

APPENDIX V – SUMMARY OF GROWTH & YIELD PROJECTS

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APPENDIX V

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SITE INDEX ADJUSTMENT / BIOPHYSICAL MODEL IN THE WET-BELT

Supporting documentation on the SIA and biophysical model is provided in the following attached documents:

1. SIA report by J.S. Thrower & Associates Ltd., November 21, 2002
2. Applying SIA options in Timber Supply Analysis

1. SITE INDEX ADJUSTMENT FOR THE WET-BELT PORTION OF THE OKANAGAN TSA – FINAL REPORT

**Site Index Adjustment
for the Wet-Belt Portion
of the Okanagan TSA
Final Report**

*Prepared for the
Okanagan Innovative Forestry Society Including:*

*Riverside Forest Products Ltd.
Weyerhaeuser Company Ltd.
Ministry of Forests, Small Business Program
Federated Co-operatives Ltd.
Tolko Industries Ltd.
Gorman Brothers Lumber Ltd.
LP Engineered Wood Products Ltd.
Bell Pole Company Ltd.
Selkirk Timber Company*

Project: OKI-003

November 21, 2002

Okanagan IFPA
Okanagan Innovative Forestry Society

Executive Summary

This Site Index Adjustment (SIA) project was completed by J.S. Thrower & Associates Ltd. (JST) in 2002 for the wet-belt portion of the Okanagan TSA under contract to forest licensees in the Okanagan Innovative Forestry Society (OIFS). Numerous studies across the province have shown that the site index estimates in many forest cover inventories under-estimate the potential growth of post-harvest regenerated (PHR) stands. The goal of this project was to develop reliable estimates of potential site index (PSI) for the major commercial species in the wet-belt portion of the Okanagan TSA. The intent is to use these estimates with other growth & yield and silviculture information to develop managed stand yield tables for the innovative timber supply analysis that will support the OIFS's request for AAC uplift in the fall of 2002.

This SIA project had two main components: low elevation and high elevation. The low elevation area consisted of the ICH and IDF zones (71% of the wet-belt productive forest landbase [PFLB]), and the high elevation component was completed for the ESSF zone (28% of PFLB). In the low elevation area, preliminary estimates of potential site index (PSI) were developed using JST's biophysical model. This model predicts site index across the landbase using biogeoclimatic unit, elevation, slope position, aspect, and bedrock geology. These PSI estimates were then statistically adjusted based on the results of a representative, random ground sample to remove the potential bias from the biophysical model predictions.

PSI was measured in the random plot clusters from Douglas-fir (Fd) and lodgepole pine (PI) site trees, resulting in average field site indices of 22.3 m for Fd and 21.0 m for PI. The analysis showed that the biophysical model under-predicted the PSI of Fd by about 1% and over-estimated PI PSI by about 4%. Due to limited sampling opportunities for Sx, final PSI estimates for Sx in the low elevation were derived using the MOF SI conversion equations based on final PI PSI estimates. For the low elevation area, the adjustments resulted in an average final PSI of 22.0m for Fd, 21.0m for PI, and 20.7m for Sx.

Species	Fd	PI
Sample Size of PSI Measurements (n)	54	27
Ground Sample PSI (m)	22.3	21.0
Biophysical Model Sample PSI (m)	22.2	21.8
Ratio of Means	1.01	0.96
Low Elevation Adjusted Average PSI (m)	22.0	21.0
Adjusted 95% Sampling Error (m)	1.0	1.1

In the high elevation area, preliminary PSI estimates were developed using the same biophysical model; however, due to limited sampling opportunities in higher elevation areas, these estimates were not statistically adjusted. A small random sample was completed to provide a level of comfort for the unadjusted estimates. Average field PSIs were 20.9 m for spruce [S] (n=14) and 18.3 m for subalpine fir [BI] (n=12). The comparison between predicted and field PSI for this small random sample showed that, on average, the model under-predicted field SI in the ESSF (by 2.3 m for S and 1.2 m for BI). For the high elevation, the biophysical model resulted in an average final PSI of 17.5m for PI and 17.7m for Sx.



BGC Subzone	PFLB Area		Fd Site Index (m)			PI Site Index (m)			Sx Site Index (m)		
	(ha)	%	Model PSI	Ratio	Final PSI	Model PSI	Ratio	Final PSI	Model PSI	Ratio	Final PSI
ICHmk1	69,059	9%	21.0	1.01	21.2	21.4	0.96	20.5	20.0	NA	20.2
ICHmk2	9,727	1%	21.1	1.01	21.3	21	0.96	20.2	20.1	NA	19.8
ICHmw2	170,070	23%	22.2	1.01	22.4	22.3	0.96	21.4	21.4	NA	21.2
ICHmw3	75,273	10%	23.5	1.01	23.7	22.6	0.96	21.7	21.8	NA	21.5
ICHvk1	21,534	3%	21.4	1.01	21.6	21.2	0.96	20.4	20.9	NA	20.0
ICHwk1	99,372	13%	22.6	1.01	22.8	22.4	0.96	21.5	21.4	NA	21.3
IDFmw1	54,976	7%	18.8	1.01	19.0	19.7	0.96	18.9	17.4	NA	18.5
IDFmw2	32,608	4%	19.8	1.01	20.0	20.8	0.96	20.0	18.3	NA	19.6
<i>ICH & IDF</i>	<i>532,619</i>	<i>72%</i>	<i>21.8</i>	<i>1.01</i>	<i>22.0</i>	<i>21.9</i>	<i>0.96</i>	<i>21.0</i>	<i>20.6</i>	<i>NA</i>	<i>20.7</i>
ESSFvc	30,568	4%	NA	NA	NA	16.9	NA	16.9	17.0	NA	17.0
ESSFwc2	119,390	16%	NA	NA	NA	18.0	NA	18.0	18.2	NA	18.2
ESSFwc4	57,584	8%	NA	NA	NA	16.6	NA	16.6	17.1	NA	17.1
<i>ESSF</i>	<i>207,542</i>	<i>28%</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>17.5</i>	<i>NA</i>	<i>17.5</i>	<i>17.7</i>	<i>NA</i>	<i>17.7</i>
<i>All</i>	<i>740,161</i>	<i>100%</i>	<i>21.8</i>	<i>1.01</i>	<i>22.0</i>	<i>20.6</i>	<i>-</i>	<i>20.0</i>	<i>19.8</i>	<i>NA</i>	<i>19.8</i>

This SIA project is the first in BC to use the JST biophysical model; however, results (PSI estimates and total variation) from this approach were similar to previous SIA projects where preliminary estimates were developed using ecological maps. We believe that the biophysical model approach is a cost-effective method to assign PSI estimates for PHR stands to large landbases.

The major recommendations from this project are:

1. Use the PSI estimates developed in this project in the upcoming OIFS timber supply analysis.
2. Improve PSI estimates for the high elevation area (ESSF) for future analyses.
3. Monitor growth & yield in PHR stands to track forest growth in the Okanagan wet-belt.

