.9	1051	16.4	0.555	275	32	21.3	15	292	30	20.0	77-73	234	16	205	12	154	8	117
60	19.8	1.2	19.3	956	16.3	0.552	306	31	22.1	17	323	31	22.1	80-80	253	15	220	12	166	7	125
65	20.9	1.1	20.6	883	16.1	0.548	337	31	23.8	16	353	31	23.8	87-87	271	15	234	11	177	7	132
70	21.9	1.0	21.9	814	16.0	0.544	366	29	24.1	16	382	29	24.1	88-88	288	14	247	11	188	7	139
75	22.7	0.8	13.2	751	16.1	0.542	391	25	25.0	15	407	25	25.0	91-91	302	14	259	10	200	7	145
80	23.4	0.7	24.4	699	16.2	0.540	413	22	24.4	15	428	21	23.3	89-85	314	14	269	10	206	6	150
85	24.0	0.6	25.5	657	16.2	0.534	432	19	23.8	15	447	19	23.8	87-87	325	14	278	10	213	6	154
90	24.5	0.5	26.5	622	16.3	0.532	449	17	24.3	15	464	17	24.3	88-88	335	14	276	10	219	6	158
95	25.0	0.5	27.3	595	16.4	0.531	463	14	20.0	15	478	14	20.0	73-73	344	13	284	10	225	6	162
100	25.4	0.4	28.0	573	16.4	0.529	574	11	18.3	15	487	11	18.3	67-67	352	13	291	10	230	6	165
105	25.7	0.3	28.7	552	16.6	0.525	483	9	18.0	14	497	8	16.0	65-58	359	12	297	9	234	6	168
110	25.9	0.2	29.4	532	16.7	0.524	490	7	17.5	13	503	6	15.0	64-55	365	12	302	9	237	5	170
115	26.1	0.2	30.0	513	16.9	0.522	495	5	12.5	12	507	4	10.0	45-36	370	11	306	8	240	5	172
120	26.2	0.1	30.6	496	17.1	0.521	498	3	10.0	11	509	2	6.7	36-24	374	10	309	7	243	4	174

Table 1(2)

Quercus Frainetto Site 2 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest / Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%
															13.75		11.00		8.25		5.50
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V
10	4.8	2.4	4.4	6000	26.9	-	30	26	10.0	0	30	26	10.0	36-36	29	0	28	0	26	0	25
15	6.5	1.7	5.9	4600	22.7	0.644	51	21	11.6	3	54	24	12.6	42-46	49	3	45	2	42	1	38
20	8.0	1.5	7.3	3476	21.2	0.616	72	21	12.4	9	80	26	15.3	45-56	71	8	64	6	56	3	50
25	9.4	1.4	8.6	2776	20.2	0.595	90	18	11.3	14	104	24	15.0	41-55	90	13	82	9	69	5	59
30	10.7	1.3	10.0	2215	19.9	0.581	109	19	12.7	16	125	21	14.0	46-51	111	15	99	10	82	5	67
35	12.0	1.3	11.4	1833	19.5	0.574	130	21	14.0	16	146	21	14.0	51-51	132	15	116	10	94	5	75
40	13.3	1.3	12.7	1598	18.8	0.570	154	24	16.0	15	169	24	16.0	58-58	152	15	132	10	106	6	83
45	14.5	1.2	14.2	1373	18.6	0.566	178	24	17.1	16	194	25	17.9	62-65	171	15	148	10	118	6	91
50	15.7	1.2	15.7	1191	18.5	0.560	203	25	17.9	17	220	26	18.6	65-68	190	16	163	10	129	6	98
55	16.8	1.1	17.0	1070	18.2	0.558	228	25	19.2	16	244	24	18.5	70-67	208	16	177	10	140	6	104
60	17.8	1.0	18.3	969	18.0	0.556	253	25	20.8	16	269	25	20.8	76-76	225	15	190	10	150	6	111
65	18.7	0.9	19.6	884	18.0	0.553	277	24	21.8	16	293	24	21.8	79-79	240	15	202	10	159	5	117
70	19.5	0.8	20.9	810	18.0	0.551	300	23	23.0	15	315	22	22.0	84-80	254	14	213	10	167	5	123
75	20.3	0.8	22.1	750	18.0	0.548	322	22	22.0	14	336	21	21.0	80-76	268	14	224	10	175	5	128
80	21.0	0.7	23.3	697	18.0	0.546	342	20	22.2	14	356	20	22.2	81-81	280	13	234	10	182	5	133
85	21.6	0.6	24.3	654	18.1	0.545	359	17	21.3	14	373	17	21.3	77-77	291	13	243	9	189	5	137
90	22.1	0.5	25.3	616	18.2	0.544	373	14	20.0	14	387	14	20.0	73-73	301	13	251	9	195	5	141
95	22.5	0.4	26.1	588	18.3	0.543	385	12	20.0	13	398	11	18.3	73-67	309	12	258	8	200	4	144
100	22.8	0.3	25.9	562	18.5	0.543	395	10	20.0	13	408	10	20.0	73-73	316	12	264	8	204	4	147
105	23.1	0.3	27.6	540	18.6	0.540	403	8	16.0	12	415	7	14.0	58-51	323	11	269	8	208	4	150
110	23.3	0.2	28.3	518	18.9	0.540	410	7	17.5	11	421	6	15.0	64-55	329	10	274	7	211	4	152
115	23.5	0.2	29.0	496	19.1	0.538	415	5	12.5	11	426	5	12.5	40-45	334	10	278	7	214	4	154
120	23.6	0.1	29.6	478	19.4	0.538	418	3	10.0	10	428	2	6.7	36-24	338	9	281	6	217	4	156

Table 1(3)

Quercus Frainetto Site 3 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest															Declined Forest						
Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%
															13.75		11.00		8.25		5.50
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V
5	2.3	2.3	2.0	6000	56.1	-	2	2	0.8	-	2	2	0.8	36222	2	0	2	0	2	0	2
10	4.2	1.9	4.0	6000	30.7	-	17	15	7.1	0	17	15	7.1	25-26	17	0	17	0	17	0	16
15	5.7	1.5	5.3	5500	23.7	-	41	24	14.1	2	43	26	15.3	51-56	40	1	36	1	32	0	24
20	7.1	1.4	6.4	3914	36.0	0.648	63	22	13.8	8	70	27	16.9	50-61	62	7	56	5	46	4	33
25	8.4	1.3	8.1	2904	22.1	0.615	78	15	10.0	12	90	20	13.3	36-48	73	11	73	9	59	7	42
30	9.6	1.2	9.5	2296	21.7	0.594	93	15	10.7	14	107	17	12.1	39-44	92	12	88	10	71	8	50
35	10.7	1.1	10.8	1902	21.4	0.582	109	16	12.3	17	124	17	13.0	45-47	110	13	103	10	83	9	57
40	11.8	1.1	12.1	1626	21.8	0.571	126	17	13.0	15	131	17	13.0	47-47	128	13	117	11	94	9	64
45	12.9	1.1	13.4	1411	29.6	0.569	146	20	15.4	14	160	19	14.6	56-53	146	13	131	11	105	9	71
50	13.9	1.0	14.9	1227	20.5	0.568	167	21	17.5	14	181	21	17.5	64-64	163	13	145	10	116	9	78
55	14.9	1.0	16.1	1092	20.3	0.568	187	20	16.7	15	202	21	17.5	61-64	179	13	157	10	126	9	85
60	15.8	0.9	17.4	970	20.5	0.567	207	20	18.2	14	221	19	17.3	68-63	194	13	170	10	136	9	91
65	16.7	0.9	18.6	886	20.1	0.564	226	19	17.3	14	240	19	17.3	63-63	209	13	182	10	145	9	97
70	17.5	0.8	19.8	811	20.1	0.560	244	18	18.0	13	257	17	17.0	65-62	213	12	193	9	153	9	103
75	18.2	0.7	21.0	746	20.2	0.557	260	16	17.8	13	273	16	17.8	65-65	225	12	203	9	161	9	108
80	18.8	0.6	22.1	691	20.3	0.555	275	15	18.8	13	288	14	17.5	68-64	236	12	212	9	168	8	112
85	19.2	0.4	23.2	643	20.5	0.552	288	13	20.0	13	301	13	20.0	72-72	246	12	220	8	174	7	116
90	19.6	0.4	24.1	607	20.7	0.552	300	12	20.0	12	312	11	18.3	72-67	254	11	227	8	178	7	119
95	20.0	0.4	24.9	578	20.8	0.551	311	11	18.3	11	322	10	16.6	67-60	262	10	234	7	182	6	122
100	20.3	0.3	25.6	559	20.9	0.551	320	9	18.0	11	331	9	18.0	66-66	269	10	240	6	186	6	125
105	20.5	0.2	26.3	531	21.1	0.550	327	7	17.5	11	338	7	17.5	64-64	275	10	245	5	189	6	127
110	20.7	0.2	27.0	513	21.3	0.550	332	5	12.5	11	343	5	12.5	45-45	280	10	249	4	192	6	129
115	20.8	0.1	27.7	502	21.5	0.548	335	3	10.0	11	346	3	10.0	36-36	284	9	252	3	195	5	131
120	20.9	0.1	28.4	492	21.6	0.545	337	2	5.0	10	348	2	5.0	18-18	288	9	255	2	197	5	133

Table 1(4)

Quercus Frainetto Site 4 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest															Declined Forest						
Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%
															13.75		11.00		8.25		5.50
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V
10	3.6	1.6	3.4	6000	35.8	-	9	9	5.0	-	9	9	5.0	18-18	9	0	9	0	9	0	9
15	5.0	1.4	4.9	5600	26.7	-	29	20	12.5	1	30	21	13.1	45-48	29	1	26	1	22	1	18
20	6.3	1.3	6.3	4097	24.8	0.637	51	22	14.7	6	57	27	18.0	53-65	51	6	48	5	34	3	26
25	7.4	1.1	7.6	3088	24.3	0.622	64	13	10.0	9	73	16	12.3	36-45	64	9	61	7	45	4	33
30	8.5	1.1	8.8	2459	24.0	0.611	77	13	10.0	11	88	15	11.5	36-42	77	10	75	8	56	5	40
35	9.5	1.0	10.0	2038	23.3	0.596	92	13	10.0	11	103	15	11.7	36-43	92	11	88	9	66	5	47
40	10.4	0.9	11.2	1737	23.1	0.587	105	13	11.8	12	117	14	12.7	43-46	105	12	100	9	75	6	53
45	11.3	0.9	12.5	1480	23.0	0.578	119	14	12.7	13	132	15	13.6	46-49	119	12	112	9	84	6	59
50	12.2	0.9	13.8	1273	23.0	0.571	133	14	12.7	13	146	14	12.7	46-46	133	13	124	9	93	6	65
55	13.0	0.8	15.0	1130	22.9	0.569	148	15	15.0	13	161	15	15.0	55-55	147	13	136	9	101	6	71
60	13.8	0.8	16.2	1015	22.7	0.569	164	16	15.5	12	176	15	15.0	56-55	161	12	147	9	109	6	76
65	14.5	0.7	17.3	928	22.5	0.564	179	15	15.0	12	191	15	15.0	55-55	173	12	157	9	117	6	81
70	15.2	0.7	18.4	845	22.5	0.564	193	14	14.6	12	205	14	14.6	61-61	185	12	167	9	124	6	86
75	15.8	0.6	19.5	775	22.8	0.564	206	13	16.3	12	218	13	16.3	68-68	196	12	176	9	130	6	90
80	16.3	0.5	20.6	712	23.0	0.564	217	11	15.7	12	229	11	15.7	50-50	206	12	184	9	136	6	94
85	16.7	0.4	21.6	661	23.2	0.562	227	10	16.7	12	239	10	16.7	61-61	214	11	191	8	141	5	97
90	17.1	0.4	22.4	624	23.4	0.559	236	9	15.0	11	247	8	13.3	55-48	222	10	197	8	147	5	100
95	17.4	0.3	23.2	591	23.6	0.558	243	8	16.0	10	253	7	14.0	58-51	229	10	203	7	151	5	103
100	17.7	0.3	23.9	568	23.7	0.550	250	7	14.0	10	260	7	14.0	51-51	236	9	208	7	155	5	106
105	18.0	0.3	24.6	541	23.7	0.556	256	6	12.0	9	265	5	10.0	44-36	243	9	213	6	159	4	108
110	18.2	0.2	25.2	519	24.1	0.554	261	5	12.5	9	270	5	12.5	45-45	249	8	217	6	162	4	110
115	18.3	0.1	25.8	499	24.5	0.553	265	4	13.3	9	274	4	13.3	48-48	253	8	220	6	165	4	112
120	18.4	0.1	26.4	479	24.6	0.550	267	2	5.0	8	275	1	3.0	36482	257	8	223	6	167	3	113

Table 1(5)
Quercus Frainetto Site 5 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest															Declined Forest							
Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%
															13.75		11.00		8.25		5.50
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V
10	2.9	1.5	3.0	6000	44.5	-	7	6	3.5	-	7	6	3.5	13-13	-	-	7	0	7	0	7
15	4.2	1.3	4.7	5500	32.1	0.68	27	20	13.3	3	30	23	15.3	48-56	-	-	27	3	26	3	25
20	5.3	1.1	5.7	4259	28.7	0.673	41	14	10.8	4	45	15	11.5	39-42	-	-	41	4	36	4	32
25	6.3	1.0	7.0	3316	27.6	0.642	51	10	8.3	7	58	13	10.8	30-39	-	-	51	6	47	5	39
30	7.2	0.9	8.1	2615	27.2	0.623	61	10	9.0	8	69	11	10.0	33-36	-	-	61	7	57	5	45
35	8.1	0.9	9.2	2212	26.3	0.609	72	11	10.9	9	81	12	10.9	40-40	-	-	72	7	66	5	51
40	8.9	0.8	10.3	1867	25.9	0.602	83	11	11.0	10	93	12	12.0	40-44	-	-	83	8	75	6	57
45	9.7	0.8	11.6	1547	25.6	0.591	94	11	11.0	10	104	11	11.0	40-40	-	-	94	8	83	6	62
50	10.4	0.7	12.8	1333	25.6	0.587	105	11	12.2	10	115	11	12.2	44-44	-	-	104	8	90	6	67
55	11.1	0.7	13.9	1184	25.6	0.581	116	11	12.2	10	126	11	12.2	44-44	-	-	114	8	97	6	72
60	11.8	0.7	15.0	1056	25.6	0.576	127	11	12.2	10	137	11	12.2	44-44	-	-	124	8	104	6	77
65	12.4	0.6	16.0	966	25.7	0.572	138	11	13.8	10	148	11	13.8	50-50	-	-	132	8	111	6	82
70	13.0	0.6	16.7	893	25.7	0.569	148	10	12.5	10	158	10	12.5	45-45	-	-	140	8	118	6	86
75	13.5	0.5	17.9	817	25.9	0.568	158	10	14.3	10	168	10	14.3	50-52	-	-	147	8	124	5	90
80	13.9	0.4	18.9	744	26.1	0.568	166	8	13.3	10	176	8	13.3	52-48	-	-	154	8	129	5	93
85	14.3	0.4	19.8	695	26.3	0.568	174	8	13.3	10	184	7	11.7	48-43	-	-	160	8	134	5	96
90	14.6	0.3	20.7	647	26.6	0.568	181	7	14.0	9	190	7	14.0	51-51	-	-	166	7	138	5	99
95	14.9	0.3	21.4	614	26.8	0.568	187	6	12.0	9	196	6	12.0	44-44	-	-	172	7	142	5	102
100	15.2	0.3	22.1	584	27.0	0.568	193	6	12.0	8	301	6	12.0	44-44	-	-	177	7	146	4	104
105	15.4	0.2	22.7	558	27.2	0.568	198	5	12.5	8	206	5	12.5	45-45	-	-	181	6	149	4	106
110	15.6	0.2	23.3	535	27.4	0.568	202	4	10.0	8	210	4	10.0	36-36	-	-	185	5	152	3	108
115	15.8	0.2	23.9	517	27.4	0.567	205	4	10.0	7	213	3	7.5	36-27	-	-	189	5	155	3	110
120	15.9	0.1	24.5	492	27.5	0.567	209	3	10.0	6	215	2	6.7	36-24	-	-	192	4	157	3	112

Table 2(1)
Quercus cerris Site 1 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest															Declined Forest								
Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%	
															13.75		11.00		8.25		5.50	
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V	v
10	7.4	3.7	6.2	6000	17.4	0.58	72	32	8.2	-	72	32	8.2	30-30	65	0	58	0	32	0	21	0
15	10.4	3.0	8.7	3000	17.6	0.566	97	25	7.8	13	110	38	11.9	28-43	89	12	80	10	58	27	39	8
20	12.5	2.1	10.9	2032	17.7	0.52	123	26	11.3	25	148	38	16.5	41-60	115	26	103	20	77	23	52	11
25	14.3	1.8	12.8	1643	17.3	0.498	152	29	14.5	27	179	31	15.5	53-56	147	27	124	23	94	20	63	11
30	16.1	1.8	14.7	1382	16.7	0.484	183	31	15.5	28	211	32	16.0	56-58	178	28	148	25	110	15	74	13
35	17.7	1.6	16.5	1196	16.3	0.472	214	31	17.2	28	242	31	17.2	63-63	203	26	168	21	125	15	84	11
40	19.1	1.4	18.2	1054	16.1	0.465	245	31	19.4	27	272	30	18.8	71-68	225	23	186	19	138	14	93	10
45	20.4	1.3	20.0	927	16.1	0.461	275	30	20.0	25	300	28	18.7	73-68	246	22	203	18	150	13	101	9
50	21.6	1.2	21.7	830	16.1	0.456	305	30	20.5	22	327	27	18.6	75-68	265	20	218	16	162	12	109	9
55	22.7	1.1	23.3	753	16.1	0.456	334	29	22.3	21	355	28	21.5	81-78	283	19	232	15	173	11	116	8
60	23.7	1.0	24.9	686	16.1	0.458	362	28	23.3	21	383	28	23.3	85-85	300	18	245	13	183	10	123	8
65	24.6	0.9	26.5	626	16.2	0.459	389	27	24.5	19	408	25	22.7	89-83	315	15	257	12	192	9	129	6
70	25.4	0.8	28.0	576	16.4	0.459	314	25	25.0	18	332	24	24.0	91-87	329	14	268	11	200	8	134	6
75	26.1	0.7	29.4	536	16.5	0.459	437	23	24.5	16	453	21	23.3	89-85	342	12	278	10	207	7	139	5
80	26.7	0.6	30.8	501	16.7	0.459	458	21	25.0	14	472	19	22.8	91-83	353	11	287	9	214	7	143	4
85	27.3	0.6	32.1	470	16.9	0.459	477	19	23.8	13	490	18	22.5	87-82	364	10	276	8	221	6	147	4
90	27.8	0.5	33.3	443	17.1	0.459	494	17	24.3	12	506	16	22.9	88-83	374	9	284	7	227	5	151	3
95	28.2	0.4	34.3	421	17.3	0.459	509	15	23.6	11	520	14	21.5	87-78	383	8	290	6	232	4	154	3
100	28.6	0.4	35.1	403	17.4	0.459	522	13	21.7	10	532	12	20.0	78-73	391	7	296	5	237	4	157	2
105	28.9	0.3	35.9	389	17.5	0.458	533	11	22.0	8	541	9	18.0	80-65	398	6	301	5	241	3	160	2
110	29.1	0.2	36.8	379	17.6	0.456	542	9	21.5	6	548	7	16.3	78-59	404	5	305	4	244	3	162	2

Table 2(2)

Quercus cerris Site 2 $Cc/(\Delta V/\Delta H2) = 80\%/22$ $\Delta H2 : \Delta H + 0.2$ (m)

Normal Forest | Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%	
															13.75		11.00		8.25		5.50	
	m	m	cm	n/ha	%		m^3	m^3		m^3	m^3	m^3		%	V	v	V	v	V	v	V	v
10	6.1	3.0	5.0	6000	21.2		58	30	9.0	0.0	58	30	9.0	33-33	54	0	48	0	42	0	32	0
15	8.7	2.6	7.6	3400	19.7		78	20	7.1	11.0	89	30	10.7	26-39	72	11	64	10	63	9	48	8
20	11.0	2.3	9.9	2195	19.4		100	22	8.8	21.0	121	32	12.8	32-47	104	21	92	20	83	17	64	14
25	12.6	1.6	11.7	1759	18.9		124	24	13.3	23.0	147	26	14.5	48-53	130	23	113	20	98	17	74	11
30	14.1	1.5	13.6	1455	18.6		148	24	14.1	24.0	172	25	14.7	51-53	153	23	132	20	112	15	83	10
35	15.5	1.4	15.2	1253	18.2		172	24	15.0	25.0	197	25	15.6	55-57	175	23	150	19	125	14	92	10
40	16.8	1.3	15.9	1099	18.0		196	24	16.0	25.0	221	24	16.0	58-58	196	22	167	18	137	13	100	9
45	18.0	1.2	18.5	967	17.9		220	24	17.1	23.0	243	23	16.4	62-60	216	21	183	16	149	12	108	9
50	19.2	1.2	20.1	867	17.7		245	25	17.9	21.0	266	23	16.4	65-60	235	20	198	15	160	11	116	8
55	20.3	1.1	21.6	791	17.5		270	25	19.2	19.0	289	23	17.7	70-64	253	19	212	14	171	10	123	7
60	21.3	1.0	23.1	721	17.5		294	24	20.0	17.0	311	22	18.3	73-67	270	18	225	13	181	9	130	7
65	22.1	0.8	24.6	657	17.7		316	22	21.2	17.0	333	22	21.2	77-77	285	16	237	12	190	9	136	6
70	22.9	0.8	26.1	602	17.8		338	22	22.0	15.0	353	20	20.0	80-73	294	14	248	11	198	8	141	5
75	23.6	0.7	27.4	559	17.9		359	21	23.3	14.0	373	20	22.2	85-81	306	12	258	10	205	7	146	5
80	24.2	0.6	28.7	524	18.1		377	18	22.5	14.0	391	18	22.5	82-82	317	11	267	9	211	6	150	4
85	24.7	0.5	29.8	494	18.2		393	16	22.9	13.0	406	15	21.4	83-78	327	9	275	7	217	5	154	3
90	25.1	0.4	30.9	469	18.4		407	14	23.3	11.0	418	12	20.0	85-73	335	8	282	6	222	4	157	3
95	25.4	0.3	31.8	449	18.6		419	12	22.2	9.0	428	10	18.4	81-67	342	7	288	5	226	4	160	2
100	25.7	0.3	32.6	433	18.7		429	10	20.0	7.0	436	8	16.0	73-58	349	6	293	4	230	3	163	2
105	25.9	0.2	33.5	419	18.9		437	8	18.2	6.0	443	7	15.9	67-58	355	5	297	4	233	2	165	1
110	26.1	0.2	34.3	408	19.0		443	6	15.0	5.0	448	5	12.5	55-45	360	4	301	3	236	2	167	1

Table 2(3)

Quercus cerris Site 3 $Cc/(\Delta V/\Delta H2) = 80\%/22$ $\Delta H2 : \Delta H + 0.2$ (m)

Normal Forest | Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%	
															13.75		11.00		8.25		5.50	
	m	m	cm	n/ha	%		m^3	m^3		m^3	m^3	m^3		%	V	v	V	v	V	v	V	v
10	4.9	2.4	4.5	6000	26.3	-	43	23	8.8	0	43	23	8.8	32-32	38	0	34	0	28	0	24	0
15	7.1	2.2	6.8	3600	23.5	0.61	60	17	7.1	8	68	25	10.4	26-38	54	7	48	6	42	5	36	5
20	9.2	2.1	8.8	2393	23.2	0.581	78	18	7.8	15	93	25	10.9	28-40	72	14	64	13	56	12	48	9
25	10.7	1.5	10.6	1880	21.6	0.546	97	19	11.2	17	115	22	12.9	41-47	90	16	80	15	70	14	57	9
30	12.1	1.4	12.3	1546	21.0	0.521	116	19	11.9	19	135	20	12.5	43-45	107	18	97	16	83	14	66	9
35	13.3	1.2	13.9	1316	20.7	0.507	136	20	14.0	20	156	21	14.6	51-53	127	20	113	16	95	13	84	9
40	14.5	1.2	14.5	1156	20.3	0.497	156	20	14.3	20	176	20	14.3	51-52	146	20	128	16	106	12	92	8
45	15.6	1.1	16.9	1022	20.0	0.489	176	20	14.8	19	195	19	14.1	54-51	164	19	143	15	117	12	99	8
50	16.7	1.1	18.3	924	19.7	0.48	196	20	15.4	18	214	19	14.6	56-53	181	18	157	15	127	11	106	8
55	17.7	1.0	19.8	838	19.5	0.47	216	20	16.1	16	232	18	14.4	59-51	198	17	170	14	137	11	113	7
60	18.7	1.0	21.2	765	19.3	0.464	235	19	15.6	15	250	18	15.0	57-55	204	16	183	13	146	10	120	6
65	19.6	0.9	22.6	701	19.3	0.461	253	18	16.4	15	268	18	16.4	60-60	219	15	194	11	156	9	126	6
70	20.4	0.8	24.0	641	19.4	0.458	271	18	18.0	14	285	17	17.0	65-62	232	13	205	10	164	8	131	5
75	21.0	0.6	25.2	597	19.5	0.458	287	16	19.8	13	300	15	18.2	72-66	243	11	214	9	171	7	136	5
80	21.5	0.5	26.4	559	19.7	0.456	301	14	20.0	12	313	13	18.6	73-68	253	10	222	8	177	6	140	4
85	21.9	0.4	27.4	527	19.9	0.457	313	12	18.8	10	323	10	15.6	68-57	262	9	229	7	182	5	143	3
90	22.3	0.4	28.4	498	20.0	0.457	325	11	18.3	8	333	10	16.7	67-61	270	8	235	6	186	5	146	3
95	22.6	0.3	29.3	470	20.4	0.458	334	10	18.5	7	341	8	14.8	67-54	277	7	241	5	190	4	149	2
100	22.9	0.3	30.1	450	20.6	0.458	342	8	16.5	6	348	7	14.0	60-51	283	6	246	4	194	3	152	2
105	23.1	0.2	30.9	433	20.8	0.458	349	7	17.5	5	354	6	15.0	64-55	289	5	250	4	197	3	154	2
110	23.2	0.1	31.6	418	21.1	0.459	354	5	16.7	4	358	4	13.3	61-48	293	4	253	3	199	2	156	2

Table 2(4)
Quercus cerris Site 4 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest / Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%	
															13.75		11.00		8.25		5.50	
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V	v
10	3.8	1.9	3.2	6000	34.0	-	30	16	7.6	0	30	16	7.6	28-28	28	0	24	0	21	0	18	0
15	5.6	1.8	5.4	4200	27.6	-	44	14	7.0	6	50	20	10.0	25-36	42	6	38	5	31	4	26	3
20	7.4	1.8	7.6	2733	25.8	0.648	59	15	7.5	10	69	19	9.5	27-35	54	10	50	9	42	7	36	6
25	8.8	1.4	9.2	2136	24.6	0.596	74	15	9.4	12	86	17	10.6	34-39	60	12	63	11	55	10	43	8
30	10.1	1.3	10.7	1755	23.6	0.558	89	15	10.0	14	103	17	11.3	36-41	85	14	78	13	67	12	51	9
35	11.3	1.2	12.2	1478	23.0	0.536	104	15	10.7	16	120	17	12.1	39-44	99	16	93	15	79	13	59	9
40	12.4	1.1	13.7	1272	22.6	0.521	120	16	12.3	16	136	16	12.3	45-45	114	16	107	15	90	12	66	8
45	13.4	1.0	15.1	1117	22.3	0.505	136	16	12.8	16	152	16	12.8	47-47	129	16	121	15	100	11	73	7
50	14.4	1.0	16.6	1000	22.0	0.497	153	17	14.2	14	167	15	12.5	52-46	146	17	134	14	110	10	80	7
55	15.4	1.0	17.9	901	21.6	0.486	170	17	14.2	13	183	16	13.3	52-48	162	16	147	13	120	10	86	6
60	16.3	0.9	19.2	821	21.4	0.479	186	16	14.5	12	198	15	13.6	53-49	177	15	159	12	129	9	92	6
65	17.1	0.8	20.5	753	21.3	0.474	202	16	16.0	11	213	15	15.0	58-55	191	14	170	11	137	8	98	6
70	17.8	0.7	21.8	692	21.4	0.468	215	13	14.5	11	226	13	14.5	53-53	203	12	180	10	144	7	103	5
75	18.3	0.5	22.9	641	21.6	0.468	227	12	16.3	10	237	11	15.9	59-58	214	11	189	9	151	6	107	4
80	18.8	0.5	24.0	597	21.8	0.465	237	10	14.3	10	247	10	14.3	52-52	224	10	197	8	157	6	111	4
85	19.2	0.4	24.9	564	21.9	0.464	246	9	15.0	10	256	9	15.0	55-55	232	9	204	7	162	5	114	3
90	19.6	0.4	25.7	541	21.9	0.462	256	8	13.3	8	264	8	13.3	48-48	240	8	210	6	167	5	117	3
95	19.9	0.3	26.4	521	22.0	0.46	263	7	14.0	7	270	6	12.0	51-44	247	7	215	5	171	4	120	2
100	20.1	0.2	27.2	503	22.2	0.46	269	6	15.0	6	275	5	12.5	55-45	252	5	220	4	174	3	122	2
105	20.3	0.2	27.8	487	22.4	0.46	274	5	12.5	5	279	4	10.0	45-36	257	5	224	4	177	3	122	2
110	20.4	0.1	28.5	473	22.5	0.45	278	4	13.3	3	281	2	6.6	48-24	261	4	227	3	179	2	124	1

Table 2(5)
Quercus cerris Site 5 Cc/(ΔV/ΔH2) = 80%/22 ΔH2 : ΔH + 0.2 (m)

Normal Forest / Declined Forest

Y	H	ΔH	D	N	Sr	f	V	ΔV	/ΔH2	v	V+v	ΔVt	/ΔH2	Cc	Cc:50%		Cc40%		Cc:30%		Cc20%	
															13.75		11.00		8.25		5.50	
	m	m	cm	n/ha	%		m³	m³		m³	m³	m³		%	V	v	V	v	V	v	V	v
10	2.7	1.4	1.2	6000	47.8	-	18	11	6.9	0	18	11	6.9	25-25	-	-	16	0	14	0	12	0
15	4.2	1.5	4.8	5000	33.7	-	29	11	6.5	3	32	14	8.2	24-30	-	-	26	3	22	2	18	1
20	5.5	1.3	6.3	3161	32.3	0.76	41	12	8.0	7	48	16	10.7	29-39	-	-	35	7	30	7	26	7
25	6.8	1.3	7.7	2500	29.4	0.677	53	12	8.0	9	62	14	9.3	29-34	-	-	48	9	43	9	34	8
30	8.0	1.2	9.1	2015	27.8	0.62	66	13	9.3	10	76	14	10.0	34-36	-	-	62	10	56	10	41	8
35	9.1	1.1	10.6	1648	27.0	0.584	79	13	10.0	11	90	14	10.8	36-39	-	-	73	11	67	11	48	8
40	10.1	1.0	12.0	1398	26.5	0.558	92	13	10.8	11	103	13	10.8	39-39	-	-	85	11	78	11	55	7
45	11.1	1.0	13.3	1230	25.7	0.537	105	13	10.8	11	116	13	10.8	39-39	-	-	96	11	88	10	61	7
50	12.1	1.0	14.5	1102	24.9	0.521	118	13	10.8	11	129	13	10.8	39-39	-	-	108	11	98	10	87	6
55	13.0	0.9	15.8	1000	24.3	0.51	131	13	11.8	10	141	12	10.9	43-40	-	-	120	10	107	9	93	6
60	13.8	0.8	17.0	907	24.0	0.503	143	12	12.0	10	153	12	12.0	44-44	-	-	131	10	115	9	98	6
65	14.5	0.7	18.2	831	23.9	0.49	155	12	13.3	9	164	11	12.2	48-44	-	-	141	10	123	8	103	5
70	15.2	0.7	19.3	764	23.8	0.487	166	11	12.9	8	174	10	11.8	47-43	-	-	150	9	130	7	108	5
75	15.7	0.5	20.4	708	23.9	0.483	176	10	14.3	7	183	9	12.9	52-47	-	-	158	8	136	6	112	4
80	16.1	0.4	21.3	670	24.0	0.481	185	9	15.0	6	191	8	13.3	55-48	-	-	165	7	141	5	116	4
85	16.5	0.4	22.1	636	24.0	0.48	193	8	13.3	5	198	7	11.7	48-43	-	-	171	6	145	5	119	3
90	16.8	0.3	22.8	614	24.0	0.478	200	7	14.0	5	205	7	14.0	51-51	-	-	177	6	149	4	121	3
95	17.1	0.3	23.4	594	24.0	0.478	206	6	12.0	4	210	5	11.0	44-40	-	-	182	5	153	4	124	2
100	17.3	0.2	24.0	576	24.1	0.477	211	5	12.5	3	214	4	10.0	45-36	-	-	186	4	156	3	126	2
105	17.5	0.2	24.6	562	24.1	0.474	215	4	10.0	2	217	3	8.0	36-29	-	-	190	4	159	3	128	2
110	17.6	0.1	25.2	556	24.2	0.472	217	2	6.7	1	219	1	3.3	36518	-	-	192	2	161	2	130	1

Researched data on forest relation between environment and forest growth

Sound forest and declined forest were surveyed by The Study Team in the Southern Plain of Romania.

List of Items :

Location : Name of Village or Region

Topography : Land Condition

Kinds of Tree : Q.f :*Quercus frainetto*, Q.c : *Quercus cerris*, Q.r : *Quercus robur*
Q.ru : *Quercus rubra*, Q.ped : *Quercus pedunculiflora* ,Q.pe : *Quercus petraea*
R.p : *Robinia pseudoacacia*, F.e : *Fraxinus excelsior*

Age : Forest Age : Years old .

v : Volume of a Forest Tree.

N. : Numbers of Forest Tree / ha. (including declined trees)
d789 : numbers of declined trees

V : Volume of Forest Stand : m^3/ha. (including declined trees)
d234 : volume of declined trees

DD : Degree of Declined Forest Trees in Volume : %
(decayed volume + declined volume) / Total volume before Damage

Sr : Relative Stance between Trees : $100 \cdot (10^4/N)^{0.5}/H$
including declined trees

Cc : Forest Crown Closure : Area Coverness of Forest Crown : %
recent value, (value of before damage)

Lower Plant : Coverness of Lower Plant : %
(Sh: Shrub, W: Weeds, Sw: Short Weeds < 0.3m)

LF : Coverness of Fallen Leaves Layer : Coverness of Litter Layer.: %

Er : Degree of Surface Erosion Area : %

Appendix E-3(3)-1 Researched Forest Data

No.	Location	Topography	Kinds of trees	Age	H m	D cm	v m^3	N Dec/Σ n/ha	V Dec/Σ m^3/ha	Deg Dec. %	Sr %	Cc rc(bf) %	Low Plant Sh %	Low Plant W %	Low Plant Sw %	LF %	Er %
1	Parsas	up-Hill	Q.spp	50	9-12	15-17	0.11	1750	193	0	22	67	80	0	20	95	0
2	Perisor	Hi.Terr.	Q.f	60	12-13	17-20	0.17	1200	204	0	23	75	5	0	70	95	0
3	Perisor	Hi.Terr.	Q.f	60	8-13	16-20	0.2	850	170	0	30	70	15	50	10	95	0
4	Poiana Mare	Dil.Dune	R.p	30	12-14	15-20	0.16	1200	192	0	22	75	5	5	0	90	5
5	Poiana Mare	Dil.Dune	R.p	30	11-14	17-25	0.22	1100	242	0	23	75	0	30	15	95	0
6	Poiana Mare	Dil.Dune	R.p	30	13-16	18-26	0.26	800	208	0	24	75	5	35	40	85	5
7	Poiana Mare	Dil.Dune	R.p	15	4-7	3-9	0.001	4300	45	0	25	80	0	22	15	95	0
8	Poiana Mare	Dil.Dune	R.p	15	4-8	4-8	0.001	3600	40	0	24	70	3	35	20	80	7
9	Poiana Mare	FloodPlain	Poplus spp.	35	14-16	15-26	0.26	420	109	0	33	65	0	3	35	70	12
10	Poiana Mare	FloodPlain	Pop.Cp70%	10	6-9	9-15	0.05	1150	63	0	37	80	0	3	20	92	3
11	Tunai Donau	Low.Terr.	Q.r	200	16-24	42-80	2.36	320	735	0	17	60	2	35	80	90	0
12	Voineasa	M.Terr.	Q.c.Seed.	60	11-13	21-29	0.25	400	100	0	42	40	17	5	85	80	7
13	Recovita	M.Terr.	Q.r	60	12-15	16-27	0.22	800	172	0	25	82	0	0	3	98	0
14	Recovita	M.Terr.	Q.r	60	11-14	17-22	0.21	530	109	0	33	65	0	0	80	94	0
15	Brebeni NW	M.Terr Exp	Q.r	60	8-12	10-17	0.09	950	87	0	30	55	40	20	15	90	0
16	Malu Mare	M.Terr.	R.p	25	13-17	14-22	0.18	630	115	13	25	60(63)	30	15	15	70	10
								decay :90/ha	Young :70/ha								
17	Secui	Low Terr.	Alnus	40	18-20	22-34	0.43	530	228	0	25	65	30	28	22	98	0
18	Bratovoesti	Low Terr.	Q.r+F.e	70	24-32	30-70	2.18	330	719	0	18	68	33	23	12	97	0
19	Bratovoesti	M.L.Terr.	Q.r+F.e	60	17-19	19-30	0.43	150	70	0	45	33	-	-	65	98	0
20	Bratovoesti	Low Terr.	Q.r	75	26-29	36-47	1.58	330	521	0	20	63	8	5	5	95	0
			F.e	75	23-26	25-30	0.70	120	84		37	27					
			Tilia		15-20	15-20	0.21	210/690	44/649		38	15/92					
21	Bratovoesti	Low Terr.	Q.r+F.e	75	22-27	36-56	1.54	340	524	0	21	64	10	10	10	95	0
			Acea.Tilia.		14-17	15-18	0.18	210/550	38/562		43	24/82					
22	Ostroveni	Low Terr.	Q.spp+F.e	55	17-24	27-52	1.04	425	442	0	22	68	23	18	18	95	0
23	Ostroveni	M.L.Terr.	Q.spp+F.e	40	8-16	7-20	0.08	440	36	0	33	42	-	-	60	98	0
24	Seaca de padure E	High Terr.	Q.f+Q.c	70	11-13	19-28	0.20	650	130	0	31	38	20	15	15	95	0
						decayed 85 17m^3	declined 570 120m	d655/735	137/148	93	30	15(42)	Strong thinning				
25	Seaca de padure E	High Terr.	Q.f+Q.c	70	11-14	19-30	0.21	850	168	6	26	61	18	20	15	95	0
						decayed 12 2m^3	declined 50 8m^3	d62/862	d10/171	6	26	59(62)					
26	Seaca de padure M	Flat in For.	Q.f	90	16-18	21-35	0.51	d110/490	d49/250	20	27	56(62)	10	10	75	95	0
27	Plenita	High Terr.	Q.c	50	10-14	14-19	0.16	550	88	34	33	48	10	40	50	90	0
						decayed 230 35m^3	declined 50 8m^3	d280/780	d43/125	34	28	42(55)	Strong thinning				
28	Plenita	High Terr.	Q.c	70	12-15	20-32	0.31	d125/1230	d35/381	9	20	64(68)	10	30	55	90	0
29	DOLJ NW	Hilly Plateau	Q.r	90	23	56	2.14	420	880	0	16	68	15	10	25	95	0
30	DOLJ NW	Hilly Plateau	Q.r	30	13	15	0.12	1600	190	0	19	80	0	0	15	90	0
31	Totea	Hill Slope 25°	Q.r	80	18-24	22-32	0.52	290	148	0	28	50	16	18	38	90	0
32	Totea	Hill Slope 30°	Q.r	80	20-24	19-25	0.46	550	253	0	19	80	15	15	50	85	5
33	Totea	up GentleSlope	Q.r	80	14-22	11-24	0.30	580	174	0	19	75	10	20	45	95	0

Appendix E-3(3)-1 Researched Forest Data

	Location	Topography	Kinds of trees	Age	H	D	v	N Dec/Σ	V Dec/Σ	Deg Dec.	Sr	Cc rc(bf)	Low Plant Sh	Low Plant W	Low Plant Sw	LF	Er
					m	cm	m^3	n/ha	m^3/ha	%	%	%	%	%	%	%	%
34	Cosoveni	Mid.Terr.	Q.f	80	11-13	16-22	0.15	1100	165	0	22	75	10	25	30	95	0
35	Cosoveni	Mid.Terr.	Q.f	80	12-14	14-17	0.13	1050	140	0	24	58	70	25	5	95	0
						decayed 60,7m^3	declined 130,19m^3	d190/1110	d26/152	17	23	50(61)					
36	Cosoveni	Mid.Terr.	Q.f	70	11-12	11-14	0.14	590	85	0	35	32	75	20	10	95	0
						decayed 110,7m^3	declined 180,22m^3	d290/700	d29/98	30	31	26(35)					
37	Cosoveni	Mid.Terr.	Q.f	80	11-13	15-22	0.14	830	115	0	33	29	5	85	30	95	0
						decayed 200,16m^3	declined 80,10m^3	d280/1030	d26/131	20	22	25(32)					
38	Cosoveni	Mid.Terr.	Q.f	70	8-10	12-16	0.08	890	70	0	36	38	15	35	50	95	0
						decayed 90,7m^3	declined 200,14m^3	d290/1020	d21/78	27	33	33(42)					
32	Cosoveni	Mid.Terr.	Q.f	80	12-14	16-23	0.18	830	150	0	26	36	40	29	40	80	0
						decayed 120,14m^3	declined 420,72m^3	d540/950	d86/165	52	24	29(42)					
33	Cosoveni	Mid.Terr	Q.f	70	10-13	12-18	0.10	930	92	0	27	37	8	12	75	95	0
						decayed 150,10m^3	declined 330,28m^3	d480/1080	d38/104	37	25	30(40)					
34	Cosoveni	Mid.Terr.	Q.f	70	11-14	14-20	0.11	540	58	0	33	40	38	28	6	95	0
						decayed 180,14m^3	declined 240,24m^3	d420/720	d38/74	51	28	35(53)					
35	Cosoveni	Mid.Terr.	Q.f	80	11-16	15-26	0.16	820	131	0	25	54	22	23	42	95	0
						decayed 60,8m^3	declined 500,80m^3	d560/880	d88/141	62	23	28(60)					
36	Fintinele	Roll Plat.	Q.ru	20	11-13	12-18	0.106	1550	110	0	21	75	8	11	9	98	0
37	Varvoru	Low Terrc.	Q.spp+F.e	35	18-27	18-26	0.37	960	352	0	13	78	11	5	12	98	0
38	Podari E	Foot Hill	Q.f	55	10-12	14-20	0.13	d470/1350	d46/176	26	24	57(67)	0	90	20	98	0
39	Podari E	Foot Hill	Q.c	65	14-16	16-24	0.27	950	257	0	21	67	0	70	20	98	0
40	Podari E	Foot Hill	Q.c	65	12-14	15-23	0.23	d70/850	d15/218	7	26	56(60)	0	65	40	98	0
41	Podari E	High Terr.	Q.f+Q.c	50	10-13	11-18	0.12	d350/1050	d30/130	23	25	59(68)	0	65	40	98	0
42	Cirligei E	Plat.E Edge	Q.f	65	18	25	0.39	510	230	0	23	55	20	35	15	98	0
43	Cirligei E	M.Plat.cvex.	Q.f	65	18	24	0.37	650	241	0	22	62	10	40	20	95	0
44	Cirligei E	Plat.For.Edge E	Q.f	55	10-12	14-20	0.17	d480/900	d80/165	48	29	50(68)	10	19	19	90	0
45	Cirligei E	inner 40m abv	Q.c	65	14-16	16-24	0.28	980	266	0	21	67	0	70	20	98	0
46	Cirligei E	Plat.For.Edge W	Q.c	65	12-14	16-24	0.26	1050	370	0	23	75	10	20	15	95	0
47	Cirligei SE	Slope Plat.	Q.c	65	12-14	15-22	0.19	d55/860	d8/165	6	26	58(60)	10	65	20	90	5
48	Cirligei SE	Slope Plat.	Q.f	65	13-18	18-24	0.26	800	210	0	21	63	10	30	15	95	0
49	Cirligei SE	Slope Plat.	Q.c	90	15-19	70-82	2.60	226	580	0	37	65	10	35	15	95	0
50	Cirligei SE	Plat For.Edge	Q.c	50	10-13	11-18	0.12	d30/1050	d3/130	2	26	63(64)	0	75	20	95	0
51	Bucovat S	Plat.Flat	Q.c	75	13-16	18-28	0.32	d65/600	d18/200	9	27	47(50)	5	35	20	85	0
52	Bucovat S	flat Plat.	Q.f	85	15-17	18-32	0.42	650	273	0	24	62	0	20	15	95	0
53	Bucovat S	flat Plat.	Q.c	55	13-16	12-20	0.18	d270/730	d36/122	30	25	38(50)	0	55	15	95	0
54	Bucovat S	Plat Slope S	Q.c	70	16-18	20-28	0.34	d120/850	d35/292	12	20	52(56)	0	35	25	90	5
55	Bucovat S	Slope,grazing	Q.f	80	18-22	26-32	0.49	d18/736	d23/355	6	16	60(62)	0	35	5	75	15
56	Bucovat S	Sholder Slope	Q.f	60	13-15	14-18	0.14	d210/820	d25/117	21	24	36(42)	0	45	20	90	5
57	Bucovat S	Plat.Flat	Q.f	100	10-14	15-23	0.18	430	80	0	40	43	25	10	15	95	0
58	Bucovat S	Plat.Flat	Q.f	65	10-12	15-18	0.12	d350/850	d36/102	36	31	40(58)	10	10	35	90	0
59	Bucovat SE	Plat flat Edge	Q.f	75	14-16	20-25	0.3	d380/640	d93/193	48	26	30(45)	35	30	15	90	0

Appendix E-3(3)-1 Researched Forest Data

	Location	Topography	Kinds of trees	Age	H m	D cm	v m^3	N Dec/ Σ n/ha	V Dec/ Σ m^3/ha	Deg Dec. %	Sr %	Cc rc(bf) %	Low Plant Sh %	Low Plant W %	Low Plant Sw %	LF %	Er %
60	Bucovat SE	Plat flat Edge	Q.f	45	10-13	10-14	0.08	d30/1100	d2/ 88	3	25	62(64)	0	35	25	95	0
61	Bucovat SE	Plat flat Edge	Q.f	75	17-20	20-26	0.33	820	271	0	18	63	10	70	20	95	0
62	Bucovat SE	Plat flat Edge	Q.f	75	17-19	19-26	0.31	d180/520	d55/162	34	24	42(57)	15	65	25	95	0
63	Criva SW	Plat flat Edge	Q.f	85	7-11	21-30	0.43	d360/840	d145/360	40	37	27(37)	10	40	25	95	0
64	Criva SW	Plat.Flat	Q.f	75	14-16	18-30	0.34	d250/540	d75/170	44	28	28(39)	10	25	20	90	0
65	Criva SW	Plat.Flat	Q.f	40	7-10	9-16	0.065	d610/2060	d16/58	28	24	56(68)	5	30	10	95	0
66	Criva SW	Plat.Flat	Q.f	80	9-13	14-20	0.13	d250/770	d28/100	28	30	44(57)	7	25	25	95	0
67	Bucovat N	Roll.Plat	Q.f>Q.c	70	15-19	15-22	0.28	1100	308	0	17	69	5	70	30	98	0
68	Bucovat N	Pl.Vall.Slope	Q.f+Q.c.	70	18-22	18-24	0.35	820	280	0	17	63	7	20	15	90	3
69	Bucovat N	Shold.V.Slope	Q.f+Q.c.	70	15-17	17-19	0.20	880	175	0	21	70	4	15	90	98	0
70	Bucovat N	Shold.Plt.Edge	Q.f+Q.c.	85	7-11	19-28	0.19	d40/650	d8/120	7	38	49(52)	7	20	35	98	0
71	Bucovat N	Shold.Plt.	Q.f+Q.c.	85	10-11	20-30	0.26	d30/530	d7/138	5	41	45(47)	5	20	20	98	0
72	Criva	ValleyFloo rPlt.	Q.c	85	20-25	21-34	0.69	700	483	0	16	65	3	15	75	98	0
73	Criva	Shold Vall Plt.	Q.f	85	18-24	18-35	0.48	670	302	0	17	65	23	40	4	98	0
74	Criva	Hill up Slope	Q.f	40	9-12	9-17	0.05	1450	75	0	24	75	10	25	25	95	0
75	Criva	Hill Slope	Q.f	95	19-24	26-40	0.59	530	327	0	20	60	22	5	35	95	0
76	Geblshi	flat Plat.	Q.f	65	10-14	16-26	0.22	d70/650	d15/143	10	30	48(51)	15	12	25	90	0
77	DOLJ W	Secu Hill up Slp.	Q.f+Q.c.	75	10-13	19-30	0.23	d80/640	d17/146	12	33	41(45)	10	18	10	90	0
78	Seaca de padure	Plat.EdgeNE	Q.f	65	10-14	11-22	0.08	d170/880	d13/72	18	26	48(53)	12	35	30	90	5
79	Seaca de padure	flatPlat.Edge E	Q.f	75	11-13	15-24	0.17	d440/1140	d70/195	36	24	40(50)	0	25	50	95	5
80	Seaca de padure	flatPlat in50m	Q.f	75	14-17	15-25	0.19	d140/1120	d24/213	11	19	57(63)	10	10	55	95	0
81	Seaca de padure	flatPlat in90m	Q.f	75	17-21	16-25	0.28	d95/880	d26/242	11	17	62(65)	8	20	45	95	0
82	Verbicioara N	fltPlt.Edge	Q.f	90	15-20	22-36	0.50	d76/550	d32/360	8	22	66(70)	15	25	50	98	0
83	Verbicioara N	flatPlt.Edge 15m	Q.f	90	17	31	0.54	d65/285	d38/157	24	35	24(30)	10	10	35	85	5
84	Verbicioara N	flatPlt. Edge 25m	Q.f	90	18	28	0.48	d30/250	d14/122	11	36	25(27)	10	15	50	85	7
85	Verbicioara N	flatPlt. Edge 35m	Q.f	90	18	28	0.48	d200/360	d94/174	54	29	36(59)	20	35	40	98	0
86	Verbiciara NE	flatPt.Edge 10m	Q.f	90	12-19	20-30	0.45	d52/410	d22/183	12	28	52(58)	15	20	70	95	0
87	Verbiciara NE	flatPt.Edge 30m	Q.f	90	16-20	20-34	0.48	d25/410	d12/194	6	26	55(57)	10	25	50	98	0
88	Verbiciara NE	flatPt.Edge in50m	Q.f	90	16-21	20-32	0.58	d35/350	d19/203	9	26	50(53)	15	25	45	98	0
89	Verbiciara NE	flatPt.Edge in70m	Q.f	90	18-21	22-36	0.54	d50/460	d26/243	11	24	60(65)	10	25	40	98	0
90	Verbicioara N	flat in90m	Q.f	90	17-20	26-40	0.65	435	285	0	25	70	15	25	40	98	0
91	Verbicioara N	Edge E 15m	Q.c	90	16	20-36	0.53	d26/340	d13/170	8	33	42(45)	15	35	40	95	0
92	Verbicioara N	Edge W 20m	Q.c	70	8-10	16-18	0.11	d85/670	d13/ 75	17	42	36(40)	10	40	35	95	0
93	Verbicioara N	Edge W 40m	Q.c	70	10-12	18-25	0.24	d70/380	d15/ 92	16	44	34(41)	10	40	35	95	0
94	Pd Plnica	flatPlat Edge	Q.f+Q.c	70	10-14	14-19	0.16	d55/550	d 8/ 87	9	33	45(47)	5	60	40	90	0
95	Pd Plnica	flatPlat Edge	Q.f+Q.c	80	12-15	16-34	0.36	d125/1280	d36/381	10	20	61(65)	3	12	10	95	0
96	Calopor	Field DoublCrwn	Q.f	80	15-18	20-28	0.40	d20/660	d 8/264	3	23	51(53)	45	6	95	95	0
		Middl Crown ley.		50	12-16	14-18	0.16	390	62	0	33	19	Total:326m^3				
97	Calopor S	Flat EdgeS	Q.f	80	14-17	17-22	0.23	d120/400	d25/93	27	31	25(29)	40	10	10	95	0
98	Calopor S	Flat EdgeS	F.Rbn. Q.f	80	15-18	17-25	0.38	d80/440	d30/152	20	28	48(55)	35	15	10	95	0
99	Calopor S	Flat Edge	Wide crown, Q.f	80	15-18	18-25	0.40	d20/410	d 9/185	5	29	53(55)	40	15	5	95	0
100	Calopor	Flat inFor.W.C.	Q.f	80	18-20	18-28	0.42	460	193	0	24	58	40	15	6	95	0
[illegible]	[illegible]	[illegible]	[illegible]	35	12-13	16-24	0.16	d70/780	d11/115	10	28	56(62)	5	25	10	95	0

Appendix E-3(3)-1 Researched Forest Data

	Location	Topography	Kinds of trees	Age	H	D	v	N Dec/Σ	V Dec/Σ	Deg Dec.	Sr	Cc rc(bf)	Low Plant Sh	W	Sw	LF	Er
					m	cm	m^3	n/ha	m^3/ha	%	%	%	%	%	%	%	%
102	Poiana Mare	Dune	R.p	20	11-14	14-20	0.145	d15/980	d2/148	2	24	74(75)	8	15	5	90	0
103	Poiana Mare	Dune	R.p	20	12-16	14-24	0.20	d15/850	d2/167	1	23	74(75)	5	55	10	95	0
104	Poiana Mare	Low Terrace	Q.r	180	16-26	57-90	3.52	81	286	0	46	33	15	35	10	95	0
105	Poiana Mare	Low Terrace	Q.r	65	19-22	22-44	0.75	540	406	0	20	72	15	35	5	90	5
106	Poiana Mare	Low Terrace	Q.r	75	16-25	28-58	1.30	430	560	0	20	65	0	30	30	95	0
107	Apele Vii	Low Terr.Sand	Q.r	55	12-14	16-25	0.25	d550/850	d130/215	60	21	38(68)	0	25	50	75	7
108	Apele Vii	Dune on M.Terr.	R.p	25	14-18	15-26	0.26	980	250	0	19	70	0	5	5	85	5
109	Apele Vii	Dune on M.Terr.	R.p	25	13-15	20-25	0.22	d360/780	d75/172	44	25	38(55)	0	22	12	90	5
110	Apele Vii	Dune on M.Terr.	R.p	25	11-16	18-25	0.22	d120/980	d38/216	18	21	62(70)	0	10	20	85	5
111	Apele Vii	Dune on M.Terr.	R.p	20	10-13	11-16	0.09	d96/1150	d9/105	9	24	64(70)	0	10	60	95	0
112	Apele Vii	Dune;concave	R.p	25	10-14	11-18	0.10	250/1800	d26/172	15	18	72(80)	0	10	30	80	10
113	Apele Vii	Dune(M.Ter)	Coppice.R.p	30	12-14	16-20	0.14	d150/1050	d21/150	14	23	60(68)	0	15	30	90	0
114	Apele Vii	Dune(M.Ter)	Coppice.R.p	35	11-14	13-18	0.15	d75/680	d11/105	10	29	54(60)	0	4	85	90	0
115	Apele Vii	Flat Dune	R.p	20	10-14	12-22	0.13	d85/765	d10/98	10	30	38(44)	0	10	12	98	0
116	Apele Vii	Flat Dune	R.p	35	11-16	15-24	0.19	d100/380	d18/75	24	37	35(45)	0	12	10	95	0
117	Apele Vii	Slope Dune	R.p	15	7-12	10-16	0.07	d670/1820	d42/126	33	22	48(60)	0	10	10	90	5
118	Apele Vii	Slope Dune	R.p	20	9-12	9-15	0.09	d390/1640	d32/146	22	22	45(55)	0	15	10	95	0
119	Bucovat NW	VallySlope	F.e+Q.r	70	24-28	34-54	0.52	340	500	0	23	78	10	40	25	95	0
120	Bucovat NW	VallySlope	Q.r+F.e	50	17-18	18-22	0.26	660	159	0	22	65	15	30	40	90	4
121	Bucovat NW	VallySlope	Q.c	80	16-18	28-32	0.50	d70/420	d35/220	16	28	55	60	10	10	90	0
122	Bucovat NW	VallySlope	Q.f	35	6-8	9-15	0.06	d75/1230	d4/66	6	39	43(46)	20	15	30	90	5
123	Bucovat NW	VallySlope	Q.c	75	18-21	20-26	0.38	d95/780	d46/304	12	18	57	30	15	65	95	0
124	Craiova	Low Terr.	Q.r	140	28-32	55-75	3.65	260	950	0	20	60	18	25	45	95	0
125	Bals S	Mid.Terr.Slop.	Q.f	60	11-12	20-29	0.23	250	35	0	55	35	26	20	20	70	15
126	Bals S	slight Slope	Q.f+Q.pet	70	10-12	15-21	0.15	d160/600	d23/90	28	37	44(55)	12	15	65	80	10
127	Bals S	Flat Mid.Terr	Q.f	60	9-15	13-21	0.17	d220/1030	35/170	21	23	56(66)	10	20	55	95	0
128	Bals N	Flat Mid.Terr	Q.f	110	17-21	32-55	1.01	240	241	0	34	36	28	15	25	96	0
129	Bals N	VallyFlr.	Tilia+Acea+Q.spp	50	12-13	15-20	0.13	1100	136	0	25	68	15	10	15	95	0
130	Bals SW	Valley.Floor	Q.pet.	60	20-23	27-32	0.68	380	258	0	23	55	35	30	30	80	5
131	Bals SW	Slope Plat W	Q.f	80	12-18	24-36	0.50	d12/ 48	d4/24	17	82	14(16)	10	60	45	95	0
132	Bals SW	upPlt.Slp.EdgeE	Q.f	70	10-12	14-20	0.11	d220/720	d23/89	26	34	48(57)	15	45	35	95	0
133	Bals SW	upPlt.Slp. 20m E	Q.f	70	11-13	12-26	0.17	d150/390	d6/70	9	42	34(36)	20	40	35	95	0
134	Bals SW	upPlt.Slp. 40m E	Q.f	80	12-14	12-36	0.19	d220/550	d40/106	38	33	32(44)	15	35	45	80	0
135	Bals SW	upPlt.Slp. 60m E	Q.f	70	12-15	12-27	0.18	d170/450	d27/81	33	33	36(45)	15	20	30	90	5
136	Bals SW	upPlt.Slp. 80m E	Q.f	70	12-15	12-26	0.17	d320/530	d53/90	47	31	34(53)	20	20	30	85	8
137	Bals SW	upPlt.Slp. 100m E	Q.f	70	13-15	16-23	0.18	d60/420	d30/258	11	35	48(53)	10	30	30	85	8
138	Bals S	Vall Head EdgeS	Q.f	80	15-17	25-36	0.50	620	310	0	24	62	20	16	70	98	0
139	Bals	Mid.Flat.SeedMother	Q.f	150	17-22	20-42	0.82	d41/320	d30/265	11	26	30(32)	5	25	40	95	0
140	Bals	Mid.Roll.Terr.	Q.f	5	4	4	-	6000	-	0	33	55	-	-	-	90	0
141	Bals	Mid.Roll.Terr.	Q.f	30	8-9	8-10	0.03	2200	60	0	25	70	0	7	9	90	0
142	Bals	Mid.Roll.Terr.	Q.f	50	10-13	10-14	0.08	1450	110	0	22	70	10	10	20	95	0
143	Bals	Mid.Roll.Terr.	Q.f	145	24-29	50-72	3.08	230	708	0	24	75	15	10	25	90	0

Appendix E-3(3)-1 Researched Forest Data

No.	Location	Topography	Kinds of trees	Age	H	D	v	N	V	Deg	Sr	Cc	Low Plant			LF	Er
								Dec/ Σ	Dec/ Σ	Dec.		rc(bf)	Sh	W	Sw		
					m	cm	m^3	n/ha	m^3/ha	%	%	%	%	%	%	%	%
144	Scornicesti	High Terr	Q.f	70	10-14	10-18	0.112	d160/1470	d10/162	6	20	76(80)	5	28	3	92	0
145	Resca	Low Terr.	Q.r	90	23-28	28-37	0.98	370	363	0	20	60	20	10	5	95	0
			Tilia,Acc.		16-19	16-20	0.23	170/540	39/402	-	43	25					
146	Resca	Low Terr.	Q.r	130	24-28	48-62	2.57	310	796	0	22	62	15	10	10	95	0
147	Corabia	flat Plat/Dune	Q.ped	70	17-24	26-54	1.13	380	422	0	23	67	12	25	10	90	0
148	Seaca Optasani	Roll.M.Terr.	Carpn.	30	7-12	7-13	0.039	2300	90	0	19	85	15	5	28	90	0
			Carp:90%,Acea:8%,Q.r:2%		Low tree Carp:75%,Acea:25%												
149	Seaca Optasani	Roll.M.Terr.	Q.f	80	18-22	30-48	0.96	d30/210	d26/169	15	35	43(49)	10	30	40	90	0
150	Seaca Optasani	Roll.M.Terr.	Q.f	20	10	12	0.06	1550	93	0	26	58	0	0	20	95	0
151	Seaca Optasani	Flat Seed Mom	Q.f	130	18-23	28-46	1.05	d125/420	d112/421	27	23	54(67)	15	10	70	95	0
152	Seaca Optasani	Flat Seed Mom	Q.f	90	18-20	28-36	0.58	d110/390	d58/220	26	27	52(62)	10	15	55	95	0
153	Topana	Slpe Plateau	Q.f	110	17-24	20-30	0.50	540	270	0	20	75	18	10	15	90	0
154	Topana	Flat Plateau	Q.f	110	19-20	21-31	0.46	440	222	0	23	60	15	10	65	95	0
155	Topana	Plateau	Q.f	90	18-24	18-42	0.77	550	423	0	19	63	7	10	15	98	0
156	Bolintin	Low Terr.	Q.r	140	25-35	30-80	2.05	310	630	0	19	68	5	25	30	95	0
157	Bolintin	Low Terr.	Tilia	100	21-25	30-40	0.84	360	302	-	22	65	18	12	30	95	0
			Q.r	130	28-33	65-85	5.12	90/450	460/762	0	34	28/80					
158	Bolintin	Low Terr.	Q.r	130	28-34	60-80	3.82	d8/150	d26/570	4	26	51(53)	22	8	8	96	0
			Tilia	100	18-24	24-32	0.60	310/460	186/656		26	42					
159	ICAS For.	Low Terr	Q.r	80	21-26	20-38	0.84	380	320	0	22	50	10	8	15	95	0
			Tilia		12-18	10-18	0.14	420/800	60/380	-	30	40/83					
160	Bucharest	Low Terr	Q.r	90	22-25	32-38	1.04	380	395	0	22	57	18	10	10	95	0
161	Bucharest	Low Terr	Q.r	90	22-27	26-32	0.82	550	451	0	18	65	10	10	75	95	0
162	Bucharest	Low Terr	Q.r	90	25-29	26-30	0.82	135	111	0	31	40	12	15	65	95	0
			Tilia		17-26	15-26	0.45	220/355	100/211	-	29	50/75					
163	Bucharest	Low Terr	Q.r	90	25-29	28-34	0.96	350	336	0	19	60	30	10	10	95	0
			Tilia		17-21	22-28	0.48	160/510	77/412	-	40	30/75					
164	Bucharest	Low Terr	Q.r	100	22-28	32-42	1.24	280	347	0	23	58	35	12	10	90	0
			Tilia		18-24	26-32	0.67	340/520	228/575	-	29	40/80					
165	Bucharest	Low Terr	Q.r	75	25-27	26-34	0.92	310	285	0	22	60	30	15	5	95	0
			Tilia		10-15	12-20	0.16	150/460	24/309		60	20/70					
166	Bucharest	Low Terr	Q.r	85	25-29	34-41	1.30	290	377	0	22	65	25	10	5	90	0
			Tilia		13-16	13-18	0.13	180/470	23/400		51	25/75					

Appendix E-4 Underlying Thinking of CO_2 Fixation Volume Calculation

The areas of declined forests in the total forest areas of Olt and Dolj Counties are shown in Table 1. Among these declined forests, the areas of *Quercus* spp. forests and *R. pseudoacacia* forests which show a particularly high level of damage were established by site quality and damage grade and the CO_2 fixation volumes in these forests were then calculated (Table 2). Using Table 2, the CO_2 volume that could be fixed in individual forests at the standard final cutting age was calculated. The numerical values required for this calculation are listed below.

- Carbon (C_6; molecular weight: 72) content in cellulose ($C_6H_{10}O_5$; molecular weight: 162) = 0.4444

- Specific gravity of wood (carbon content: 15%): *Q. frainetto*: 0.86; *Q. cerris*: 0.81; *Q. robur*: 0.77; *R. pseudoacacia*: 0.82

- Wood shrinkage is not considered as the weight of the root system is ignored.

- Oxygen fixation volume in stand (/ha) = 0.85 (stand volume x specific gravity) (carbon content)

- Value of fixed carbon: At present, this value is under consideration in the form of a carbon tax in European countries and the US. While the suggested value varies from US$ 20/tC to US$ 100/tC, the US suggestion of US$ 40/tc is considered to be appropriate.

Based on the above conditions, the CO_2 fixation volume (converted from the volumes at final cutting) at existing forests and declined forests were calculated to roughly establish their monetary values. The calculation results are shown in Table 3.

The period of evaluation is not only the most important factor but also the most difficult factor to determine in this evaluation exercise. Here, the period of evaluation is set at 150 years in view of a concrete analysis.

As the stock built up over the years at a commercial forest becomes zero at the time of cutting for harvesting, it is necessary to recreate the forest to ensure continuous CO_2 fixation. The actual CO_2 fixation volume at a forest where harvesting and regeneration are repeated can be regarded as half of the stock at the final cutting age or the stock halfway through the cutting period. Which ever is the greater should be selected and the latter is usually the greater. If the period of evaluation is sufficiently long vis-a-vis the cutting period, the volume halfway through the standard cutting period is considered to be the stable fixation medium of CO_2.

The standard final cutting age of *Quercus* spp. stands in the Study Area is 100 years and the stock at that time is estimated to be 309 m^3/ha. As described earlier, harvesting is assumed for a commercial plantation and the maximum stock, i.e. maximum CO_2 fixation volume, is achieved at the time of final cutting. As the stock becomes zero after harvesting, the actual average stock during the evaluation period is indicated by the stock at 50 years of age, i.e. halfway through the cutting period. Given the evaluation period of 150 years, *Quercus* forests are cut and regenerated at an age of 100 years. After 150 years, however, regenerated forests reach an age of 50 years (163 m^3/ha), i.e. halfway through the cutting period. If harvesting at 100 years of age is believed not to produce positive income, cutting (309 m^3/ha) will not be conducted, resulting in prolongment of the cutting period. Assuming a cutting period of 150 years (320 m^3/ha), evaluation is conducted with the stock level at 75 years of age (257 m^3/ha), i.e. halfway through the cutting period. This may appear to be advantageous from the viewpoint of the CO_2 fixation volume and it could be inferred that a longer cutting period increases the CO_2 fixation volume. In reality, however, a very long cutting period permits the natural decline of forest trees. Accordingly, a cutting period of 130 - 150 years may well be the tolerable limit.

In the case of fast growing *Robinia* forests, the standard final cutting age is set at 30 years and, therefore, harvesting can be conducted five times (163 m^3/ha x 5 = 815 m^3/ha) in 150 years. The average stock subject to evaluation, however, is 99 m^3/ha at the stand age halfway through the standard cutting period and is not particularly high. If the cutting period is prolonged to 40 years, the total yield is slightly reduced to 728 m^3/ha (182 x 4) but the evaluation result of the CO_2 fixation volume slightly improves because of the higher stock (119 m^3/ha) at 20 years of age. Nevertheless, there is a strong possibility of a stock decrease due to natural decline when *Robinia* stands pass the 40 year old mark. As such, the scope for a long cutting period is limited and stable CO_2 fixation over a long period of time cannot be expected in the case of *Robinia* stands.

Even though analysis is not conducted here, both *Populus* and *Eucalyptus* forests with large annual growth appear to be advantageous because of their high levels of annual CO_2 fixation. However, these species have the disadvantages that their low specific gravity means a low CO_2 fixation volume despite the relatively large volume and that their short life cannot sustain fixation over many years.

In short, forests consisting of fast growing species where harvesting and regeneration are frequently repeated do not necessarily offer a large CO_2 fixation volume in terms of the volume halfway through the cutting period and may well be disadvantageous due to the expenses involved in regeneration unless they enjoy a high level of profitability. In this sense, *Quercus* spp. forests, particularly those healthy forests of Grade IV or higher, can be evaluated as excellent forests which offer a good functional performance and profitability.

Table 1 Forest restoration area on researched districts. (ha)(%)

Item	Whole Forest Area		Declined Stand Area		Regeneration Area		Prevention Area to Decline*1	
Quercus spp.	60,441.5	(100.0)	7,941.5	(13.14)	2,556.7	(4.23)	5,384.8	(8.91)
Robinia sp.	25,696.6	(100.0)	836.2	(3.25)	587.4	(2.29)	-	
Populus spp.	12,031.1	(100.0)	26.9	(0.22)	26.9	(0.22)	-	
Others	16,875.5	(100.0)	393.0	(2.33)	154.7	(0.92)	238.3	(1.41)
Total	115,044.7	(100.0)	9,197.6	(7.99)	3,325.7	(2.89)	5,623.1	(4.89)

Note: *1: "Prevention area to decline" is included the reserved area in the damaged forests with the prevention forests.

Table 2 Fixed Quantities of Carbon in the Forests in Olt and Dolj Counties.

(1) *Quercus* spp. and Others

Site Class			I		II		III		IV		V		Total	
m^3/ha	100y		487m^3		398m^3		331m^3		260m^3		201m^3		(309m^3)	
t/ha	100y		356t		291t		242t		190t		147t		(226t)	
tC/ha			158tC		129tC		108tC		84tC		65tC		(100.5tC)	
Forest Area		(ha)	982.1	(1.27)	6,552.4	(8.47)	44,873.5	(58.04)	18,589.4	(24.04)	6,319.6	(8.17)	77,317.0	(100.00)
tC*A		(10^4t)	1,551.7		8,452.5		47,991.6		15,576.9		4,111.0		77,680.6	
Declined Forest Area		(ha)	16.6	(0.02)	231.0	(0.30)	3,558.3	(4.60)	3,178.4	(4.11)	1,350.2	(1.75)	8,334.5	(10.78)
tC*A		(10^4t)	26.2		298.0		3,805.6		2,663.4		878.3		7,671.4	
Σ(f*tC*a)		(10^4t)	22.3		241.2		3,134.2		1,617.8		309.5		5,325.0	
Strong	(*0.3)	(ha)					10.5	(0.01)	310.1	(0.40)	1,114.5	(1.44)	1,435.1	(1.86)
Moderate	(*0.6)	(ha)			37.4	(0.05)	467.1	(0.60)	2,420.7	(3.13)	235.7	(0.31)	3,160.9	(4.09)
Weak	(*0.8)	(ha)	16.6	(0.02)	193.6	(0.25)	3,080.7	(3.98)	447.6	(0.58)	-		3,738.5	(4.64)

(2) *Robinia pseudoacacia*

Site Class			I		II		III		IV		V		Total	
m^3/ha	100y		360m^3		274m^3		189m^3		129m^3		74m^3		(163m^3)	
t/ha	100y		245t		186t		128t		85t		50t		(111t)	
tC/ha			109tC		82tC		57tC		38tC		23tC		(49.4tC)	
Forest Area		(ha)	4.6	(0.02)	1,087.2	(4.15)	13,396.5	(52.13)	8,338.5	(32.45)	2,869.8	(11.17)	25,696.6	(100.00)
tC*A		(10^4t)	5.0		879.5		7,672.6		3,485.4		645.4		13,267.5	
Declined Forest Area		(ha)	0.0	(0.00)	47.1	(0.18)	366.7	(1.43)	260.0	(1.01)	166.3	(0.65)	840.1	(3.27)
tC*A		(10^4t)	0.0		38.8		210.0		99.3		37.4		410.4	
Σ(f*tC*a)		(10^4t)	0.0		29.4		121.8		42.2		13.7		221.7	
Strong	(*0.3)	(ha)	-		-		119.8	(0.47)	169.6	(0.66)	131.2	(0.51)	420.6	(1.64)
Moderate	(*0.6)	(ha)	-		10.1	(0.04)	104.4	(0.41)	64.0	(0.24)	35.1	(0.14)	213.6	(0.83)
Weak	(*0.8)	(ha)	-		37.0	(0.14)	142.5	(0.56)	26.4	(0.10)	-		205.9	(0.80)

Note: tC: carbon weight in ton.
tC*A: Fixed carbon weight in the forest before damage at standard cutting age.
tC*a: Fixed carbon weight in the declined forest stand before damage at standard cutting age.
Σ(f*tC*a): Fixed carbon weight in the declined forest stand after damage at standard cutting age.

Table 3 Quatitative Fixation Ability in Existing Forests and Declined Forests.

Kinds of Forest	Forest Area	On Standard Cutting Age				On Standard Cutting Age				Annual Fixed Quantity of Carbon	
		Unit Stock	Forest Stocks	Carbon in Forests	Evaluation	Unit Stock	Forest Stocks	Carbon in Forests	Evaluation	Fixed Carbon	Evaluation
	ha	m^3/ha	10^4m^3	10^4tC (A)	$10^6$$	m^3/ha	10^4m^3	10^4tC (B)	$10^6$$ (Be)	10^4tC	$10^4$$
Quercus Forest		(100 years old)				(50 years old)				B/50y	Be/50y
Whole Forest	77,317.0	309	23,891.0	7,768.10	310.72	170	13,143.9	4,266.04	170.64	85.32	3,413
Declined Forest											
before damage	8,334.5	284	2,370.5	767.10	30.69	156	1,301.8	422.52	16.90	8.45	338
after damage	5,504.8	299	1,644.8	532.50	21.30	164	905.5	293.89	11.76	5.88	235
damaged ammount	2,829.7	260	735.7	233.60	9.39	143	369.3	128.63	5.15	2.57	103
Robinia Forest		(30 years old)				(15 years old)				B/15y	Be/15y
Whole Forest	25,696.6	163	4,188.5	1,268.40	50.74	99	2,544.0	768.02	30.72	51.20	2,048
Declined Forest											
before damage	840.1	152	127.7	38.55	15.42	92	77.3	23.33	0.93	1.56	62
after damage	419.1	163	68.6	20.71	8.28	99	41.5	12.53	0.50	0.84	33
damaged ammount	421.0	140	59.1	17.84	7.14	85	35.8	10.80	0.43	0.72	29

tC*A*10^4: Quantability of carbon fixiation in the existing forests
tC*a*10^4: Quantability of carbon fixiation in the declined forests (before damage)
Σ(f*tC*a)*10^4: Quantability of carbon fixiation in the declined forests (after damage)

Appendix E-5 Area of damaged forests by forest range office and forest functions in Romania

County		Olt							Dolj										Total
Forest Function Under the Plan	Forest Function Group in Romania	Bals	Caracal	(Corabia)	Slatina	(Draganesti-Olt)	Vaduresti	Olt (ha)	Amaradia	Calafat	(Poiana Mare)	Craiova	Filiasi	Perisor	Sadova	(Apele Vii)	Segarcea	Dolj (ha)	(ha)
1 Timber Production	2.0 A																		
	2.0 B	1,491.7	1.5		679.7		3.8	2,176.7	421.4				366.3				166.3	954.0	3,130.7
	2.0 C	7.1			23.8			30.9	38.0				22.1				19.3	79.4	110.3
		1,498.8	1.5		703.5		3.8	2,207.6	459.4				388.4				185.6	1,033.4	3,241.0
2 Water Conservation	1.1 A																		
	1.1 B				1.9		23.5	25.4											25.4
	1.1 C																		
	1.1 D																2.1	2.1	2.1
	1.1 E																		
	1.1 G																		
	1.1 H																		
					1.9		23.5	25.4									2.1	2.1	27.5
3 Soil Conservation	1.1 F																		
	1.2 A				10.1			10.1				2.4	23.9					26.3	36.4
	1.2 B																		
	1.2 E									13.4					8.0	39.0	31.2	91.6	91.6
	1.2 H																		
	1.2 I																		
	1.2 J																		
	1.2 L				1.7			1.7					41.7				0.8	42.5	44.2
					11.8			11.8		13.4		2.4	65.6		8.0	39.0	32.0	160.4	172.2
4 Windbreak (Protection of Farmland)	1.2 G									107.1	3.7			41.7	32.6	375.4	35.4	595.9	595.9
	1.3 E																		9.7
	1.3 K		9.7					9.7											
			9.7					9.7		107.1	3.7			41.7	32.6	375.4	35.4	595.9	605.6
5 Climate Mitigation	1.3 A		19.5	7.9				27.4				5.4		0.8			80.4	86.6	114.0
	1.3 D																		
	1.3 G		23.2			39.0		62.2								110.9	26.3	137.2	199.4
	1.3 H																		
	1.3 I																		
	1.3 J																		
			42.7	7.9		39.0		89.6				5.4		0.8		110.9	106.7	223.8	313.4
6 *Quercus* Forests in Plain Areas	1.3 C			0.3		1.5		1.8				1,280.1		2,839.1		0.6	12.5	4,132.3	4,134.1
				0.3		1.5		1.8				1,280.1		2,839.1		0.6	12.5	4,132.3	4,134.1
7 Recreational Use and Landscape Maintenance	1.4 A																		
	1.4 B	115.7			1.7			117.4					3.4				39.8	43.2	160.6
	1.4 E																		
	1.4 F	4.9						4.9											4.9
	1.4 G																		
	1.4 H				12.3			12.3											12.3
	1.4 I	56.7			6.5			63.2						7.0			15.8	22.8	86.0
	1.4 K																		
	1.5 E																		
		177.3			20.5			197.8					3.4	7.0			55.6	66.0	263.8
8 Hunting	1.4 J		165.7			156.4		322.1											322.1
			165.7			156.4		322.1											322.1
9 Wildlife Protection and Preservation	1.5 C								3.6			32.8		84.3			3.6	124.3	124.3
	1.5 D								3.6			32.8		84.3			3.6	124.3	124.3
	1.5 F	1,676.1	219.6	8.2	737.7	196.9	27.3	2,865.8	463.0	120.5	3.7	1,320.7	457.4	2,972.9	40.6	525.9	433.5	6,338.2	9,204.0
	1.5 G																		
	1.5 I																		
	1.5 J																		
10 Seed Stands	1.5 H								3.6			32.8		84.3			3.6	124.3	124.3
									3.6			32.8		84.3			3.6	124.3	124.3
Total		1,676.1	219.6	8.2	737.7	196.9	27.3	2,865.8	463.0	120.5	3.7	1,320.7	457.4	2,972.9	40.6	525.9	433.5	6,338.2	9,204.0

Note: As the area figure used in this table are quoted from the forest planning of each forest range office, their total figures differ from those used in this report.

Appendix E-6 Designation of the Seed Stands

County	Forest Range	UP	ua.	Area (ha)	Efective Area (ha)	Composition	Stand Density	Stand Age	Productivity Class
Olt	Vulturesti	III	22D	3.70	2.60	7GI3CE	0.9	116	2
		III	23C	10.50	8.40	8GI2DT	0.9	131	2
		III	24B	7.90	6.40	9GI1CE7GI3	0.8	121	2
		III	25B	11.80	8.30	CE	0.8	115	2
		III	26B	5.20	2.60	5GI5CE	0.8	96	2
		III	27B	5.40	3.20	6GI4CE	0.9	121	2
		III	28B	8.80	5.30	6GI4CE	0.8	126	2
		III	29A	6.80	4.10	6GI4CE	0.8	126	2
		III	159D	11.60	4.60	4GI3GO3CE	0.8	116	3
		III	29B	6.10	4.30	7GI3CE	0.9	116	2
		III	28D	2.80	1.70	6GI4CE	0.8	146	2
		III	28C	4.00	2.40	6GI4CE	0.8	116	3
		III	27D	0.40	0.30	8GI2CE	0.8	146	3
		III	27C	2.40	1.40	6GI4CE	1.0	126	3
		III	26C	2.60	2.10	8GI2CE	0.8	116	3
		III	25C	9.90	7.90	8GI2CE	0.8	116	3
		III	157B	4.70	2.80	6GI2GO2CE	0.8	106	3
		III	29C	5.60	3.90	7GI3CE	1.0	129	2
		III	23D	3.90	3.90	10GI	0.8	116	3
		III	24C	7.00	7.00	10GI	0.8	116	3
		III	157D	5.60	2.20	4GO3GI3DT	0.7	116	3
		III	158A	5.00	2.50	5GO4GI1CE	0.7	136	3
		V	36	17.30	17.30	10GI	0.7	145	2
		V	37	21.60	21.60	10GI	0.7	145	2
		V	38	23.00	23.00	10GI	0.6	145	2
		V	35B	15.80	15.80	10GI	0.6	145	3
		V	43C	1.80	1.80	10GI	0.7	145	2
		V	43F	10.30	10.30	10GI	0.6	135	3
		V	44D	11.80	11.80	10GI	0.7	135	2
		V	55A	17.40	17.40	10GI	0.7	145	2
		V	56B	17.00	17.00	10GI	0.7	145	2
		V	57A	27.90	27.90	10GI	0.7	145	2
		V	53B	14.20	14.20	10GI	0.7	145	2
		V	46	24.90	24.90	10GI	0.6	145	3
		V	45B	23.10	23.10	10GI	0.8	154	2
Subtotal				357.80	314.00				
Dolj	Craiova	III	50A	6.80	4.80	10GI	0.7	85	3
		III	51A	26.50	26.50	10GI	0.7	80	3
	Amaradia	III	185B	6.10	3.20	5GI4CE1DT	0.8	91	3
		III	184D	7.20	2.50	5GI5CE	0.7	90	3
		III	187A	4.00	1.90	6GIECE	0.8	91	3
Subtotal				50.60	38.90				
Total				408.40	352.90				

Appendix E-7 System of Thinning and Estimated Value of Standing Trees

Species	Thinning Year	Actual Regeneration Area (ha)	Volume for Thinning		Estimated Value of Standing Trees by Thinning	
			m3/ha	Quantitiy m3	Unit Price US$	Total Ammount 1,000 US$
Populus spp.	8	9.80	26	255	10.6	2.7
Total			40	255		2.7
Robinia sp.	10	585.15	13	7,607	12.4	94.3
	15	585.15	13	7,607	12.4	94.3
	20	585.15	14	8,192	12.4	101.6
Total			40	23,406		290.2
Quercus spp.	35	2,719.29	19	51,667	13.9	718.2
	45	2,719.29	15	40,789	13.9	567.0
	55	2,719.29	16	43,509	13.9	604.8
	65	2,719.29	18	48,947	13.9	680.4
	75	2,719.29	18	48,947	13.9	680.4
Total			86	233,859		3,250.6

Appendix F Forest Restoration Plan

Appendix F: Forest Restoration Plan

Appendix F-1 Felling Volume of Damaged Forests by Damage Grade and Forest Range Office (m^3)

County	Forest Range	Damage Grade			Total
		Strong	Moderate	Weak	
Olt	Bals	19,043	23,837	33,638	76,519
	Caracal	13,046	5,025	872	18,944
	(Corabia)		437	60	497
	Slatina	3,532	20,150	8,224	31,906
	(Doraganesti-Olt)	5,666	8,843	2,129	16,638
	Vulturesti	638	1,521	46	2,205
Olt Total		41,926	59,813	44,968	146,708
Dolj	Amaradia	3,159	21,461	1,789	26,410
	Calafat	7,796	964		8,760
	(Poiana Mare)	422			422
	Craiova	50,783	39,963	5,740	96,487
	Filiasi	1,808	10,118	6,497	18,423
	Perisor	36,568	57,313	34,877	128,758
	Sadova	334	708	252	1,294
	(Apele Vii)	20,688	12,757	7,262	40,707
	Segarcea	6,641	11,870	3,610	22,121
Dolj Total		128,200	155,154	60,028	343,382
Total		170,126	214,967	104,996	490,089

Appendix F-2 Felling Volume of Damaged Forests by Forest Range Office, Forest Management Type and Damage Grade (m³)

County	Forest Range	Damage Grade	Forest Management Type *1													Total
			F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	
Olt	Bals	1					8,453	5,973	141	4,399			78			19,043
		2					8,222	14,789	193	565	68					23,837
		3					14,056	13,398	1,472	4,634	72	7				33,638
							30,731	34,159	1,806	9,598	140	7	78			76,519
	Caracal	1					272	640	3,104	8,693	300	38				13,046
		2						1,492	2,452	1,081						5,025
		3						198	167	472		34				872
							272	2,330	5,724	10,247	300	71				18,944
	Corabia	1														
		2							29	259		149				437
		3										60				60
									29	259		209				497
	Doraganesti-Olt	1					4,185	951	360	106		65				5,666
		2					7,462	1,252		19		109				8,843
		3					69	2,048			11					2,129
							11,716	4,251	360	125	11	174				16,638
	Slatina	1					1,739	1,389	10	299		95				3,532
		2					14,033	4,518	76	1,092	216	135			80	20,150
		3					4,853	2,664	30	602	46	28				8,224
							20,625	8,571	117	1,993	262	259			80	31,906
	Vulturesti	1					638									638
		2					525		996							1,521
		3							46							46
							1,163		1,042							2,205
Olt Total							64,507	49,311	9,078	22,221	713	720	78		80	146,708
Dolj	Amaradia	1					949	162			1,806	242				3,159
		2		76			6,557	13,239	1,234	268		88				21,461
		3		89			829	853	18							1,789
				165			8,336	14,254	1,252	268	1,806	329				26,410
	Apele Vii	1					2,465	1,213		87	11,151	4,117			1,656	20,688
		2					1,015	518	51		10,474	664			34	12,757
		3					1,612	812			4,591	246				7,262
							5,092	2,543	51	87	26,216	5,028			1,690	40,707
	Calafat	1								113	6,204	1,479				7,796
		2									569	315			81	964
		3														
										113	6,773	1,794			81	8,760
	Craiova	1	3,365				34,691	11,371	98	1,113	146					50,783
		2					15,469	20,774	2,428	1,126			166			39,963
		3					1,186	4,468	67	11				9		5,740
			3,365				51,345	36,612	2,593	2,250	146		166	9		96,487
	Filiasi	1					52	650	109	105	584	307				1,808
		2					2,669	4,825	133	1,294	733	356			109	10,118
		3					2,338	3,687	21	424	21	7				6,497
							5,058	9,161	263	1,824	1,337	670			109	18,423
	Perisor	1		5,011			3,222	23,239	2,664	510	1,704	218				36,568
		2		1,138			4,246	48,640	961	348	1,925	54				57,313
		3		760			2,858	30,978	130	145	4	2				34,877
				6,909			10,326	102,857	3,755	1,004	3,634	274				128,758
	Poiana Mare	1									363				59	422
		2														
		3														
											363				59	422
	Sadova	1										289		45		334
		2									708					708
		3									252					252
											960	289		45		1,294
	Segarcea	1					73	2,961	927	1,158	697	433			392	6,641
		2			374		1,400	2,305	4,175	3,133	141	175			168	11,870
		3					266	1,082	1,289	830		143				3,610
					374		1,739	6,348	6,390	5,121	838	750			560	22,121
Dolj Total			3,365	7,074	374		81,897	171,775	14,304	10,667	42,072	9,134	166	54	2,499	343,382
Total			3,365	7,074	374		146,403	221,086	23,382	32,888	42,786	9,854	244	54	2,579	490,089

Note: *1: As grouping of forest management type, refer to Table 2-1-1 in the First Part; Study Findings.

Appendix F-3 Area of Damaged Forests by Forest Range Office, Forest Function and Damage Grade (ha)

County	Forest Range	Damage Grade	Forest Function [*1]										Total
			1	2	3	4	5	6	7	8	9	10	
Olt	Bals	1	160.5						33.0				193.5
		2	331.6						35.0				366.6
		3	1,006.7						109.3				1,116.0
			1,498.8						177.3				1,676.1
	Caracal	1	1.3		1.0	3.5	13.4			106.2			125.4
		2				3.2	16.9			45.5			65.6
		3	0.2			2.0	12.4			14.0			28.6
			1.5		1.0	8.7	42.7			165.7			219.6
	(Corabia)	1											
		2					5.4	0.3					5.7
		3					2.5						2.5
							7.9	0.3					8.2
	Slatina	1	66.6	2.3	3.9				1.7				74.5
		2	321.3	1.3	7.6				5.6				335.8
		3	315.1		0.8				11.5				327.4
			703.0	3.6	12.3				18.8				737.7
	(Doraganesti-Olt)	1						1.5		40.3			41.8
		2								102.9			102.9
		3								52.2			52.2
								1.5		195.4			196.9
	Vulturesti	1	1.3	4.5									5.8
		2	2.5	17.4									19.9
		3		1.6									1.6
			3.8	23.5									27.3
Olt Total			2,207.1	27.1	13.3	8.7	50.6	1.8	196.1	361.1			2,865.8
Dolj	Amaradia	1	44.5										44.5
		2	354.5									1.0	355.5
		3	60.4									2.6	63.0
			459.4									3.6	463.0
	Calafat	1			13.4	88.4							101.8
		2				18.7							18.7
		3											
					13.4	107.1							120.5
	(Poiana Mare)	1				3.7							3.7
		2											
		3											
						3.7							3.7
	Craiova	1			4.1			455.1	27.9			32.8	519.9
		2						594.9	3.8				598.7
		3						182.0	20.1				202.1
					4.1			1,232.0	51.8			32.8	1,320.7
	Filiasi	1	12.4		36.6								49.0
		2	152.8		21.1				3.4				177.3
		3	223.2		7.9								231.1
			388.4		65.6				3.4				457.4
	Perisor	1				25.8	0.6	339.6	15.9			45.2	427.1
		2				16.1	0.2	952.0	33.6			14.2	1,016.1
		3				0.4		1,404.8	99.6			24.9	1,529.7
						42.3	0.8	2,696.4	149.1			84.3	2,972.9
	Sadova	1			8.0	4.8							12.8
		2				9.9							9.9
		3				17.9							17.9
					8.0	32.6							40.6
	(Apele Vii)	1			19.3	140.7	24.9						184.9
		2			17.1	81.9	17.6	0.6					117.2
		3			2.6	152.8	68.4						223.8
					39.0	375.4	110.9	0.6					525.9
	Segarcea	1	24.7		28.0	27.0	23.3	6.1	5.5	2.8			117.4
		2	93.1	1.6	4.0	8.4	27.5	6.4	36.8	3.4		3.6	184.8
		3	67.8	0.5			31.1		13.3	18.6			131.3
			185.6	2.1	32.0	35.4	81.9	12.5	55.6	24.8		3.6	433.5
Dolj Total			1,033.4	2.1	162.1	596.5	193.6	3,941.5	259.9	24.8		124.3	6,338.2
Total			3,240.5	29.2	175.4	605.2	244.2	3,943.3	456.0	385.9		124.3	9,204.0

Note: *1: As grouping of forest functions, refer to Table 2-4-23 in the First Part; Study Findings.

Appendix F-4 Felling Volume of Damaged Forests by Forest Range Office, Forest Function and Damage Grade (m³)

County	Forest Range	Damage Grade	Forest Function *1										Total
			1	2	3	4	5	6	7	8	9	10	
Olt	Bals	1	14,379						4,664				19,043
		2	21,847						1,990				23,837
		3	31,048						2,590				33,638
			67,275						9,244				76,519
	Caracal	1	138		48	101	1,170			11,590			13,046
		2				144	1,114			3,767			5,025
		3	13			33	390			435			872
			151		48	279	2,674			15,793			18,944
	(Corabia)	1											
		2					408	29					437
		3					60						60
							468	29					497
	Slatina	1	3,115	29	276				113				3,532
		2	19,329	65	411				346				20,150
		3	7,865		7				352				8,224
			30,309	94	693				810				31,906
	(Doraganesti-Olt)	1						360		5,306			5,666
		2								8,843			8,843
		3								2,129			2,129
								360		16,278			16,638
	Vulturesti	1	236	402									638
		2	140	1,381									1,521
		3		46									46
			377	1,828									2,205
Olt Total			98,111	1,922	741	279	3,141	389	10,054	32,070			146,708
Dolj	Amaradia	1	3,159										3,159
		2	21,386									76	21,461
		3	1,700									89	1,789
			26,245									165	26,410
	Calafat	1			786	7,010							7,796
		2				964							964
		3											
					786	7,974							8,760
	(Poiana Mare)	1				422							422
		2											
		3											
						422							422
	Craiova	1			67			44,702	2,649			3,365	50,783
		2						39,677	286				39,963
		3						5,130	611				5,740
					67			89,509	3,546			3,365	96,487
	Filiasi	1	627		1,181								1,808
		2	9,286		728				103				10,118
		3	6,291		206								6,497
			16,204		2,115				103				18,423
	Perisor	1				1,917	17	28,749	874			5,011	36,568
		2				1,971	8	52,247	1,948			1,138	57,313
		3				1		31,936	2,180			760	34,877
						3,889	25	112,932	5,002			6,909	128,758
	Sadova	1			161	173							334
		2				708							708
		3				252							252
					161	1,133							1,294
	(Apele Vii)	1			799	16,125	3,765						20,688
		2			412	10,761	1,533	51					12,757
		3			11	4,826	2,424						7,262
					1,222	31,712	7,722	51					40,707
	Segarcea	1	1,532		248	1,255	2,082	862	440	221			6,641
		2	5,940	125	166	511	2,142	544	1,729	339		374	11,870
		3	1,876	13			682		355	685			3,610
			9,348	138	414	1,766	4,907	1,406	2,524	1,245		374	22,121
Dolj Total			51,797	138	4,765	46,896	12,654	203,898	11,175	1,245		10,813	343,382
Total			149,908	2,060	5,506	47,175	15,795	204,287	21,230	33,315		10,813	490,089

Note: *1: As grouping of forest functions, refer to Table 2-4-23 in the First Part; Study Findings.

Appendix F-5 Selection Standards of Planting Species

(1) Resistance against Water Conditions

Species	H0	H1	H2	H3	H4	H5	H(E)	HE
Q.frainetto	······	— — —	═══	═══				
Q.cerris	— — —	═══	═══	— — —	— — —	······	······	
Q.robur			······	— — —	═══	═══	— — —	······
Q.petraea		······	— — —	═══	═══	— — —	······	
Fraxinus excelsior		— — —	— — —	— — —	═══	═══	— — —	······
Robinia pseudoacacia	— — —	═══	═══	— — —	······			
Populus alba			······	······	— — —	═══	═══	— — —

Note: Symbols (H0 - HE) indicate that water contents in soils are from zero (dry) to much (wet).

Legend: ═══ very resistant — — — resistant ······ rather resistant

Source: Flora Forestiera Lemnoasa a Romaniei: Victor Stanescu, Nicolae Sofletea, Oana Popescu

(2) Resistance against Soil Texture

Species	Very Rough	Rough	Moderate Compact	Compact	Very Compact
Q.frainetto	······	— — —	═══	═══	═══
Q.cerris	······	— — —	═══	═══	— — —
Q.robur	— — —	═══	═══	═══	······
Q.petraea	— — —	═══	═══	— — —	······
Fraxinus excelsior	— — —	═══	═══	— — —	······
Robinia pseudoacacia	═══	═══	······	······	
Populus alba	— — —	═══	═══	— — —	

Legend: ═══ very resistant — — — resistant ······ rather resistant

Source: Flora Forestiera Lemnoasa a Romaniei: Victor Stanescu, Nicolae Sofletea, Oana Popescu

(3) Resistance against Soil Nature

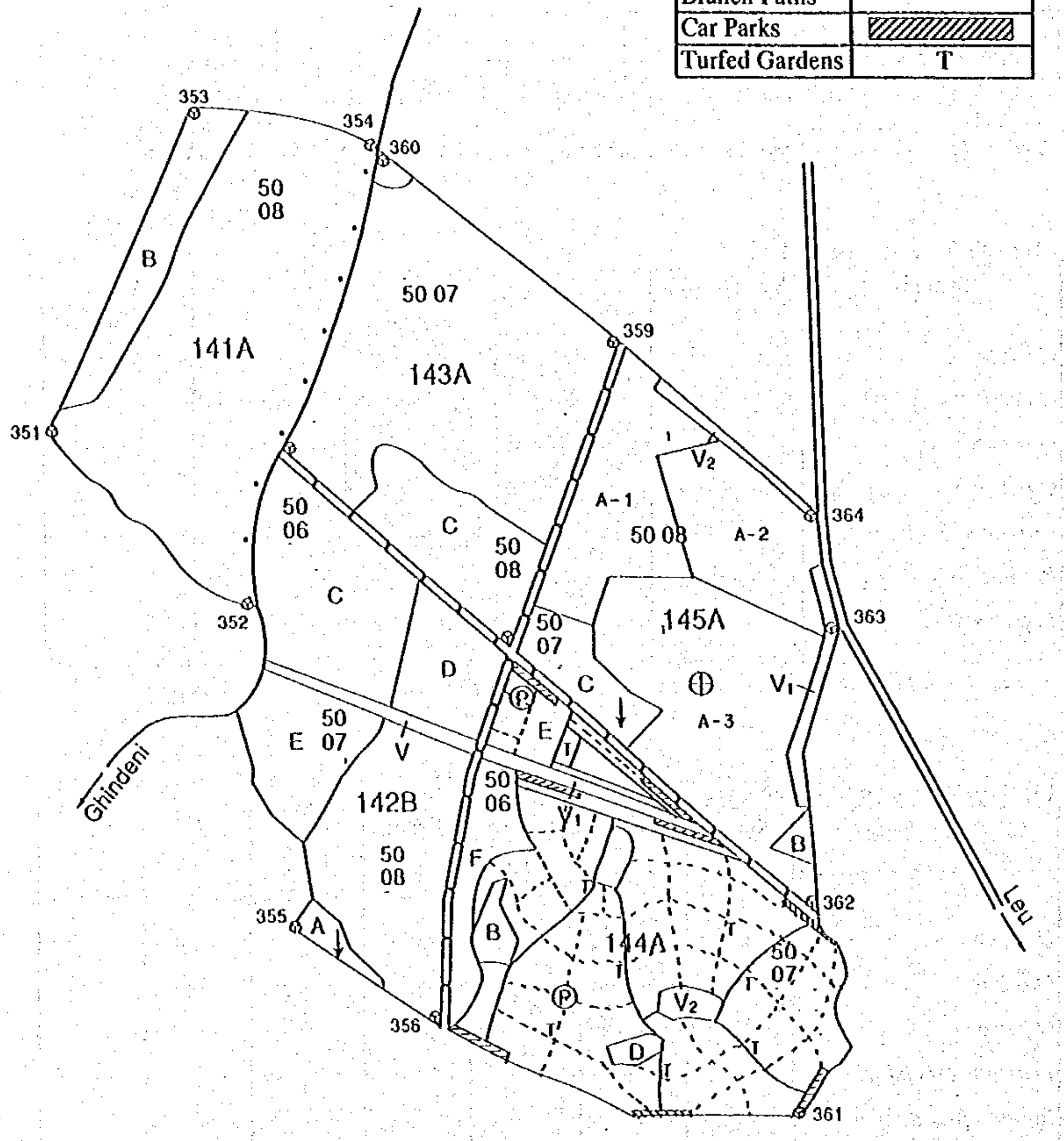
Species	Sand	Loamy Sand	Sandy Loam	Loam	Sandy Clay	Clay Loam	Clay
Q.frainetto		······	— — —	═══	═══	— — —	— — —
Q.cerris		······	— — —	═══	═══	═══	— — —
Q.robur		······	═══	═══	— — —	— — —	······
Q.petraea	······	═══	═══	═══	— — —	······	
Fraxinus excelsior		······	— — —	═══	═══	— — —	······
Robinia pseudoacacia	═══	═══	— — —	······	······		
Populus alba	······	═══	═══	═══	— — —	······	······

Legend: ═══ very resistant — — — resistant ······ rather resistant

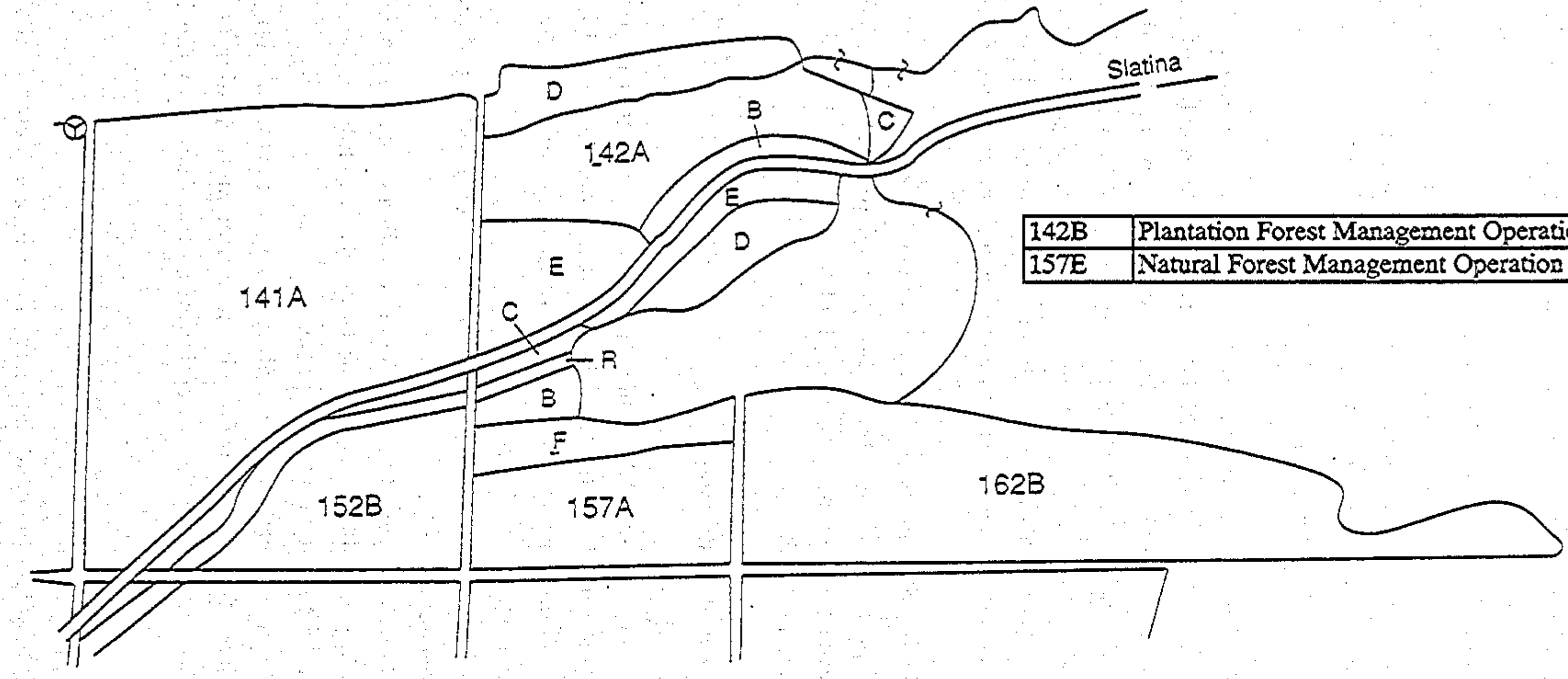
Source: Flora Forestiera Lemnoasa a Romaniei: Victor Stanescu, Nicolae Sofletea, Oana Popescu

145A-1	Natural Forest Management Operation	5.1ha
145A-2	Plantation Forest Management Operation	4.4ha
145A-3	Plantation Forest Management Operation	9.7ha

Main Paths	————————
Branch Paths	------------------
Car Parks	//////////////
Turfed Gardens	T



Appendix F-6(1) Working Item Arrangement Map of General Arboretum and Forestry Work Demonstration Forest (Craiova UP IV)



142B	Plantation Forest Management Operation	1.3ha
157E	Natural Forest Management Operation	2.4ha

Appendix F-6(2) Working Item Arrangement Map of General Arboretum and Forestry Work Demonstration Forest (Bais UP V)

Appendix F-7 Development of Breeding Technique for Resistant Trees

A breeding technique for resistant trees will be developed to create *Q. frainetto* and *R. pseudoacacia* trees which are highly resistant to drought. The actual development process will consist of (i) selection of candidate resistant trees, (ii) Propagation of resistant planting stock, (iii) verification of resistance (at test forest-cum-scion garden) and (iv) establishment and management of scion gardens and seed orchards.

Firstly, healthy surviving *Q. frainetto* and *P. pseudoacacia* trees will be selected from declined forests due to drought as candidate trees and the number of planting stock will be increased using cuttings. The rooted cuttings will then be planted at the test forest to verify their resistance to drought. This test forest will also act as a scion garden. As soon as the establishment of the test forest commences, work will begin to create a seed orchard. Candidate trees that show favorable growth at the test forest will be confirmed as resistant trees. Those candidate trees showing low resistance will be removed from the seed orchard.

The rooted cuttings for planting will be mass-produced at the scion garden from clones which have successfully passed the test. When the planted trees at the seed orchard created by resistant clones reach the seed bearing age, planting stock will be mass-produced from seeds produced at the seed orchard.

1) Selection of Candidate Resistant Trees

a) Selection Criteria

- Selection of stands with strong damage and large area in need of restoration and then selection of candidate resistant trees from these stands. Selection of stands with moderate damage in areas of forest range offices where the above strongly damaged stands are selected.
- Tree selection area: minimum of 3 ha for *Q. frainetto* stands and 1.5 ha for *R. pseudoacacia* stands.
- Even though the selection of as many candidate trees as possible from the selected stands is preferable, it is assumed that five candidate trees will be selected from each stand for the present purposes.
- The candidate trees must be healthy, straight trees with a large upper-story crown.
- Selection of candidate trees with a sufficient stem diameter of 10 cm or more which is suitable for the collection of cuttings and showing healthy growth of the coppiced shoots.

b) Timing of Selection

The work to select the candidate trees must be conducted in the first year of the Plan to ensure the early development of the breeding technique.

c) Selection of Candidate Tree Selection Sites

The selection sites for candidate resistant trees are shown in Table 1 and Table 2.

Factory *Q. frainetto* sites will be selected in Olt and Dolj Countries, consisting of 32 strongly damaged sites and eight moderately damaged sites. The relevant forest range offices are Bals, former Draganesti-Olt and Slatina in Olt County and former Apele Vii, Craiova and Perisor in Dolj County. Twenty-five sites will be selected in the area of the Craiova Forest Range Office where many strongly damaged *Q. frainetto* forests are distributed.

The area per site ranges from approximately 3 ha to 28 ha and the diameter of the selected trees ranges from 14 cm to 30 cm which is a suitable size for the collection of cuttings.

While one moderately damaged site will be selected in the area of each forest range office, three sites will be selected in the area of the Craiova Forest Range Office in view of the many strongly damaged sites in this area.

Eighteen *R. pseudoacacia* sites will be selected in Olt and Dolj Counties, consisting of 15 strongly damaged sites and three moderately damaged sites. The relevant forest range offices are Caracal and former Corabia in Olt County and Amaradia, former Apele Vii, Filiasi and Perisor in Dolj County.

The area per site ranges from 1.7 ha to 16.6 ha and the diameter of the selected trees ranges from 8 cm to 22 cm which is a fairly suitable size for the collection of cuttings. One moderately damaged site will be selected in each forest range office area.

2) Propagation of Resistant Planting Stock

a) Breeding Method of Cuttings

- Two methods are used to obtain *Q. frainetto* cuttings, i.e. hydroponic cuttings and cuttings from coppiced shoots from stems. In the case of *R. pseudoacacia*, cuttings are obtained from coppiced shoots.
- Preparation of materials to produce cuttings: the logs used for hydroponics are prepared from branches of the candidate trees and have dimensions of 3 - 10 cm in diameter and 30 - 40 cm in length with two cut ends. Collection from coppiced shoots uses healthy, young coppiced shoots without any disease or pest damage.
- The hydroponic method involves the immersion of prepared logs in water to encourage coppicing from logs and the coppiced shoots are used as cuttings. When prepared logs immersed in a container filled with water (diameter: 25 - 30

Table 1 Selected forests from where resistant trees will be chosen. (*Quercus frainetto*)

County	Forest Range	UP	ua.	Forest Area (ha)	Species	Damage Grade	Regeneration Area (ha) (Total)	Regeneration Area (ha) (Qf)	Height (m)	DBH (cm)	Age (years)
OLT	Bals	II	13A	11.6	Qf,Qc	Strong	11.6	10.44	13	16	53
		II	13B	11.1	Qf	Strong	8.7	8.70	12	14	53
		II	28A	19.1	Qf	Strong	4.4	4.40	12	14	53
		III	33	18.2	Qf,Qc	Strong	3.2	2.88	12	20	68
		III	74D	15.6	Qf,Qc	Strong	15.6	12.48	10	14	43
		(5)		75.6			43.5	38.90			
		III	34A	21.2	Qf,Qc	Moderate	4.1	3.60	12	18	68
		(1)		21.2			4.1	3.60			
	(Draganesti-Olt)	IV	17A	9.1	Qf,Qc	Strong	9.1	8.19	15	22	80
		(1)		9.1			9.1	8.19			
		IV	45A	19.4	Qf	Moderate	16.7	16.70	13	18	60
		(1)		19.4			16.7	16.70			
	Slatina	III	46B	3.5	Qf,Qc	Strong	3.5	2.45	12	20	62
		III	55D	8.4	Qf,Qc	Strong	8.4	7.56	12	20	57
		(2)		11.9			11.9	10.01			
		IV	15A	21.3	Qf	Moderate	12.1	12.10	15	30	87
		(1)		21.3			12.1	12.10			
Sub total	Strong	(8)		96.6			64.5	57.10			
	Moderate	(3)		61.9			32.9	32.40			
DOLJ	(Apele Vii)	III	111A	18.3	Qf,Qc	Strong	4.3	3.87	15	22	73
		(1)		18.3			4.3	3.87			
		III	98C	4.0	Qf	Moderate	3.7	3.70	14	18	63
		(1)		4.0			3.7	3.70			
	Craiova	I	68B	6.4	Qf	Strong	6.4	6.40	17	30	87
		I	77B	12.8	Qf,Qc	Strong	12.8	8.96	17	28	87
		I	78A	9.5	Qf,Qc	Strong	9.5	7.60	17	28	87
		I	79A	14.6	Qf,Qc	Strong	6.1	5.49	16	26	87
		I	116B	13.8	Qf	Strong	13.8	13.80	18	24	82
		II	8A	5.7	Qf,Qc	Strong	5.2	4.68	13	16	47
		II	38H	7.0	Qf,Qc	Strong	5.4	4.86	14	24	62
		II	97	13.3	Qf,Qpet	Strong	4.0	3.60	13	16	52
		II	98C	9.4	Qf,Qc	Strong	3.8	3.04	15	28	82
		III	6A	16.3	Qf	Strong	16.3	16.30	14	18	62
		III	25E	11.6	Qf	Strong	11.6	11.60	15	24	82
		III	25F	13.1	Qf	Strong	13.1	13.10	14	22	82
		III	26C	5.6	Qf	Strong	5.6	5.60	16	26	82
		III	26D	4.8	Qf	Strong	4.8	4.80	14	22	82
		III	30A	27.8	Qf	Strong	27.8	27.80	16	24	87
		III	35E	14.1	Qf,Qc	Strong	14.1	12.69	15	26	87
		IV	141	17.9	Qf	Strong	17.9	17.90	13	16	52
		IV	142B	7.2	Qf	Strong	7.2	7.20	13	22	52
		IV	142C	6.1	Qf	Strong	6.1	6.10	13	18	52
		IV	143A	18.9	Qf	Strong	18.9	18.90	14	18	52
		IV	144A	20.1	Qf	Strong	20.1	20.10	13	18	52
		IV	145A	19.2	Qf,Qc	Strong	19.2	17.28	14	20	52
		(22)		275.2			249.7	237.80			
		I	80	15.3	Qf,Qc	Moderate	14.2	11.36	16	26	82
		II	8C	6.8	Qf,Qc	Moderate	5.2	4.16	12	16	47
		III	52C	14.5	Qf	Moderate	14.5	14.50	14	18	62
		(3)		36.6			33.9	30.02			
	Perisor	II	9C	7.1	Qf,Qc	Strong	7.1	4.97	14	22	70
		(1)		7.1			7.1	4.97			
		II	33A	15.7	Qf,Qc	Moderate	8.4	5.04	12	20	55
		(1)		15.7			8.4	5.04			
Sub total	Strong	(24)		300.6			261.1	246.64			
	Moderate	(5)		56.3			46.0	38.76			
Total	Strong	(32)		397.2			325.6	303.74			
	Moderate	(8)		118.2			78.9	71.16			

Table 2 Selected forests from where resistant trees will be chosen. (*Robinia pseudoacacia*)

County	Forest Range	UP	ua.	Forest Area (ha)	Species	Damage Grade	Regeneration Area (ha)		Height	DBH	Age
							(Total)	(Qf)	(m)	(cm)	(years)
OLT	Caracal	II	26E	4.0	Rp	Strong	2.3	2.30	8	12	21
		(1)		17.7			2.4	2.40			
	(Corabia)	IV	13F	2.0	Rp	Moderate	1.7	1.70	14	14	19
		(1)		2.0			1.7	1.70			
Sub total	Strong	(1)		17.7			2.4	2.40			
	Moderate	(1)		2.0			1.7	1.70			
DOLJ	Amaradia	I	147	7.8	Rp	Strong	7.5	7.50	15	16	22
		I	155A	18.8	Rp	Strong	7.9	7.90	12	14	22
		I	155B	18.8	Rp	Strong	5.4	5.40	12	14	22
		(3)		45.4			20.8	20.80			
		I	43B	7.8	Rp	Moderate	5.8	5.80	7	8	12
		(1)		7.8			5.8	5.80			
	(Apele Vii)	I	12	16.6	Rp	Strong	16.6	16.60	15	14	25
		I	55C	6.9	Rp	Strong	3.0	3.00	14	13	22
		III	56B	8.5	Rp	Strong	2.4	2.40	17	16	23
		I	88E	5.2	Rp	Strong	5.2	5.20	11	10	18
		I	107A	19.8	Rp	Strong	13.1	13.10	15	14	24
		(5)		57.0			40.3	40.30			
		III	56B	8.5	Rp	Moderate	3.5	3.50	17	16	23
		(1)		8.5			3.5	3.50			
	Filiasi	I	160B	8.1	Rp	Strong	8.1	8.10	10	12	21
		I	136A	4.2	Rp	Strong	4.2	4.20	9	12	21
		I	136A	8.1	Rp	Strong	4.0	4.00	8	10	16
		(3)		20.4			16.3	16.30			
		II	124A	5.3	Rp	Moderate	5.3	5.30	12	14	18
		(1)		5.3			5.3	5.30			
	Perisor	II	61A	15.2	Rp	Strong	12.2	9.76	16	22	25
		(1)		15.2			12.2	12.20			
		II	66	8.6	Rp	Moderate	8.6	6.02	18	20	25
		(1)		8.6			8.6	6.02			
Sub total	Strong	(12)		138.0			89.6	89.6			
	Moderate	(4)		30.2			23.2	20.6			
Total	Strong	(13)		155.7			92.0	92.0			
	Moderate	(5)		32.2			24.9	22.3			