

# Site Index Curves and Tables for British Columbia — Coastal Species

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Land Management Handbook  
FIELD GUIDE INSERT 3  
Second edition



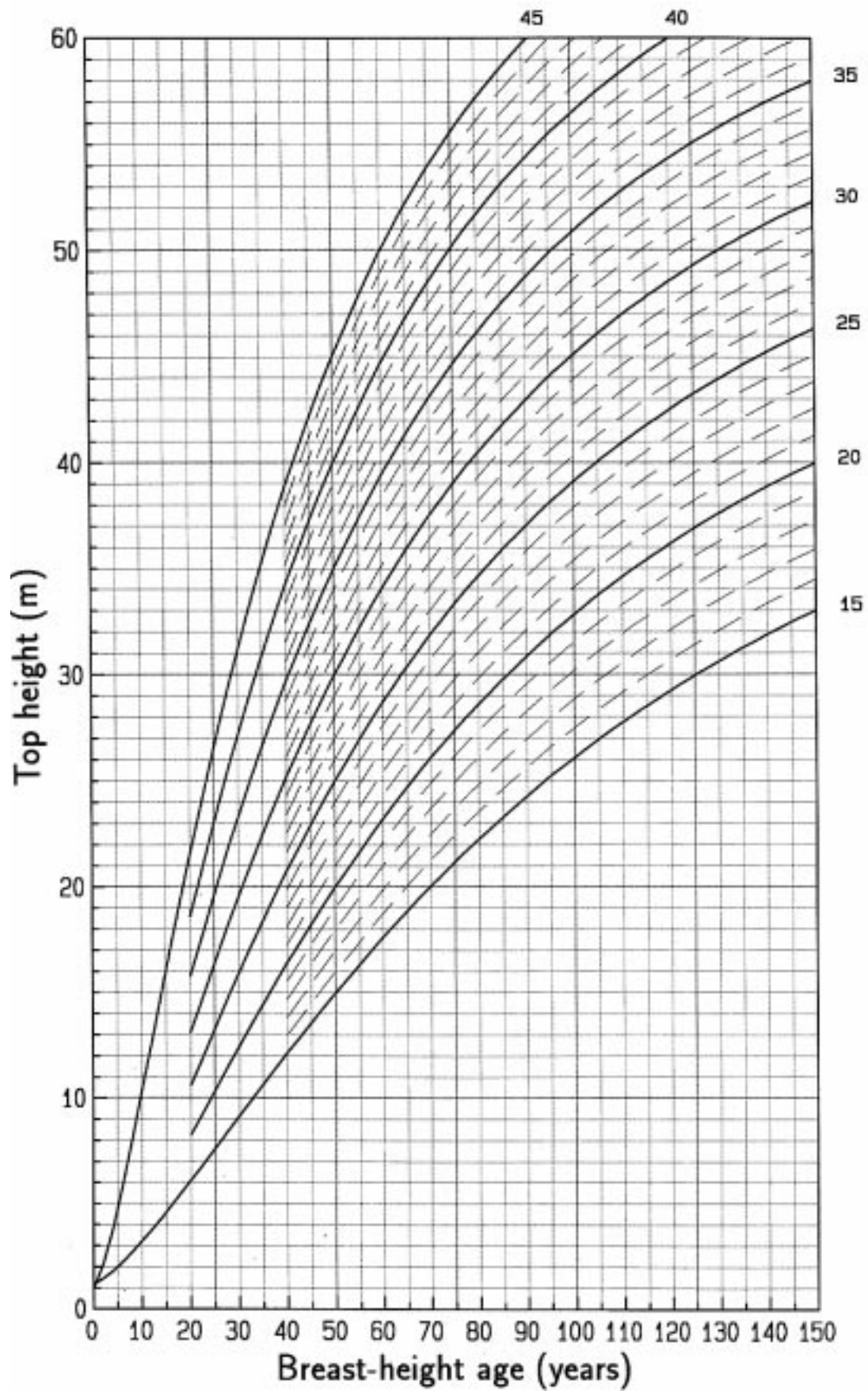
BRITISH  
COLUMBIA

Ministry of Forests Research Program

(continued)

Top height (m)														bh age (years)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	
Site Index (m)														
-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
49	-	-	-	-	-	-	-	-	-	-	-	-	-	30
44	46	48	50	-	-	-	-	-	-	-	-	-	-	35
40	42	44	46	48	-	-	-	-	-	-	-	-	-	40
37	39	41	43	45	47	49	-	-	-	-	-	-	-	45
34	36	38	40	42	44	46	48	50	-	-	-	-	-	50
32	34	36	38	40	42	43	45	47	49	-	-	-	-	55
30	32	34	36	37	39	41	43	45	47	49	-	-	-	60
28	30	32	34	36	38	39	41	43	45	47	49	-	-	65
27	29	30	32	34	36	38	40	41	43	45	47	49	-	70
26	27	29	31	33	34	36	38	40	42	44	45	47	49	75
24	26	28	30	31	33	35	37	39	40	42	44	46	48	80
23	25	27	28	30	32	34	36	37	39	41	43	45	46	85
23	24	26	27	29	31	33	34	36	38	40	42	43	45	90
22	23	25	27	28	30	32	33	35	37	39	41	42	44	95
21	22	24	26	27	29	31	33	34	36	38	40	41	43	100
20	22	23	25	27	28	30	32	33	35	37	39	41	42	105
20	21	23	24	26	28	29	31	33	34	36	38	40	42	110
19	20	22	24	25	27	29	30	32	34	35	37	39	41	115
18	20	21	23	25	26	28	30	31	33	35	36	38	40	120
18	19	21	22	24	26	27	29	31	32	34	36	38	39	125
17	19	20	22	23	25	27	28	30	32	33	35	37	39	130
17	18	20	21	23	25	26	28	30	31	33	35	36	38	135
16	18	19	21	22	24	26	27	29	31	32	34	36	38	140
16	17	19	20	22	24	25	27	29	30	32	34	35	37	145
16	17	19	20	22	23	25	26	28	30	31	33	35	37	150
15	17	18	20	21	23	24	26	28	29	31	33	35	36	155
15	16	18	19	21	22	24	26	27	29	31	32	34	36	160
15	16	17	19	20	22	24	25	27	29	30	32	34	36	165
14	16	17	19	20	22	23	25	26	28	30	32	33	35	170
14	15	17	18	20	21	23	24	26	28	30	31	33	35	175
14	15	16	18	19	21	23	24	26	27	29	31	33	34	180
13	15	16	18	19	21	22	24	26	27	29	31	32	34	185
13	15	16	17	19	20	22	24	25	27	29	30	32	34	190
13	14	16	17	19	20	22	23	25	27	28	30	32	34	195
13	14	15	17	18	20	21	23	25	26	28	30	32	33	200
Site Index	≤ 11	12-18	19-22	23-28	29-33	34-38	≥ 39							
Years to bh	10	9	8	7	6	5	4							

# Coastal Sitka Spruce



## Coastal Western Hemlock

### Source:

Wiley, K.N. 1978. Site index tables for western hemlock in the Pacific Northwest. Weyerhaeuser Co., For. Res. Cent. For. Pap. 17. 28 p.

### Formulation:

$$H = 0.3048 [4.5 + A^2 / (b_1 + b_2A + b_3A^2)]$$

$$b_1 = -1.7307 + 348.5 / (S / 0.3048 - 4.5)$$

$$b_2 = -0.0616 + 34.25 / (S / 0.3048 - 4.5)$$

$$b_3 = 0.00192428 + 0.1756 / (S / 0.3048 - 4.5)$$

$$y_{tb} = 9.43 - 0.043 (S / 0.3048)$$

where:

H = top height (m)

S = site index (height at 50 years breast-height age)

A = breast-height age (years)

y<sub>tb</sub> = number of years to reach breast height (1.3 m)

### Notes:

The site index (height-age) curves were developed from stem analysis data collected from 90 plots in Washington and Oregon. The plots ranged from site index 18 to 40 m and from about 60 to 130 years breast-height age. The height-age equation should not be used for ages less than 10 years.

Site Index Table for Coastal Western Hemlock

bh age (years)	Top height (m)													
	6	8	10	12	14	16	18	20	22	24	26	28	30	32
	Site Index (m)													
10	26	33	39	44	49	-	-	-	-	-	-	-	-	-
15	18	23	28	33	37	41	45	48	-	-	-	-	-	-
20	13	18	22	26	30	33	37	40	43	46	48	-	-	-
25	11	14	18	21	25	28	31	34	37	40	42	45	47	50
30	-	12	15	18	21	24	27	30	32	35	37	40	42	45
35	-	11	13	16	19	21	24	26	29	31	34	36	38	41
40	-	10	12	14	17	19	21	24	26	28	31	33	35	37
45	-	-	11	13	15	17	20	22	24	26	28	30	32	34
50	-	-	10	12	14	16	18	20	22	24	26	28	30	32
55	-	-	-	11	13	15	17	19	21	22	24	26	28	30
60	-	-	-	10	12	14	16	17	19	21	23	25	27	28
65	-	-	-	10	12	13	15	17	18	20	22	23	25	27
70	-	-	-	-	11	13	14	16	17	19	21	22	24	26
75	-	-	-	-	10	12	13	15	17	18	20	21	23	24
80	-	-	-	-	10	11	13	14	16	17	19	20	22	24
85	-	-	-	-	10	11	12	14	15	17	18	20	21	23
90	-	-	-	-	-	11	12	13	15	16	17	19	20	22
95	-	-	-	-	-	10	12	13	14	16	17	18	20	21
100	-	-	-	-	-	10	11	12	14	15	16	18	19	20
105	-	-	-	-	-	10	11	12	13	15	16	17	19	20
110	-	-	-	-	-	-	11	12	13	14	15	17	18	19
115	-	-	-	-	-	-	10	11	13	14	15	16	18	19
120	-	-	-	-	-	-	10	11	12	14	15	16	17	18
125	-	-	-	-	-	-	10	11	12	13	14	16	17	18
130	-	-	-	-	-	-	10	11	12	13	14	15	16	18
135	-	-	-	-	-	-	-	10	12	13	14	15	16	17
140	-	-	-	-	-	-	-	10	11	12	14	15	16	17
145	-	-	-	-	-	-	-	10	11	12	13	14	16	17
150	-	-	-	-	-	-	-	10	11	12	13	14	15	16
155	-	-	-	-	-	-	-	10	11	12	13	14	15	16
160	-	-	-	-	-	-	-	10	11	12	13	14	15	16
165	-	-	-	-	-	-	-	-	10	11	12	13	15	16
170	-	-	-	-	-	-	-	-	10	11	12	13	14	15
175	-	-	-	-	-	-	-	-	10	11	12	13	14	15
180	-	-	-	-	-	-	-	-	10	11	12	13	14	15
185	-	-	-	-	-	-	-	-	10	11	12	13	14	15
190	-	-	-	-	-	-	-	-	10	11	12	13	14	15
195	-	-	-	-	-	-	-	-	10	11	12	12	13	14
200	-	-	-	-	-	-	-	-	10	10	11	12	13	14
Site Index Years to bh	≤ 20		21-27			28-34			35-42			≥ 43		
	7		6			5			4			3		

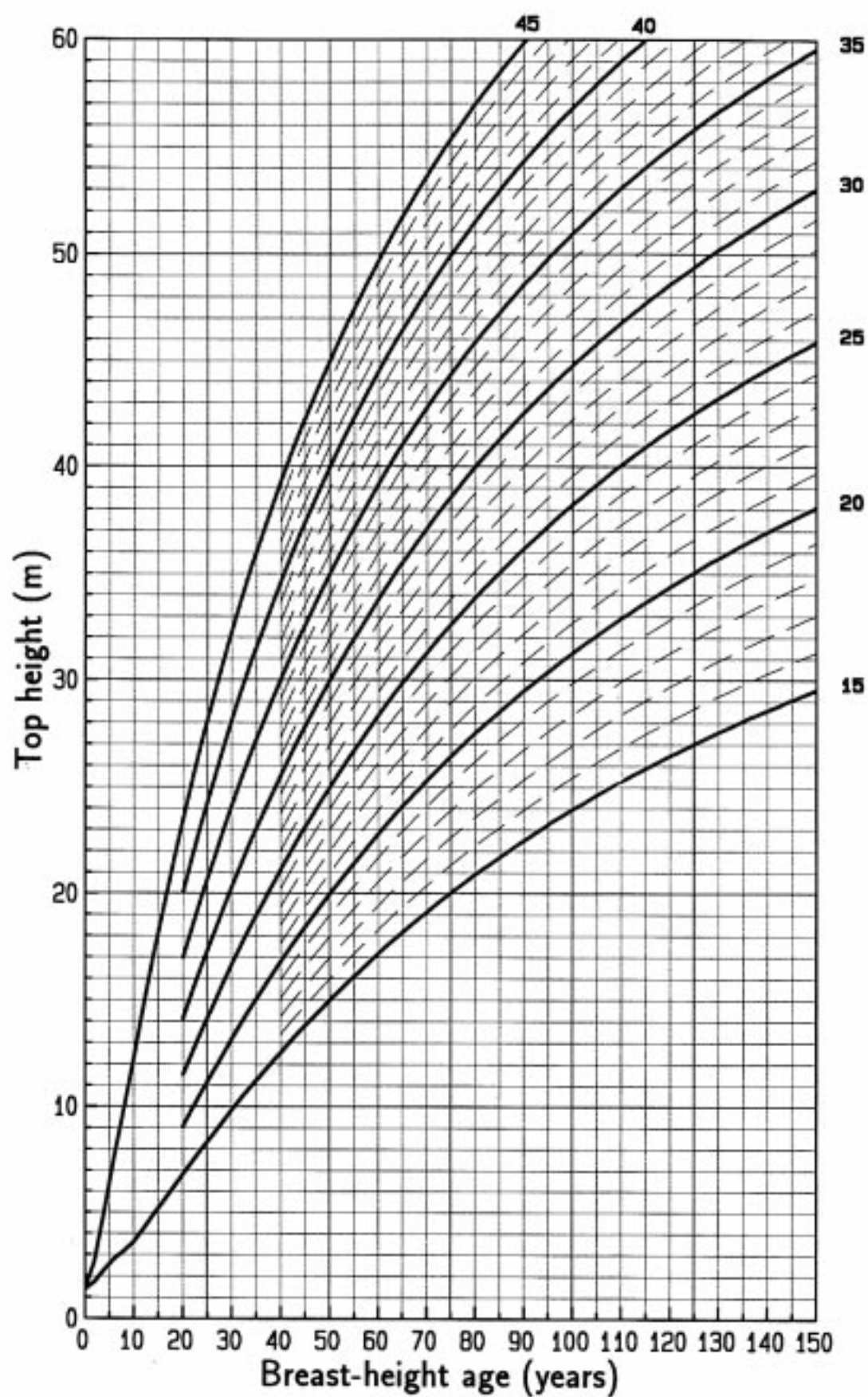
(continued)

Top height (m)														bh age (years)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	
Site Index (m)														10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
47	49	-	-	-	-	-	-	-	-	-	-	-	-	30
43	45	47	49	-	-	-	-	-	-	-	-	-	-	35
39	41	44	46	48	50	-	-	-	-	-	-	-	-	40
36	39	41	43	45	47	49	-	-	-	-	-	-	-	45
34	36	38	40	42	44	46	48	50	-	-	-	-	-	50
32	34	36	38	40	42	44	46	48	49	-	-	-	-	55
30	32	34	36	38	40	41	43	45	47	49	-	-	-	60
29	30	32	34	36	38	40	41	43	45	47	49	-	-	65
27	29	31	33	34	36	38	40	42	43	45	47	49	-	70
26	28	29	31	33	35	36	38	40	42	44	46	48	49	75
25	27	28	30	32	33	35	37	39	40	42	44	46	48	80
24	26	27	29	31	32	34	36	37	39	41	43	45	46	85
23	25	26	28	30	31	33	35	36	38	40	41	43	45	90
23	24	26	27	29	30	32	34	35	37	39	40	42	44	95
22	23	25	26	28	29	31	33	34	36	38	39	41	43	100
21	23	24	26	27	29	30	32	33	35	37	38	40	42	105
21	22	24	25	26	28	29	31	33	34	36	37	39	41	110
20	22	23	24	26	27	29	30	32	33	35	37	38	40	115
20	21	22	24	25	27	28	30	31	33	34	36	38	39	120
19	21	22	23	25	26	27	29	30	32	34	35	37	38	125
19	20	21	23	24	26	27	28	30	31	33	34	36	38	130
19	20	21	22	24	25	26	28	29	31	32	34	35	37	135
18	19	21	22	23	25	26	27	29	30	32	33	35	36	140
18	19	20	22	23	24	26	27	28	30	31	33	34	36	145
1	19	20	21	22	24	25	26	28	29	31	32	34	35	150
17	18	20	21	22	23	25	26	27	29	30	32	33	35	155
17	18	19	21	22	23	24	26	27	28	30	31	33	34	160
17	18	19	20	21	23	24	25	27	28	29	31	32	34	165
17	18	19	20	21	22	24	25	26	28	29	30	32	33	170
16	17	19	20	21	22	23	25	26	27	29	30	32	33	175
16	17	18	19	21	22	23	24	26	27	28	30	31	33	180
16	17	18	19	20	22	23	24	25	27	28	29	31	32	185
16	17	18	19	20	21	22	24	25	26	28	29	30	32	190
15	17	18	19	20	21	22	23	25	26	27	29	30	32	195
15	16	17	19	20	21	22	23	24	26	27	28	30	31	200

Site Index	≤ 20	21-27	28-34	35-42	≥ 43
Years to bh	7	6	5	4	3

# Coastal Western Hemlock



## Coastal Western Redcedar

### Source:

This 1985 formulation is an updated version of the curves given in 1978 by J. F. Kurucz (1978. Preliminary, polymorphic site index curves for western redcedar (*Thuja plicata* Donn) in coastal British Columbia. MacMillan Bloedel For. Res. Note No. 3. 14 p. + appendix.) (Personal communication with Kurucz, Nov. 1990).

### Formulation:

$$H = 1.3 + A^2 / (b_1 + b_2A + b_3A^2)$$

if age > 50 years then

$$H = H + 0.02379545 H - 0.000475909 AH$$

$$b_1 = -3.11785 + 125.675 / (S - 1.3)$$

$$b_2 = -0.02465 + 35.275 / (S - 1.3)$$

$$b_3 = 0.00174 + 0.2441675 / (S - 1.3)$$

$$y_{tb} = 13.25 - S / 6.096 \quad (\text{from King [1966] for Fdc})$$

where:

H = top height (m)

A = breast-height age (years)

S = site index (height at 50 years breast-height age)

y<sub>tb</sub> = number of years to reach breast height (1.3 m)

### Notes:

The height-age (site index) curves were developed from stem analysis of undamaged, dominant and co-dominant trees located in approximately 50 stands throughout Vancouver Island and the mid-coast region of the mainland. The sample trees ranged in breast-height age from 33 to 285 years and in site index from 8 to 37 m. Kurucz suggested using this formulation with caution for breast-height ages less than 10 years and for site indexes greater than 37 m.

Site Index Table for Coastal Western Redcedar

bh age (years)	Top height (m)													
	6	8	10	12	14	16	18	20	22	24	26	28	30	32
	Site Index (m)													
10	22	29	36	41	47	-	-	-	-	-	-	-	-	-
15	15	21	26	31	35	40	44	48	-	-	-	-	-	-
20	12	16	20	24	28	32	36	40	43	47	50	-	-	-
25	10	13	17	20	24	27	30	33	37	40	43	46	49	-
30	-	12	15	18	21	23	26	29	32	35	38	40	43	46
35	-	10	13	16	18	21	23	26	29	31	34	36	39	41
40	-	-	12	14	16	19	21	23	26	28	30	33	35	37
45	-	-	11	13	15	17	19	22	24	26	28	30	32	34
50	-	-	10	12	14	16	18	20	22	24	26	28	30	32
55	-	-	-	11	13	15	17	19	21	23	24	26	28	30
60	-	-	-	11	12	14	16	18	20	21	23	25	27	28
65	-	-	-	10	12	14	15	17	19	20	22	24	25	27
70	-	-	-	10	11	13	15	16	18	19	21	23	24	26
75	-	-	-	-	11	12	14	15	17	19	20	22	23	25
80	-	-	-	-	11	12	13	15	16	18	19	21	22	24
85	-	-	-	-	10	12	13	14	16	17	19	20	22	23
90	-	-	-	-	10	11	13	14	15	17	18	20	21	22
95	-	-	-	-	10	11	12	14	15	16	18	19	20	22
100	-	-	-	-	-	11	12	13	15	16	17	19	20	21
105	-	-	-	-	-	10	12	13	14	16	17	18	19	21
110	-	-	-	-	-	10	11	13	14	15	16	18	19	20
115	-	-	-	-	-	10	11	12	14	15	16	17	19	20
120	-	-	-	-	-	10	11	12	13	15	16	17	18	19
125	-	-	-	-	-	10	11	12	13	14	16	17	18	19
130	-	-	-	-	-	-	11	12	13	14	15	16	18	19
135	-	-	-	-	-	-	10	12	13	14	15	16	17	18
140	-	-	-	-	-	-	10	11	13	14	15	16	17	18
145	-	-	-	-	-	-	10	11	12	13	15	16	17	18
150	-	-	-	-	-	-	10	11	12	13	14	16	17	18
155	-	-	-	-	-	-	10	11	12	13	14	15	16	18
160	-	-	-	-	-	-	10	11	12	13	14	15	16	17
165	-	-	-	-	-	-	10	11	12	13	14	15	16	17
170	-	-	-	-	-	-	10	11	12	13	14	15	16	17
175	-	-	-	-	-	-	10	11	12	13	14	15	16	17
180	-	-	-	-	-	-	-	10	11	12	14	15	16	17
185	-	-	-	-	-	-	-	10	11	12	13	14	15	16
190	-	-	-	-	-	-	-	10	11	12	13	14	15	16
195	-	-	-	-	-	-	-	10	11	12	13	14	15	16
200	-	-	-	-	-	-	-	10	11	12	13	14	15	16

Site Index	≤ 16	17-22	23-28	29-35	36-41	42-47	≥ 48
Years to bh	11	10	9	8	7	6	5

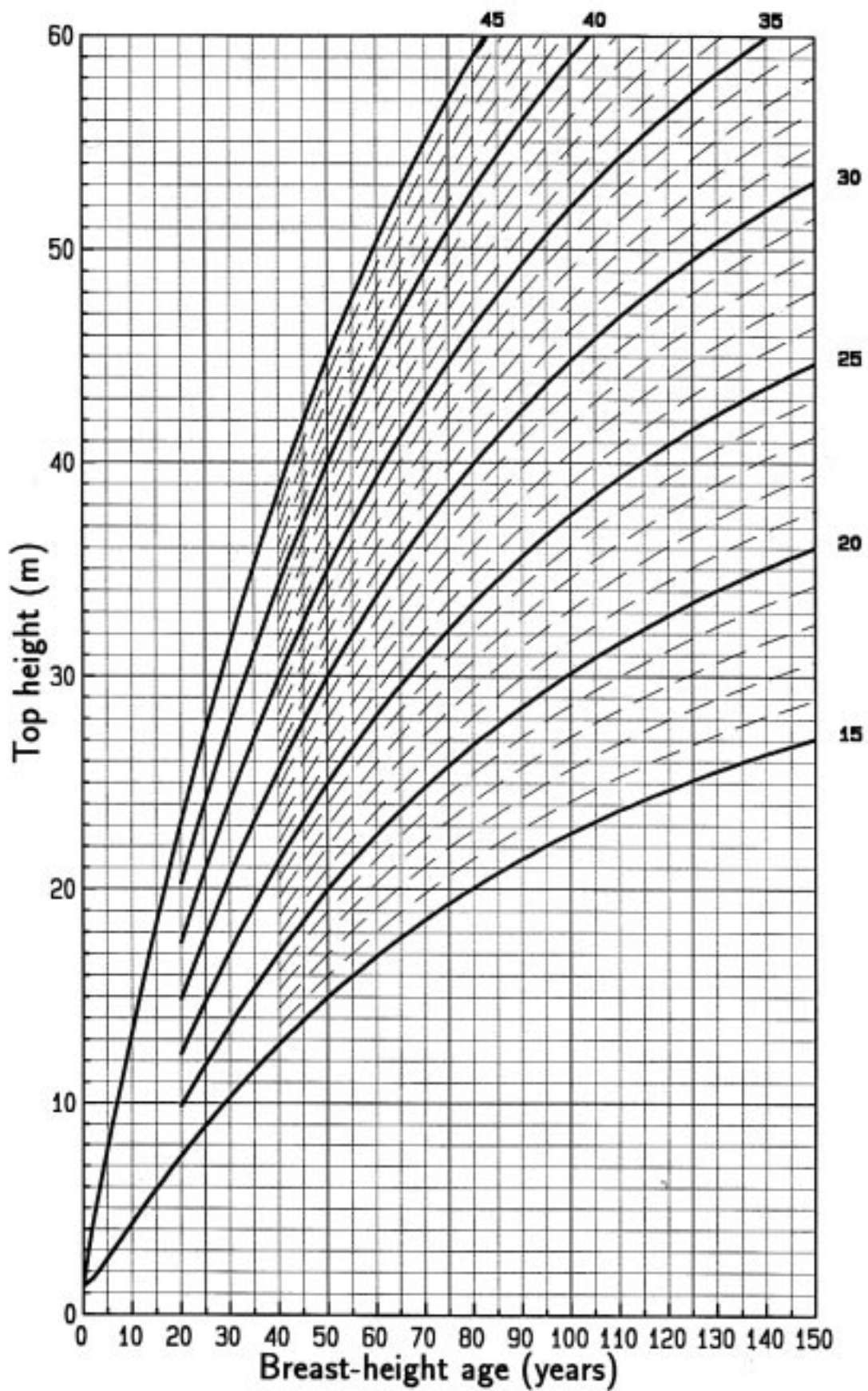
(continued)

Top height (m)														bh age (years)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	
Site Index (m)														10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
48	-	-	-	-	-	-	-	-	-	-	-	-	-	30
44	46	48	-	-	-	-	-	-	-	-	-	-	-	35
40	42	44	46	49	-	-	-	-	-	-	-	-	-	40
37	39	41	43	45	47	49	-	-	-	-	-	-	-	45
34	36	38	40	42	44	46	48	50	-	-	-	-	-	50
32	34	36	38	40	41	43	45	47	49	-	-	-	-	55
30	32	34	36	37	39	41	43	45	47	48	50	-	-	60
29	30	32	34	36	37	39	41	43	44	46	48	50	-	65
28	29	31	32	34	36	37	39	41	43	44	46	48	49	70
26	28	30	31	33	34	36	38	39	41	43	44	46	47	75
25	27	29	30	32	33	35	36	38	39	41	43	44	46	80
25	26	28	29	31	32	34	35	37	38	40	41	43	44	85
24	25	27	28	30	31	33	34	36	37	38	40	42	43	90
23	25	26	27	29	30	32	33	35	36	37	39	40	42	95
23	24	25	27	28	29	31	32	34	35	36	38	39	41	100
22	23	25	26	27	29	30	31	33	34	36	37	38	40	105
22	23	24	25	27	28	29	31	32	33	35	36	38	39	110
21	22	24	25	26	28	29	30	31	33	34	35	37	38	115
21	22	23	24	26	27	28	30	31	32	33	35	36	37	120
20	22	23	24	25	26	28	29	30	32	33	34	35	37	125
20	21	22	24	25	26	27	29	30	31	32	34	35	36	130
20	21	22	23	24	26	27	28	29	31	32	33	34	36	135
19	21	22	23	24	25	26	28	29	30	31	33	34	35	140
19	20	21	23	24	25	26	27	28	30	31	32	33	35	145
19	20	21	22	23	25	26	27	28	29	30	32	33	34	150
19	20	21	22	23	24	25	27	28	29	30	31	33	34	155
18	20	21	22	23	24	25	26	27	29	30	31	32	33	160
18	19	20	22	23	24	25	26	27	28	29	31	32	33	165
18	19	20	21	22	23	25	26	27	28	29	30	31	33	170
18	19	20	21	22	23	24	25	27	28	29	30	31	32	175
18	19	20	21	22	23	24	25	26	27	29	30	31	32	180
18	19	20	21	22	23	24	25	26	27	28	29	31	32	185
17	18	19	21	22	23	24	25	26	27	28	29	30	31	190
17	18	19	20	21	22	24	25	26	27	28	29	30	31	195
17	18	19	20	21	22	23	24	26	27	28	29	30	31	200

Site Index	≤ 16	17-22	23-28	29-35	36-41	42-47	≥ 48
Years to bh	11	10	9	8	7	6	5

# Coastal Western Redcedar



## Coastal Black Cottonwood

### Source:

Thrower, J.S. 1992. Height-age/site-index curves for Black Cottonwood in British Columbia. B.C. Min. For., Inv. Branch, Unpubl. Rep. Proj. 92-07-1B, 21 p.

### Formulation:

$$\begin{aligned}H &= 1.3 + (S - 1.3) (b_1/b_2) \\b_1 &= 1 + \exp [10.3861 - 1.3481 \ln 50 - 1.6555 \ln (S - 1.3)] \\b_2 &= 1 + \exp [10.3861 - 1.3481 \ln A - 1.6555 \ln (S - 1.3)] \\y_{tb} &= 2\end{aligned}$$

where:

H = top height (m)

S = site index (height at 50 years breast-height age)

A = breast-height age (years)

exp = exponential function to the base e

ln = natural logarithm

y<sub>tb</sub> = number of years to reach breast height (1.3 m)

### Notes:

The height-age (site index) curves were developed from stem analysis of black cottonwood trees in 25 plots. Plots were established in three geographic regions of British Columbia and four dominant trees were selected from each plot. Plot ages ranged from 40 to 150 years at breast height and site index from 29.6 to 45 m.

Site Index Table for Coastal Black Cottonwood

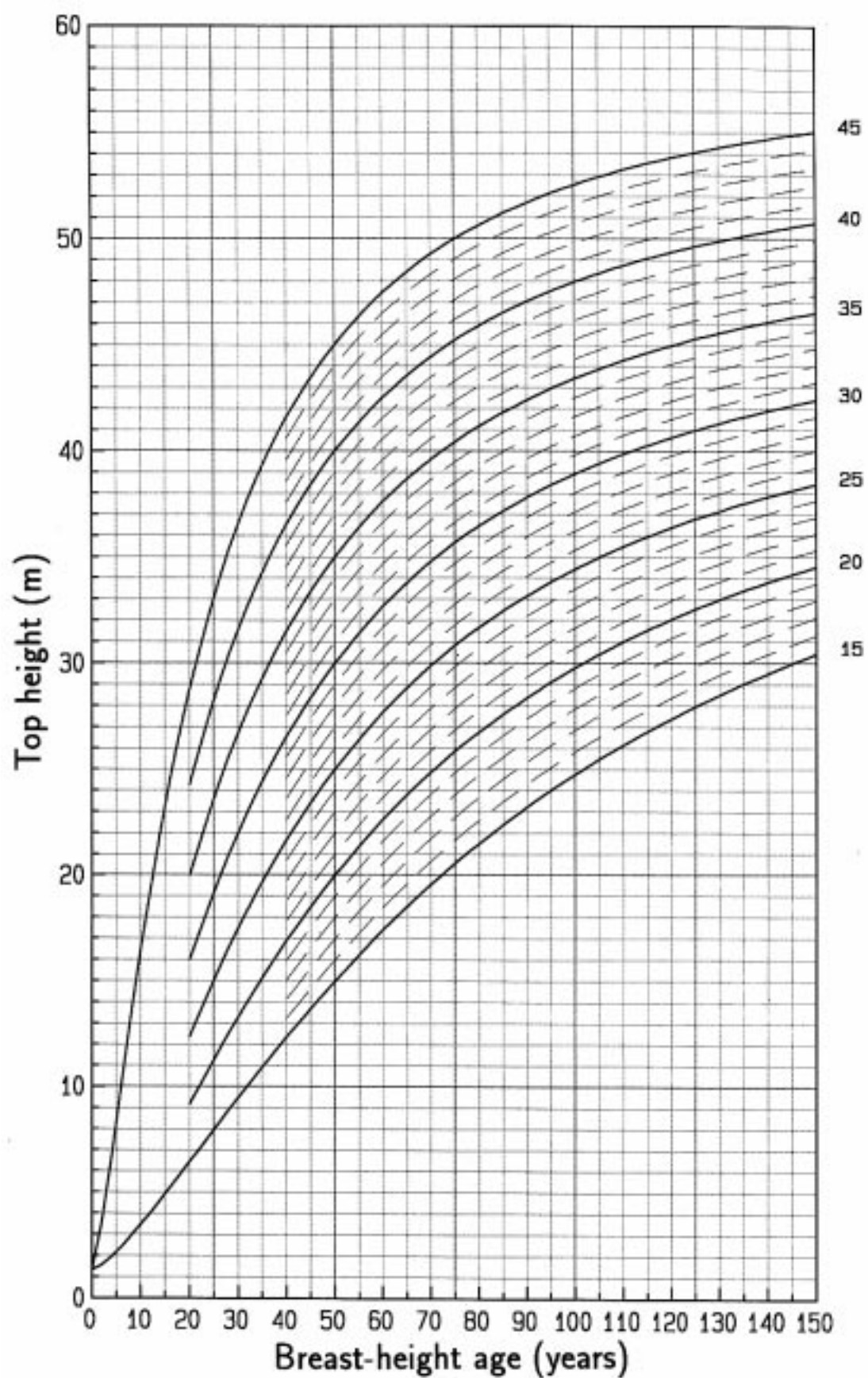
bh age (years)	Top height (m)													
	6	8	10	12	14	16	18	20	22	24	26	28	30	32
	Site Index (m)													
10	24	29	33	37	41	44	47	50	-	-	-	-	-	-
15	18	22	26	29	33	35	38	41	43	46	48	-	-	-
20	14	18	21	24	27	30	33	35	37	40	42	44	46	48
25	12	15	18	21	24	26	29	31	33	35	38	40	42	44
30	10	13	16	18	21	23	26	28	30	32	34	36	38	40
35	-	11	14	16	19	21	23	25	27	30	32	34	36	38
40	-	10	12	15	17	19	21	23	25	27	29	31	33	36
45	-	-	11	13	15	17	19	22	24	26	28	30	32	34
50	-	-	10	12	14	16	18	20	22	24	26	28	30	32
55	-	-	-	11	13	15	17	19	21	23	25	27	29	31
60	-	-	-	10	12	14	16	17	19	21	23	25	27	29
65	-	-	-	-	11	13	15	16	18	20	22	24	26	28
70	-	-	-	-	10	12	14	15	17	19	21	23	25	27
75	-	-	-	-	10	11	13	14	16	18	20	22	24	26
80	-	-	-	-	-	10	12	14	15	17	19	21	23	25
85	-	-	-	-	-	10	11	13	15	16	18	20	22	25
90	-	-	-	-	-	-	11	12	14	16	18	20	22	24
95	-	-	-	-	-	-	10	12	13	15	17	19	21	23
100	-	-	-	-	-	-	10	11	13	14	16	18	20	22
105	-	-	-	-	-	-	-	10	12	14	15	17	20	22
110	-	-	-	-	-	-	-	10	11	13	15	17	19	21
115	-	-	-	-	-	-	-	-	11	12	14	16	18	21
120	-	-	-	-	-	-	-	-	10	12	14	16	18	20
125	-	-	-	-	-	-	-	-	10	11	13	15	17	19
130	-	-	-	-	-	-	-	-	-	11	13	14	17	19
135	-	-	-	-	-	-	-	-	-	10	12	14	16	18
140	-	-	-	-	-	-	-	-	-	10	12	13	16	18
145	-	-	-	-	-	-	-	-	-	10	11	13	15	17
150	-	-	-	-	-	-	-	-	-	-	11	12	15	17
155	-	-	-	-	-	-	-	-	-	-	10	12	14	16
160	-	-	-	-	-	-	-	-	-	-	10	12	14	16
165	-	-	-	-	-	-	-	-	-	-	-	11	13	15
170	-	-	-	-	-	-	-	-	-	-	-	11	13	15
175	-	-	-	-	-	-	-	-	-	-	-	10	12	15
180	-	-	-	-	-	-	-	-	-	-	-	10	12	14
185	-	-	-	-	-	-	-	-	-	-	-	10	11	14
190	-	-	-	-	-	-	-	-	-	-	-	-	11	13
195	-	-	-	-	-	-	-	-	-	-	-	-	11	13
200	-	-	-	-	-	-	-	-	-	-	-	-	10	12

Site Index	all sites
Years to bh	2

(continued)

Top height (m)														bh age (years)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	
Site Index (m)														
-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
46	48	50	-	-	-	-	-	-	-	-	-	-	-	25
42	44	46	48	50	-	-	-	-	-	-	-	-	-	30
40	42	44	46	48	50	-	-	-	-	-	-	-	-	35
37	39	41	43	45	47	49	-	-	-	-	-	-	-	40
36	38	40	42	44	46	48	50	-	-	-	-	-	-	45
34	36	38	40	42	44	46	48	50	-	-	-	-	-	50
33	35	37	39	41	43	45	47	49	-	-	-	-	-	55
31	33	35	37	39	42	44	46	48	50	-	-	-	-	60
30	32	34	36	38	40	43	45	47	49	-	-	-	-	65
29	31	33	35	37	40	42	44	46	48	50	-	-	-	70
28	30	32	35	37	39	41	43	45	47	49	-	-	-	75
27	30	32	34	36	38	40	42	44	46	49	-	-	-	80
27	29	31	33	35	37	39	42	44	46	48	50	-	-	85
26	28	30	32	35	37	39	41	43	45	47	50	-	-	90
25	27	30	32	34	36	38	41	43	45	47	49	-	-	95
25	27	29	31	33	36	38	40	42	44	47	49	-	-	100
24	26	28	31	33	35	37	40	42	44	46	48	-	-	105
23	26	28	30	32	35	37	39	41	44	46	48	50	-	110
23	25	27	30	32	34	37	39	41	43	46	48	50	-	115
22	25	27	29	32	34	36	38	41	43	45	47	50	-	120
22	24	26	29	31	34	36	38	40	43	45	47	49	-	125
21	24	26	28	31	33	36	38	40	42	45	47	49	-	130
21	23	26	28	30	33	35	38	40	42	44	47	49	-	135
20	23	25	28	30	33	35	37	40	42	44	46	49	-	140
20	22	25	27	30	32	35	37	39	42	44	46	49	-	145
19	22	24	27	29	32	34	37	39	41	44	46	48	-	150
19	21	24	27	29	32	34	37	39	41	44	46	48	50	155
18	21	24	26	29	31	34	36	39	41	43	46	48	50	160
18	21	23	26	29	31	34	36	39	41	43	46	48	50	165
18	20	23	26	28	31	33	36	38	41	43	45	48	50	170
17	20	23	26	28	31	33	36	38	41	43	45	48	50	175
17	20	22	25	28	31	33	36	38	40	43	45	47	50	180
16	19	22	25	28	30	33	35	38	40	43	45	47	50	185
16	19	22	25	27	30	33	35	38	40	43	45	47	50	190
16	19	22	24	27	30	33	35	38	40	42	45	47	49	195
15	18	21	24	27	30	32	35	37	40	42	45	47	49	200
Site Index	all sites													
Years to bh	2													

# Coastal Black Cottonwood



## Coastal Red Alder

### Source:

Harrington, C.A. and R.O. Curtis. 1986. Height growth and site index curves for red alder. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-358. 14 p.

### Formulation:

$$\begin{aligned}
 H &= S_{20} + (18.1622 + 0.7953 S_{20}) \\
 &\quad \times (1 - \exp[(A + ytb) (0.00194 - 0.002441 S_{20})])^{0.9198} \\
 &\quad - (18.1622 + 0.7953 S_{20}) \\
 &\quad \times (1 - \exp[0.0388 - 0.04882 S_{20}])^{0.9198} \\
 S_{20} &= S^{1.5}/8 \quad (\text{approximation})
 \end{aligned}$$

where:

H = top height (m)

S<sub>20</sub> = height at 20 years total age

S = site index (height at 50 years breast-height age)

A = breast-height age (years)

exp = exponential function to the base e

ytb = 2 (number of years to reach breast height)

### Notes:

The height-age equation was developed from stem analysis of 156 undamaged, dominant and co-dominant trees from natural red alder stands in western Washington and northwestern Oregon. Ages ranged up to 80 years (total age) and site index ranged from about 8 to 23 m (at 20 years total age). The height-age equation performs poorly for estimating site index below about site index 20 (see table). Harrington and Curtis developed an equation for directly estimating site index at 20 years total age, but our conversion to site index at 50 years breast-height age was not suitable for field application.

The height equation assumes a constant of 2 years to reach breast height. This may be 1 or 2 years more on poor sites and less on good sites.

Site Index Table for Coastal Red Alder

bh age (years)	Top height (m)													
	6	8	10	12	14	16	18	20	22	24	26	28	30	32
	Site Index (m)													
10	17	21	25	28	30	33	35	37	39	41	43	45	46	48
15	14	17	20	23	26	28	30	32	34	36	38	40	41	43
20	13	15	18	20	22	25	27	29	31	33	35	36	38	40
25	11	14	16	18	20	22	25	27	28	30	32	34	36	38
30	10	13	15	17	19	21	23	25	27	28	30	32	34	36
35	10	12	14	16	17	19	21	23	25	27	29	31	33	34
40	-	11	13	15	16	18	20	22	24	26	28	30	32	33
45	-	10	12	14	16	17	19	21	23	25	27	29	31	33
50	-	10	12	13	15	17	18	20	22	24	26	28	30	32
55	-	10	11	13	14	16	18	19	21	23	25	27	29	31
60	-	-	11	12	14	15	17	19	21	22	25	27	29	31
65	-	-	10	12	13	15	16	18	20	22	24	26	28	31
70	-	-	10	11	13	14	16	18	19	21	23	26	28	30
75	-	-	10	11	12	14	15	17	19	21	23	25	28	30
80	-	-	-	11	12	14	15	17	19	20	23	25	27	30
85	-	-	-	10	12	13	15	16	18	20	22	25	27	30
90	-	-	-	10	11	13	14	16	18	20	22	24	27	29
95	-	-	-	10	11	13	14	16	17	19	22	24	27	29
100	-	-	-	10	11	12	14	15	17	19	21	24	26	29
105	-	-	-	-	11	12	13	15	17	19	21	24	26	29
110	-	-	-	-	10	12	13	15	17	19	21	24	26	29
115	-	-	-	-	10	12	13	15	16	18	21	23	26	29
120	-	-	-	-	10	11	13	14	16	18	21	23	26	29
125	-	-	-	-	10	11	13	14	16	18	20	23	26	29
130	-	-	-	-	10	11	12	14	16	18	20	23	26	29
135	-	-	-	-	10	11	12	14	16	18	20	23	26	29
140	-	-	-	-	-	11	12	14	15	18	20	23	26	29
145	-	-	-	-	-	10	12	13	15	17	20	23	26	29
150	-	-	-	-	-	10	12	13	15	17	20	23	26	29
155	-	-	-	-	-	10	11	13	15	17	20	23	26	29
160	-	-	-	-	-	10	11	13	15	17	20	23	26	29
165	-	-	-	-	-	10	11	13	15	17	20	23	26	29
170	-	-	-	-	-	10	11	13	14	17	20	23	26	29
175	-	-	-	-	-	10	11	12	14	17	19	23	26	29
180	-	-	-	-	-	10	11	12	14	17	19	23	26	29
185	-	-	-	-	-	-	11	12	14	16	19	23	26	29
190	-	-	-	-	-	-	11	12	14	16	19	22	26	29
195	-	-	-	-	-	-	10	12	14	16	19	22	26	29
200	-	-	-	-	-	-	10	12	14	16	19	22	26	29
Site Index	all sites													
Years to bh	2													

(continued)

Top height (m)														bh age (years)
34	36	38	40	42	44	46	48	50	52	54	56	58	60	
Site Index (m)														
50	-	-	-	-	-	-	-	-	-	-	-	-	-	10
45	46	48	49	-	-	-	-	-	-	-	-	-	-	15
41	43	45	46	48	49	-	-	-	-	-	-	-	-	20
39	41	43	44	46	48	49	-	-	-	-	-	-	-	25
38	39	41	43	45	46	48	50	-	-	-	-	-	-	30
36	38	40	42	44	46	47	49	-	-	-	-	-	-	35
35	37	39	41	43	45	47	49	50	-	-	-	-	-	40
35	37	39	41	43	45	47	48	50	-	-	-	-	-	45
34	36	38	40	42	44	46	48	50	-	-	-	-	-	50
34	36	38	40	42	44	46	48	50	-	-	-	-	-	55
33	35	38	40	42	44	46	48	50	-	-	-	-	-	60
33	35	37	40	42	44	46	48	50	-	-	-	-	-	65
33	35	37	40	42	44	46	48	50	-	-	-	-	-	70
32	35	37	40	42	44	46	48	50	-	-	-	-	-	75
32	35	37	39	42	44	46	48	50	-	-	-	-	-	80
32	35	37	39	42	44	46	48	50	-	-	-	-	-	85
32	35	37	39	42	44	46	48	50	-	-	-	-	-	90
32	35	37	39	42	44	46	48	50	-	-	-	-	-	95
32	34	37	39	42	44	46	48	50	-	-	-	-	-	100
32	34	37	39	42	44	46	48	50	-	-	-	-	-	105
32	34	37	39	42	44	46	48	50	-	-	-	-	-	110
32	34	37	39	42	44	46	48	50	-	-	-	-	-	115
32	34	37	39	42	44	46	48	50	-	-	-	-	-	120
32	34	37	39	42	44	46	48	50	-	-	-	-	-	125
32	34	37	39	42	44	46	48	50	-	-	-	-	-	130
32	34	37	39	42	44	46	48	50	-	-	-	-	-	135
32	34	37	39	42	44	46	48	50	-	-	-	-	-	140
32	34	37	39	42	44	46	48	50	-	-	-	-	-	145
32	34	37	39	42	44	46	48	50	-	-	-	-	-	150
32	34	37	39	42	44	46	48	50	-	-	-	-	-	155
32	34	37	39	42	44	46	48	50	-	-	-	-	-	160
32	34	37	39	42	44	46	48	50	-	-	-	-	-	165
32	34	37	39	42	44	46	48	50	-	-	-	-	-	170
32	34	37	39	42	44	46	48	50	-	-	-	-	-	175
32	34	37	39	42	44	46	48	50	-	-	-	-	-	180
32	34	37	39	42	44	46	48	50	-	-	-	-	-	185
32	34	37	39	42	44	46	48	50	-	-	-	-	-	190
32	34	37	39	42	44	46	48	50	-	-	-	-	-	195
32	34	37	39	42	44	46	48	50	-	-	-	-	-	200

Site Index	all sites
Years to bh	2

# Coastal Red Alder

