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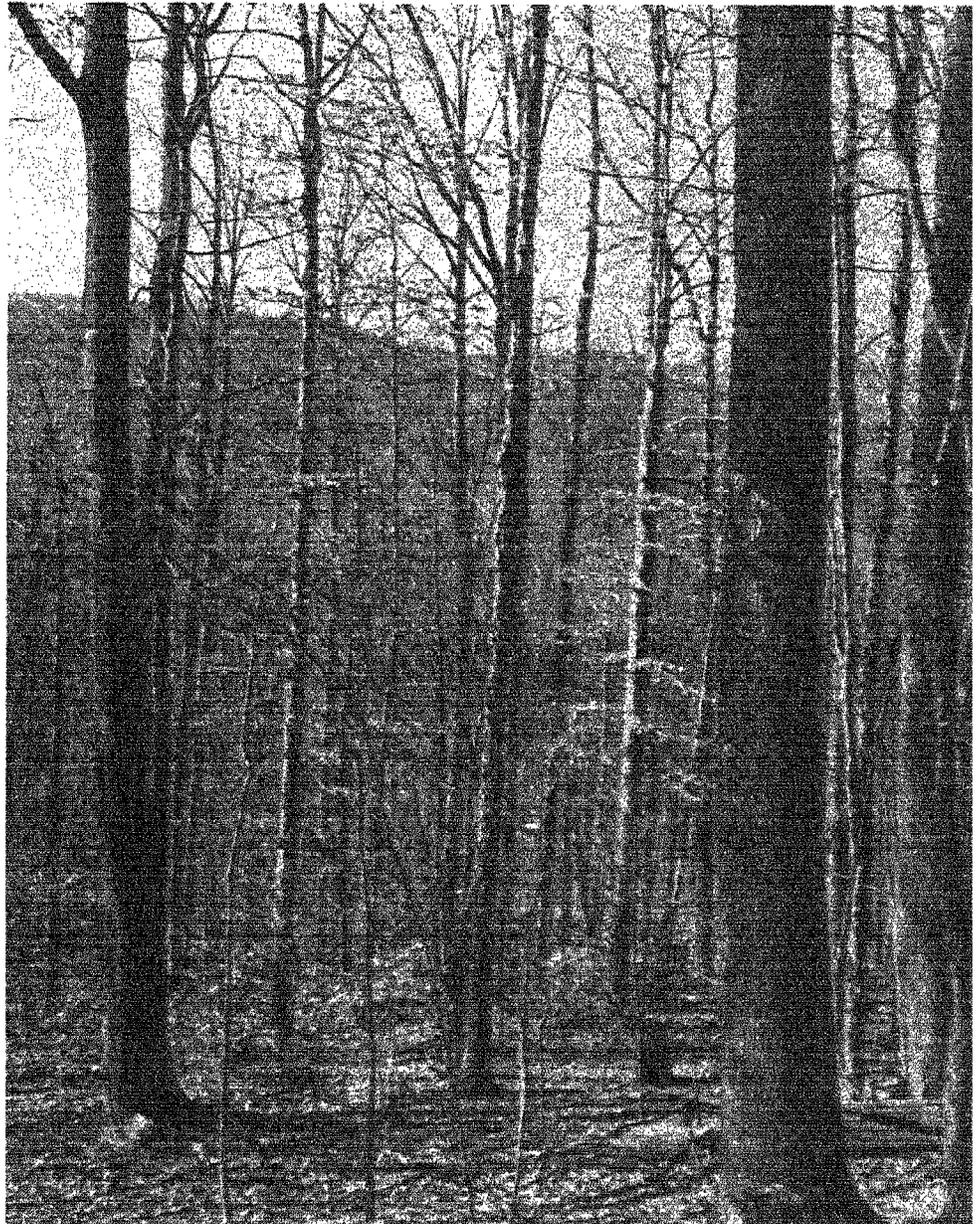
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Number of Residual Trees: A Guide for Selection Cutting

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Abstract

Marking trees for removal by an individual-tree selection cutting is described. The number of desirable residual trees is computed for given ranges of residual basal areas, largest diameter trees to grow, and q -values. Included are guidelines for applying this selection cutting practice.

Introduction

Individual-tree selection is an uneven-age cutting practice by which some mature trees, including high-risk and low-quality trees, are removed periodically. This cutting method provides space so that reproduction can be established and residual trees can develop into timber products.

To use the individual-tree selection practice described here, foresters need to determine the number of residual trees to leave in each diameter class, and then over a period of years manage the stand to attain these goals. The number of residual trees is calculated using: desired residual-tree basal area (RBA), largest diameter trees (LDT) grown in the stand, and an expression of stand structure for an uneven-aged stand—a “q-value” (Meyer 1952). This method aims at eventually attaining a fairly rigid stand structure with a specified number of trees in each diameter class. This is in contrast to other methods of individual-tree selection where factors such as tree quality or spacing are emphasized and the number of leave trees by size class is left to fluctuate.

In this paper we indicate the number of leave trees per acre by dbh class for a range of RBA, LDT, and q-values, and illustrate how to use this information to mark a stand.

Background

To many, the use of selection cutting in eastern hardwood stands is not new. In most cases, high-risk and low-value trees were removed, or high-value or large trees, or both, were harvested to recover the most profit. These cuttings largely disregarded the diameter distribution in the residual stand. Thus, in many of the previously logged eastern hardwood stands, trees are concentrated in certain dbh classes.

Individual-tree selection is successful only when reproduction is established after each cut, and residual trees are released to grow. These trees then move into successively larger size classes so that a logical stand diameter distribution can be maintained.

For the past 30 years, individual-tree selection has been practiced in central Appalachian hardwood stands on the Fernow Experimental Forest near Parsons, West Virginia. The number of trees to be removed has been based primarily on the number of desired trees per acre in each dbh class as related to individual tree characteristics and spacing. Most of the trees removed are from those dbh classes with a surplus of trees above the desired number. Also, the cut volume normally does not exceed the periodic growth.

Several selection cuts usually are necessary before the desired number of residual trees per dbh class can be attained. But these desired residual number of trees per acre are goals. We know that when using selection cutting, tolerant species will dominate future stands, and tolerant commercial species must be available or selection cutting should not be used. The majority of these tolerant commercial species are usually beech, sugar maple, and red maple. Also, the desired goals probably will be modified eventually because tolerant species usually have slower growth rates and less total volume per tree than intolerant species.

Making an Individual-Tree Selection Cut

Determine the desired stand characteristics

Initially, the forester must do the following: 1) Select a q-value, which is an expression of a desired uneven-aged stand curve (Meyer 1952); 2) determine the RBA to maintain; and 3) choose the LDT.

q-value. The relationship between number of trees and diameter classes in an uneven-aged hardwood stand is a reversed J-shaped curve. One mathematical expression of the shape of this curve is called a

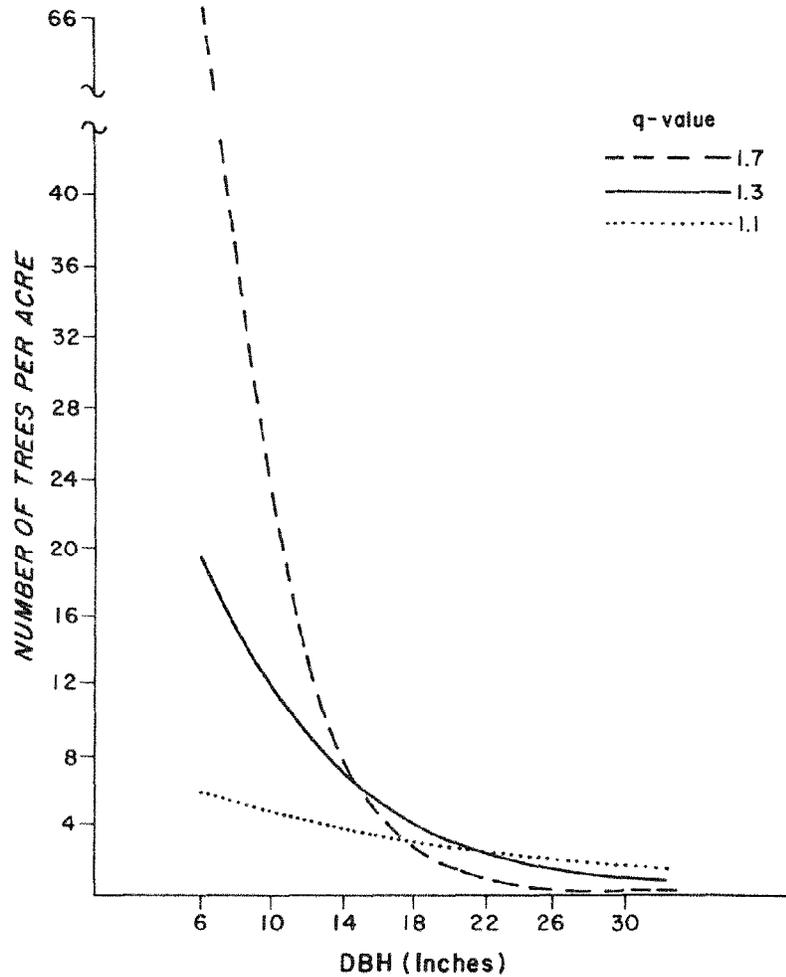
quotient ("q"). Quotients can be calculated by dividing the number of trees in each dbh class by the number of trees in the next larger dbh class (Meyer 1952). The average of these quotients is the q-value.

For the production of hardwood sawtimber on the Fernow, we are using an average q-value of 1.3 for 2-inch dbh classes (Fig. 1). Before management, these second-growth stands contained a relatively large number of small-diameter trees with stand q-values ranging from 1.5 to 1.8. It was decided that under management a lower q-value would be feasible and would result in a higher proportion of stand growth on larger and more valuable stems (Trimble and Smith 1976).

Where pulpwood-size material is the major stand product, we suggest a q-value that provides more trees in the smaller dbh classes, for example, a q-value of 1.7 (Fig. 1). Leak and Filip (1975) discussed stand q-values as related to wood products, intensity of management, and markets for northern hardwood stands.

Basal area and largest diameter tree. Information on RBA and LDT by site index class was developed from periodic selection cuts in second-growth Appalachian hardwood stands over a 30-year period (Fig. 2). The RBA data are for trees 5.0 inches dbh and larger (Trimble 1968). The LDT value is based on growth characteristics of the species present and the objective of growing a few large trees per acre.

Figure 1.—Stand structure curves for uneven-aged stands for three q-values.



Oak site index	Residual basal area/acre ft ²	Maximum tree size (dbh) inches	Cutting cycle years
60	50	20	15
70	65	26	10
80	80	32	10

Figure 2.—Periodic selection cut in a second-growth Appalachian hardwood stand. This stand has been cut three times.



On the basis of research and our own experience, we believe the number of residual trees per acre suggested for central Appalachian hardwood stands (Table 1) is reasonable when the objective is the production of sawlogs. However, it should be understood that other goals could have been set for RBA, LDT, and "q".

Table 1.— Number of residual trees per acre suggested for production of sawlogs from central Appalachian hardwood stands (for trees 5.0 inches dbh and larger); based on residual basal areas indicated for each site index class and a "q" of 1.3

Dbh (inches)	Oak site index ^a		
	60	70	80
	----- trees per acre -----		
6	19.1	18.6	19.4
8	14.7	14.3	14.9
10	11.3	11.0	11.5
12	8.7	8.5	8.8
14	6.7	6.5	6.8
16	5.2	5.0	5.2
18	4.0	3.9	4.0
20	3.0	3.0	3.1
22	—	2.3	2.4
24	—	1.8	1.8
26	—	1.4	1.4
28	—	—	1.1
30	—	—	0.8
32	—	—	0.6
Total	72.7	76.3	81.8

^a Residual basal area 50 ft² for SI 60, 65 ft² for SI 70, and 80 ft² for SI 80.

Determine the residual number of trees

To assist those foresters who may want to use different combinations of "q", basal area, and largest diameter tree, we have included in the Appendix the desired number of residual trees per acre, by 2.0-inch dbh classes, for the following range of stand characteristics:

q-value—1.1 to 2.0 by 0.1 intervals.
 RBA—50 to 100 ft² by 10-ft² classes.
 LDT—20 to 32 inches by 2-inch classes.

The number of desired trees per diameter class is determined by selecting the combination of "q", RBA and LDT. For example, for a q-value of 1.4, RBA of 70 ft² per acre, and LDT of 28 inches dbh, the

desired number of trees per acre in the 6-inch dbh class is 27.41; the desired number of trees in the 8-inch dbh class is 19.58 (Appendix). In practice, these values for trees per acre would be multiplied by the total acres to be marked, and then rounded to the nearest whole tree to determine the desired tree distribution in the stand.

Number of trees for RBA values not shown in the Appendix can be computed by interpolation. For example, the number of 6-inch dbh trees for a "q" of 1.4, RBA of 60, and LDT of 26 is 24.51, while the number of 6-inch dbh trees for a "q" of 1.4, RBA of 70, and LDT of 26 is 28.59. The number of 6-inch dbh trees for a "q" of 1.4, RBA of 65, and LDT of 26 would be $(24.51 + 28.59)/2$ or 26.55.

Determine how many trees to cut

Before a manager can decide on number of trees to cut, he must first conduct a stand inventory to determine the actual number of trees per acre in each dbh class. Inventory procedures vary with stand conditions, but plot sampling totaling about 10 percent of the area usually is adequate for hardwood stands (Meyer et al. 1952). While this is an intensive and often too expensive sample, the better the stand inventory, the better the results. As indicated in Figure 3, the surplus trees in a given dbh class are eligible for cutting. Usually there is no cutting in the deficit dbh class. Also, it is important to inventory the seedling and sapling stems as these stems are replacements for the future stand.

Figure 3.—Actual and desired stand stocking using stand structure control.

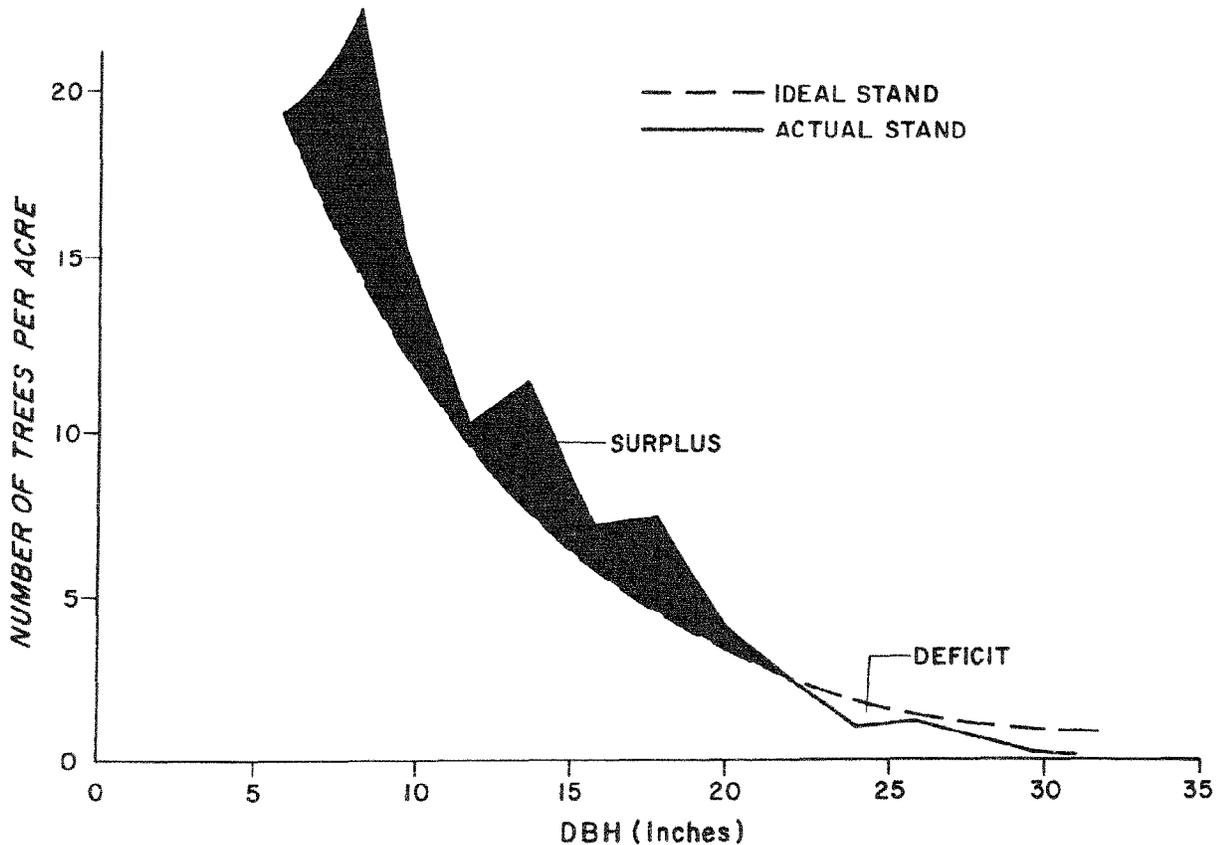


Table 2 shows how to use the desired number of residual trees with field data. All values for the desired number of residual trees are based on a q-value of 1.3, RBA of 80, and LDT of 32. The number of surplus trees to be cut per acre is determined by subtracting the desired number from the actual number. In Table 2, the number of surplus 6-inch trees to cut is 13.2 (32.6 - 19.4). In addition, the total number of trees to be cut in each dbh class is calculated by multiplying the number of trees to cut per acre by the total number of acres in the stand. For the 6-inch dbh class, the total number of trees to cut is 660 (13.2 × 50).

To further help the marker, a percentage of trees to cut for each dbh class can be used (Table 2). This percentage for each dbh class is determined by dividing the number of surplus trees to be cut per acre by the actual number. In our example for the 6-inch dbh class, 40 percent of the trees would be marked for cutting (13.2/32.6). This value can be converted to an approximate ratio. In Table 2, two of every five 6-inch trees should be cut in the stand; two of seven 14-inch trees; and one of eight 16-inch trees.

Select the trees to be cut

The desired number of trees by dbh class is a goal—a future distribution to try to attain. Considerable flexibility is needed in marking previously unmanaged and managed stands. In many cases, the first cut in the stand, regardless of the stand structure desired, will include removing of a high proportion of the old residuals from previous cutting, along with poor-quality stems and undesirable species. In future cuts, the guidelines for desirable trees can be applied more rigidly. However, even in the first cut, most trees should be marked in those dbh classes with surplus trees.

The number of surplus trees to mark can be grouped by dbh class, perhaps by 4-inch classes, for those

Table 2.—Number of trees to be cut by individual-tree selection cutting for a 50-acre stand (for q-value of 1.3, RBA of 80, and LDT of 32).

Dbh class (inches)	Actual no. trees/acre	No. desired trees/acre	No. surplus to cut/acre	No. trees to cut/ dbh class	Percent of trees to cut/ dbh class	Ratio
6	32.6	19.4	13.2	660	40 ^a	2:5 ^b
8	17.0	14.9	2.1	105	12	3:25
10	14.0	11.5	2.5	125	18	2:11
Subtotal				890		
12	8.8	8.8	0	0	0	—
14	9.6	6.8	2.8	140	29	2:7
16	6.0	5.2	0.8	40	13	1:8
18	6.0	4.0	2.0	100	33	1:3
20	4.9	3.1	1.8	90	37	3:8
22	4.2	2.4	1.8	90	43	3:7
24	3.3	1.8	1.5	75	45	5:11
26	1.0	1.4	-0.4 ^c	0	0	—
28	1.2	1.1	0.1	5	8	2:25
30	0.2	0.8	-0.6	0	0	—
32	0.4	0.6	-0.2	0	0	—
Subtotal				540		
Total				1,430		

^a Percent cut = 13.2/32.6 = 40.

^b Two of every five 6-inch trees can be marked for cut.

^c Deficit dbh class; usually, no trees should be cut.

managers who are not familiar with this marking procedure or who are satisfied with a less rigorously defined stand structure. With experience, and as the stands pass through the early cutting cycles, it is desirable to go to the 2-inch dbh classes.

Once the number of trees to cut has been determined for the acreage to be cut, the marking can begin. The marker should mark first those trees that are less desirable as to form, defect, species, and vigor. Eventually, spacing also will be a major criterion for marking a tree to cut. Try to leave better quality, high-value trees that will provide future stand products.

Of course, there are exceptions to cutting all eligible trees in a surplus dbh class or retaining all trees in deficit classes. For example, one

might retain some trees from a surplus dbh class to develop and fill in deficit dbh classes. Also, one need not retain high-risk trees from deficit dbh classes that will die before the next cutting cycle.

In marking stands with deficit dbh classes, retain some of the trees in the surplus dbh classes so that the residual basal area will not be reduced below the desired level. We determine the amount of basal area in deficit trees and leave at least a compensating amount of basal area in trees below the deficit dbh class or classes.

Several cutting cycles may be needed to attain the goals for number of trees. Also, 5 to 10 percent of the residual stand probably will be lost to logging damage.

It is important to try to mark the trees to cut in one pass over the

area. To do this, it is necessary to keep a running tally of marked trees and an estimate of the acres marked. The number of trees marked per acre can then be periodically compared to the number of surplus trees in each diameter class. Also, the marked and residual basal area can be periodically checked with prism counts.

Usually, a cut of 2,500 to 3,500 fbm per acre (International Rule) is economical, especially where the road system is acceptable. With growth rates known, or closely estimated, a cutting cycle can be set to maintain sustained yield.

Conclusions

In using this method of individual-tree selection, the desired number of residual trees is determined by the stand characteristics and management objectives. We believe that stand sustained yield is more easily attained by this method of controlling tree removal than by other practices where the number of leave trees by dbh class is not specified. The best silvicultural practice is to remove trees from all diameter classes. In our opinion, if there are no markets for small-diameter trees, it is acceptable to use the number of tree goals down to 10 or 12 inches dbh. This is better than selecting trees for removal without any consideration for the residual number of trees by diameter class.

It is neither good silviculture nor good economics to practice individual-tree selection unless desirable tolerant species are present or can be established in the stand.

The data on residual tree and stand basal area control in this paper should help foresters better understand the use of individual-tree selection to control stand structure. However, experience and good judgement are prerequisites for applying this information.

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Appendix

Desired number of trees per acre by dbh class for combinations of q-values, residual basal areas, and maximum size trees to grow—trees 5.0 inches dbh and larger.

Q = 1.2

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	13.90	11.87	10.37	9.23	8.34	7.64	7.08
8	11.58	9.89	8.64	7.69	6.95	6.37	5.90
10	9.65	8.24	7.20	6.41	5.80	5.31	4.92
12	8.04	6.87	6.00	5.34	4.83	4.42	4.10
14	6.70	5.73	5.00	4.45	4.02	3.69	3.41
16	5.58	4.77	4.17	3.71	3.35	3.07	2.84
18	4.65	3.98	3.47	3.09	2.79	2.56	2.37
20	3.88	3.31	2.89	2.58	2.33	2.13	1.98
22	----	2.76	2.41	2.15	1.94	1.78	1.65
24	----	----	2.01	1.79	1.62	1.48	1.37
26	----	----	----	1.49	1.35	1.23	1.14
28	----	----	----	----	1.12	1.03	.95
30	----	----	----	----	----	.86	.79
32	----	----	----	----	----	----	.66

Q = 1.2

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	16.68	14.25	12.45	11.08	10.01	9.17	8.49
8	13.90	11.87	10.37	9.23	8.34	7.64	7.08
10	11.58	9.89	8.64	7.69	6.95	6.37	5.90
12	9.65	8.24	7.20	6.41	5.80	5.31	4.92
14	8.04	6.87	6.00	5.34	4.83	4.42	4.10
16	6.70	5.73	5.00	4.45	4.02	3.69	3.41
18	5.58	4.77	4.17	3.71	3.35	3.07	2.84
20	4.65	3.98	3.47	3.09	2.79	2.56	2.37
22	----	3.31	2.89	2.58	2.33	2.13	1.98
24	----	----	2.41	2.15	1.94	1.78	1.65
26	----	----	----	1.79	1.62	1.48	1.37
28	----	----	----	----	1.35	1.23	1.14
30	----	----	----	----	----	1.03	.95
32	----	----	----	----	----	----	.79

Q = 1.2

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	19.46	16.62	14.52	12.92	11.68	10.70	9.91
8	16.21	13.85	12.10	10.77	9.74	8.92	8.26
10	13.51	11.54	10.08	8.98	8.11	7.43	6.88
12	11.26	9.62	8.40	7.48	6.76	6.19	5.73
14	9.38	8.02	7.00	6.23	5.63	5.16	4.78
16	7.82	6.68	5.84	5.19	4.70	4.30	3.98
18	6.52	5.57	4.86	4.33	3.91	3.58	3.32
20	5.43	4.64	4.05	3.61	3.26	2.99	2.77
22	----	3.87	3.38	3.01	2.72	2.49	2.30
24	----	----	2.81	2.50	2.26	2.07	1.92
26	----	----	----	2.09	1.89	1.73	1.60
28	----	----	----	----	1.57	1.44	1.33
30	----	----	----	----	----	1.20	1.11
32	----	----	----	----	----	----	.93

Q = 1.2

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	22.24	18.99	16.60	14.77	13.35	12.23	11.32
8	18.53	15.83	13.83	12.31	11.13	10.19	9.44
10	15.44	13.19	11.52	10.26	9.27	8.49	7.86
12	12.87	10.99	9.60	8.55	7.73	7.08	6.55
14	10.72	9.16	8.00	7.12	6.44	5.90	5.46
16	8.94	7.63	6.67	5.94	5.37	4.91	4.55
18	7.45	6.36	5.56	4.95	4.47	4.10	3.79
20	6.21	5.30	4.63	4.12	3.73	3.41	3.16
22	----	4.42	3.86	3.44	3.11	2.84	2.63
24	----	----	3.22	2.86	2.59	2.37	2.19
26	----	----	----	2.39	2.16	1.97	1.83
28	----	----	----	----	1.80	1.65	1.52
30	----	----	----	----	----	1.37	1.27
32	----	----	----	----	----	----	1.06

Q = 1.2

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	25.01	21.37	18.67	16.62	15.02	13.76	12.74
8	20.85	17.81	15.56	13.85	12.52	11.46	10.62
10	17.37	14.84	12.97	11.54	10.43	9.55	8.85
12	14.48	12.37	10.80	9.62	8.69	7.96	7.37
14	12.06	10.31	9.00	8.01	7.24	6.63	6.14
16	10.05	8.59	7.50	6.68	6.04	5.53	5.12
18	8.38	7.16	6.25	5.57	5.03	4.61	4.27
20	6.98	5.96	5.21	4.64	4.19	3.84	3.56
22	----	4.97	4.34	3.86	3.49	3.20	2.96
24	----	----	3.62	3.22	2.91	2.67	2.47
26	----	----	----	2.68	2.43	2.22	2.06
28	----	----	----	----	2.02	1.85	1.71
30	----	----	----	----	----	1.54	1.43
32	----	----	----	----	----	----	1.19

Q = 1.2

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	27.79	23.74	20.74	18.46	16.69	15.29	14.16
8	23.16	19.79	17.29	15.39	13.91	12.74	11.80
10	19.30	16.49	14.41	12.82	11.59	10.61	9.83
12	16.08	13.74	12.00	10.68	9.66	8.85	8.19
14	13.40	11.45	10.00	8.90	8.05	7.37	6.83
16	11.17	9.54	8.34	7.42	6.71	6.14	5.69
18	9.31	7.95	6.95	6.18	5.59	5.12	4.74
20	7.76	6.63	5.79	5.15	4.66	4.27	3.95
22	----	5.52	4.82	4.29	3.88	3.55	3.29
24	----	----	4.02	3.58	3.23	2.96	2.74
26	----	----	----	2.98	2.70	2.47	2.29
28	----	----	----	----	2.25	2.06	1.91
30	----	----	----	----	----	1.71	1.59
32	----	----	----	----	----	----	1.32

Q = 1.3

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	19.16	17.05	15.48	14.30	13.39	12.67	12.11
8	14.74	13.11	11.91	11.00	10.30	9.75	9.31
10	11.34	10.09	9.16	8.46	7.92	7.50	7.16
12	8.72	7.76	7.05	6.51	6.09	5.77	5.51
14	6.71	5.97	5.42	5.01	4.69	4.44	4.24
16	5.16	4.59	4.17	3.85	3.61	3.41	3.26
18	3.97	3.53	3.21	2.96	2.77	2.63	2.51
20	3.05	2.72	2.47	2.28	2.13	2.02	1.93
22	----	2.09	1.90	1.75	1.64	1.55	1.48
24	----	----	1.46	1.35	1.26	1.19	1.14
26	----	----	----	1.04	.97	.92	.88
28	----	----	----	----	.75	.71	.68
30	----	----	----	----	----	.54	.52
32	----	----	----	----	----	----	.40

Q = 1.3

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	23.00	20.46	18.58	17.16	16.06	15.21	14.53
8	17.69	15.74	14.29	13.20	12.36	11.70	11.17
10	13.61	12.11	10.99	10.15	9.51	9.00	8.60
12	10.47	9.31	8.46	7.81	7.31	6.92	6.61
14	8.05	7.16	6.51	6.01	5.62	5.32	5.09
16	6.19	5.51	5.00	4.62	4.33	4.10	3.91
18	4.76	4.24	3.85	3.56	3.33	3.15	3.01
20	3.66	3.26	2.96	2.73	2.56	2.42	2.32
22	----	2.51	2.28	2.10	1.97	1.86	1.78
24	----	----	1.75	1.62	1.51	1.43	1.37
26	----	----	----	1.24	1.17	1.10	1.05
28	----	----	----	----	.90	.85	.81
30	----	----	----	----	----	.65	.62
32	----	----	----	----	----	----	.48

Q = 1.3

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	26.83	23.87	21.68	20.02	18.74	17.74	16.95
8	20.64	18.36	16.68	15.40	14.42	13.65	13.04
10	15.87	14.12	12.83	11.85	11.09	10.50	10.03
12	12.21	10.86	9.87	9.11	8.53	8.07	7.71
14	9.39	8.36	7.59	7.01	6.56	6.21	5.93
16	7.23	6.43	5.84	5.39	5.05	4.78	4.56
18	5.56	4.94	4.49	4.15	3.88	3.68	3.51
20	4.28	3.80	3.45	3.19	2.99	2.83	2.70
22	---	2.93	2.66	2.45	2.30	2.17	2.08
24	---	---	2.04	1.89	1.77	1.67	1.60
26	---	---	---	1.45	1.36	1.29	1.23
28	---	---	---	---	1.05	.99	.95
30	---	---	---	---	---	.76	.73
32	---	---	---	---	---	---	.56

Q = 1.3

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	30.66	27.28	24.77	22.88	21.42	20.27	19.37
8	23.59	20.98	19.06	17.60	16.48	15.60	14.90
10	18.14	16.14	14.66	13.54	12.67	12.00	11.46
12	13.96	12.42	11.28	10.41	9.75	9.23	8.82
14	10.74	9.55	8.67	8.01	7.50	7.10	6.78
16	8.26	7.35	6.67	6.16	5.77	5.46	5.22
18	6.35	5.65	5.13	4.74	4.44	4.20	4.01
20	4.89	4.35	3.95	3.65	3.41	3.23	3.09
22	---	3.34	3.04	2.80	2.63	2.49	2.37
24	---	---	2.34	2.16	2.02	1.91	1.83
26	---	---	---	1.66	1.55	1.47	1.41
28	---	---	---	---	1.20	1.13	1.08
30	---	---	---	---	---	.87	.83
32	---	---	---	---	---	---	.64

Q = 1.3

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	34.49	30.69	27.87	25.74	24.10	22.81	21.79
8	26.53	23.61	21.44	19.80	18.54	17.55	16.76
10	20.41	18.16	16.49	15.23	14.26	13.50	12.89
12	15.70	13.97	12.69	11.72	10.97	10.38	9.92
14	12.08	10.74	9.76	9.01	8.44	7.99	7.63
16	9.29	8.26	7.51	6.93	6.49	6.14	5.87
18	7.15	6.36	5.77	5.33	4.99	4.73	4.51
20	5.50	4.89	4.44	4.10	3.84	3.63	3.47
22	----	3.76	3.42	3.16	2.95	2.80	2.67
24	----	----	2.63	2.43	2.27	2.15	2.05
26	----	----	----	1.87	1.75	1.65	1.58
28	----	----	----	----	1.34	1.27	1.22
30	----	----	----	----	----	.98	.94
32	----	----	----	----	----	----	.72

Q = 1.3

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	38.33	34.10	30.97	28.60	26.77	25.34	24.21
8	29.48	26.23	23.82	22.00	20.59	19.49	18.62
10	22.68	20.18	18.32	16.92	15.84	15.00	14.33
12	17.44	15.52	14.10	13.02	12.19	11.54	11.02
14	13.42	11.94	10.84	10.01	9.37	8.87	8.48
16	10.32	9.18	8.34	7.70	7.21	6.83	6.52
18	7.94	7.06	6.42	5.93	5.55	5.25	5.02
20	6.11	5.43	4.94	4.56	4.27	4.04	3.86
22	----	4.18	3.80	3.51	3.28	3.11	2.97
24	----	----	2.92	2.70	2.52	2.39	2.28
26	----	----	----	2.07	1.94	1.84	1.76
28	----	----	----	----	1.49	1.41	1.35
30	----	----	----	----	----	1.09	1.04
32	----	----	----	----	----	----	.80

Q = 1.4

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	25.13	23.06	21.55	20.42	19.58	18.94	18.45
8	17.95	16.47	15.39	14.59	13.99	13.53	13.18
10	12.82	11.76	10.99	10.42	9.99	9.66	9.41
12	9.16	8.40	7.85	7.44	7.14	6.90	6.72
14	6.54	6.00	5.61	5.32	5.10	4.93	4.80
16	4.67	4.29	4.01	3.80	3.64	3.52	3.43
18	3.34	3.06	2.86	2.71	2.60	2.52	2.45
20	2.38	2.19	2.04	1.94	1.86	1.80	1.75
22	---	1.56	1.46	1.38	1.33	1.28	1.25
24	---	---	1.04	.99	.95	.92	.89
26	---	---	---	.71	.68	.65	.64
28	---	---	---	---	.48	.47	.46
30	---	---	---	---	---	.33	.33
32	---	---	---	---	---	---	.23

Q = 1.4

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	30.15	27.67	25.85	24.51	23.50	22.72	22.13
8	21.54	19.76	18.47	17.51	16.78	16.23	15.81
10	15.39	14.12	13.19	12.50	11.99	11.59	11.29
12	10.99	10.08	9.42	8.93	8.56	8.28	8.07
14	7.85	7.20	6.73	6.38	6.12	5.92	5.76
16	5.61	5.14	4.81	4.56	4.37	4.23	4.12
18	4.00	3.67	3.43	3.25	3.12	3.02	2.94
20	2.86	2.62	2.45	2.32	2.23	2.16	2.10
22	---	1.87	1.75	1.66	1.59	1.54	1.50
24	---	---	1.25	1.19	1.14	1.10	1.07
26	---	---	---	.85	.81	.79	.77
28	---	---	---	---	.58	.56	.55
30	---	---	---	---	---	.40	.39
32	---	---	---	---	---	---	.28

Q = 1.4

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	35.18	32.28	30.16	28.59	27.41	26.51	25.82
8	25.13	23.06	21.55	20.42	19.58	18.94	18.45
10	17.95	16.47	15.39	14.59	13.99	13.53	13.18
12	12.82	11.74	10.99	10.42	9.99	9.66	9.41
14	9.16	8.40	7.85	7.44	7.14	6.90	6.72
16	6.54	6.00	5.61	5.32	5.10	4.93	4.80
18	4.67	4.29	4.01	3.80	3.64	3.52	3.43
20	3.34	3.06	2.86	2.71	2.60	2.52	2.45
22	----	2.19	2.04	1.94	1.86	1.80	1.75
24	----	----	1.46	1.38	1.33	1.28	1.25
26	----	----	----	.99	.95	.92	.89
28	----	----	----	----	.68	.65	.64
30	----	----	----	----	----	.47	.46
32	----	----	----	----	----	----	.33

Q = 1.4

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	40.21	36.89	34.47	32.68	31.33	30.30	29.51
8	28.72	26.35	24.62	23.34	22.38	21.64	21.08
10	20.51	18.82	17.59	16.67	15.98	15.46	15.06
12	14.65	13.44	12.56	11.91	11.42	11.04	10.76
14	10.47	9.60	8.97	8.51	8.15	7.89	7.68
16	7.48	6.86	6.41	6.08	5.82	5.63	5.49
18	5.34	4.90	4.58	4.34	4.16	4.02	3.92
20	3.81	3.50	3.27	3.10	2.97	2.87	2.80
22	----	2.50	2.34	2.21	2.12	2.05	2.00
24	----	----	1.67	1.58	1.52	1.47	1.43
26	----	----	----	1.13	1.08	1.05	1.02
28	----	----	----	----	.77	.75	.73
30	----	----	----	----	----	.53	.52
32	----	----	----	----	----	----	.37

Q = 1.4

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	45.23	41.50	38.78	36.76	35.24	34.09	33.20
8	32.31	29.64	27.70	26.26	25.17	24.35	23.72
10	23.08	21.17	19.79	18.76	17.98	17.39	16.94
12	16.48	15.12	14.13	13.40	12.84	12.42	12.10
14	11.77	10.80	10.10	9.57	9.17	8.87	8.64
16	8.41	7.72	7.21	6.84	6.55	6.34	6.17
18	6.01	5.51	5.15	4.88	4.68	4.53	4.41
20	4.29	3.94	3.68	3.49	3.34	3.23	3.15
22	---	2.81	2.63	2.49	2.39	2.31	2.25
24	---	---	1.88	1.78	1.71	1.65	1.61
26	---	---	---	1.27	1.22	1.18	1.15
28	---	---	---	---	.87	.84	.82
30	---	---	---	---	---	.60	.59
32	---	---	---	---	---	---	.42

Q = 1.4

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	50.26	46.11	43.09	40.85	39.16	37.87	36.89
8	35.90	32.94	30.78	29.18	27.97	27.05	26.35
10	25.64	23.53	21.99	20.84	19.98	19.32	18.82
12	18.32	16.80	15.70	14.89	14.27	13.80	13.44
14	13.08	12.00	11.22	10.63	10.19	9.86	9.60
16	9.34	8.57	8.01	7.59	7.28	7.04	6.86
18	6.67	6.12	5.72	5.42	5.20	5.03	4.90
20	4.77	4.37	4.09	3.87	3.71	3.59	3.50
22	---	3.12	2.92	2.77	2.65	2.57	2.50
24	---	---	2.09	1.98	1.90	1.83	1.79
26	---	---	---	1.41	1.35	1.31	1.28
28	---	---	---	---	.97	.94	.91
30	---	---	---	---	---	.67	.65
32	---	---	---	---	---	---	.46

Q = 1.6

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	53.76	51.33	49.67	48.51	47.71	47.15	46.76
8	33.66	32.08	31.04	30.32	29.82	29.47	29.22
10	21.00	20.05	19.40	18.95	18.64	18.42	18.27
12	13.12	12.53	12.13	11.84	11.65	11.51	11.42
14	9.20	7.83	7.58	7.40	7.28	7.19	7.13
16	5.13	4.90	4.74	4.63	4.55	4.50	4.46
18	3.20	3.06	2.96	2.89	2.84	2.81	2.79
20	2.00	1.91	1.85	1.81	1.78	1.76	1.74
22	---	1.20	1.16	1.13	1.11	1.10	1.09
24	---	---	.72	.71	.69	.69	.68
26	---	---	---	.44	.43	.43	.43
28	---	---	---	---	.27	.27	.27
30	---	---	---	---	---	.17	.17
32	---	---	---	---	---	---	.10

Q = 1.6

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	61.43	58.67	56.76	55.44	54.53	53.88	53.44
8	38.40	36.67	35.48	34.65	34.08	33.68	33.40
10	24.00	23.92	22.17	21.66	21.30	21.05	20.87
12	15.00	14.32	13.86	13.54	13.31	13.16	13.05
14	9.37	8.95	8.66	8.46	8.32	8.22	8.15
16	5.86	5.59	5.41	5.29	5.20	5.14	5.10
18	3.66	3.50	3.38	3.30	3.25	3.21	3.19
20	2.29	2.19	2.11	2.07	2.03	2.01	1.99
22	---	1.37	1.32	1.29	1.27	1.25	1.24
24	---	---	.83	.81	.79	.78	.78
26	---	---	---	.50	.50	.49	.49
28	---	---	---	---	.31	.31	.30
30	---	---	---	---	---	.19	.19
32	---	---	---	---	---	---	.12

Q = 1.6

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	69.11	66.00	63.86	62.57	61.39	60.62	60.12
8	43.20	41.25	39.91	38.98	38.34	37.89	37.57
10	27.00	25.78	24.94	24.36	23.96	23.68	23.40
12	16.87	16.11	15.59	15.23	14.93	14.90	14.68
14	10.55	10.07	9.74	9.52	9.36	9.25	9.17
16	6.59	6.29	6.09	5.95	5.85	5.78	5.73
18	4.12	3.93	3.81	3.72	3.66	3.61	3.58
20	2.57	2.46	2.38	2.32	2.29	2.26	2.24
22	---	1.54	1.49	1.45	1.43	1.41	1.40
24	---	---	.93	.91	.89	.88	.87
26	---	---	---	.57	.56	.55	.55
28	---	---	---	---	.35	.34	.34
30	---	---	---	---	---	.22	.21
32	---	---	---	---	---	---	.13

Q = 1.6

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	76.79	73.33	70.95	69.30	68.16	67.36	66.80
8	48.00	45.83	44.35	43.32	42.60	42.10	41.75
10	30.00	28.65	27.72	27.07	26.62	26.31	26.09
12	18.75	17.90	17.32	16.92	16.64	16.44	16.31
14	11.72	11.19	10.83	10.58	10.40	10.28	10.19
16	7.32	6.99	6.77	6.61	6.50	6.42	6.37
18	4.58	4.37	4.23	4.13	4.06	4.01	3.98
20	2.86	2.73	2.64	2.58	2.54	2.51	2.49
22	---	1.71	1.65	1.61	1.59	1.57	1.56
24	---	---	1.03	1.01	.99	.98	.97
26	---	---	---	.63	.62	.61	.61
28	---	---	---	---	.39	.38	.38
30	---	---	---	---	---	.24	.24
32	---	---	---	---	---	---	.15

Q = 1.7

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	45.33	43.83	42.83	42.17	41.73	41.44	41.25
8	26.67	25.78	25.20	24.81	24.55	24.38	24.26
10	15.69	15.17	14.82	14.59	14.44	14.34	14.27
12	9.23	8.92	8.72	8.58	8.49	8.44	8.40
14	5.43	5.25	5.13	5.05	5.00	4.96	4.94
16	3.19	3.09	3.02	2.97	2.94	2.92	2.91
18	1.88	1.82	1.77	1.75	1.73	1.72	1.71
20	1.10	1.07	1.04	1.03	1.02	1.01	1.01
22	----	.63	.61	.60	.60	.59	.59
24	----	----	.36	.36	.35	.35	.35
26	----	----	----	.21	.21	.21	.20
28	----	----	----	----	.12	.12	.12
30	----	----	----	----	----	.07	.07
32	----	----	----	----	----	----	.04

Q = 1.7

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	54.40	52.59	51.40	50.61	50.08	49.73	49.50
8	32.00	30.94	30.24	29.77	29.46	29.25	29.12
10	18.82	18.20	17.79	17.51	17.33	17.21	17.13
12	11.07	10.70	10.46	10.30	10.19	10.12	10.08
14	6.51	6.30	6.15	6.06	6.00	5.95	5.93
16	3.83	3.70	3.62	3.56	3.53	3.50	3.49
18	2.25	2.18	2.13	2.10	2.07	2.06	2.05
20	1.33	1.28	1.25	1.23	1.22	1.21	1.21
22	----	.75	.74	.73	.72	.71	.71
24	----	----	.43	.43	.42	.42	.42
26	----	----	----	.25	.25	.25	.25
28	----	----	----	----	.15	.15	.14
30	----	----	----	----	----	.09	.08
32	----	----	----	----	----	----	.05

Q = 1.7

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	63.46	61.36	59.97	59.04	58.43	58.02	57.75
8	37.33	36.09	35.27	34.73	34.37	34.13	33.97
10	21.96	21.23	20.75	20.43	20.22	20.08	19.98
12	12.92	12.49	12.21	12.02	11.89	11.81	11.75
14	7.60	7.35	7.18	7.07	7.00	6.95	6.91
16	4.47	4.32	4.22	4.16	4.11	4.09	4.07
18	2.63	2.54	2.48	2.45	2.42	2.40	2.39
20	1.55	1.50	1.46	1.44	1.42	1.41	1.41
22	----	.88	.86	.85	.84	.83	.83
24	----	----	.51	.50	.49	.49	.49
26	----	----	----	.29	.29	.29	.29
28	----	----	----	----	.17	.17	.17
30	----	----	----	----	----	.10	.10
32	----	----	----	----	----	----	.06

Q = 1.7

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	72.53	70.12	68.53	67.48	66.77	66.31	66.00
8	42.67	41.25	40.31	39.69	39.28	39.00	38.82
10	25.10	24.26	23.71	23.35	23.11	22.94	22.84
12	14.76	14.27	13.95	13.73	13.59	13.50	13.43
14	8.68	8.40	8.21	8.08	7.99	7.94	7.90
16	5.11	4.94	4.83	4.75	4.70	4.67	4.65
18	3.00	2.91	2.84	2.80	2.77	2.75	2.73
20	1.77	1.71	1.67	1.64	1.63	1.62	1.61
22	----	1.01	.98	.97	.96	.95	.95
24	----	----	.58	.57	.56	.56	.56
26	----	----	----	.33	.33	.33	.33
28	----	----	----	----	.19	.19	.19
30	----	----	----	----	----	.11	.11
32	----	----	----	----	----	----	.07

Q = 1.8

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	73.18	71.39	70.25	69.53	69.08	68.79	68.61
8	40.65	39.66	39.03	38.63	38.38	38.22	38.12
10	22.59	22.03	21.68	21.46	21.32	21.23	21.18
12	12.55	12.24	12.05	11.92	11.84	11.79	11.76
14	6.97	6.80	6.69	6.62	6.58	6.55	6.54
16	3.87	3.78	3.72	3.68	3.66	3.64	3.63
18	2.15	2.10	2.07	2.04	2.03	2.02	2.02
20	1.20	1.17	1.15	1.14	1.13	1.12	1.12
22	----	.65	.64	.63	.63	.62	.62
24	----	----	.35	.35	.35	.35	.35
26	----	----	----	.19	.19	.19	.19
28	----	----	----	----	.11	.11	.11
30	----	----	----	----	----	.06	.06
32	----	----	----	----	----	----	.03

Q = 1.8

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	83.63	81.59	80.29	79.47	78.94	78.61	78.41
8	46.46	45.33	44.61	44.15	43.86	43.67	43.56
10	25.81	25.18	24.78	24.53	24.37	24.26	24.20
12	14.34	13.99	13.77	13.63	13.54	13.48	13.44
14	7.97	7.77	7.65	7.57	7.52	7.49	7.47
16	4.43	4.32	4.25	4.21	4.18	4.16	4.15
18	2.46	2.40	2.36	2.34	2.32	2.31	2.31
20	1.37	1.33	1.31	1.30	1.29	1.28	1.28
22	----	.74	.73	.72	.72	.71	.71
24	----	----	.40	.40	.40	.40	.40
26	----	----	----	.22	.22	.22	.22
28	----	----	----	----	.12	.12	.12
30	----	----	----	----	----	.07	.07
32	----	----	----	----	----	----	.04

Q = 1.8

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	94.08	91.78	90.33	89.40	88.81	88.44	88.21
8	52.27	50.99	50.18	49.67	49.34	49.13	49.01
10	29.04	28.33	27.88	27.59	27.41	27.30	27.23
12	16.13	15.74	15.49	15.33	15.23	15.16	15.13
14	8.96	8.74	8.60	8.52	8.46	8.42	8.40
16	4.98	4.86	4.78	4.73	4.70	4.68	4.67
18	2.77	2.70	2.66	2.63	2.61	2.60	2.59
20	1.54	1.50	1.48	1.46	1.45	1.44	1.44
22	---	.83	.82	.81	.81	.80	.80
24	---	---	.46	.45	.45	.45	.44
26	---	---	---	.25	.25	.25	.25
28	---	---	---	---	.14	.14	.14
30	---	---	---	---	---	.08	.08
32	---	---	---	---	---	---	.04

Q = 1.8

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	104.54	101.98	100.36	99.33	98.68	98.27	98.01
8	58.08	56.66	55.76	55.18	54.82	54.59	54.45
10	32.26	31.48	30.98	30.66	30.46	30.33	30.25
12	17.92	17.49	17.21	17.03	16.92	16.85	16.81
14	9.96	9.71	9.56	9.46	9.40	9.36	9.34
16	5.53	5.40	5.31	5.26	5.22	5.20	5.19
18	3.07	3.00	2.95	2.92	2.90	2.89	2.88
20	1.71	1.67	1.64	1.62	1.61	1.61	1.60
22	---	.93	.91	.90	.90	.89	.89
24	---	---	.51	.50	.50	.50	.49
26	---	---	---	.28	.28	.28	.27
28	---	---	---	---	.15	.15	.15
30	---	---	---	---	---	.08	.08
32	---	---	---	---	---	---	.05

Q = 1.9

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	59.10	58.03	57.38	56.99	56.75	56.61	56.53
8	31.10	30.54	30.20	29.99	29.87	29.79	29.75
10	16.37	16.08	15.90	15.79	15.72	15.68	15.66
12	8.62	8.46	8.37	8.31	8.27	8.25	8.24
14	4.53	4.45	4.40	4.37	4.35	4.34	4.34
16	2.39	2.34	2.32	2.30	2.29	2.29	2.28
18	1.26	1.23	1.22	1.21	1.21	1.20	1.20
20	.66	.65	.64	.64	.63	.63	.63
22	----	.34	.34	.34	.33	.33	.33
24	----	----	.18	.18	.18	.18	.18
26	----	----	----	.09	.09	.09	.09
28	----	----	----	----	.05	.05	.05
30	----	----	----	----	----	.03	.03
32	----	----	----	----	----	----	.01

Q = 1.9

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	70.92	69.64	68.86	68.39	68.10	67.93	67.83
8	37.33	36.65	36.24	35.99	35.84	35.75	35.70
10	19.64	19.29	19.07	18.94	18.87	18.82	18.79
12	10.34	10.15	10.04	9.97	9.93	9.90	9.89
14	5.44	5.34	5.28	5.25	5.23	5.21	5.20
16	2.86	2.81	2.78	2.76	2.75	2.74	2.74
18	1.51	1.48	1.46	1.45	1.45	1.44	1.44
20	.79	.78	.77	.77	.76	.76	.76
22	----	.41	.41	.40	.40	.40	.40
24	----	----	.21	.21	.21	.21	.21
26	----	----	----	.11	.11	.11	.11
28	----	----	----	----	.06	.06	.06
30	----	----	----	----	----	.03	.03
32	----	----	----	----	----	----	.02

Q = 1.9

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	82.74	81.25	80.34	79.79	79.45	79.25	79.14
8	43.55	42.76	42.28	41.99	41.82	41.71	41.65
10	22.92	22.51	22.25	22.10	22.01	21.95	21.92
12	12.06	11.85	11.71	11.63	11.58	11.55	11.54
14	6.35	6.23	6.16	6.12	6.10	6.08	6.07
16	3.34	3.28	3.24	3.22	3.21	3.20	3.20
18	1.76	1.73	1.71	1.70	1.69	1.68	1.68
20	.93	.91	.90	.89	.89	.89	.89
22	---	.48	.47	.47	.47	.47	.47
24	---	---	.25	.25	.25	.25	.25
26	---	---	---	.13	.13	.13	.13
28	---	---	---	---	.07	.07	.07
30	---	---	---	---	---	.04	.04
32	---	---	---	---	---	---	.02

Q = 1.9

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	94.56	92.85	91.81	91.18	90.80	90.58	90.44
8	49.77	48.87	48.32	47.99	47.79	47.67	47.60
10	26.19	25.72	25.43	25.26	25.15	25.09	25.05
12	13.79	13.54	13.39	13.29	13.24	13.21	13.19
14	7.26	7.12	7.05	7.00	6.97	6.95	6.94
16	3.82	3.75	3.71	3.68	3.67	3.66	3.65
18	2.01	1.97	1.95	1.94	1.93	1.93	1.92
20	1.06	1.04	1.03	1.02	1.02	1.01	1.01
22	---	.55	.54	.54	.53	.53	.53
24	---	---	.28	.28	.28	.28	.28
26	---	---	---	.15	.15	.15	.15
28	---	---	---	---	.08	.08	.08
30	---	---	---	---	---	.04	.04
32	---	---	---	---	---	---	.02

Q = 1.9

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	106.38	104.46	103.29	102.58	102.16	101.90	101.75
8	55.99	54.98	54.36	53.99	53.77	53.63	53.55
10	29.47	28.94	28.61	28.42	28.30	28.23	28.18
12	15.51	15.23	15.06	14.96	14.89	14.86	14.83
14	8.16	8.02	7.93	7.87	7.84	7.82	7.81
16	4.30	4.22	4.17	4.14	4.13	4.12	4.11
18	2.26	2.22	2.20	2.18	2.17	2.17	2.16
20	1.19	1.17	1.16	1.15	1.14	1.14	1.14
22	----	.62	.61	.60	.60	.60	.60
24	----	----	.32	.32	.32	.32	.32
26	----	----	----	.17	.17	.17	.17
28	----	----	----	----	.09	.09	.09
30	----	----	----	----	----	.05	.05
32	----	----	----	----	----	----	.02

Q = 1.9

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	118.20	116.06	114.77	113.98	113.51	113.22	113.05
8	62.21	61.09	60.40	59.99	59.74	59.59	59.50
10	32.74	32.15	31.79	31.57	31.44	31.36	31.32
12	17.23	16.92	16.73	16.62	16.55	16.51	16.48
14	9.07	8.91	8.81	8.75	8.71	8.69	8.67
16	4.77	4.69	4.64	4.60	4.58	4.57	4.57
18	2.51	2.47	2.44	2.42	2.41	2.41	2.40
20	1.32	1.30	1.28	1.28	1.27	1.27	1.26
22	----	.68	.68	.67	.67	.67	.67
24	----	----	.36	.35	.35	.35	.35
26	----	----	----	.19	.19	.18	.18
28	----	----	----	----	.10	.10	.10
30	----	----	----	----	----	.05	.05
32	----	----	----	----	----	----	.03

Q = 2.0

RESIDUAL BASAL AREA = 50 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	65.75	64.87	64.35	64.06	63.89	63.79	63.73
8	32.87	32.43	32.18	32.03	31.94	31.89	31.87
10	16.44	16.22	16.09	16.01	15.97	15.95	15.93
12	8.22	8.11	8.04	8.01	7.99	7.97	7.97
14	4.11	4.05	4.02	4.00	3.99	3.99	3.98
16	2.05	2.03	2.01	2.00	2.00	1.99	1.99
18	1.03	1.01	1.01	1.00	1.00	1.00	1.00
20	.51	.51	.50	.50	.50	.50	.50
22	---	.25	.25	.25	.25	.25	.25
24	---	---	.13	.13	.12	.12	.12
26	---	---	---	.06	.06	.06	.06
28	---	---	---	---	.03	.03	.03
30	---	---	---	---	---	.02	.02
32	---	---	---	---	---	---	.01

Q = 2.0

RESIDUAL BASAL AREA = 60 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	78.89	77.84	77.22	76.87	76.66	76.55	76.48
8	39.45	38.92	38.61	38.43	38.33	38.27	38.24
10	19.72	19.46	19.31	19.22	19.17	19.14	19.12
12	9.86	9.73	9.65	9.61	9.58	9.57	9.56
14	4.93	4.86	4.83	4.80	4.79	4.78	4.78
16	2.47	2.43	2.41	2.40	2.40	2.39	2.39
18	1.23	1.22	1.21	1.20	1.20	1.20	1.19
20	.62	.61	.60	.60	.60	.60	.60
22	---	.30	.30	.30	.30	.30	.30
24	---	---	.15	.15	.15	.15	.15
26	---	---	---	.08	.07	.07	.07
28	---	---	---	---	.04	.04	.04
30	---	---	---	---	---	.02	.02
32	---	---	---	---	---	---	.01

Q = 2.0

RESIDUAL BASAL AREA = 70 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	92.04	90.81	90.09	89.68	89.44	89.30	89.23
8	46.02	45.41	45.05	44.84	44.72	44.65	44.61
10	23.01	22.70	22.52	22.42	22.36	22.33	22.31
12	11.51	11.35	11.26	11.21	11.18	11.16	11.15
14	5.75	5.68	5.63	5.60	5.59	5.58	5.58
16	2.88	2.84	2.82	2.80	2.79	2.79	2.79
18	1.44	1.42	1.41	1.40	1.40	1.40	1.39
20	.72	.71	.70	.70	.70	.70	.70
22	----	.35	.35	.35	.35	.35	.35
24	----	----	.18	.18	.17	.17	.17
26	----	----	----	.09	.09	.09	.09
28	----	----	----	----	.04	.04	.04
30	----	----	----	----	----	.02	.02
32	----	----	----	----	----	----	.01

Q = 2.0

RESIDUAL BASAL AREA = 80 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	105.19	103.78	102.97	102.49	102.22	102.06	101.97
8	52.60	51.89	51.48	51.25	51.11	51.03	50.99
10	26.30	25.95	25.74	25.62	25.55	25.52	25.49
12	13.15	12.97	12.87	12.81	12.78	12.76	12.75
14	6.57	6.49	6.44	6.41	6.39	6.38	6.37
16	3.29	3.24	3.22	3.20	3.19	3.19	3.19
18	1.64	1.62	1.61	1.60	1.60	1.59	1.59
20	.82	.81	.80	.80	.80	.80	.80
22	----	.41	.40	.40	.40	.40	.40
24	----	----	.20	.20	.20	.20	.20
26	----	----	----	.10	.10	.10	.10
28	----	----	----	----	.05	.05	.05
30	----	----	----	----	----	.02	.02
32	----	----	----	----	----	----	.01

Q = 2.0

RESIDUAL BASAL AREA = 90 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	118.34	116.76	115.84	115.30	114.99	114.82	114.72
8	59.17	58.38	57.92	57.65	57.50	57.41	57.36
10	29.59	29.19	28.96	28.83	28.75	28.70	28.68
12	14.79	14.59	14.48	14.41	14.37	14.35	14.34
14	7.40	7.30	7.24	7.21	7.19	7.18	7.17
16	3.70	3.65	3.62	3.60	3.59	3.59	3.58
18	1.85	1.82	1.81	1.80	1.80	1.79	1.79
20	.92	.91	.90	.90	.90	.90	.90
22	---	.46	.45	.45	.45	.45	.45
24	---	---	.23	.23	.22	.22	.22
26	---	---	---	.11	.11	.11	.11
28	---	---	---	---	.06	.06	.06
30	---	---	---	---	---	.03	.03
32	---	---	---	---	---	---	.01

Q = 2.0

RESIDUAL BASAL AREA = 100 SQ. FT./AC.

LARGEST DIAMETER TREE TO GROW

DBH CLASS	20	22	24	26	28	30	32
6	131.49	129.73	128.71	128.11	127.77	127.58	127.46
8	65.75	64.87	64.35	64.06	63.89	63.79	63.73
10	32.87	32.43	32.18	32.03	31.94	31.89	31.87
12	16.44	16.22	16.09	16.01	15.97	15.95	15.93
14	8.22	8.11	8.04	8.01	7.99	7.97	7.97
16	4.11	4.05	4.02	4.00	3.99	3.99	3.98
18	2.05	2.03	2.01	2.00	2.00	1.99	1.99
20	1.03	1.01	1.01	1.00	1.00	1.00	1.00
22	---	.51	.50	.50	.50	.50	.50
24	---	---	.25	.25	.25	.25	.25
26	---	---	---	.13	.12	.12	.12
28	---	---	---	---	.06	.06	.06
30	---	---	---	---	---	.03	.03
32	---	---	---	---	---	---	.02

Headquarters of the Northeastern Forest Experiment Station are in Broomall, Pa. Field laboratories are maintained at:

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Smith, H. Clay; Lamson, Neil I. Number of residual trees: a guide for selection cutting. Broomall, PA: Northeast. For. Exp. Stn. 1982; USDA For. Serv. Gen. Tech. Rep. NE-80. 33 p.

Marking trees for removal by an individual-tree selection cutting is described. The number of desirable residual trees is computed for given ranges of residual basal areas, largest diameter trees to grow, and q-values. Included are guidelines for applying this selection cutting practice.

221.4:176.1

Keywords: Basal area, q-value, tree diameter, marking.