

Site Index Curves and Tables for British Columbia — Interior Species

Land Management Handbook
FIELD GUIDE INSERT 6
Second edition



BRITISH
COLUMBIA

Ministry of Forests Research Program

This publication is Land Management Handbook,
Field Guide Insert 6

Citation:

Thrower, J.S., Nussbaum, A.F., and Di Lucca, C.M. 1994.
Site index curves and tables for British Columbia: interior species.
2nd edition. B.C. Min. For. Res. Br. Land Manage. Handb. Field Guide
Insert 6.

Copies of this report may be obtained, depending upon supply, from:

B.C. Ministry of Forests
Forestry Division Services Branch
Production Resources
1205 Broad Street (2nd Floor)
Victoria, B.C. V8W 3E7

The contents of this report may not be cited, in whole or part, without
the approval of the Director, Research Branch, B.C. Ministry of Forests,
Victoria, B.C.

SITE INDEX CURVES AND TABLES FOR BRITISH COLUMBIA: INTERIOR SPECIES

James S. Thrower, Albert F. Nussbaum and C. Mario Di Lucca

Forest Productivity and Decision Support Section
B.C. Ministry of Forests, Research Branch
31 Bastion Square, Victoria, B.C. V8W 3E7

This field guide insert gives the height-age (site index) curves and tables recommended for use in the interior of British Columbia. Included are site curves and tables for:

Species	Code	Reference	Issued
Lodgepole pine	Pli	Goudie (1984)	Oct. 1991
White spruce	Sw	Goudie (1984)	Oct. 1991
Douglas-fir	Fdi	Thrower and Goudie (1991)	Oct. 1991
Balsam	Bl	Kurucz (1982)	Oct. 1991
Western hemlock	Hw	Wiley (1978)	Oct. 1991
Western redcedar	Cw	Kurucz (1985)	Oct. 1991
Western white pine	Pw	Curtis et al. (1990)	Oct. 1991
Ponderosa pine	Py	Hann and Scrivani (1986)	Oct. 1991
Western larch	Lw	Milner (1989)	Oct. 1991
Trembling aspen	At	Alberta For. Ser. (1985)	Oct. 1991
Paper birch	Ep	Alberta For. Ser. (1985)	Oct. 1991

For species where specific height-age (site index) curves are not available, alternative curves of another species are recommended or coastal curves are substituted for interim use. The site index tables were generated from numerical iterations between the height-age curves, and thus may not give exactly the same estimates of site index as the site index functions (where available). These tables are designed for rough estimation of site index in the field, and thus are given at low resolution.

The arbitrary range of site index given is 5–40 m in the tables and 5–30 m for most curves. The tables and curves are given in a common format for consistency among species and do not necessarily represent the range of site index or age used in the development of the curves. All species use top height to represent dominant height and 50 years (breast-height age) as the site index reference age. Estimates of height and site index that are beyond the range of the data used in the analyses (given in the notes section for each species) should be interpreted with caution.

Site curves and tables will be replaced as new ones are implemented. A revised reference list will be issued with each addition or revision. Write to the above address for updates.

SITE INDEX FIELD HANDBOOK

What is site index and what it is used for?

Site Index (SI) is a measure of the land's productive potential for a particular tree species. SI in British Columbia is expressed as potential tree height at 50 years breast-height age. SI provides standardized comparisons of productive potential between sites, across a broad range of existing stand conditions. As such, it is used as a silvicultural tool to prescribe treatments and analyze investments. SI also serves as the main "driver" for many growth and yield models, which predict future forest growth and timber yields.

What are the theories and assumptions behind SI?

Central to the concept are the theories that: (1) stand height is closely related to stand volume, and (2) relative to other growth measures (diameter, volume, basal area, etc.), stand height is independent of stocking density, except possibly at the extremes. Theoretically, the SI concept is assumed to apply only to single-species, even-aged stands historically free from damage and competition. These assumptions are needed to avoid the confounding effects of competition, suppression, repression and top damage on the height-age relationship.

What happens when these assumptions are violated?

Luckily, in practice the concept and its assumptions are somewhat forgiving. The more severe the violation(s), the more the resulting SI estimate becomes confounded by individual stand history and SI's usefulness as a comparative index declines. Operationally, the key is recognizing to what extent the assumptions have been violated and the resulting SI estimate biased. This requires informed, professional judgment.

What determines SI?

SI reflects inherent physical site factors, such as climate (solar input, precipitation, temperature, etc.) and soil (nutrients, moisture, etc.). SI should be independent of stand history and management (possible exceptions: overstocking, genetic improvement, and fertilization).

How are SI estimation functions derived?

Modern SI functions are developed from historical height growth data derived from the extensive stem analyses (sectioning) of carefully selected trees. The SI function of each species is calibrated across a defined age range determined by the original data. Generally the range is about 20–150 years (see notes for each species). Caution should be exercised when making extrapolations outside this range.

This handbook represents SI functions for each species in three forms: (1) equation, (2) tabular, and (3) graphical. All three forms require that you provide breast-height age and height.

What is breast-height age?

Breast-height (bh) age is the number of years that site trees require to grow from breast height to their current height. It is determined by increment boring and ring counts of trees at bh (1.3 m, uphill side).

What measure of height should I use with SI functions?

SI height is the average height of undamaged dominants and co-dominants in the stand. Operationally, this definition is impossible to implement without crown-class, damage and disease information which is often difficult to obtain. The B.C. Forest Service has therefore adopted a definition for height known as top height.

What is top height?

Conceptually, top height is defined as the average height of the 100 fattest (largest dbh) trees per hectare. Operationally, the number of trees selected is proportional to plot area; that is, one fat tree per 0.01 ha of plot area (preferably undamaged and well spaced). Note that for plot sizes smaller than 0.04 ha (a four-tree plot) there is a detectable bias. The definition of top height is currently under review by the Forest Productivity Councils of British Columbia and may be changed.

What are some common pitfalls in estimating SI?

In practice, we nearly always violate one or more of the SI assumptions to some degree. Violations of the assumptions regarding historical freedom from competition and damage are perhaps the least obvious and most common. Clearly, as a stand ages it becomes increasingly difficult to know its history, and damage becomes the norm rather than the exception. Measurements of SI in old-growth stands can easily be confounded for this reason. This problem also limits the availability of old-growth trees for the collection of stem analysis data, which are used to construct SI functions. This is why SI functions rarely contain data beyond 150–200 years.

How can I estimate SI if no appropriate trees exist?

One of two possible alternatives may be available in any given situation. First, for young stands, growth intercept functions may be available to predict SI. Second, work is ongoing to correlate SI with biophysical site factors or ecological classification systems, most notably the Biogeoclimatic Ecosystem Classification (BEC) system. Some of the existing regional BEC field guides include SI correlations. The Ministry of Forests is scheduled to publish the first provincial report on SI-BEC correlations in early 1997.

For more information on site index or on using this handbook, contact:
Steve Stearns-Smith, Growth and Yield Extension Officer,
B.C. Ministry of Forests, Research Branch, at 250-953-3495,
E-mail: Steve.StearnsSmith@gems6.gov.bc.ca

OTHER FIELD REFERENCES

Field Guide Inserts

Site Index Curves and Tables for British Columbia – Coastal Species. 1991. Land Manage. Handb. Field Guide Insert 3, Ministry of Forests, Research Branch.

Site Index Curves and Tables for British Columbia – Interior Species. 1991. Land Manage. Handb. Field Guide Insert 6, Ministry of Forests, Research Branch.

Growth Intercept Models and Tables for British Columbia – Coastal Species. 1995. Land Manage. Handb. Field Guide Insert 9, Ministry of Forests, Research Branch.

Growth Intercept Models and Tables for British Columbia – Interior Species. 1995. Land Manage. Handb. Field Guide Insert 10, Ministry of Forests, Research Branch.

Growth Intercept Tables (with procedures). 1995. Ministry of Forests, Silviculture Practices Branch.

Spp.	Publication No.
Pli	FS 415A HSP 95/6
Sw, Se	FS 415B HSP 95/6
Hwc	FS 415C HSP 95/6
Ss	FS 415D HSP 95/6
Fdc	FS 415E HSP 95/6

Application Manual

Growth Intercept Method for Silviculture Surveys. 1995. Ministry of Forests, Silviculture Practices Branch.

Information Brochure

Site Index: A Growing Issue (colour brochure). 1996. Ministry of Forests, Site Productivity Working Group.

Publication Sources

Research and Silviculture Practices Branch publications are available from Publications Distribution, Forestry Division Services Branch, Ministry of Forests, Victoria (250-387-6719).

Computer Software

SITETOOLS (Site Index calculator for DOS/Windows). 1997.

Ministry of Forests, Research Branch. Download from the Internet at:
<http://www.res.gov.bc.ca/groups/fpds/sitetool.html>

Training Courses

(available through BC Forestry Continuing Studies Network, 604-822-3106)

How to Determine Site Index in Silviculture. 1996. Developed by Ministry of Forests, Silviculture Practices Branch.

Intro to VDYP and SITETOOLS. 1997. Developed by Ministry of Forests, Research Branch.

Interior Lodgepole Pine

Source:

Goudie J.W. 1984. Height growth and site index curves for lodgepole pine and white spruce and interim managed stand yield tables for lodgepole pine in British Columbia. B.C. Min. For., Res. Br. Unpubl. Rep. 75 p.

Formulation:

$$H = 1.3 + (S - 1.3) (b_1 / b_2)$$

$$b_1 = 1 + \exp [7.815 - 1.285 \ln 50 - 1.007 \ln (S - 1.3)]$$

$$b_2 = 1 + \exp [7.815 - 1.285 \ln A - 1.007 \ln (S - 1.3)]$$

$$y_{tb} = 5.6 + 42.64 / S$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 188 dominant and co-dominant trees located throughout Alberta and eastern British Columbia. Plots ranged in site index from about 6 to 22 m at 50 years breast height, and in age from 10 to 150 years.

Site Index Table for Interior Lodgepole Pine

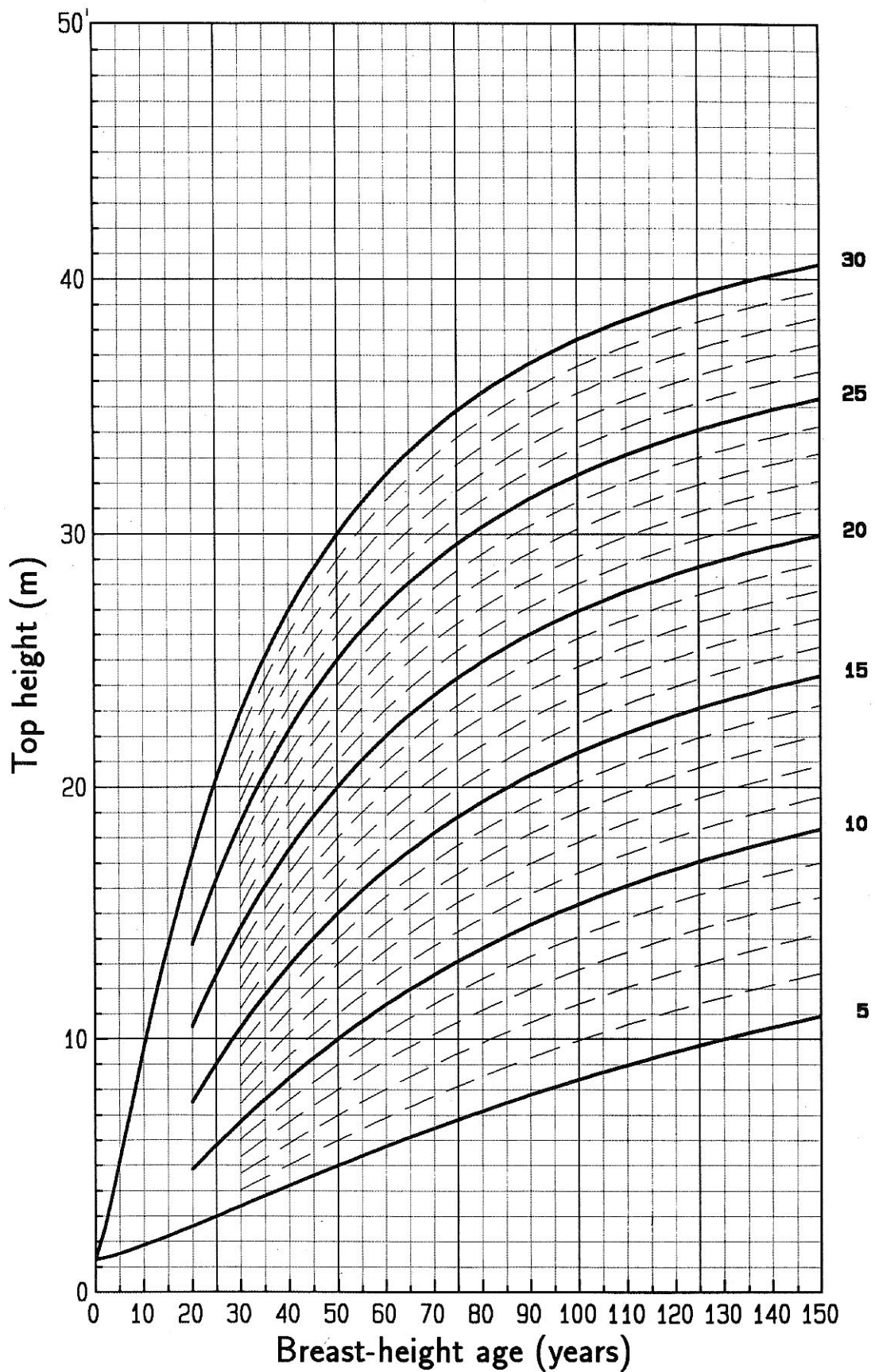
bh age (years)	Top height (m)															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Site Index (m)															
10	18	21	23	26	29	31	33	35	38	40	-	-	-	-	-	-
15	13	15	17	20	22	23	25	27	29	31	32	34	35	37	39	40
20	10	12	14	16	18	19	21	22	24	25	27	28	30	31	32	34
25	9	10	12	13	15	16	18	19	21	22	23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

Site Index	5	6	7	8	9-10	11-14	15-22	≥23
Years to bh	14	13	12	11	10	9	8	7

(continued)

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

Interior Lodgepole Pine



Interior White Spruce

Source:

Goudie J.W. 1984. Height growth and site index curves for lodgepole pine and white spruce and interim managed stand yield tables for lodgepole pine in British Columbia. B.C. Min. For, Res. Br. Unpubl. Rep. 75 p.

Formulation:

$$H = 1.3 + (S - 1.3) (b_1/b_2)$$

$$b_1 = 1 + \exp [9.794 - 1.466 \ln 50 - 1.287 \ln (S - 1.3)]$$

$$b_2 = 1 + \exp [9.794 - 1.466 \ln A - 1.287 \ln (S - 1.3)]$$

$$y_{tb} = 4.16 + 110.76 / S$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 157 dominant and co-dominant trees located throughout Alberta and eastern British Columbia. Plots ranged in site index from about 3 to 24 m at 50 years breast height, and in age from 10 to 130 years.

Site Index Table for Interior White Spruce

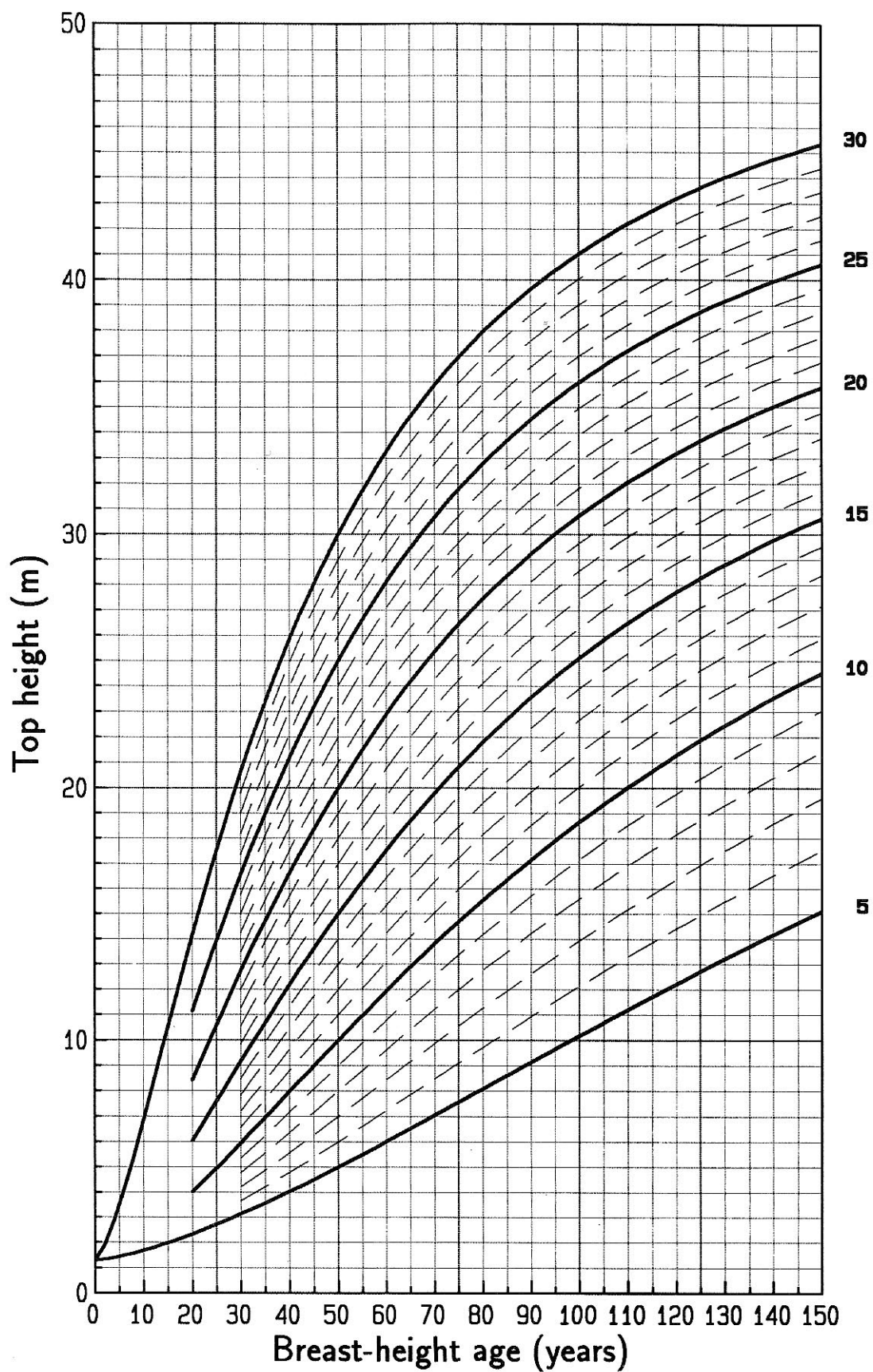
bh age (years)	Top height (m)																		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	Site Index (m)																		
10	23	27	31	34	36	39	-	-	-	-	-	-	-	-	-	-			
15	16	19	22	24	27	29	31	33	35	37	39	40	-	-	-	-			
20	13	15	17	19	21	23	25	26	28	30	31	33	34	36	37	39			
25	10	12	14	16	17	19	21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

Site Index	5	6	7	8	9	10	11	12-13
Years to bh	26	23	20	18	16	15	14	13

(continued)

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

Interior White Spruce



Interior Douglas-fir

Source:

Thrower, J.S. and J.W. Goudie. 1991. Estimating dominant height and site index for even-aged interior Douglas-fir in British Columbia. Western J. Applied For. (In press).

Formulation:

$$H = 1.3 + (S - 1.3) (b_1/b_2)$$

$$b_1 = 1 + \exp [5.78 - 1.15 \ln 50 - 0.238 \ln (S - 1.3)]$$

$$b_2 = 1 + \exp [5.78 - 1.15 \ln A - 0.238 \ln (S - 1.3)]$$

$$y_{tb} = 4.0 + 99 / S$$

$$S = 0.39 + 0.31 H + 33.38 H/A$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

exp = exponential function to the base e

Notes:

The height-growth and site index curves were developed from stem analysis of 262 dominant trees in 68 plots located in even-aged Douglas-fir stands throughout the interior of British Columbia. The curves were developed from plots ranging in site index from 8 to 30 m and up to 100 years breast-height age. On high sites, 30 m and greater, the curves may over-estimate height growth at older ages.

Site Index Table for Interior Douglas-fir

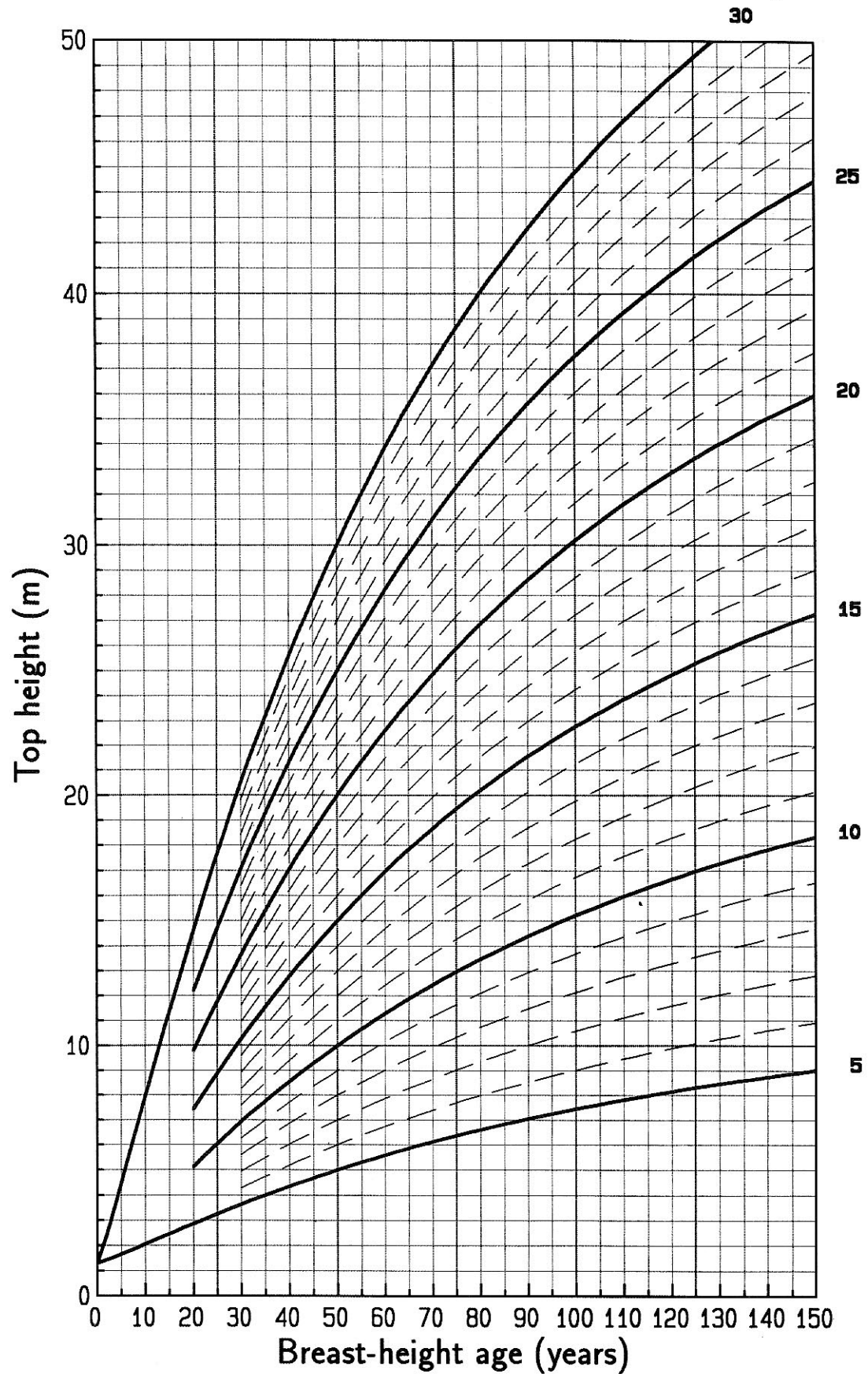
bh age (years)	Top height (m)															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Site Index (m)															
10	18	22	26	30	34	38	-	-	-	-	-	-	-	-	-	-
15	12	15	18	21	24	26	29	32	34	37	40	-	-	-	-	-
20	10	12	14	16	18	20	23	25	27	29	31	33	35	37	39	-
25	8	10	12	13	15	17	19	20	22	24	25	27	29	31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

Site Index	5	6	7	8	9	10	11	12-13
Years to bh	24	21	18	16	15	14	13	12

(continued)

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

Interior Douglas-fir



Interior Balsam

Source:

For interior balsam, use site index curves for coastal balsam developed by J.F. Kurucz. 1982. Polymorphic site index curves for balsam (*Abies amabilis*) in coastal British Columbia. MacMillan Bloedel. Rep. on Project 933-3. 24 p. + appendix.

Formulation:

$$H = 1.3 + A^2 / (b_1 + b_2 A + b_3 A^2)$$

if age < 50 years and $A \times H < 1695.3$ then

$$H = H - (0.45773 - 0.00027 A H)$$

$$b_1 = -2.3465 + 141.25 / (S - 1.3)$$

$$b_2 = -0.42007 + 42.175 / (S - 1.3)$$

$$b_3 = 0.00934 + 0.1 / (S - 1.3)$$

$$y_{tb} = 42.25 - 10.66 \ln S \quad (\text{B.C. Min. For. 1991})$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

Notes:

The height-age (site index) curves were developed from stem analysis of 199 undamaged, dominant *Abies amabilis* trees from 50 plots located throughout the coastal region of British Columbia. Plot ages ranged from 50 to 160 years at breast height and site index ranged from 11 to 34 m. These coastal curves are recommended for interim use in the Interior, as they seem to approximate our limited source of stem analysis data for interior balsam. The discontinuity in the height-age curve at age 50 is caused by the adjustment equation to reduce bias at ages below 50 and is exaggerated by extending the equation beyond the range of the site index from which it was developed. The years to breast height function was developed by the Forest Science Research Branch from interior balsam data.

B.C. Ministry of Forests, Forest Science Research Branch - Forest Productivity and Decision Support Section.

Site Index Table for Interior Balsam

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

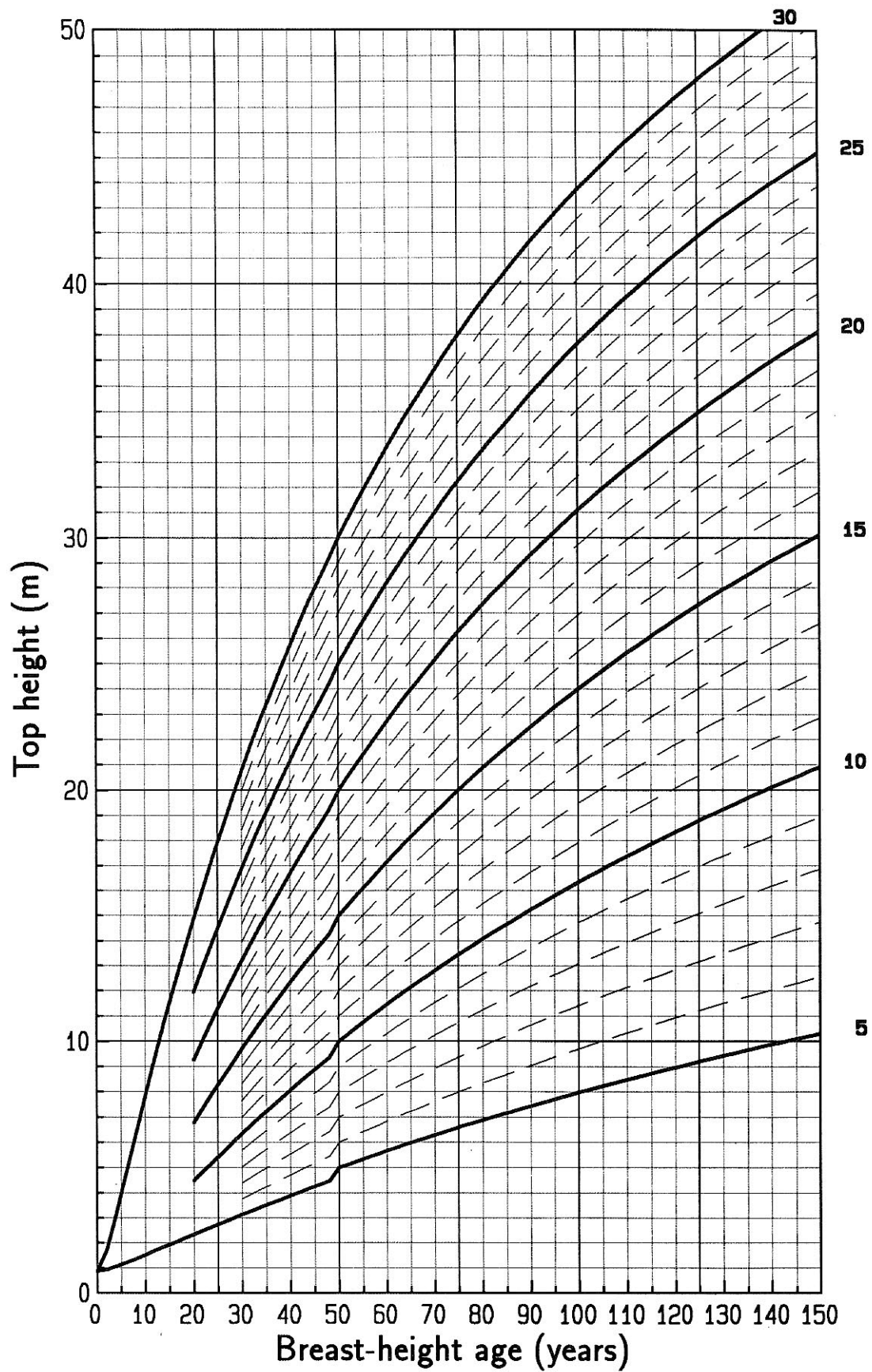
Site Index	5	6	7	8	9	10	11	12	13	14	15-16
Years to bh	25	23	22	20	19	18	17	16	15	14	13

(continued)

Top height (m)																bh age (years)
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Site Index (m)																
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
34	36	37	38	39	-	-	-	-	-	-	-	-	-	-	-	25
30	32	33	34	35	36	38	39	40	-	-	-	-	-	-	-	30
27	28	30	31	32	33	34	35	36	38	39	40	-	-	-	-	35
25	26	27	28	29	30	31	32	34	35	36	37	38	39	40	-	40
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	45
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	50
20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	34	55
18	19	20	21	22	23	24	25	26	27	28	29	30	30	31	32	60
17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	65
17	17	18	19	20	21	22	22	23	24	25	26	27	28	29	29	70
16	17	17	18	19	20	21	21	22	23	24	25	26	27	27	28	75
15	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	80
14	15	16	17	17	18	19	20	21	21	22	23	24	25	25	26	85
14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25	90
13	14	15	16	16	17	18	18	19	20	21	21	22	23	24	24	95
13	14	14	15	16	16	17	18	18	19	20	21	21	22	23	24	100
13	13	14	15	15	16	17	17	18	19	19	20	21	22	22	23	115
12	13	13	14	15	15	16	17	17	18	19	19	20	21	22	22	110
12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	22	115
12	12	13	13	14	15	15	16	16	17	18	18	19	20	21	21	120
11	12	12	13	14	14	15	15	16	17	17	18	19	19	20	21	125
11	12	12	13	13	14	14	15	16	16	17	18	18	19	20	20	130
11	11	12	12	13	14	14	15	15	16	17	17	18	18	19	20	135
10	11	12	12	13	13	14	14	15	16	16	17	17	18	19	19	140
10	11	11	12	12	13	14	14	15	15	16	16	17	18	18	19	145
10	11	11	12	12	13	13	14	14	15	16	16	17	17	18	19	150
10	10	11	11	12	12	13	14	14	15	15	16	16	17	18	18	155
10	10	11	11	12	12	13	13	14	14	15	16	16	17	17	18	160
9	10	10	11	11	12	13	13	14	14	15	15	16	16	17	18	165
9	10	10	11	11	12	12	13	13	14	14	15	16	16	17	17	170
9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	175
9	9	10	10	11	11	12	12	13	13	14	15	15	16	16	17	180
9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	17	185
9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	190
9	9	10	10	10	11	11	12	12	13	13	14	14	15	15	16	195
9	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	200

Site Index	17	18-19	20-21	22-23	24-26	27-28	29-31	≥32
Years to bh	12	11	10	9	8	7	6	5

Interior Balsam



Interior Western Hemlock

Source:

For interior western hemlock, use site index curves for coastal hemlock developed by K.N. Wiley. 1978. Site index tables for western hemlock in the Pacific Northwest. Weyerhaeuser Co., For. Res. Cent. For. Pap. 17. 28 p.

Formulation:

$$H = 0.3048 [4.5 + A^2 / (b_1 + b_2 A + b_3 A^2)]$$

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

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

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

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

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

Notes:

The height-age (site index) curves were developed from stem analysis data collected from 90 plots in coastal 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. These coastal curves are recommended for interim use in the Interior, as they seem to approximate our limited source of stem analysis data for interior western hemlock.

Site Index Table for Interior Western Hemlock

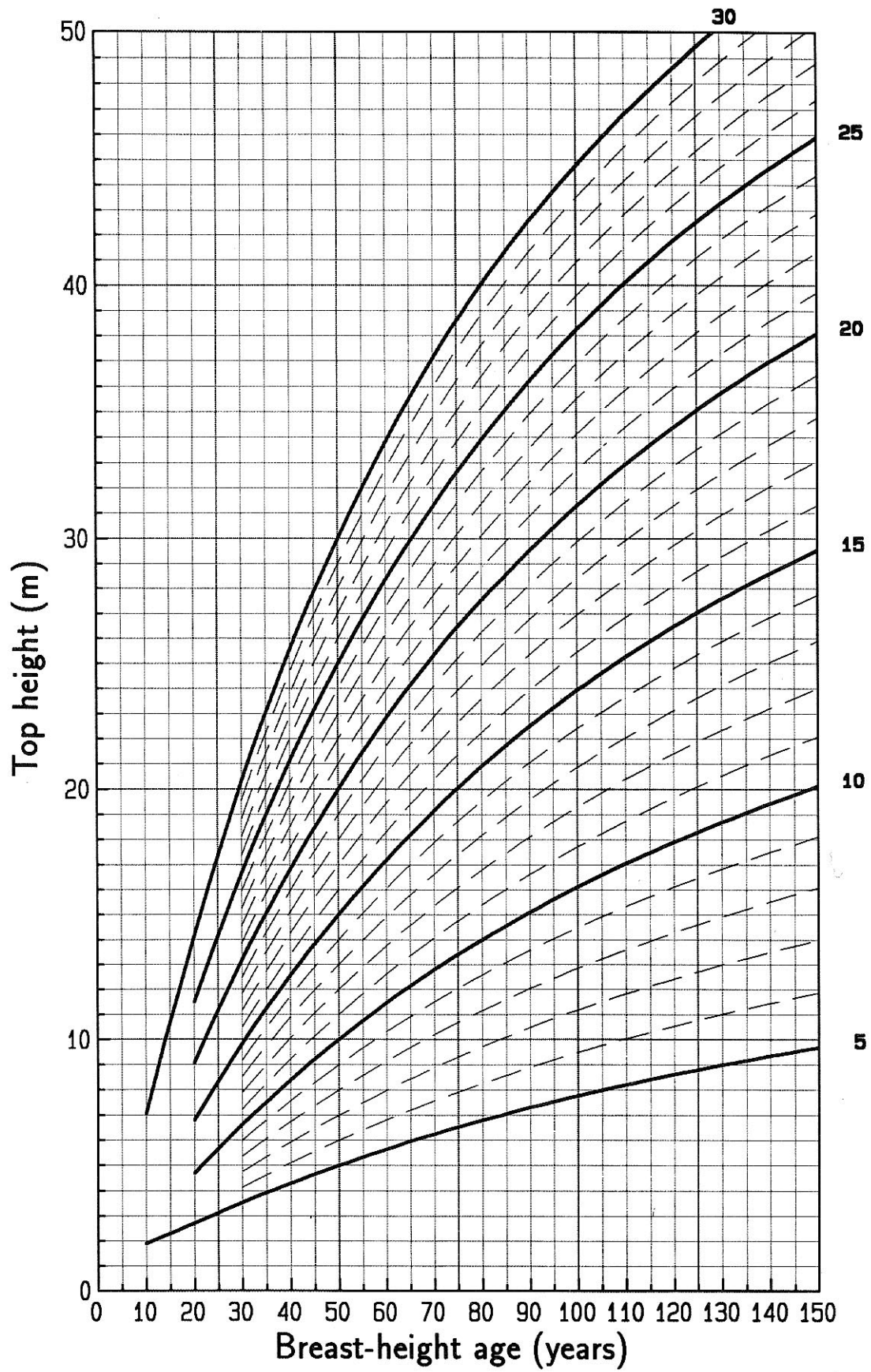
bh age (years)	Top height (m)																		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	Site Index (m)																		
10	22	26	30	33	36	39	-	-	-	-	-	-	-	-	-	-			
15	14	18	20	23	26	28	31	33	35	37	39	-	-	-	-	-			
20	11	13	15	18	20	22	24	26	28	30	32	33	35	37	38	40			
25	9	11	13	14	16	18	20	21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

Site Index	≤ 6	7-13	14-20	21-27	28-34	≥ 35
Years to bh	9	8	7	6	5	4

(continued)

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

Interior Western Hemlock



Interior Western Redcedar

Source:

For interior western redcedar, use updated 1985 formulation of site index curves for coastal western redcedar developed by John 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.

Formulation:

$$H = 1.3 + A^2 / (b_1 + b_2 A + b_3 A^2)$$

if age > 50 years then

$$H = H + 0.02379545 H - 0.000475909 A H$$

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

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

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

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

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = 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 coastal 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 coastal formulation with caution for ages less than 10 years breast-height and site indices greater than 37 m. These coastal curves are recommended for interim use in the Interior as they seem to approximate our limited source of stem analysis data for interior western redcedar. The years to breast height function is taken from J.E. King (1966. Site index curves for Douglas-fir in the Pacific Northwest. Weyerhaeuser Co., For. Res. Cent. For. Pap. 8. 49p.).

B.C. Ministry of Forests, Forest Science Research Branch - Forest Productivity and Decision Support Section.

Site Index Table for Interior Western Redcedar

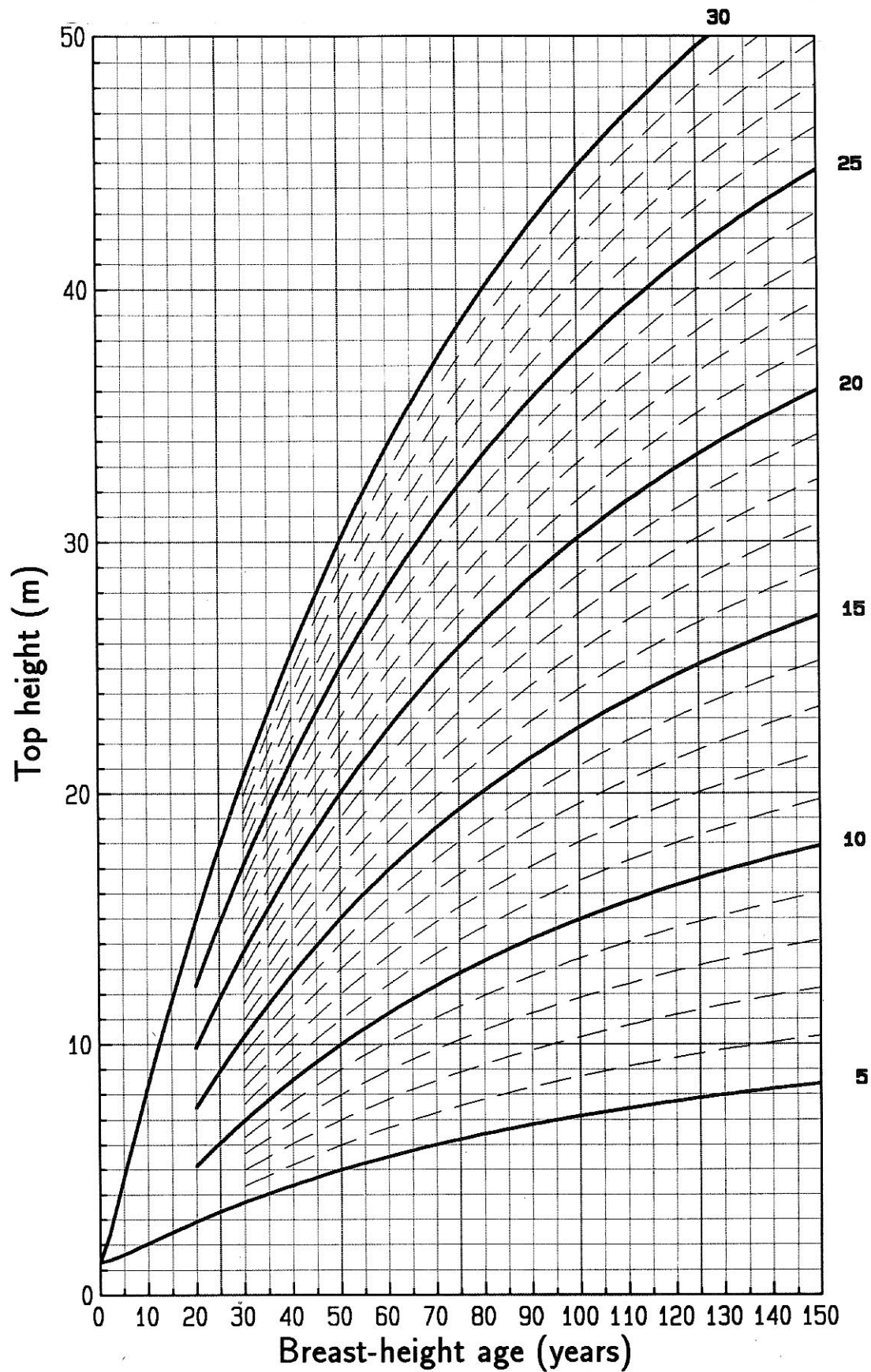
bh age (years)	Top height (m)																		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	Site Index (m)																		
10	18	22	26	29	32	36	39	-	-	-	-	-	-	-	-	-			
15	12	15	18	21	23	26	28	31	33	35	38	40	-	-	-	-			
20	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40			
25	8	10	12	13	15	17	19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

Site Index	5-10	11-16	17-22	23-28	29-35	≥36
Years to bh	12	11	10	9	8	7

(continued)

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

Interior Western Redcedar



Interior Western White Pine

Source:

Curtis, R.O., N.M. Diaz, and G.W. Clendenen. 1990. Height growth and site index curves for western white pine in the Cascade Range of Western Washington and Oregon. U.S. Dep. Agric. For. Serv. Res. Pap. RNW-PR-423. 14 p.

Formulation:

$$\begin{aligned}
 H &= 0.3048 [4.5 + (S/0.3048 - 4.5)(b_1/b_2)] \\
 b_1 &= 1 - \exp [- \exp (b_3 + 1.119438 \ln (S/0.3048))] \\
 b_2 &= 1 - \exp [- \exp (b_4 + 1.119438 \ln (S/0.3048))] \\
 b_3 &= -9.975053 + 1.361523 \ln A \\
 b_4 &= -9.975053 + 1.747353 \ln 50 - 0.38583 \ln A \\
 ytb &= 4.16 + 110.76 / S \quad (\text{from Goudie [1984] for } S_w)
 \end{aligned}$$

where:

H = top height (m)
 S = site index (height at 50 years breast-height age)
 A = breast-height age (years)
 ytb = number of years to reach breast height (1.3 m)
 $\ln$ = natural logarithm
 $\exp$ = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 38 dominant and co-dominant western white pine trees located throughout the Cascade Range of Washington and Oregon. Site index ranged from about 9 to 31 m at 50 years breast height and included trees up to 200 years old.

Site Index Table for Interior Western White Pine

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

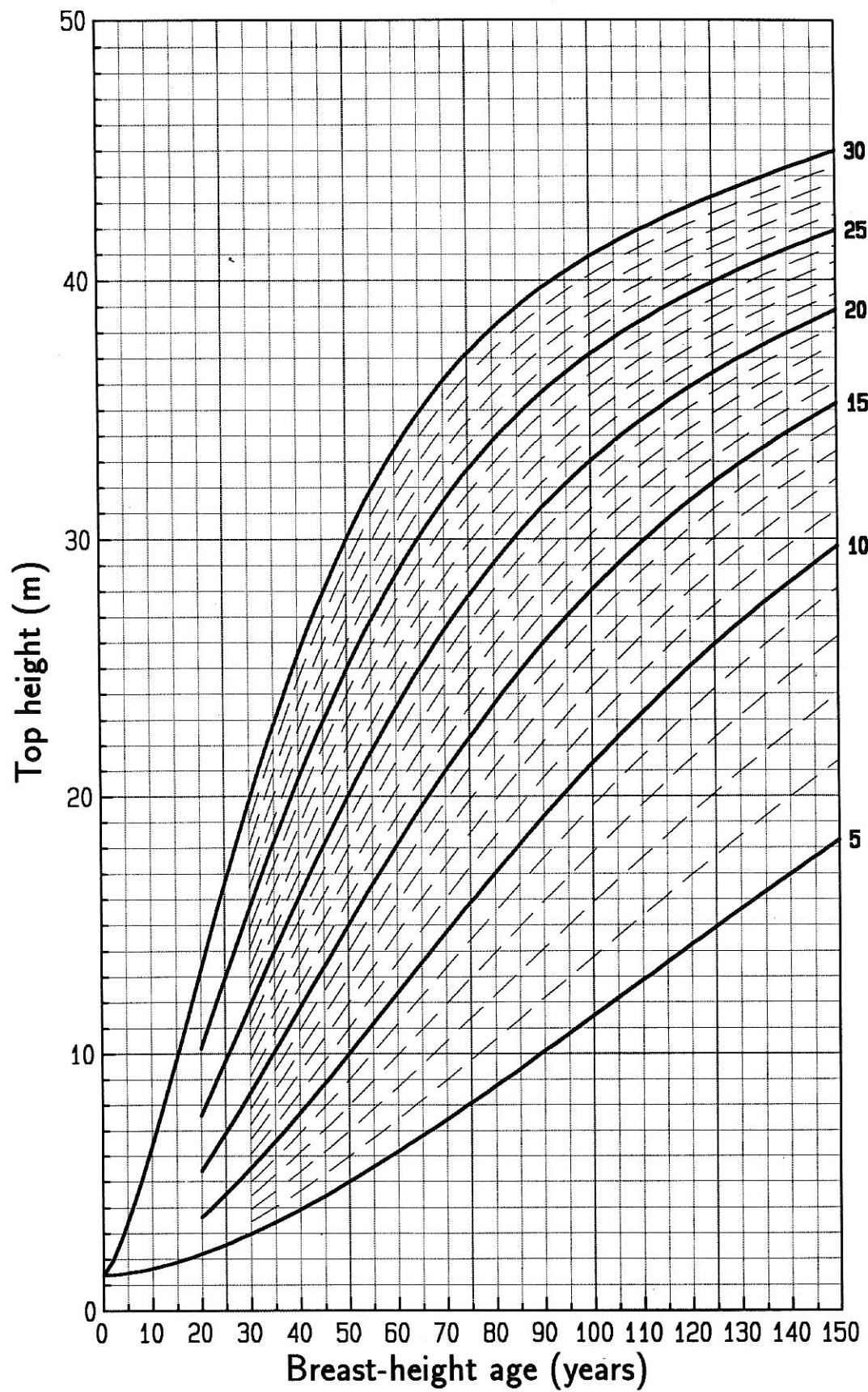
Site Index	5	6	7	8	9	10	11	12-13
Years to bh	26	23	20	18	16	15	14	13

(continued)

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

Site Index	14-15	16-17	18-20	21-25	26-33	≥34
Years to bh	12	11	10	9	8	7

Interior Western White Pine



Interior Ponderosa Pine

Source:

Hann, D.W. and J.A. Scrivani. 1986. Dominant height growth and site index equations for Douglas-fir and ponderosa pine in southwest Oregon. Oreg. State Univ. For. Res. Lab., Corvallis Oreg., Res. Bull. 59. 13 p.

Formulation:

$$\begin{aligned} H &= 0.3048 [4.5 + (S/0.3048 - 4.5) b_1/b_2] \\ b_1 &= 1 - \exp [- \exp (b_3 + 1.21297 \ln A)] \\ b_2 &= 1 - \exp [- \exp (b_3 + 1.21297 \ln 50)] \\ b_3 &= -6.54707 + 0.288169 \ln (S/0.3048 - 4.5) \\ ytb &= 5.6 + 42.64 / S \end{aligned}$$

where:

H = top height (m)
 S = site index (height at 50 years breast-height age)
 A = breast-height age (years)
 ytb = number of years to reach breast height (1.3 m)
 ln = natural logarithm
 exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 41 trees located throughout southwest Oregon. Selected trees came from natural, even- and uneven-aged, second-growth stands. Site index ranged from 19 to 34 m and from about 50 to 148 years breast-height age. Most stem analysis trees were under 120 years.

Site Index Table for Interior Ponderosa Pine

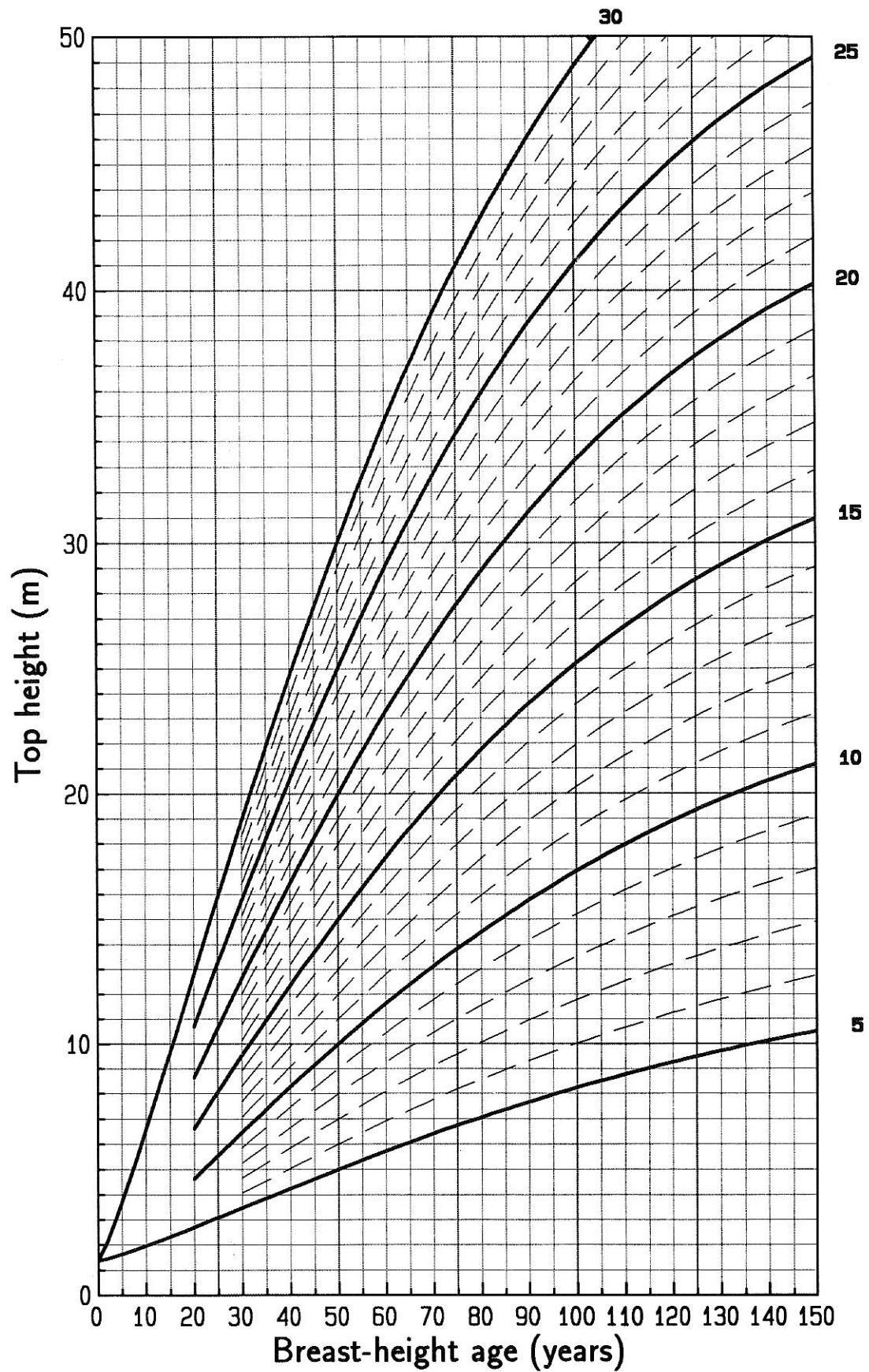
bh age (years)	Top height (m)																		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	Site Index (m)																		
10	22	27	32	37	-	-	-	-	-	-	-	-	-	-	-	-			
15	14	18	21	25	28	31	34	38	-	-	-	-	-	-	-	-			
20	11	13	16	18	21	23	26	28	31	33	35	38	40	-	-	-			
25	9	11	13	15	17	19	21	23	25	26	28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

Site Index	5	6	7	8	9-10	11-14	15-22	≥23
Years to bh	14	13	12	11	10	9	8	7

(continued)

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

Interior Ponderosa Pine



Interior Western Larch

Source:

Milner, K.S. 1989. Site index and height growth curves for ponderosa pine, Douglas-fir, western larch and lodgepole pine in western Montana. Inland Northwest Growth and Yield Coop. Rep. No. 90-3. 11 p.

Formulation:

$$H = 0.3048 [4.5 + b_1 + b_2 (S/0.3048 - 69.0)]$$

$$b_1 = 127.8 [1 - \exp(-0.01655A)]^{1.196}$$

$$b_2 = 1.289 [1 - \exp(-0.03211A)]^{1.047}$$

$$y_{tb} = 3.36 + 87.18/S \quad (\text{B.C. Min. For. 1991})$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of trees in 37 plots located throughout Western Montana. Site index ranged from 15 to 30 m. The abnormal shape of the height-age curves at young ages and low sites is the result of extending the curves beyond the range of the data from which they were developed. Accordingly, the site curves should not be used below a site index of 10 m and 30 years of age. The years to breast height function was developed by the Forest Science Research Branch from interior western larch data.

Site Index Table for Interior Western Larch

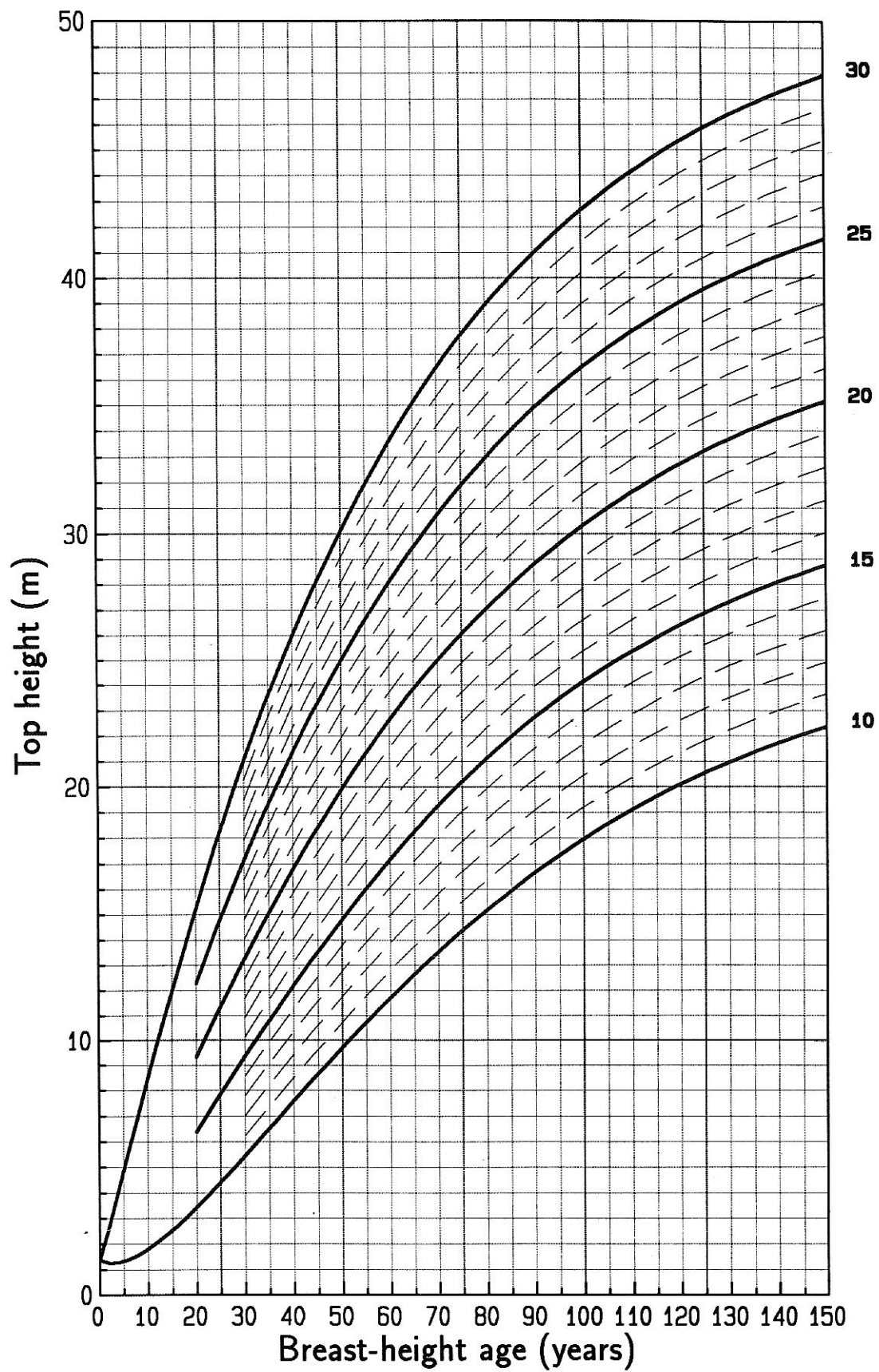
bh age (years)	Top height (m)															
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Site Index (m)															
10	20	23	26	29	32	35	38	-	-	-	-	-	-	-	-	-
15	15	17	19	22	24	26	28	30	32	34	36	39	-	-	-	-
20	13	14	16	18	19	21	23	25	26	28	30	31	33	35	36	38
25	11	12	14	15	17	18	20	21	22	24	25	27	28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

Site Index	5	6	7	8	9	10	11-12
Years to bh	21	18	16	14	13	12	11

(continued)

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

Interior Western Larch



Interior Trembling Aspen

Source:

Alberta Forest Service. 1985. Alberta phase 3 forest inventory: yield tables for unmanaged stands. ENR Rep. No. Dep. 60a.

Formulation:

$$H = 1.3 + (S - 1.3) b_1 / b_2$$

$$b_1 = 1 + \exp [6.879 - 1.32 \ln 50 - 0.618 \ln (S - 1.3)]$$

$$b_2 = 1 + \exp [6.879 - 1.32 \ln A - 0.618 \ln (S - 1.3)]$$

$$y_{tb} = 1.33 + 38.56 / S$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 207 dominant and co-dominant trembling aspen trees located throughout Alberta. Site index ranged from about 9 to 24 m at 50 years breast-height age and included trees up to 90 years old.

Site Index Table for Interior Trembling Aspen

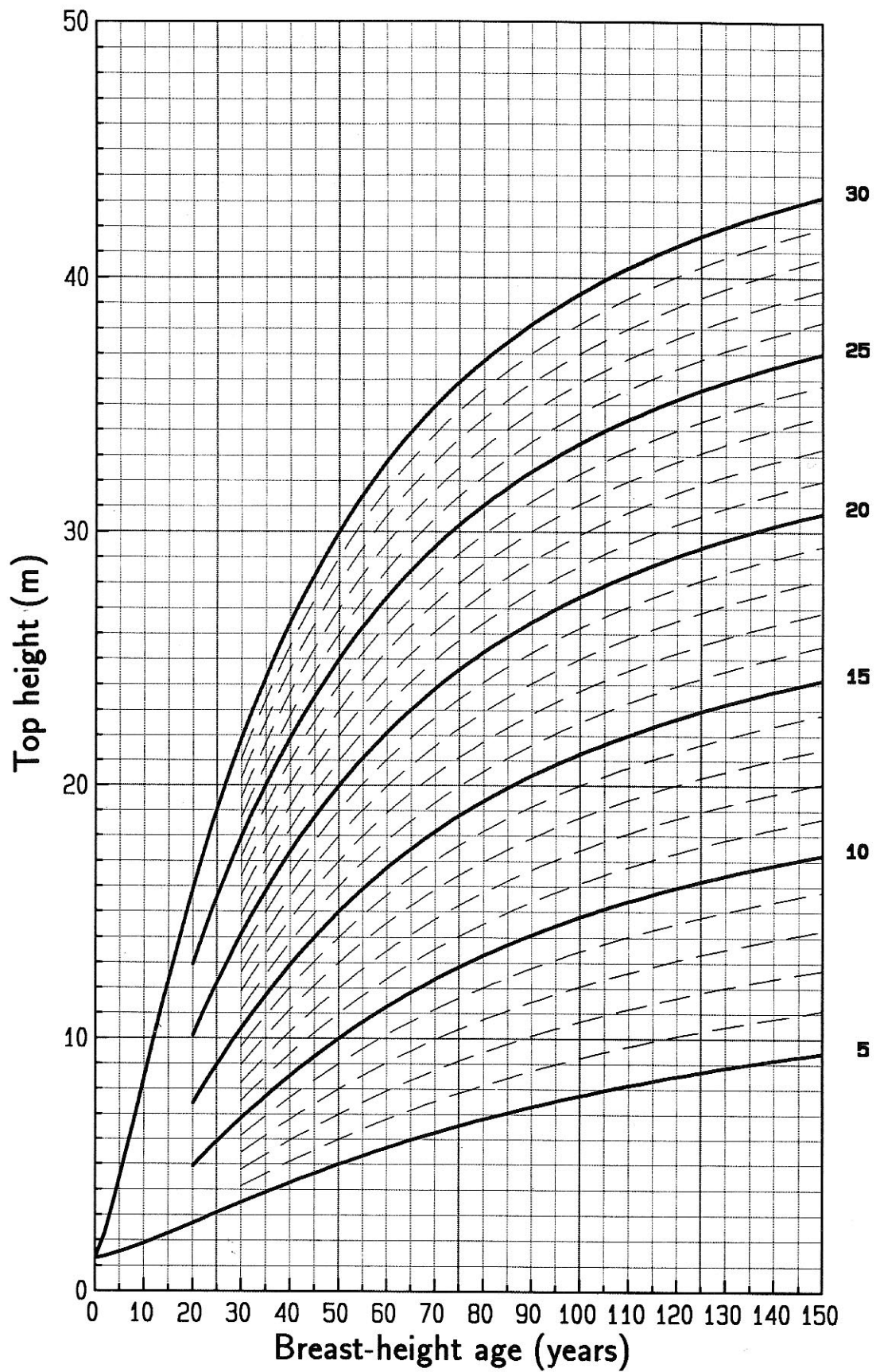
bh age (years)	Top height (m)																		
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
	Site Index (m)																		
10	18	22	25	29	32	35	38	-	-	-	-	-	-	-	-	-			
15	13	16	18	20	23	25	27	29	31	34	36	38	40	-	-	-			
20	10	12	14	16	18	20	22	23	25	27	29	30	32	33	35	37			
25	8	10	12	13	15	17	18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

Site Index	5	6	7	8-9	10-12	13-17	≥18
Years to bh	9	8	7	6	5	4	3

(continued)

Top height (m)																bh age (years)
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Site Index (m)																
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
38	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
33	34	36	37	38	40	-	-	-	-	-	-	-	-	-	-	25
29	30	31	33	34	35	36	38	39	40	-	-	-	-	-	-	30
26	27	28	30	31	32	33	34	35	37	38	39	40	-	-	-	35
24	25	26	27	28	30	31	32	33	34	35	36	37	38	39	40	40
22	23	24	25	27	28	29	30	31	32	33	34	35	36	37	38	45
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	50
20	21	22	23	24	25	26	27	28	29	30	31	31	32	33	34	55
19	20	21	22	23	24	25	26	26	27	28	29	30	31	32	33	60
18	19	20	21	22	23	24	25	25	26	27	28	29	30	31	32	65
17	18	19	20	21	22	23	24	25	26	26	27	28	29	30	31	70
17	18	19	19	20	21	22	23	24	25	26	27	27	28	29	30	75
16	17	18	19	20	21	21	22	23	24	25	26	27	28	28	29	80
16	17	18	18	19	20	21	22	23	23	24	25	26	27	28	29	85
15	16	17	18	19	20	20	21	22	23	24	25	26	26	27	28	90
15	16	17	18	18	19	20	21	22	23	23	24	25	26	27	28	95
15	16	16	17	18	19	20	20	21	22	23	24	25	25	26	27	100
14	15	16	17	18	18	19	20	21	22	23	23	24	25	26	27	105
14	15	16	17	17	18	19	20	21	21	22	23	24	25	25	26	110
14	15	15	16	17	18	19	19	20	21	22	23	23	24	25	26	115
14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26	120
14	14	15	16	17	17	18	19	20	20	21	22	23	24	25	25	125
13	14	15	16	16	17	18	19	19	20	21	22	23	23	24	25	130
13	14	15	15	16	17	18	18	19	20	21	22	22	23	24	25	135
13	14	14	15	16	17	17	18	19	20	21	21	22	23	24	25	140
13	14	14	15	16	17	17	18	19	20	20	21	22	23	24	24	145
13	13	14	15	16	16	17	18	19	19	20	21	22	23	23	24	150
13	13	14	15	15	16	17	18	18	19	20	21	22	22	23	24	155
12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	160
12	13	14	14	15	16	17	17	18	19	20	21	21	22	23	24	165
12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	170
12	13	13	14	15	16	16	17	18	19	19	20	21	22	23	23	175
12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	180
12	13	13	14	15	15	16	17	18	18	19	20	21	22	22	23	185
12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	190
12	12	13	14	15	15	16	17	17	18	19	20	21	21	22	23	195
12	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	200
Site Index					5	6	7	8-9		10-12		13-17		≥ 18		
Years to bh					9	8	7	6		5		4		3		

Interior Trembling Aspen



Interior Paper Birch

Source:

For interior paper birch, use site index curves for trembling aspen developed by the Alberta Forest Service. 1985. Alberta phase 3 forest inventory: yield tables for unmanaged stands. ENR Rep. No. Dep. 60a.

Formulation:

$$H = 1.3 + (S - 1.3) b_1/b_2$$

$$b_1 = 1 + \exp [6.879 - 1.32 \ln 50 - 0.618 \ln (S - 1.3)]$$

$$b_2 = 1 + \exp [6.879 - 1.32 \ln A - 0.618 \ln (S - 1.3)]$$

$$y_{tb} = 1.33 + 38.56 / S \quad (\text{from Alberta For. Serv. [1985] for At})$$

where:

H = top height (m)

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

A = breast-height age (years)

y_{tb} = number of years to reach breast height (1.3 m)

ln = natural logarithm

exp = exponential function to the base e

Notes:

The height-age (site index) curves were developed from stem analysis of 207 dominant and co-dominant trembling aspen trees located throughout Alberta. Site index ranged from about 9 to 24 m at 50 years breast-height age and included trees up to 90 years old. These curves are recommended for interim use with paper birch until new curves are developed.

Site Index Table for Interior Paper Birch

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

Site Index	5	6	7	8-9	10-12	13-17	≥18
Years to bh	9	8	7	6	5	4	3

(continued)

Top height (m)																bh age (years)
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Site Index (m)																
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
38	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
33	34	36	37	38	40	-	-	-	-	-	-	-	-	-	-	25
29	30	31	33	34	35	36	38	39	40	-	-	-	-	-	-	30
26	27	28	30	31	32	33	34	35	37	38	39	40	-	-	-	35
24	25	26	27	28	30	31	32	33	34	35	36	37	38	39	40	40
22	23	24	25	27	28	29	30	31	32	33	34	35	36	37	38	45
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	50
20	21	22	23	24	25	26	27	28	29	30	31	31	32	33	34	55
19	20	21	22	23	24	25	26	26	27	28	29	30	31	32	33	60
18	19	20	21	22	23	24	25	25	26	27	28	29	30	31	32	65
17	18	19	20	21	22	23	24	25	26	26	27	28	29	30	31	70
17	18	19	19	20	21	22	23	24	25	26	27	27	28	29	30	75
16	17	18	19	20	21	21	22	23	24	25	26	27	28	28	29	80
16	17	18	18	19	20	21	22	23	23	24	25	26	27	28	29	85
15	16	17	18	19	20	20	21	22	23	24	25	26	26	27	28	90
15	16	17	18	18	19	20	21	22	23	23	24	25	26	27	28	95
15	16	16	17	18	19	20	20	21	22	23	24	25	25	26	27	100
14	15	16	17	18	18	19	20	21	22	23	23	24	25	26	27	105
14	15	16	17	17	18	19	20	21	21	22	23	24	25	25	26	110
14	15	15	16	17	18	19	19	20	21	22	23	23	24	25	26	115
14	14	15	16	17	18	18	19	20	21	22	22	23	24	25	26	120
14	14	15	16	17	17	18	19	20	20	21	22	23	24	25	25	125
13	14	15	16	16	17	18	19	19	20	21	22	23	23	24	25	130
13	14	15	15	16	17	18	18	19	20	21	22	22	23	24	25	135
13	14	14	15	16	17	17	18	19	20	21	21	22	23	24	25	140
13	14	14	15	16	17	17	18	19	20	20	21	22	23	24	24	145
13	13	14	15	16	16	17	18	19	19	20	21	22	23	23	24	150
13	13	14	15	15	16	17	18	18	19	20	21	22	22	23	24	155
12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	160
12	13	14	14	15	16	17	17	18	19	20	21	21	22	23	24	165
12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	170
12	13	13	14	15	16	16	17	18	19	19	20	21	22	23	23	175
12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	180
12	13	13	14	15	15	16	17	18	18	19	20	21	22	22	23	185
12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	190
12	12	13	14	15	15	16	17	17	18	19	20	21	21	22	23	195
12	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	200
Site Index					5	6	7	8-9		10-12		13-17		≥18		
Years to bh					9	8	7	6		5		4		3		

Interior Paper Birch

Top height (m)

