

Growth Intercept Models and Tables for British Columbia — Coastal Species

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GROWTH INTERCEPT MODELS AND TABLES FOR BRITISH COLUMBIA — COASTAL SPECIES

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This field guide insert presents the growth intercept models and tables available for use in coastal regions of British Columbia. Included are growth intercept models and tables for:

Species	Code	Reference	Revised
Western Hemlock	Hw	Nigh (1996)	Oct. 1997
Sitka Spruce	Ss	Nigh (1996)	Oct. 1997
Douglas-fir	Fd	Nigh (1997)	Oct. 1997

The Options section notes any options and alternative models or model formulations, and provides references that are available from the above address.

The tables are designed for rough estimation of site index in the field. The formulation or the appropriate publication should be consulted for accurate site index determination.

The arbitrary range of site index in the tables is 10–50 m. The tables are in a common format for consistency among species and do not necessarily represent the range of site indices found in the model development data. Site index is based on top height and a reference age of 50 years (breast height) for all species. Estimates of growth intercept 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.

The tables presented in this handbook do not have sufficient resolution, particularly at young ages, to be used in silviculture surveys. Silviculture surveyors, and others who need to estimate site index during a silviculture survey or a reconnaissance, should consult the appropriate field guide for silviculture surveys (B.C. Min. For. 1995. Growth intercept method for silviculture surveys. Forest Practices Br., Victoria, B.C.). As well, information about the application of the models can be obtained from the source reports.

Growth intercept models and tables will be refined and updated as new information becomes available. A revised reference list will be issued with each addition or revision. Write to the above address for updates.

Coastal Western Hemlock

Source:

Nigh, G.D. 1996. Growth intercept models for species without distinct annual branch whorls: western hemlock. Can. J. For. Res. 26: 1407–1415.

Formulation:

Age	Model	Age	Model
1	$SI = 4.957 GI_1^{0.4325}$	16	$SI = 1.665 GI_{16}^{0.6986}$
2	$SI = 4.413 GI_2^{0.4649}$	17	$SI = 1.620 GI_{17}^{0.7046}$
3	$SI = 4.002 GI_3^{0.4939}$	18	$SI = 1.575 GI_{18}^{0.7105}$
4	$SI = 3.812 GI_4^{0.5095}$	19	$SI = 1.524 GI_{19}^{0.7172}$
5	$SI = 3.386 GI_5^{0.5412}$	20	$SI = 1.465 GI_{20}^{0.7259}$
6	$SI = 2.932 GI_6^{0.5786}$	21	$SI = 1.424 GI_{21}^{0.7321}$
7	$SI = 2.680 GI_7^{0.6006}$	22	$SI = 1.381 GI_{22}^{0.7388}$
8	$SI = 2.595 GI_8^{0.6062}$	23	$SI = 1.337 GI_{23}^{0.7461}$
9	$SI = 2.462 GI_9^{0.6165}$	24	$SI = 1.309 GI_{24}^{0.7508}$
10	$SI = 2.247 GI_{10}^{0.6365}$	25	$SI = 1.274 GI_{25}^{0.7574}$
11	$SI = 2.066 GI_{11}^{0.6546}$	26	$SI = 1.215 GI_{26}^{0.7693}$
12	$SI = 1.905 GI_{12}^{0.6712}$	27	$SI = 1.145 GI_{27}^{0.7839}$
13	$SI = 1.786 GI_{13}^{0.6843}$	28	$SI = 1.091 GI_{28}^{0.7960}$
14	$SI = 1.728 GI_{14}^{0.6912}$	29	$SI = 1.038 GI_{29}^{0.8085}$
15	$SI = 1.693 GI_{15}^{0.6954}$	30	$SI = 0.9789 GI_{30}^{0.8235}$

where: SI = estimated site index (m at breast height age 50), and
GI = growth intercept (cm/year).

Options:

1. The growth intercept can also be determined by calculating the average annual height growth from the sub-nodal branches (see source report). This method is useful when the stem is not suitable for growth intercept measurements (e.g., when the trees have top damage) and for research applications.

Site Index Table for Coastal Western Hemlock

bh ring count	Tree Height (m)														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Site Index (m)														
1	42	—	—	—	—	—	—	—	—	—	—	—	—	—	
2	26	40	49	—	—	—	—	—	—	—	—	—	—	—	
3	21	32	40	47	—	—	—	—	—	—	—	—	—	—	
4	18	28	35	41	46	—	—	—	—	—	—	—	—	—	
5	15	24	31	37	42	47	—	—	—	—	—	—	—	—	
6	13	21	28	33	38	43	47	—	—	—	—	—	—	—	
7	11	19	25	30	35	39	43	47	—	—	—	—	—	—	
8	10	17	23	28	32	36	40	43	46	49	—	—	—	—	
9	—	16	21	25	29	33	36	40	43	46	49	—	—	—	
10	—	14	19	23	27	30	34	37	40	43	45	48	—	—	
11	—	13	17	21	25	28	31	34	37	40	43	45	48	50	
12	—	12	16	20	23	26	29	32	35	37	40	42	45	47	
13	—	11	15	18	21	24	27	30	33	35	38	40	42	44	
14	—	10	14	17	20	23	26	28	31	33	35	38	40	42	
15	—	—	13	16	19	22	24	27	29	31	34	36	38	40	
16	—	—	12	15	18	21	23	25	28	30	32	34	36	38	
17	—	—	12	14	17	20	22	24	26	29	31	33	35	36	
18	—	—	11	14	16	19	21	23	25	27	29	31	33	35	
19	—	—	10	13	16	18	20	22	24	26	28	30	32	33	
20	—	—	10	12	15	17	19	21	23	25	27	29	30	32	
21	—	—	—	12	14	16	18	20	22	24	26	28	29	31	
22	—	—	—	11	13	16	18	19	21	23	25	26	28	30	
23	—	—	—	11	13	15	17	19	20	22	24	25	27	29	
24	—	—	—	10	12	14	16	18	20	21	23	25	26	28	
25	—	—	—	10	12	14	16	17	19	21	22	24	25	27	
26	—	—	—	10	11	13	15	17	18	20	22	23	25	26	
27	—	—	—	—	11	13	14	16	18	19	21	22	24	25	
28	—	—	—	—	10	12	14	15	17	19	20	22	23	24	
29	—	—	—	—	10	12	13	15	16	18	19	21	22	24	
30	—	—	—	—	10	11	13	14	16	17	19	20	22	23	

bh - breast height = 1.3 m

(continued)

Tree Height (m)															bh ring count
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
Site Index (m)															
—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	
49	—	—	—	—	—	—	—	—	—	—	—	—	—	12	
47	49	—	—	—	—	—	—	—	—	—	—	—	—	13	
44	46	48	50	—	—	—	—	—	—	—	—	—	—	14	
42	44	46	48	50	—	—	—	—	—	—	—	—	—	15	
40	42	44	46	47	49	—	—	—	—	—	—	—	—	16	
38	40	42	44	45	47	49	50	—	—	—	—	—	—	17	
37	38	40	42	44	45	47	48	50	—	—	—	—	—	18	
35	37	39	40	42	43	45	46	48	49	—	—	—	—	19	
34	35	37	39	40	42	43	45	46	48	49	—	—	—	20	
33	34	36	37	39	40	42	43	45	46	48	49	50	—	21	
31	33	34	36	37	39	40	42	43	45	46	47	49	50	22	
30	32	33	35	36	38	39	40	42	43	45	46	47	48	23	
29	31	32	34	35	36	38	39	40	42	43	44	46	47	24	
28	30	31	33	34	35	37	38	39	41	42	43	44	46	25	
27	29	30	32	33	34	36	37	38	40	41	42	44	45	26	
27	28	29	31	32	34	35	36	37	39	40	41	43	44	27	
26	27	29	30	31	33	34	35	37	38	39	40	42	43	28	
25	27	28	29	31	32	33	34	36	37	38	40	41	42	29	
24	26	27	29	30	31	32	34	35	36	38	39	40	41	30	

Notes:

The growth intercept table (preceding) eliminates the need to calculate the growth intercept. To use the table, first measure the total height of a top height tree and count the number of annual growth rings at its breast height. Find the row corresponding to the ring count and the column most closely corresponding to the tree height. The number at the intersection of this row and column is the approximate site index.

The model formulation provides better resolution than the table. For those wanting this resolution, the growth intercept is calculated by subtracting 1.3 from the tree height (in m), dividing by the number of years of growth above breast height (ring count -0.5), and then multiplying by 100 to convert metres into centimetres. The site index is first calculated for each tree in the plot from its growth intercept and the model corresponding to age = ring count. The site indices are then averaged to get a site index for the plot.

The growth intercept models were developed from 46 stem analysis plots located in the Coastal Western Hemlock biogeoclimatic zone. Plots ranged in site index from about 7 to 40 m, and the growth intercepts ranged from about 10 to 100 cm. The models can be used throughout coastal British Columbia.

Coastal Sitka Spruce

Source:

Nigh, G.D. 1996. A variable growth intercept model for Sitka spruce.
B.C. Min. For., Res. Br., Victoria, B.C. Ext. Note 03

Formulation:

Age	Model	Age	Model
1	$SI = 3.317 GI_1^{0.5634}$	16	$SI = 2.248 GI_{16}^{0.6373}$
2	$SI = 3.277 GI_2^{0.5663}$	17	$SI = 2.056 GI_{17}^{0.6574}$
3	$SI = 3.287 GI_3^{0.5654}$	18	$SI = 1.911 GI_{18}^{0.6738}$
4	$SI = 3.232 GI_4^{0.5699}$	19	$SI = 1.794 GI_{19}^{0.6879}$
5	$SI = 3.164 GI_5^{0.5756}$	20	$SI = 1.680 GI_{20}^{0.7026}$
6	$SI = 3.140 GI_6^{0.5776}$	21	$SI = 1.568 GI_{21}^{0.7182}$
7	$SI = 3.281 GI_7^{0.5658}$	22	$SI = 1.456 GI_{22}^{0.7349}$
8	$SI = 3.463 GI_8^{0.5502}$	23	$SI = 1.355 GI_{23}^{0.7514}$
9	$SI = 3.540 GI_9^{0.5421}$	24	$SI = 1.273 GI_{24}^{0.7656}$
10	$SI = 3.508 GI_{10}^{0.5418}$	25	$SI = 1.220 GI_{25}^{0.7753}$
11	$SI = 3.386 GI_{11}^{0.5481}$	26	$SI = 1.185 GI_{26}^{0.7820}$
12	$SI = 3.224 GI_{12}^{0.5578}$	27	$SI = 1.155 GI_{27}^{0.7877}$
13	$SI = 2.982 GI_{13}^{0.5746}$	28	$SI = 1.126 GI_{28}^{0.7938}$
14	$SI = 2.708 GI_{14}^{0.5959}$	29	$SI = 1.089 GI_{29}^{0.8020}$
15	$SI = 2.474 GI_{15}^{0.6158}$	30	$SI = 1.074 GI_{30}^{0.8052}$

where: SI = estimated site index (m at breast height age 50), and
GI = growth intercept (cm/year).

Options:

1. The growth intercept can also be determined by calculating the average annual height growth from the annual whorls. This method is useful when the stem is not suitable for growth intercept measurements (e.g., when the trees have top damage) and for research applications.

Site Index Table for Coastal Sitka Spruce

bh ring count	Tree Height (m)														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Site Index (m)														
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2	29	48	—	—	—	—	—	—	—	—	—	—	—	—	
3	22	36	46	—	—	—	—	—	—	—	—	—	—	—	
4	18	30	38	46	—	—	—	—	—	—	—	—	—	—	
5	15	26	33	40	46	—	—	—	—	—	—	—	—	—	
6	14	23	30	36	41	46	50	—	—	—	—	—	—	—	
7	13	21	27	32	37	41	45	49	—	—	—	—	—	—	
8	12	19	25	30	34	38	41	44	47	50	—	—	—	—	
9	11	18	23	27	31	35	38	41	44	46	49	—	—	—	
10	10	17	22	26	29	32	35	38	41	43	45	48	50	—	
11	10	16	20	24	27	30	33	36	38	40	43	45	47	49	
12	—	14	19	22	26	28	31	34	36	38	40	42	44	46	
13	—	13	17	21	24	27	29	32	34	36	38	40	42	44	
14	—	12	16	19	22	25	28	30	32	35	37	39	41	42	
15	—	11	15	18	21	24	26	29	31	33	35	37	39	41	
16	—	10	14	17	20	22	25	27	29	31	33	35	37	39	
17	—	10	13	16	19	21	23	26	28	30	32	34	36	38	
18	—	—	12	15	18	20	22	24	27	29	31	32	34	36	
19	—	—	11	14	17	19	21	23	25	27	29	31	33	35	
20	—	—	11	13	16	18	20	22	24	26	28	30	32	33	
21	—	—	10	13	15	17	19	21	23	25	27	29	30	32	
22	—	—	—	12	14	16	18	20	22	24	26	27	29	31	
23	—	—	—	11	13	15	17	19	21	23	25	26	28	30	
24	—	—	—	11	13	15	17	18	20	22	24	25	27	29	
25	—	—	—	10	12	14	16	18	19	21	23	24	26	28	
26	—	—	—	10	12	13	15	17	19	20	22	24	25	27	
27	—	—	—	—	11	13	15	16	18	20	21	23	24	26	
28	—	—	—	—	11	12	14	16	17	19	21	22	24	25	
29	—	—	—	—	10	12	14	15	17	18	20	21	23	24	
30	—	—	—	—	10	12	13	15	16	18	19	21	22	24	

bh - breast height = 1.3 m

(continued)

Tree Height (m)															bh ring count
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
Site Index (m)															bh ring count
-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	
48	50	-	-	-	-	-	-	-	-	-	-	-	-	12	
46	48	50	-	-	-	-	-	-	-	-	-	-	-	13	
44	46	48	49	-	-	-	-	-	-	-	-	-	-	14	
43	44	46	48	49	-	-	-	-	-	-	-	-	-	15	
41	43	44	46	48	49	-	-	-	-	-	-	-	-	16	
39	41	43	44	46	48	49	-	-	-	-	-	-	-	17	
38	40	41	43	44	46	48	49	-	-	-	-	-	-	18	
36	38	40	41	43	45	46	48	49	-	-	-	-	-	19	
35	37	38	40	41	43	45	46	48	49	50	-	-	-	20	
34	35	37	39	40	42	43	45	46	48	49	50	-	-	21	
32	34	36	37	39	40	42	43	45	46	48	49	50	-	22	
31	33	34	36	38	39	41	42	43	45	46	48	49	50	23	
30	32	33	35	36	38	39	41	42	44	45	46	48	49	24	
29	31	32	34	35	37	38	39	41	42	44	45	46	48	25	
28	30	31	33	34	35	37	38	40	41	42	44	45	46	26	
27	29	30	32	33	34	36	37	38	40	41	42	44	45	27	
26	28	29	31	32	33	35	36	37	39	40	41	43	44	28	
26	27	29	30	31	33	34	35	36	38	39	40	42	43	29	
25	26	28	29	30	32	33	34	35	37	38	39	40	42	30	

Notes:

The growth intercept table (preceding) eliminates the need to calculate the growth intercept. To use the table, first measure the total height of a top height tree and count the number of annual growth rings at its breast height. Find the row corresponding to the ring count and the column most closely corresponding to the tree height. The number at the intersection of this row and column is the approximate site index.

The model formulation provides better resolution than the table. For those wanting this resolution, the growth intercept is calculated by subtracting 1.3 from the tree height (in m), dividing by the number of years of growth above breast height (ring count -0.5), and then multiplying by 100 to convert metres into centimetres. The site index is first calculated for each tree in the plot from its growth intercept and the model corresponding to age = ring count. The site indices are then averaged to get a site index for the plot.

The growth intercept models were developed from 38 stem analysis plots located in the Coastal Western Hemlock biogeoclimatic zone. Plots ranged in site index from about 16 to 40 m, and the growth intercepts ranged from about 20 to 90 cm. The models can be used throughout coastal British Columbia.

Coastal Douglas-fir

Source:

Nigh, G.D. 1997. A growth intercept model for coastal Douglas-fir.
B.C. Min. For., Res. Br., Victoria, B.C. Res. Rep. 10.

Formulation:

Age	Model	Age	Model
1	$SI = 1.3 + 3.89 GI_1^{0.538}$	26	$SI = 1.3 + 0.658 GI_{26}^{0.906}$
2	$SI = 1.3 + 2.55 GI_2^{0.633}$	27	$SI = 1.3 + 0.659 GI_{27}^{0.906}$
3	$SI = 1.3 + 2.45 GI_3^{0.633}$	28	$SI = 1.3 + 0.641 GI_{28}^{0.913}$
4	$SI = 1.3 + 2.35 GI_4^{0.636}$	29	$SI = 1.3 + 0.624 GI_{29}^{0.920}$
5	$SI = 1.3 + 2.19 GI_5^{0.647}$	30	$SI = 1.3 + 0.618 GI_{30}^{0.924}$
6	$SI = 1.3 + 2.03 GI_6^{0.659}$	31	$SI = 1.3 + 0.616 GI_{31}^{0.925}$
7	$SI = 1.3 + 1.77 GI_7^{0.688}$	32	$SI = 1.3 + 0.603 GI_{32}^{0.931}$
8	$SI = 1.3 + 1.60 GI_8^{0.708}$	33	$SI = 1.3 + 0.591 GI_{33}^{0.937}$
9	$SI = 1.3 + 1.44 GI_9^{0.730}$	34	$SI = 1.3 + 0.580 GI_{34}^{0.943}$
10	$SI = 1.3 + 1.27 GI_{10}^{0.757}$	35	$SI = 1.3 + 0.564 GI_{35}^{0.951}$
11	$SI = 1.3 + 1.16 GI_{11}^{0.776}$	36	$SI = 1.3 + 0.564 GI_{36}^{0.952}$
12	$SI = 1.3 + 1.04 GI_{12}^{0.798}$	37	$SI = 1.3 + 0.550 GI_{37}^{0.958}$
13	$SI = 1.3 + 0.972 GI_{13}^{0.814}$	38	$SI = 1.3 + 0.546 GI_{38}^{0.962}$
14	$SI = 1.3 + 0.897 GI_{14}^{0.831}$	39	$SI = 1.3 + 0.536 GI_{39}^{0.967}$
15	$SI = 1.3 + 0.881 GI_{15}^{0.834}$	40	$SI = 1.3 + 0.529 GI_{40}^{0.971}$
16	$SI = 1.3 + 0.837 GI_{16}^{0.846}$	41	$SI = 1.3 + 0.518 GI_{41}^{0.977}$
17	$SI = 1.3 + 0.787 GI_{17}^{0.860}$	42	$SI = 1.3 + 0.514 GI_{42}^{0.980}$
18	$SI = 1.3 + 0.755 GI_{18}^{0.869}$	43	$SI = 1.3 + 0.511 GI_{43}^{0.983}$
19	$SI = 1.3 + 0.737 GI_{19}^{0.875}$	44	$SI = 1.3 + 0.504 GI_{44}^{0.988}$
20	$SI = 1.3 + 0.717 GI_{20}^{0.882}$	45	$SI = 1.3 + 0.499 GI_{45}^{0.991}$
21	$SI = 1.3 + 0.701 GI_{21}^{0.887}$	46	$SI = 1.3 + 0.490 GI_{46}^{0.997}$
22	$SI = 1.3 + 0.681 GI_{22}^{0.894}$	47	$SI = 1.3 + 0.484 GI_{47}^{1.00}$
23	$SI = 1.3 + 0.681 GI_{23}^{0.895}$	48	$SI = 1.3 + 0.486 GI_{48}^{1.00}$
24	$SI = 1.3 + 0.674 GI_{24}^{0.898}$	49	$SI = 1.3 + 0.484 GI_{49}^{1.00}$
25	$SI = 1.3 + 0.670 GI_{25}^{0.900}$	50	$SI = 1.3 + 0.489 GI_{50}^{1.00}$

where: SI = estimated site index (m at breast height age 50), and
GI = growth intercept (cm/year).

Site Index Table for Coastal Douglas-fir

bh ring count	Tree Height (m)														
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	Site Index (m)														
2	30	—	—	—	—	—	—	—	—	—	—	—	—	—	
4	17	29	38	47	—	—	—	—	—	—	—	—	—	—	
6	12	21	28	34	39	45	50	—	—	—	—	—	—	—	
8	—	16	21	27	31	36	40	44	48	—	—	—	—	—	
10	—	13	17	22	26	29	33	37	40	43	47	50	—	—	
12	—	10	14	18	21	25	28	31	34	37	40	43	46	49	
14	—	—	12	15	18	21	24	27	30	33	35	38	40	43	
16	—	—	11	14	16	19	22	24	27	29	31	34	36	38	
18	—	—	—	12	14	17	19	22	24	26	28	30	33	35	
20	—	—	—	11	13	15	18	20	22	24	26	28	30	32	
22	—	—	—	10	12	14	16	18	20	22	24	26	27	29	
24	—	—	—	—	11	13	15	17	19	20	22	24	26	27	
26	—	—	—	—	11	12	14	16	17	19	21	22	24	26	
28	—	—	—	—	10	12	13	15	16	18	19	21	23	24	
30	—	—	—	—	—	11	12	14	15	17	18	20	21	23	
32	—	—	—	—	—	10	12	13	15	16	17	19	20	22	
34	—	—	—	—	—	10	11	12	14	15	16	18	19	20	
36	—	—	—	—	—	—	11	12	13	14	16	17	18	20	
38	—	—	—	—	—	—	10	11	13	14	15	16	17	19	
40	—	—	—	—	—	—	10	11	12	13	14	16	17	18	
42	—	—	—	—	—	—	—	10	11	13	14	15	16	17	
44	—	—	—	—	—	—	—	10	11	12	13	14	15	16	
46	—	—	—	—	—	—	—	10	11	12	13	14	15	16	
48	—	—	—	—	—	—	—	—	10	11	12	13	14	15	
50	—	—	—	—	—	—	—	—	10	11	12	13	14	15	

bh - breast height = 1.3 m

(continued)

Tree Height (m)															bh ring count
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
Site Index (m)															
—	—	—	—	—	—	—	—	—	—	—	—	—	—		
—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	
46	48	50	—	—	—	—	—	—	—	—	—	—	—	14	
41	43	45	47	49	—	—	—	—	—	—	—	—	—	16	
37	39	41	43	45	47	49	—	—	—	—	—	—	—	18	
34	36	38	39	41	43	45	47	49	—	—	—	—	—	20	
31	33	35	37	38	40	42	44	45	47	49	50	—	—	22	
29	31	32	34	36	37	39	41	42	44	45	47	49	50	24	
27	29	30	32	33	35	37	38	40	41	43	44	46	47	26	
26	27	29	30	32	33	34	36	37	39	40	42	43	45	28	
24	26	27	28	30	31	33	34	35	37	38	40	41	42	30	
23	24	26	27	28	30	31	32	34	35	36	38	39	40	32	
22	23	24	26	27	28	30	31	32	33	35	36	37	39	34	
21	22	23	25	26	27	28	30	31	32	33	34	36	37	36	
20	21	22	23	25	26	27	28	29	31	32	33	34	35	38	
19	20	21	23	24	25	26	27	28	29	31	32	33	34	40	
18	19	21	22	23	24	25	26	27	28	30	31	32	33	42	
18	19	20	21	22	23	24	25	26	27	29	30	31	32	44	
17	18	19	20	21	22	23	24	25	27	28	29	30	31	46	
16	17	19	20	21	22	23	24	25	26	27	28	29	30	48	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	50	

Options:

1. The growth intercept can also be determined by calculating the average annual height growth from the annual whorls. This method is useful when the stem is not suitable for growth intercept measurements (e.g., when the trees have top damage) and for research applications.

Notes:

This is the first species to have growth intercept models up to breast height age 50.

The growth intercept table (preceding) eliminates the need to calculate the growth intercept. To use the table, first measure the total height of a top height tree and count the number of annual growth rings at its breast height. Find the row corresponding to the ring count and the column most closely corresponding to the tree height. The number at the intersection of this row and column is the approximate site index.

The model formulation provides better resolution than the table. For those wanting this resolution, the growth intercept is calculated by subtracting 1.3 from the tree height (in m), dividing by the number of years of growth above breast height (ring count -0.5), and then multiplying by 100 to convert metres into centimetres. The site index is first calculated for each tree in the plot from its growth intercept and the model corresponding to age = ring count. The site indices are then averaged to get a site index for the plot.

The growth intercept models were developed from 47 stem analysis plots located in the Coastal Western Hemlock and Coastal Douglas-fir biogeoclimatic zones. Plots ranged in site index from about 15 to 46 m, and the growth intercepts ranged from about 22 to 108 cm. The models can be used throughout coastal British Columbia.