

**Determining the AAC for
The Weyerhaeuser Drayton Valley FMA
Component#1: Yield Projections
- DRAFT -**

**Forest Management Agreement Area
FMA #8500023**

April 26, 2005

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Acknowledgements

This report is based on the hard work of several individuals. Thanks to Mark Messmer and Neil Stevens for preparing the original documentation on which this analysis was based. Shongming Huang of the Alberta Department of Sustainable Resource Development prepared many of the invaluable references and assisted in development of the methods applied. Thanks also to Janis Braze of Timberline Forest Inventory Consultants for his assistance with this analysis.

Our special thanks go to Glenn Buckmaster who authored the Weyerhaeuser Edson FMA Yield Analysis document, which is the basis of our report. His advice and suggestions are greatly appreciated.

Executive Summary

Yield equations for the Weyerhaeuser Drayton Valley FMA were developed by stratifying locally collected TSP data (sample years 1996 to 1999) by broad inventory cover group (coniferous dominated versus deciduous dominated) and applying nonlinear volume estimation procedures to the data.

The methodology and report structure follow closely the document titled “Determining the AAC for the Weyerhaeuser Edson FMA. Component #1: Yield Projections” produced by Glenn Buckmaster. This reflects the similarity in ecology and stand types between the Drayton Valley and Edson FMA areas.

Processing program and version used: SAS 8.02

Plot and spatial data overlay: Each TSP was spatially linked to an Alberta Vegetation Inventory (AVI) polygon, a SiteLogix™ ecosite classification polygon and the provincial natural subregion spatial coverage.

Site Index: When possible, each sampled stand was assigned a site index value. To be eligible as for a site index measurement a tree could not be severely damaged and had to be either dominant or co-dominant with both a valid field measured height and age.

Height prediction equations: Localized species-specific coefficients were produced for height prediction from DBH using the Chapman-Richards functional form. These calculations were conducted for individual site productivity classes based on the plot level ecosite class and natural subregion. A minimum of 20 observations was required for a valid model. If valid coefficients could not be found, the provincial coefficients were used.

Plot age calculations: Plot age was assigned using the following equation:

$$TSP \text{ sample year} - AVI \text{ inventory origin year}$$

Tree volume compilation: Coniferous volumes were compiled based on a whole tree system at a 15/11-utilization standard. Deciduous volumes were compiled based on a short wood harvesting system and a 15/10 utilization standard. Both systems assume a 15 cm stump height. These are consistent with current mill standards.

Subjective deletions and cull: All plots located in stands with a composition of 80%+ black spruce or 10%+ larch composition were assumed to be unmerchantable and removed from any yield projections. Cull was not deducted during the yield analysis. It will be addressed as a proportional reduction applied to the recommended annual allowable cut level based on historical scaling data.

Merchantable total volume: In general, total stand yields were estimated as a function of coniferous/deciduous composition dominance, AVI crown closure, site index, site quality, and stand age.

Merchantable major species volume: In general, major species volume (i.e. coniferous volume from coniferous dominated stands) was estimated as a function of natural subregion, total volume, and AVI coniferous composition.

Merchantable incidental volume: Incidental volume (i.e. deciduous volume from coniferous dominated stands) was estimated by simply subtracting merchantable major species volume from merchantable total volume.

Deciduous mortality reductions: Although TSP data to some extent already considers mortality (as dead trees do not contribute merchantable volume) an additional mortality constant was applied to deciduous volumes.

Yield Strata:

In total 35 yield strata were used:

1. Coniferous dominated stands – Lower Foothills – Good Site – “A” Crown Closure
 2. Coniferous dominated stands – Lower Foothills – Good Site – “B” Crown Closure
 3. Coniferous dominated stands – Lower Foothills – Good Site – “C” Crown Closure
 4. Coniferous dominated stands – Lower Foothills – Good Site – “D” Crown Closure
 5. Coniferous dominated stands – Lower Foothills – Medium Site – “A” Crown Closure
 6. Coniferous dominated stands – Lower Foothills – Medium Site – “B” Crown Closure
 7. Coniferous dominated stands – Lower Foothills – Medium Site – “C” Crown Closure
 8. Coniferous dominated stands – Lower Foothills – Medium Site – “D” Crown Closure
 9. Coniferous dominated stands – Lower Foothills – Poor Site – All Crown Closures
 10. Coniferous dominated stands – Upper Foothills – Good Site – “A” Crown Closure
 11. Coniferous dominated stands – Upper Foothills – Good Site – “B” Crown Closure
 12. Coniferous dominated stands – Upper Foothills – Good Site – “C” Crown Closure
 13. Coniferous dominated stands – Upper Foothills – Good Site – “D” Crown Closure
 14. Coniferous dominated stands – Upper Foothills – Medium Site – “A” Crown Closure
 15. Coniferous dominated stands – Upper Foothills – Medium Site – “B” Crown Closure
 16. Coniferous dominated stands – Upper Foothills – Medium Site – “C” Crown Closure
 17. Coniferous dominated stands – Upper Foothills – Medium Site – “D” Crown Closure
 18. Coniferous dominated stands – Upper Foothills – Poor Site – All Crown Closures
 19. Coniferous dominated stands – Subalpine – Good Site – “A” Crown Closure
 20. Coniferous dominated stands – Subalpine – Good Site – “B” Crown Closure
 21. Coniferous dominated stands – Subalpine – Good Site – “C” Crown Closure
 22. Coniferous dominated stands – Subalpine – Good Site – “D” Crown Closure
 23. Coniferous dominated stands – Subalpine – Poor Site – All Crown Closures
 24. Coniferous dominated stands (Switch Stands Only) – Lower/Upper Foothills/Subalpine – Good Site – All Crown Closures*
 25. Coniferous dominated stands (Switch Stands Only) – Lower/Upper Foothills/Subalpine – Medium Site – All Crown Closures*
 26. Coniferous dominated stands (Switch Stands Only) – Lower/Upper Foothills/Subalpine – Poor Site – All Crown Closures*
-
1. Deciduous dominated stands – Lower Foothills – Good Site – “A” Crown Closure
 2. Deciduous dominated stands – Lower Foothills – Good Site – “B” Crown Closure
 3. Deciduous dominated stands – Lower Foothills – Good Site – “C” Crown Closure
 4. Deciduous dominated stands – Lower Foothills – Good Site – “D” Crown Closure

5. Deciduous dominated stands – Upper Foothills – Good Site – “A” Crown Closure
6. Deciduous dominated stands – Upper Foothills – Good Site – “B” Crown Closure
7. Deciduous dominated stands – Upper Foothills – Good Site – “C” Crown Closure
8. Deciduous dominated stands – Upper Foothills – Good Site – “D” Crown Closure
9. Deciduous dominated stands – Lower/Upper Foothills – Poor Site – All Crown Closures**

Yield Curves – For this project the terms *Yield Curve* and *Yield Strata* are not synonymous. Each yield strata has 6 associated yield curves (except *=1 yield curve, **=2 yield curves), all of which project the same total volumes. The 6 curves differ only in the relative coniferous/deciduous volume contribution, which is based on coniferous species composition. There are 141 yield curves for coniferous dominated stands and 50 yield curves for deciduous dominated stands for a total of 191 yield curves.

Area Weighted Projections: The 141 coniferous and 50 deciduous yield curves were weighted by estimated net harvestable area to produce four yield curves to represent yields from each broad cover group (C, CD, DC, and D). Yields are based on 15/11 coniferous utilization and 15/10 deciduous utilization.

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1. INTRODUCTION

1.1 BACKGROUND

Weyerhaeuser is committed to sound forest management and a thorough understanding of forest ecology. As part of this effort, Weyerhaeuser has implemented sampling programs to measure various forest attributes including timber volume, which provide vital information for yield projections. This document (in support of the Detailed Forest Management Plan) describes the method and results of the Weyerhaeuser Drayton Valley FMA yield curve development process. This is the first component of a three-part technical document that estimates the sustainable annual allowable cut AAC for the Weyerhaeuser Drayton Valley FMA.

Stand volume is a function of several factors, including some that are relatively easy to measure and some that are more difficult to define quantitatively. Easier to measure variables include site index, stand density, dominant species type, and age. Therefore, this report used the common approach where total volume was predicted as a function of site quality, AVI crown closure, coniferous or deciduous dominated stand type, and age.

Stochastic events (fire, significant insect infestations, or disease outbreaks) are more difficult to measure (and predict) but can also significantly impact stand volume. Except for large-scale fires, (which must be addressed through a post disturbance timber supply analysis) it was assumed that over the timber supply analysis planning horizon the average occurrence of stochastic events would remain the same.

Therefore, the impact on current stand volume due to stochastic events that was expressed in the field-collected data was assumed representative of the impact on future stand volume.

Obviously, management activities can also impact stand volume. However, the purpose of this report is to provide an estimate of volume in forest stands that have not experienced extensive management intervention. Therefore, as much as possible, plots were not placed in stands that had recent management intervention.

1.2 OBJECTIVES

The main objectives of this report are to:

1. Explain the methods used to produce the Drayton Valley FMA yield functions.
2. Present the final Drayton Valley FMA yield functions and curves that will be used during the timber supply modeling process.

2. METHODS

The main methods follow closely the document titled "Determining the AAC for the Weyerhaeuser Edson FMA. Component #1: Yield Projections" produced by Glenn Buckmaster. This was done due to the similarity of ecology and stand types between the Drayton Valley and Edson FMA areas. The supporting biometrics information used for constructing the yield curves was based largely on documents written by Huang (see References). The overall procedure was subdivided into six tasks. Six separate SAS programs were written to address each individual task (Table 1).

Table 1. Summary of six tasks (and associated SAS code) used to produce yield curves.

Task Number	Task Description	SAS Program
1	Prepare data (amalgamate and clean the temporary sample plot data)	<i>01mergetsp</i>
2	Analyze site index relationships	<i>02si1</i>
3	Produce height/DBH functions	<i>03ht_dbh</i>
4	Compile plot volumes	<i>04volume</i>
5	Develop coniferous yield curves	<i>05total_yield_con</i>
6	Develop deciduous yield curves	<i>06total_yield_dec</i>

Figure 1 provides a flowchart summary of the process. Each SAS program number indicates the order of execution (the program number is equal to the task number). In an attempt to assist the auditing process, each of the following sections addresses issues in close to the same order as presented in the programs.

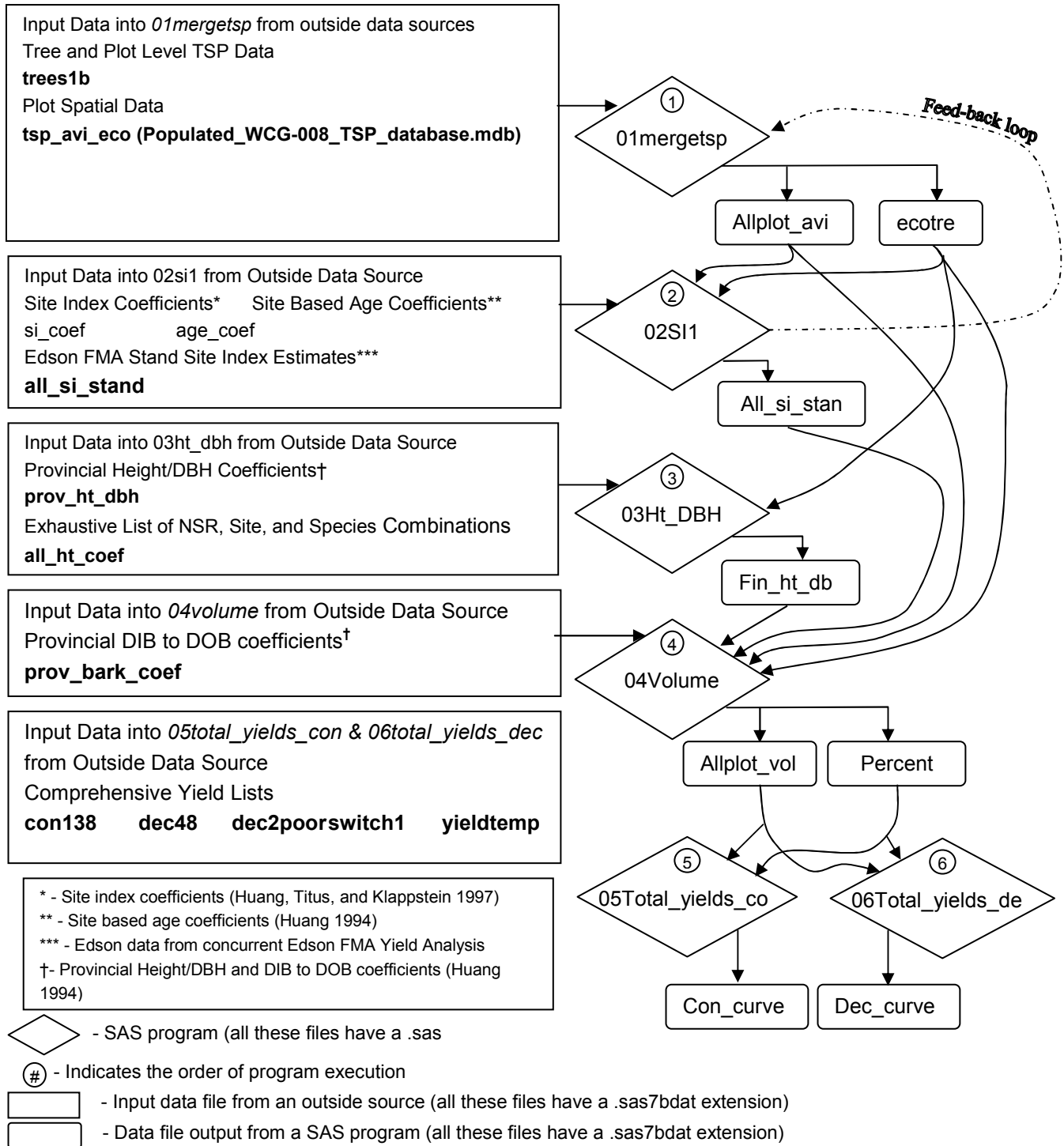


Figure 1. Schematic flowchart of overall yield curve production process.

2.1 OVERVIEW OF TEMPORARY SAMPLE PLOT RAW DATA

Volume sampling temporary sample plot (TSP) data used in this analysis was compiled from a number of stratified random sampling programs. During the summers of 1996, 1997, 1998 and 1999 Weyerhaeuser established TSPs in the Drayton Valley FMA to provide a basis for the Timber Supply Analysis that is localized to the FMA area (Table 2). All TSPs were marked with an aluminum stake and referenced with a location determined by Global Positioning System in order to:

- record the location of plot center,
- confirm location on forest inventory maps,
- facilitate check cruising, and
- allow for the possible re-establishment of plot locations in subsequent volume sampling programs.

Minor changes to the plot configuration occurred during subsequent year’s programs to simplify establishment and check cruising. Comprehensive field procedures are provided in the Drayton Valley DFMP, Appendix 10 (December 2000).

Table 2. Temporary volume sampling sources.

Program	Locations sampled	Description
1996-1997 FMA volume sampling program	FMA	Program was conducted in 1996 & 1997. Stratification was based on AVI in the pre-extension FMA and Phase 3 in the extended portion of the FMA. The stratification using AVI and Phase 3 was based on species composition, species, density and height class. Plots were established as 3-plot clusters. Plot size was 0.016 ha.
1998 FMA volume sampling program	FMA	Program was conducted in 1998. Stratification was based on AVI in the FMA. The stratification was based on species composition, species, density and height class. Transects were established for the entire FMA at an azimuth of 60° every 250 m. (A square grid of 250 m × 250 m results in 1 intersection for every 6.25 ha.) The grid of transects was overlaid (using GIS) onto the AVI polygon base. The linear distance of each transect within each polygon was determined and three plots within each polygon were randomly placed on the transect(s) within each stand. Not all polygons were intersected by the transects. Plot size was 0.016 ha.
1999 FMA volume sampling program	FMA	Program was conducted in 1999. Stratification was based on AVI in the FMA. The stratification was based on species composition, species, density and height class. Plot location was based on the same transects established for the entire FMA in 1998. Plot size was 0.016 ha.

A total of 2, 958 temporary sample plots were measured from 1996 to 1999 (Table 3).

Table 3. Summary of TSP programs from 1996 to 1999.

TSP Sampling Year	TSP Program Code	Number of Plots Sampled	Number of Trees* Sampled
1996	V0005	283	4, 954
1997	V0002	658	13, 859
1998	V0001	1, 811	29, 853
1999	V0004	206	3, 973
Totals		2, 958	52, 639

*Includes dead and living trees and 36 null plot placeholders.

2.2 TASK 1: DATA AMALGAMATION AND PREPARATION

Program: *01Mergetsp.sas*

Objective:

Amalgamate all TSP field tally data into two files, one listing individual plot measurements and another listing each individual tree measured. Both files are subjected to preliminary processing and are linked to AVI and SiteLogix ecosite data.

Input files:

trees1B.sas7bdat – 1996, 1997, 1998 and 1999 TSP individual tree data (52, 639 records).

allplot_avi.sas7bat – plot spatial data – includes SiteLogix and AVI attributes (2, 958 records).

2.2.1 Amalgamate plot level and tree level TSP data (Step 1)

The TSP individual tree level data was read into one file (*tsp_data*). Each tree is uniquely identified by the fields: *key_new*, and *tree*. Plot level data were extracted from the tree level data and then spatially merged to inventory and SiteLogix data (*allplot_avi.sas7bat*). Each plot is uniquely identified by the field: *key_new*.

2.2.2 Data cleaning (Step 2)

The TSP data had some missing crown class calls. Reconciling these records was important because only dominant and co-dominant trees were used for determining stand site index (SI). In total 5, 714 trees did not have a crown class call. While having 5, 714 trees with missing calls may appear to be a problem, after removing severely damaged trees, dead trees, and trees without a breast height age, there were only 8 trees (potentially valid for estimating plot SI) that had no CC call. These trees (Table 4) were individually checked and a crown class was assigned based on comparing height and diameters of the trees within the plot. When the crown class could not be determined, no call was made and these trees remained out of the SI analysis.

Table 4. Individual trees that had crown class manually checked.

Case	Year	TWP	RGE	MER	PID	KEY_NEW	TREE	SP	DBH	HT	new CC
1	1998	44	9	5	686	V0001440950686A	1	SW	22.9	19.3	No call
2	1998	44	9	5	686	V0001440950686A	5	SW	25.9	24.6	No call
3	1998	46	12	5	452	V0001461250452B	20	SB	10.9	10.8	I
4	1998	47	9	5	395	V0001470950395B	14	PB	26.5	20.3	C
5	1997	41	8	5	969	V0002410850970A	1	SB	21.6	14.5	D
6	1997	42	9	5	954	V0002420950954C	3	SW	20	17	D
7	1997	44	14	5	143	V0002441450284A	1	SW	31.6	23.5	No call
8	1997	44	14	5	143	V0002441450284A	5	SW	40.4	26.5	No call

Case Reason

- 1-2 No CC calls in plot. HT ranges from 19.3 to 24.6 m. DBH ranges from 22.9 to 41.6 cm.
 3-4 C trees range from 15.1 to 20.3 m
 5 No CC calls in plot but is the tallest tree.
 6 This tree is 1.4 m taller than the co-dominant tree in the same plot (15.6 m).
 7-8 No CC calls in plot. HT ranges from 23.5 to 26.5 m. DBH ranges from 22.5 to 52.7 cm.

2.2.3 Assigning plots to landbase attributes (Step 3)

Assigning plots to landbase attributes such as ecosites, provincial natural subregion, and AVI covertype call was required to begin the process of defining yield strata. The AVI attributes assigned to a plot were based upon the same logic used to define the net landbase (see *Technical Report Component#2 Landbase Allocations* for more detail).

2.2.3.1 Assigning AVI attributes

During the netdown process, each stand within the FMA was assigned to a landbase category. The term *landbase* is an administrative assignment of the volume type (coniferous or deciduous) that a stand is to be primarily managed for. As landbase sometimes is not reflective of a stand's expressed biological/ecological attributes, it is of no consequence during yield curve process. Instead, the expressed attributes of the story of primary management (defined as the story for which a stand is managed for) either overstory or understory were used to stratify the data and provide the variables for the yield functions.

In most cases the SoPM of non-horizontal polygons was designated on the overstory, except for the following:

Across the Drayton Valley FMA, stands were assigned to the understory AVI attributes when a polygon had a pure deciduous "A" crown closure overstory with an understory with a crown closure greater than "A". When understory AVI attributes are used, the stand is referred to as a "Switch" stand.

2.2.3.2 Note on using understory attributes in yield functions

Alberta SRD has traditionally insisted that the AVI attributes assigned to plots (and subsequently used in the yield functions) mirror landbase netdown method. Thus, (as described above) the overstory AVI

attributes must only be used for plots located in stands that are to be managed based on the overstory. While the understory attributes must be used for “Switch” stands. The yield curve development process in this report adheres to this traditional method.

In the authors’ opinion, this traditional method violates some rules of sampling and statistics. Rather the yield curves should have been built based on overstory attributes only. The rationale is as follows:

- **TSP volumes are very poorly represented by AVI understory attributes** - As volume has a close relationship with tree size and overstory trees are obviously larger than understory trees, TSP volumes are best represented by the AVI overstory call. Even if a sound objective method of estimating understory volume only could be devised, this volume would not fairly represent the “release” that the understory trees would experience as the overstory trees die. Therefore, in “switch” stands the overstory is more closely tied to volume. The potential for bias is quite significant when estimating individual coniferous and deciduous volumes because “switch” stands typically have deciduous overstory with a coniferous understory. Therefore, plots with predominately deciduous TSP volumes are assigned to coniferous understory AVI attributes.
- It is reasonable to assume that a significant number of **non-switch stands were switch stands in the past** - Therefore, “switch” stands do not require a unique category but are better estimated simply from non-switch stands.

The above caveat aside, the authors have agreed to develop the yield relationships under the traditional method. Switch stands represent a relatively small area (2, 060 ha) in the Drayton Valley FMA area and thus these assumptions will not have any significant effect on the subsequent AAC calculations.

2.2.3.3 Horizontal Stands

Horizontal stands are defined in the *Alberta Vegetation Inventory Standards Manual* as “Stands...composed of numerous homogeneous stands within other distinctly different homogeneous stands, but both or each individual stand are too small to delineate...”. Therefore, horizontal stands are processed somewhat differently than non-horizontal polygons. Although the different parts of a horizontal stand are located in the overstory and understory fields, they are not to be understood as overstory and understory but rather separate “mini-stands” within the polygon. The following rules for delineating horizontal stands were used:

Horizontal stands that had a valid forest covertime for both the overstory and understory fields:

- if the overstory proportion of the stand was 50% or greater, the overstory was defined as the SoPM.
- if the understory proportion of the stand was greater than 50%, the understory was defined as the SoPM.

Stands that had only one valid forest covertime:

- if the overstory was the only valid forest covertime then the SoPM was defined as the overstory.
- if the understory was the only valid forest covertime then the SoPM was defined as the understory.

2.2.3.4 Stand level vegetation attributes (species composition, density, and age)

The coniferous and deciduous composition for the SoPM of each sampled stand was used to define if a plot was included in coniferous and/or deciduous yield projections (see section 2.6.1 for more detail).

- Deciduous species – AW, BW, and PB
- Coniferous species – SW, SB, PL, P, PJ, FB, FD, and LT

In addition, each plot was assigned a stand age by the following formula:

Total Stand Age = Year TSP Sampled – AVI origin

2.2.3.5 Stand natural subregion, ecosite and site quality assignment

The Drayton Valley FMA includes 3 natural sub-regions (NSR), the lower and upper foothills and sub-alpine. Each plot was assigned to an NSR as defined by the provincial natural subregion boundaries spatial coverage.

Site quality can be a strong determining factor of future yield. Each plot was assigned to an ecosite class by referencing a spatial data coverage developed for the Weyerhaeuser Drayton Valley FMA in July 2000 (called – SiteLogix, Geographic Dynamics Corporation, 2000). SiteLogix ecosite classifications were based on the *Field Guide to Ecosites of West-central Alberta* (Beckingham et al. 1996). To maintain consistency, SiteLogix ecosite calls were used for all plots (field calls were ignored).

Based on SiteLogix ecosite, plots were assigned both a coniferous and deciduous site quality category of good, medium or poor. Some ecosite categories (for example C, D, and I) result in a different site quality ratings for both the coniferous or deciduous species types (Table 5). Site quality groupings were determined by comparing mean plot SI and confidence interval for each ecosite (see Appendix III and section 2.3.4). To strengthen these relationships both Edson and Drayton Valley FMA data were used. Final site categories were assigned by referencing both the boxplots and the *Field Guide to Ecosites of West-central Alberta* (Beckingham et al. 1996) as well as utilizing personal knowledge of the Drayton Valley FMA from a Weyerhaeuser professional forester with expertise in ecosite classification.

Table 5. Summary of assumed site quality for coniferous and deciduous stands by SiteLogix ecosite call.

Species Type	NSR	Site Quality	Ecosite Categories
Coniferous	LF	Good	E, F
		Medium	C, D, I
		Poor	A, B, G, H, J, K, L, M, N
	UF	Good	D, E, F
		Medium	C, H, J
		Poor	A, B, G, I, K, L, M, N
	SA	Good	C, E, G
		Medium	-
		Poor	D

Species Type	NSR	Site Quality	Ecosite Categories
Deciduous	LF	Good	E, F, I
		Medium	-
		Poor	A, B, C, D, G, H, J, K, L, M, N
	UF	Good	E, F
		Medium	-
		Poor	A, B, C, D, G, H, I, J, K, L, M, N

2.2.3.6 Identify dead and severely damaged trees

Dead trees located within a plot were recorded, however they did not contribute volume. Two methods were used to identify dead trees:

- a tree condition code of 25 or 26 or
- a species type of 'DC' or 'DD'.
- Severely damaged trees are included in volume compilations however; they were not permitted for estimating stand site index.
- Severely damaged trees were identified based on: a 05, 13, 19, 24, 28, 34, or 35 tree condition code.

2.2.3.7 Removing plots located in unmerchantable stands

All plots located in stands that had 10% or greater larch composition (based on the SoPM) and/or 80% or greater black spruce composition (based on the SoPM) were deemed unmerchantable and removed from the yield analysis. Plots located in areas removed from the net landbase for reasons other than merchantability were considered relevant for estimating the volume on other stands grouped within the same stratum and remained in the yield analysis. However, a follow-up analysis was performed to ensure no bias in this assumption (Appendix II).

2.2.4 Summary of results – plot netdown

The output files from the *mergetsp.sas* program were *ecotree.sas7bdat* (tree level data) and *Allplot_avi.sas7bdat* (plot level data). After removing all plots outside the FMA area and those not in the R1 FMU or located in unmerchantable stands, a total of 2,720 plots with 47,619 trees were used to construct the yield relationships (Table 6 and Table 7).

Table 6. Plot netdown summary.

Category	Number of Plots	Number of Trees*
Starting point – All digitally entered data	2,958	52,639
Plots not in FMA or in the R1 FMU	-123	2,132
Plots in subjective deletion stands	-115	2,888
Totals used to construct yield relationship	2,720	47,619

* Number of sampled trees includes 31 placeholders for null plots (5 null plots were located in removed stands).

Table 7. Summary of net data by sample year.

TSP Sampling Year	Sample Year Code Name	Total Number of Plots	Number of Null Plots	Total Number of Trees Sampled*
1996	V0005	166	0	2,961
1997	V0002	614	10	12,404
1998	V0001	1,752	20	28,673
1999	V0004	188	1	3,581
Totals		2,720	31	47,619

* Number of sampled trees includes 31 placeholders for null plots (5 null plots were located in removed stands).

2.3 TASK 2: ANALYZE SITE INDEX RELATIONSHIPS

Program: *02si1.sas*

Objective:

Calculate coniferous and deciduous stand site index (50 years breast height age based).

Input files:

Ecotree.sas7bdat- individual tree data - output from *01Mergetsp.sas*.

age_coef.sas7bdat- a listing of coefficients used to calculate stump age based on breast height age and site index (coefficients are stratified by natural subregion and species).

si_coef.sas7bdat- a listing of coefficients used to calculate site index (coefficients are stratified by natural subregion and species).

2.3.1 Identifying eligible site trees (Step 1)

Site index is a standard method of estimating the site quality where a stand is located. More specifically, it is based on the total height attained by "site index trees" at a defined age (traditionally 50 years breast height in Alberta). A number of slightly different definitions have been used for site index trees. This report used the common definition of the largest dominant and co-dominant non-defect 100 trees per hectare (veterans were not included).

During yield estimation, stand level SI was used rather than individual plot level SI. The rationale being that plots in deciduous or low density stands often do not have a tree that can be successfully aged. Thus, overall this approach allows for more plots to be used to fit yield functions and should improve the estimates of volume on all strata and especially for deciduous and low density stands.

Ideally, enough site trees should have been sampled in each stand to meet the 100 largest trees per hectare criteria. For example if 5 plots of 160 m² were located in *stand A*, a maximum of 8 trees would be used to estimate SI in *stand A*. In high density stands there were sometimes an over abundance of eligible SI trees. Therefore, the largest trees (based on DBH) were selected in order until the 100 largest

trees per hectare criteria was met. This was done to ensure that the site index values of high density stands were compatible to the SI estimate of lower density stands. If too many trees were used for a SI estimate it becomes a measure of stand mean height growth rather than an estimate of site quality and therefore an estimate of expressed mean height growth which can be impacted by other factors such as competition, disease, insect, and climate. By selecting the largest trees, the impact of confounding factors should be reduced. Alternatively, in low density stands there was often not enough SI trees to make the minimum 100 per ha requirement. When this occurred, the SI estimate was based as normal on the fewer number of trees. This was considered a superior option to removing these stands.

Individual trees were considered valid for predicting SI if the following were true:

1. Tree had both a field-measured height and a breast height age count.
2. Tree was assigned to a natural subregion.
3. Tree was not dead or severely damaged.
4. Tree was assigned to either a dominant or co-dominant crown class.
5. Tree was not birch or larch.
6. Coniferous trees were not older than 180 years breast height.
7. Deciduous trees were not older than 150 years breast height.

When the above criteria were applied, there were 4, 238 valid SI trees.

2.3.2 Calculating individual tree SI and stump height age (Step 2)

The iterative process suggested by Huang et al. (1997) was used to calculate a site index value for each individual tree. The following SAS code was used:

```
si0=20;
do until(abs(si0-si1)<0.00000001);
x1= (1+b0*(si0-1.3)+exp(b1+b2*log(bhage+b3)+b4*log(bhage+b5)**2-log(si0-1.3)));
x2= (1+b0*(si0-1.3)+exp(b1+b2*log(50 +b3)+b4*log(50 +b5)**2-log(si0-1.3)));
si1=1.3+(ht-1.3)*x1/x2;
si0=(si0+si1)/2;
end;
```

where:

si0, si1 = the site index values converged to estimate site index.

bhage = breast height age (years)

ht = tree height (m)

Tree stump age (at 30 cm) was estimated based on breast height age and site index. The equation used was (Huang, 1994):

$$T_s = a + b T_b + c / SI$$

Equation 1

where:

T_s = Stump height age (years)

T_b = Breast height age (years)

SI = Site index

a, b, and c = parameters to be estimated

Total tree age was calculated by adding years to stump height to the stump height age (Table 8).

Table 8. Number of years to stump height by species.

Species	Years to Stump Height (30cm)
AW	1
PB	1
PL	5
PJ	5
SW	8
SB	8
FB	8
FA	8

2.3.3 Calculating and assigning stand site index (Step 3)

Ideally, SI should be estimated based on individual trees species. However, for simplicity only a general coniferous and deciduous SI were calculated for each stand (where possible) by averaging all coniferous (excluding larch) and all deciduous (excluding birch) tree species respectively.

- deciduous species group - trembling aspen and balsam poplar
- coniferous species group – white spruce, black spruce, balsam fir, alpine fir, lodgepole pine, and jack pine

2.3.4 Evaluation of ecosite versus SI (the feed-back loop – Step 4)

The Edson stand SI data was combined with the Drayton Valley stand SI data to produce boxplots showing the mean, median, 25th quartile, and 75th quartile SI for each ecosites (Appendix III). This information was used to validate the assumptions on site quality and used as a feed-back loop for the *mergetsp.sas* program (section 2.2.3). If there was an indication that the assignment of site quality classification (good, medium, poor) was incorrect the necessary changes were made to the *mergetsp.sas* program and it was re-run.

2.4 TASKS 3: PRODUCE HEIGHT/DIAMETER FUNCTION COEFFICIENTS

Program: *03Ht_DBH.sas*

Objective: Model height/DBH relationships stratified by species and site quality. This relationship was used to estimate height for trees that did not have a field measured height taken.

Input files:

Ecotree.sas7bdat – individual trees data - derived from *01Mergetsp.sas*.

Prov_ht_dbh.sas7bdat – provincial height/DBH coefficients, as per Huang, 1994.

All_ht_coef.sas7bdat – a complete listing of all possible natural subregion, site quality and species combinations.

2.4.1 Identifying trees eligible for height/DBH regression analysis (Step 1)

The individual tree records with the following attributes were not included in a height/DBH relationship:

- either the height or the DBH measurement was missing;
- there was no natural sub-region or species call assigned;
- tree was dead or severely damaged (see section 2.2.3 for definition).

This protocol resulted in 10, 716 records for estimating the height/DBH coefficients.

2.4.2 Estimating coefficients through Richards-type non-linear regression analysis (Step 2)

All eligible tree records were stratified into groups based on natural subregion, site quality, and species. Huang (1994) suggests that a Richards-type non-linear model can be used to estimate total height from DBH measurements for major Alberta tree species. The following model was used:

$$H = 1.3 + a(1 - e^{-bD})^c \quad \text{Equation 2}$$

where:

H = total tree height (m)

D = diameter at breast height outside bark (cm)

e = base of the natural logarithm

a, b, c = parameters to be estimated

2.4.3 Outputting coefficients (Step 3)

Each stratum required a minimum of 20 observations for a valid height/DBH model to be constructed (Table 9). Otherwise, the provincial coefficients (by natural subregion) were assumed to be more trustworthy (Huang 1994). The graphical output of this data was displayed within the SAS program, however due to space the graphs are not presented in this report.

Table 9. Height to DBH coefficients output from regression analysis of stratum with 20 or more.

Nsr	Site Quality	Spp	Number of Observations	R ²	a	b	c
LF	LFG	AW	1, 651	0.7311	26.7363	0.0742	1.3681
LF	LFG	BW	222	0.5654	100.6793	0.0014	0.5387
LF	LFG	FB	47	0.7616	24.5375	0.0546	1.2199
LF	LFG	LT	26	0.7878	29.6809	0.0438	1.0839
LF	LFG	PB	655	0.7391	30.5415	0.0372	0.9836
LF	LFG	PL	849	0.6080	25.3936	0.0961	2.0159
LF	LFG	SB	425	0.5782	20.1005	0.0994	1.9359
LF	LFG	SW	1, 282	0.7814	32.6413	0.0408	1.2965
LF	LFM	LT	22	0.5392	14.8134	0.3414	18.4887
LF	LFM	PL	865	0.6861	24.6609	0.0866	1.7392
LF	LFM	SB	537	0.6412	18.7295	0.1113	1.8581
LF	LFM	SW	123	0.8237	41.6735	0.0182	0.8330
LF	LFP	AW	93	0.6381	22.3571	0.0847	1.3386
LF	LFP	PB	34	0.6764	25.0834	0.0464	0.9382
LF	LFP	PL	47	0.6443	20.0145	0.1866	4.8682
LF	LFP	SB	159	0.4906	20.6712	0.0865	1.4248
LF	LFP	SW	88	0.6284	27.9444	0.0473	1.3157
SA	SAG	FA	22	0.8371	24.7159	0.0691	1.8896
SA	SAG	PL	122	0.6223	20.2201	0.0454	0.7265
SA	SAG	SW	61	0.8576	43.4534	0.0199	1.1265
SA	SAP	FA	71	0.7465	19.9801	0.1106	2.7028
SA	SAP	PL	71	0.3658	18.0202	0.0843	1.2932
SA	SAP	SW	197	0.6960	26.3669	0.0376	1.0736
UF	UFG	AW	67	0.3180	26.3264	0.0760	1.5163
UF	UFG	FA	44	0.6947	22.0946	0.0879	1.9060
UF	UFG	PB	23	0.7902	27.0515	0.0597	1.5319
UF	UFG	PL	1, 385	0.5918	59.9941	0.0089	0.7004
UF	UFG	SB	344	0.5712	21.7514	0.0623	1.2541
UF	UFG	SW	561	0.7142	87.9707	0.0057	0.7910
UF	UFM	PL	294	0.7402	21.3689	0.0892	1.8962
UF	UFM	SW	37	0.5945	65.7599	0.0036	0.5865
UF	UFP	SW	37	0.9159	32.6184	0.0220	0.9605

2.5 TASK 4: COMPILE PLOT VOLUMES

Program: *04volume.sas*

Objective:

Use Huang's (1994) protocol to estimate the volume of each individual tree and compile into plot level estimates of m³/ha volume.

Input files:

Prov_bark_coef.sas7bdat – provincial DIB to DOB coefficients, as per Huang, 1994.

Ecotree.sas7bdat- individual tree data - output from *01Mergetsp.sas*.

Fin_ht_dbh.sas7bdat- height/DBH coefficients used in estimating tree heights – output from *03Ht_DBH.sas*.

Allplot_avi.sas7bdat- plot data linked to spatial data - output from *01Mergetsp.sas*.

All_SI_stand.sas7bdat- stand SI estimates – output from *02SI.sas*.

2.5.1 Merging coefficients to individual tree data (Step 1)

Provincial coefficients for taper, DBH/stump height diameter, DIB to DOB, and height/DBH were merged directly to individual tree records file (*Ecotree.sas7bdat*). The taper and DBH/stump height coefficients (Huang 1994) were entered directly in the *volume.sas* program file. The DIB to DOB, taper and DBH/stump height diameter coefficients (Huang 1994) were entered via SAS data sets.

2.5.2 Calculating individual tree volume (Step 2)

2.5.2.1 Estimating total tree height and stump height diameter

Calculating tree volume requires an estimate of total tree height and stump height diameter. Tree heights were estimated by Equation 2. If a tree had both a field-measured height and an equation-estimated height, the field-measured height took precedence. Tree volumes were estimated at a 15 cm stump height where the stump height diameter (inside bark) was estimated by using Kozak's variable-exponent taper equation the results of which were fed into:

$$\text{DOB} = a + b\text{DIB}$$

Equation 3

where:

DOB = diameter outside bark at any point on the stem (cm)

DIB = diameter inside bark at any point on the stem (cm)

a, b = parameters to be estimated

2.5.2.2 Calculating coniferous and deciduous volumes

Coniferous volumes were calculated based on the whole tree method and deciduous volumes were calculated based on the shortwood method. In total 31, 438 coniferous trees and 10, 375 deciduous trees were considered valid for volume compilation (Table 10).

Table 10. Summary of individual coniferous and deciduous trees used in volume compilation.

Data used in coniferous and deciduous volume compilation	Number of Valid Records
Input all TSP individual tree observations (<i>Ecotree.sas7bdat</i>)	47, 619*
Coniferous volume compilation – tree must be a living coniferous tree with a valid NSR and site call (i.e. (sptype='pine' or sptype='conif') and site<>'XXX' and dead='N')	31, 438
Deciduous volume compilation – tree must be a living deciduous tree with a valid NSR and site call (i.e. sptype='decid' and site<>'XXX' and dead<>'N')	10, 375

* File included 31 null plot place holders as indicated by a "NO" species code.

2.5.2.3 Utilization standard and calculating merchantable length

Merchantable coniferous tree volumes were calculated at 15/11 utilization standard; whereas 15/10 was used for deciduous trees. The merchantable length of both deciduous and coniferous trees was calculated using Kozak's variable taper equation (Equation 5) through the following iterative process:

$g_0 = 0.9$;

```
do until(abs(g0-g1)<0.00000001);
  c=b1*(g0)**2+b2*log(g0+0.001)+b3*SQRT(g0)+b4*exp(g0)+b5*(DBH/ht);
  g1=(1-((TOPDIAM/(a0*DBH**a1*a2**DBH))**(1/c))*(1-SQRT(0.225)))**2;
  g0=(g0+g1)/2;
end;
```

where:

g_0 = h/ht (essentially the Z variable from Kozak's variable taper equation)

TOPDIAM= top diameter limit for the utilization standard (11 cm for coniferous, and 10 cm for deciduous)

DBH = diameter at breast height outside bark (cm)

SQRT = square root

$a_0, a_1, a_2, b_1, b_2, b_3, b_4, b_5$ = taper coefficients

The final solved value for g_0 equals the location on the tree stem where diameter inside bark (DIB) is equal to the top diameter limit of the utilization standard. The following equation was then used to estimate the actual height off the ground of the top diameter limit:

$$HI = g_0 * HT$$

Equation 4

where;

HI = merchantable height (m)

g_0 = final solved g_0 value from the iterative process

HT = total tree height (m)

Total merchantable length of the tree was calculated by simply subtracting the stump height (0.15m) from the total height (merchantable length=HI-0.15).

2.5.2.4 Sectioning coniferous trees (whole tree system)

The merchantable length of each coniferous tree was divided into 10 equal length sections (merchantable length/10). To aid in volume calculation, the DIB was estimated at the bottom, middle and top of each section. The first point of measurement was at stump height, and then in total there were an additional 20 DIB measurements all equal distance apart (measurement distance = total merchantable length / 20).

2.5.2.5 Sectioning deciduous trees (shortwood system)

Deciduous tree volume was calculated based on the shortwood system used in the Drayton Valley FMA. The total merchantable length of each individual deciduous tree was divided into 2.56 m (101 inches) logs. The last segment was allowed to have some variability in length from 2.13 m (84 inches) to 2.69 m (106 inches). DIB was estimated at the bottom, middle, and top of each log.

2.5.2.6 Calculating DIB

Using taper models can increase volume projection accuracy (Huang, 1994). Kozak's variable taper equation was used:

$$DIB = a_0 DBH^{a_1} \cdot a_2^{DBH} \cdot X^{b_1 Z^2 + b_2 \ln(Z+0.001) + b_3 \sqrt{Z} + b_4 e^Z + b_5 \left(\frac{DBH}{H}\right)} \quad \text{Equation 5}$$

where:

DIB = diameter inside bark (cm) at height h (m)

DBH = diameter at breast height outside bark (cm)

H = total tree height (m)

h = height above ground that DIB is to be estimated at (m)

Z = h/H

$$X = \frac{1 - \sqrt{h/H}}{1 - \sqrt{p}}$$

p = location of the inflection point (assume to be 0.225 or 22.5% of total tree height)

$a_0, a_1, a_2, b_1, b_2, b_3, b_4, b_5$ = taper coefficients

2.5.2.7 Individual Tree Volume Compilation

Newton's formula was used to calculate the volume for each section:

$$VM = \frac{ML/10}{6} (0.00007854) \cdot (d_b^2 + 4d_m^2 + d_t^2) \quad \text{Equation 6}$$

VM = merchantable volume (m³)
 ML = merchantable length (m)
 d_b = diameter inside bark at the bottom of the section (cm)
 d_m = diameter inside bark at the middle of the section (cm)
 d_t = diameter inside bark at the top of the section (cm)

Each section's volume was added together to obtain the merchantable volume for the entire tree.

2.5.3 Compiling plot volume (Step 3)

Various plot level volumes were calculated by summing individual tree volumes. Volumes calculated include:

- total coniferous volume - 15/11 utilization (all coniferous species – does not include LT)
- total coniferous + larch volume - 15/11 utilization (all coniferous species – includes LT)
- total deciduous volume - 15/10 utilization (all deciduous species)
- total spruce volume - 15/11 utilization (defined as 'SW' and 'SB' species only)
- total fir volume - 15/11 utilization (defined as 'FB' and 'FA' species only)
- total pine volume - 15/11 utilization (defined as 'PL' and 'PJ' species only)
- total larch volume - 15/11 utilization (defined as 'LT' species only)
- total aspen volume - 15/10 utilization (defined as 'AW' species only)
- total balsam poplar volume - 15/10 utilization (defined as 'PB' species only)
- total birch volume - 15/11 utilization (defined as 'BW' species only)

Total plot volume was converted to volume per hectare by multiplying by 10,000/plot size. Volume compilations were output to the SAS data file *Allplot_vol.sas7dbat* file. In addition, the relative volume each tree species contributes to coniferous and deciduous volumes were calculated and stored in the files *Conpercent.sas7dbat*, *Swtpercent.sas7dbat* and *Decpercent.sas7dbat* (see section 2.6.5).

2.6 TASKS 5 AND 6: CONIFEROUS AND DECIDUOUS YIELD MODEL DEVELOPMENT

Programs:

05total_yields_con.sas – evaluates coniferous yield form

06total_yields_dec.sas – evaluates deciduous yield form

Objective:

To produce the final yield projections for coniferous and deciduous dominated stands.

Input files:

Allplot_vol.sas7bdat – Compiled plot volume data (output from *04Volume.sas*).

Percent.sas7bdat - summary of relative contributions each species makes to total deciduous and coniferous volume (stratified by natural subregion and site quality).

con138.sas7bdat – an exhaustive list of all 138 possible coniferous yield curves (temporary SAS dataset).

dec48.sas7bdat – an exhaustive list of all 48 possible deciduous good site yield curves.

dec2poor.sas7bdat – an exhaustive list of the 2 possible deciduous poor site yield curves.

switch1.sas7bdat – an exhaustive list of the 1 possible switch stand yield curve.

decmort.sas7bdat – proportion of deciduous volume to be retained from mortality as stand ages (Table 14).

yieldtemp.sas7bdat – an exhaustive list of all possible stands ages from 0 to 200 (by 5 year increments).

2.6.1 Selecting plots to be included in yield groups (Step 1)

Plot compiled volumes were placed in four yield groups.

1. Coniferous dominated stands (switch stands not included)
2. Deciduous dominated stands on good sites (includes both switch and non-switch stands)
3. Coniferous dominated switch stands on good sites
4. Stands with greater than 10% Deciduous composition on poor sites

One SAS program estimated coniferous stand yields (Yield Groups #1 and #3) and another SAS program was used to estimate deciduous dominated stand yields (Yield Groups #2 and #4) (Figure 2). The vast majority of the Drayton Valley FMA harvestable area is estimated within Yield Groups #1 and #2, both of which used a similar method of yield projection. The methods used for yield group #3 and #4 are discussed separately at the end of the section.

The procedure of grouping pine and white spruce species types into a single coniferous coertype may cause concern due to the different growth trajectories that pine and spruce follow. However, the impact this will have on the projected AAC should be minimal because the distribution of plots located in white spruce and pine leading species coniferous stands is in almost exactly the same proportion as the net landbase area (Plots - 67% pine leading, 33% white spruce leading versus Net landbase area – 71% pine leading, 29% white spruce leading).

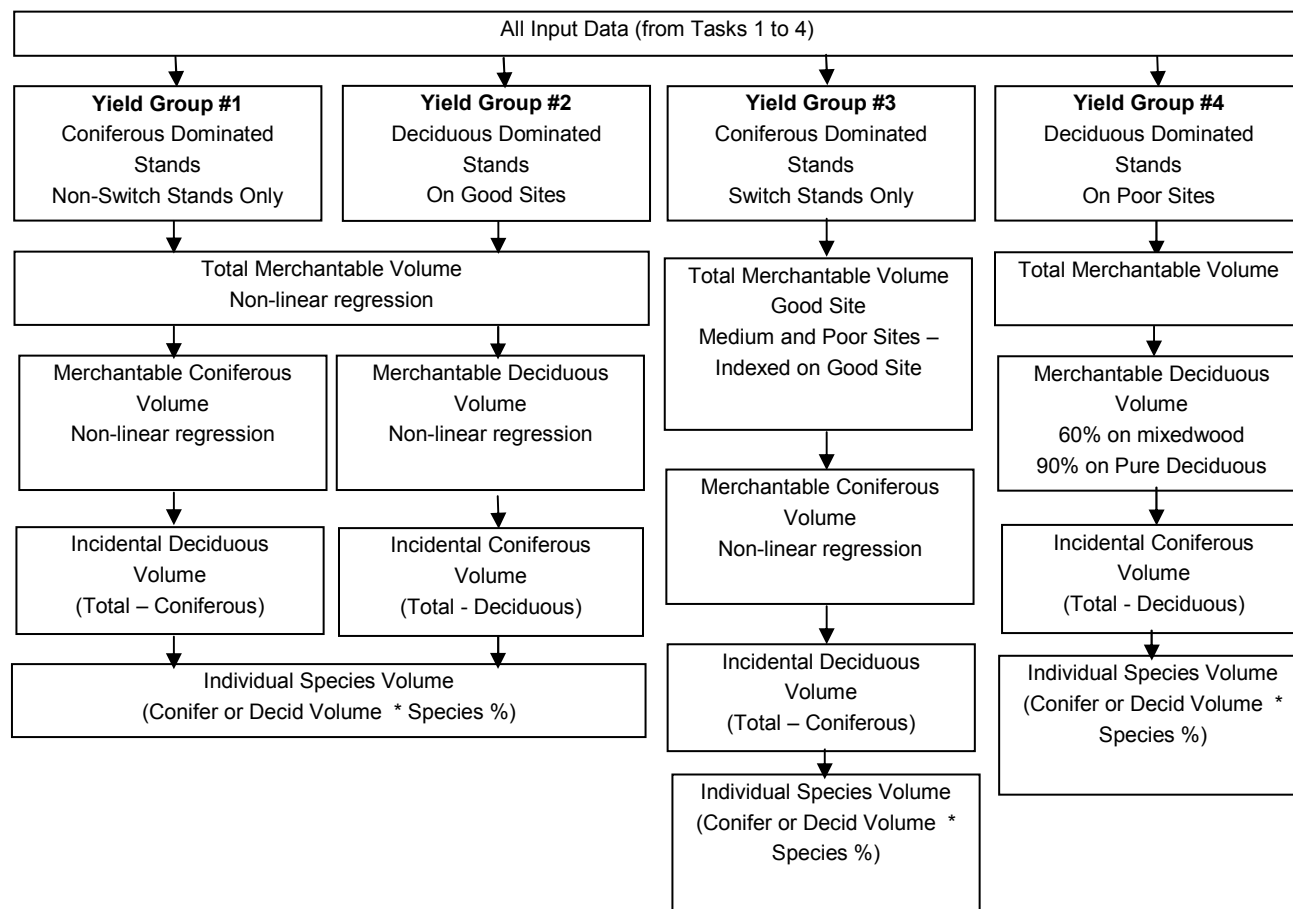


Figure 2. Flowchart summary of fitting yield curves.

The majority of the 2, 720 valid plots sampled were used to estimate volumes for yield group #1 and #2 (Table 11). Due to the significant number of plots sampled the yield projections for groups 1 and 2 were primarily data driven (considered in association with biological/ecological theory). Plots with 40%, 50%, or 60% coniferous stand composition were used in both the coniferous (non-switch stands) and deciduous good site models. This allowed for an increased range of data to assist volume predictions for mixedwood stands.

Due to a lack of plots, yield groups 3 and 4 had to incorporate assumptions based on educated “guesses”. It was recognized that this was not an ideal situation; therefore, the yield projections for groups 3 and 4 were carefully examined to ensure a reasonable result. Over 99% of the net landbase area is assigned to either yield group 1 or 2 therefore any concerns about the reliability of the yield projections for groups 3 and 4 should be assuaged as the impact on the projected AAC will be minimal.

Table 11. Number of plots used to estimate yields on coniferous and deciduous dominated stands.

Yield Group	Yield Model	Coniferous Composition	Number of plots by natural subregion			Total
			LF	UF	SA	
1	Coniferous Switch stands not included	70%, 80%, 90%, or 100%	843	580	113	1,536
		40%, 50%, or 60%	169	20	0	189
	Total	40% to 100%	1,012	600	113	1,725
2	Deciduous Good Site Switch and Non-switch stands included	0%, 10%, 20%, 30%	841	31	0	872
		40%, 50%, or 60%	163	19	0	182
	Total	0% to 60%	1,004	50	0	1,054
3	Coniferous switch stand	50% to 100%	22	1	0	23
4	Deciduous Poor Site Switch and Non-switch stands included	>10% Deciduous composition on Poor Sites only	20	0	0	20

*plots excluded from the modeling process are listed in Appendix VIII.

2.6.2 Modeling yields for yield groups 1 and 2 (Step 2)

Total stand volume is frequently estimated as a function of site quality, density, and species composition (Husch et al. 2003). Similarly, total yield volumes for yield groups 1 and 2 were derived as:

Total Gross Volume = $f\{\text{species dominance, site quality, site index, age, stand density}\}$

More specifically, total gross merchantable volume (15/11 utilization for coniferous trees, 15/10 utilization for deciduous trees) model was fit to the following non-linear model:

$$\text{Total Volume} = (t_0 + t_1 \bullet \text{CC_B} + T_5 \bullet \text{CC_C} + T_6 \bullet \text{CC_D} + t_2 \bullet \text{SSI}) \bullet \text{SAGE} \bullet \exp(t_4 \bullet \text{SAGE}) + t_3$$

Equation 7

where:

SSI – stand level site index (m)

SAGE – AVI stand age (see section 2.2.3)

CC_B – Dummy variable used to identify stands assigned a “B” AVI crown closure

CC_C – Dummy variable used to identify stands assigned a “C” AVI crown closure

CC_D – Dummy variable used to identify stands assigned a “D” AVI crown closure

t0, t1, t2, t3, t4, t5, and t6 – Coefficients output from the modeling process (see Table 17 for the final values of these parameters).

Site index, plot age, and crown closure (CC_B, CC_C, and CC_D) were directly fit as independent variables within the total volume function. Species dominance and site quality were addressed as strata variables. Stratification by species dominance (or yield group) has already been discussed (Table 11). Yield group #1 (Coniferous dominated (non-switch) stands) was further stratified into two site categories. Good and medium site plots were grouped separately from poor site plots (site quality as defined by Table 5) for the following three reasons: First, greater similarity was observed between good and medium sites (in terms of moisture and species type) than with poor sites. Second, the expressed form of the curve fit for good and medium sites was different from poor site curves (see Appendix II). Third, crown closure parameters were significant ($\alpha=0.05$) predictors of total volume on good and medium sites, but were not significant for poor sites. For these reasons the crown closure parameters were dropped ($t_1=0, t_5=0, t_6=0$) from the function used to estimate total volume on coniferous dominated poor site stands. Equation 7 was modified to estimate total volume on poor site conifer dominated stands:

$$\text{Total Volume} = (t_0 + t_2 \bullet \text{SSI}) \bullet \text{SAGE} \bullet \exp(t_4 \bullet \text{SAGE}) + t_3 \tag{Equation 8}$$

Coniferous and deciduous SI measurements were not obtained in all sampled stands (due to rot or lack of qualifying trees). For coniferous yields (yield group 1, Table 17) 139 plots did not have a valid coniferous SI measurement and for deciduous dominated stands on good sites 194 plots did not have a valid deciduous SI. To ensure no bias, these plots could not simply be dropped from the process but rather an SI value was assigned to those plots equal to the mean SI value by NSR and site quality classification (Table 5).

Using site index directly in Equation 7 (or 8) recognizes the inherent range of variability of site quality within each stratum. Theoretically, it should be possible to estimate the volume of individual stands with more accuracy by applying a stand-specific SI value to Equation 7 rather than using the “mean” curve for a given strata. However, as SI was not estimated for each stand in the inventory, mean SI (calculated by natural subregion and site quality classification (Table 5)) was used to produce the final yield curves.

There are 35 total volume yield strata for the Drayton Valley FMA (Table 12). Approximately 72% of the Drayton Valley FMA net harvestable land area is located in the lower foothills, thus significantly more plots (72%) were located in the Lower Foothills.

Table 12. Number plots and areas used for each total yield stratum.

Stratum Number	Yield Group Number and Description	NSR	Site	Mean SI (m)	CC	Net Area (ha)*	Number of Plots
1	1 Coniferous Switch Stands Not included	LF	G	17.0	A	10,632	94
2					B	13,525	103
3					C	42,701	253
4					D	7,948	99
5			M	14.4	A	5,693	44
6					B	6,805	59
7					C	17,071	166
8					D	6,683	58
9			P	13.8	A to D	7,638	57

Stratum Number	Yield Group Number and Description	NSR	Site	Mean SI (m)	CC	Net Area (ha)*	Number of Plots
10		UF	G	13.8	A	6,889	48
11					B	10,597	97
12					C	35,693	258
13					D	14,098	113
14			M	11.0	A	478	3
15					B	491	5
16					C	2,342	28
17					D	2,885	31
18			P	6.6	A to D	1,967	10
19		SA	G	10.2	A	72	2
20					B	207	7
21					C	825	13
22					D	346	15
23			P	8.3	A to D	3,526	76
Coniferous Non-Switch Stand Totals						199,112	1,639
24	3 Coniferous Switch Stands	LF/UF	G	NA	A to D	2,033	23
25			M	NA	A to D	25	0
26			P	NA	A to D	3	0
Coniferous Totals						2,061	23
1	2 Deciduous Good Site Switch and Non- switch stands	LF	G	18.4	A	5,072	36
2					B	18,284	186
3					C	63,058	522
4					D	15,082	181
5		UF	G	16.7	A	70	0
6					B	284	5
7					C	2,326	26
8					D	427	6
Deciduous Good Site Non-Switch and Switch Stand Totals						104,603	962
9	4 Deciduous Poor Site Switch and Non- switch stands	LF/UF	P	NA	A to D	579	4
Deciduous Totals						579	4

* The areas presented are close approximations. In instance of conflict, values presented in technical report *Component #2: Landbase Allocations* take precedence.

†- Coniferous Yield Strata 25 and 26 were not directly estimated through plot data but with an adjustment factor see section 2.6.8.

‡- Deciduous Yield Strata 9 includes 17 coniferous poor site plots.

2.6.3 Determining major species volume – Yield Groups 1 and 2 (Step 3)

“Major species group” was defined as the species for which a stand is primarily managed (i.e. coniferous trees from coniferous dominated stands and deciduous trees from deciduous dominated stands). Proper

strategic management necessitates a reasonable estimate of major species volume. The following general model was used:

Major species gross merchantable volume = $f\{\text{natural sub-region, percentage coniferous, plot age, and total gross merchantable volume}\}$

The 1, 725 coniferous plots and 1, 054 deciduous plots were stratified by natural subregion (Table 11) and both sets of plots were used to fit the following function:

$$\text{Major species merchantable volume} = (c_0 + c_1 \cdot \text{PC}) \cdot \text{TOTVOLFM} \quad \text{Equation 9}$$

where:

PC – AVI percent coniferous composition

TOTVOLFM – Total gross merchantable volume (field measured)

c_0 , and c_1 – Coefficients output from the modeling process (see Table 18 for the final values of these parameters)

This equation simply estimates major species volume as a proportion of total volume based upon the AVI percentage of coniferous composition.

2.6.4 Determining incidental coniferous or deciduous volumes

Incidental volumes were estimated by the following simple formula:

Incidental volume = Total Volume – Major species volume

2.6.5 Calculating volumes by species type and preparing data for output (Step 4)

The contribution of individual trees species (coniferous and deciduous) was estimated by assuming each species would contribute the same proportion to the projected volume as the plot observed volumes. For both coniferous and deciduous dominated stands, volumes were compiled by natural subregion and site (Table 13). The contribution percentages were then applied against the respective estimated coniferous or deciduous volumes to predict stand volume by species.

For the most part, the Drayton Valley FMA deciduous volume was dominated by trembling aspen (*Populus tremuloides* Michx.) the only exception was on coniferous dominated stands on medium/poor sites in the upper foothills where balsam poplar (*Populus balsamifera* L.) provided the majority of volume. The majority of the coniferous volume was split between lodgepole pine (*Pinus contorta* Doug. ex. Loud. var. *latifolia* Engelm.) and both black and white spruce (*Picea mariana* (Mill.) BSP and *Picea glauca* (Moench) Voss). Lodgepole pine was more prevalent on good sites in the upper foothills and medium sites in the upper and lower foothills and subalpine, whereas spruce species were more likely to dominate good sites in the lower foothills and poor sites in general.

Table 13. Percentage contribution of merchantable volume by species, natural subregion and site quality for deciduous and non-switch coniferous stands.

Stand Species Dominance	NSR and Site	Deciduous (15/10 utilization)				Coniferous (15/11 utilization)			
		Aspen	Balsam Poplar	White Birch	Totals	Pine	Spruce	Fir	Totals
Coniferous (Switch stands not included)	LFG	72%	27%	1%	100%	46%	53%	0%	100%
	LFM	80%	19%	1%	100%	68%	32%	0%	100%
	LFP	57%	41%	2%	100%	30%	70%	0%	100%
	SAG*	79%	21%	0%	100%	57%	35%	9%	100%
	SAP*	25%	74%	1%	100%	25%	57%	19%	100%
	UFG	79%	21%	0%	100%	62%	35%	3%	100%
	UFM*	25%	74%	1%	100%	80%	17%	4%	100%
	UFP*	25%	74%	1%	100%	47%	48%	5%	100%
Deciduous	LFG	74%	23%	3%	100%	32%	66%	2%	100%
	LFP/UFP*	52%	48%	0%	100%	92%	6%	2%	100%
	UFG	86%	14%	0%	100%	63%	37%	0%	100%

Note: Due to lack of data deciduous volume proportions for SAG was substituted using UFG. SAP, UFM and UFP were substituted using the Edson FMA deciduous proportions. The deciduous volume proportions for LFP/UFP in deciduous stands were substituted using the Edson FMA proportions.

2.6.6 Calculating mortality in deciduous volumes

When field sampled TSPs are used to estimate yield, losses due to mortality are reflected because dead trees are removed from volume compilations. However, deciduous mortality typically accelerates as stands age. Due to a lack of plots in the older age classes (few plots greater than 150 years) it is possible the empirical yield curves under-represent the mortality loss to deciduous volumes. Therefore, an age-based mortality constant (Huang 1999) was applied to the deciduous volumes in an attempt to more fully capture this loss. Deciduous volumes were reduced by an estimated percentage volume loss due to mortality (Table 14, Figure 3). Volume reduction due to mortality is applied to deciduous species only, therefore the more deciduous volume predicted in a stand the greater the decrease in projected total volume projected as a stand ages.

Table 14. Estimated rate of deciduous volume retention due to mortality.

Stand Age (yrs)	0 to 100	110	120	130	140	150	160	170	180+
Decid. Retention Rate	1.000	0.941	0.814	0.644	0.465	0.305	0.181	0.096	0.046

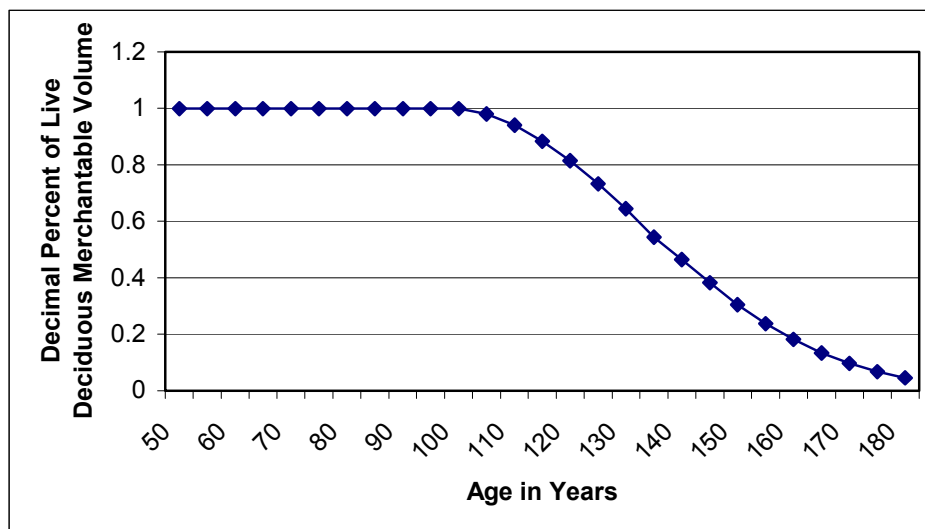


Figure 3. Estimated rate of deciduous volume retention versus stand age.

After applying the mortality constants, it might be expected that deciduous volumes will be more accurate. However, losses in volume due to mortality are to some extent offset by ingrowth (often of coniferous species) and growth release (of surviving trees) (Husch et al. 2003). Currently, no information is available to reliably estimate the rate of ingrowth and release. As these potential volume variables are not included, it must be acknowledged that after applying the mortality constant, it is quite possible that total volumes at older ages (especially 125+ years) are underestimated.

2.6.7 Verifying yields and bias check (Step 4)

Yield projections were verified versus field observed plots (See AppendixII).

2.6.8 Determining yields from coniferous “switch” stands - yield group 3 (Step 5)

Volumes for coniferous switch stands (yield group 3) were estimated as separate coniferous strata. There were sufficient plots (23) to develop a yield relationship for good site coniferous stands but not for medium and poor sites.

$$\text{Total Volume Coniferous Switch Stands} = t_0 \bullet \text{SAGE} \bullet \exp(t_4 \bullet \text{SAGE}) + t_3 \quad \text{Equation 10}$$

Total volumes from medium and poor site switch stands were estimated by developing a site conversion factor by comparing the following yield group #1 yield curves:

1. Yield Curve 18 – Good site, Lower Foothills, C crown closure, 100% coniferous composition
2. Yield Curve 42 – Medium site, Lower Foothills, C crown closure, 100% coniferous composition
3. Yield Curve 54 – Poor site, Lower Foothills, All crown closures, 100% coniferous composition

Lower Foothills yield curves were used to develop the relationships because all but 1 switch stand plot occurred in the lower foothills. Likewise, stands with a crown closure of “C” were also sampled with the

greatest frequency and provided the strongest set of data to develop the relationship. Yield curves with 100% coniferous composition were used because they show the truest relative difference to volume caused by site (the least impacted by the deciduous mortality constant). The index was developed to reflect the changes as a stand ages (Table 15) and a conversion factor was calculated for every 5-year age class from 0 to 200 years.

Table 15. Estimate of relative volume compared to good site projections for coniferous switch stands.

Age	Relative difference in volume compared to Good site		
	Good Site	Medium Site	Poor Site
50	100%	83%	63%
100	100%	87%	62%
150	100%	88%	66%

For switch stands, there was no relationship between the AVI coniferous composition and the coniferous volume. The major species volume was estimated by removing the C1 parameter in Equation 9:

$$\text{Major species merchantable volume} = c0 \bullet \text{TOTVOLFM} \tag{Equation 11}$$

Individual species volumes were then estimated using Table 16.

Table 16. Percentage contribution of merchantable volume by species, natural subregion and site quality for deciduous and non-switch coniferous stands.

Stand Species Dominance	NSR and Site	Deciduous (15/10 utilization)				Coniferous (15/11 utilization)			
		Aspen	Balsam Poplar	White Birch	Totals	Pine	Spruce	Fir	Totals
Coniferous (Switch Stands only)	All	66%	33%	1%	100%	27%	73%	0%	100%

2.6.9 Determining yields from deciduous dominated stands on “Poor” sites – yield group 4 (Step 5)

In the Drayton Valley FMA, merchantable deciduous stands do not occur across as wide a band of ecosites as do coniferous stands. Therefore, deciduous stands were grouped into “good” and “poor” ecosite categories only (Table 5). The vast majority of deciduous merchantable stands were located on “good” sites (Table 12). In fact, deciduous stands on “poor” sites will usually be considered non-merchantable and removed from the harvestable land area. However, stands can be assigned to a “landbase” which does not necessarily correspond to the BCG. This makes it possible for a stand to be identified as coniferous landbase but have a deciduous BCG, which will require a poor site deciduous yield curve to estimate volume.

As seen above, constructing “good” site deciduous curves was a relatively straightforward data-driven process. However, “poor” site deciduous curves were difficult to construct as there were only 3 valid deciduous “poor” site plots sampled. In an attempt to construct a reasonable relationship for poor site deciduous curves, poor site coniferous plots that had at least 20% deciduous composition were added to

the relationship. This resulted in 20 plots (17 coniferous stands and 3 deciduous stands). The modest numbers of coniferous poor site plots added to the data ensure that the model was still strongly influenced by the deciduous plots. It would be correct to argue that 20 points is too few to fit a yield curve, however this is such a small area (605 ha) that it is not vital that the curve be statistically valid but rather that the results are theoretically reasonable (as deciduous yield curves #49 and #50 suggest). The total volume equation used for deciduous dominated stands on poor sites was similar to the equation used for poor site coniferous stands, the only difference being SI was not used in the equation.

$$\text{Deciduous Dominated Stands on Poor Sites Total Volume} = t_0 \bullet \text{SAGE} \bullet \exp(t_4 \bullet \text{SAGE}) + t_3$$

Equation 12

It was not possible to produce a valid major species volume estimate for this yield curve. Therefore, a simple method was used where major species volume was estimated based on BCG. All deciduous dominated mixedwood stands were assumed to have a 60/40 deciduous to coniferous volume split and similarly all pure deciduous stands were assumed to have a 90/10 deciduous to coniferous volume split. Species volumes and deciduous mortality were calculated as section 2.6.5 describes above.

2.6.10 Cull deductions

Cull deductions will be applied as a percentage reduction to the final AAC volume.

2.6.11 Application of yield curves to the landbase

See technical document #2 *Landbase Assignment* for an explanation as to how the yield curves were assigned to individual stands.

2.6.12 Area-weighted yield curves by broad cover group

The 141 coniferous and 50 deciduous yield curves were weighted by the estimated net harvestable area associated with each curve. We assigned a broad cover group (C, CD, DC or D) to each yield curve and calculated area-weighted yield curves by broad cover group: (Appendix V). Yields are based on 15/11 coniferous utilization and 15/10 deciduous utilization

2.6.13 Analysis of the applicability of the yield curves in the R2U FMU (formerly part of the Sunpine FMA)

In 2000, Weyerhaeuser approached Sunpine Forests Products Ltd with the opportunity to amend the boundary of the R2U management unit so that Weyerhaeuser could access its conifer quota within its own FMA boundary. Negotiations occurred over a period to fine-tune the boundary. In 2001, an agreed-upon area was identified, and the boundaries to each FMA were amended. The amended area was sufficient to provide Weyerhaeuser with a conifer annual allowable cut out of the unit sufficient to meet the previous quota commitment.

Since the Weyerhaeuser Volume Sampling TSP Programs from 1996-1999 did not cover the R2U management unit, an analysis was undertaken to compare representative TSP data¹ from R2U to the area-weighted yield curves by broad cover group and 30-year age class². This was done to ensure that there is no bias in applying the Drayton Valley yield curves.

The graphical analysis shows no apparent bias in applying the yield curves to the newly acquired area (Figures 4-7). The majority of the plots are located in the conifer broad covergroup. The growth and yield monitoring program will also ensure that the projected yields using the Drayton Valley curves are justified.

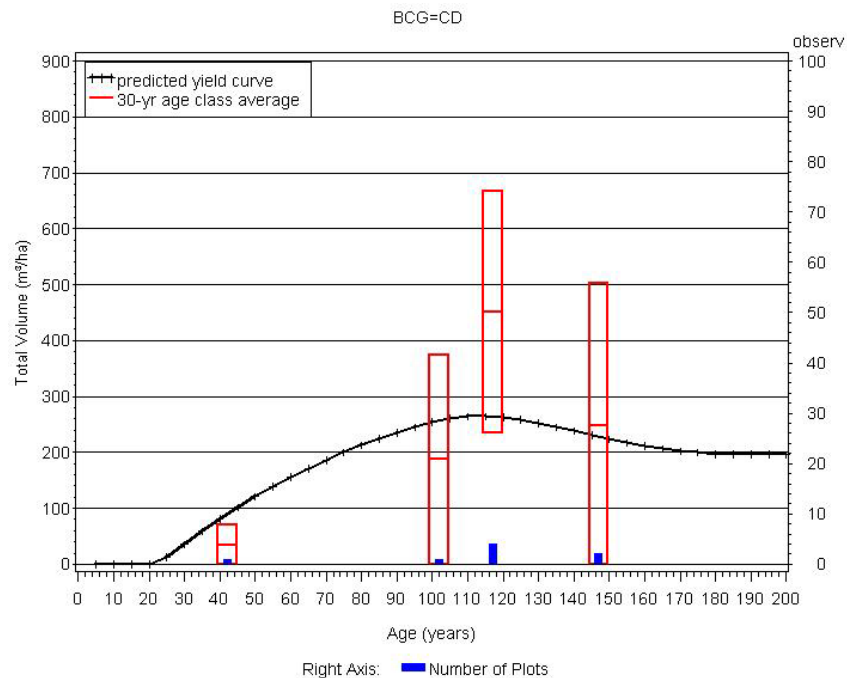


Figure 4. CD broad cover group: area-weighted yield curve versus Sunpine TSP averages.

¹ One hundred and seventy eight TSPs were provided by Bob Held (Sunpine Forest Industry) on July 8, 2004. All plots were linked to polygons in the Sunpine AVI.

² As per follow-up note to the March 30, 2004 meeting between ASRD and Weyerhaeuser by Greg Greidanus (ASRD) on April 6, 2004.

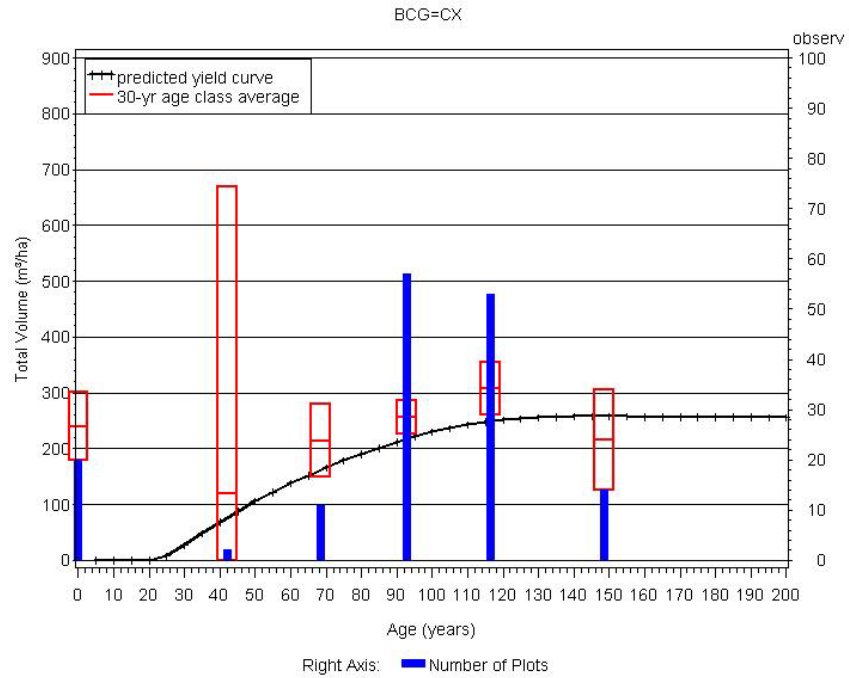


Figure 5. C broad cover group: area-weighted yield curve versus Sunpine TSP averages.

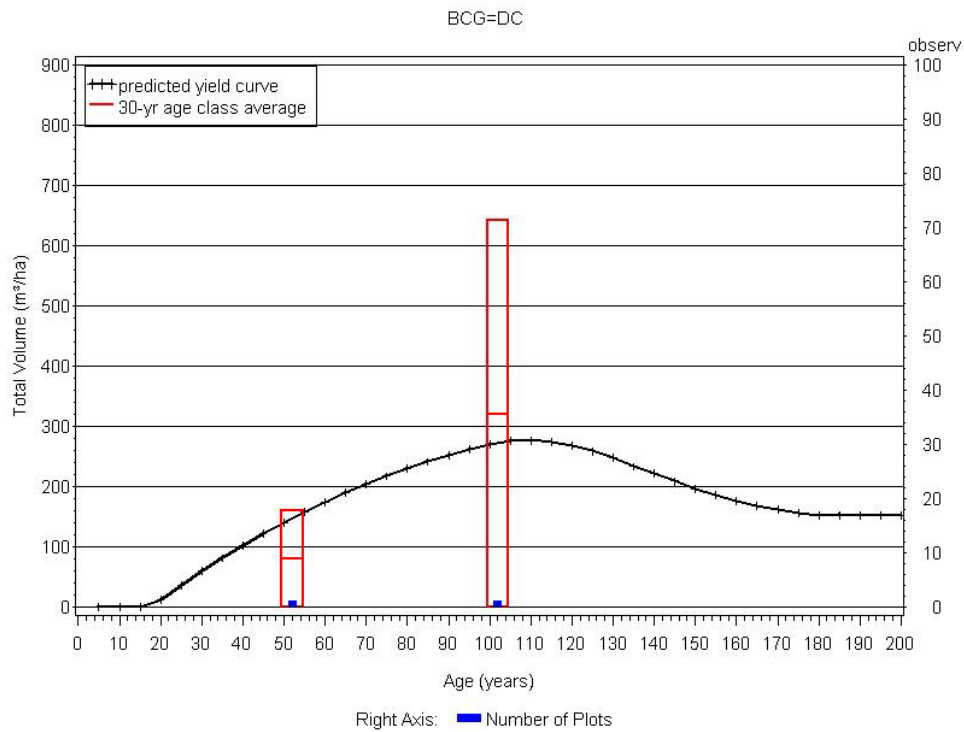


Figure 6. DC broad cover group: area-weighted yield curve versus Sunpine TSP averages.

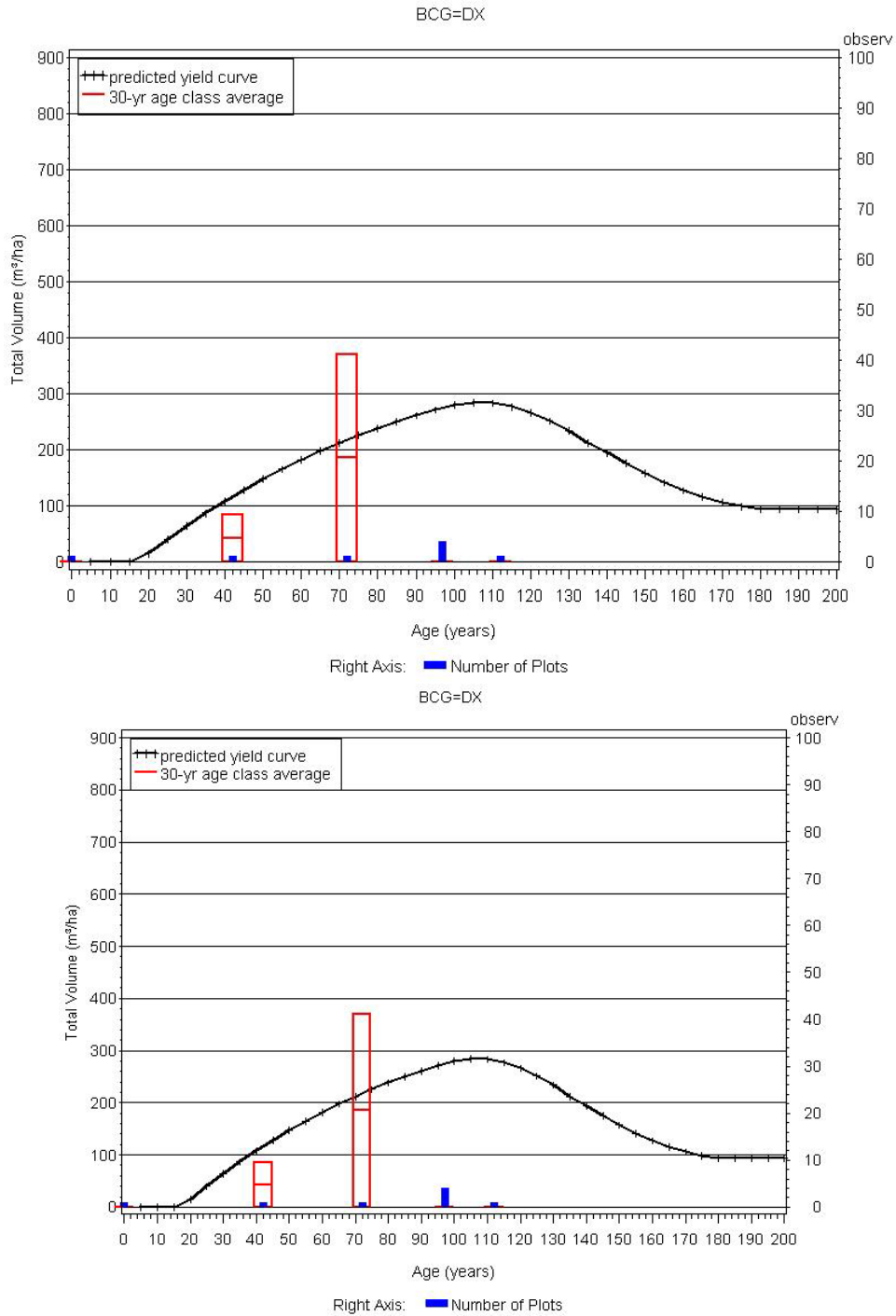


Figure 7. D broad cover group: area-weighted yield curve versus Sunpine TSP averages.

3. RESULTS & DISCUSSION

3.1 YIELD GROUPS #1 AND #2

For yield groups #1 and #2 three total volume models were fit (Table 17):

1. Coniferous dominated stands on good and medium sites
2. Coniferous dominated stands on poor sites
3. Deciduous dominated stands on good sites

The results were similar for all three models. The t_1 , t_5 , and t_6 parameters were not fit for poor site coniferous stands because crown closure was not a significant indicator of merchantable volume on poor sites. However, crown closure was significant at 95% confidence for both the good and medium site coniferous model and the deciduous model, showing a positive relationship with total volume. The model relationship of crown closure to total volume indicates that plots with an "A" crown closure predict the lowest total volume, then followed by "B", then "C" and finally "D" (predicting the largest total volume). This relationship is expected. Site index was also shown to be a significant variable (t_2) for good sites with models showing an increase predicted volume with increased SI. The site index showed a weak negative correlation on poor conifer sites. Both the t_0 and t_4 parameters show that age significantly impacts volume. All three models also had similar results with t_0 showing a positive relationship and t_4 showing a significant negative with total volume. This indicates as a stand ages total volume increases, however late-mature to over-mature stands experience increasing downward pressure on stand volume (t_4 parameter) perhaps due to stagnation and/or mortality. This relationship between stand age and total volume is somewhat expected, however the loss of volume at the older ages in coniferous dominated stands appears to be more rapid than what would be anticipated. This is likely due to only a small number of plots present in coniferous stands greater than 160 years old, meaning at the older ages the yield estimates are based on extrapolation. Otherwise, the results for the total volume equation are reasonable from a statistical and biological standpoint.

When both coniferous and deciduous major species volumes were modeled (Table 18 - models 4 to 7) all parameters were significant. In all four models, there was a positive relationship between total volume and major species volume. Additionally, as expected, an increased coniferous composition was shown to significantly increase the coniferous volume in coniferous dominated stands and to significantly decrease the deciduous volume in deciduous dominated stands.

3.2 YIELD GROUP #3

The model for estimating total volume from good site coniferous dominated switch stands had no significant parameters (Table 19). However, the results were comparable to the volumes predicted from good, medium and poor sites from yield groups #1 and #2. These yield predictions will be applied to a relatively small area, less than 1% of the entire net harvestable landbase. Therefore, these projections can be used with some caution. Interestingly, the model for predicting coniferous volume as a function of total volume showed that its only parameter was significant at 95% confidence (Table 20).

3.3 YIELD GROUP #4

The model for deciduous dominated stands on poor sites was not significant for any of the parameters (Table 21). However, the results are what would be expected theoretically and the area these yield projections will be applied to is small (605 ha). Therefore, it is expected that these yield projections can be used with some caution but with the understanding that there will be little impact on the final AAC.

Table 17. Summary of total volume model (Yield Group #1 and #2) coefficients.

Model Type	N	E#	Major Species	Natural SR	Site Quality	Function	t0	t1	t2	t3	t4	t5	t6
Total Volume	1	7	Coniferous (switch stands not included)	LF/UF	Good & Medium	TGMVOL	2.1240	0.3697	0.2226	-134.9000	-0.00543	1.0349	1.4293
	2	8	stands not included)		Poor		3.8594	NA	-0.0322	-54.7018	-0.00420	NA	NA
	3	7	Deciduous	LF/UF	Good	TGMVOL	2.5198	0.0355	0.1695	-103.500	-0.00536	1.0429	1.6777

Note: Bolding indicates parameter is significant at 95% confidence

N – Model number

E# - Equation number

$$TGMVOL = (t0+t1 \bullet CC_B+t5 \bullet CC_C+t6 \bullet CC_D+t2 \bullet SSI) \bullet SAGE \bullet exp(t4 \bullet SAGE)+t3$$

where:

TGMVOL – Total Gross Merchantable Volume

CC_B – Dummy variable signifying “B” crown closure

CC_C – Dummy variable signifying “C” crown closure

CC_D – Dummy variable signifying “D” crown closure

SSI – Stand Site Index (Conifer SI used when major species = conifer, Deciduous SI used when major species = deciduous)

SAGE – AVI stand age

Table 18. Summary of major species volume model (Yield Group #1 and #2) coefficients.

Model Type	N	E#	Major Species	Natural SR	Site Quality	Function	c0	c1
Coniferous Volume	4	9	Coniferous	LF	ALL	CGMVOL	0.1274	0.0739
	5	9	Coniferous	UF/SA			0.5215	0.0459
Deciduous Volume	6	9	Deciduous	LF	ALL	DGMVOL	0.8300	-0.0697
	7	9	Deciduous	UF			0.6539	-0.0807

Note: Bolding indicates parameter is significant at 95% confidence

N – Model Number

E# - Equation number

$$CGMVOL = (c0 + c1 \cdot PC) \cdot TGMVOLFM$$

$$DGMVOL = (c0 + c1 \cdot PC) \cdot TGMVOLFM$$

where:

CGMVOL – Gross Coniferous Merchantable Volume

DGMVOL – Deciduous Merchantable Volume

PC – Stand percentage coniferous composition (from AVI)

TGMVOLFM – Field Measured Total Gross Merchantable Volume

Table 19. Summary of total volume model (Yield Group #3) coefficients.

Model Type	N	E#	Major Species	Natural SR	Site Quality	Function	t0	t3	t4
Total Volume	8	10	Coniferous Switch	LF/UF	Good	TVOLSWT	15.6846	-362.7	-0.00863

Note: None of the parameters were significant at 95% confidence.

N – Model number

E# - Equation number

$$TVOLSWT = t0 \cdot SAGE \cdot \exp(t4 \cdot SAGE) + t3$$

where:

TVOLSWT – Total Gross Merchantable Volume (Switch Stands)

SAGE – AVI stand age

Table 20. Summary of major species model (Yield Group #3) coefficients for DV DFMP yield curves

Model Type	N	E#	Major Species	Natural SR	Site Quality	Function	c0
Coniferous	9	11	Coniferous Switch	LF/UF	All	CONVOLSWT	0.2683

N – Model number

E# - Equation number

$$CONVOLSWT = c0 \cdot TOTVOLFM$$

where:

TVOLSWT – Total Gross Merchantable Volume (Switch Stands)

SAGE – AVI stand age

TGMVOLFM – Field Measured Total Gross Merchantable Volume

Table 21. Summary of total yield model (Yield Group #4) and major species model coefficients for poor site deciduous dominated stands.

Model Type	N	E#	Major Species	Natural SR	Site Quality	Function	t0	t3	t4
Total Volume	10	12	Deciduous	LF/UF	Poor	TVOLPD	9.6342	-282.4	-0.00679

Note: None of the parameters were significant at 95% confidence.

N – Model Number

$$TVOLPD = t0 \cdot SAGE \cdot \exp(t4 \cdot SAGE) + t3$$

where:

SAGE – AVI stand age

4. SUGGESTIONS FOR FUTURE TSP PROGRAMS

Site index is being increasingly used to estimate growth and yield projections. A clear and consistent sampling protocol must be implemented for selecting SI trees to ensure that some estimate of SI is obtained for each plot. In addition if no valid SI tree is available within a plot a procedure must be developed to allow for an SI tree to be sampled outside the plot but within the same stand.

5. REFERENCES

- Beckingham, J., Corn, I., Archibald, J., 1996. Field guide to ecosites of west-central Alberta. Nat. Resour. Can., Can. For. Serv., Northwest Reg., North. For. Cent., Edmonton, Alberta. Spec. Rep. 9.
- Geographic Dynamics Corporation. 2000. Ecosite classification of the Weyerhaeuser Edson FMA area.
- Huang, S. 1994. Ecologically-based individual tree volume estimation procedures for Alberta: methods of formulation and statistical foundations. Alberta Environmental Protection Report #1. Pub. No.: T/288.
- Huang, S. 1994. Ecologically based reference-age invariant polymorphic height growth and site index curves for major Alberta tree species: Least squares fit statistics and residual plots. Alberta Environmental Protection Report . Pub. No.: T/308.
- Huang, S. 1997. Subregion-based compatible height and site index models for young and mature stands in Alberta: revisions and summaries (Part II). Forest Management Research Note. Alberta Environmental Protection No. 10 August 1997. Pub. No.:T/390.
- Huang, S. 1999. Interim mortality models for white spruce and aspen grown in boreal mixed-species stands. Forest Management Division, Lands and Forest Service. Alberta Environment. Presented at the WESBOGY Annual Meeting, September 1999.
- Huang, S., Titus, S. J., and Klappstein, G. 1997. Subregion-based compatible height and site index models for young and mature stands in Alberta: revisions and summaries (Part I). Forest Management Research Note. Alberta Environmental Protection No. 9 August 1997. Pub. No.:T/389.
- Husch, B., Beers, T., and Kershaw, J. 2003. Forest Mensuration – 4th edition. John Wiley & Sons, Inc., Hoboken, New Jersey. pp 443.
- Weyerhaeuser Company Limited. 2005. Determining the AAC for the Weyerhaeuser Edson FMA. Component#1: Yield Projections. Forest Management Agreement Area FMA #9700035. Draft Report. Submitted to ASRD.

APPENDIX I – DATA DICTIONARY

Table 22. Data dictionary.

Field Name	Data Type	Description and Possible Values
_AVI		All fields with the extension “_AVI” designate a standard AVI field. AVI stand calls. See AVI manual for description. Some AVI fields without a “_AVI” extension include: moisture, structure, horper, tpr, nonfortype, nonforcl, natnonveg, anthveg, anthnonveg, interpret, refsourc, refyear, u_moisture, u_horper, u_tpr, u_nonforty, u_nonforcl, u_natnonveg, u_anthveg, u_anthnonv, u_interpre
a1, a2, b1, b2, b3, b4, b5	Numeric	Taper Coefficients
Actconvol	Numeric	Plot Observed Mean Coniferous Volume
Actconvol	Numeric	Plot Observed Mean coniferous volume
Actdecvol	Numeric	Plot Observed Mean Deciduous Volume
Actdecvol	Numeric	Plot Observed Mean deciduous volume
Actvol	Numeric	Plot Observed Mean total volume
Age_lcl	Numeric	Plot Observed Lower 95% confidence interval for stand age
Age_ucl	Numeric	Plot Observed Upper 95% confidence interval for stand age
Age_x	Numeric	Plot Observed Mean stand age
agecof1, agecof2, agecof3	Numeric	Provincial breast height age to stump height age coefficients Numeric
allcon_si	Numeric	Stand Site Index – based on all coniferous species (excludes LT) SI at 50 years
allcon_totage	Numeric	Stand age – based on all coniferous species (excludes LT) site trees Total age (years)
ANTHNONVEG	Character	Anthropogenic Non-Vegetated Land Identified as Follows: AIE – Peat extractions; AIF – Farm; AIG – Gravel or borrow pit; AIH – Permanent right-of-way; All – Industrial sites; AIW – Water reservoir; ASC – City, town, village; ASR – Ribbon development.
ANTHVEG	Character	Anthropogenic Vegetated Land Identified as Follows: CA – Annual crops; CIP – Pipeline; CIW – Geophysical activity (wellsite); CP – Cropland (perennial); CPR – Perennial crops (with SO or SC N.F.TYPE).
AREA	Numeric	Area in Square Metres
Area_ha	Numeric	AVI Stand Area Area in ha
aspenha	Numeric	Plot measured aspen volume per hectare (15/10 utilization)

Field Name	Data Type	Description and Possible Values
		m ³ / ha
aw_si	Numeric	Stand Site Index – based on AW and PB SI at 50 years
aw_totage	Numeric	Stand Total Age – based on AW and PB site trees Total age (years)
awvol15	Numeric	Projected aspen volume per hectare (15/10 utilization) m ³ / ha
B0, B1, B2, B3, B4, B5	Numeric	Provincial coefficients for estimating site index Numeric
bark_a, bark_b	Numeric	DIB to DOB bark coefficients Numeric
Bhage	Numeric	Individual Tree Breast Height Age Age in years
birchha	Numeric	Plot measured birch volume per hectare (15/10 utilization) m ³ / ha
bwvol15	Numeric	Projected birch volume per hectare (15/10 utilization) m ³ / ha
c_vol15ha	Numeric	Plot measured coniferous volume per ha (15 / 11 utilization standard) m ³ / ha
C0, C1	Numeric	Parameters for coniferous volume function Numeric
CC	Character	Crown class of individual sampled trees C – Co-dominant D – Dominant I – Intermediate N – Unknown O – Open Grown S – Suppressed U – Understory V – Veteran X – Dead
CC_AVI	Character	Crown Closure Identified as Follows: A – 6 – 30% Crown Closure; B – 31 – 50% Crown Closure; C – 51 – 70% Crown Closure; D – 71 – 100% Crown Closure.
cc_AVI	Character	Crown closure as defined by AVI A – 6% to 30% B – 31% to 50% C – 51% to 70% D – 71% to 100% X – for poor sites only all crown closure classes are grouped into the “X” category.
Con_site	Character	Coniferous site quality based on sitelogix call G- Good M- Medium P- Poor
Cond1, Cond2, and Cond3	Character	Condition Code - Description of individual tree characteristics 01 – Conks

Field Name	Data Type	Description and Possible Values
		02 – Open Scars 12 – Burls and Galls 13 – Forks 14 – Pronounced Crook 19 – Broken Top 22 – Limby 23 – Leaning 24 – Broken Stem 25 – Standing Dead 26 – Missing 27 – Dead and Down 28 – Same Stump 29 – Cut Down 30 – Stem Insects 31 – Stem Disease 32 – Foliar Insects 33 – Foliar Disease 34 – Stem Form Defects 35 – Dead Top/Dieback 36 – Closed Scars 37 – Unknown 43 & 46 – Non-valid entry (assumed to be a non-entry) 91 – 96 Dwarf Mistletoe
conmai	Numeric	Coniferous mean annual increment m ³ / ha / year
convol15ha	Numeric	Projected coniferous volume per ha (15 / 11 utilization standard) m ³ / ha
Counter	Numeric	Counts the order of trees in a stand by DBH Numeric
Cullsup	Character	Cull suspect class – Description of individual tree characteristics C – conks and punk knots O - old broken tops S - scars and other wounds N - non-suspect F - frost cracks I – unknown (suspect an “intermediate” cc call that ended up in wrong column)
Cvol_lcl	Numeric	Plot Observed Lower 95% confidence interval for Coniferous Volume
Cvol_ucl	Numeric	Plot Observed Upper 95% confidence interval for Coniferous Volume
Cvol_x	Numeric	Plot Observed Mean Coniferous Volume
d_vol15ha	Numeric	Plot measured deciduous volume per ha (15 / 10 utilization standard) m ³ / ha
DBH	Numeric	Tree -Diameter Breast Height Diameter in cm
Dead	Character	Identifies Dead Trees Y – Tree dead N – Tree alive (dead tree is defined as a condition code equal to either 25, 26, or a species call of either ‘DC’, or ‘DD’)

Field Name	Data Type	Description and Possible Values
Dec_mort	Numeric	Percentage deciduous volume retention after mortality Numeric proportion
Dec_site	Character	Deciduous site quality based on sitelogix call G- Good M- Medium P- Poor
decmai	Numeric	Deciduous mean annual increment m ³ / ha / year
decvol15ha	Numeric	Projected deciduous volume per ha (15 / 10 utilization standard) m ³ / ha
Dvol_lcl	Numeric	Plot Observed Lower 95% confidence interval for Deciduous Volume
Dvol_ucl	Numeric	Plot Observed Upper 95% confidence interval for Deciduous Volume
Dvol_x	Numeric	Plot Observed Mean Deciduous Volume
Ecolet_x/ ecoletter	Character	Plot ecosite as defined by SiteLogix See <i>Field guide to ecosites of west-central Alberta – (Beckingham, Corns, and Archibald, 1996)</i>
Ecophs1	Character	Primary Sitelogix ecosite phase assignment Recorded as: Natural Subregion – Ecosite.Phase
Ecophs2	Character	Secondary Sitelogix ecosite ecophase assignment Recorded as: Natural Subregion – Ecosite.Phase
Ecosit1	Character	Primary Sitelogix ecosite assignment Recorded as: Natural Subregion - Ecosite
Ecosit2	Character	Secondary Sitelogix ecosite assignment Recorded as: Natural Subregion – Ecosite
Ecosite	Character	Plot Ecosite Equal to ecolet_f field when a field call is available, otherwise equal to ecolet_x W – Water Y – Road and well sites
Ecounit	Character	Full Sitelogix ecosite call Primary and Secondary (Ecosit1 and Ecosit2) are shown in combination
Ecox_Site	Character	Stand site quality classification (based on SiteLogix calls only) LFG – Lower Foothills Good LFM – Lower Foothills Medium LFP – Lower Foothills Poor UFG – Upper Foothills Good UFM – Upper Foothills Medium UFP – Upper Foothills Poor
EXT1	Numeric	Extent of Modification 1
EXT2	Numeric	Extent of Modification 2
fbvol15ha	Numeric	Projected fir volume per ha (15 / 11 utilization standard) m ³ / ha
firha	Numeric	Plot measured fir volume per hectare (15/11 utilization) m ³ / ha

Field Name	Data Type	Description and Possible Values
FORSTKEY	Character	AVI Polygon ID Composed of PID, MER, TWP, RGE
gis_link	Numeric	Linking field to spatial database
HGT_AVI	Numeric	Height (m)
HORPER	Numeric	Stand Structure Value
Ht	Numeric	Total tree height of individual sampled trees Height in m
ht_a, ht_b, ht_c	Numeric	Height diameter coefficient Numeric
Htcrown	Numeric	Height to live crown of individual sampled trees Height in m
Indexm	Numeric	Proportion of volume present on Medium site switch stands compared to good site
indexp	Numeric	Proportion of volume present on Poor site switch stands compared to good site
INTERPRETE	Character	Interpreter's Initials
key_new	Character	Unique identifier for temporary sample plots
larchha	Numeric	Plot larch volume per hectare (15/11 utilization) m ³ / ha
linkvar	Numeric	Link variable Amalgamates township, range, meridian, and stand into a single variable
Lower	Character	Volume Record Indicator Y – Record volume is a lower 95% confidence interval
M_NSR	Character	Natural subregion as defined by Sitelogix LF – Lower Foothills UF – Upper Foothills
M_SI	Numeric	Mean site index by site quality Numeric
Meanx	Character	Volume Record Indicator Y – Record volume is a mean
Mer	Numeric	Meridian Numeric
MER_AVI	Numeric	Meridian:
merlast	Numeric	Meridan of previous record Numeric
MOD1_AVI	Character	Stand Modifier 1 Identified as Follows: AK – Animal kill; BU – Burn; CC – Clearcut; CL – Clearing; CW – Abandoned wellsite; DT – Discolored / dead tops; FL – Flooded; FT – Fire tower; IK – Insect kill; MT – Microwave tower; PI – Pipeline; RW – Railway;

Field Name	Data Type	Description and Possible Values
		SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
MOD2_AVI	Character	Stand Modifier 2 Identified as Follows: BU – Burn; CC – Clearcut; CL – Clearing; GR – Grazing; IK – Insect kill; PI – Pipeline; PL – Planted; SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
MOISTURE	Character	Moisture Regime Identified as Follows: A – Aquatic; D – Dry; M – Mesic; W – Wet.
NATNONVEG	Character	Naturally Non-Vegetated Land Identified as Follows: NMB – Recent burn; NMC – Cutbank; NMS – Sand; NWF – Flooded; NWL – Lake or pond; NWR – River.
NONFORCL	Numeric	Non-Forested Natural Vegetated Land Shrub Closure
NONFORTYPE	Character	Naturally Non-Forested Vegetated Land Identified as Follows: BR – Bryophytes / mosses; HF – Herbaceous forbs; HG – Herbaceous grassland; SC – Closed shrubs; SO – Open shrubs.
Nregion	Numeric	Standard provincial natural subregion numeric code 8 – Sub-Alpine 10 – Upper Foothills 11 – Lower Foothills
NSN	Character	Natural subregion (Provincial natural subregion is the standard) Lower Foothills Upper Foothills Sub-Alpine Alpine

Field Name	Data Type	Description and Possible Values
NSR	Character	Natural subregion (Provincial natural subregion is the standard) LF – Lower Foothills UF – Upper Foothills SA – Sub-Alpine
O_LAND	Character	Overstory Landbase CON - Coniferous DEC - Deciduous
ORIGIN_AVI	Numeric	Origin
OS_AGE	Numeric	Overstory AVI Age =1998 – origin (in years)
OS_CC	Character	Stand overstory crown closure A – Low Density (indicates A or B – AVI crown closure) C – Low Density (indicates C or D – AVI crown closure)
OS_Cov	Character	Overstory Cover Group CX – Pure Coniferous Stand CD – Coniferous Dominated Mixedwood DC - Deciduous Dominated Mixedwood DX – Pure Deciduous Stand
Pbvol15ha	Numeric	Projected poplar volume per ha (15 / 10 utilization standard) m ³ / ha
Per_AW	Numeric	Percentage of total deciduous volume made up by Aspen numeric value
Per_BW	Numeric	Percentage of total deciduous volume made up by Birch numeric value
Per_Con	Numeric	Stand percentage coniferous composition (excludes larch) 1 to 10 – denotes composition in 10% categories
Per_Conlt	Numeric	Stand percentage coniferous composition (includes larch) 1 to 10 – denotes composition in 10% categories
Per_Dec	Numeric	Stand percentage deciduous composition 1 to 10 - denotes composition in 10% categories
Per_FB	Numeric	Percentage of total coniferous volume (excluding LT) made up by Fir numeric value
Per_Larch	Numeric	Stand percentage larch composition 1 to 10 – denotes composition in 10% categories
Per_LT	Numeric	Percentage of total coniferous volume (including LT) made up by Larch numeric value
Per_PB	Numeric	Percentage of total deciduous volume made up by Poplar numeric value
Per_PL	Numeric	Percentage of total coniferous volume (excluding LT) made up by Pine numeric value
Per_Sb	Numeric	Stand percentage SB composition 1 to 10 - denotes composition in 10% categories
Per_SW	Numeric	Percentage of total coniferous volume (excluding LT) made up by spruce species numeric value
Phsunit	Character	Full Sitelogix ecosites phase call Primary and Secondary (Ecophs1 and Ecophs2) are shown in combination

Field Name	Data Type	Description and Possible Values
PID	Numeric	AVI Polygon ID
pineha	Numeric	Plot measured pine volume per hectare (15/11 utilization) m ³ / ha
pl_si	Numeric	Stand Site Index – based on PL and PJ SI at 50 years
pl_totage	Numeric	Stand Age – based on PL and PJ site trees Total age (years)
plot_age	Numeric	Plot Age in years = 1998 – origin
plot_num	Numeric	Number of plots in stand Numeric
Plot_si	Numeric	Plot SI
plot_site	Character	Plot Site Quality LFG – Lower Foothills Good LFM – Lower Foothills Medium LFP – Lower Foothills Poor UFG – Upper Foothills Good UFM – Upper Foothills Medium UFP – Upper Foothills Poor SAG – Subalpine Good SAP – Subalpine Poor XXG – Lower and Upper Foothills Good XXM – Lower and Upper Foothills Medium XXP – Lower and Upper Foothills Poor
plotarea	Numeric	Total plot area in a stand Plot_num * 160m ²
Plotid	Character	Plot Identifier Unique plot identifier
Plotlet	Character	Plot Letter During some TSP years a alpha character was used to differentiate between multiple plots in a stand. Valid assignments are: A, B, C,...Z.
Plotno	Character	Plot Number Alpha-numeric value assigned by field crews during sampling
PlotSize	Numeric	TSP Plot Size All plots were 160m ²
plvol15ha	Numeric	Projected Pine volume per hectare (15/11 utilization) in m ³
poplarha	Numeric	Plot measured poplar volume per hectare (15/10 utilization) m ³ / ha
prov_a, prov_b, prov_c	Numeric	Provincial coefficients for Height/DBH regression relationship Numeric
REFSOURCE	Character	Reference Source Identified as Follows: A – Air call; F – Field plot; I – Interpreted TPR; P – PSP; S – Supplementary photography;

Field Name	Data Type	Description and Possible Values
		V – Volume plot.
REFYEAR	Numeric	Reference Year
Rge	Numeric	Range Numeric
RGE_AVI	Numeric	Range:
rgelast	Numeric	Range of previous record Numeric
Rsq	Numeric	Estimate of R^2 from non-linear regression Numeric
Sev	Character	Identifies trees as severely damaged enough to be excluded from SI calculations Y – Severe Damage N – No severe damage (severe damage is defined as a condition code equal to either 13, 19, 24, 28, 34, 35, or cull suspect class equal to either 'O' or 'F')
Si_obs	Numeric	Number of Site Index Trees in Stand Numeric
Site	Character	Site quality based on the species present (see sptype field) and sitelogix ecosites call G – Good M – Medium P – Poor
Site_t_req	Numeric	Maximum number of site trees required Numeric
Sitequal	Character	Stand Quality GM – Good or medium site PX – Poor site
Source	Character	TSP program code name rawtree – 1996 edvsamp – 1997 d0001 – 1998 v0006 – 1999
Sp	Character	Tree species DC – Dead coniferous DD – Dead deciduous NO – No species (used to indicate null plots) All other codes - Standard Alberta species codes used
SP1_AVI	Character	Species 1 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.

Field Name	Data Type	Description and Possible Values
SP1P_AVI	Numeric	Species 1 Percent
SP2_AVI	Character	Species 2 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
SP2P_AVI	Numeric	Species 2 Percent
SP3_AVI	Character	Species 3 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
SP3P_AVI	Numeric	Species 3 Percent
SP4_AVI	Character	Species 4 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
SP4P_AVI	Numeric	Species 4 Percent
SP5_AVI	Character	Species 5 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; SB – Black Spruce; SW – White Spruce.
SP5P_AVI	Numeric	Species 5 Percent

Field Name	Data Type	Description and Possible Values
spruceha	Numeric	Plot measured spruce species volume per hectare (15/11 utilization) m ³ / ha
Sptype	Character	Identifies trees as either: deciduous, pine, other coniferous species decid – Deciduous pine – Pine conif – Coniferous (Excludes pine and larch)
ST_Site	Character	Stand site quality classification LFG – Lower Foothills Good LFM – Lower Foothills Medium LFP – Lower Foothills Poor UFG – Upper Foothills Good UFM – Upper Foothills Medium UFP – Upper Foothills Poor
Stand*	Numeric	Stand Number Numeric
STAND_AVI	Numeric	AVI Stand ID
Standlast	Numeric	Stand number of previous record Numeric
Std_age	Numeric	Stand age (based on SoPM)
Std_cc	Character	Stand crown closure (based on SoPM) A – 6% to 30% B – 31% to 50% C – 51% to 70% D – 71% to 100% X – for poor sites only all crown closure classes are grouped into the “X” category.
Std_larch	Numeric	Stand percentage larch composition (based on SoPM) 1 to 10 – denotes composition in 10% categories
Std_sb	Numeric	Stand percentage black spruce composition (based on SoPM) 1 to 10 – denotes composition in 10% categories
Std_sp1	Character	First species (based on SoPM) AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
Std_sp1per	Numeric	Stand percentage first species composition (based on SoPM) 1 to 10 – denotes composition in 10% categories
Std_sp2	Character	Second species (based on SoPM) AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar;

Field Name	Data Type	Description and Possible Values
		PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
STD_TYPE	Character	Stand Type CON – Coniferous Dominated Stand DEC – Deciduous Dominated Stand
Stdper_con	Numeric	Stand percentage coniferous composition (based on SoPM) 1 to 10 – denotes composition in 10% categories
Stdper_dec	Numeric	Stand percentage deciduous composition (based on SoPM) 1 to 10 – denotes composition in 10% categories
Story	Character	Designates the SoPM O – Overstory A – Understory – Switch stand designation
stpdbh_a, stpdbh_b, stpdbh_c	Numeric	DBH / Stump Height Diameter coefficients Numeric
STRUCTURE	Character	Stand Structure Identified as Follows: C – Complex; H – Horizontal; M – Multi-storey.
stumpage	Numeric	Stump age (30cm) Numeric (years)
sw_si	Numeric	Stand site index – based on SW, SB, FB and FA SI at 50 years breast height age
sw_totage	Numeric	Stand age – based on SW, SB, FB and FA site trees Total age (years)
Swt_only	Numeric	Switch Stand Indicator 0 – Not a switch stand 1 – Switch stand
swvol15ha	Numeric	Projected spruce species volume per hectare (15/11 utilization) in m ³
t_vol15ha	Numeric	Plot measured total volume per ha (15/11 Coniferous, 15/10 Deciduous) m ³ / ha
t0, t1, t2, t3, t4, t5, t6	Numeric	Parameters for total volume function Numeric
thlb_flag	Character	Indicates if plot is in Drayton Valley FMA Y N
totage	Numeric	Total Age of Stand Total age (years)
totmai	Numeric	Total mean annual increment m ³ / ha / year
tottemp15ha	Numeric	Projected total volume per ha (15/11 Coniferous + 15/10 Deciduous) prior to deciduous mortality retention has been applied m ³ / ha
totvol15ha	Numeric	Projected total volume per ha (15/11 Coniferous + 15/10 Deciduous) after deciduous mortality retention has been applied m ³ / ha

Field Name	Data Type	Description and Possible Values
TPR	Character	Timber Productivity Rating Identified as Follows: G – Good; M – Medium; F – Fair; U – Unproductive.
Tree	Numeric	Plot sampled tree number Sequential number
Tvol_lcl	Numeric	Plot Observed Lower 95% confidence interval for total volume
Tvol_ucl	Numeric	Plot Observed Upper 95% confidence interval for total volume
Tvol_x	Numeric	Plot Observed Mean total volume
Twp	Numeric	Township Numeric
TWP_AVI	Numeric	Township:
twplast	Numeric	Township of previous record Numeric
U_ANTHNONV	Character	Anthropogenic Non-Vegetated Land Identified as Follows: AIF – Farm; AIG – Gravel or borrow pit; AIH – Permanent right-of-way; AII – Industrial sites; AIW – Water reservoir; ASR – Ribbon development.
U_ANTHVEG	Character	Anthropogenic Vegetated Land Identified as Follows: CA – Annual crops; CIP – Pipeline; CIW – Geophysical activity (wellsite); CP – Cropland (perennial); CPR – Perennial crops (with SO or SC N.F.TYPE).
U_CC_AVI	Character	Crown Closure Identified as Follows: A – 6 – 30% Crown Closure; B – 31 – 50% Crown Closure; C – 51 – 70% Crown Closure; D – 71 – 100% Crown Closure.
U_EXT1_AVI	Numeric	Extent of Modification 1
U_EXT2_AVI	Numeric	Extent of Modification 2
U_HGT_AVI	Numeric	Height (m)
U_HORPER	Numeric	Stand Structure Value
U_INTERPRE	Character	Interpreter's Initials
U_LAND	Character	Understory Landbase CON - Coniferous DEC - Deciduous
U_MOD1_AVI	Character	Stand Modifier 1 Identified as Follows: AK – Animal kill; BU – Burn; CC – Clearcut; CL – Clearing; CW – Abandoned wellsite; DT – Discolored / dead tops;

Field Name	Data Type	Description and Possible Values
		FL – Flooded; MT – Microwave tower; RW – Railway; SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
U_MOD2_AVI	Character	Stand Modifier 2 Identified as Follows: BU – Burn; CC – Clearcut; CL – Clearing; GR – Grazing; PL – Planted; SC – Scarified; SN – Snags; TH – Thinned.
U_MOISTURE	Character	Moisture Regime Identified as Follows: A – Aquatic; D – Dry; M – Mesic; W – Wet.
U_NATNONVE	Character	Naturally Non-Vegetated Land Identified as Follows: NMC – Cutbank; NMS – Sand; NWF – Flooded; NWL – Lake or pond; NWR – River.
U_NONFORCL	Numeric	Non-Forested Natural Vegetated Land Shrub Closure
U_NONFORTY	Character	Non-Forested Natural Vegetated Land Type Identified as Follows: BR – Bryophytes / mosses; HF – Herbaceous forbs; HG – Herbaceous grass; SC – Closed shrubs; SO – Open shrubs.
U_ORIGIN	Numeric	Origin
U_REFSOURC	Character	Reference Source Identified as Follows: A – Air call; F – Field plot; I – Interpreted TPR.
U_REFYEAR	Numeric	Reference Year
U_SP1_AVI	Character	Species 1 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine;

Field Name	Data Type	Description and Possible Values
		PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
U_SP1P_AVI	Numeric	Species 1 Percent
U_SP2_AVI	Character	Species 2 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
U_SP2P_AVI	Numeric	Species 2 Percent
U_SP3_AVI	Character	Species 3 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
U_SP3P_AVI	Numeric	Species 3 Percent
U_SP4_AVI	Character	Species 4 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
U_SP4P_AVI	Numeric	Species 4 Percent
U_SP5_AVI	Character	Species 5 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch;

Field Name	Data Type	Description and Possible Values
		P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
U_SP5P_AVI	Numeric	Species 5 Percent
U_STRUCTURE	Character	Stand Structure Identified as Follows: H – Horizontal; M – Multi-storey.
U_TPR	Character	Timber Productivity Rating Identified as Follows: G – Good; M – Medium; F – Fair; U – Unproductive.
U_YEAR1_AVI	Numeric	Year of Modification 1
U_YEAR2_AVI	Numeric	Year of Modification 2
UPer_Larch	Numeric	Understory percentage larch composition 1 to 10 – denotes composition in 10% categories
UPer_Sb	Numeric	Understory percentage SB composition 1 to 10 - denotes composition in 10% categories
Upper	Character	Volume Record Indicator Y – Record volume is an upper 95% confidence interval
US_AGE	Numeric	Understory AVI Age =1998 – origin (in years)
US_CC	Character	Stand understory crown closure A – Low Density (indicates A or B – AVI crown closure) C – Low Density (indicates C or D – AVI crown closure)
US_Cov	Character	Understory Cover Group CX – Pure Coniferous Stand CD – Coniferous Dominated Mixedwood DC - Deciduous Dominated Mixedwood DX – Pure Deciduous Stand
Year_sam	Numeric	Year TSP sampled 1996 to 1999
Yieldmodel	Character	Plot in yield model identifier YES – Plot has SI and is included in model NO – Plot does not have SI and is not included in model
Yieldnum	Numeric	Yield Curve Number Numeric

APPENDIX II – VALIDATION OF YIELD MODELS

An analysis was completed to validate the final yield projections by comparing projected volume yields to field observed means (Figure 8 to Figure 38).

When comparing field observed means to projected yields the following must be understood:

The strength of a field-measured mean is dependant upon the number of plots used to estimate a mean. To demonstrate, Figure 10 illustrates “C” crown closure stands on good sites; here the field measures for stand age 100, 110, and 120 are of most concern to us because they comprise the majority of the plots sampled and is within the likely harvest age range.

Predicted yields total yields upper foothills and lower foothills data were combined, for improved model performance. The differences in predicted total volume between natural sub-regions were driven by the differences in SI. The field observed averages do not combine the plots from both natural subregions.

Verifying total yield projections from coniferous dominated stands

When compared to TSP field-measured mean volumes, the total yield projections for the coniferous total yield strata are shown to be reasonable estimates (Figure 8 to Figure 30). Focusing first on lower foothills good and medium sites, the yield projections for “C” crown closure stands (yield stratum #3, and #7) have a strong relationship with the estimated means (Figure 10 and Figure 14). The majority of plots that were sampled (in yield stratum #3 and #7) were between 100 and 120 years old and here the yield projections and field means are compatible.

Yield projections for “C” crown closure stands in upper foothills good and medium sites (yield stratum #12, and #16) have a strong relationship with the estimated means (Figure 19 and Figure 23). For both lower and upper foothills poor site stands, the yield projections and the field measured means align as expected (Figure 16 and Figure 25). Yield projections and the field-measured means were also in alignment in the sub-alpine sites (Figure 26 to Figure 30). Overall total volume projections for coniferous dominated stands match well with the field observed measurements.

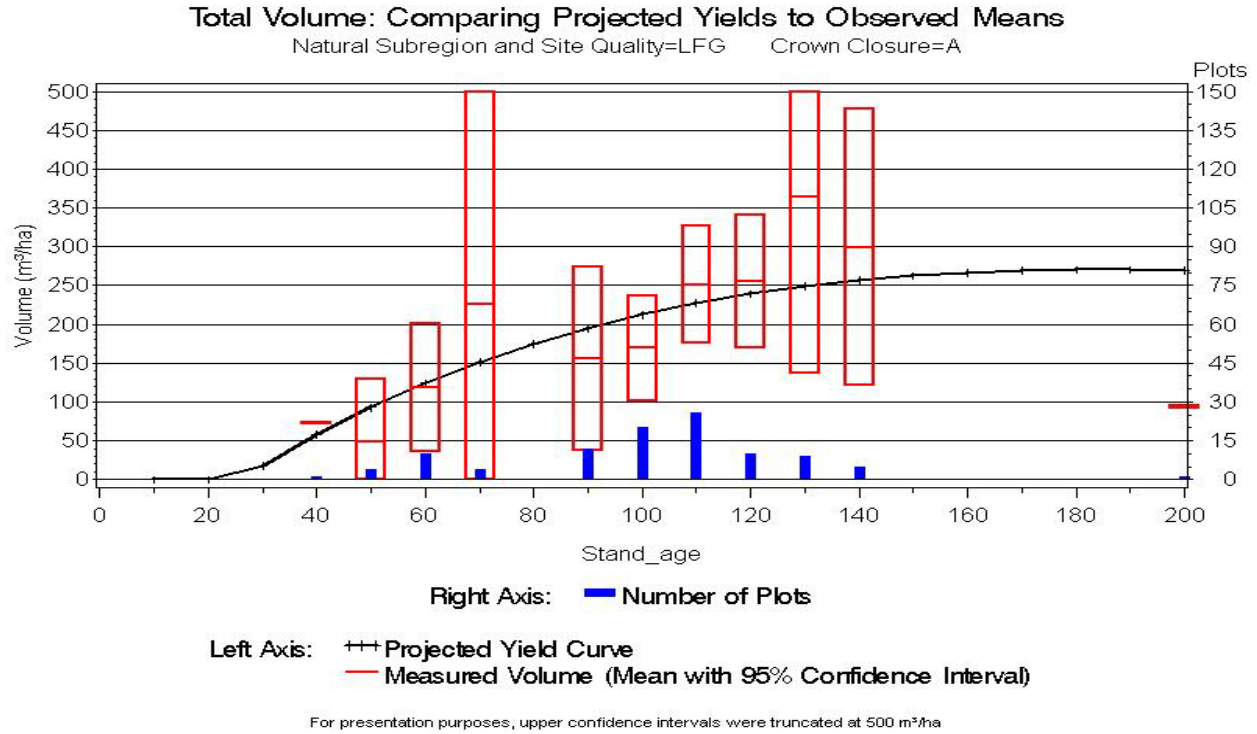


Figure 8. Yield stratum #1 - Projected total volume (NSR= LF, Site=G, and CC=A) from coniferous dominated stands compared to observed field measured means.

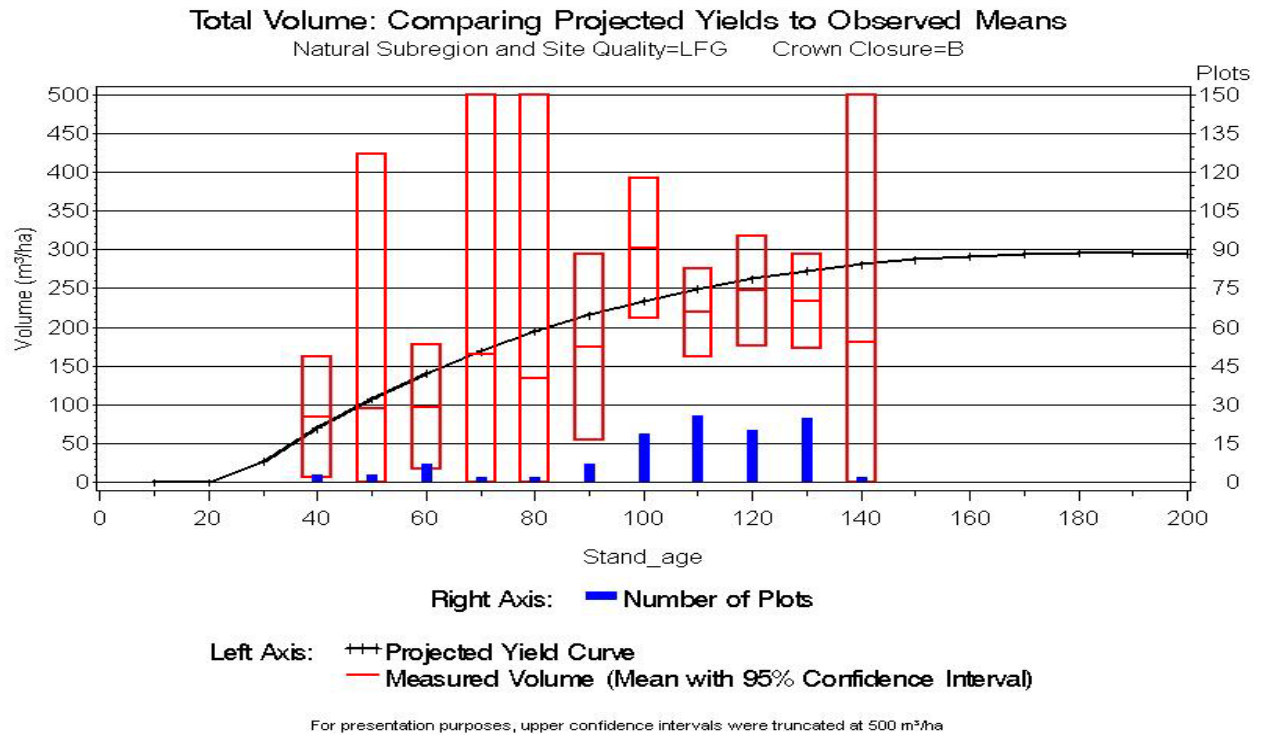


Figure 9. Yield stratum #2 - Projected total volume (NSR= LF, Site=G, and CC=B) from coniferous dominated stands compared to observed field measured means.

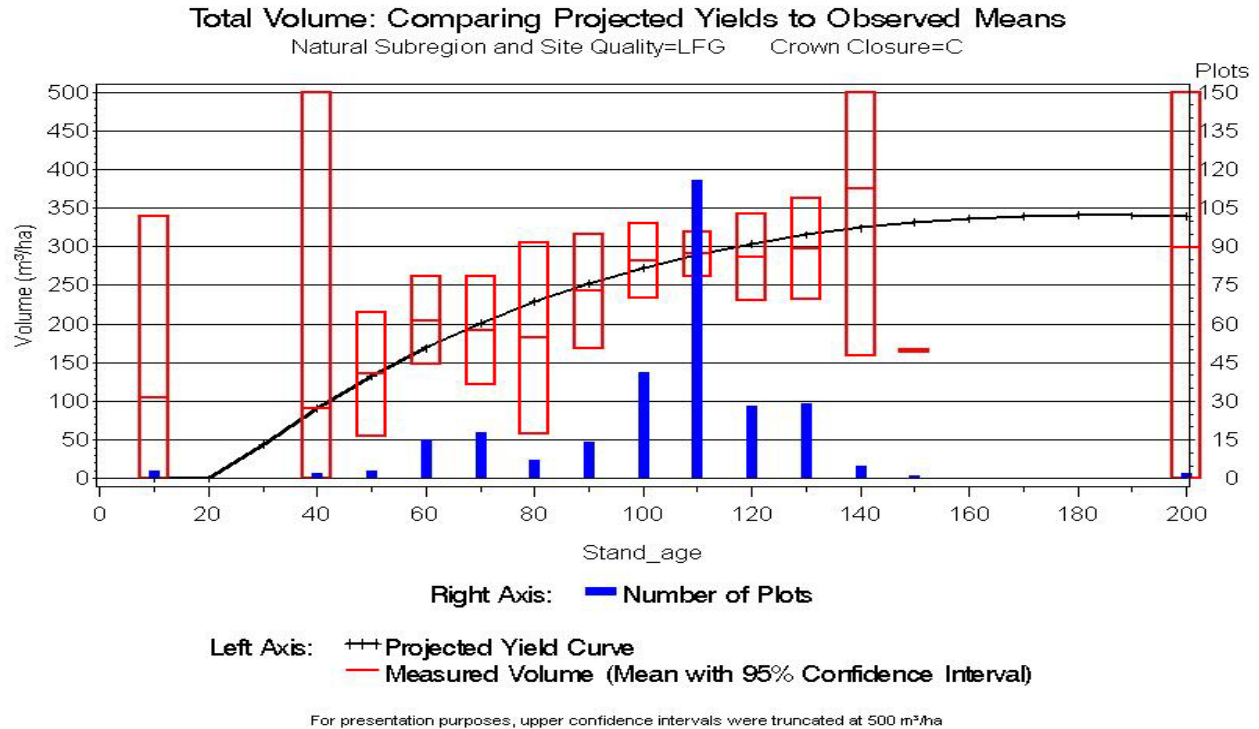


Figure 10. Yield stratum #3 - Projected total volume (NSR= LF, Site=G, and CC=C) from coniferous dominated stands compared to observed field measured means.

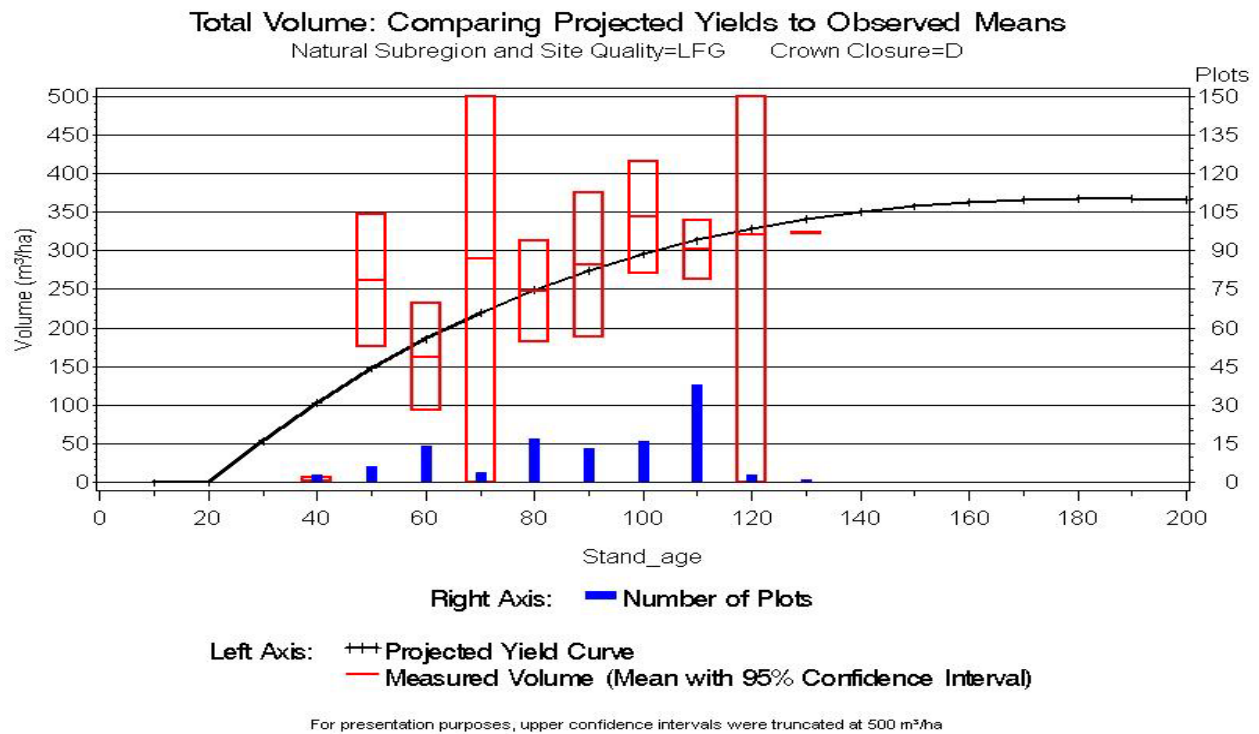
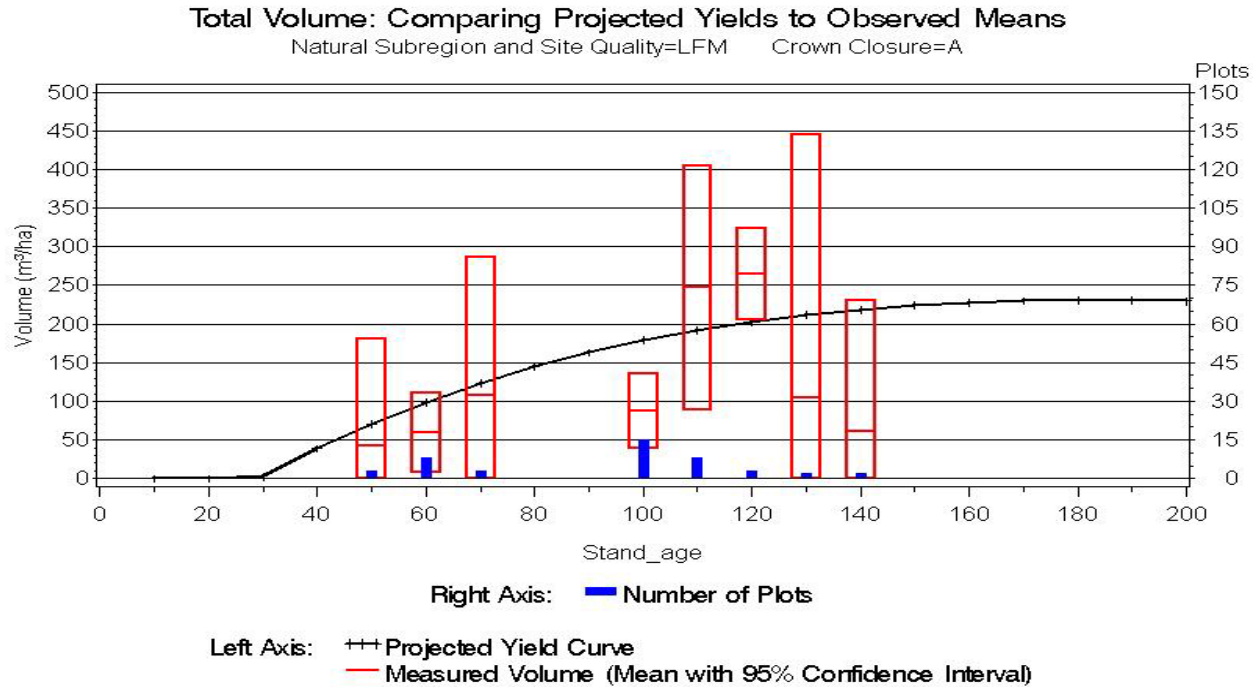
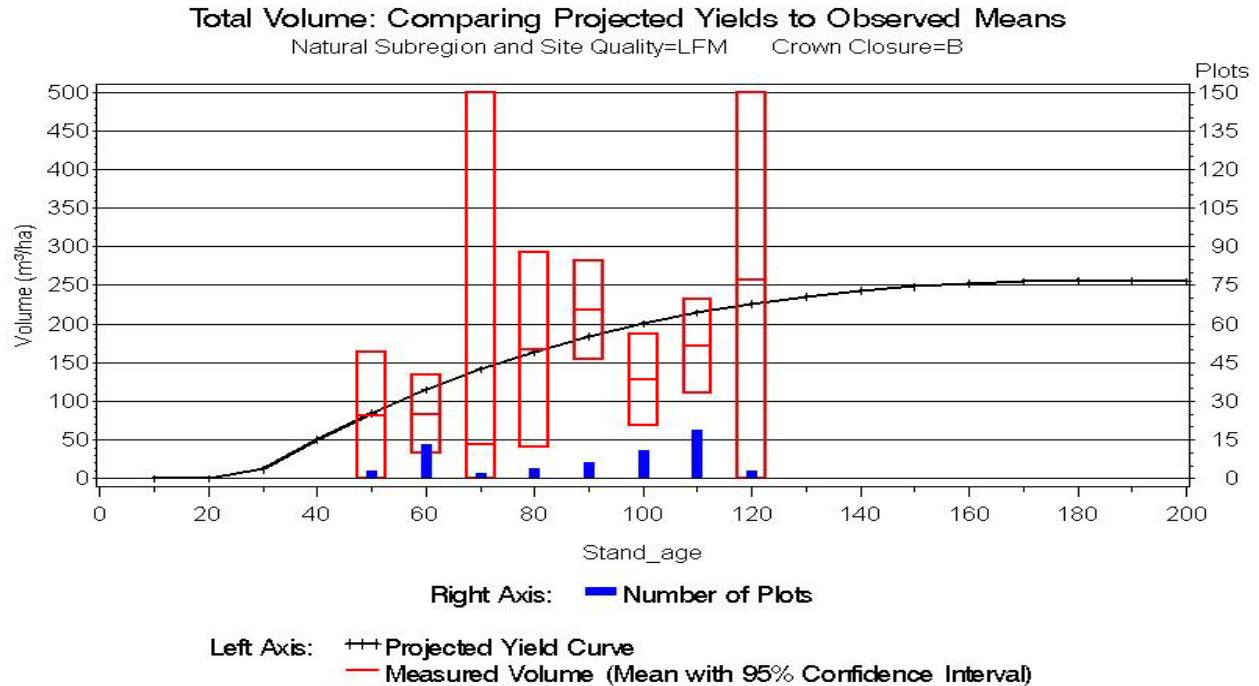


Figure 11. Yield stratum #4 - Projected total volume (NSR= LF, Site=G, and CC=D) from coniferous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 12. Yield stratum #5 - Projected total volume (NSR= LF, Site=M, and CC=A) from coniferous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 13. Yield stratum #6 - Projected total volume (NSR= LF, Site=M, and CC=B) from coniferous dominated stands compared to observed field measured means.

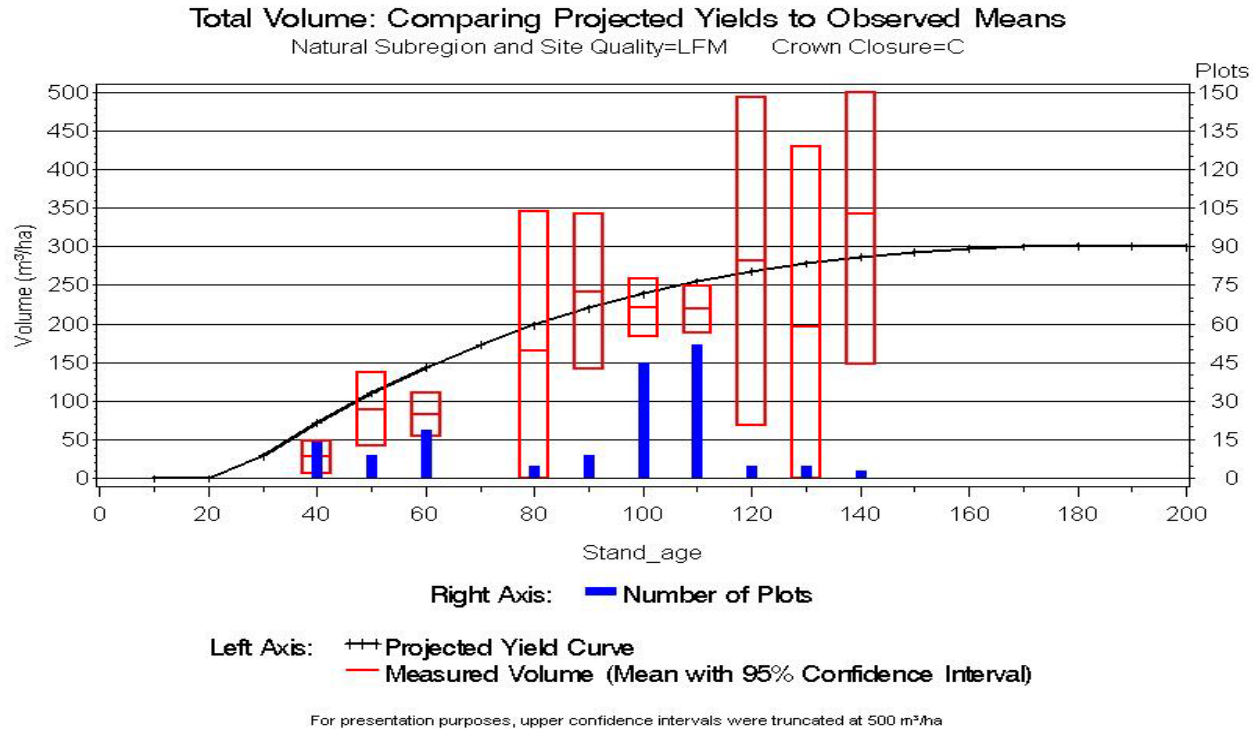


Figure 14. Yield stratum #7 - Projected total volume (NSR= LF, Site=M, and CC=C) from coniferous dominated stands compared to observed field measured means.

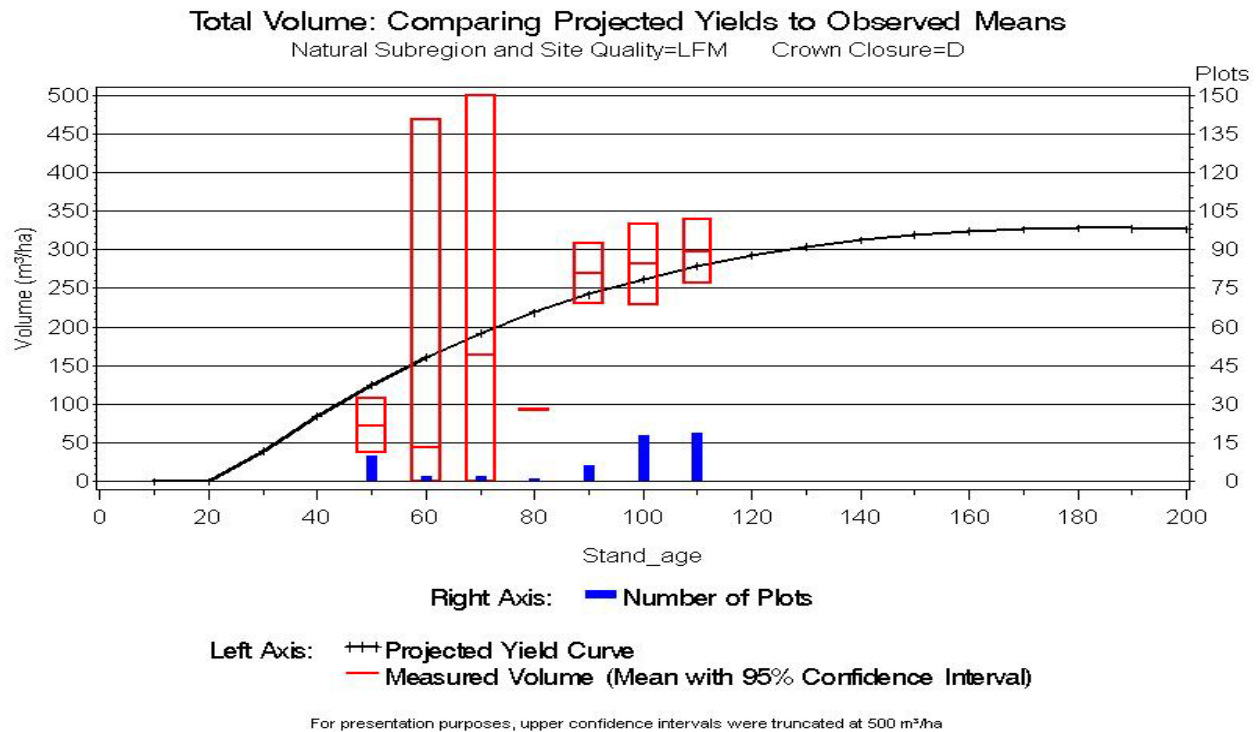


Figure 15. Yield stratum #8 - Projected total volume (NSR= LF, Site=M, and CC=D) from coniferous dominated stands compared to observed field measured means.

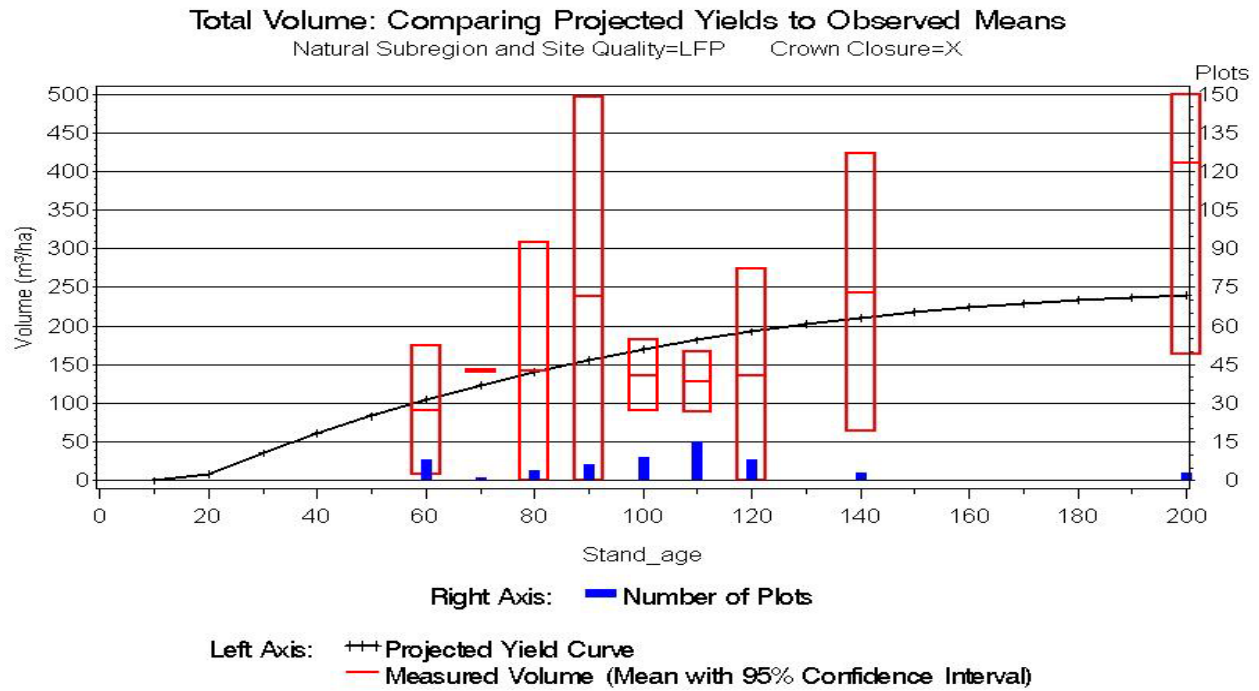


Figure 16. Yield stratum #9 - Projected total volume (NSR= LF, Site=P, and CC=A to D) from coniferous dominated stands compared to observed field measured means.

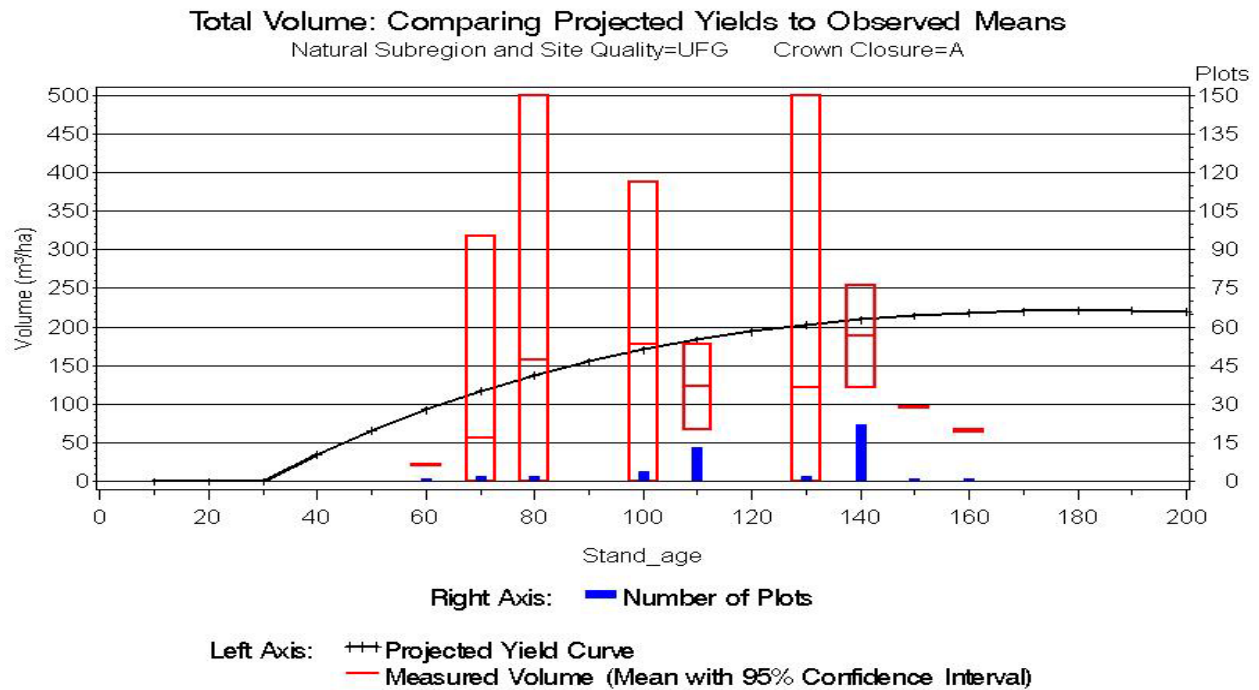
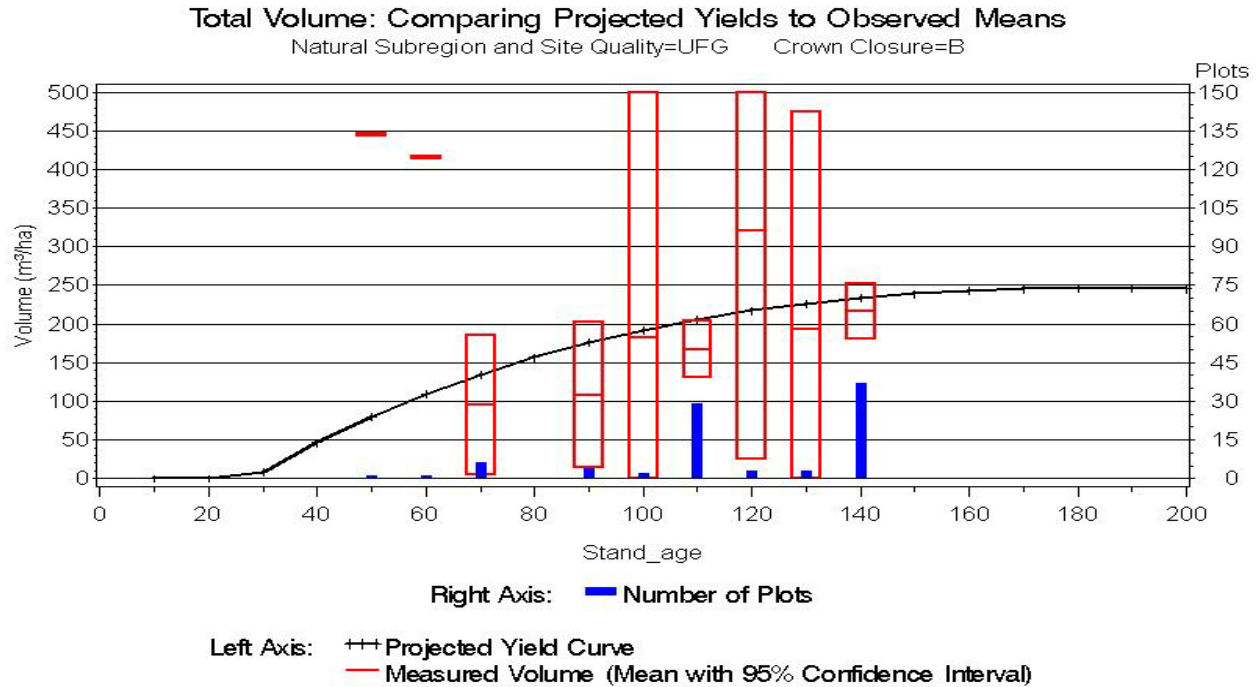
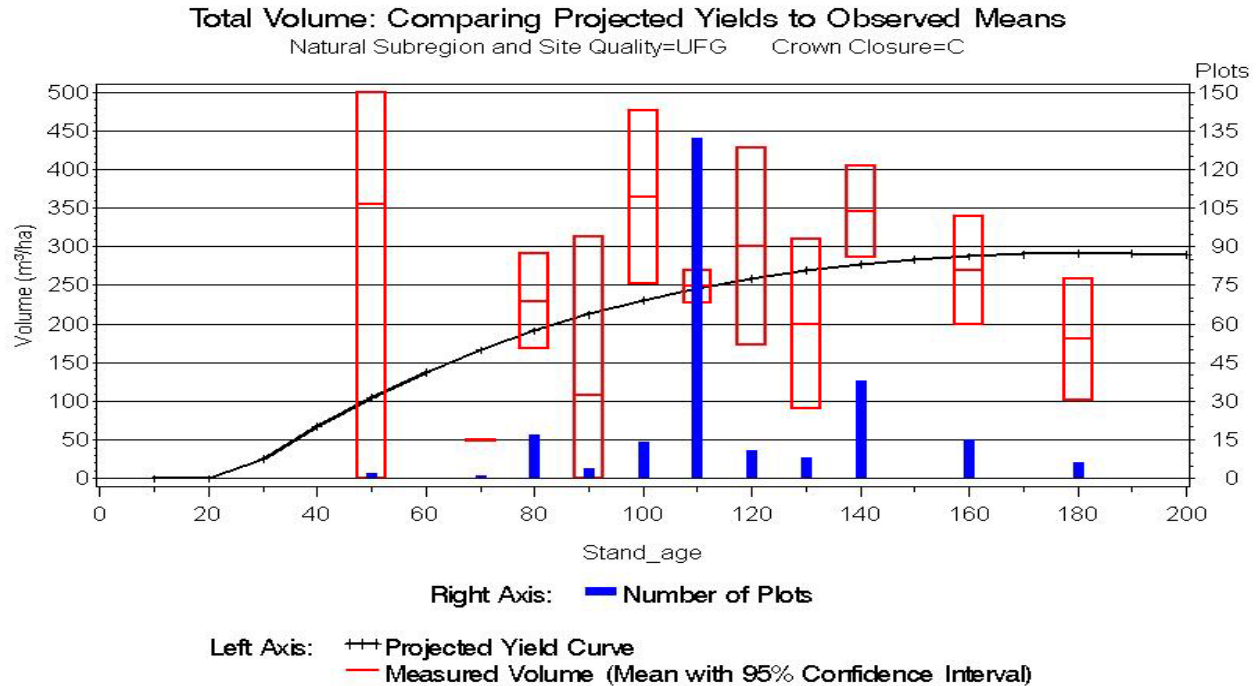


Figure 17. Yield stratum #10 - Projected total volume (NSR= UF, Site=G, and CC=A) from coniferous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 18. Yield stratum #11 - Projected total volume (NSR= UF, Site=G, and CC=B) from coniferous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 19. Yield stratum #12 - Projected total volume (NSR= UF, Site=G, and CC=C) from coniferous dominated stands compared to observed field measured means.

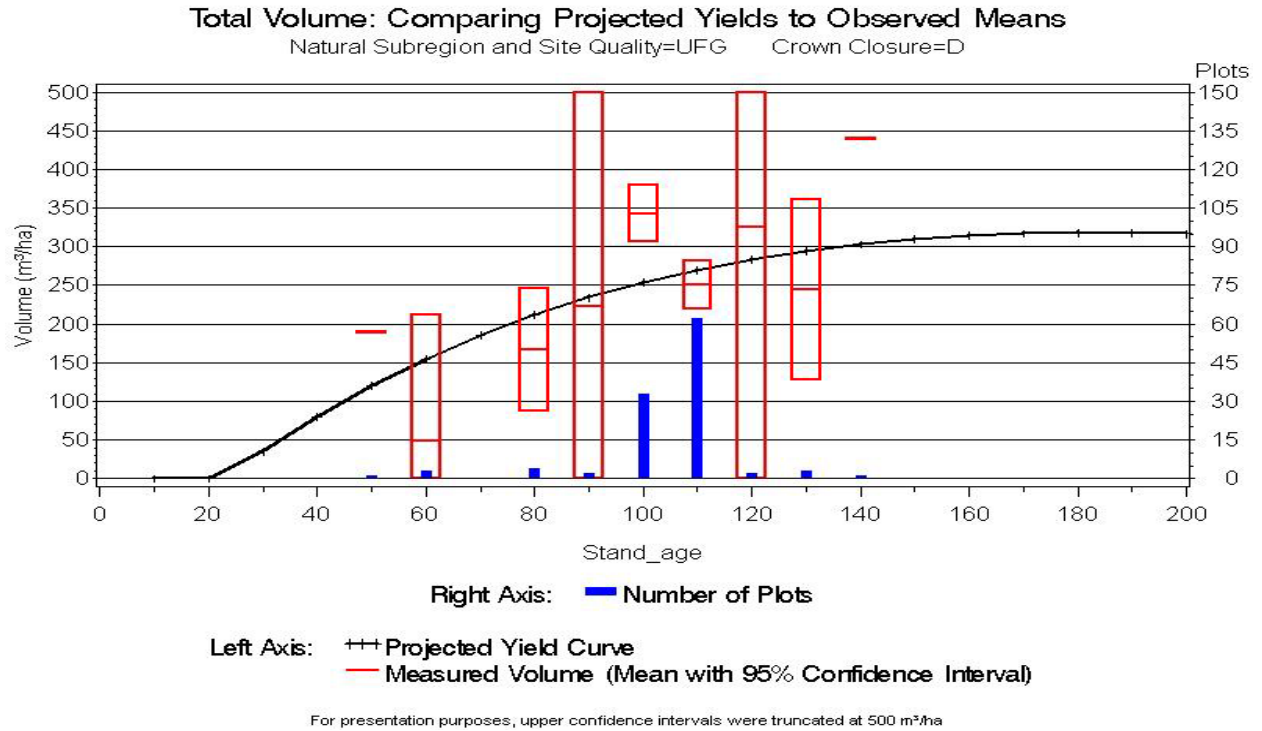


Figure 20. Yield stratum #13 - Projected total volume (NSR= UF, Site=G, and CC=D) from coniferous dominated stands compared to observed field measured means.

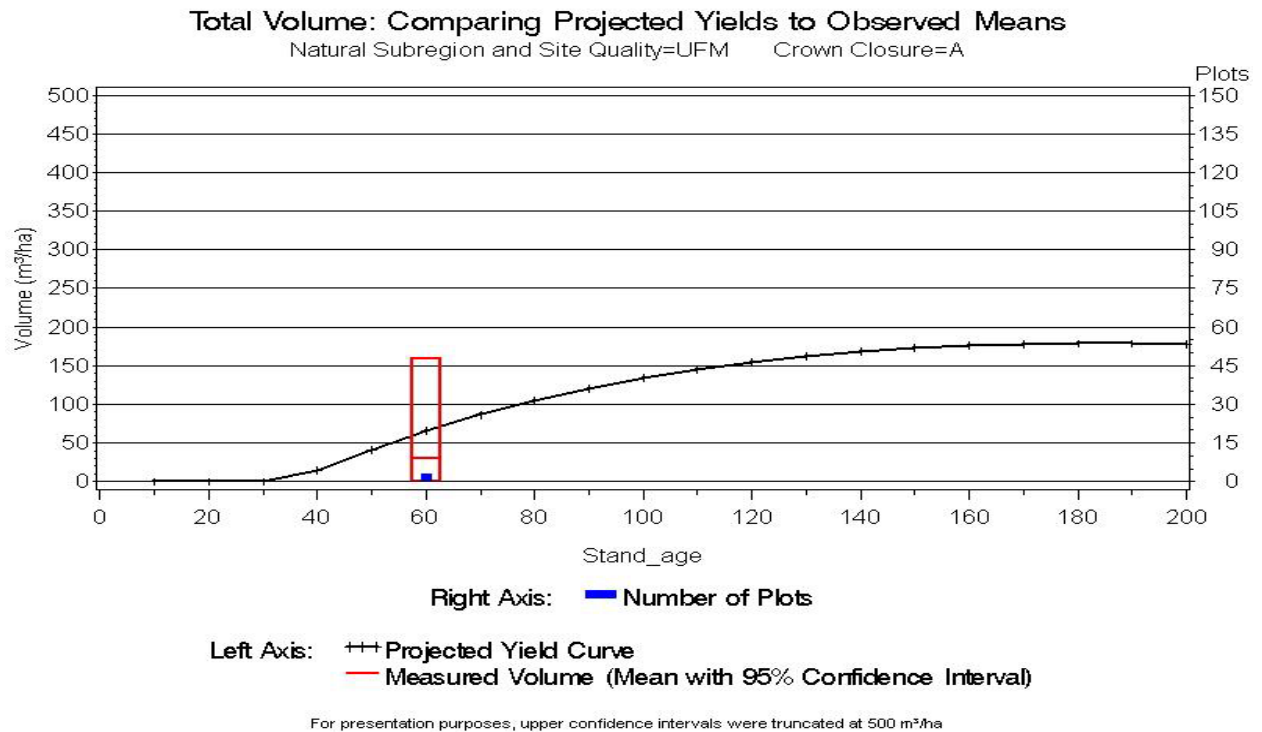


Figure 21. Yield stratum #14 - Projected total volume (NSR= UF, Site=M, and CC=A) from coniferous dominated stands compared to observed field measured means.

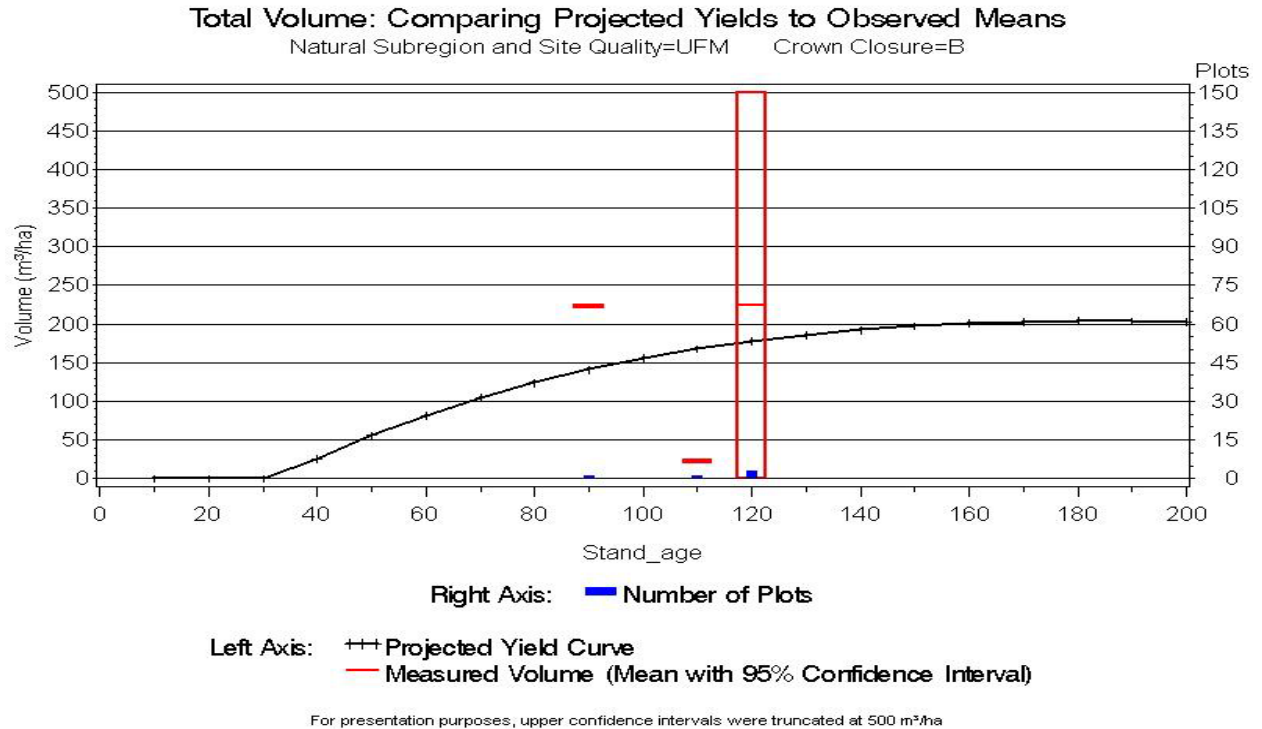


Figure 22. Yield stratum #15 - Projected total volume (NSR= UF, Site=M, and CC=B) from coniferous dominated stands compared to observed field measured means.

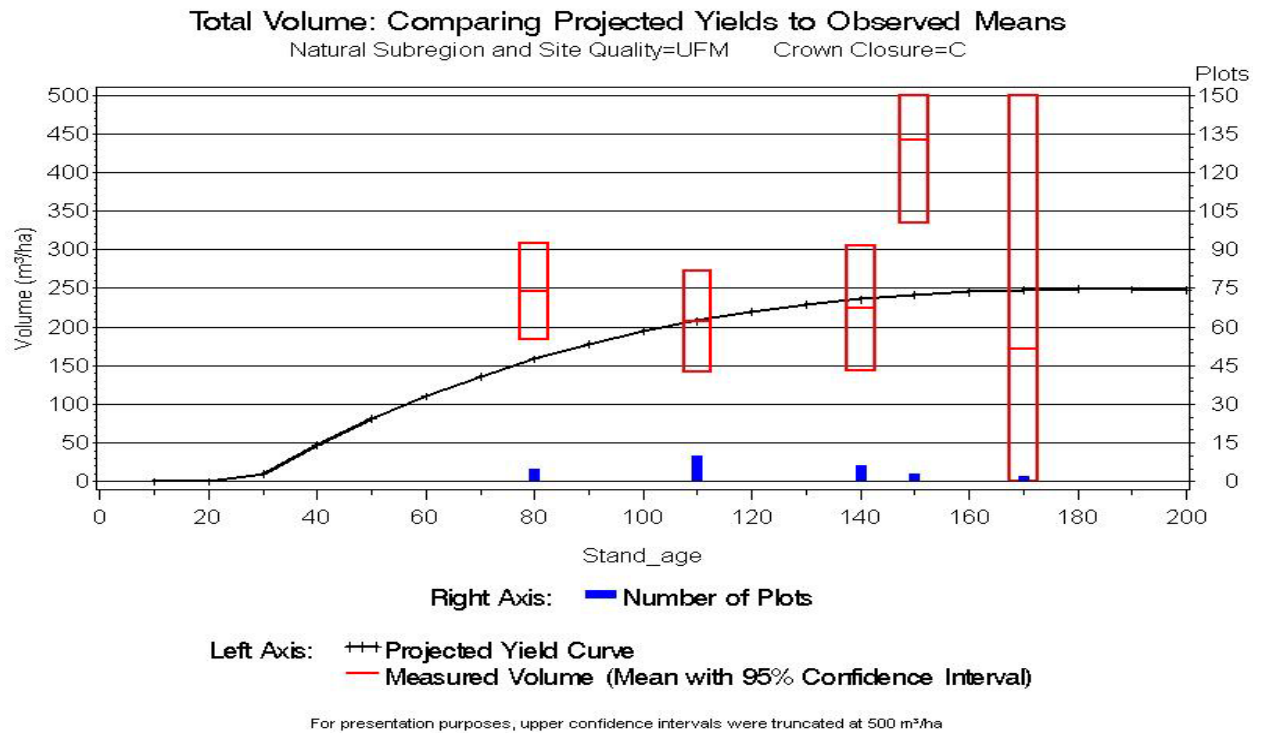
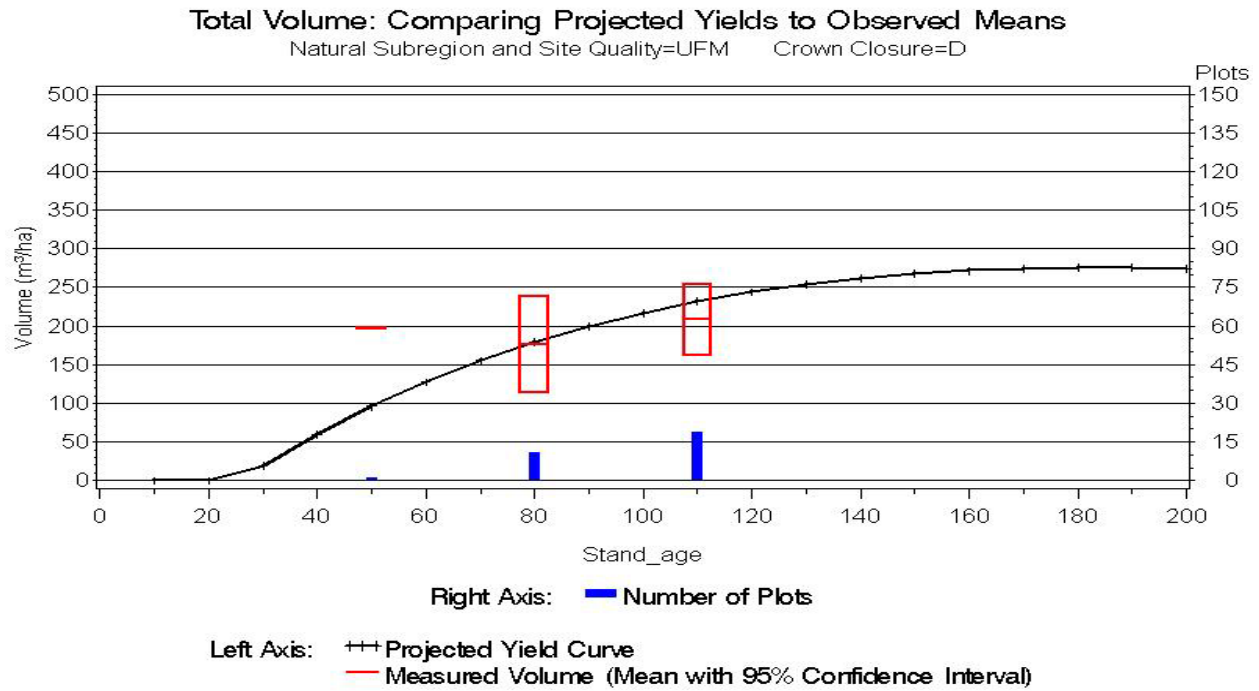
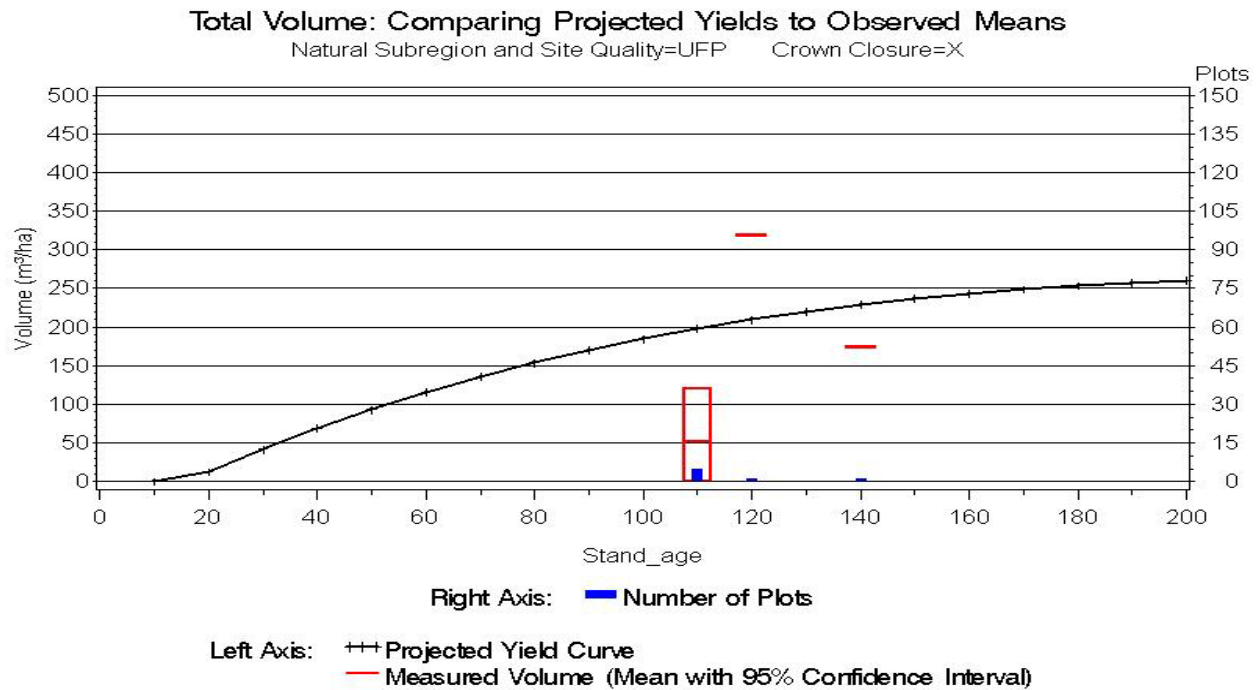


Figure 23. Yield stratum #16 - Projected total volume (NSR= LF, Site=M, and CC=C) from coniferous dominated stands compared to observed field measured means.



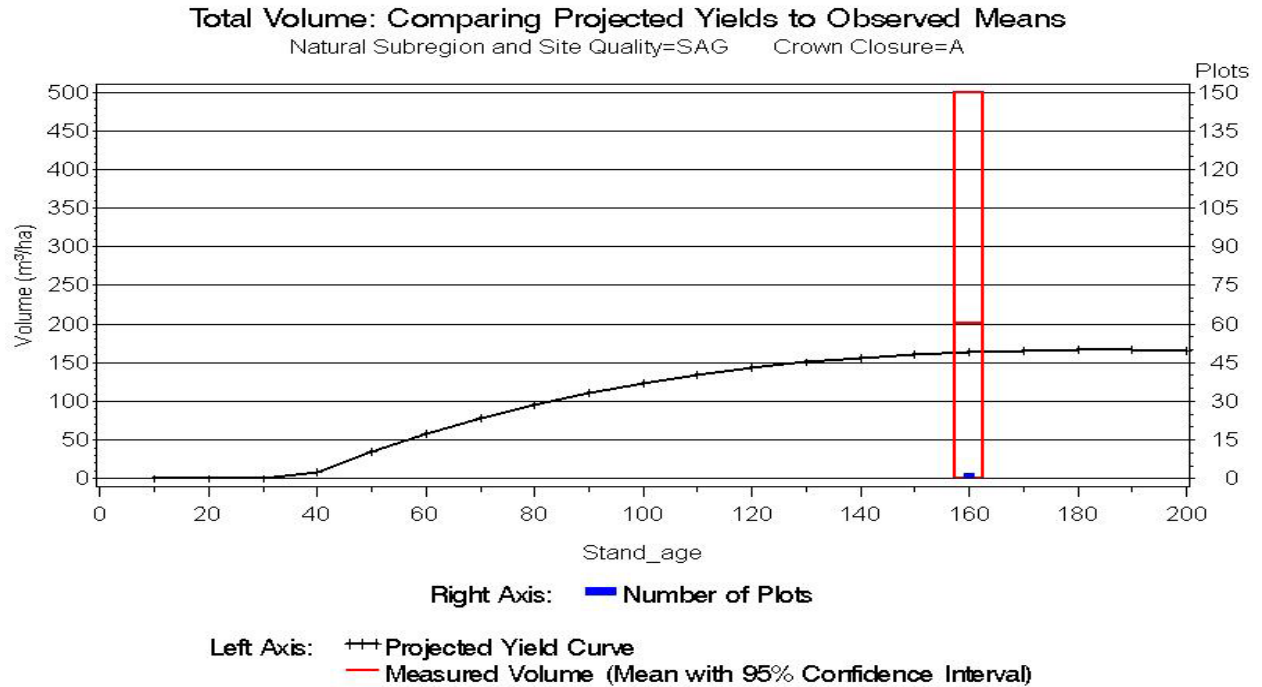
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 24. Yield stratum #17 - Projected total volume (NSR= UF, Site=M, and CC=D) from coniferous dominated stands compared to observed field measured means.



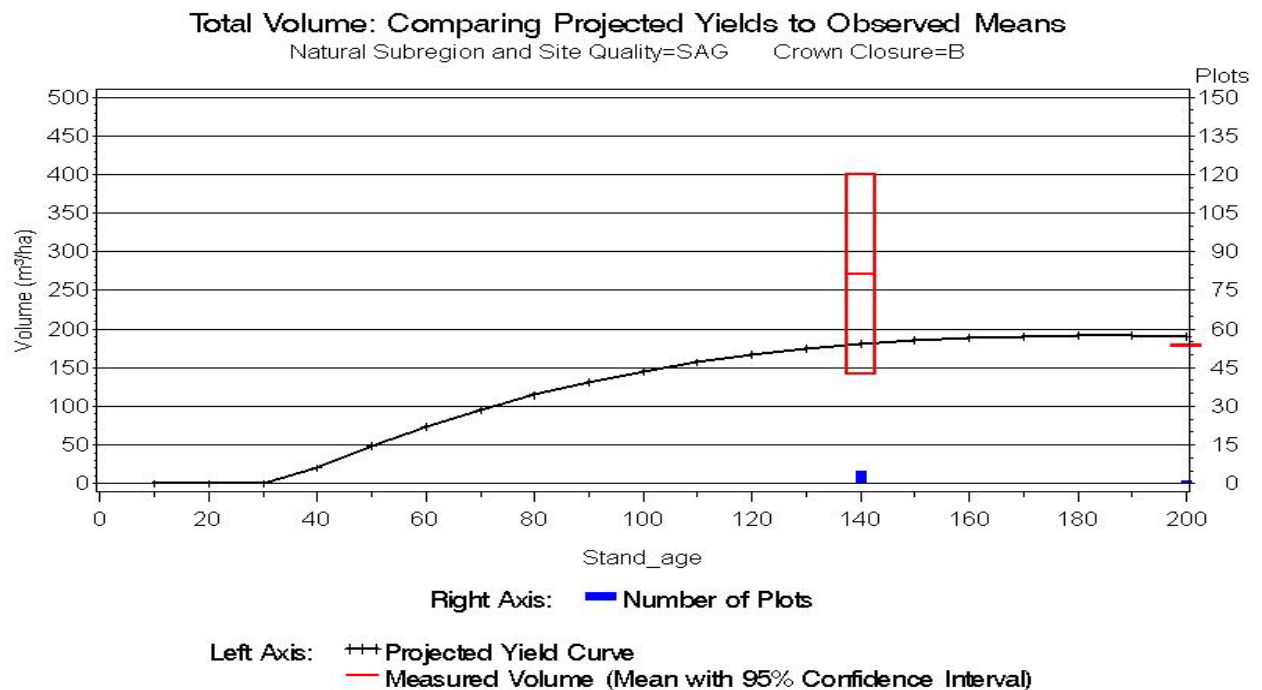
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 25. Yield stratum #18 - Projected total volume (NSR= UF, Site=P, and CC=A to D) from coniferous dominated stands compared to observed field measured means.



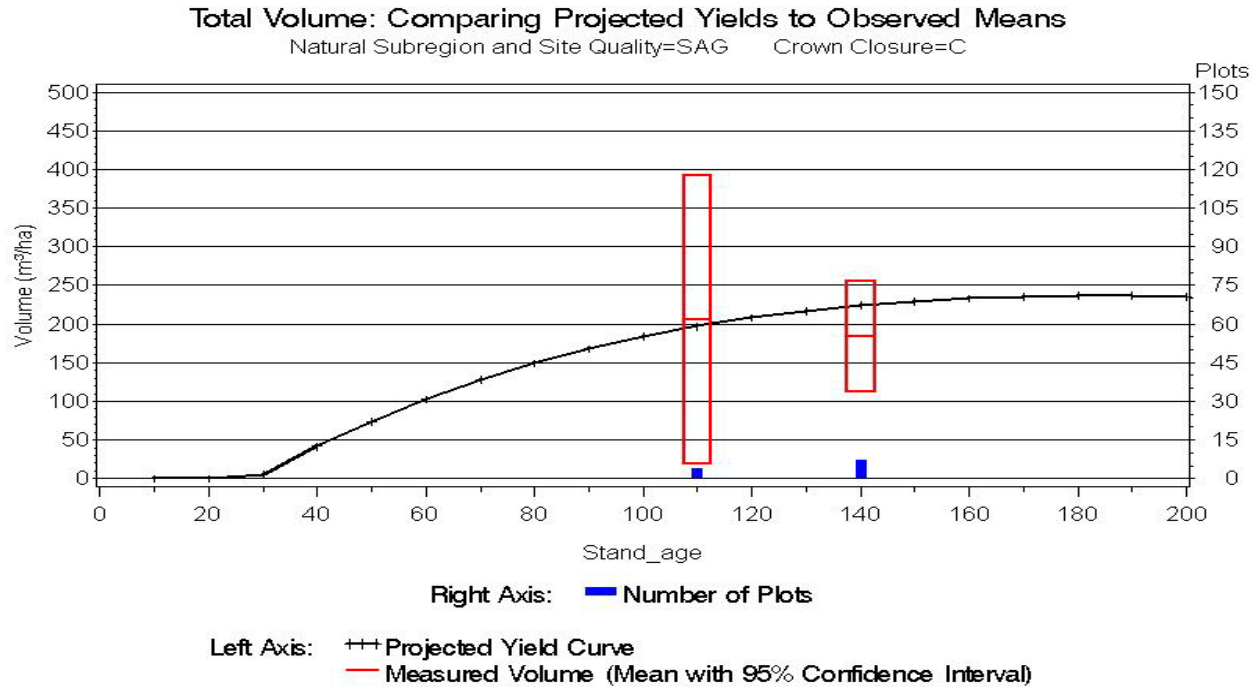
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 26. Yield stratum #19 - Projected total volume (NSR= SA, Site=G, and CC=A) from coniferous dominated stands compared to observed field measured means.



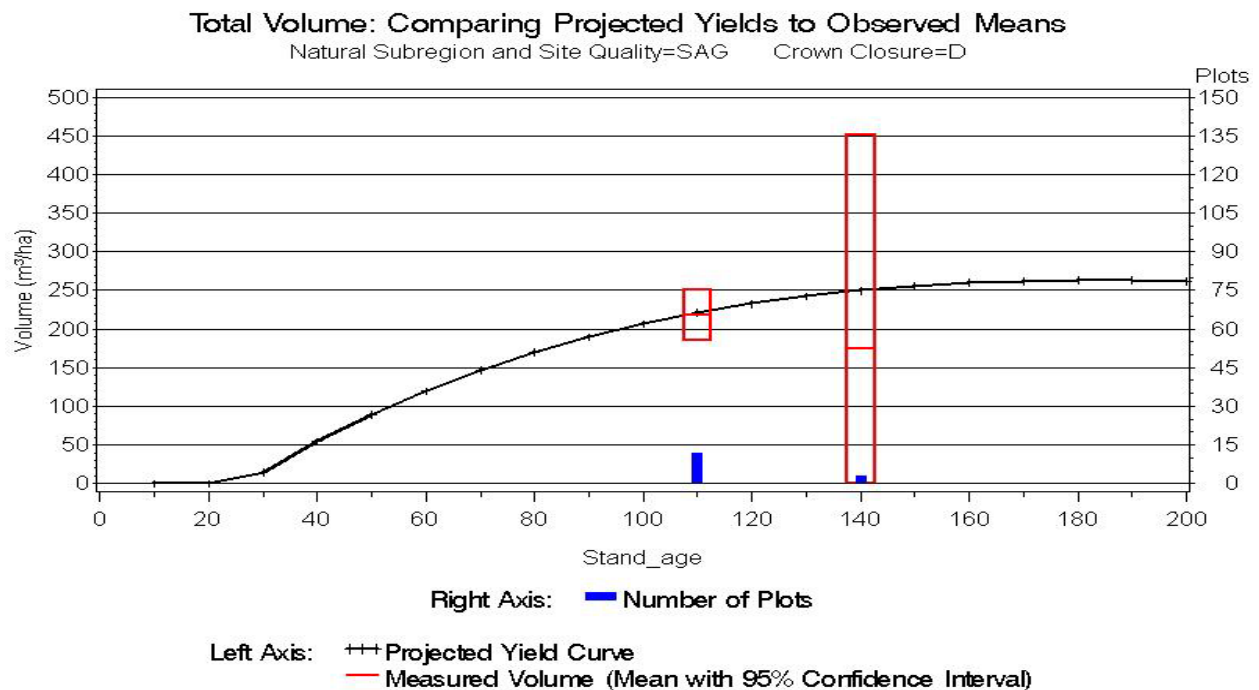
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 27. Yield stratum #20 - Projected total volume (NSR= SA, Site=G, and CC=B) from coniferous dominated stands compared to observed field measured means.



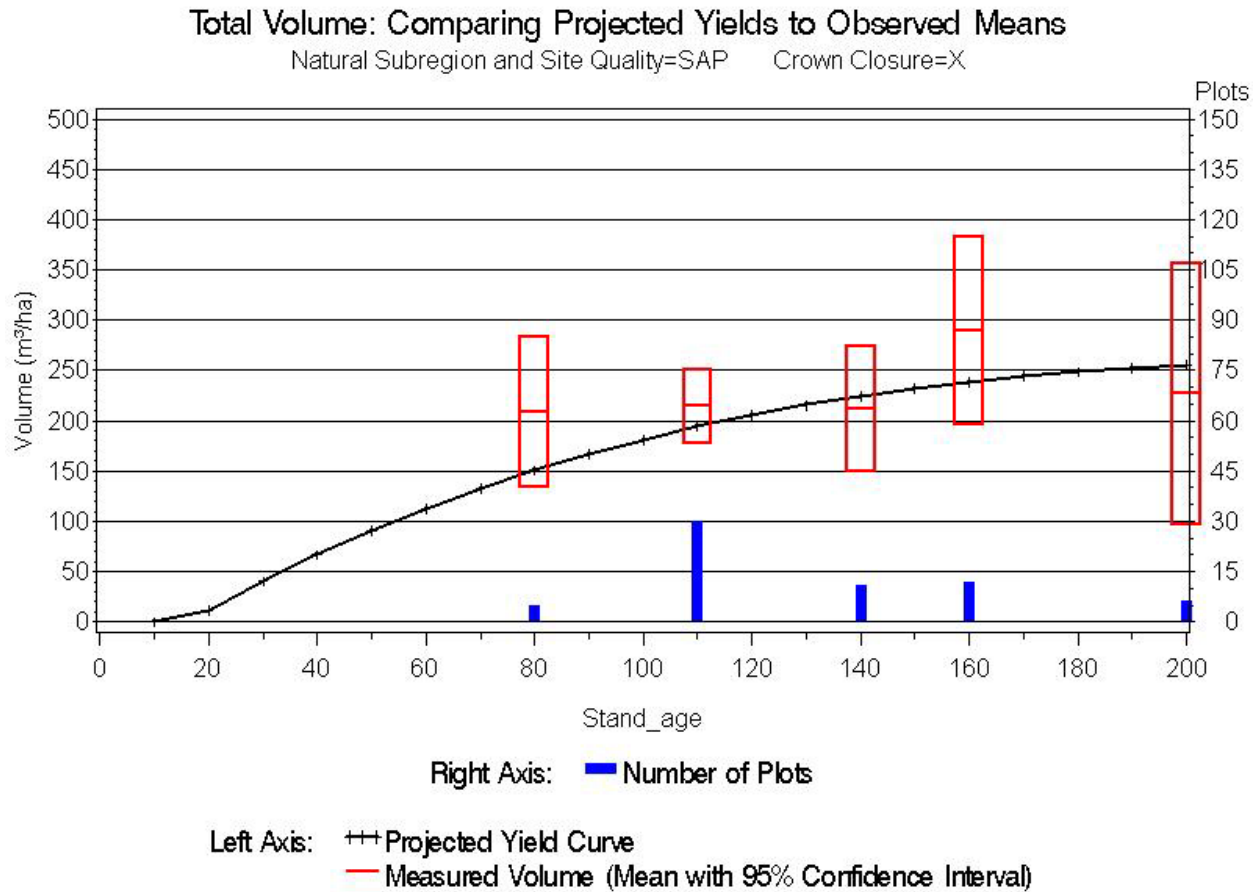
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 28. Yield stratum #21 - Projected total volume (NSR= SA, Site=G, and CC=C) from coniferous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 29. Yield stratum #22 - Projected total volume (NSR= SA, Site=G, and CC=D) from coniferous dominated stands compared to observed field measured means.



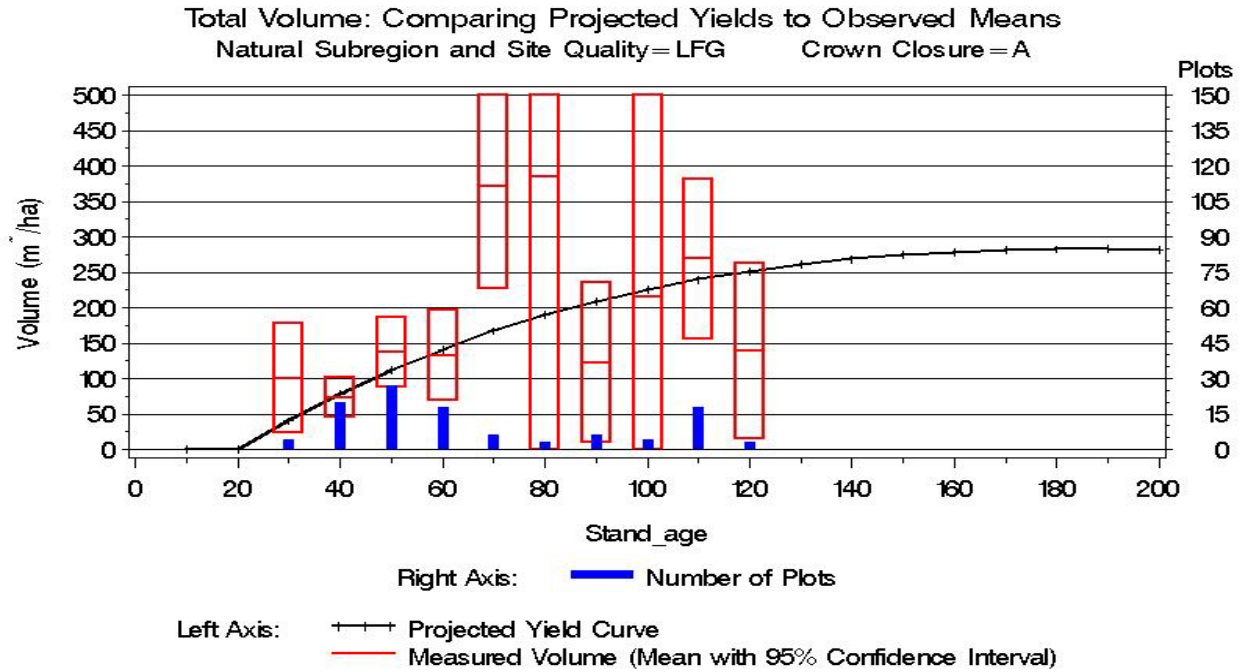
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 30. Yield stratum #23 - Projected total volume (NSR= SA, Site=A, and CC=A to D) from coniferous dominated stands compared to observed field measured means.

Verifying total yield projections from deciduous dominated stands

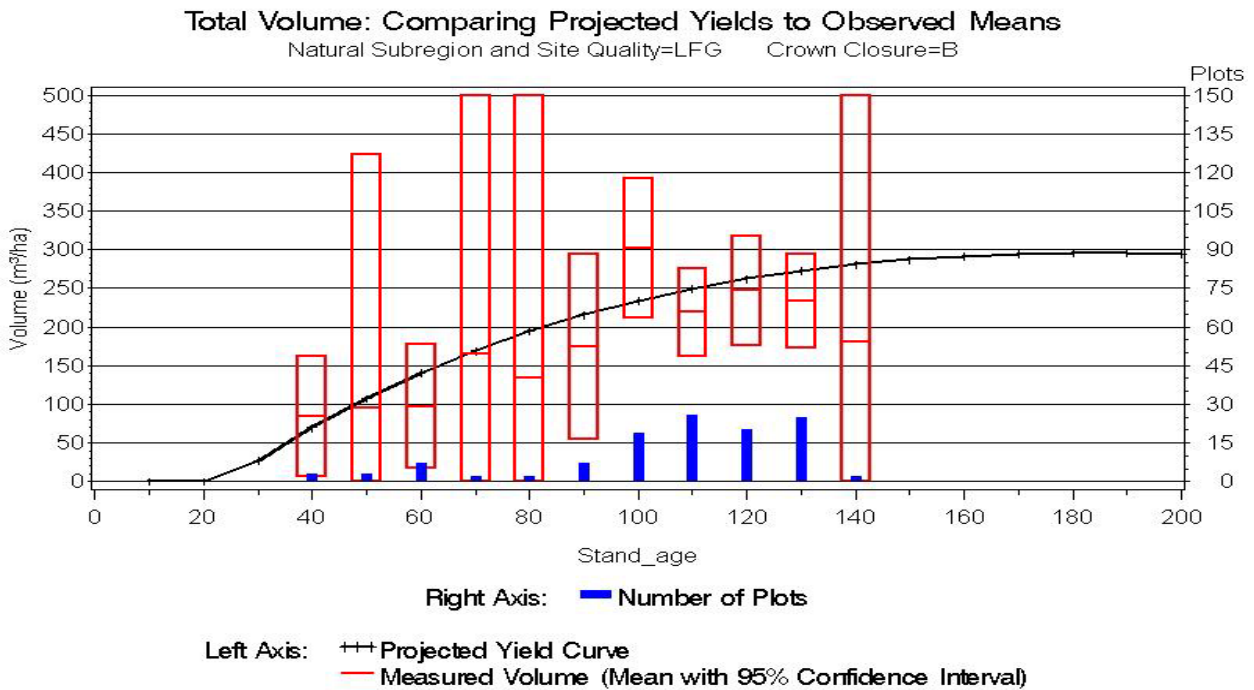
When compared to TSP field measured-mean volumes the total yield projections for the 8 major deciduous strata (due to a lack of plots the poor site yield strata was not included) are shown to be reasonable (Figure 31 to Figure 38). For the most part, all yield projections in the lower and upper foothills are comparable to the estimates provided by the TSP means.

When making these comparisons it must also be remembered that proposed yield curves have an additional deciduous mortality constant (section 2.6.6) applied (which is not included in the projections here to avoid confounding the comparison). Overall total volume projections for deciduous dominated stands match well with the field observed measurements.



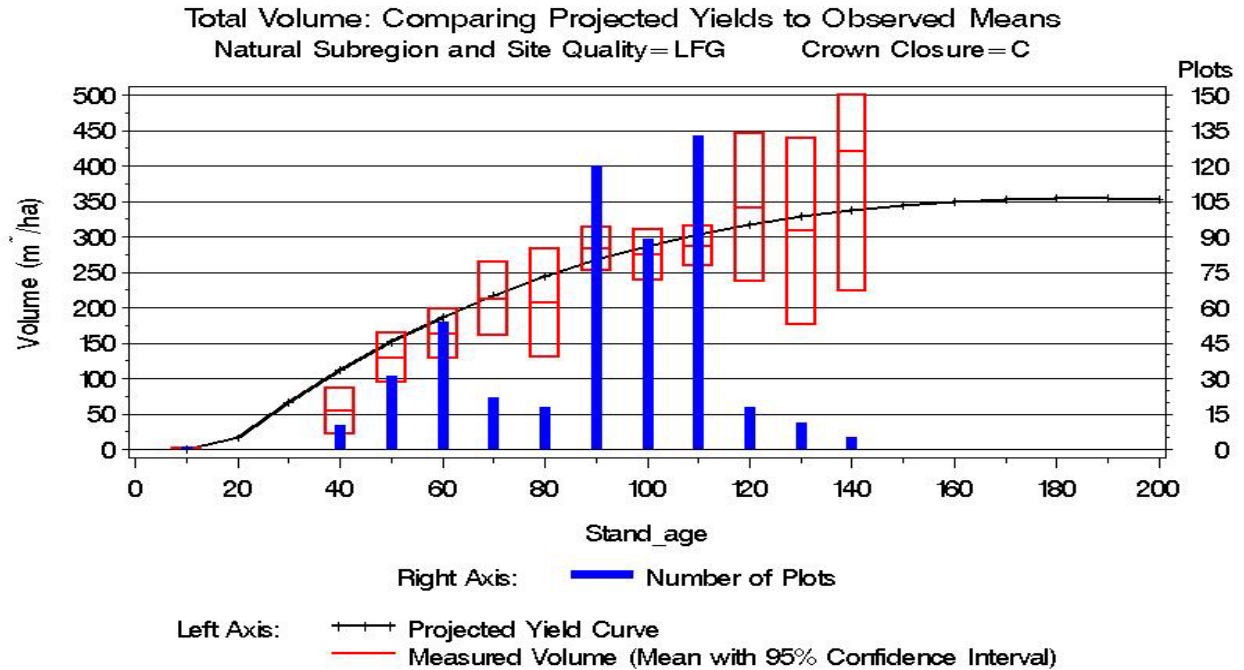
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 31. Yield stratum #1 - Projected total volume (NSR= LF, Site=G, and CC=A) from deciduous dominated stands compared to observed field measured means.



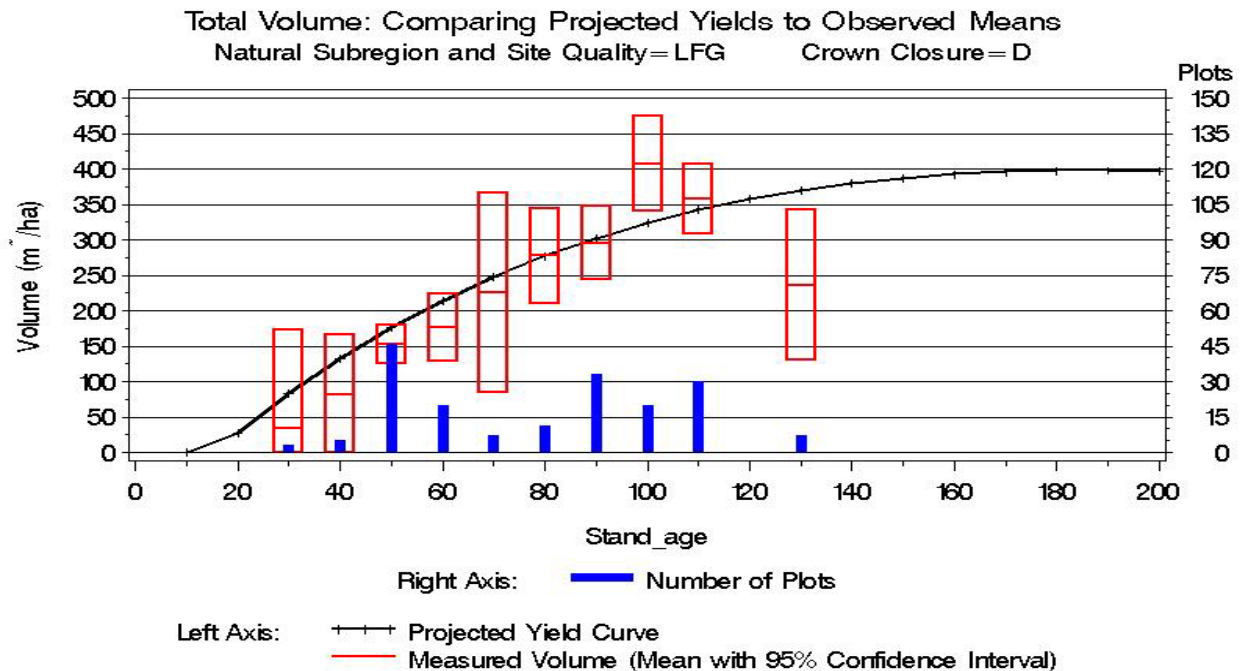
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 32. Yield stratum #2 - Projected total volume (NSR= LF, Site=G, and CC=B) from deciduous dominated stands compared to observed field measured means.



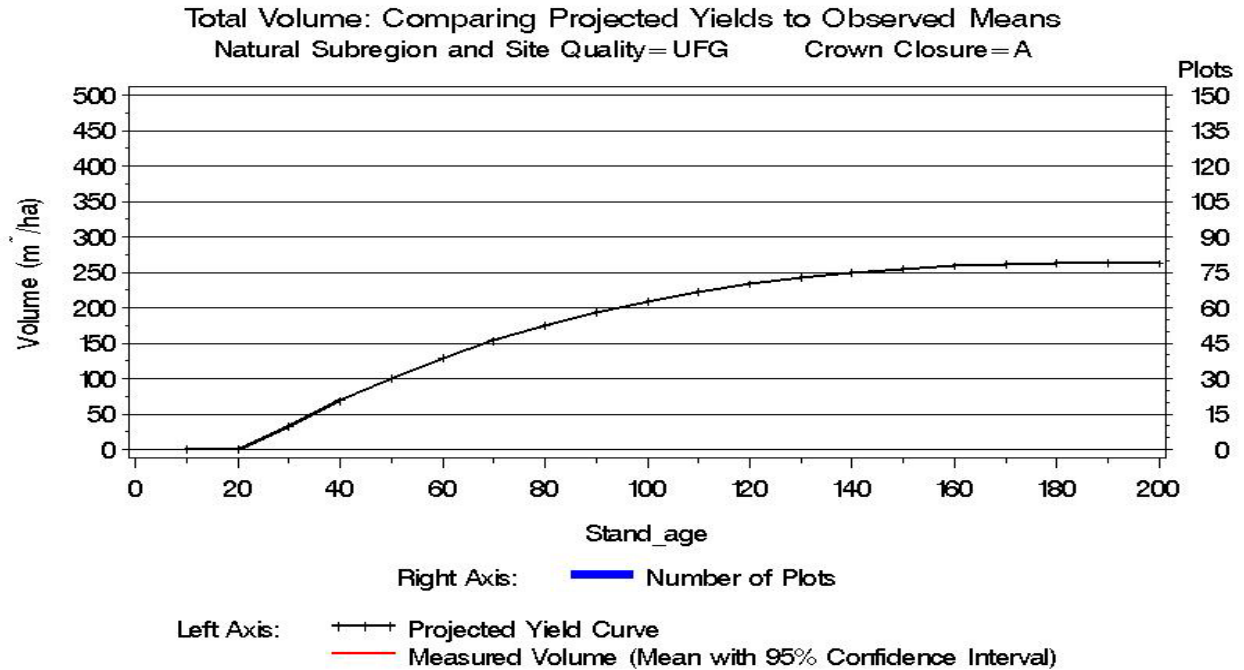
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 33. Yield stratum #3 - Projected total volume (NSR= LF, Site=G, and CC=C) from deciduous dominated stands compared to observed field measured means.



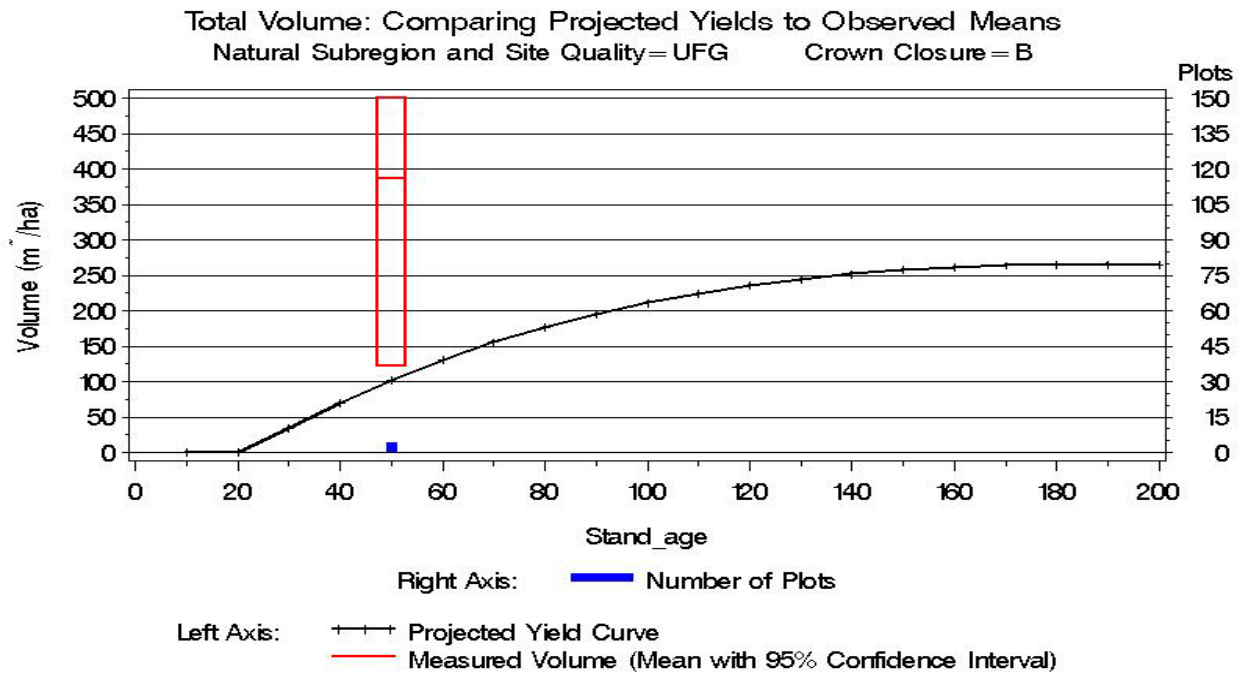
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 34. Yield stratum #4 - Projected total volume (NSR= LF, Site=G, and CC=D) from deciduous dominated stands compared to observed field measured means.



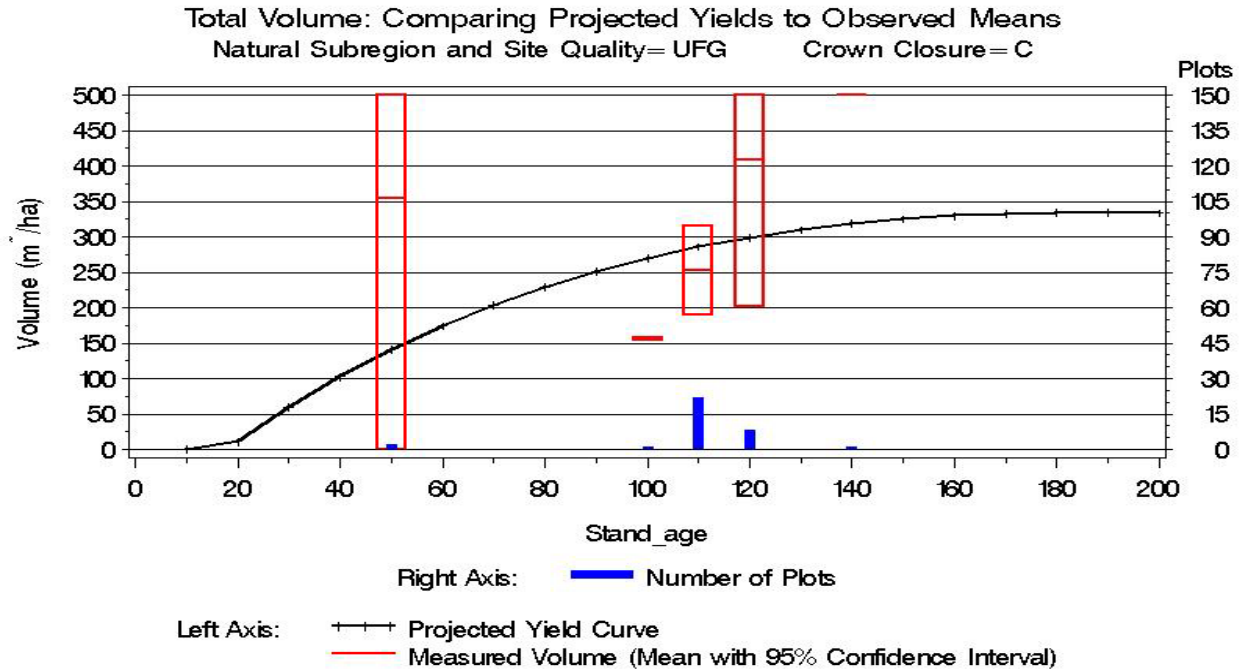
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 35. Yield stratum #5 - Projected total volume (NSR= UF, Site=G, and CC=A) from deciduous dominated stands compared to observed field measured means.



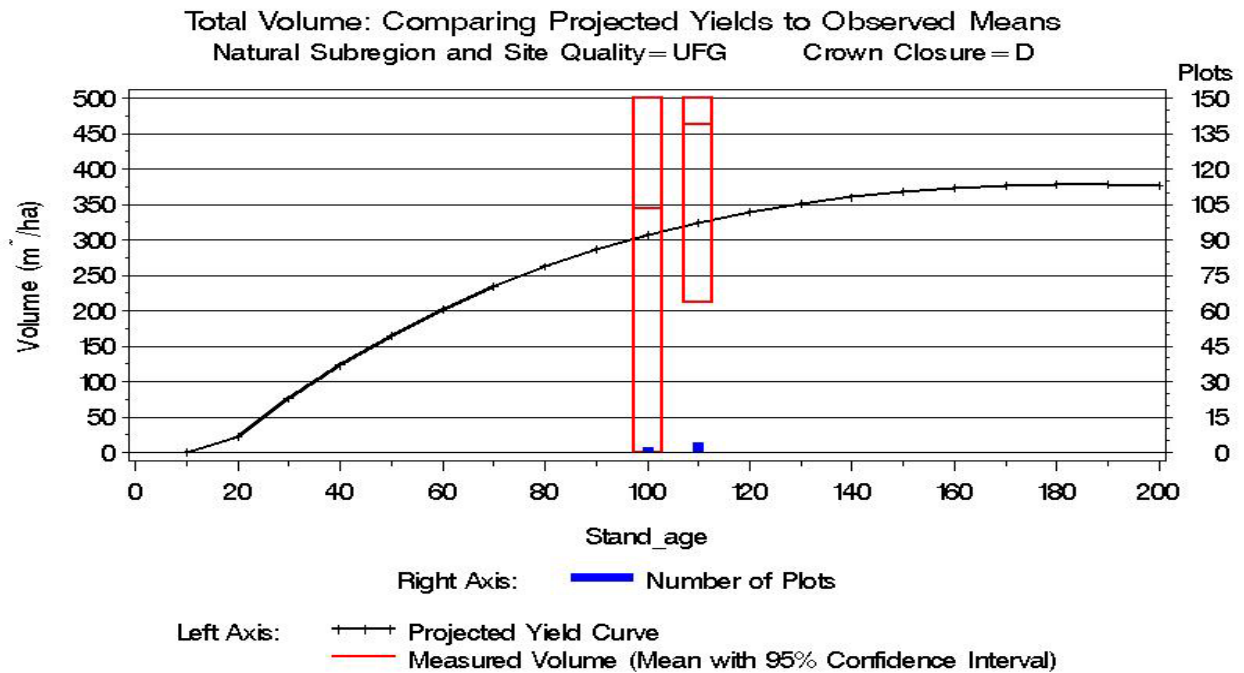
For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 36. Yield stratum #6 - Projected total volume (NSR= UF, Site=G, and CC=B) from deciduous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 37. Yield stratum #7 - Projected total volume (NSR= UF, Site=G, and CC=C) from deciduous dominated stands compared to observed field measured means.



For presentation purposes, upper confidence intervals were truncated at 500 m³/ha

Figure 38. Yield stratum #8 - Projected total volume (NSR= UF, Site=G, and CC=D) from deciduous dominated stands compared to observed field measured means.

Verifying major species volume projections

Major species volumes were estimated by Equation 9, which in effect represents major species volume as a proportion of total volume. Therefore, to check for errors an analysis was done that compared the proportional contribution of major species volume to total volume from field observations (coniferous volume/total volume – for coniferous dominated stands) to the results from Equation 9 with the total volume parameter removed:

$$\text{Proportion of total volume contributed by major species} = (c_0 + c_1 \bullet PC) \quad \text{Equation 13}$$

Coniferous Volumes

The results show that Equation 9 predicts coniferous volumes in accord with the field observations. The results are also consistent with statistical and biological expectations. For coniferous dominated stands in lower foothills, the proportion of coniferous species volume increases consistently with increasing AVI coniferous composition (Figure 39). The higher than expected field coniferous species proportions in the upper foothills are a result of low plot representation (e.g. there are only 2 plots in the upper foothills 40% AVI coniferous composition category, and both have 100% coniferous species). Moreover, the Sub-Alpine plots were also combined with the upper foothills. All sub-alpine plots show 100% conifer proportion. However, the predicted coniferous volume for these sites are comparable to the field measured means (Figure 17 to Figure 25).

Therefore, Equation 9 can be used with confidence for predicting the major species volume for coniferous dominated stands.

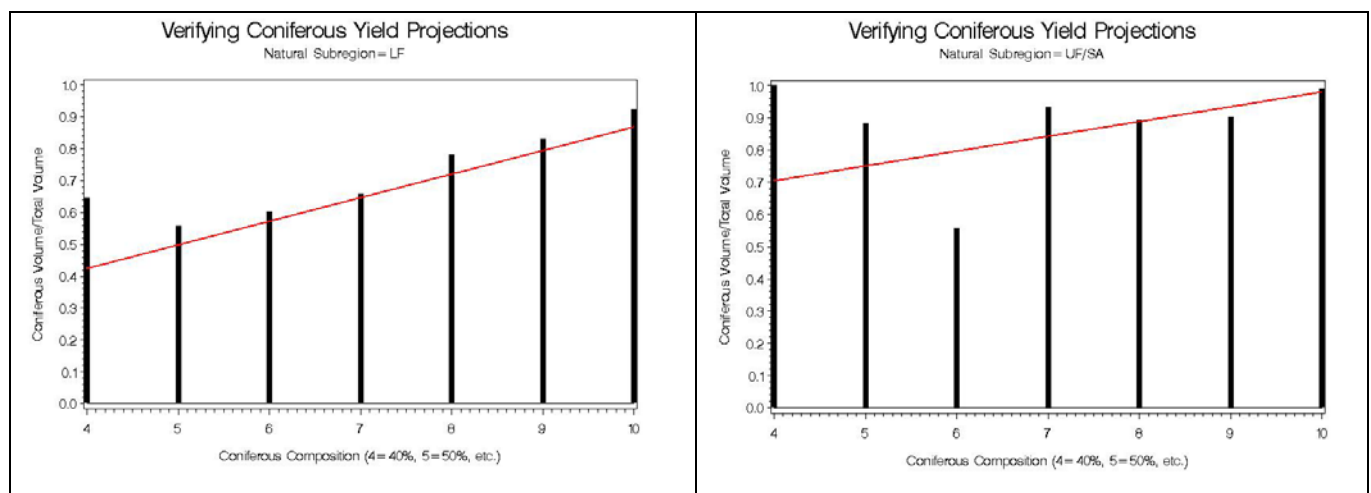
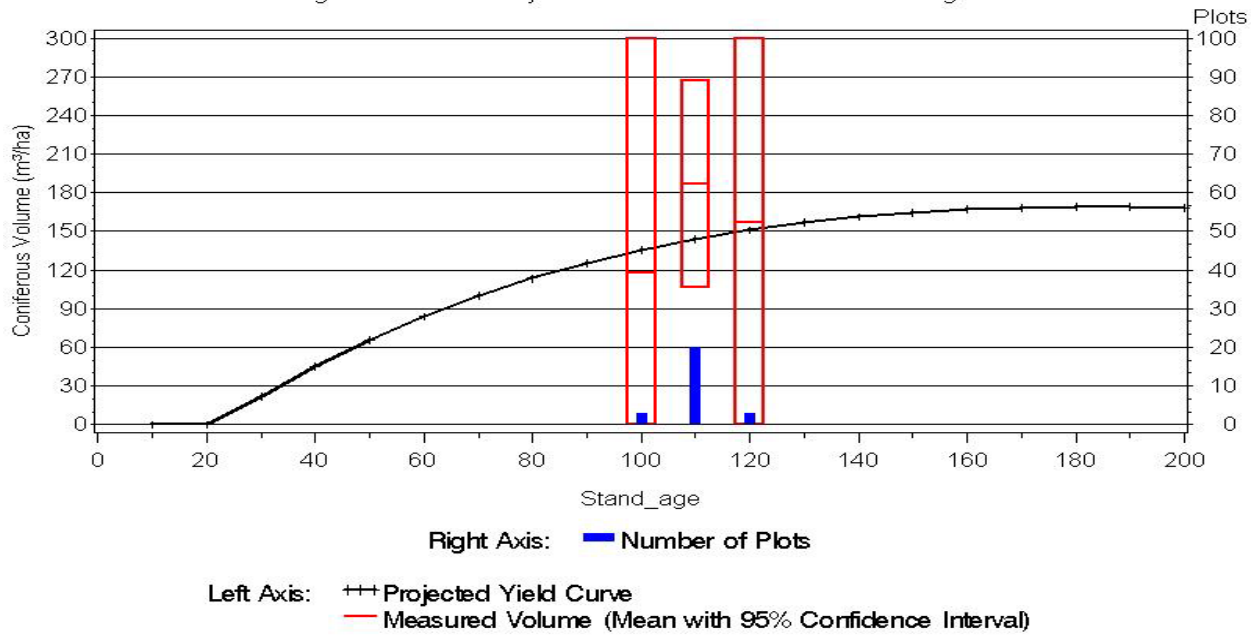


Figure 39. Verifying proportion of volume obtained from coniferous species based on different AVI coniferous composition on coniferous dominated stands (Yield projection versus field measured data).

Six examples of how coniferous volume predictions directly compare to field measured volumes

Coniferous Volumes: Comparing Projected Yields to Observed Means

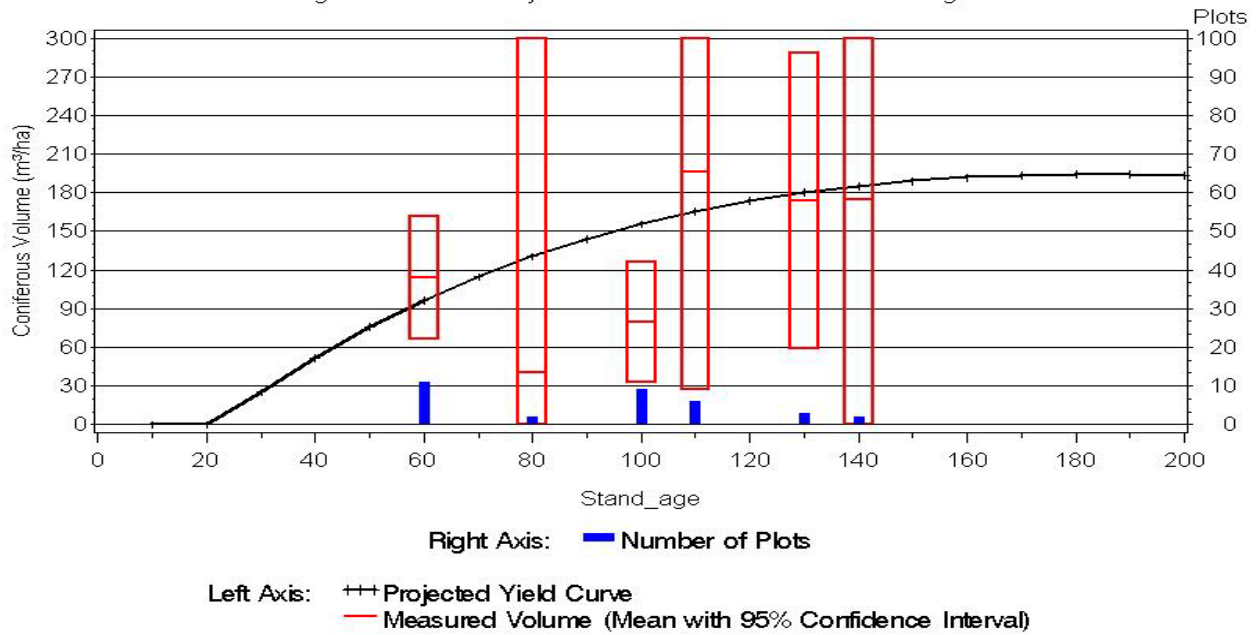
Natural Subregion and Site Quality=LFG Crown Closure=C Percentage Conifer=5



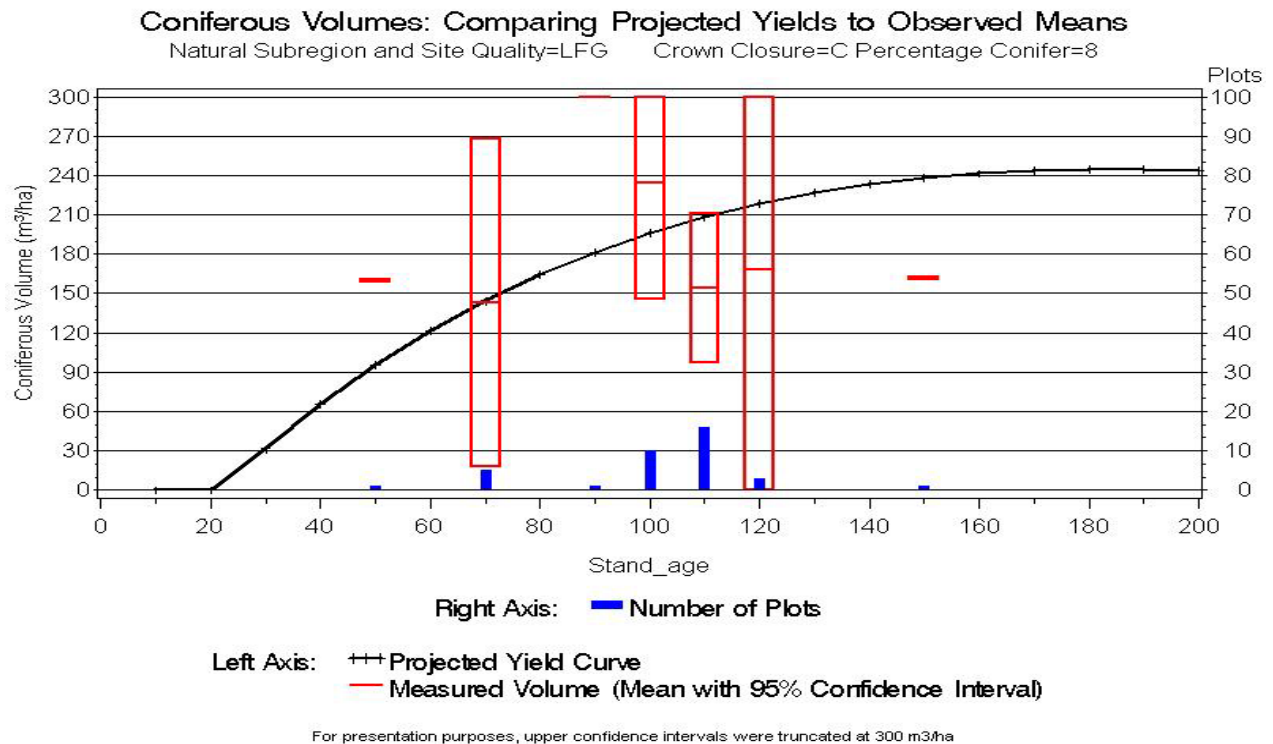
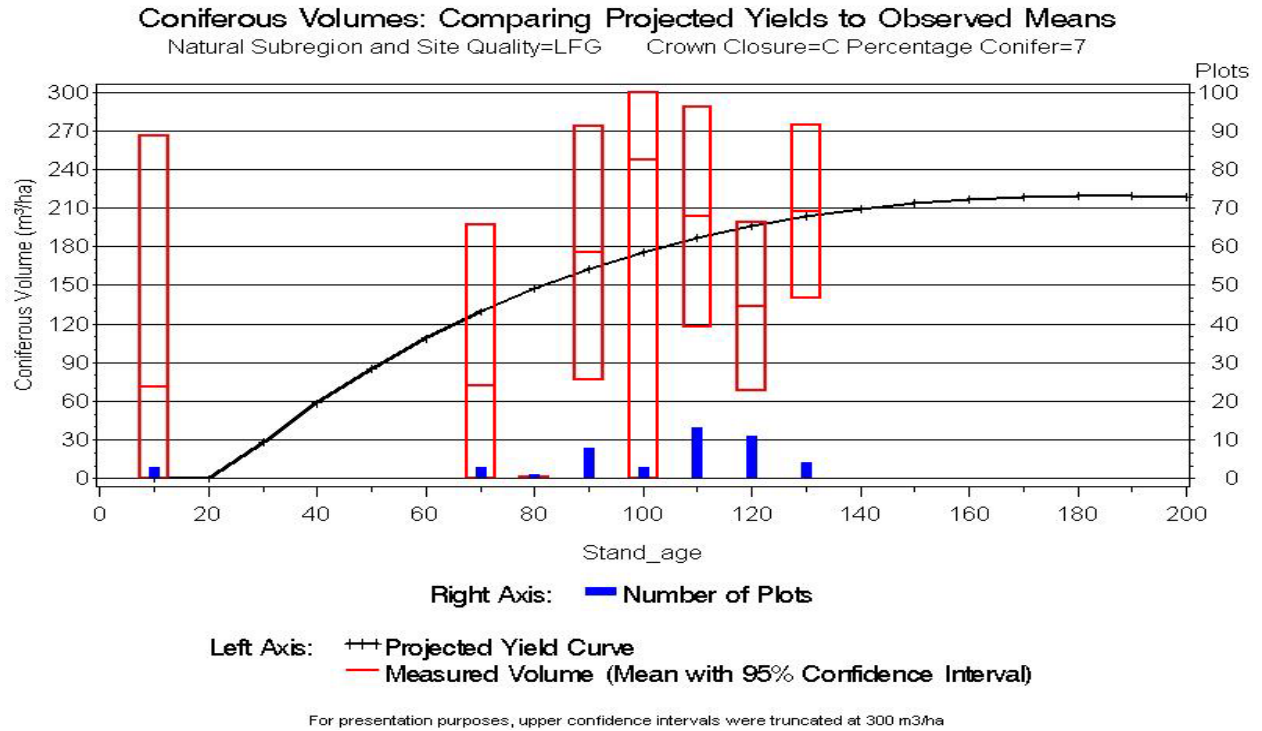
For presentation purposes, upper confidence intervals were truncated at 300 m3/ha

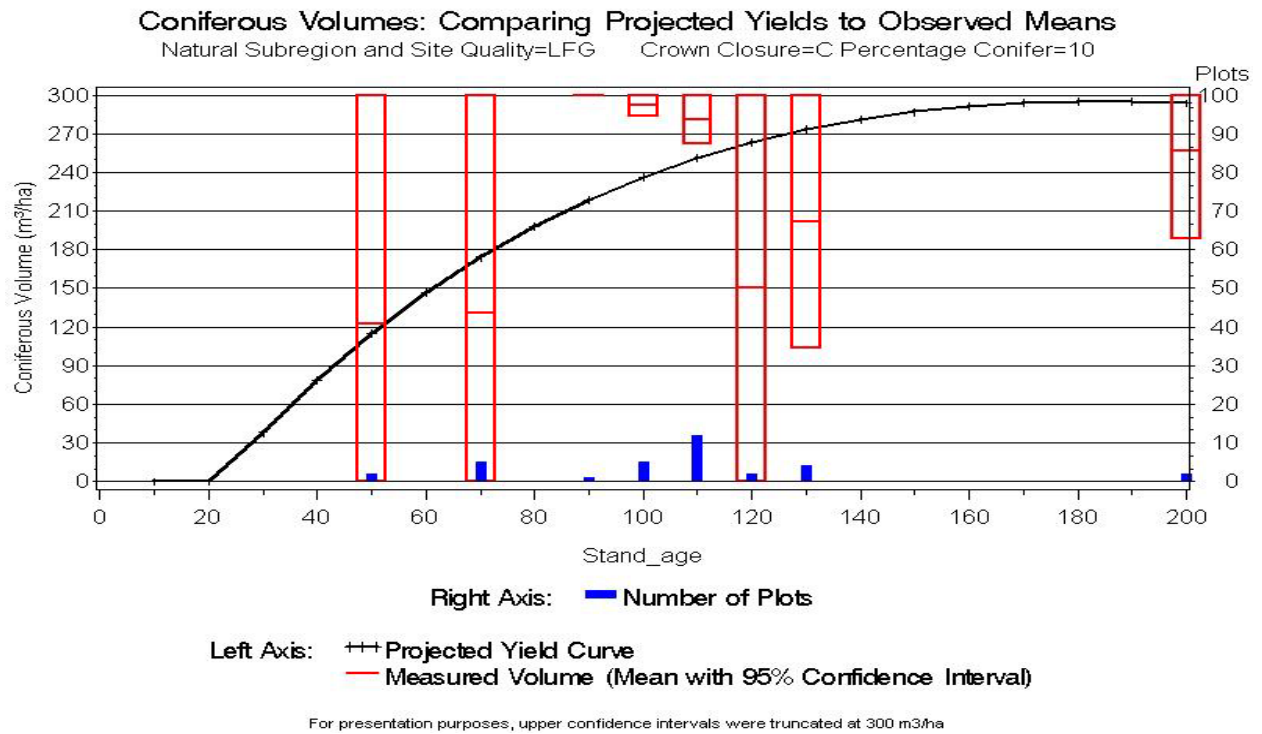
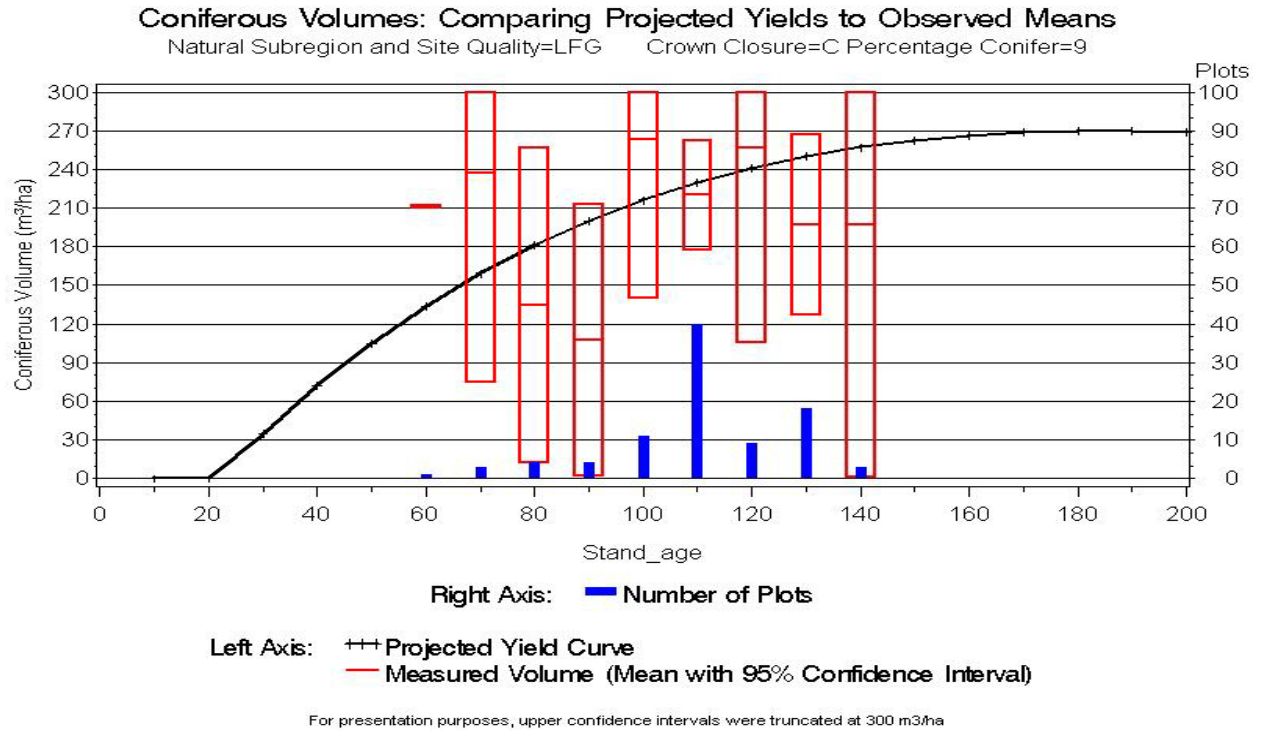
Coniferous Volumes: Comparing Projected Yields to Observed Means

Natural Subregion and Site Quality=LFG Crown Closure=C Percentage Conifer=6



For presentation purposes, upper confidence intervals were truncated at 300 m3/ha





Deciduous Volumes

The results show that Equation 9 predicts deciduous volumes in accord with the field observations. The results are also consistent with statistical and biological expectations. For deciduous dominated stands in the lower foothills the proportion of deciduous species volume increases consistently with increasing AVI deciduous composition (Figure 40). The lower than expected field coniferous species proportions in the upper foothills are a result of low plot representation. However, the predicted coniferous volume for these sites are comparable to the field measured means (Figure 35 to Figure 38).

Therefore, Equation 9 can be used with confidence for predicting the major species volume for deciduous dominated stands.

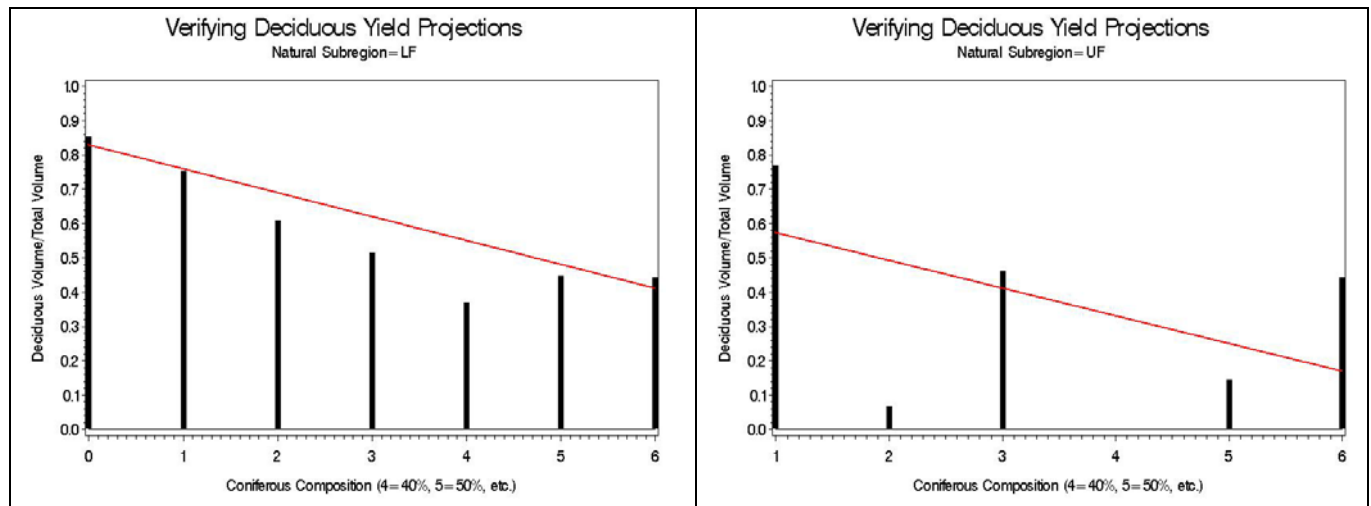
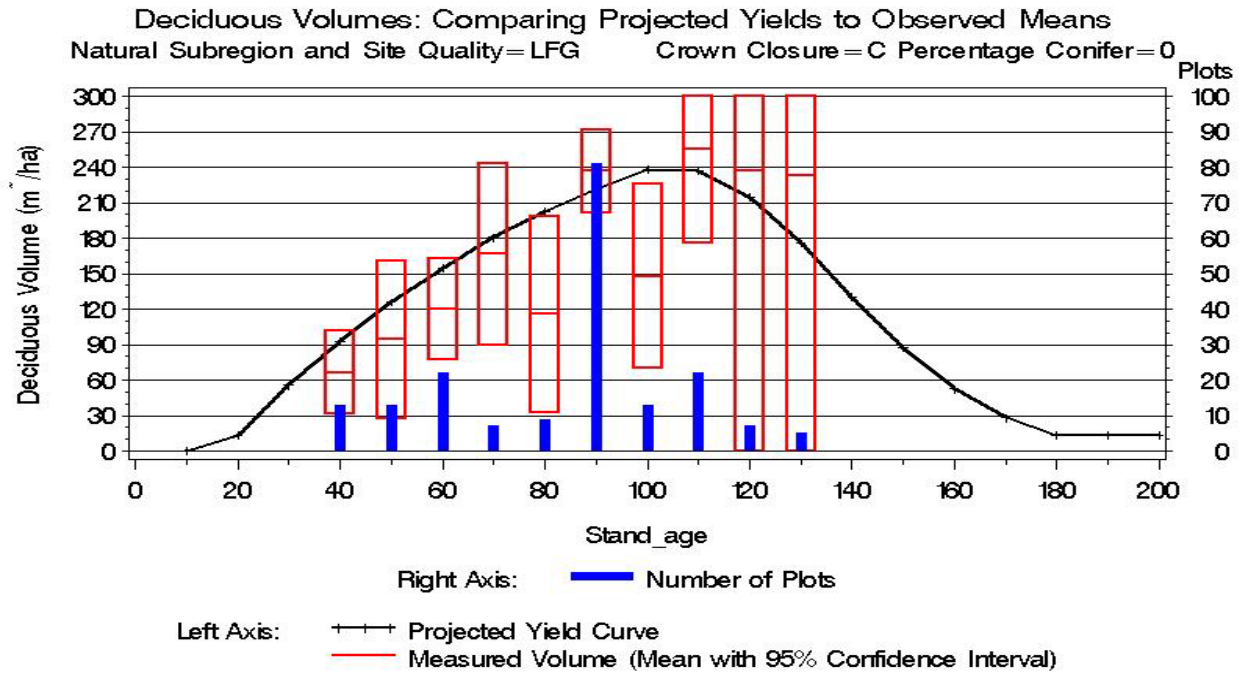
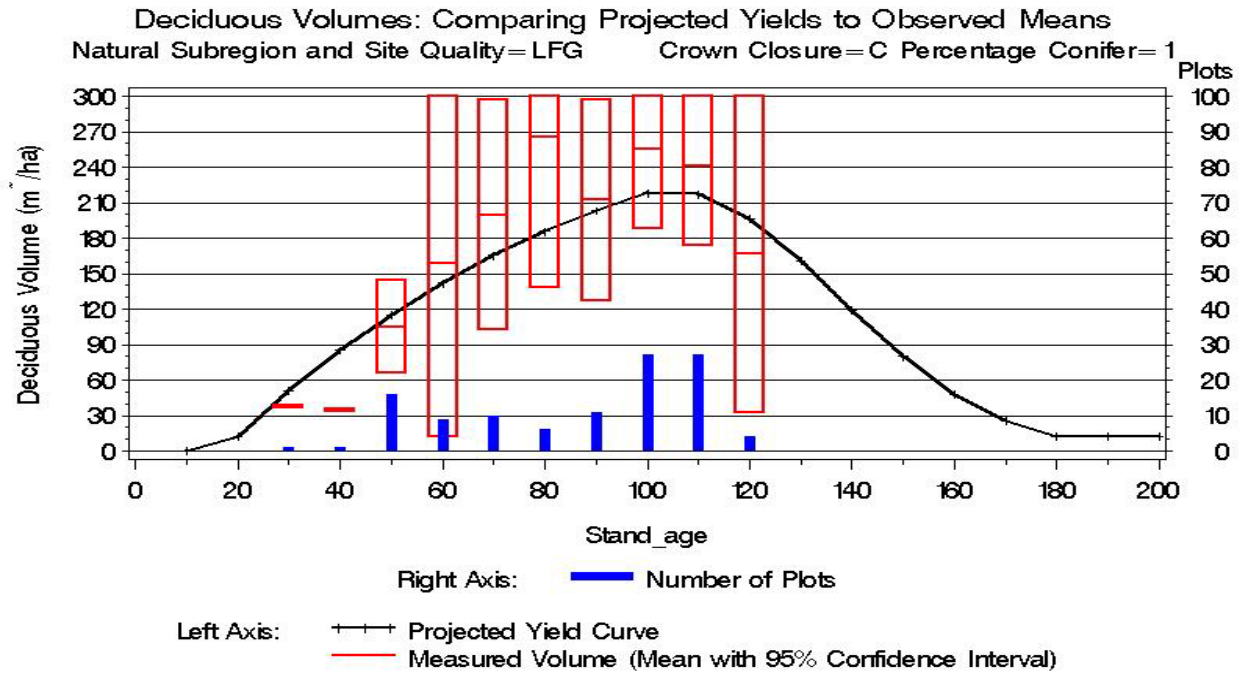


Figure 40. Verifying proportion of volume obtained from deciduous species based on different AVI coniferous composition on deciduous dominated stands (Yield projection versus field measured data).

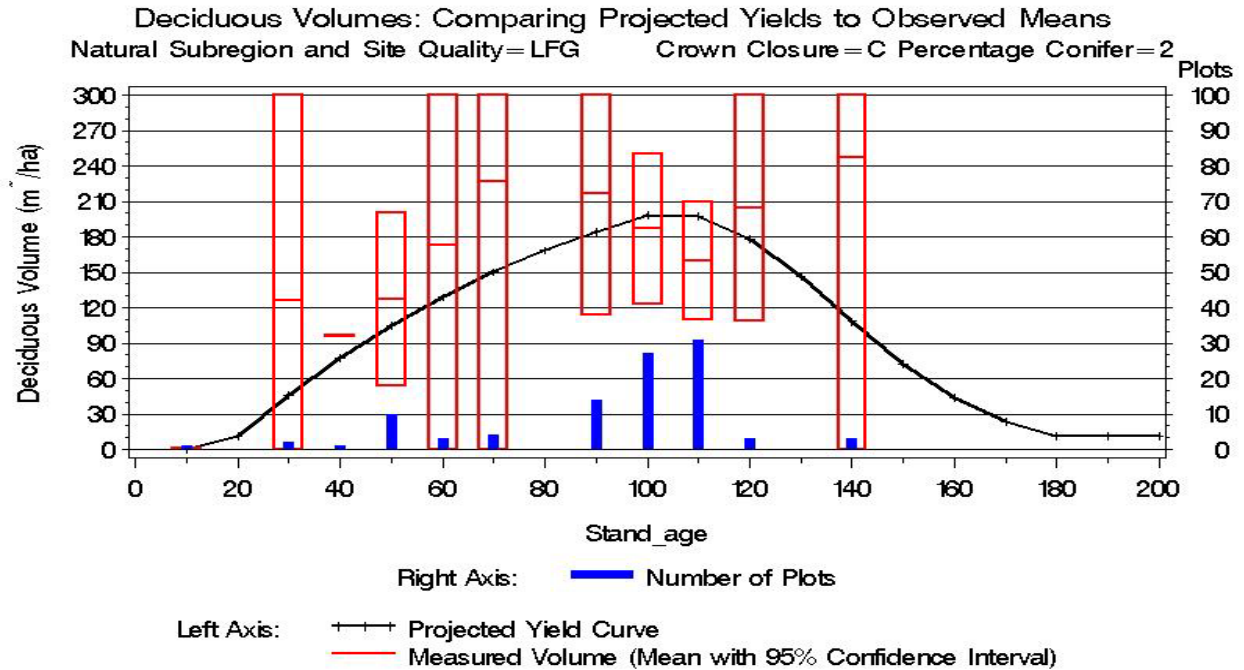
Six examples of how deciduous volume predictions directly compare to field measured volumes



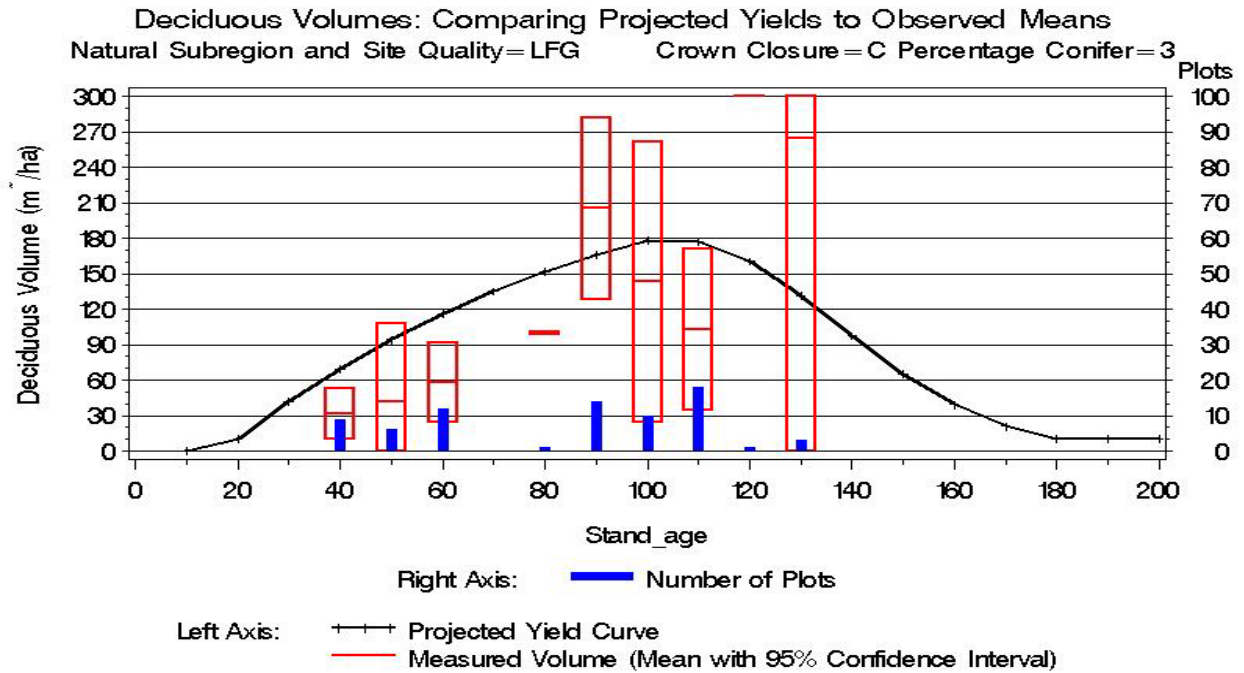
For presentation purposes, upper confidence intervals were truncated at 300 m³/ha



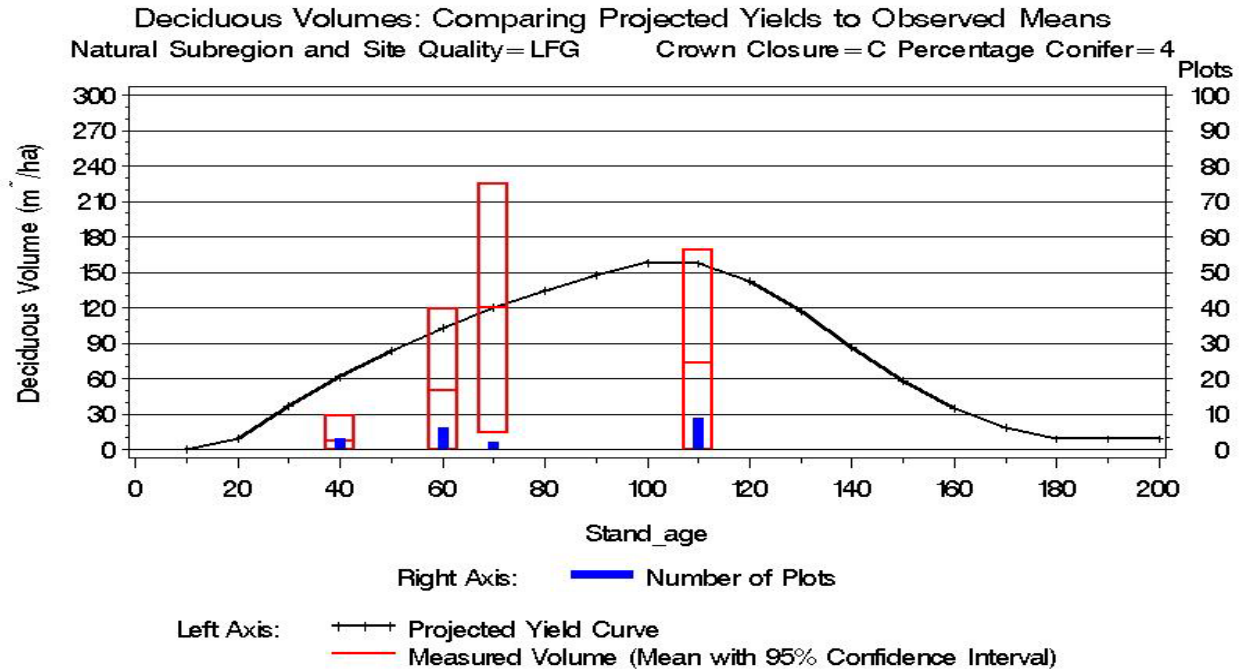
For presentation purposes, upper confidence intervals were truncated at 300 m³/ha



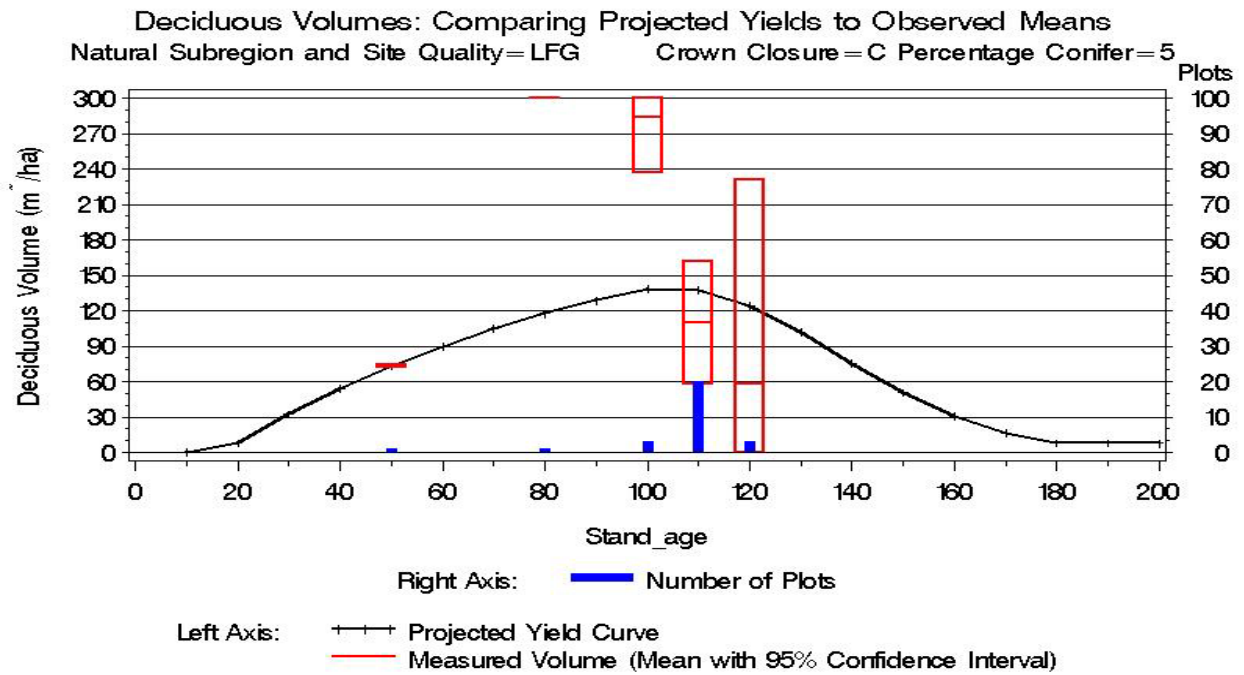
For presentation purposes, upper confidence intervals were truncated at 300 m³/ha



For presentation purposes, upper confidence intervals were truncated at 300 m³/ha



For presentation purposes, upper confidence intervals were truncated at 300 m³/ha



For presentation purposes, upper confidence intervals were truncated at 300 m³/ha

Analyzing plots in and out of the net landbase for bias

Of the 2, 720 plots that were evaluated for use in the total volume function 437 were in netted out areas (an area removed from the harvestable landbase). As discussed above subjective deletion stands were already removed from the analysis. Both the coniferous and deciduous plots below suggest that including these 437 plots do not bias the proposed yield curves. Mean total volume for all plots (inside and outside the net landbase) versus plots inside the net landbase by 20-year age class was not significantly different ($p>0.05$).

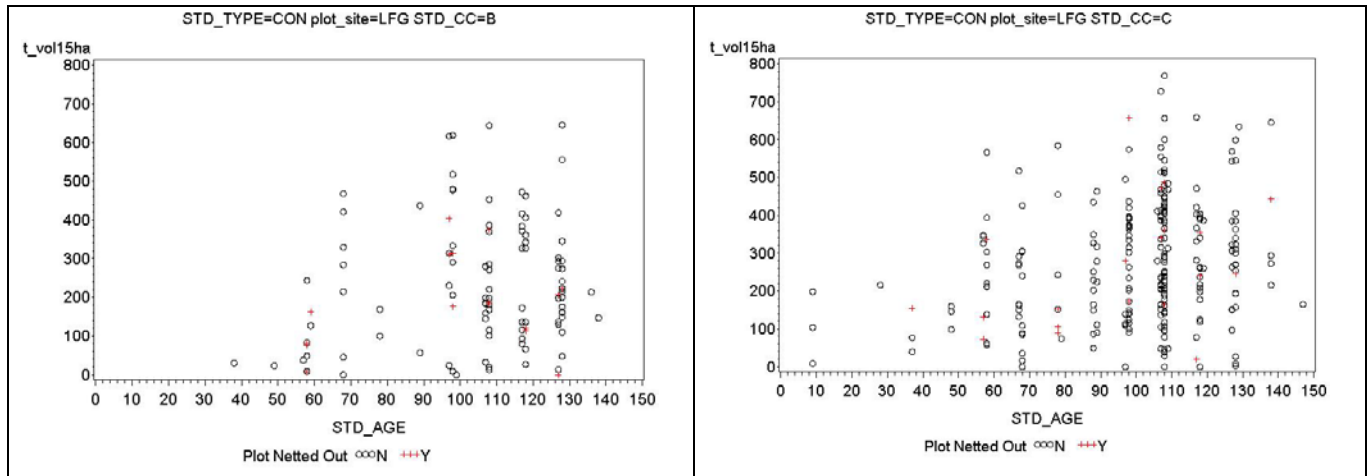


Figure 41. Comparison of plot volumes of plots located in netted-out areas (not removed due to subjective deletions) versus plots located in the net harvestable coniferous landbase.

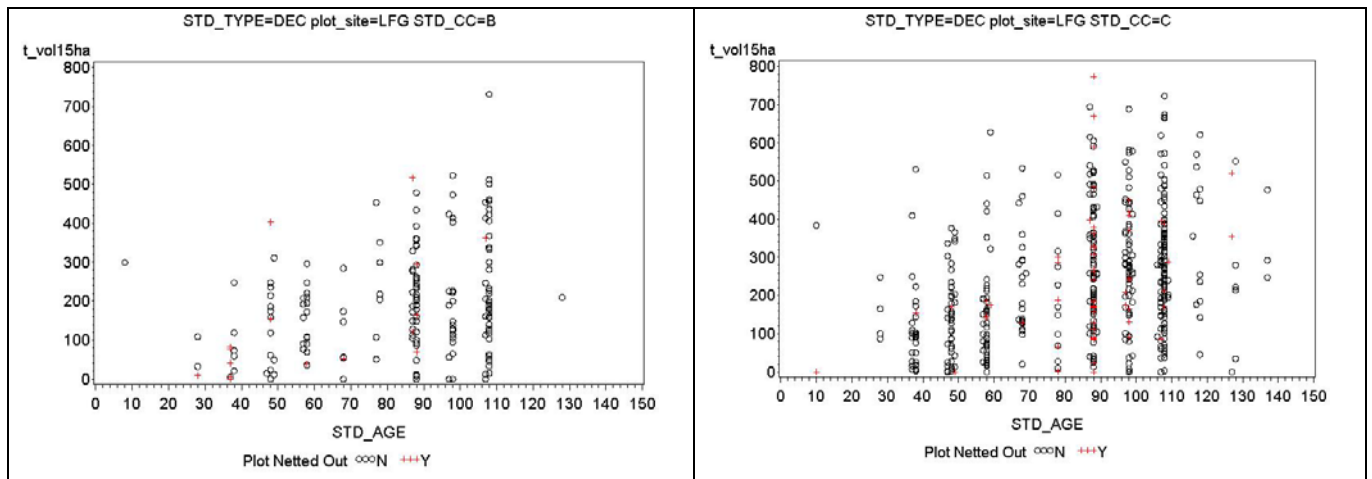


Figure 42. Comparison of plot volumes of plots located in netted-out areas (not removed due to subjective deletions) versus plots located in the net harvestable deciduous landbase.

APPENDIX III – ECOSITE GROUPING INTO SITE QUALITY

Program: *ecogroups.prg*

Site productivity categories were identified based on ecosite. SiteLogix was used to assign each plot to an ecosite based on the ecological classification system defined in *Field Guide to Ecosites of West-central Alberta*. Due to some ecosites being under represented in the Edson sampling program Drayton Valley FMA data were used to buttress the ecosites groupings (Please note: the compiled Drayton Valley data only is included in this submission – the raw plot data for the Edson FMA data is available upon request or can be viewed during the Edson yield curve submission). This is a reasonable approach because the two FMAs are within the same natural subregions (Lower and Upper Foothills) and have similar forest vegetation. In addition, Weyerhaeuser Company’s plans are to fully integrate sampling programs between the FMAs.

The following process was used to group site productivity classes:

1. Both Edson and Drayton Valley FMA TSP protocol included plot productivity information acquired by measuring the age and height of dominant and co-dominant trees.
2. The age and height of site trees (see section 2.3.1) were used to derive a site index value for deciduous and coniferous species groups at each plot.
3. Site index values for coniferous and deciduous species groups for each plot were stratified by ecosite classes based on the SiteLogix prediction for ecosites.
4. Box plots were used to analyze the distribution of site index values for SiteLogix ecosite calls.
5. Ecosite classes were grouped into productivity classes based on:
 - a. Median and mean productivity values,
 - b. Range of productivity variation,
 - c. Number of observations per class, and
 - d. Ecological relationship between classes.
 - e. Knowledge of harvesting history in the area

Table 23. Summary of assumed site quality for coniferous and deciduous stands by SiteLogix ecosite call.

Species Type	NSR	Site Quality	Ecosite Categories
Coniferous	LF	Good	E, F
		Medium	C, D, I
		Poor	A, B, G, H, J, K, L, M, N
	UF	Good	D, E, F
		Medium	C, H, J
		Poor	A, B, G, I, K, L, M, N
	SA	Good	C, E, G
		Medium	-
		Poor	D

Deciduous	LF	Good	E, F, I
		Medium	-
		Poor	A, B, C, D, G, H, J, K, L, M, N
	UF	Good	E, F
		Medium	-
		Poor	A, B, C, D, G, H, I, J, K, L, M, N

Note: Only two productivity classes were used to represent deciduous because of the narrow range of site utilization or low numbers of observations.

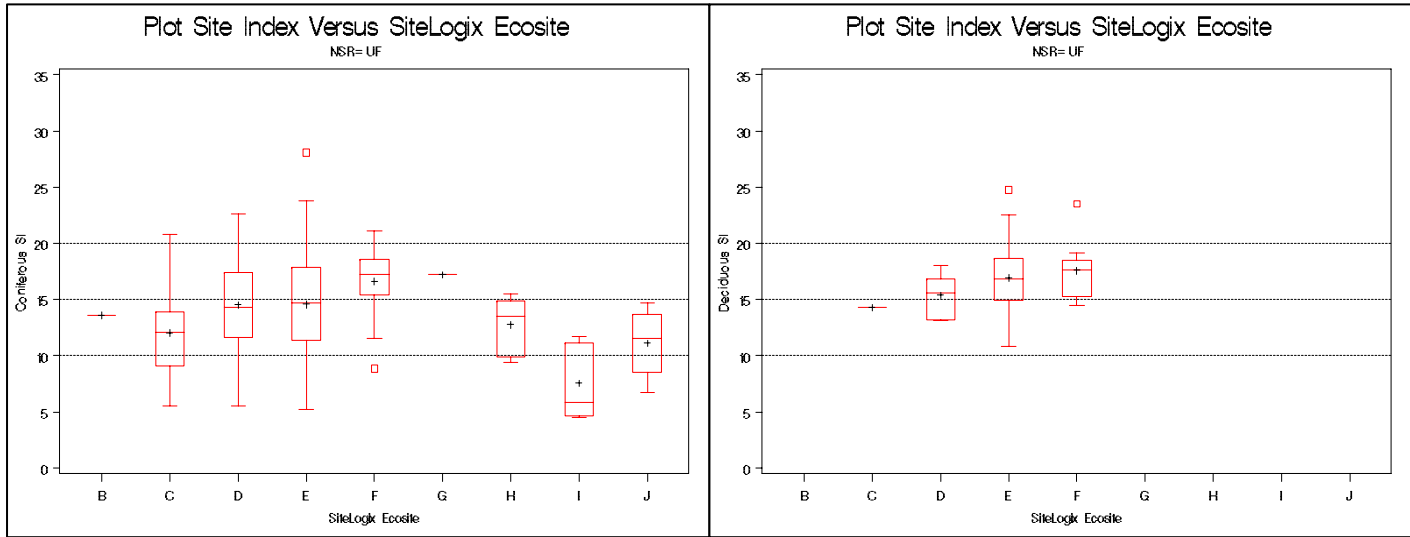


Figure 43. Distribution of site index in the Upper Foothills by SiteLogix (includes Edson and Drayton Valley data)

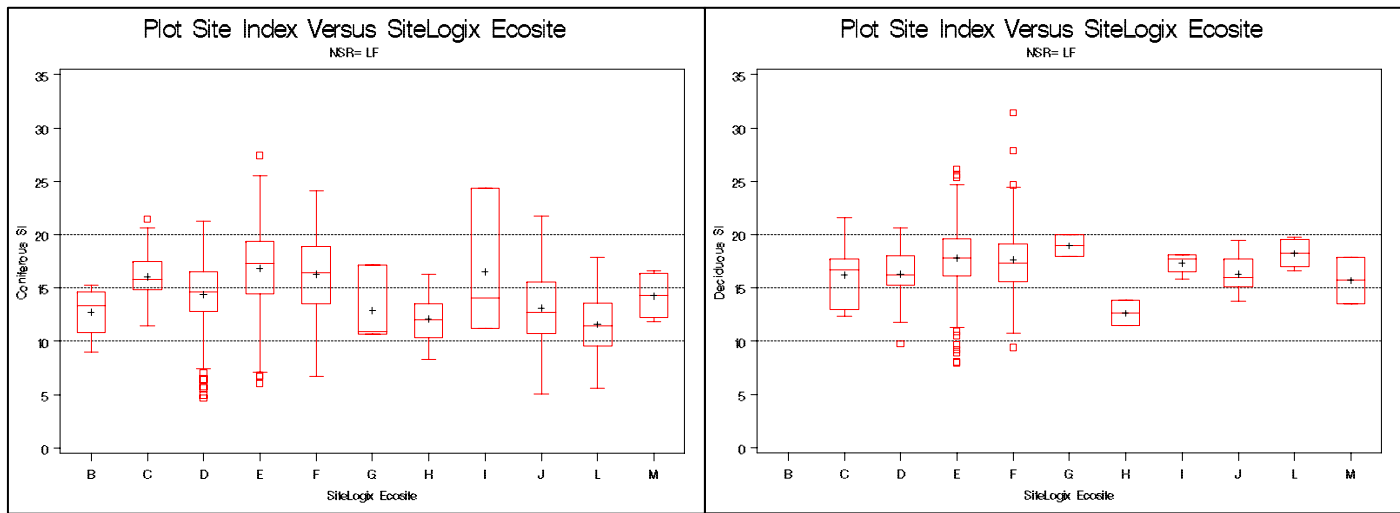


Figure 44. Distribution of site index in the Lower Foothills by SiteLogix ecosite (includes Edson and Drayton Valley data)

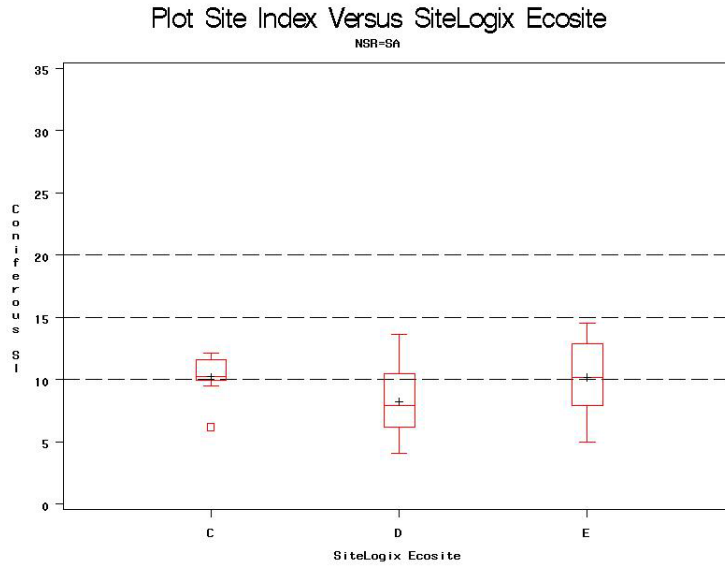


Figure 45. Distribution of site index values in the SubAlpine.

Timber Productivity Rating Versus SiteLogix

The AVI-based TPR rating was also compared to the SiteLogix ecosite based site quality rating to ensure no apparent bias. The average stand site index values by TPR compare well to the ecosite based site quality groups for the major strata (Table 24).

Table 24. Average stand site index by TPR and ecosite.

Natural SR	Site Productivity	Conifer		Deciduous	
		TPR	Ecosite	TPR	Ecosite
LF	G	17.2	17.0	18.3	18.4
LF	M	15.9	14.4	17.8	
LF	F (P)	13.5	13.8	16.9	
SA	G		10.2		
SA	M	13.6			
SA	F (P)	9.3	8.3		
UF	G	17.7	13.8	13.0	16.7
UF	M	15.2	11.0	16.5	
UF	F (P)	11.7	6.6	19.6	

Note: Fair (TPR) is compared to Poor (Ecosite).

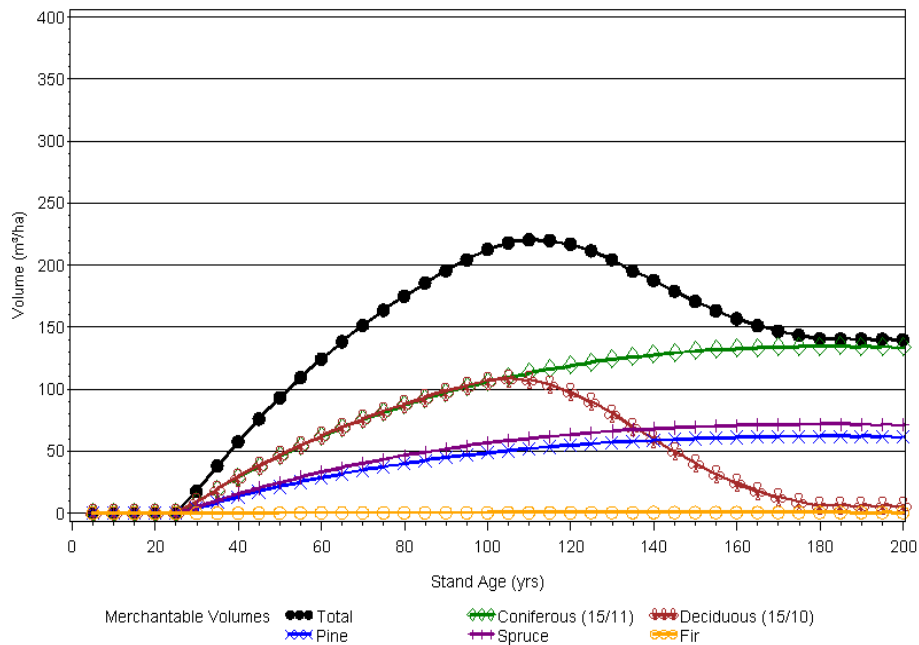
APPENDIX IV – YIELD CURVES

NSR & Site=LFG CC=A %Con=5 Yield Curve #=1

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	9	0.3	9	0.3
40	58	1.4	29	0.7	29	0.7
50	93	1.9	46	0.9	47	0.9
60	124	2.1	62	1.0	63	1.0
70	152	2.2	75	1.1	76	1.1
80	175	2.2	87	1.1	88	1.1
90	195	2.2	97	1.1	98	1.1
100	213	2.1	106	1.1	107	1.1
110	221	2.0	113	1.0	108	1.0
120	217	1.8	119	1.0	98	0.8
130	205	1.6	124	1.0	81	0.6
140	188	1.3	128	0.9	60	0.4
150	171	1.1	131	0.9	40	0.3
160	157	1.0	133	0.8	24	0.2
170	147	0.9	134	0.8	13	0.1
180	141	0.8	134	0.7	6	0.0
190	141	0.7	134	0.7	6	0.0
200	140	0.7	134	0.7	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=5 Yield Curve #=1

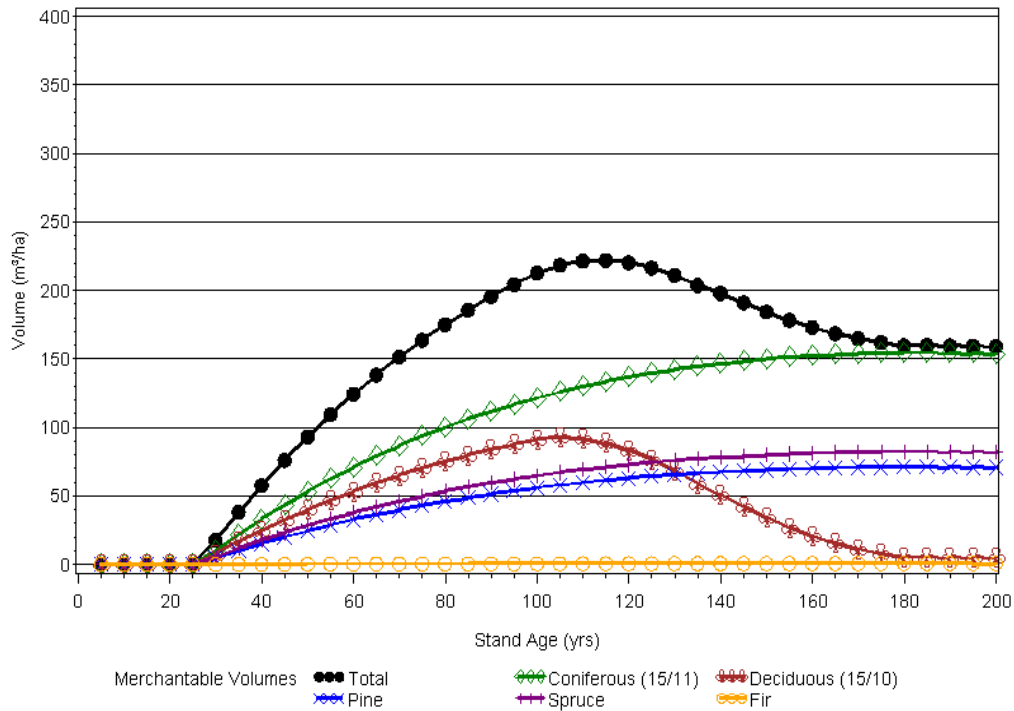


NSR & Site=LFG CC=A %Con=6 Yield Curve #=2

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	10	0.3	8	0.3
40	58	1.4	33	0.8	25	0.6
50	93	1.9	53	1.1	40	0.8
60	124	2.1	71	1.2	53	0.9
70	152	2.2	86	1.2	65	0.9
80	175	2.2	100	1.2	75	0.9
90	195	2.2	112	1.2	84	0.9
100	213	2.1	121	1.2	91	0.9
110	222	2.0	130	1.2	92	0.8
120	220	1.8	137	1.1	84	0.7
130	211	1.6	142	1.1	69	0.5
140	198	1.4	147	1.0	51	0.4
150	184	1.2	150	1.0	34	0.2
160	173	1.1	152	1.0	21	0.1
170	165	1.0	154	0.9	11	0.1
180	160	0.9	154	0.9	5	0.0
190	160	0.8	154	0.8	5	0.0
200	159	0.8	154	0.8	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=6 Yield Curve #=2

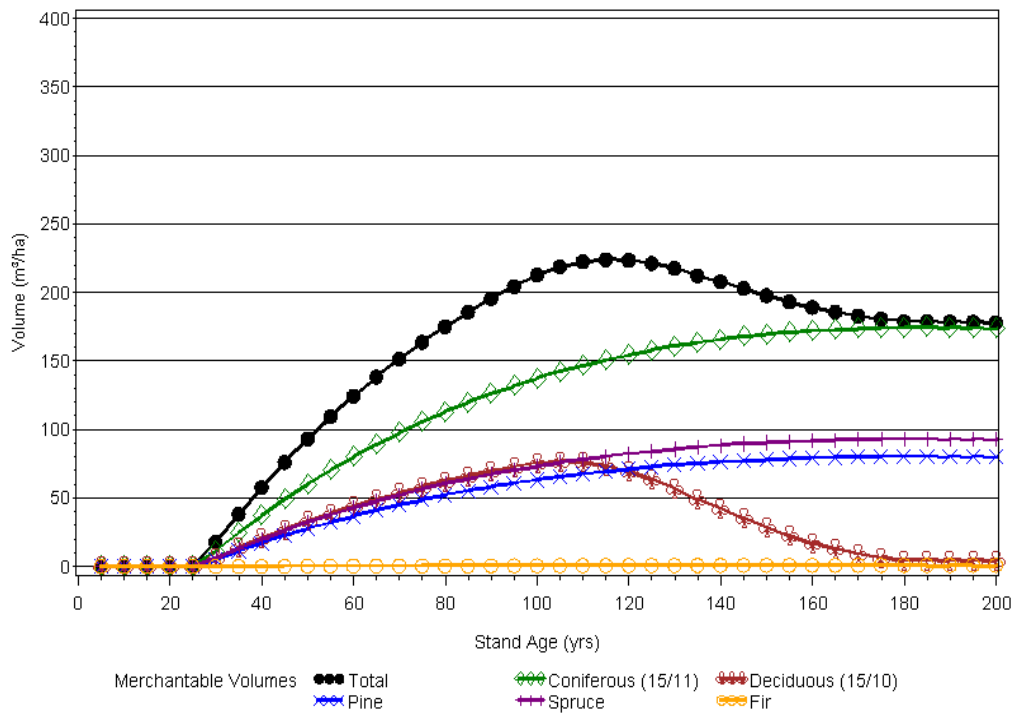


NSR & Site=LFG CC=A %Con=7 Yield Curve #=3

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	11	0.4	6	0.2
40	58	1.4	37	0.9	20	0.5
50	93	1.9	60	1.2	33	0.7
60	124	2.1	80	1.3	44	0.7
70	152	2.2	98	1.4	54	0.8
80	175	2.2	113	1.4	62	0.8
90	195	2.2	126	1.4	69	0.8
100	213	2.1	137	1.4	76	0.8
110	223	2.0	147	1.3	76	0.7
120	224	1.9	154	1.3	69	0.6
130	218	1.7	161	1.2	57	0.4
140	208	1.5	166	1.2	42	0.3
150	198	1.3	169	1.1	28	0.2
160	189	1.2	172	1.1	17	0.1
170	183	1.1	174	1.0	9	0.1
180	179	1.0	174	1.0	4	0.0
190	179	0.9	174	0.9	4	0.0
200	178	0.9	174	0.9	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=7 Yield Curve #=3

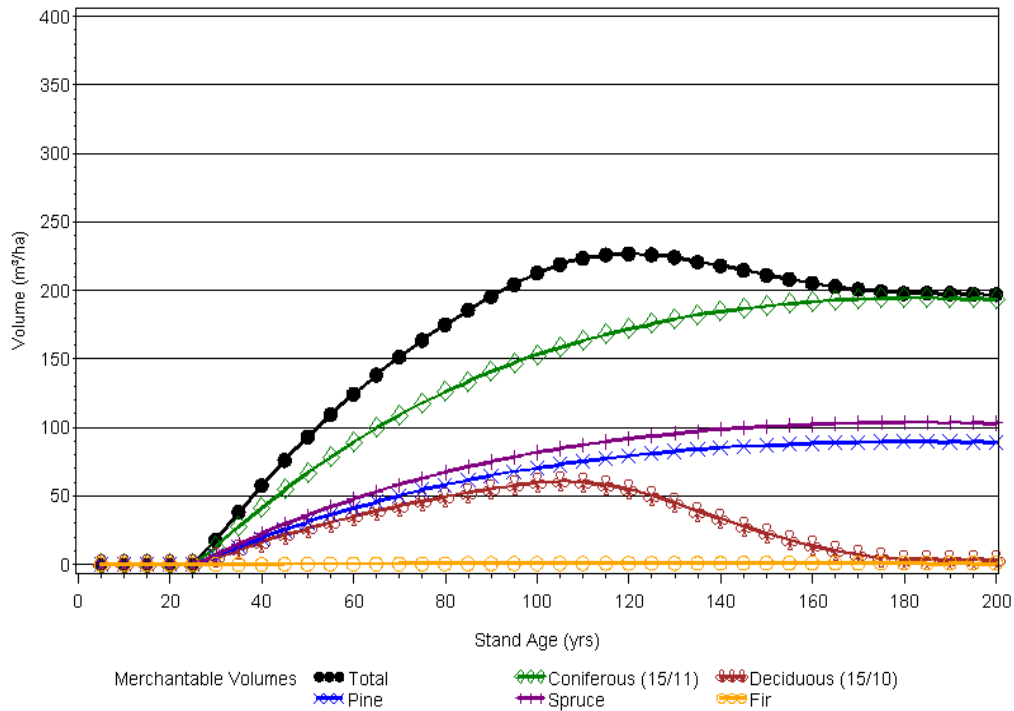


NSR & Site=LFG CC=A %Con=8 Yield Curve #=4

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	13	0.4	5	0.2
40	58	1.4	41	1.0	16	0.4
50	93	1.9	67	1.3	26	0.5
60	124	2.1	89	1.5	35	0.6
70	152	2.2	109	1.6	43	0.6
80	175	2.2	126	1.6	49	0.6
90	195	2.2	140	1.6	55	0.6
100	213	2.1	153	1.5	60	0.6
110	224	2.0	163	1.5	60	0.5
120	227	1.9	172	1.4	55	0.5
130	224	1.7	179	1.4	45	0.3
140	218	1.6	185	1.3	34	0.2
150	211	1.4	189	1.3	23	0.2
160	205	1.3	192	1.2	14	0.1
170	201	1.2	194	1.1	7	0.0
180	198	1.1	194	1.1	4	0.0
190	198	1.0	194	1.0	3	0.0
200	197	1.0	193	1.0	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=8 Yield Curve #=4

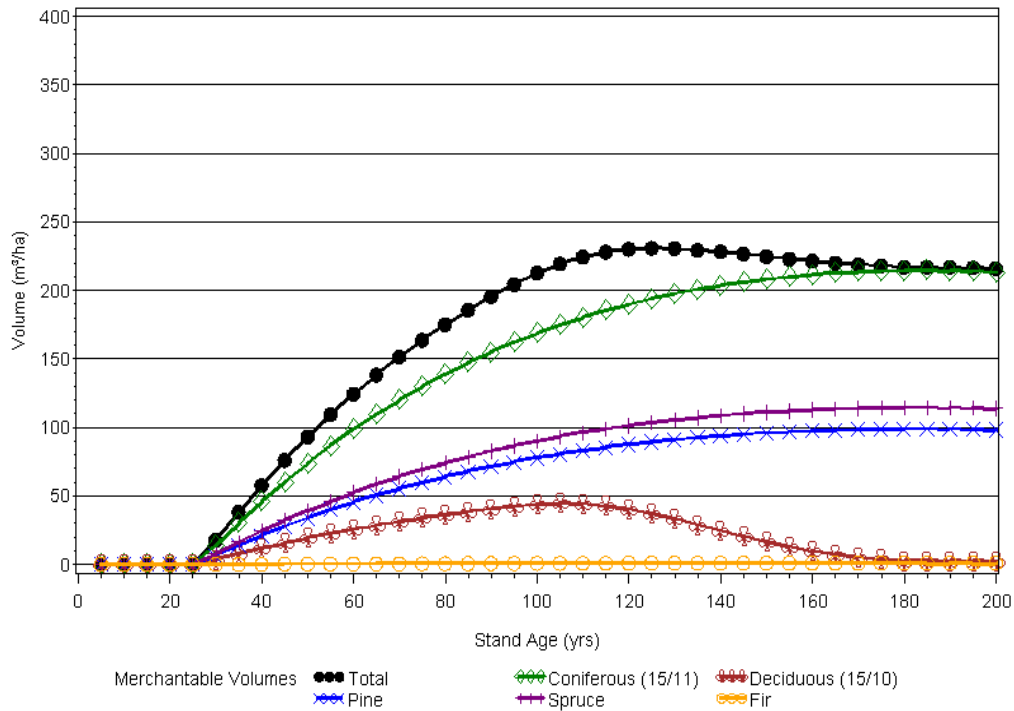


NSR & Site=LFG CC=A %Con=9 Yield Curve #=5

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	14	0.5	4	0.1
40	58	1.4	46	1.1	12	0.3
50	93	1.9	74	1.5	19	0.4
60	124	2.1	99	1.6	26	0.4
70	152	2.2	120	1.7	31	0.4
80	175	2.2	139	1.7	36	0.5
90	195	2.2	155	1.7	41	0.5
100	213	2.1	169	1.7	44	0.4
110	225	2.0	180	1.6	44	0.4
120	230	1.9	190	1.6	40	0.3
130	231	1.8	198	1.5	33	0.3
140	228	1.6	204	1.5	25	0.2
150	225	1.5	208	1.4	17	0.1
160	221	1.4	211	1.3	10	0.1
170	219	1.3	213	1.3	5	0.0
180	217	1.2	214	1.2	3	0.0
190	217	1.1	214	1.1	3	0.0
200	216	1.1	213	1.1	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=9 Yield Curve #=5

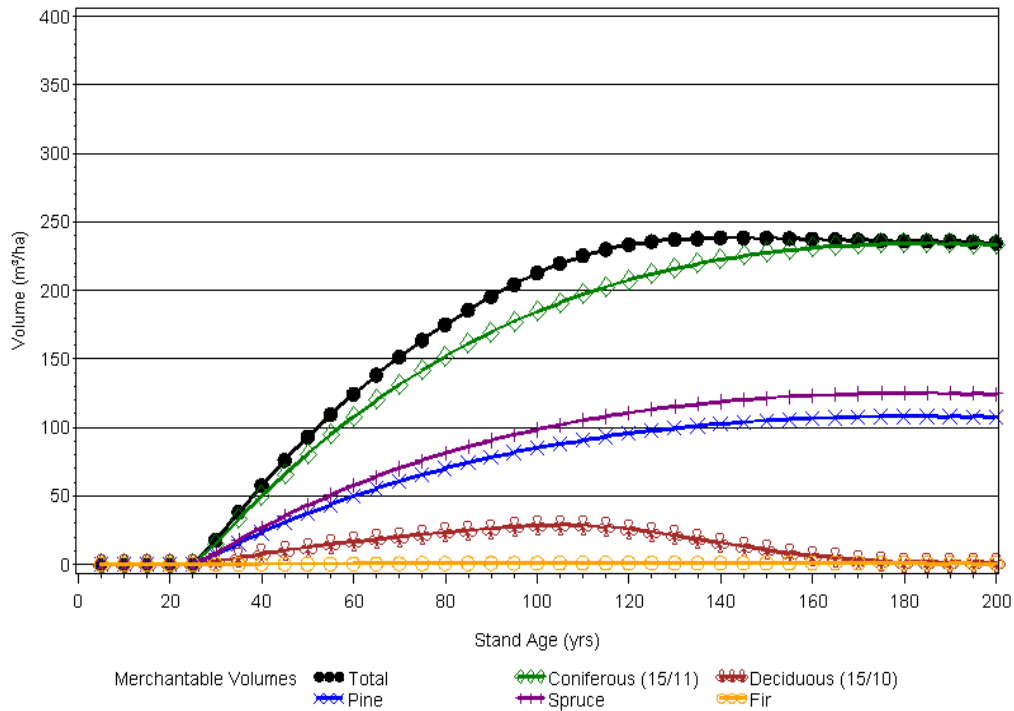


NSR & Site=LFG CC=A %Con=10 Yield Curve #=6

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	18	0.6	15	0.5	2	0.1
40	58	1.4	50	1.3	8	0.2
50	93	1.9	81	1.6	12	0.2
60	124	2.1	108	1.8	17	0.3
70	152	2.2	131	1.9	20	0.3
80	175	2.2	152	1.9	23	0.3
90	195	2.2	169	1.9	26	0.3
100	213	2.1	184	1.8	28	0.3
110	226	2.1	197	1.8	29	0.3
120	233	1.9	207	1.7	26	0.2
130	237	1.8	216	1.7	21	0.2
140	239	1.7	223	1.6	16	0.1
150	238	1.6	228	1.5	11	0.1
160	238	1.5	231	1.4	6	0.0
170	237	1.4	233	1.4	3	0.0
180	236	1.3	234	1.3	2	0.0
190	236	1.2	234	1.2	2	0.0
200	235	1.2	233	1.2	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=A %Con=10 Yield Curve #=6

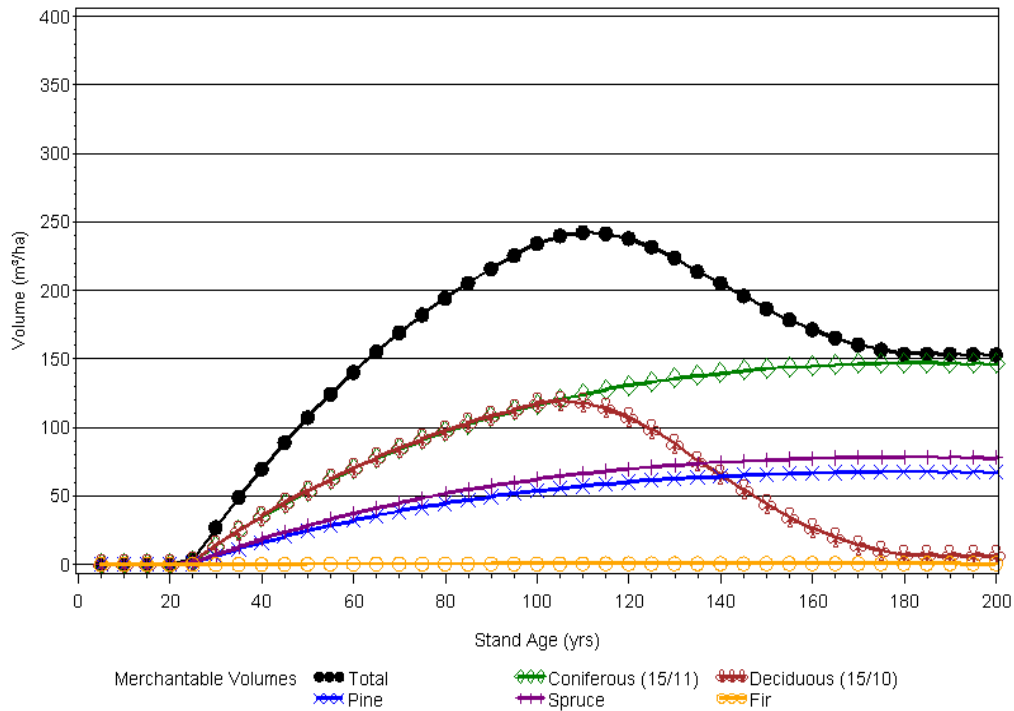


NSR & Site=LFG CC=B %Con=5 Yield Curve #=7

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	13	0.4	14	0.5
40	70	1.7	35	0.9	35	0.9
50	107	2.1	53	1.1	54	1.1
60	140	2.3	70	1.2	71	1.2
70	169	2.4	84	1.2	85	1.2
80	194	2.4	97	1.2	98	1.2
90	216	2.4	107	1.2	109	1.2
100	234	2.3	116	1.2	118	1.2
110	242	2.2	124	1.1	118	1.1
120	238	2.0	130	1.1	108	0.9
130	224	1.7	136	1.0	88	0.7
140	205	1.5	140	1.0	66	0.5
150	187	1.2	143	1.0	44	0.3
160	171	1.1	145	0.9	27	0.2
170	160	0.9	146	0.9	14	0.1
180	154	0.9	147	0.8	7	0.0
190	154	0.8	147	0.8	7	0.0
200	153	0.8	146	0.7	7	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=5 Yield Curve #=7

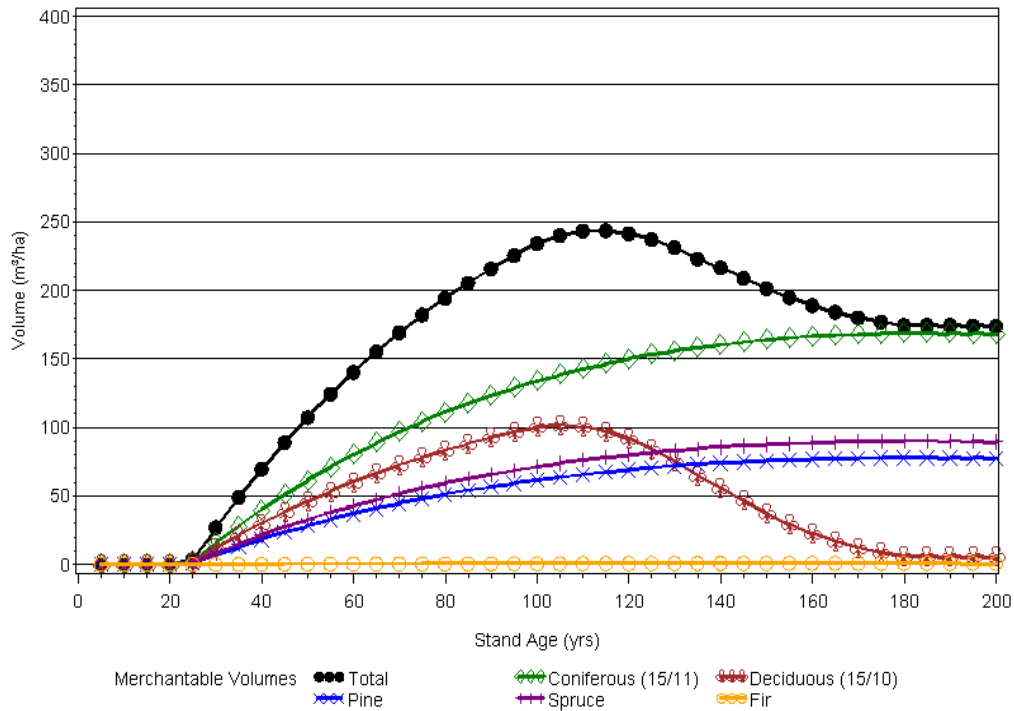


NSR & Site=LFG CC=B %Con=6 Yield Curve #=8

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	15	0.5	12	0.4
40	70	1.7	40	1.0	30	0.7
50	107	2.1	61	1.2	46	0.9
60	140	2.3	80	1.3	60	1.0
70	169	2.4	97	1.4	73	1.0
80	194	2.4	111	1.4	83	1.0
90	216	2.4	123	1.4	93	1.0
100	234	2.3	134	1.3	101	1.0
110	243	2.2	143	1.3	101	0.9
120	242	2.0	150	1.2	92	0.8
130	231	1.8	156	1.2	75	0.6
140	217	1.5	160	1.1	56	0.4
150	202	1.3	164	1.1	38	0.3
160	189	1.2	166	1.0	23	0.1
170	180	1.1	168	1.0	12	0.1
180	175	1.0	169	0.9	6	0.0
190	175	0.9	169	0.9	6	0.0
200	174	0.9	168	0.8	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=6 Yield Curve #=8

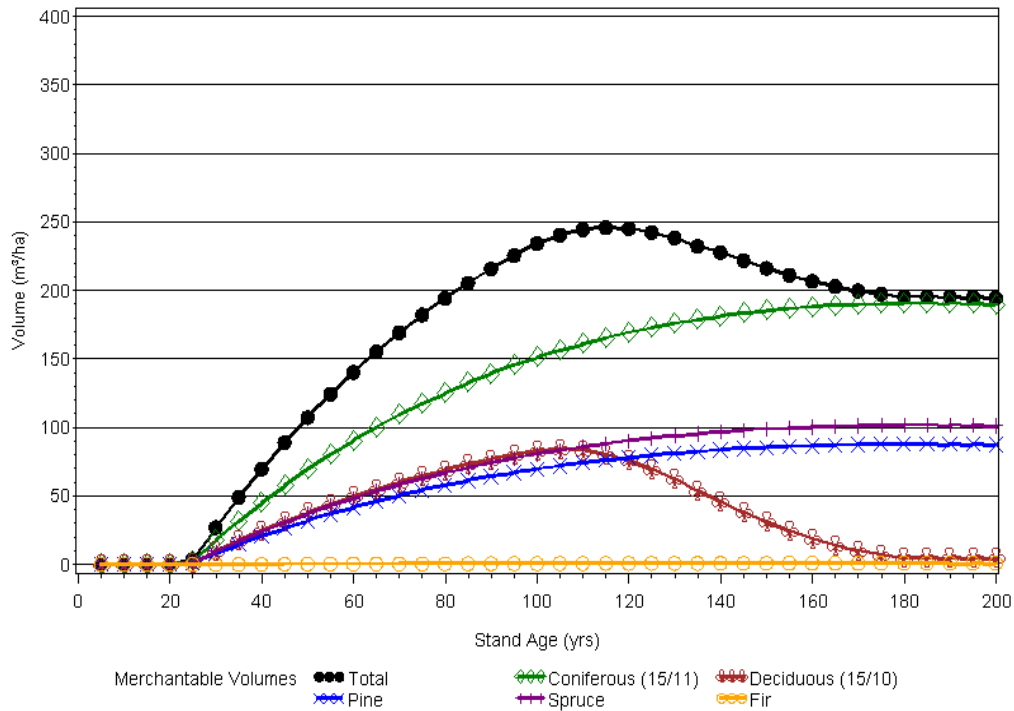


NSR & Site=LFG CC=B %Con=7 Yield Curve #=9

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	17	0.6	10	0.3
40	70	1.7	45	1.1	25	0.6
50	107	2.1	69	1.4	38	0.8
60	140	2.3	90	1.5	50	0.8
70	169	2.4	109	1.6	60	0.9
80	194	2.4	125	1.6	69	0.9
90	216	2.4	139	1.5	77	0.9
100	234	2.3	151	1.5	83	0.8
110	245	2.2	161	1.5	83	0.8
120	245	2.0	169	1.4	76	0.6
130	238	1.8	176	1.4	62	0.5
140	228	1.6	181	1.3	46	0.3
150	216	1.4	185	1.2	31	0.2
160	207	1.3	188	1.2	19	0.1
170	200	1.2	190	1.1	10	0.1
180	195	1.1	191	1.1	5	0.0
190	195	1.0	191	1.0	5	0.0
200	195	1.0	190	0.9	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=7 Yield Curve #=9

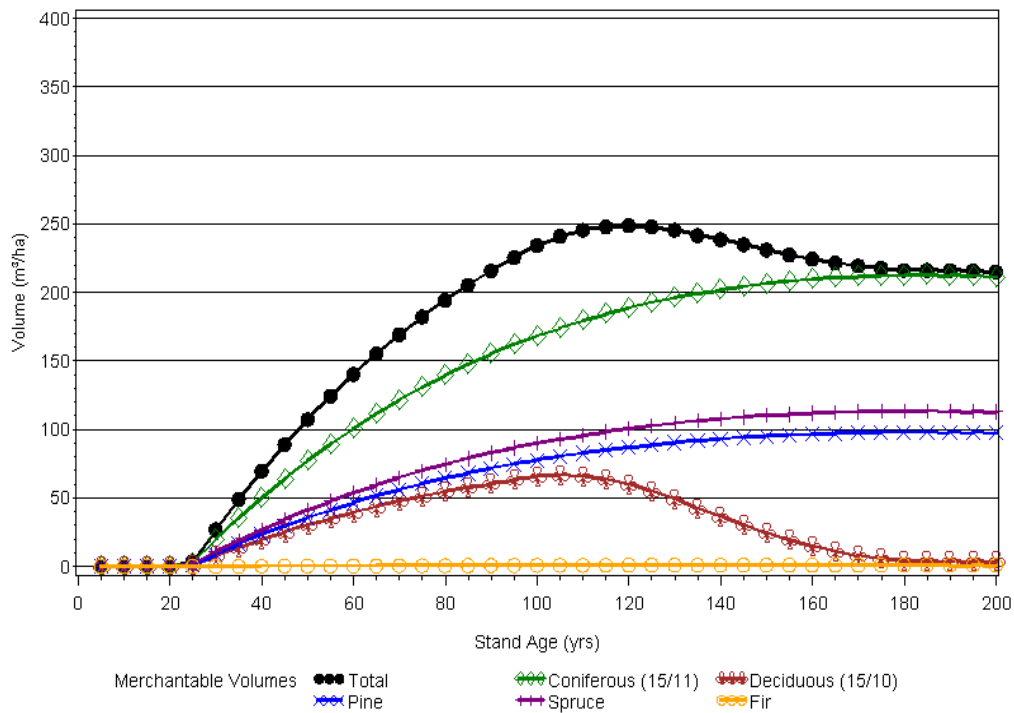


NSR & Site=LFG CC=B %Con=8 Yield Curve #=10

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	19	0.6	8	0.3
40	70	1.7	50	1.3	20	0.5
50	107	2.1	77	1.5	30	0.6
60	140	2.3	101	1.7	39	0.7
70	169	2.4	122	1.7	48	0.7
80	194	2.4	140	1.7	55	0.7
90	216	2.4	155	1.7	61	0.7
100	234	2.3	168	1.7	66	0.7
110	246	2.2	179	1.6	66	0.6
120	249	2.1	189	1.6	60	0.5
130	246	1.9	196	1.5	49	0.4
140	239	1.7	202	1.4	37	0.3
150	231	1.5	206	1.4	25	0.2
160	224	1.4	210	1.3	15	0.1
170	219	1.3	212	1.2	8	0.0
180	216	1.2	212	1.2	4	0.0
190	216	1.1	212	1.1	4	0.0
200	215	1.1	211	1.1	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=8 Yield Curve #=10

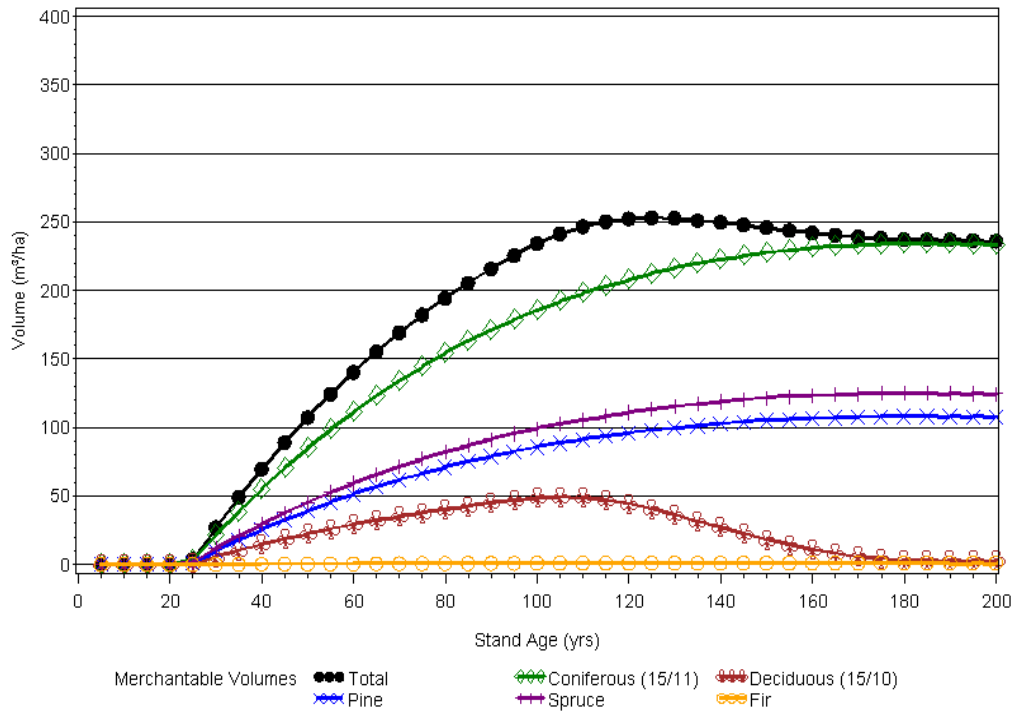


NSR & Site=LFG CC=B %Con=9 Yield Curve #=11

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	21	0.7	6	0.2
40	70	1.7	55	1.4	14	0.4
50	107	2.1	85	1.7	22	0.4
60	140	2.3	111	1.9	29	0.5
70	169	2.4	134	1.9	35	0.5
80	194	2.4	154	1.9	40	0.5
90	216	2.4	171	1.9	45	0.5
100	234	2.3	186	1.9	49	0.5
110	247	2.2	198	1.8	49	0.4
120	252	2.1	208	1.7	44	0.4
130	253	1.9	216	1.7	36	0.3
140	250	1.8	223	1.6	27	0.2
150	246	1.6	228	1.5	18	0.1
160	242	1.5	231	1.4	11	0.1
170	239	1.4	233	1.4	6	0.0
180	237	1.3	234	1.3	3	0.0
190	237	1.2	234	1.2	3	0.0
200	236	1.2	233	1.2	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=9 Yield Curve #=11

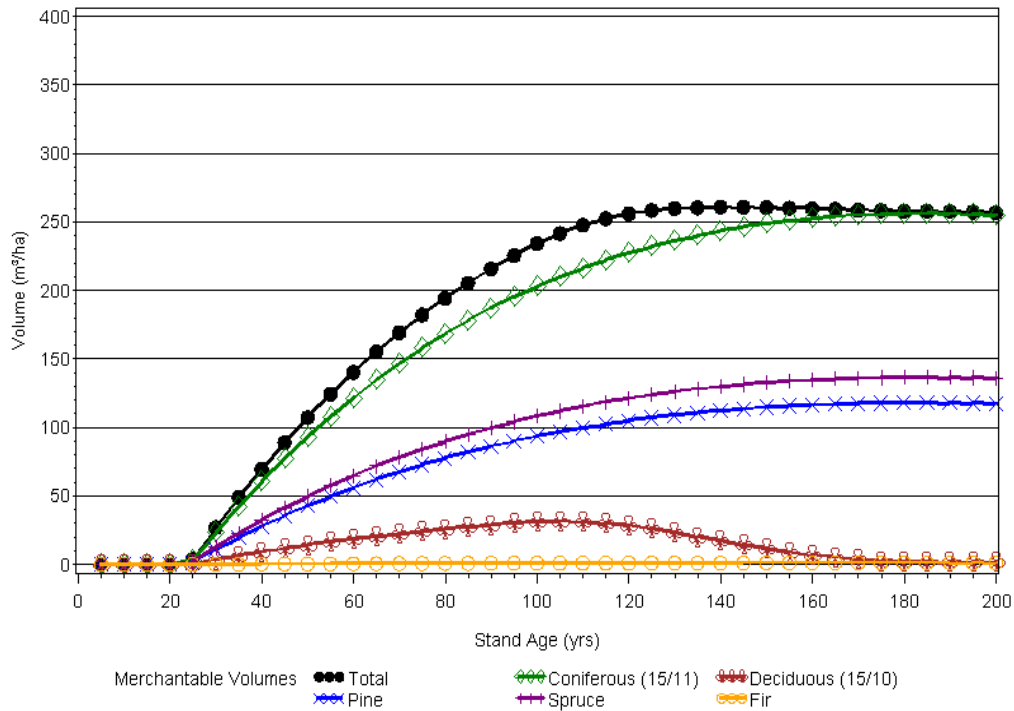


NSR & Site=LFG CC=B %Con=10 Yield Curve #=12

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	27	0.9	23	0.8	4	0.1
40	70	1.7	60	1.5	9	0.2
50	107	2.1	93	1.9	14	0.3
60	140	2.3	122	2.0	19	0.3
70	169	2.4	147	2.1	23	0.3
80	194	2.4	168	2.1	26	0.3
90	216	2.4	187	2.1	29	0.3
100	234	2.3	203	2.0	31	0.3
110	248	2.3	216	2.0	31	0.3
120	256	2.1	227	1.9	29	0.2
130	260	2.0	236	1.8	23	0.2
140	261	1.9	244	1.7	17	0.1
150	261	1.7	249	1.7	12	0.1
160	260	1.6	253	1.6	7	0.0
170	259	1.5	255	1.5	4	0.0
180	258	1.4	256	1.4	2	0.0
190	258	1.4	256	1.3	2	0.0
200	257	1.3	255	1.3	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=B %Con=10 Yield Curve #=12

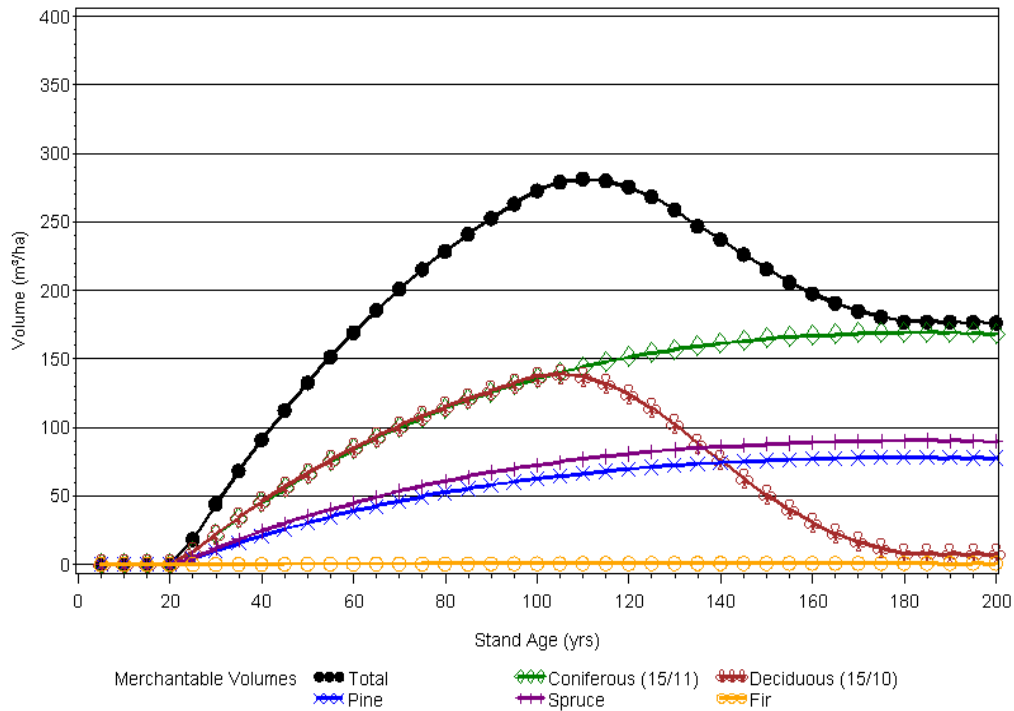


NSR & Site=LFG CC=C %Con=5 Yield Curve #=13

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	22	0.7	22	0.7
40	91	2.3	45	1.1	46	1.1
50	133	2.7	66	1.3	67	1.3
60	169	2.8	84	1.4	85	1.4
70	201	2.9	100	1.4	101	1.4
80	229	2.9	114	1.4	115	1.4
90	253	2.8	126	1.4	127	1.4
100	273	2.7	136	1.4	137	1.4
110	281	2.6	144	1.3	137	1.2
120	276	2.3	151	1.3	125	1.0
130	259	2.0	157	1.2	102	0.8
140	237	1.7	161	1.2	76	0.5
150	216	1.4	165	1.1	51	0.3
160	198	1.2	167	1.0	31	0.2
170	185	1.1	169	1.0	16	0.1
180	177	1.0	169	0.9	8	0.0
190	177	0.9	169	0.9	8	0.0
200	176	0.9	169	0.8	8	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=5 Yield Curve #=13

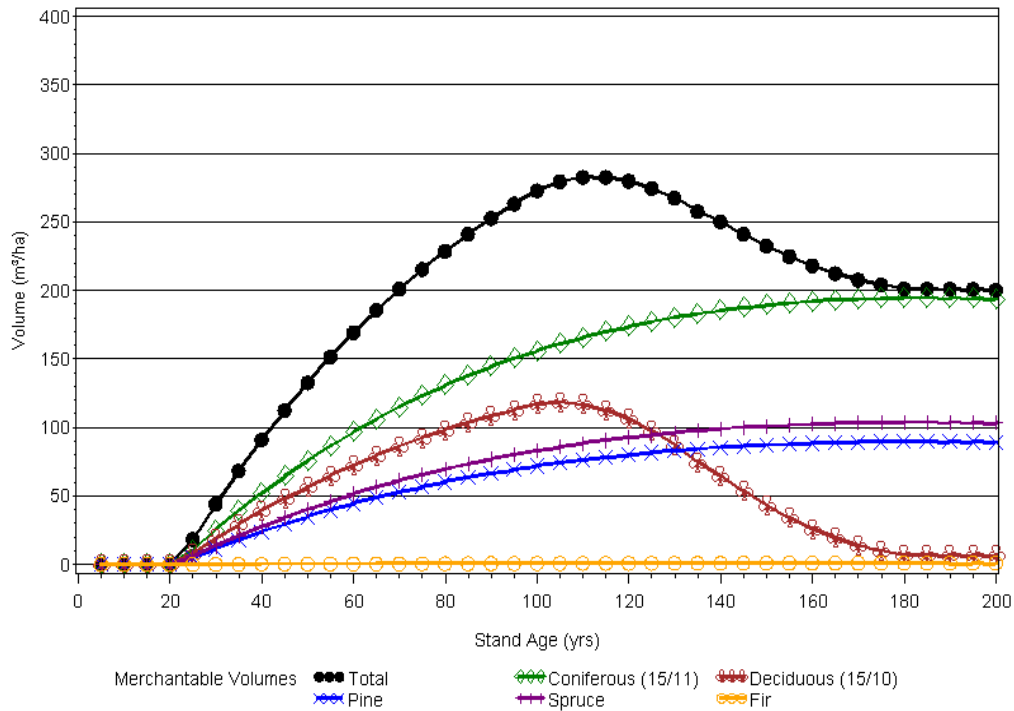


NSR & Site=LFG CC=C %Con=6 Yield Curve #=14

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	25	0.8	19	0.6
40	91	2.3	52	1.3	39	1.0
50	133	2.7	76	1.5	57	1.1
60	169	2.8	97	1.6	73	1.2
70	201	2.9	115	1.6	86	1.2
80	229	2.9	131	1.6	98	1.2
90	253	2.8	144	1.6	108	1.2
100	273	2.7	156	1.6	117	1.2
110	283	2.6	166	1.5	117	1.1
120	280	2.3	174	1.4	106	0.9
130	267	2.1	180	1.4	87	0.7
140	250	1.8	185	1.3	65	0.5
150	233	1.6	189	1.3	43	0.3
160	218	1.4	192	1.2	26	0.2
170	208	1.2	194	1.1	14	0.1
180	201	1.1	194	1.1	7	0.0
190	201	1.1	194	1.0	7	0.0
200	200	1.0	194	1.0	7	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=6 Yield Curve #=14

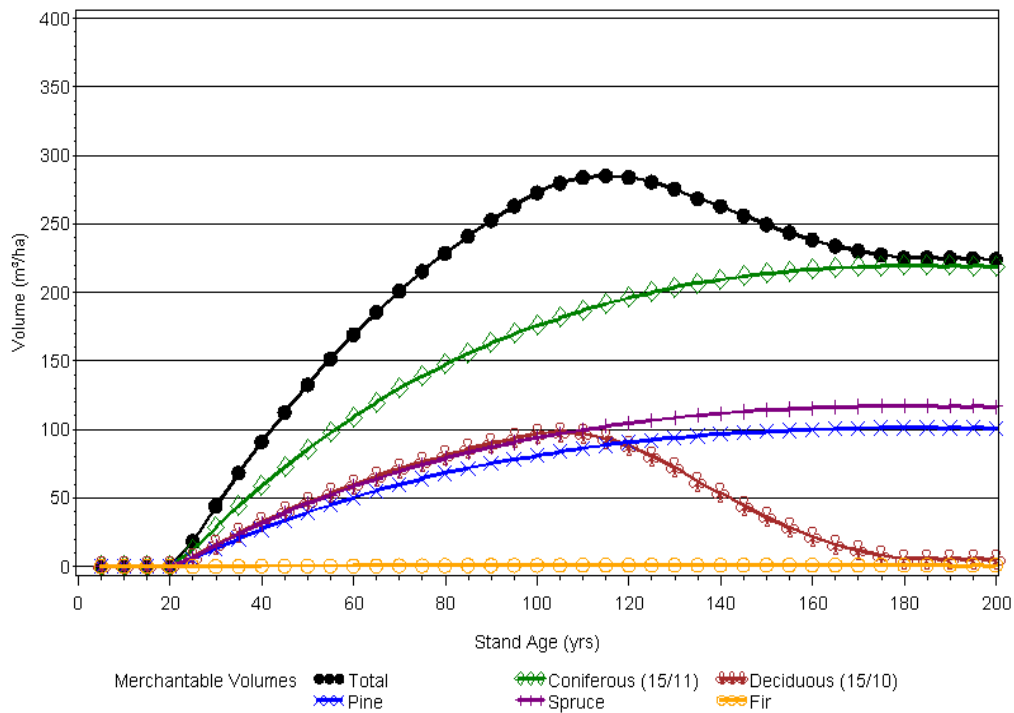


NSR & Site=LFG CC=C %Con=7 Yield Curve #=15

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	28	0.9	16	0.5
40	91	2.3	59	1.5	32	0.8
50	133	2.7	85	1.7	47	0.9
60	169	2.8	109	1.8	60	1.0
70	201	2.9	130	1.9	71	1.0
80	229	2.9	148	1.8	81	1.0
90	253	2.8	163	1.8	90	1.0
100	273	2.7	176	1.8	97	1.0
110	284	2.6	187	1.7	97	0.9
120	284	2.4	196	1.6	88	0.7
130	276	2.1	204	1.6	72	0.6
140	263	1.9	209	1.5	54	0.4
150	250	1.7	214	1.4	36	0.2
160	238	1.5	217	1.4	22	0.1
170	230	1.4	219	1.3	12	0.1
180	225	1.3	220	1.2	6	0.0
190	225	1.2	220	1.2	6	0.0
200	224	1.1	219	1.1	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=7 Yield Curve #=15

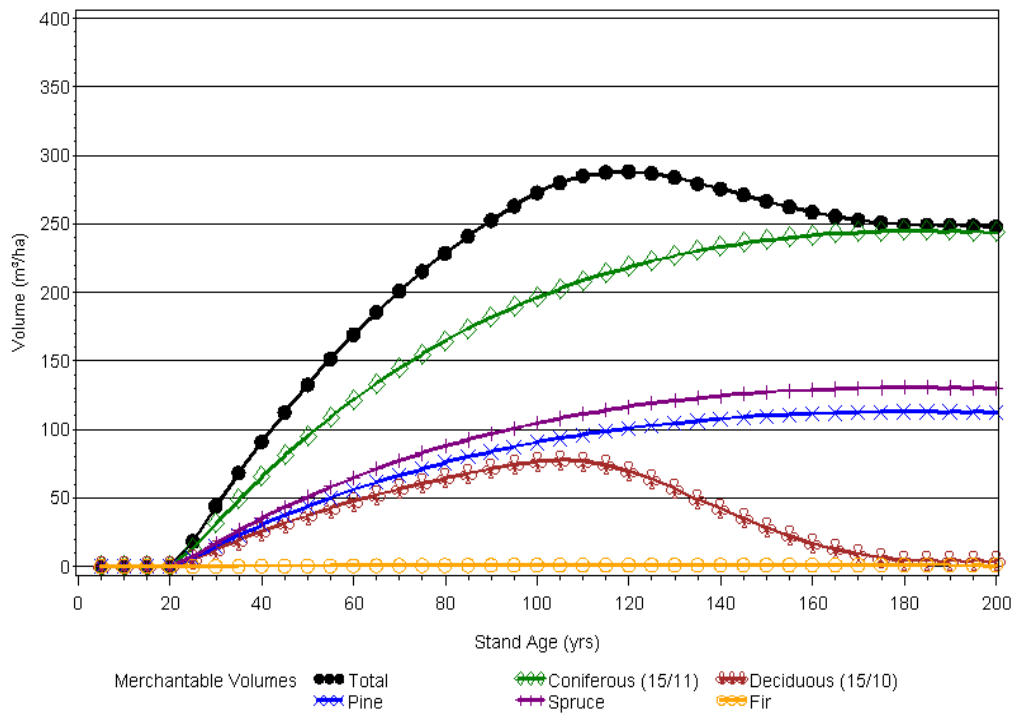


NSR & Site=LFG CC=C %Con=8 Yield Curve #=16

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	32	1.1	12	0.4
40	91	2.3	65	1.6	26	0.6
50	133	2.7	95	1.9	37	0.7
60	169	2.8	122	2.0	48	0.8
70	201	2.9	145	2.1	57	0.8
80	229	2.9	164	2.1	64	0.8
90	253	2.8	182	2.0	71	0.8
100	273	2.7	196	2.0	77	0.8
110	285	2.6	208	1.9	77	0.7
120	288	2.4	219	1.8	70	0.6
130	284	2.2	227	1.7	57	0.4
140	276	2.0	233	1.7	42	0.3
150	267	1.8	238	1.6	28	0.2
160	259	1.6	242	1.5	17	0.1
170	253	1.5	244	1.4	9	0.1
180	249	1.4	245	1.4	4	0.0
190	249	1.3	245	1.3	4	0.0
200	248	1.2	244	1.2	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=8 Yield Curve #=16

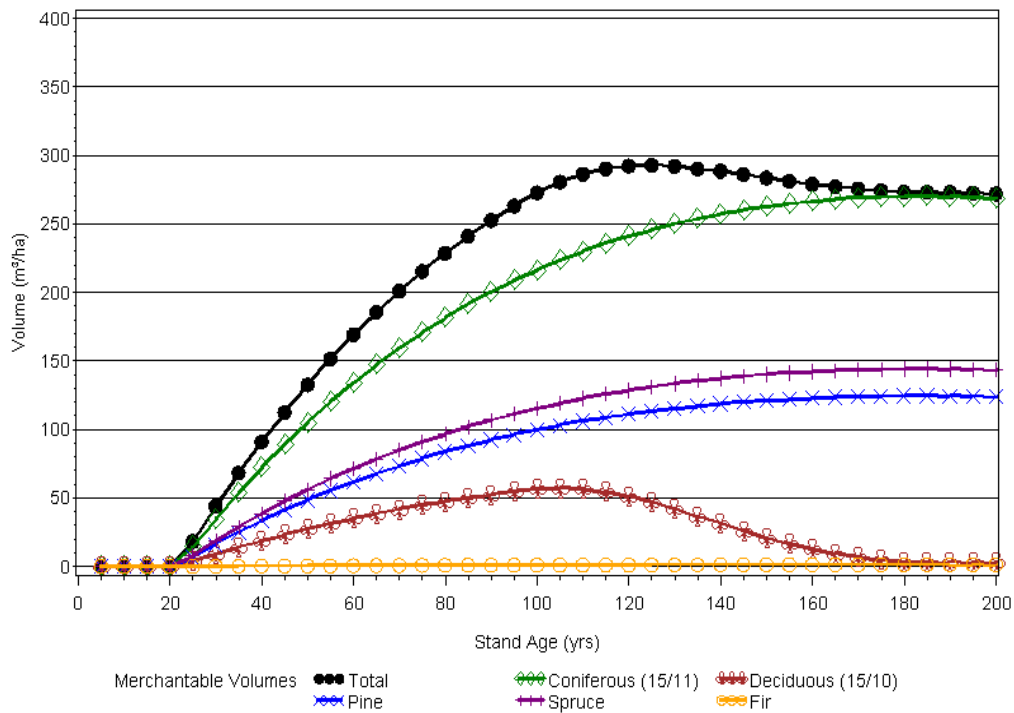


NSR & Site=LFG CC=C %Con=9 Yield Curve #=17

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	35	1.2	9	0.3
40	91	2.3	72	1.8	19	0.5
50	133	2.7	105	2.1	27	0.5
60	169	2.8	134	2.2	35	0.6
70	201	2.9	159	2.3	42	0.6
80	229	2.9	181	2.3	47	0.6
90	253	2.8	200	2.2	52	0.6
100	273	2.7	216	2.2	57	0.6
110	286	2.6	230	2.1	57	0.5
120	292	2.4	241	2.0	51	0.4
130	292	2.2	250	1.9	42	0.3
140	289	2.1	257	1.8	31	0.2
150	284	1.9	263	1.8	21	0.1
160	279	1.7	267	1.7	13	0.1
170	276	1.6	269	1.6	7	0.0
180	273	1.5	270	1.5	3	0.0
190	273	1.4	270	1.4	3	0.0
200	272	1.4	269	1.3	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=9 Yield Curve #=17

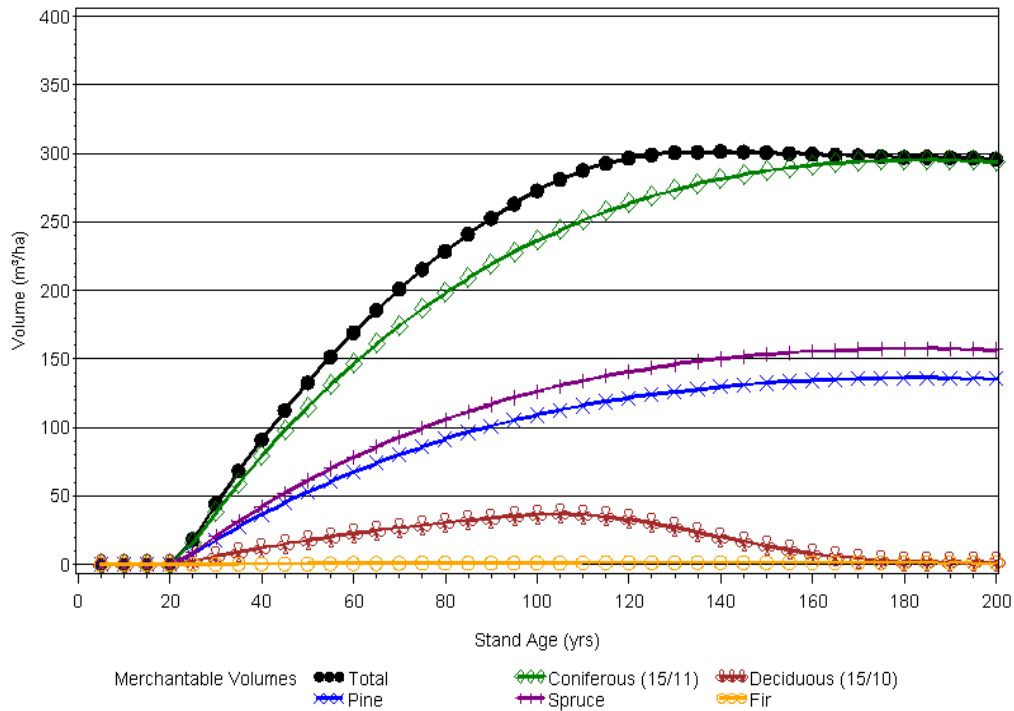


NSR & Site=LFG CC=C %Con=10 Yield Curve #=18

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	44	1.5	38	1.3	6	0.2
40	91	2.3	79	2.0	12	0.3
50	133	2.7	115	2.3	18	0.4
60	169	2.8	147	2.4	23	0.4
70	201	2.9	174	2.5	27	0.4
80	229	2.9	198	2.5	31	0.4
90	253	2.8	219	2.4	34	0.4
100	273	2.7	237	2.4	36	0.4
110	288	2.6	251	2.3	36	0.3
120	297	2.5	264	2.2	33	0.3
130	301	2.3	273	2.1	27	0.2
140	301	2.2	281	2.0	20	0.1
150	301	2.0	287	1.9	13	0.1
160	300	1.9	291	1.8	8	0.1
170	298	1.8	294	1.7	4	0.0
180	297	1.7	295	1.6	2	0.0
190	297	1.6	295	1.6	2	0.0
200	296	1.5	294	1.5	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=C %Con=10 Yield Curve #=18

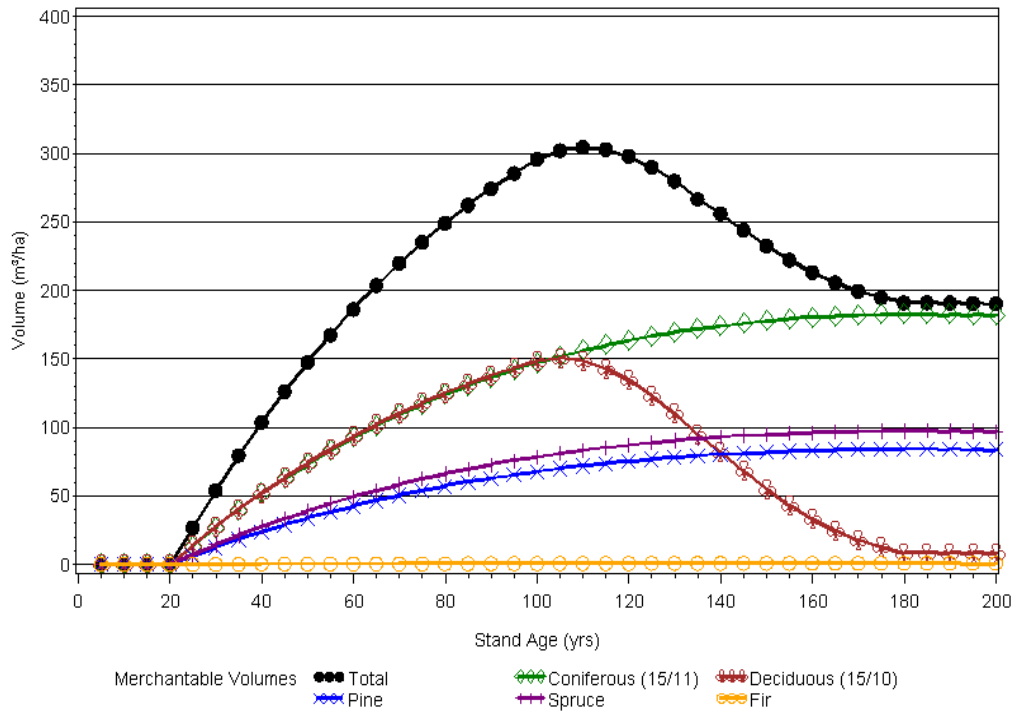


NSR & Site=LFG CC=D %Con=5 Yield Curve #=19

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	27	0.9	27	0.9
40	104	2.6	52	1.3	52	1.3
50	148	3.0	73	1.5	74	1.5
60	186	3.1	93	1.5	94	1.6
70	220	3.1	109	1.6	111	1.6
80	249	3.1	124	1.5	125	1.6
90	274	3.0	136	1.5	138	1.5
100	296	3.0	147	1.5	149	1.5
110	305	2.8	156	1.4	149	1.4
120	298	2.5	163	1.4	135	1.1
130	280	2.2	169	1.3	110	0.8
140	256	1.8	174	1.2	82	0.6
150	233	1.6	178	1.2	55	0.4
160	213	1.3	180	1.1	33	0.2
170	200	1.2	182	1.1	18	0.1
180	191	1.1	183	1.0	9	0.0
190	191	1.0	183	1.0	8	0.0
200	190	1.0	182	0.9	8	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=5 Yield Curve #=19

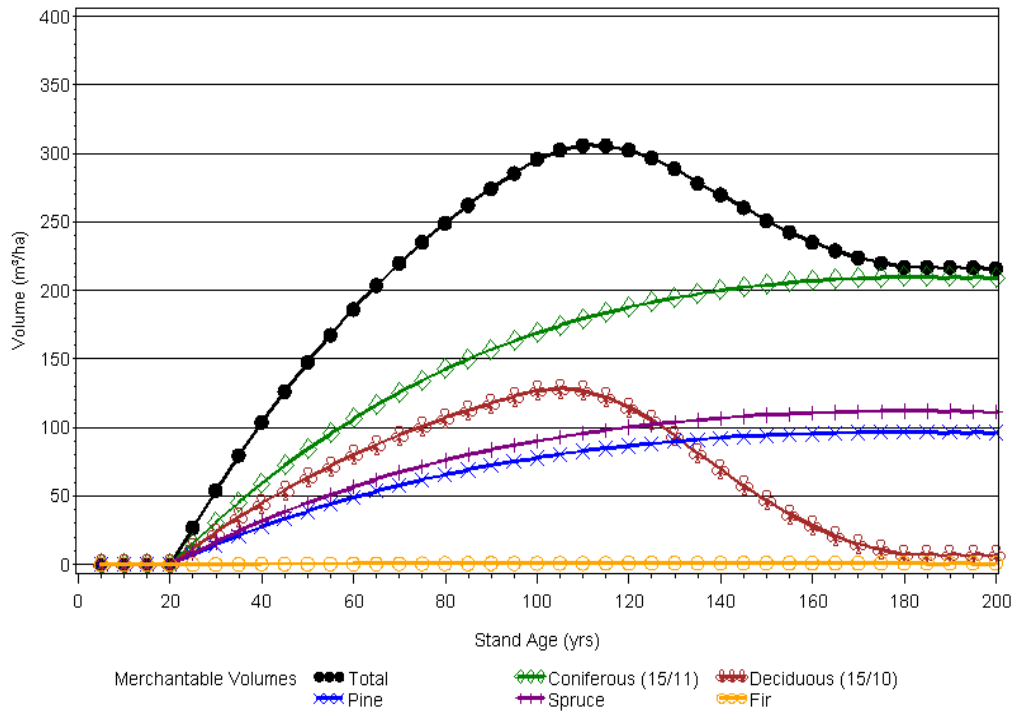


NSR & Site=LFG CC=D %Con=6 Yield Curve #=20

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	31	1.0	23	0.8
40	104	2.6	59	1.5	45	1.1
50	148	3.0	84	1.7	63	1.3
60	186	3.1	106	1.8	80	1.3
70	220	3.1	126	1.8	94	1.3
80	249	3.1	142	1.8	107	1.3
90	274	3.0	157	1.7	118	1.3
100	296	3.0	169	1.7	127	1.3
110	306	2.8	179	1.6	127	1.2
120	303	2.5	188	1.6	115	1.0
130	289	2.2	195	1.5	94	0.7
140	270	1.9	200	1.4	70	0.5
150	251	1.7	204	1.4	47	0.3
160	235	1.5	207	1.3	28	0.2
170	224	1.3	209	1.2	15	0.1
180	217	1.2	210	1.2	7	0.0
190	217	1.1	210	1.1	7	0.0
200	216	1.1	209	1.0	7	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=6 Yield Curve #=20

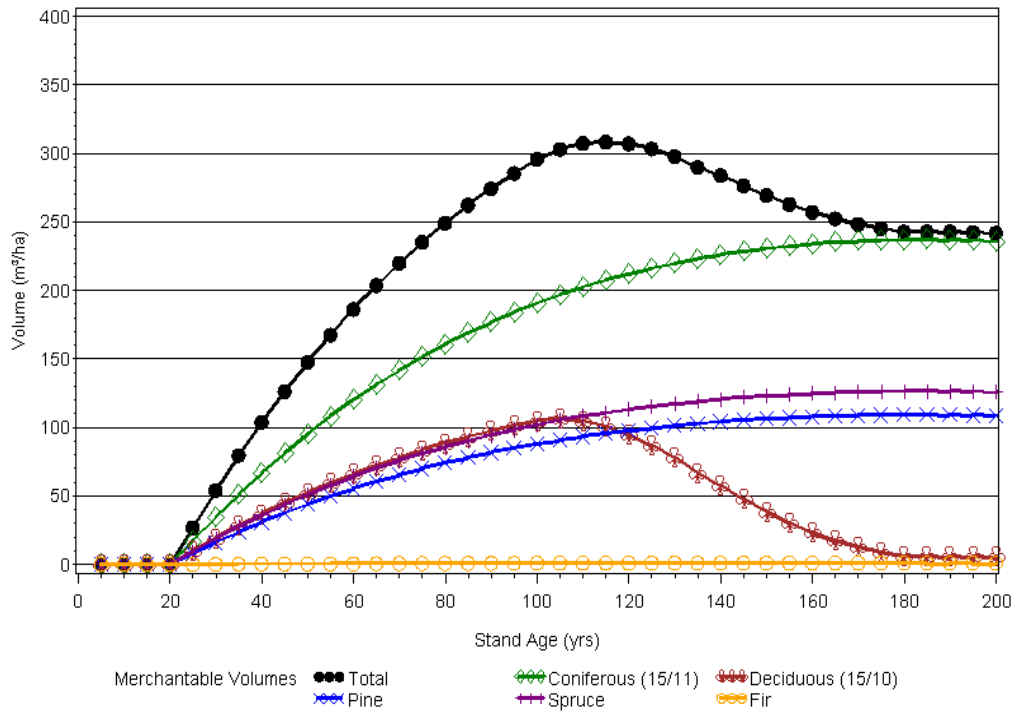


NSR & Site=LFG CC=D %Con=7 Yield Curve #=21

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	35	1.2	19	0.6
40	104	2.6	67	1.7	37	0.9
50	148	3.0	95	1.9	52	1.0
60	186	3.1	120	2.0	66	1.1
70	220	3.1	142	2.0	78	1.1
80	249	3.1	161	2.0	89	1.1
90	274	3.0	177	2.0	97	1.1
100	296	3.0	191	1.9	105	1.1
110	307	2.8	202	1.8	105	1.0
120	307	2.6	212	1.8	95	0.8
130	298	2.3	220	1.7	78	0.6
140	284	2.0	226	1.6	58	0.4
150	269	1.8	231	1.5	39	0.3
160	257	1.6	234	1.5	23	0.1
170	248	1.5	236	1.4	12	0.1
180	243	1.3	237	1.3	6	0.0
190	243	1.3	237	1.2	6	0.0
200	242	1.2	236	1.2	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=7 Yield Curve #=21

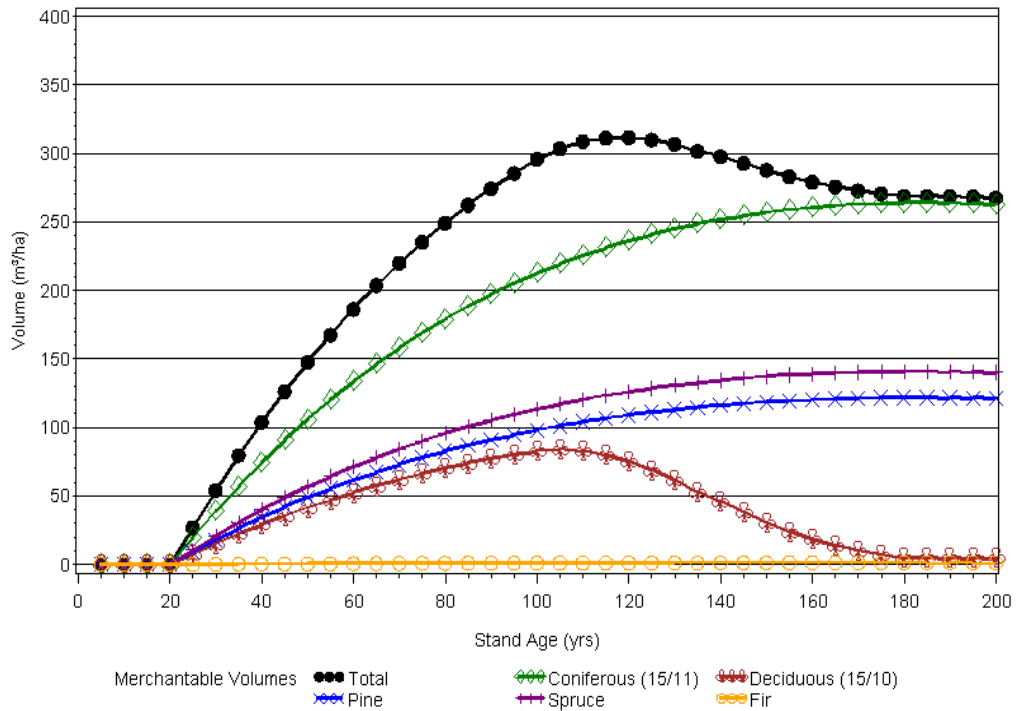


NSR & Site=LFG CC=D %Con=8 Yield Curve #=22

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	39	1.3	15	0.5
40	104	2.6	75	1.9	29	0.7
50	148	3.0	106	2.1	42	0.8
60	186	3.1	134	2.2	52	0.9
70	220	3.1	158	2.3	62	0.9
80	249	3.1	179	2.2	70	0.9
90	274	3.0	197	2.2	77	0.9
100	296	3.0	213	2.1	83	0.8
110	309	2.8	226	2.1	83	0.8
120	312	2.6	236	2.0	75	0.6
130	307	2.4	245	1.9	62	0.5
140	298	2.1	252	1.8	46	0.3
150	288	1.9	257	1.7	31	0.2
160	279	1.7	261	1.6	18	0.1
170	273	1.6	263	1.5	10	0.1
180	269	1.5	264	1.5	5	0.0
190	269	1.4	264	1.4	5	0.0
200	268	1.3	263	1.3	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=8 Yield Curve #=22

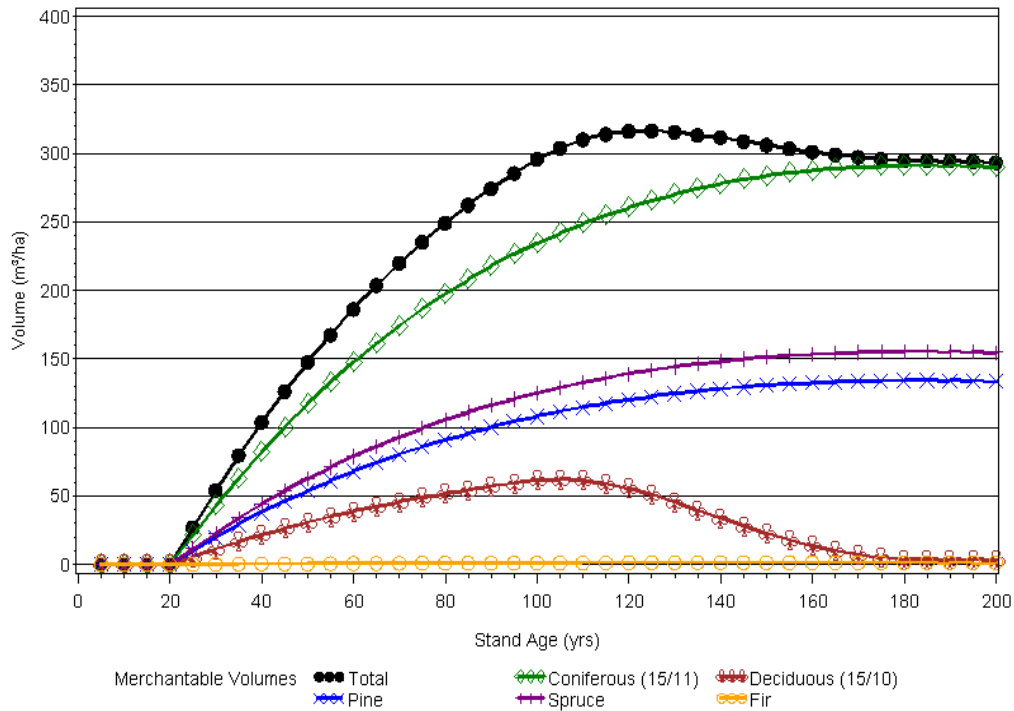


NSR & Site=LFG CC=D %Con=9 Yield Curve #=23

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	43	1.4	11	0.4
40	104	2.6	82	2.1	22	0.5
50	148	3.0	117	2.3	31	0.6
60	186	3.1	148	2.5	39	0.6
70	220	3.1	174	2.5	46	0.7
80	249	3.1	198	2.5	52	0.6
90	274	3.0	217	2.4	57	0.6
100	296	3.0	234	2.3	61	0.6
110	310	2.8	249	2.3	61	0.6
120	316	2.6	261	2.2	56	0.5
130	316	2.4	270	2.1	46	0.4
140	312	2.2	278	2.0	34	0.2
150	306	2.0	283	1.9	23	0.2
160	301	1.9	288	1.8	14	0.1
170	297	1.7	290	1.7	7	0.0
180	295	1.6	291	1.6	4	0.0
190	295	1.6	291	1.5	4	0.0
200	293	1.5	290	1.4	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=9 Yield Curve #=23

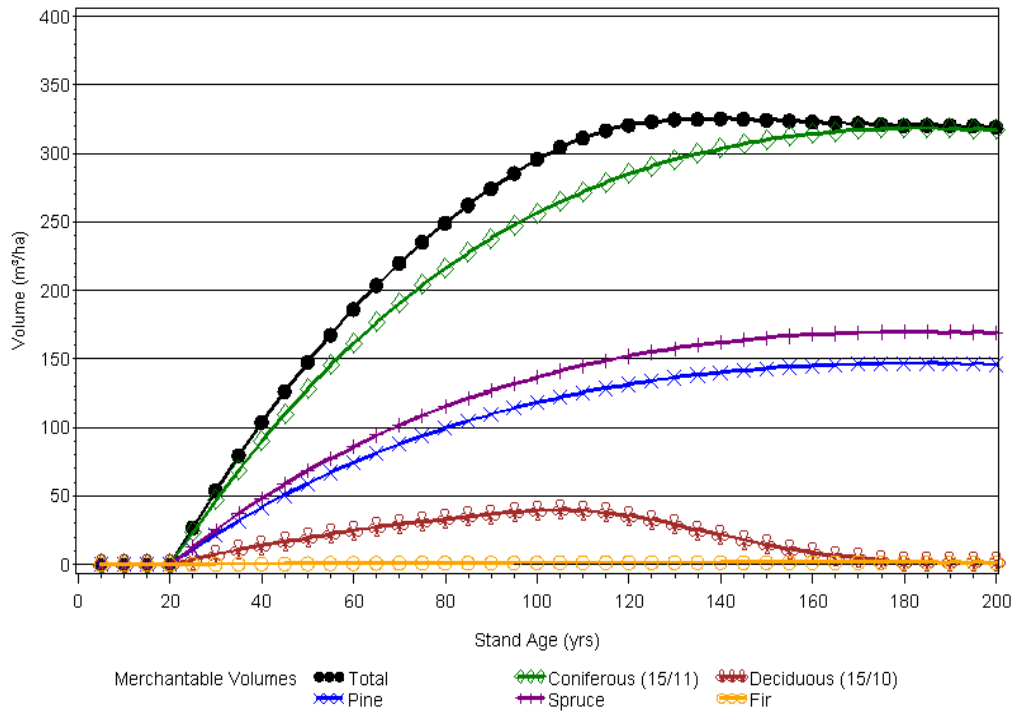


NSR & Site=LFG CC=D %Con=10 Yield Curve #=24

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	54	1.8	47	1.6	7	0.2
40	104	2.6	90	2.2	14	0.3
50	148	3.0	128	2.6	20	0.4
60	186	3.1	161	2.7	25	0.4
70	220	3.1	191	2.7	29	0.4
80	249	3.1	216	2.7	33	0.4
90	274	3.0	238	2.6	37	0.4
100	296	3.0	256	2.6	39	0.4
110	311	2.8	272	2.5	39	0.4
120	321	2.7	285	2.4	36	0.3
130	325	2.5	295	2.3	29	0.2
140	325	2.3	304	2.2	22	0.2
150	324	2.2	310	2.1	15	0.1
160	323	2.0	314	2.0	9	0.1
170	322	1.9	317	1.9	5	0.0
180	321	1.8	318	1.8	2	0.0
190	321	1.7	318	1.7	2	0.0
200	319	1.6	317	1.6	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFG CC=D %Con=10 Yield Curve #=24

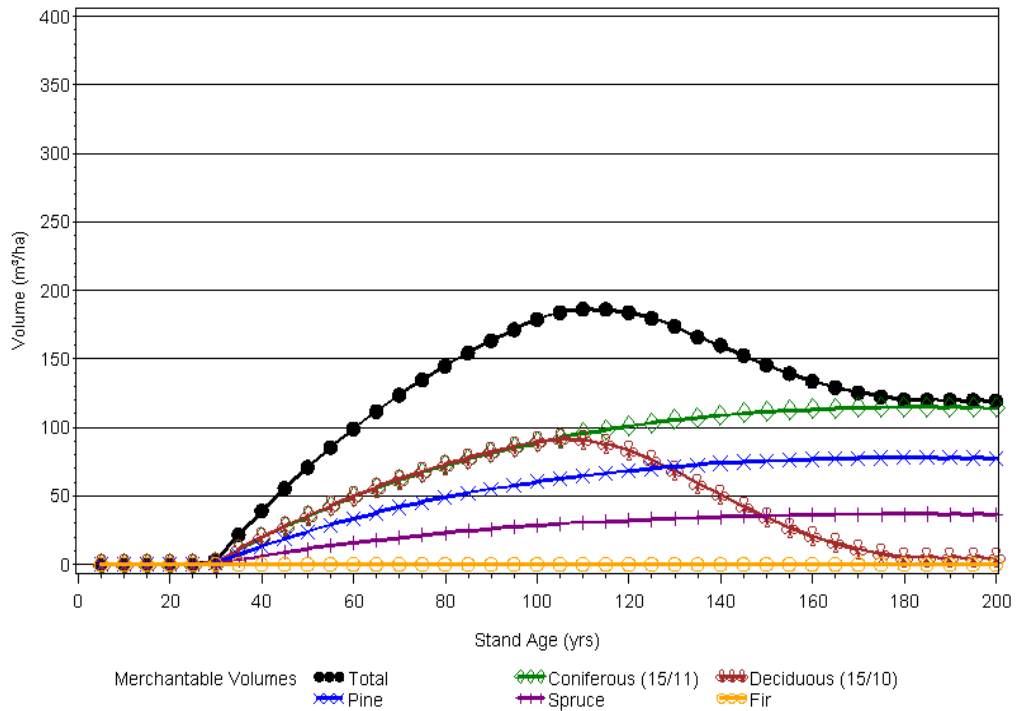


NSR & Site=LFM CC=A %Con=5 Yield Curve #=25

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	1	0.0	1	0.0
40	39	1.0	19	0.5	20	0.5
50	71	1.4	35	0.7	36	0.7
60	99	1.7	49	0.8	50	0.8
70	124	1.8	61	0.9	62	0.9
80	145	1.8	72	0.9	73	0.9
90	163	1.8	81	0.9	82	0.9
100	179	1.8	89	0.9	90	0.9
110	186	1.7	95	0.9	91	0.8
120	184	1.5	101	0.8	83	0.7
130	174	1.3	105	0.8	69	0.5
140	160	1.1	109	0.8	51	0.4
150	146	1.0	111	0.7	34	0.2
160	134	0.8	113	0.7	21	0.1
170	125	0.7	114	0.7	11	0.1
180	120	0.7	115	0.6	5	0.0
190	120	0.6	115	0.6	5	0.0
200	120	0.6	114	0.6	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=5 Yield Curve #=25

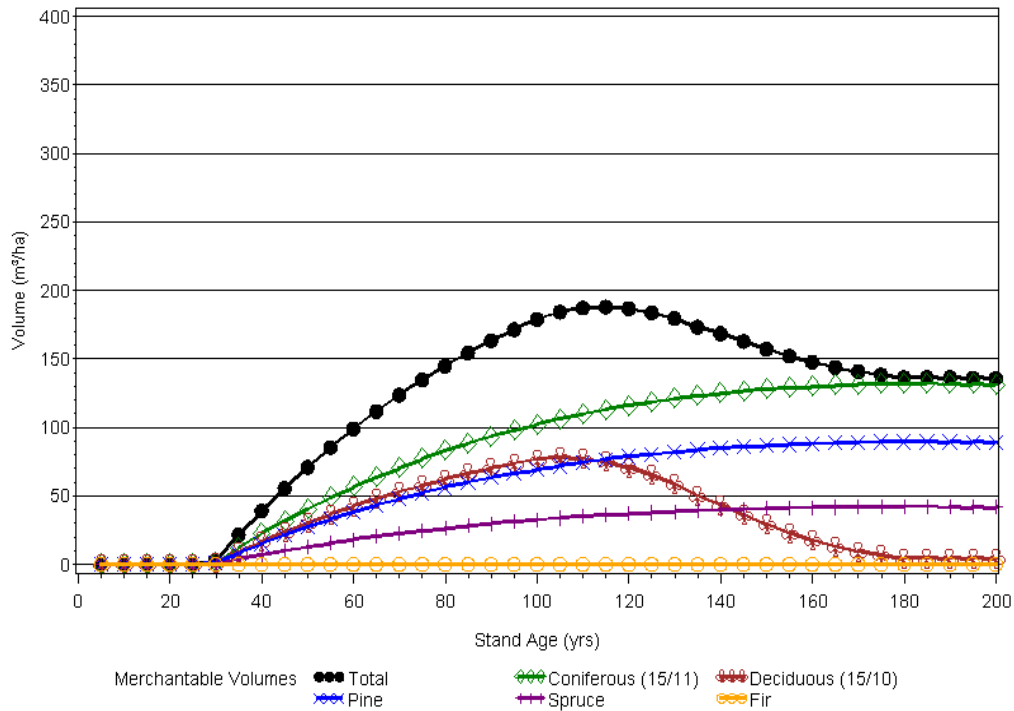


NSR & Site=LFM CC=A %Con=6 Yield Curve #=26

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	2	0.1	1	0.0
40	39	1.0	22	0.6	17	0.4
50	71	1.4	41	0.8	30	0.6
60	99	1.7	57	0.9	43	0.7
70	124	1.8	71	1.0	53	0.8
80	145	1.8	83	1.0	62	0.8
90	163	1.8	93	1.0	70	0.8
100	179	1.8	102	1.0	77	0.8
110	187	1.7	110	1.0	78	0.7
120	187	1.6	116	1.0	71	0.6
130	179	1.4	121	0.9	59	0.5
140	169	1.2	125	0.9	44	0.3
150	157	1.0	128	0.9	29	0.2
160	148	0.9	130	0.8	18	0.1
170	141	0.8	131	0.8	9	0.1
180	136	0.8	132	0.7	5	0.0
190	136	0.7	132	0.7	5	0.0
200	136	0.7	131	0.7	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=6 Yield Curve #=26

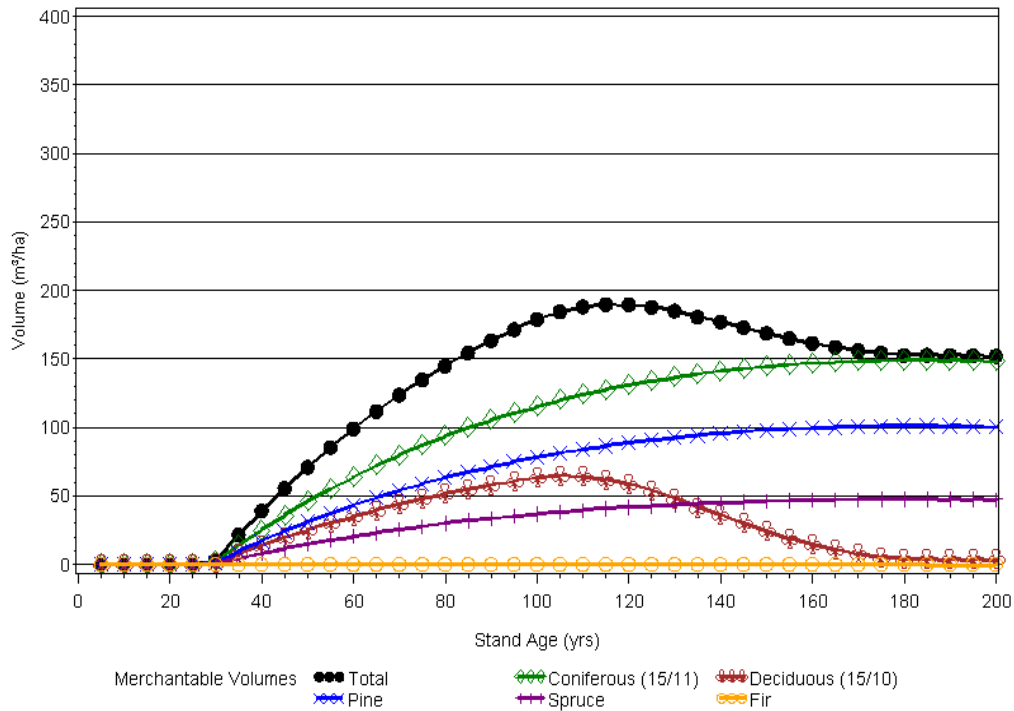


NSR & Site=LFM CC=A %Con=7 Yield Curve #=27

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	2	0.1	1	0.0
40	39	1.0	25	0.6	14	0.3
50	71	1.4	46	0.9	25	0.5
60	99	1.7	64	1.1	35	0.6
70	124	1.8	80	1.1	44	0.6
80	145	1.8	93	1.2	52	0.6
90	163	1.8	105	1.2	58	0.6
100	179	1.8	115	1.2	64	0.6
110	188	1.7	124	1.1	64	0.6
120	190	1.6	131	1.1	59	0.5
130	185	1.4	137	1.1	48	0.4
140	177	1.3	141	1.0	36	0.3
150	169	1.1	144	1.0	24	0.2
160	161	1.0	147	0.9	15	0.1
170	156	0.9	148	0.9	8	0.0
180	153	0.8	149	0.8	4	0.0
190	153	0.8	149	0.8	4	0.0
200	152	0.8	148	0.7	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=7 Yield Curve #=27

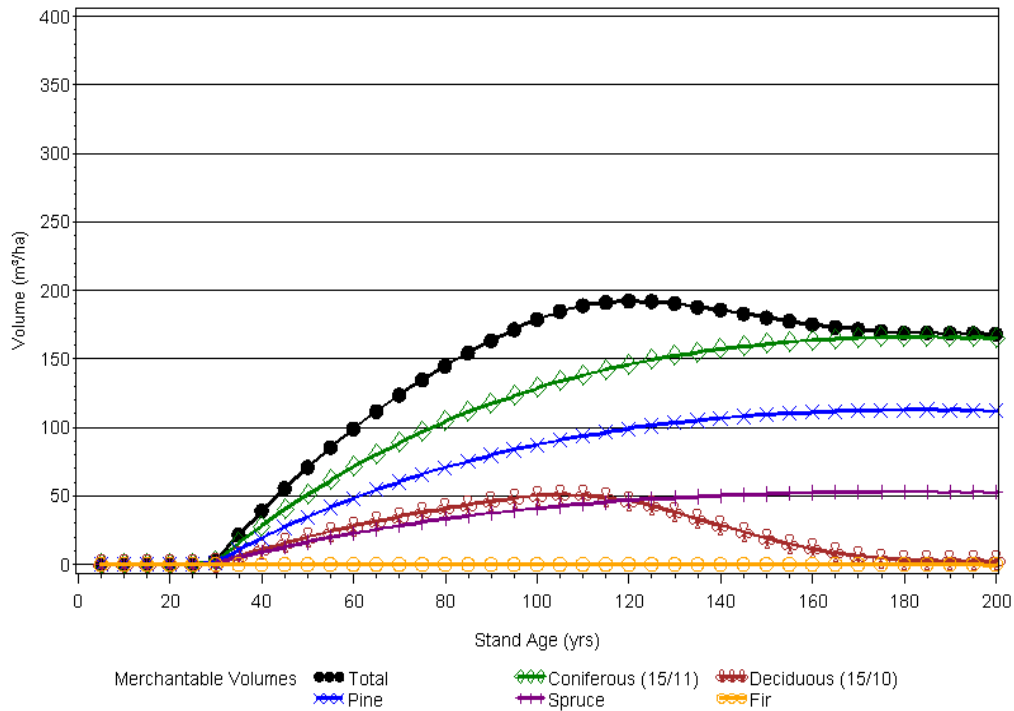


NSR & Site=LFM CC=A %Con=8 Yield Curve #=28

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	2	0.1	1	0.0
40	39	1.0	28	0.7	11	0.3
50	71	1.4	51	1.0	20	0.4
60	99	1.7	71	1.2	28	0.5
70	124	1.8	89	1.3	35	0.5
80	145	1.8	104	1.3	41	0.5
90	163	1.8	117	1.3	46	0.5
100	179	1.8	129	1.3	50	0.5
110	189	1.7	138	1.3	51	0.5
120	192	1.6	146	1.2	46	0.4
130	191	1.5	152	1.2	38	0.3
140	186	1.3	157	1.1	29	0.2
150	180	1.2	161	1.1	19	0.1
160	175	1.1	164	1.0	12	0.1
170	172	1.0	165	1.0	6	0.0
180	169	0.9	166	0.9	3	0.0
190	169	0.9	166	0.9	3	0.0
200	168	0.8	165	0.8	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=8 Yield Curve #=28

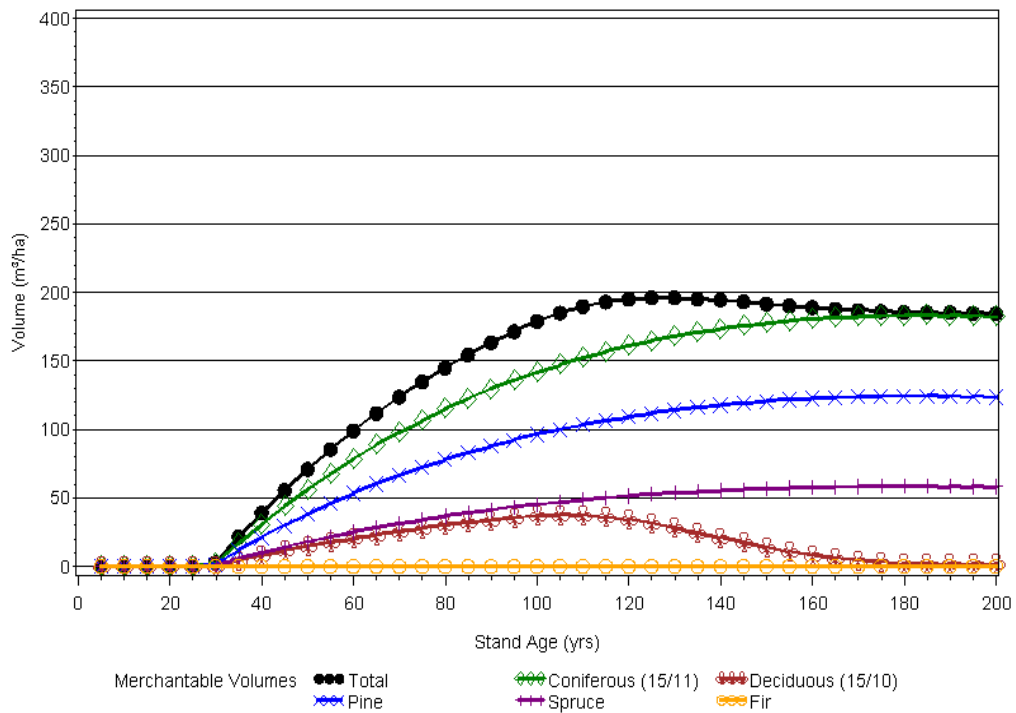


NSR & Site=LFM CC=A %Con=9 Yield Curve #=29

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	2	0.1	1	0.0
40	39	1.0	31	0.8	8	0.2
50	71	1.4	56	1.1	15	0.3
60	99	1.7	79	1.3	21	0.3
70	124	1.8	98	1.4	26	0.4
80	145	1.8	115	1.4	30	0.4
90	163	1.8	129	1.4	34	0.4
100	179	1.8	142	1.4	37	0.4
110	190	1.7	152	1.4	37	0.3
120	195	1.6	161	1.3	34	0.3
130	196	1.5	168	1.3	28	0.2
140	195	1.4	173	1.2	21	0.2
150	192	1.3	178	1.2	14	0.1
160	189	1.2	181	1.1	9	0.1
170	187	1.1	182	1.1	5	0.0
180	185	1.0	183	1.0	2	0.0
190	185	1.0	183	1.0	2	0.0
200	184	0.9	182	0.9	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=9 Yield Curve #=29

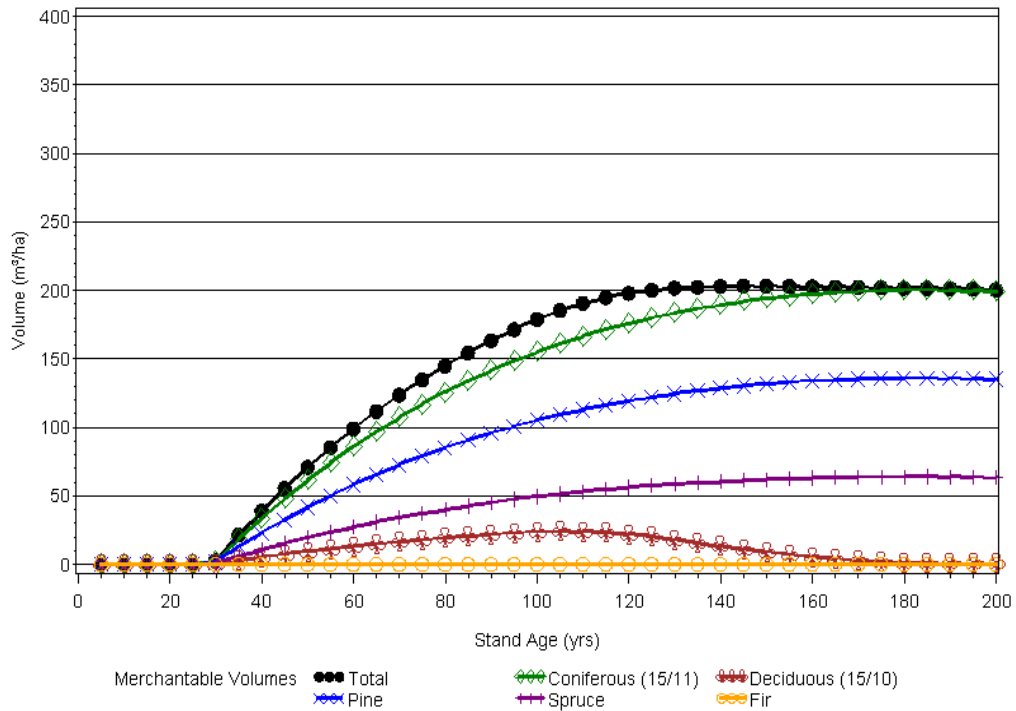


NSR & Site=LFM CC=A %Con=10 Yield Curve #=30

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	3	0.1	2	0.1	0	0.0
40	39	1.0	34	0.8	5	0.1
50	71	1.4	61	1.2	9	0.2
60	99	1.7	86	1.4	13	0.2
70	124	1.8	107	1.5	17	0.2
80	145	1.8	126	1.6	19	0.2
90	163	1.8	142	1.6	22	0.2
100	179	1.8	155	1.6	24	0.2
110	191	1.7	166	1.5	24	0.2
120	198	1.6	176	1.5	22	0.2
130	202	1.6	184	1.4	18	0.1
140	203	1.5	190	1.4	14	0.1
150	203	1.4	194	1.3	9	0.1
160	203	1.3	197	1.2	6	0.0
170	202	1.2	199	1.2	3	0.0
180	202	1.1	200	1.1	1	0.0
190	202	1.1	200	1.1	1	0.0
200	201	1.0	199	1.0	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=A %Con=10 Yield Curve #=30

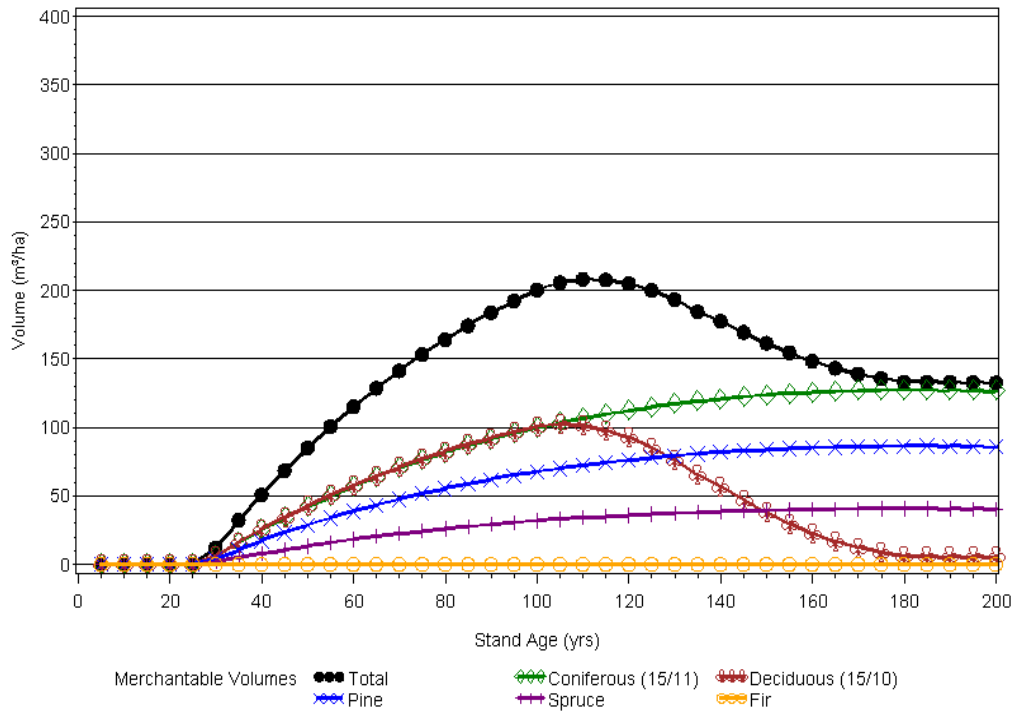


NSR & Site=LFM CC=B %Con=5 Yield Curve #=31

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	6	0.2	6	0.2
40	51	1.3	25	0.6	26	0.6
50	85	1.7	42	0.8	43	0.9
60	115	1.9	57	1.0	58	1.0
70	141	2.0	70	1.0	71	1.0
80	164	2.1	82	1.0	83	1.0
90	184	2.0	91	1.0	92	1.0
100	200	2.0	100	1.0	101	1.0
110	208	1.9	107	1.0	102	0.9
120	205	1.7	112	0.9	93	0.8
130	193	1.5	117	0.9	76	0.6
140	178	1.3	121	0.9	57	0.4
150	162	1.1	124	0.8	38	0.3
160	149	0.9	126	0.8	23	0.1
170	139	0.8	127	0.7	12	0.1
180	133	0.7	127	0.7	6	0.0
190	133	0.7	127	0.7	6	0.0
200	133	0.7	127	0.6	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=5 Yield Curve #=31

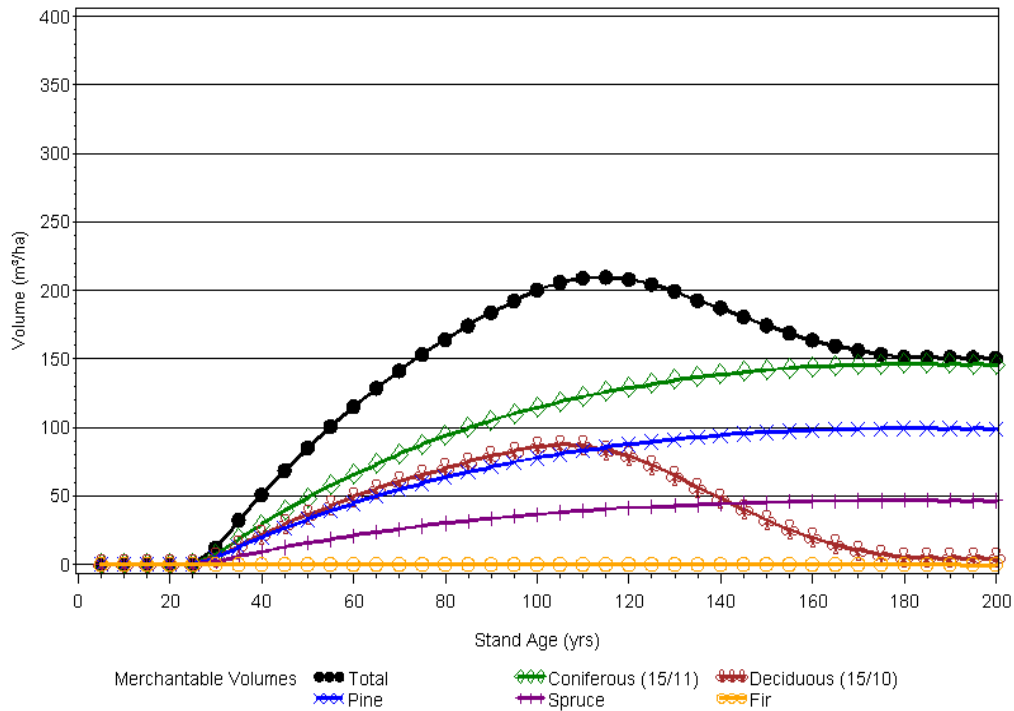


NSR & Site=LFM CC=B %Con=6 Yield Curve #=32

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	7	0.2	5	0.2
40	51	1.3	29	0.7	22	0.5
50	85	1.7	49	1.0	37	0.7
60	115	1.9	66	1.1	49	0.8
70	141	2.0	81	1.2	61	0.9
80	164	2.1	94	1.2	70	0.9
90	184	2.0	105	1.2	79	0.9
100	200	2.0	114	1.1	86	0.9
110	209	1.9	122	1.1	87	0.8
120	208	1.7	129	1.1	79	0.7
130	200	1.5	134	1.0	65	0.5
140	187	1.3	139	1.0	48	0.3
150	174	1.2	142	0.9	33	0.2
160	164	1.0	144	0.9	20	0.1
170	156	0.9	146	0.9	11	0.1
180	151	0.8	146	0.8	5	0.0
190	151	0.8	146	0.8	5	0.0
200	151	0.8	146	0.7	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=6 Yield Curve #=32

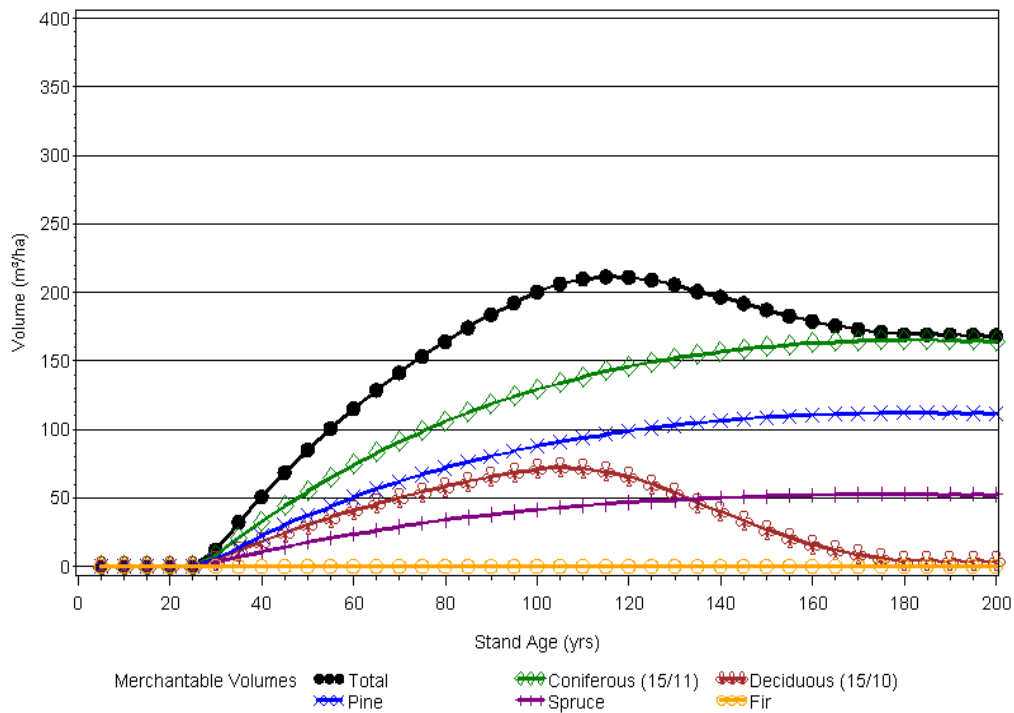


NSR & Site=LFM CC=B %Con=7 Yield Curve #=33

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	8	0.3	4	0.1
40	51	1.3	33	0.8	18	0.5
50	85	1.7	55	1.1	30	0.6
60	115	1.9	74	1.2	41	0.7
70	141	2.0	91	1.3	50	0.7
80	164	2.1	106	1.3	58	0.7
90	184	2.0	118	1.3	65	0.7
100	200	2.0	129	1.3	71	0.7
110	210	1.9	138	1.3	72	0.7
120	211	1.8	146	1.2	65	0.5
130	206	1.6	152	1.2	54	0.4
140	197	1.4	157	1.1	40	0.3
150	187	1.2	160	1.1	27	0.2
160	179	1.1	163	1.0	16	0.1
170	173	1.0	164	1.0	9	0.1
180	169	0.9	165	0.9	4	0.0
190	169	0.9	165	0.9	4	0.0
200	169	0.8	164	0.8	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=7 Yield Curve #=33

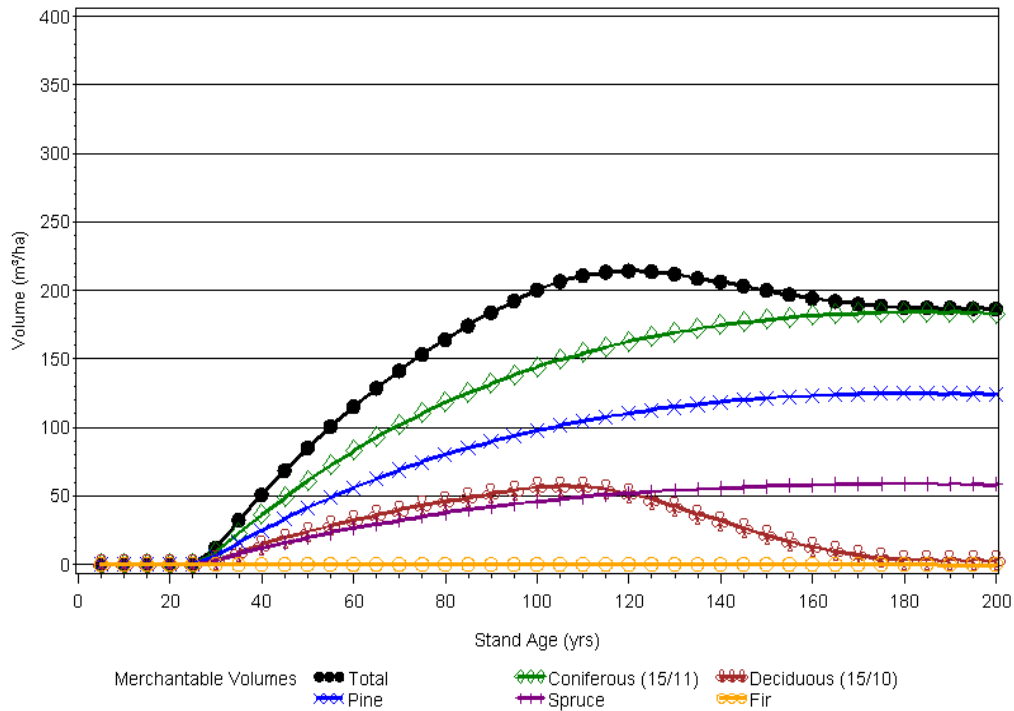


NSR & Site=LFM CC=B %Con=8 Yield Curve #=34

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	9	0.3	3	0.1
40	51	1.3	37	0.9	14	0.4
50	85	1.7	61	1.2	24	0.5
60	115	1.9	83	1.4	32	0.5
70	141	2.0	102	1.5	40	0.6
80	164	2.1	118	1.5	46	0.6
90	184	2.0	132	1.5	52	0.6
100	200	2.0	144	1.4	56	0.6
110	211	1.9	154	1.4	57	0.5
120	214	1.8	163	1.4	52	0.4
130	212	1.6	169	1.3	43	0.3
140	206	1.5	175	1.2	32	0.2
150	200	1.3	179	1.2	21	0.1
160	194	1.2	182	1.1	13	0.1
170	190	1.1	183	1.1	7	0.0
180	187	1.0	184	1.0	3	0.0
190	187	1.0	184	1.0	3	0.0
200	187	0.9	183	0.9	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=8 Yield Curve #=34

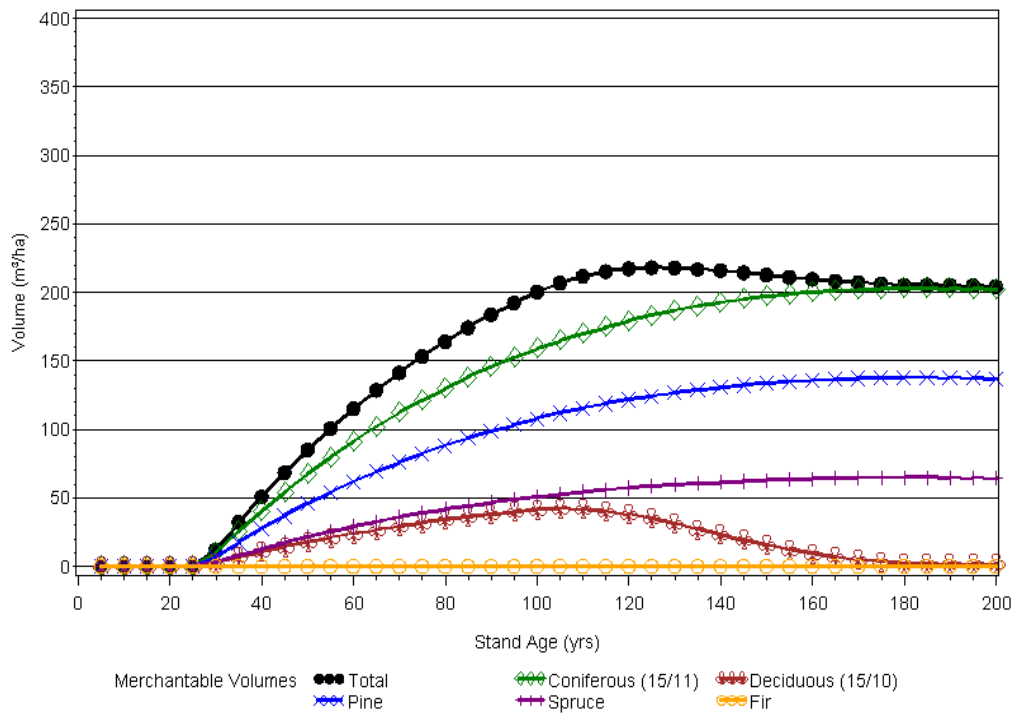


NSR & Site=LFM CC=B %Con=9 Yield Curve #=35

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	10	0.3	3	0.1
40	51	1.3	40	1.0	11	0.3
50	85	1.7	67	1.3	18	0.4
60	115	1.9	91	1.5	24	0.4
70	141	2.0	112	1.6	29	0.4
80	164	2.1	130	1.6	34	0.4
90	184	2.0	146	1.6	38	0.4
100	200	2.0	159	1.6	42	0.4
110	212	1.9	170	1.5	42	0.4
120	217	1.8	179	1.5	38	0.3
130	218	1.7	187	1.4	31	0.2
140	216	1.5	193	1.4	23	0.2
150	213	1.4	197	1.3	16	0.1
160	210	1.3	200	1.3	9	0.1
170	207	1.2	202	1.2	5	0.0
180	205	1.1	203	1.1	2	0.0
190	205	1.1	203	1.1	2	0.0
200	204	1.0	202	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=9 Yield Curve #=35

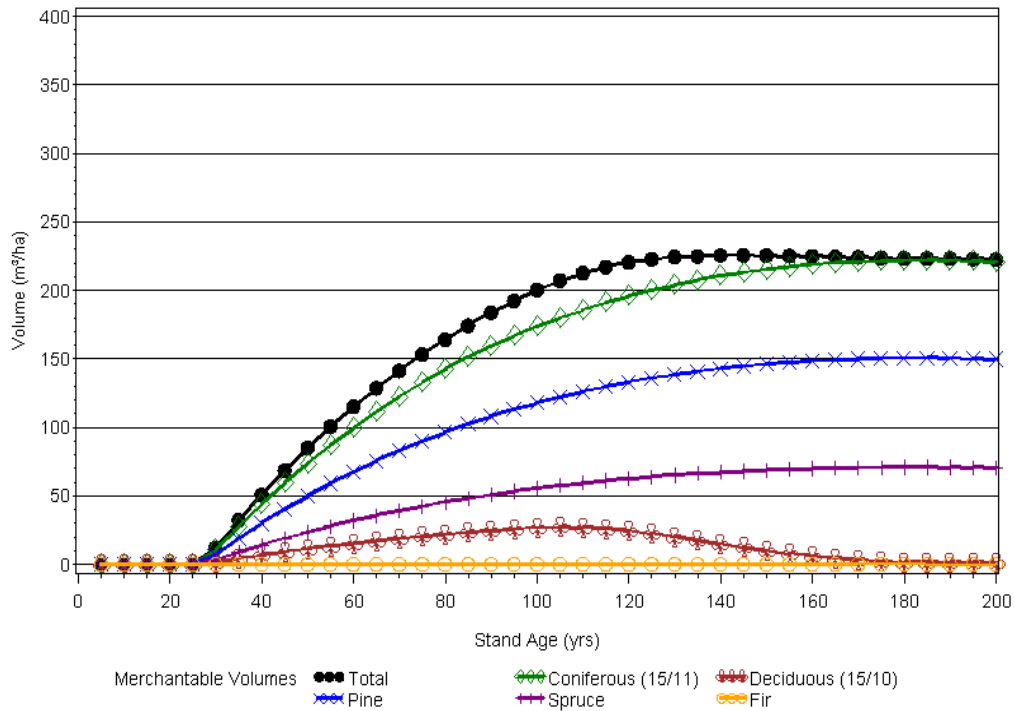


NSR & Site=LFM CC=B %Con=10 Yield Curve #=36

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	12	0.4	11	0.4	2	0.1
40	51	1.3	44	1.1	7	0.2
50	85	1.7	74	1.5	11	0.2
60	115	1.9	100	1.7	15	0.3
70	141	2.0	123	1.8	19	0.3
80	164	2.1	142	1.8	22	0.3
90	184	2.0	159	1.8	25	0.3
100	200	2.0	174	1.7	27	0.3
110	213	1.9	186	1.7	27	0.2
120	221	1.8	196	1.6	25	0.2
130	224	1.7	204	1.6	20	0.2
140	226	1.6	211	1.5	15	0.1
150	226	1.5	215	1.4	10	0.1
160	225	1.4	219	1.4	6	0.0
170	224	1.3	221	1.3	3	0.0
180	224	1.2	222	1.2	2	0.0
190	223	1.2	222	1.2	2	0.0
200	222	1.1	221	1.1	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=B %Con=10 Yield Curve #=36

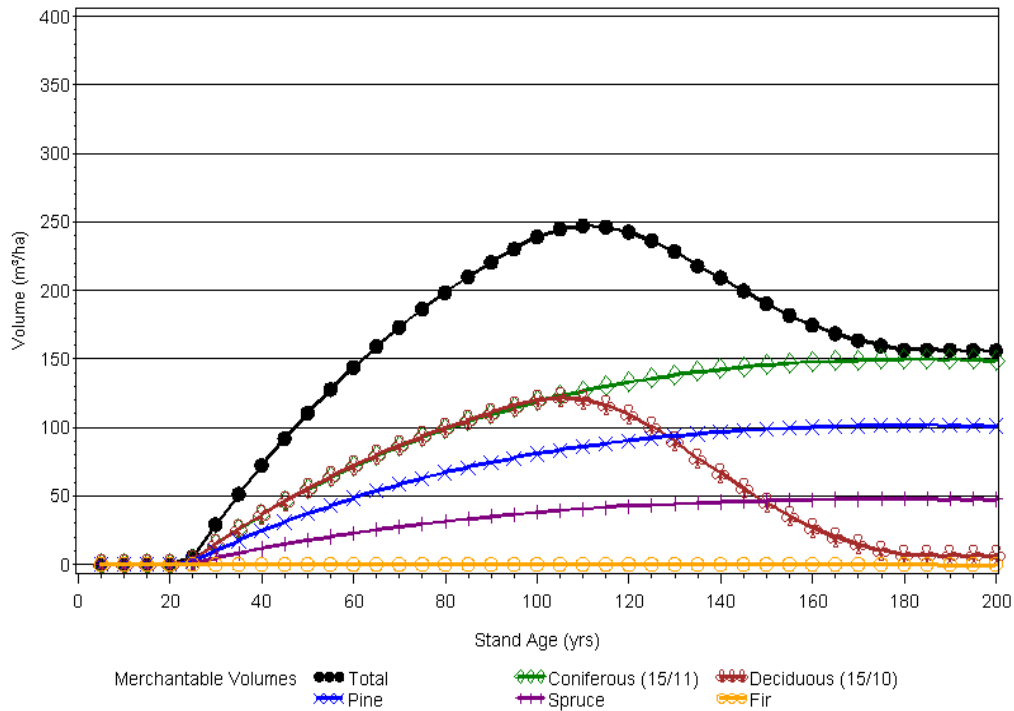


NSR & Site=LFM CC=C %Con=5 Yield Curve #=37

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	14	0.5	15	0.5
40	72	1.8	36	0.9	36	0.9
50	110	2.2	55	1.1	56	1.1
60	144	2.4	72	1.2	72	1.2
70	173	2.5	86	1.2	87	1.2
80	199	2.5	99	1.2	100	1.2
90	221	2.5	110	1.2	111	1.2
100	239	2.4	119	1.2	120	1.2
110	247	2.2	127	1.2	121	1.1
120	243	2.0	133	1.1	110	0.9
130	228	1.8	138	1.1	90	0.7
140	209	1.5	142	1.0	67	0.5
150	190	1.3	146	1.0	45	0.3
160	175	1.1	148	0.9	27	0.2
170	164	1.0	149	0.9	14	0.1
180	157	0.9	150	0.8	7	0.0
190	157	0.8	150	0.8	7	0.0
200	156	0.8	149	0.7	7	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=5 Yield Curve #=37

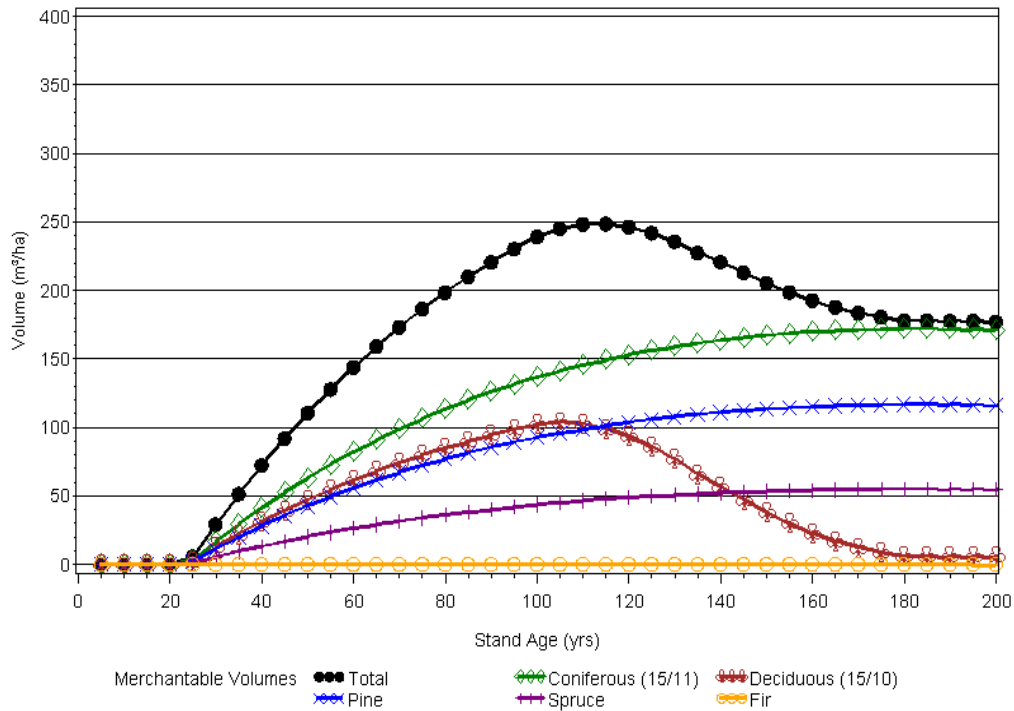


NSR & Site=LFM CC=C %Con=6 Yield Curve #=38

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	17	0.6	13	0.4
40	72	1.8	41	1.0	31	0.8
50	110	2.2	63	1.3	47	0.9
60	144	2.4	82	1.4	62	1.0
70	173	2.5	99	1.4	74	1.1
80	199	2.5	113	1.4	85	1.1
90	221	2.5	126	1.4	95	1.1
100	239	2.4	137	1.4	103	1.0
110	248	2.3	145	1.3	103	0.9
120	246	2.1	153	1.3	94	0.8
130	236	1.8	159	1.2	77	0.6
140	221	1.6	164	1.2	57	0.4
150	205	1.4	167	1.1	38	0.3
160	193	1.2	170	1.1	23	0.1
170	184	1.1	171	1.0	12	0.1
180	178	1.0	172	1.0	6	0.0
190	178	0.9	172	0.9	6	0.0
200	177	0.9	171	0.9	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=6 Yield Curve #=38

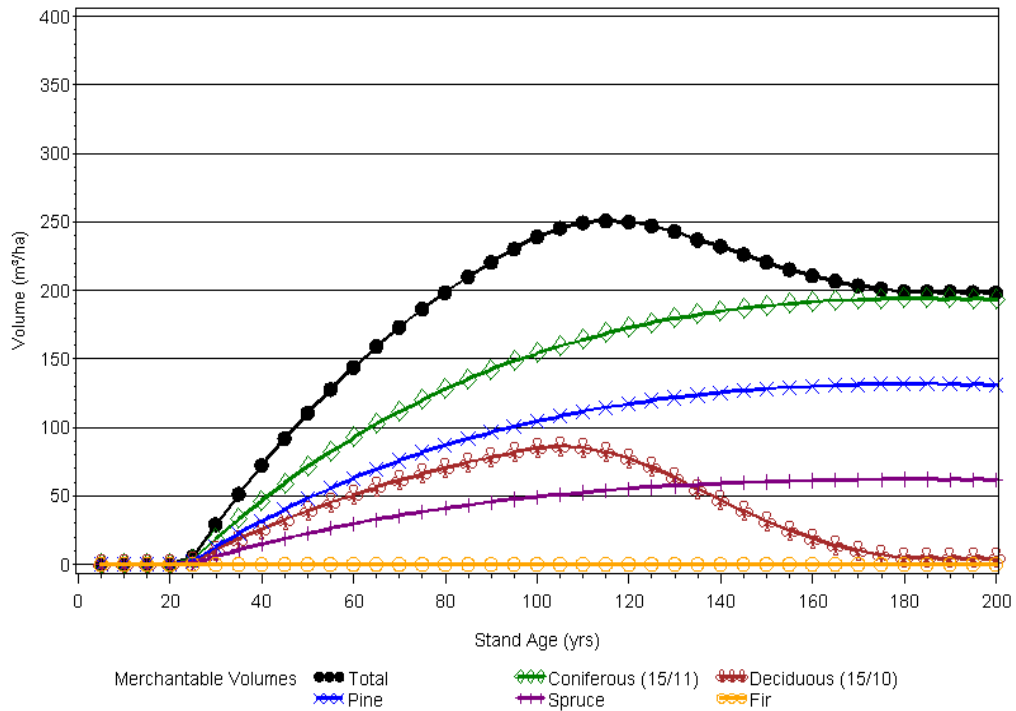


NSR & Site=LFM CC=C %Con=7 Yield Curve #=39

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	19	0.6	10	0.3
40	72	1.8	47	1.2	26	0.6
50	110	2.2	71	1.4	39	0.8
60	144	2.4	93	1.5	51	0.9
70	173	2.5	112	1.6	62	0.9
80	199	2.5	128	1.6	71	0.9
90	221	2.5	142	1.6	78	0.9
100	239	2.4	154	1.5	85	0.8
110	249	2.3	164	1.5	85	0.8
120	250	2.1	173	1.4	77	0.6
130	243	1.9	179	1.4	64	0.5
140	232	1.7	185	1.3	47	0.3
150	221	1.5	189	1.3	32	0.2
160	211	1.3	192	1.2	19	0.1
170	204	1.2	193	1.1	10	0.1
180	199	1.1	194	1.1	5	0.0
190	199	1.0	194	1.0	5	0.0
200	198	1.0	193	1.0	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=7 Yield Curve #=39

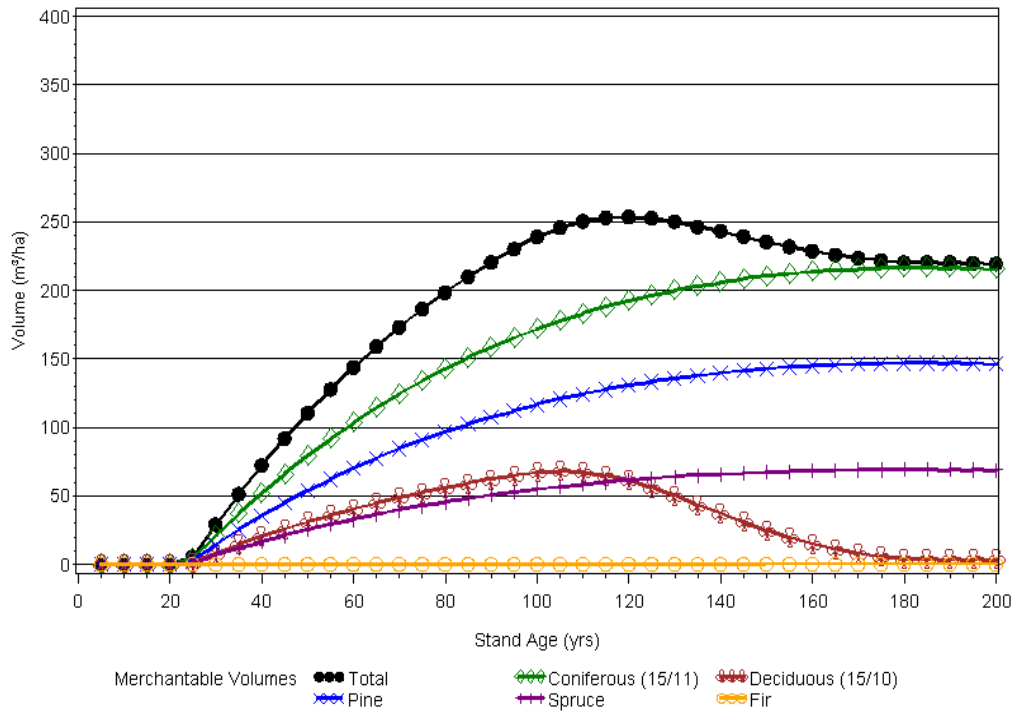


NSR & Site=LFM CC=C %Con=8 Yield Curve #=40

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	21	0.7	8	0.3
40	72	1.8	52	1.3	20	0.5
50	110	2.2	79	1.6	31	0.6
60	144	2.4	103	1.7	40	0.7
70	173	2.5	124	1.8	49	0.7
80	199	2.5	143	1.8	56	0.7
90	221	2.5	158	1.8	62	0.7
100	239	2.4	172	1.7	67	0.7
110	251	2.3	183	1.7	67	0.6
120	254	2.1	192	1.6	61	0.5
130	250	1.9	200	1.5	50	0.4
140	243	1.7	206	1.5	37	0.3
150	236	1.6	210	1.4	25	0.2
160	229	1.4	214	1.3	15	0.1
170	224	1.3	216	1.3	8	0.0
180	220	1.2	217	1.2	4	0.0
190	220	1.2	216	1.1	4	0.0
200	219	1.1	216	1.1	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=8 Yield Curve #=40

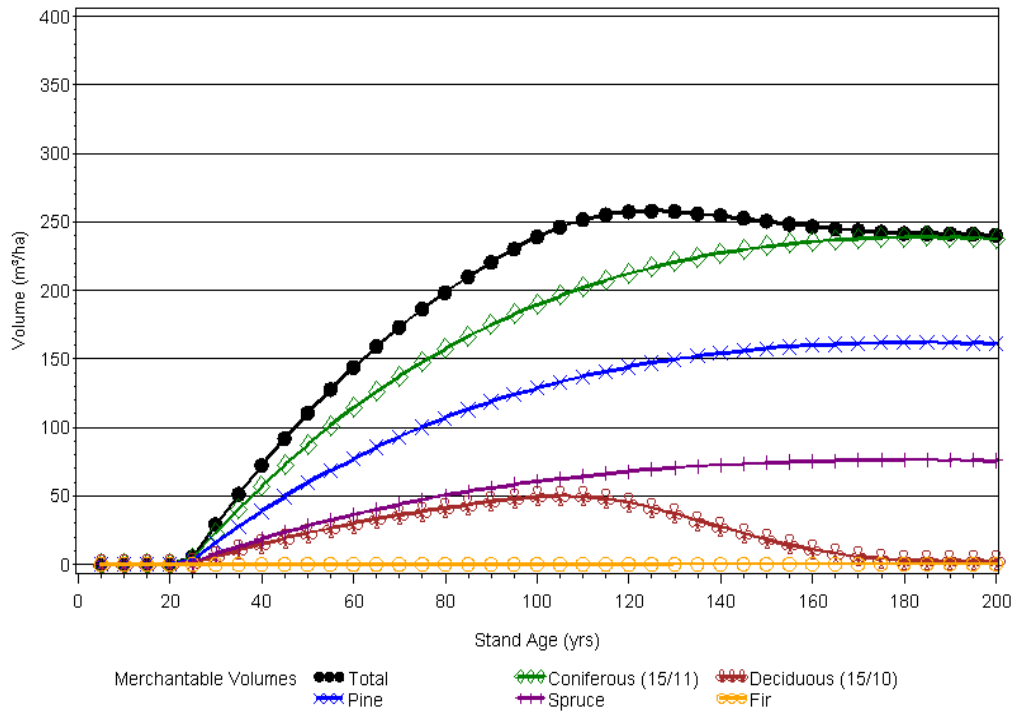


NSR & Site=LFM CC=C %Con=9 Yield Curve #=41

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	23	0.8	6	0.2
40	72	1.8	57	1.4	15	0.4
50	110	2.2	88	1.8	23	0.5
60	144	2.4	114	1.9	30	0.5
70	173	2.5	137	2.0	36	0.5
80	199	2.5	157	2.0	41	0.5
90	221	2.5	175	1.9	46	0.5
100	239	2.4	190	1.9	50	0.5
110	252	2.3	202	1.8	50	0.5
120	257	2.1	212	1.8	45	0.4
130	258	2.0	221	1.7	37	0.3
140	255	1.8	227	1.6	28	0.2
150	251	1.7	232	1.5	19	0.1
160	247	1.5	236	1.5	11	0.1
170	244	1.4	238	1.4	6	0.0
180	242	1.3	239	1.3	3	0.0
190	242	1.3	239	1.3	3	0.0
200	241	1.2	238	1.2	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=9 Yield Curve #=41

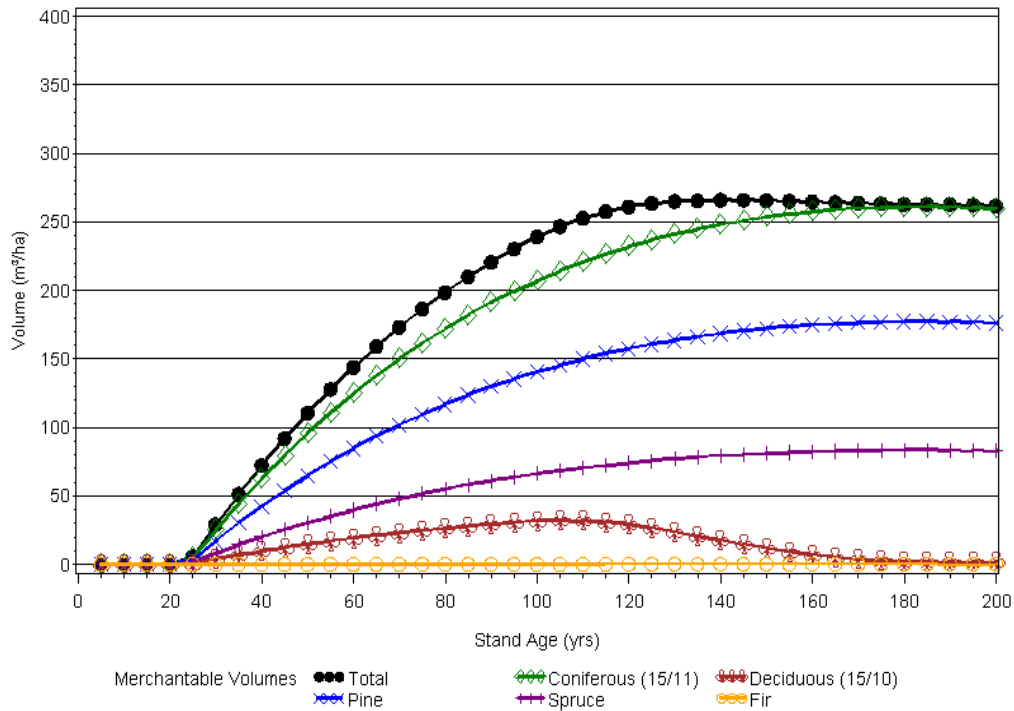


NSR & Site=LFM CC=C %Con=10 Yield Curve #=42

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	29	1.0	25	0.8	4	0.1
40	72	1.8	63	1.6	10	0.2
50	110	2.2	96	1.9	15	0.3
60	144	2.4	125	2.1	19	0.3
70	173	2.5	150	2.1	23	0.3
80	199	2.5	172	2.2	27	0.3
90	221	2.5	191	2.1	29	0.3
100	239	2.4	207	2.1	32	0.3
110	253	2.3	221	2.0	32	0.3
120	261	2.2	232	1.9	29	0.2
130	265	2.0	241	1.9	24	0.2
140	266	1.9	248	1.8	18	0.1
150	266	1.8	254	1.7	12	0.1
160	265	1.7	258	1.6	7	0.0
170	264	1.6	260	1.5	4	0.0
180	263	1.5	261	1.5	2	0.0
190	263	1.4	261	1.4	2	0.0
200	262	1.3	260	1.3	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=C %Con=10 Yield Curve #=42

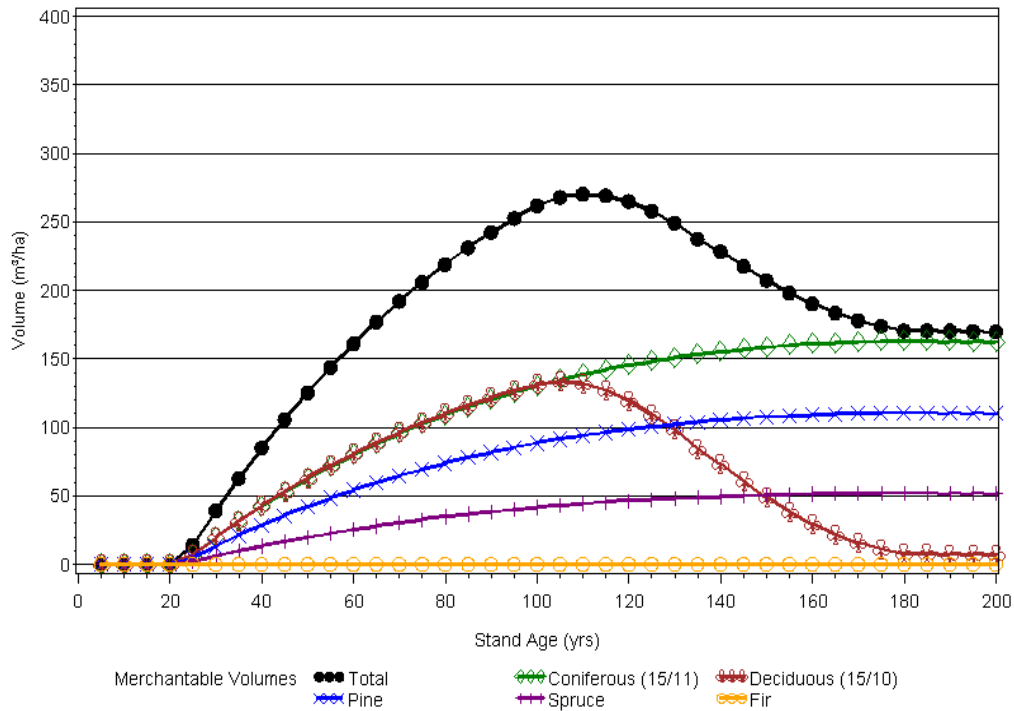


NSR & Site=LFM CC=D %Con=5 Yield Curve #=43

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	19	0.6	20	0.7
40	85	2.1	42	1.1	43	1.1
50	125	2.5	62	1.2	63	1.3
60	161	2.7	80	1.3	81	1.4
70	192	2.7	95	1.4	97	1.4
80	219	2.7	109	1.4	110	1.4
90	242	2.7	120	1.3	122	1.4
100	262	2.6	130	1.3	132	1.3
110	270	2.5	138	1.3	132	1.2
120	265	2.2	145	1.2	120	1.0
130	249	1.9	151	1.2	98	0.8
140	228	1.6	155	1.1	73	0.5
150	207	1.4	159	1.1	49	0.3
160	190	1.2	161	1.0	29	0.2
170	178	1.0	162	1.0	16	0.1
180	171	0.9	163	0.9	8	0.0
190	171	0.9	163	0.9	8	0.0
200	170	0.8	162	0.8	8	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=5 Yield Curve #=43

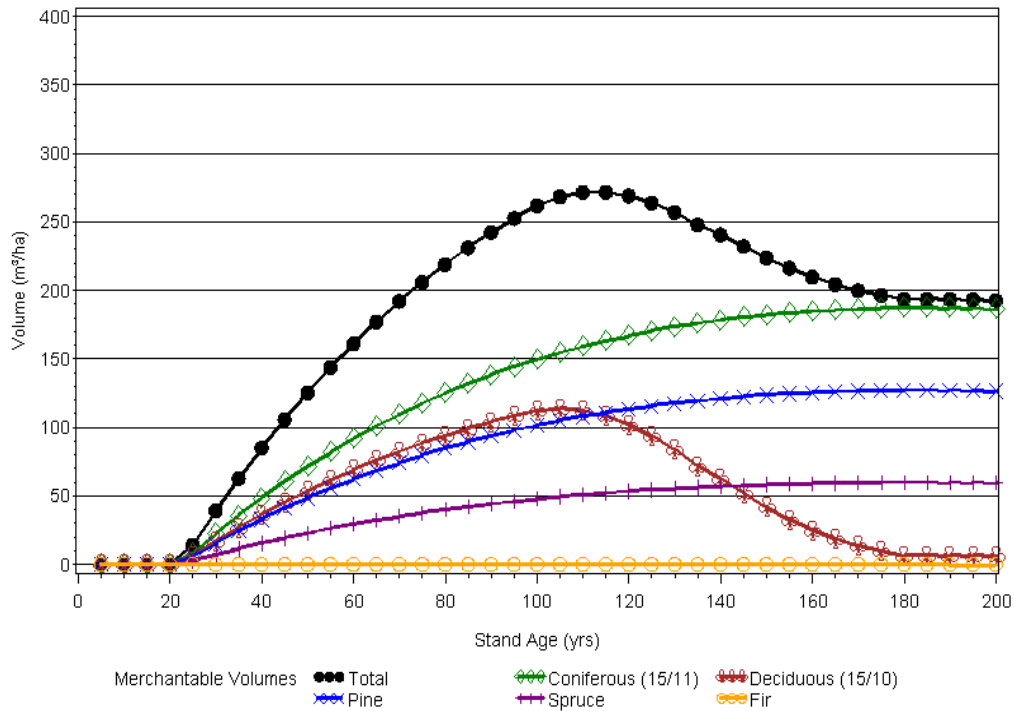


NSR & Site=LFM CC=D %Con=6 Yield Curve #=44

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	22	0.7	17	0.6
40	85	2.1	49	1.2	36	0.9
50	125	2.5	72	1.4	54	1.1
60	161	2.7	92	1.5	69	1.2
70	192	2.7	110	1.6	82	1.2
80	219	2.7	125	1.6	94	1.2
90	242	2.7	138	1.5	104	1.2
100	262	2.6	150	1.5	112	1.1
110	272	2.5	159	1.4	113	1.0
120	269	2.2	167	1.4	102	0.9
130	257	2.0	173	1.3	84	0.6
140	241	1.7	178	1.3	62	0.4
150	224	1.5	182	1.2	42	0.3
160	210	1.3	185	1.2	25	0.2
170	200	1.2	186	1.1	13	0.1
180	194	1.1	187	1.0	6	0.0
190	194	1.0	187	1.0	6	0.0
200	193	1.0	186	0.9	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=6 Yield Curve #=44

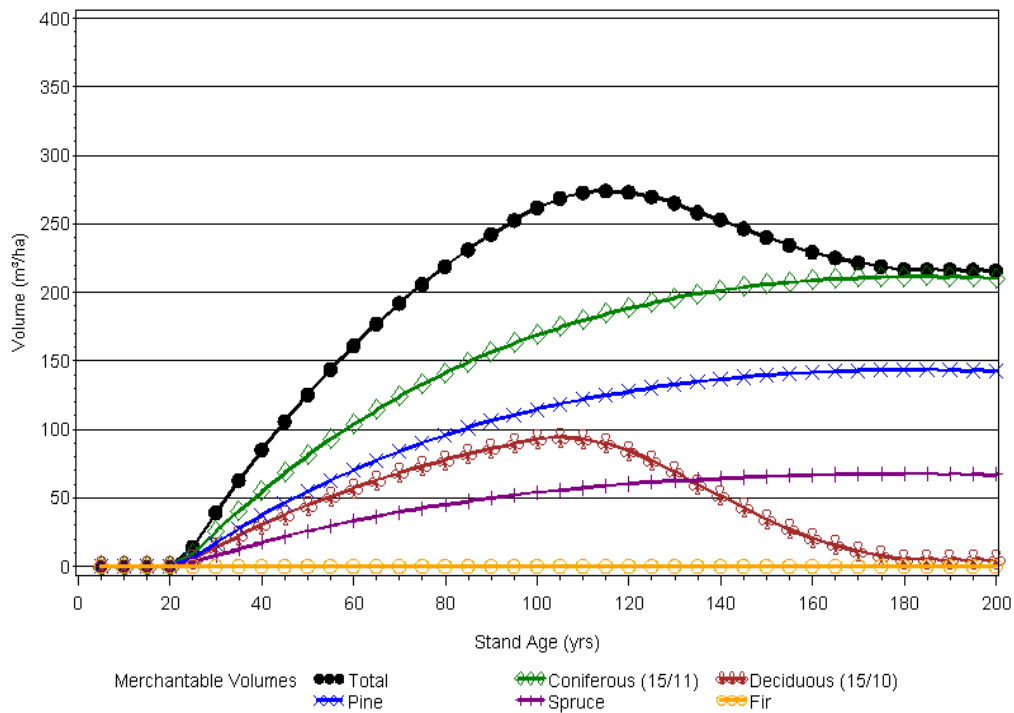


NSR & Site=LFM CC=D %Con=7 Yield Curve #=45

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	25	0.8	14	0.5
40	85	2.1	55	1.4	30	0.8
50	125	2.5	81	1.6	45	0.9
60	161	2.7	104	1.7	57	1.0
70	192	2.7	124	1.8	68	1.0
80	219	2.7	141	1.8	78	1.0
90	242	2.7	156	1.7	86	1.0
100	262	2.6	169	1.7	93	0.9
110	273	2.5	180	1.6	93	0.8
120	273	2.3	189	1.6	85	0.7
130	265	2.0	196	1.5	69	0.5
140	253	1.8	201	1.4	52	0.4
150	240	1.6	206	1.4	35	0.2
160	230	1.4	209	1.3	21	0.1
170	222	1.3	211	1.2	11	0.1
180	217	1.2	211	1.2	5	0.0
190	217	1.1	211	1.1	5	0.0
200	216	1.1	211	1.1	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=7 Yield Curve #=45

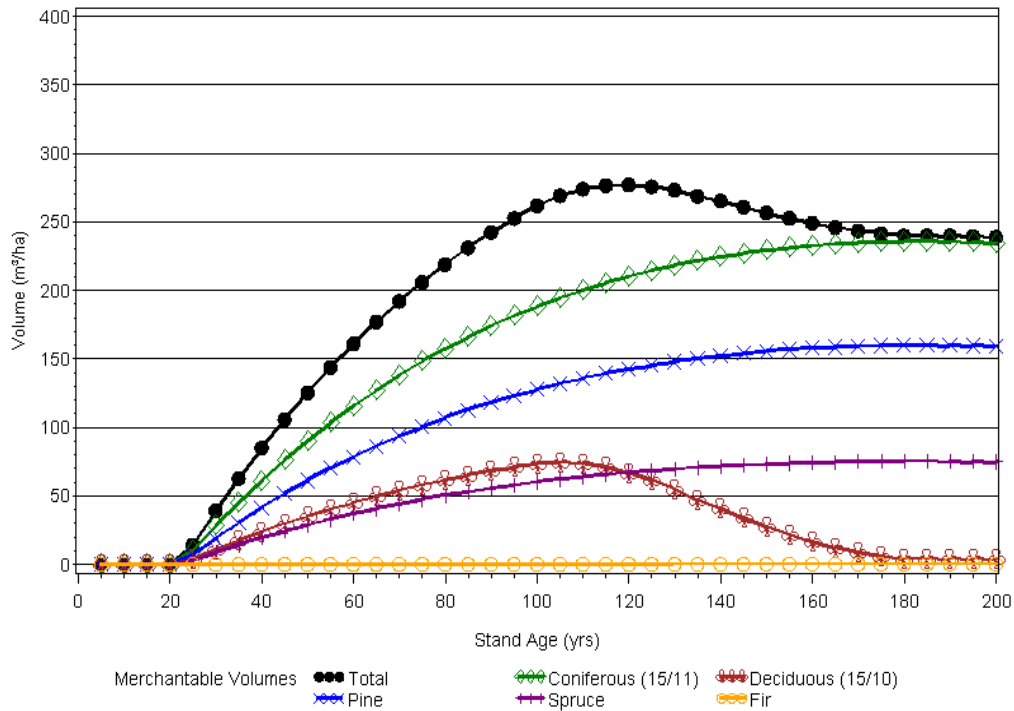


NSR & Site=LFM CC=D %Con=8 Yield Curve #=46

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	28	0.9	11	0.4
40	85	2.1	61	1.5	24	0.6
50	125	2.5	90	1.8	35	0.7
60	161	2.7	116	1.9	45	0.8
70	192	2.7	138	2.0	54	0.8
80	219	2.7	157	2.0	62	0.8
90	242	2.7	174	1.9	68	0.8
100	262	2.6	188	1.9	74	0.7
110	274	2.5	200	1.8	74	0.7
120	277	2.3	210	1.8	67	0.6
130	273	2.1	218	1.7	55	0.4
140	265	1.9	225	1.6	41	0.3
150	257	1.7	229	1.5	27	0.2
160	249	1.6	233	1.5	16	0.1
170	244	1.4	235	1.4	9	0.1
180	240	1.3	236	1.3	4	0.0
190	240	1.3	236	1.2	4	0.0
200	239	1.2	235	1.2	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=8 Yield Curve #=46

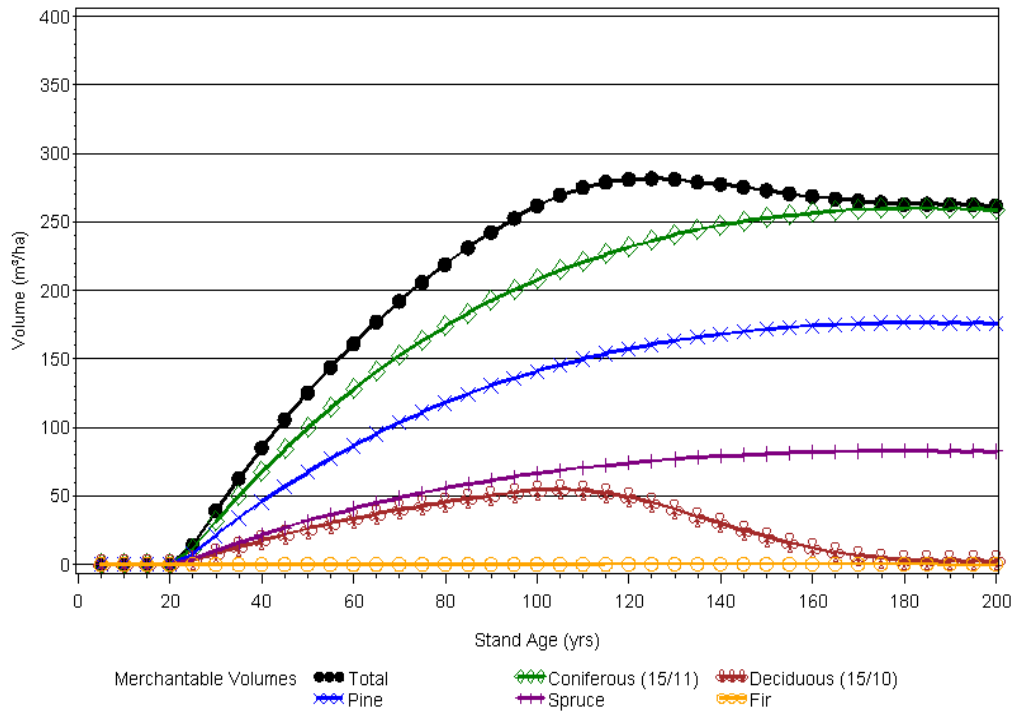


NSR & Site=LFM CC=D %Con=9 Yield Curve #=47

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	31	1.0	8	0.3
40	85	2.1	67	1.7	18	0.4
50	125	2.5	99	2.0	26	0.5
60	161	2.7	128	2.1	33	0.6
70	192	2.7	152	2.2	40	0.6
80	219	2.7	174	2.2	45	0.6
90	242	2.7	192	2.1	50	0.6
100	262	2.6	208	2.1	54	0.5
110	275	2.5	221	2.0	54	0.5
120	281	2.3	232	1.9	49	0.4
130	281	2.2	241	1.9	41	0.3
140	278	2.0	248	1.8	30	0.2
150	273	1.8	253	1.7	20	0.1
160	269	1.7	257	1.6	12	0.1
170	265	1.6	259	1.5	7	0.0
180	263	1.5	260	1.4	3	0.0
190	263	1.4	260	1.4	3	0.0
200	262	1.3	259	1.3	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=9 Yield Curve #=47

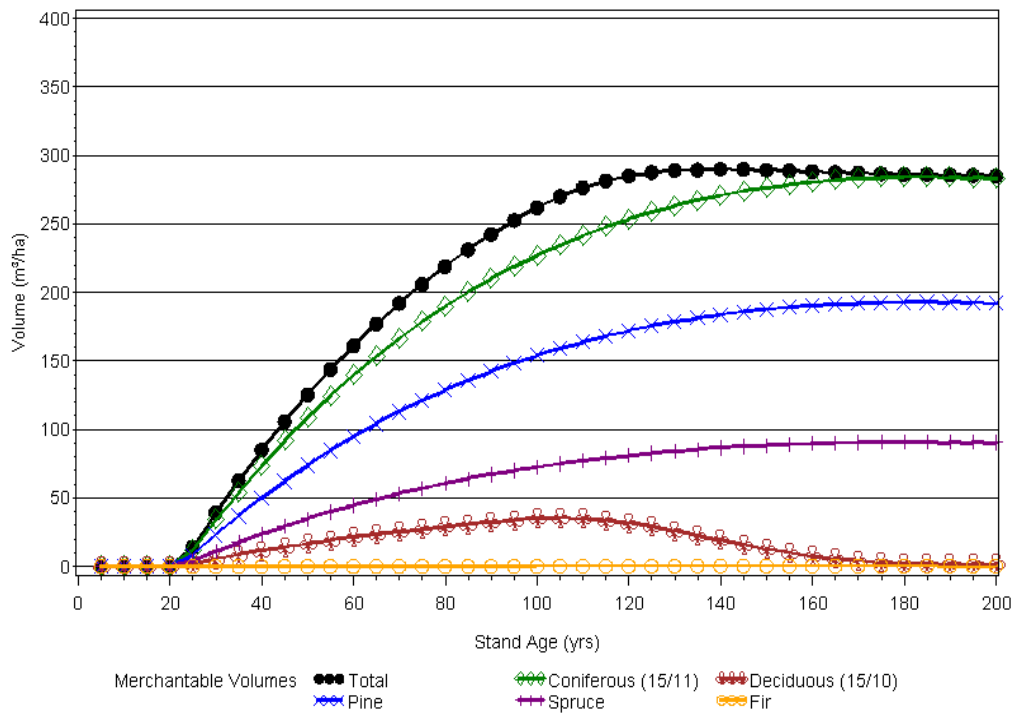


NSR & Site=LFM CC=D %Con=10 Yield Curve #=48

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	39	1.3	34	1.1	5	0.2
40	85	2.1	74	1.8	11	0.3
50	125	2.5	109	2.2	17	0.3
60	161	2.7	140	2.3	21	0.4
70	192	2.7	166	2.4	26	0.4
80	219	2.7	190	2.4	29	0.4
90	242	2.7	210	2.3	32	0.4
100	262	2.6	227	2.3	35	0.3
110	276	2.5	241	2.2	35	0.3
120	285	2.4	253	2.1	32	0.3
130	289	2.2	263	2.0	26	0.2
140	290	2.1	271	1.9	19	0.1
150	289	1.9	276	1.8	13	0.1
160	288	1.8	281	1.8	8	0.0
170	287	1.7	283	1.7	4	0.0
180	286	1.6	284	1.6	2	0.0
190	286	1.5	284	1.5	2	0.0
200	285	1.4	283	1.4	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFM CC=D %Con=10 Yield Curve #=48

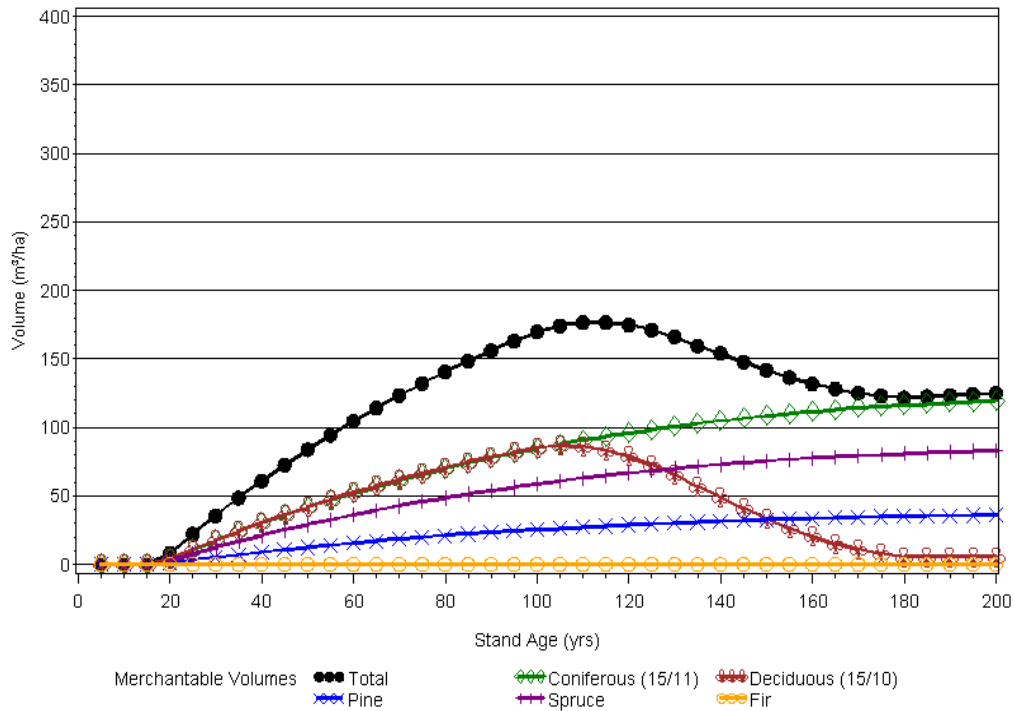


NSR & Site=LFP CC=X %Con=5 Yield Curve #=49

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	4	0.2	4	0.2
30	36	1.2	18	0.6	18	0.6
40	61	1.5	30	0.8	31	0.8
50	84	1.7	42	0.8	42	0.8
60	105	1.7	52	0.9	53	0.9
70	124	1.8	61	0.9	62	0.9
80	141	1.8	70	0.9	71	0.9
90	156	1.7	78	0.9	78	0.9
100	170	1.7	84	0.8	85	0.9
110	177	1.6	90	0.8	86	0.8
120	175	1.5	96	0.8	79	0.7
130	166	1.3	101	0.8	66	0.5
140	154	1.1	105	0.7	49	0.4
150	142	0.9	108	0.7	33	0.2
160	132	0.8	111	0.7	20	0.1
170	125	0.7	114	0.7	11	0.1
180	122	0.7	116	0.6	5	0.0
190	123	0.6	118	0.6	5	0.0
200	125	0.6	119	0.6	6	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=5 Yield Curve #=49

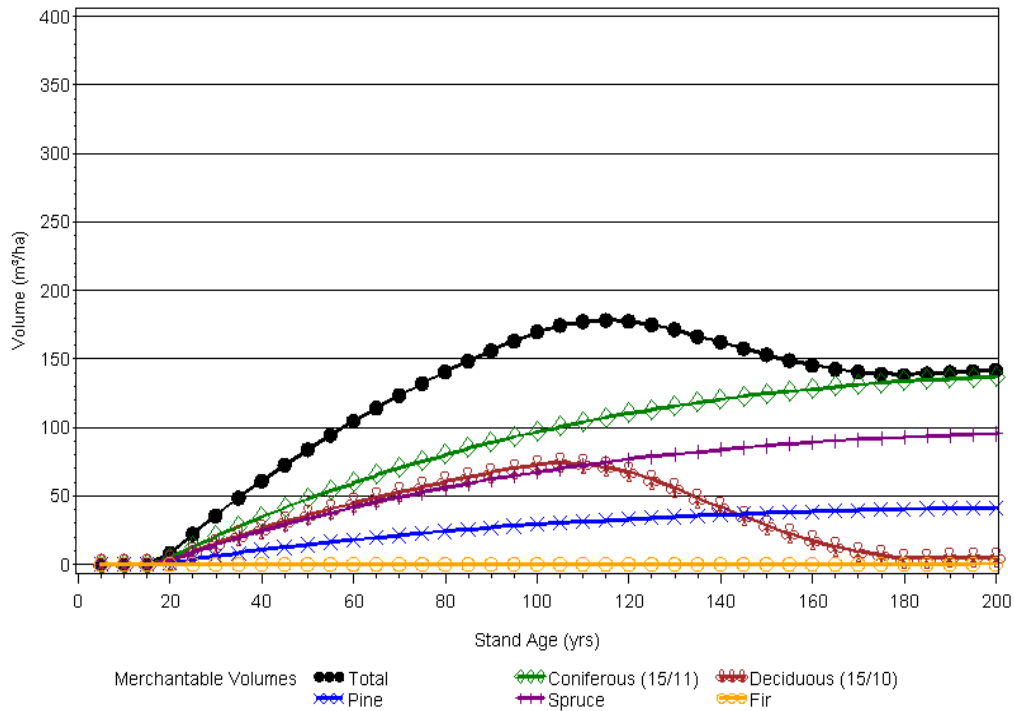


NSR & Site=LFP CC=X %Con=6 Yield Curve #=50

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	5	0.2	3	0.2
30	36	1.2	20	0.7	15	0.5
40	61	1.5	35	0.9	26	0.7
50	84	1.7	48	1.0	36	0.7
60	105	1.7	60	1.0	45	0.7
70	124	1.8	71	1.0	53	0.8
80	141	1.8	80	1.0	60	0.8
90	156	1.7	89	1.0	67	0.7
100	170	1.7	97	1.0	73	0.7
110	177	1.6	104	0.9	74	0.7
120	178	1.5	110	0.9	67	0.6
130	172	1.3	116	0.9	56	0.4
140	162	1.2	120	0.9	42	0.3
150	153	1.0	125	0.8	29	0.2
160	146	0.9	128	0.8	17	0.1
170	141	0.8	131	0.8	9	0.1
180	138	0.8	134	0.7	5	0.0
190	140	0.7	136	0.7	5	0.0
200	142	0.7	137	0.7	5	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=6 Yield Curve #=50

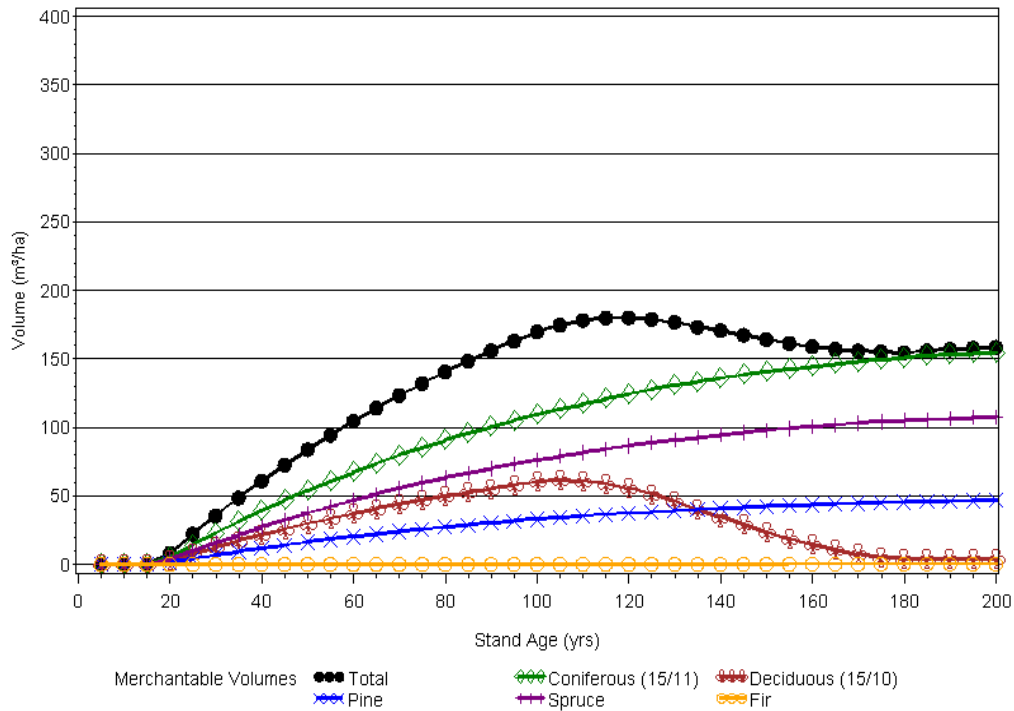


NSR & Site=LFP CC=X %Con=7 Yield Curve #=51

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	5	0.3	3	0.1
30	36	1.2	23	0.8	13	0.4
40	61	1.5	39	1.0	22	0.5
50	84	1.7	54	1.1	30	0.6
60	105	1.7	67	1.1	37	0.6
70	124	1.8	80	1.1	44	0.6
80	141	1.8	91	1.1	50	0.6
90	156	1.7	101	1.1	55	0.6
100	170	1.7	109	1.1	60	0.6
110	178	1.6	117	1.1	61	0.6
120	180	1.5	124	1.0	56	0.5
130	177	1.4	131	1.0	46	0.4
140	171	1.2	136	1.0	35	0.2
150	164	1.1	141	0.9	24	0.2
160	159	1.0	145	0.9	14	0.1
170	156	0.9	148	0.9	8	0.0
180	155	0.9	151	0.8	4	0.0
190	157	0.8	153	0.8	4	0.0
200	159	0.8	155	0.8	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=7 Yield Curve #=51

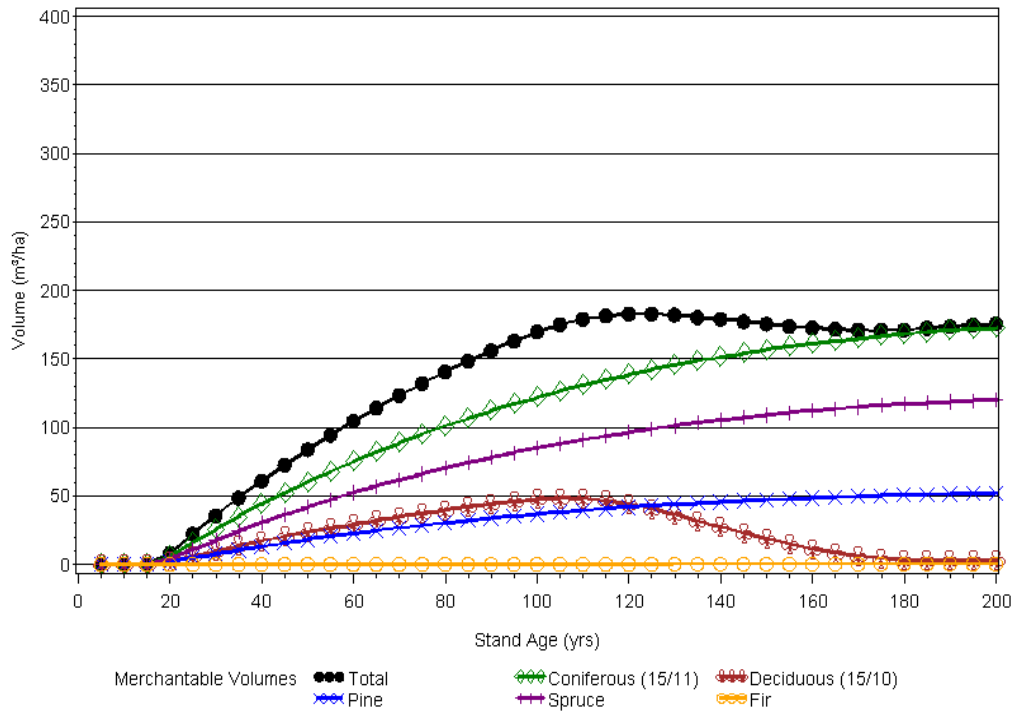


NSR & Site=LFP CC=X %Con=8 Yield Curve #=52

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	6	0.3	2	0.1
30	36	1.2	26	0.9	10	0.3
40	61	1.5	44	1.1	17	0.4
50	84	1.7	60	1.2	24	0.5
60	105	1.7	75	1.3	29	0.5
70	124	1.8	89	1.3	35	0.5
80	141	1.8	101	1.3	40	0.5
90	156	1.7	112	1.2	44	0.5
100	170	1.7	122	1.2	48	0.5
110	179	1.6	131	1.2	48	0.4
120	183	1.5	139	1.2	44	0.4
130	182	1.4	146	1.1	37	0.3
140	179	1.3	152	1.1	28	0.2
150	175	1.2	157	1.0	19	0.1
160	173	1.1	161	1.0	11	0.1
170	171	1.0	165	1.0	6	0.0
180	171	1.0	168	0.9	3	0.0
190	174	0.9	171	0.9	3	0.0
200	176	0.9	173	0.9	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=8 Yield Curve #=52

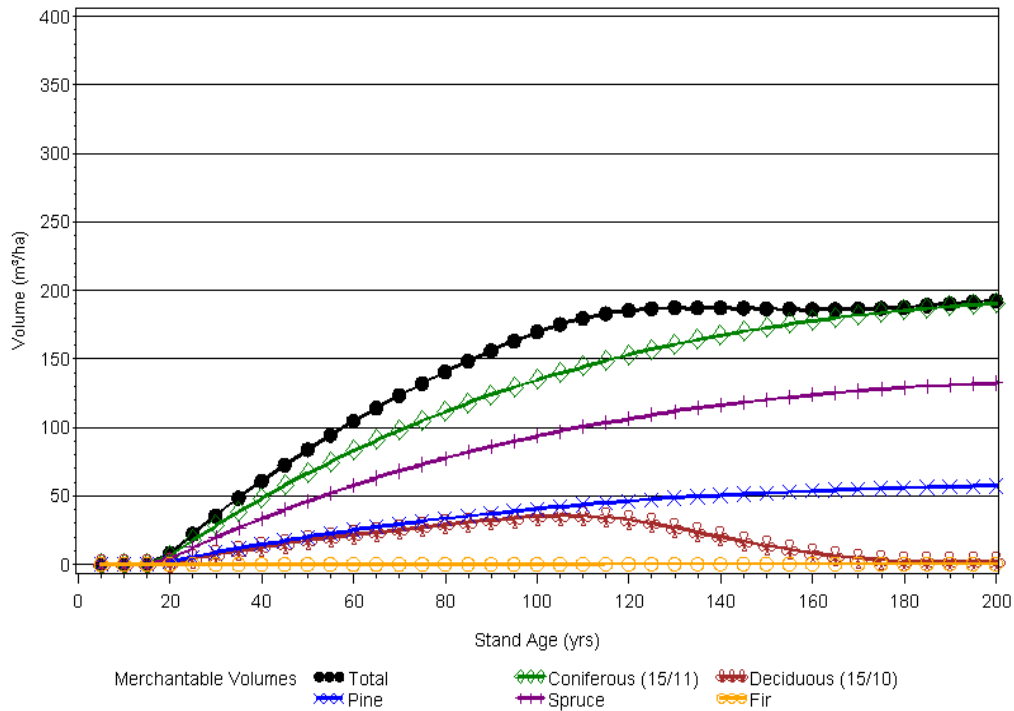


NSR & Site=LFP CC=X %Con=9 Yield Curve #=53

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	6	0.3	2	0.1
30	36	1.2	28	0.9	7	0.2
40	61	1.5	48	1.2	13	0.3
50	84	1.7	66	1.3	17	0.3
60	105	1.7	83	1.4	22	0.4
70	124	1.8	98	1.4	26	0.4
80	141	1.8	111	1.4	29	0.4
90	156	1.7	124	1.4	32	0.4
100	170	1.7	135	1.3	35	0.4
110	180	1.6	144	1.3	36	0.3
120	185	1.5	153	1.3	33	0.3
130	188	1.4	161	1.2	27	0.2
140	187	1.3	167	1.2	20	0.1
150	187	1.2	173	1.2	14	0.1
160	186	1.2	178	1.1	8	0.1
170	187	1.1	182	1.1	5	0.0
180	188	1.0	185	1.0	2	0.0
190	190	1.0	188	1.0	2	0.0
200	193	1.0	190	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=9 Yield Curve #=53

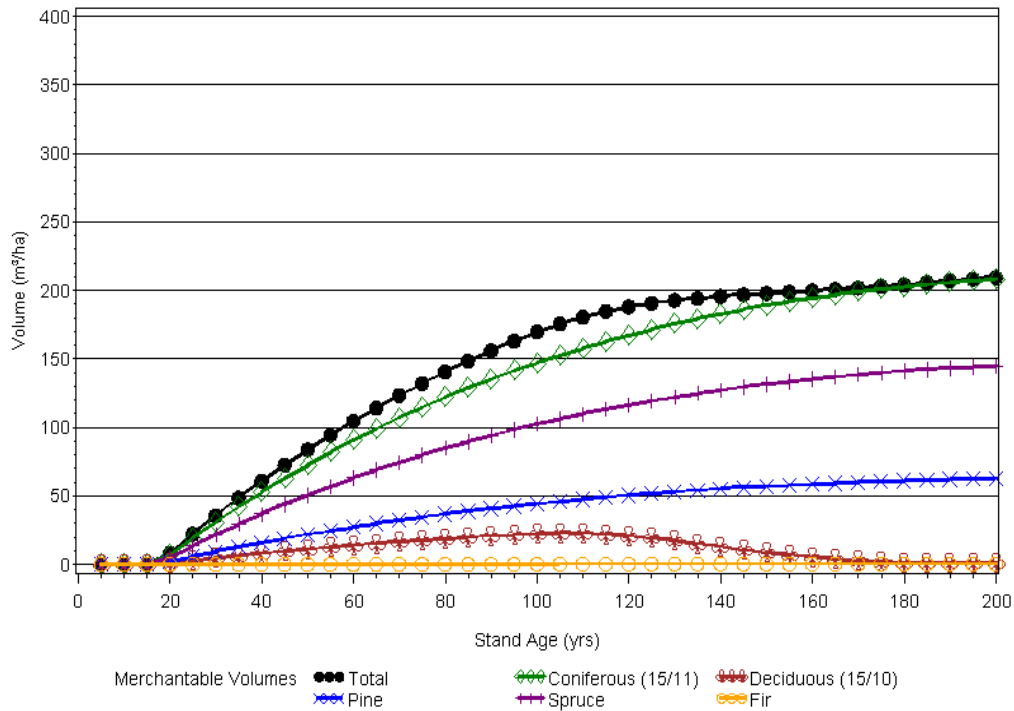


NSR & Site=LFP CC=X %Con=10 Yield Curve #-54

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	8	0.4	7	0.4	1	0.1
30	36	1.2	31	1.0	5	0.2
40	61	1.5	53	1.3	8	0.2
50	84	1.7	73	1.5	11	0.2
60	105	1.7	91	1.5	14	0.2
70	124	1.8	107	1.5	16	0.2
80	141	1.8	122	1.5	19	0.2
90	156	1.7	135	1.5	21	0.2
100	170	1.7	147	1.5	23	0.2
110	181	1.6	158	1.4	23	0.2
120	188	1.6	167	1.4	21	0.2
130	193	1.5	175	1.3	17	0.1
140	196	1.4	183	1.3	13	0.1
150	198	1.3	189	1.3	9	0.1
160	200	1.2	194	1.2	5	0.0
170	202	1.2	199	1.2	3	0.0
180	204	1.1	203	1.1	1	0.0
190	207	1.1	206	1.1	1	0.0
200	210	1.0	208	1.0	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=LFP CC=X %Con=10 Yield Curve #-54

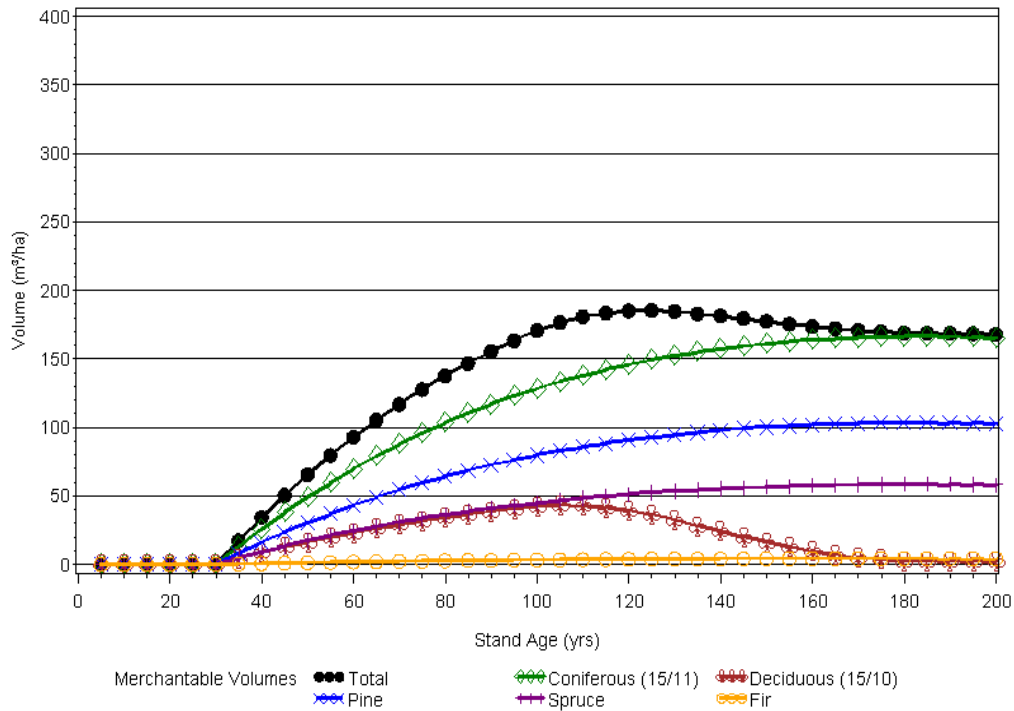


NSR & Site=UFG CC=A %Con=5 Yield Curve #=55

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	26	0.6	9	0.2
50	66	1.3	49	1.0	16	0.3
60	93	1.5	70	1.2	23	0.4
70	117	1.7	88	1.3	29	0.4
80	138	1.7	103	1.3	34	0.4
90	156	1.7	117	1.3	39	0.4
100	171	1.7	128	1.3	42	0.4
110	181	1.6	138	1.3	43	0.4
120	185	1.5	146	1.2	39	0.3
130	185	1.4	152	1.2	32	0.2
140	182	1.3	157	1.1	24	0.2
150	178	1.2	161	1.1	16	0.1
160	174	1.1	164	1.0	10	0.1
170	171	1.0	166	1.0	5	0.0
180	169	0.9	166	0.9	3	0.0
190	169	0.9	166	0.9	3	0.0
200	168	0.8	166	0.8	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=5 Yield Curve #=55

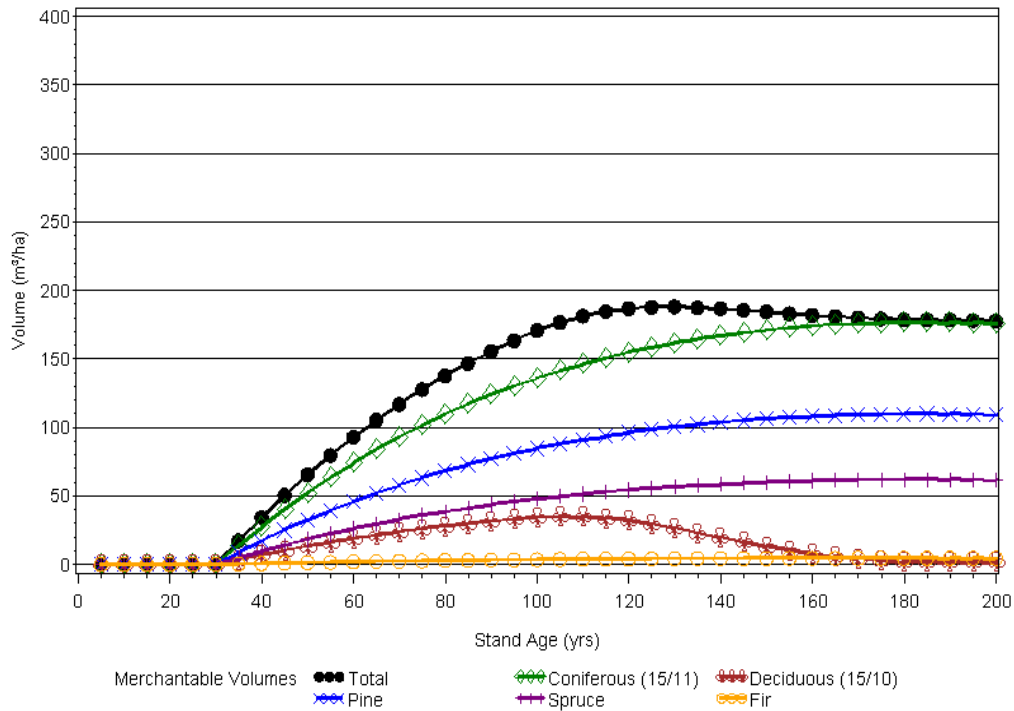


NSR & Site=UFG CC=A %Con=6 Yield Curve #=56

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	27	0.7	7	0.2
50	66	1.3	52	1.0	13	0.3
60	93	1.5	74	1.2	19	0.3
70	117	1.7	93	1.3	24	0.3
80	138	1.7	110	1.4	28	0.3
90	156	1.7	124	1.4	32	0.4
100	171	1.7	136	1.4	35	0.3
110	181	1.6	146	1.3	35	0.3
120	187	1.6	155	1.3	32	0.3
130	188	1.4	162	1.2	26	0.2
140	187	1.3	167	1.2	20	0.1
150	184	1.2	171	1.1	13	0.1
160	182	1.1	174	1.1	8	0.1
170	180	1.1	176	1.0	4	0.0
180	179	1.0	177	1.0	2	0.0
190	179	0.9	177	0.9	2	0.0
200	178	0.9	176	0.9	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=6 Yield Curve #=56

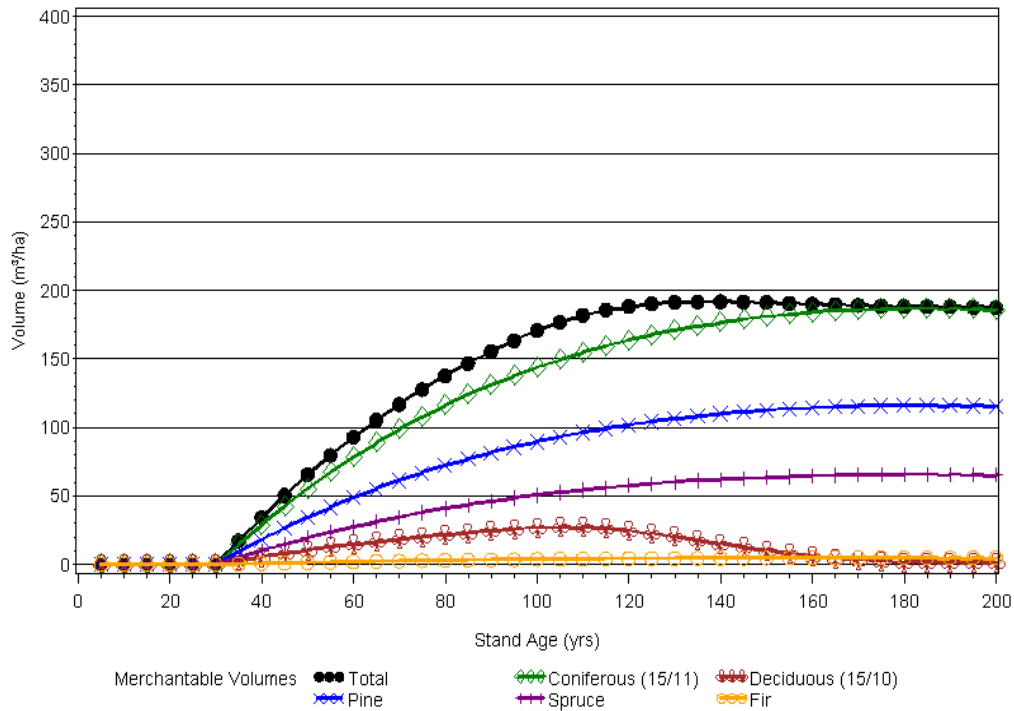


NSR & Site=UFG CC=A %Con=7 Yield Curve #=57

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	29	0.7	5	0.1
50	66	1.3	55	1.1	10	0.2
60	93	1.5	78	1.3	15	0.2
70	117	1.7	99	1.4	18	0.3
80	138	1.7	116	1.5	22	0.3
90	156	1.7	131	1.5	24	0.3
100	171	1.7	144	1.4	27	0.3
110	182	1.7	155	1.4	27	0.2
120	189	1.6	164	1.4	25	0.2
130	191	1.5	171	1.3	21	0.2
140	192	1.4	177	1.3	15	0.1
150	191	1.3	181	1.2	10	0.1
160	190	1.2	184	1.1	6	0.0
170	189	1.1	186	1.1	3	0.0
180	188	1.0	187	1.0	2	0.0
190	188	1.0	187	1.0	2	0.0
200	187	0.9	186	0.9	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=7 Yield Curve #=57

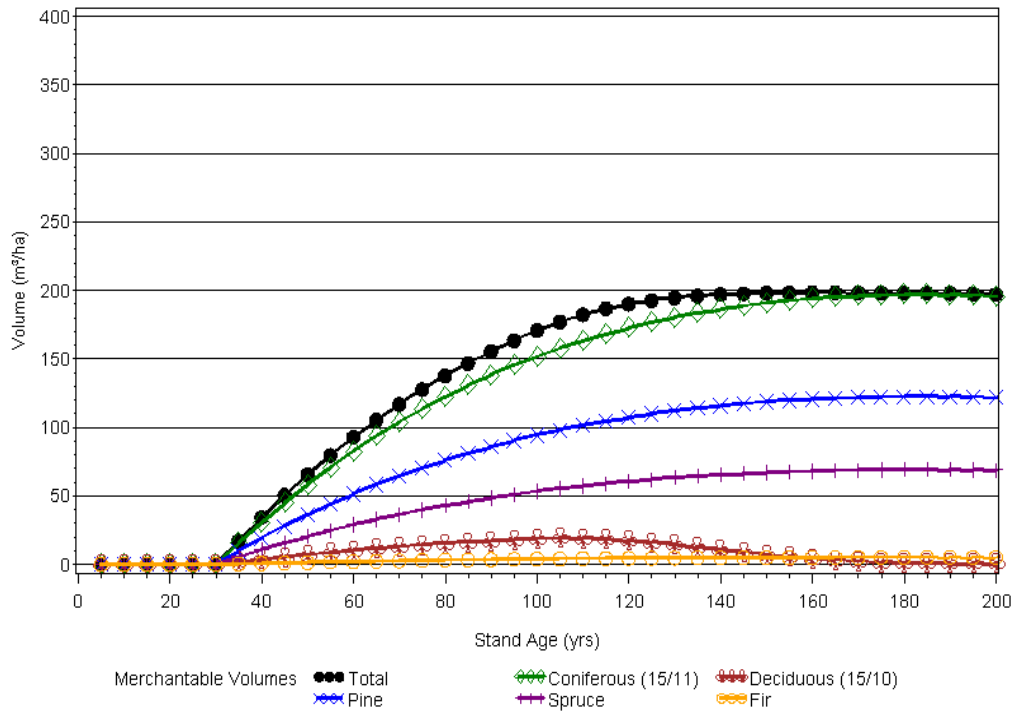


NSR & Site=UFG CC=A %Con=8 Yield Curve #=58

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	31	0.8	4	0.1
50	66	1.3	58	1.2	7	0.1
60	93	1.5	83	1.4	10	0.2
70	117	1.7	104	1.5	13	0.2
80	138	1.7	122	1.5	15	0.2
90	156	1.7	138	1.5	17	0.2
100	171	1.7	152	1.5	19	0.2
110	182	1.7	163	1.5	19	0.2
120	190	1.6	173	1.4	18	0.1
130	195	1.5	180	1.4	15	0.1
140	197	1.4	186	1.3	11	0.1
150	198	1.3	191	1.3	7	0.0
160	198	1.2	194	1.2	4	0.0
170	198	1.2	196	1.2	2	0.0
180	198	1.1	197	1.1	1	0.0
190	198	1.0	197	1.0	1	0.0
200	197	1.0	196	1.0	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=8 Yield Curve #=58

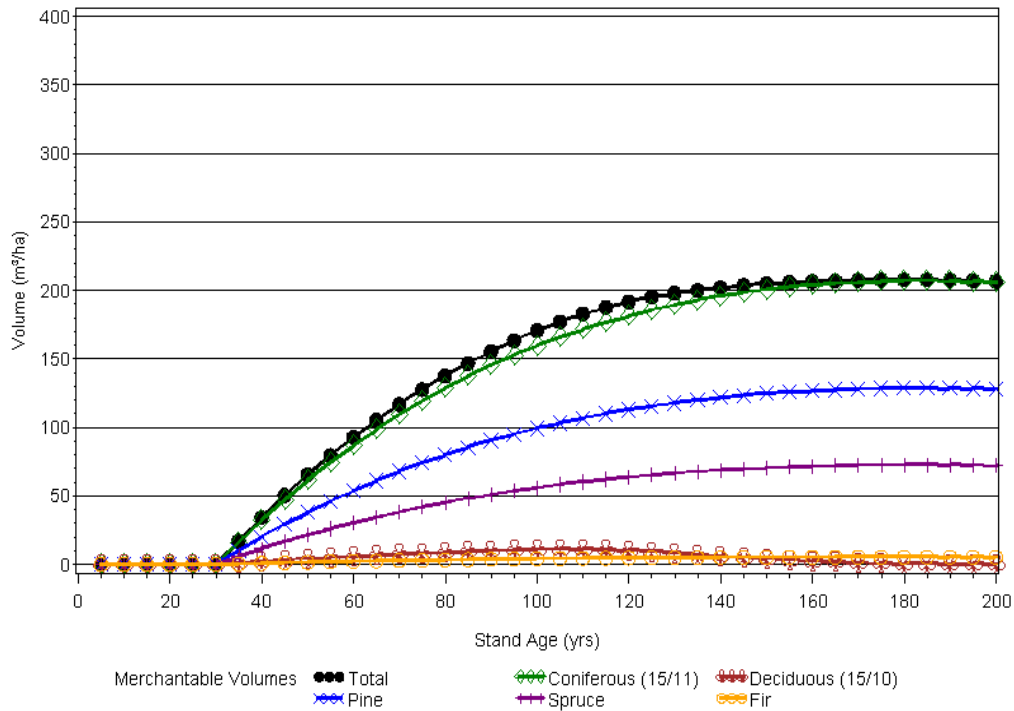


NSR & Site=UFG CC=A %Con=9 Yield Curve #=59

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	32	0.8	2	0.1
50	66	1.3	61	1.2	4	0.1
60	93	1.5	87	1.4	6	0.1
70	117	1.7	109	1.6	8	0.1
80	138	1.7	129	1.6	9	0.1
90	156	1.7	145	1.6	10	0.1
100	171	1.7	160	1.6	11	0.1
110	183	1.7	172	1.6	11	0.1
120	192	1.6	182	1.5	10	0.1
130	198	1.5	190	1.5	9	0.1
140	202	1.4	196	1.4	6	0.0
150	205	1.4	201	1.3	4	0.0
160	207	1.3	204	1.3	3	0.0
170	208	1.2	206	1.2	1	0.0
180	208	1.2	207	1.2	1	0.0
190	208	1.1	207	1.1	1	0.0
200	207	1.0	206	1.0	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=9 Yield Curve #=59

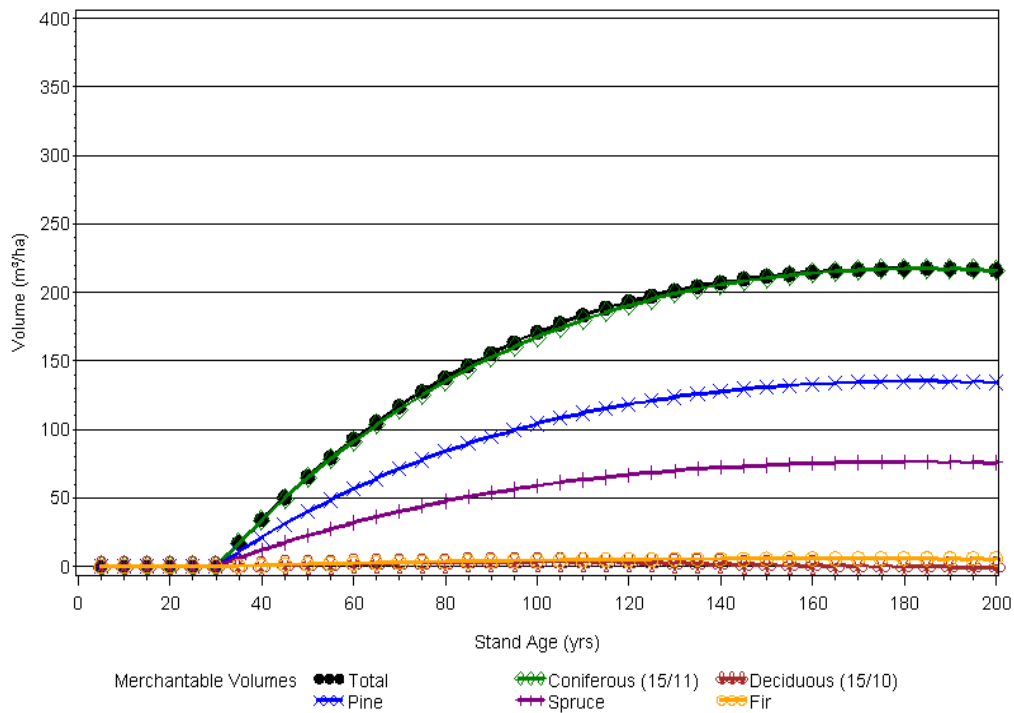


NSR & Site=UFG CC=A %Con=10 Yield Curve #=60

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	34	0.9	34	0.8	1	0.0
50	66	1.3	64	1.3	1	0.0
60	93	1.5	91	1.5	2	0.0
70	117	1.7	115	1.6	2	0.0
80	138	1.7	135	1.7	3	0.0
90	156	1.7	153	1.7	3	0.0
100	171	1.7	167	1.7	3	0.0
110	183	1.7	180	1.6	3	0.0
120	193	1.6	190	1.6	3	0.0
130	201	1.5	199	1.5	3	0.0
140	207	1.5	206	1.5	2	0.0
150	212	1.4	211	1.4	1	0.0
160	215	1.3	214	1.3	1	0.0
170	217	1.3	216	1.3	0	0.0
180	217	1.2	217	1.2	0	0.0
190	217	1.1	217	1.1	0	0.0
200	216	1.1	216	1.1	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=A %Con=10 Yield Curve #=60

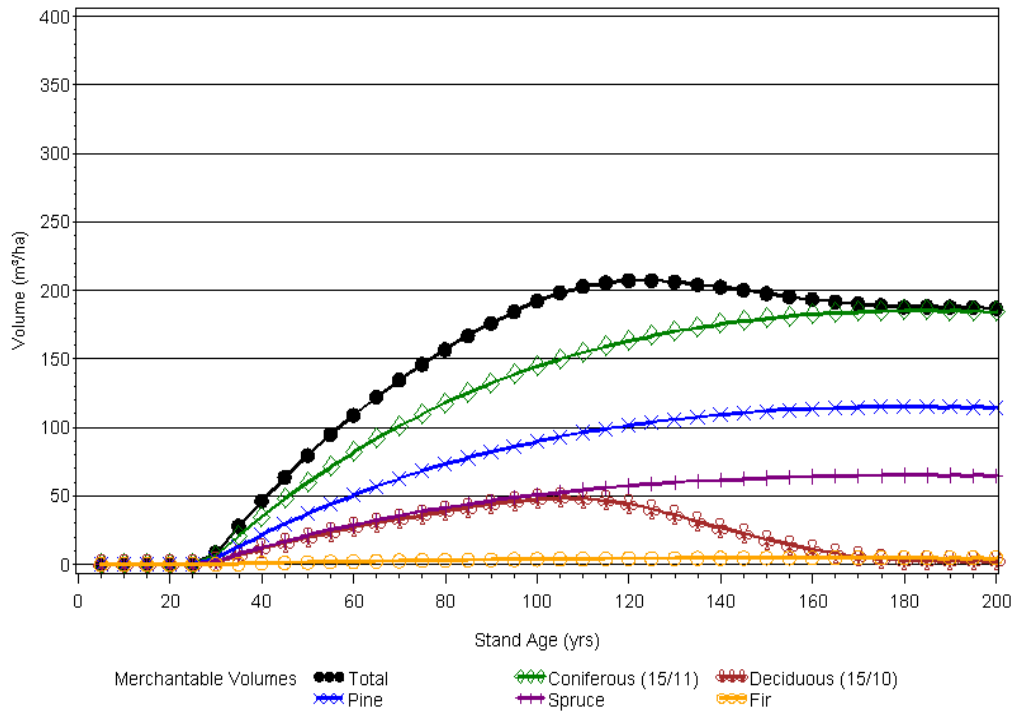


NSR & Site=UFG CC=B %Con=5 Yield Curve #=61

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	6	0.2	2	0.1
40	46	1.2	35	0.9	12	0.3
50	80	1.6	60	1.2	20	0.4
60	109	1.8	82	1.4	27	0.5
70	135	1.9	101	1.4	33	0.5
80	157	2.0	118	1.5	39	0.5
90	176	2.0	132	1.5	44	0.5
100	192	1.9	144	1.4	48	0.5
110	203	1.8	155	1.4	48	0.4
120	207	1.7	163	1.4	44	0.4
130	206	1.6	170	1.3	36	0.3
140	203	1.4	176	1.3	27	0.2
150	198	1.3	180	1.2	18	0.1
160	194	1.2	183	1.1	11	0.1
170	190	1.1	184	1.1	6	0.0
180	188	1.0	185	1.0	3	0.0
190	188	1.0	185	1.0	3	0.0
200	187	0.9	184	0.9	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=5 Yield Curve #=61

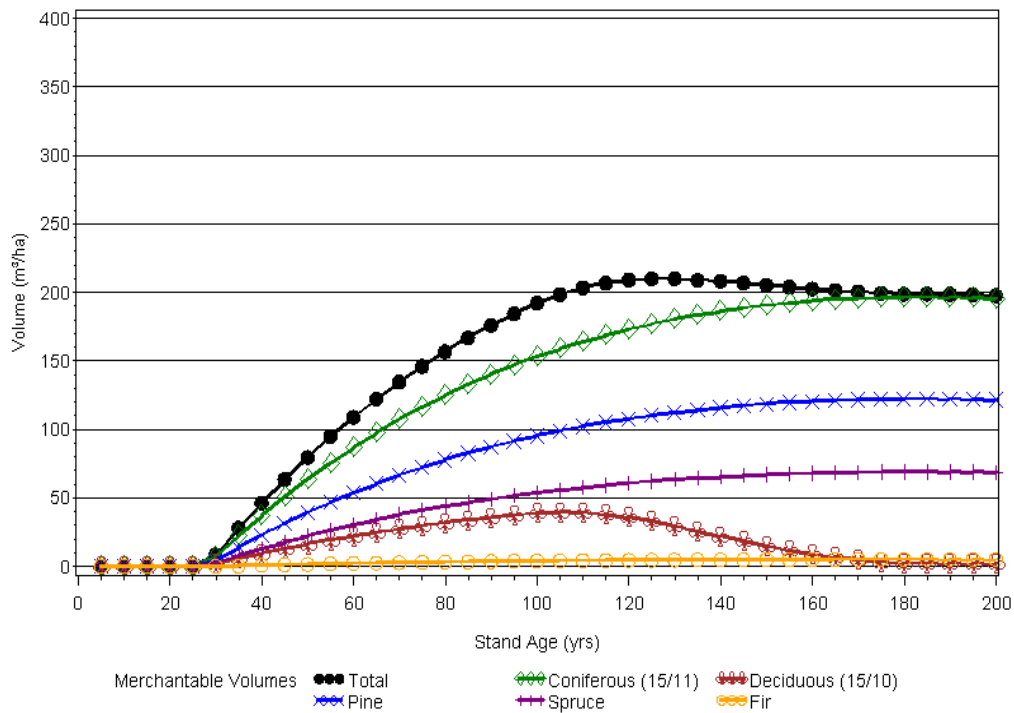


NSR & Site=UFG CC=B %Con=6 Yield Curve #=62

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	7	0.2	2	0.1
40	46	1.2	37	0.9	9	0.2
50	80	1.6	64	1.3	16	0.3
60	109	1.8	87	1.4	22	0.4
70	135	1.9	107	1.5	27	0.4
80	157	2.0	125	1.6	32	0.4
90	176	2.0	140	1.6	36	0.4
100	192	1.9	153	1.5	39	0.4
110	203	1.8	164	1.5	39	0.4
120	209	1.7	173	1.4	36	0.3
130	210	1.6	181	1.4	30	0.2
140	208	1.5	186	1.3	22	0.2
150	205	1.4	191	1.3	15	0.1
160	203	1.3	194	1.2	9	0.1
170	200	1.2	196	1.2	5	0.0
180	199	1.1	197	1.1	2	0.0
190	199	1.0	196	1.0	2	0.0
200	198	1.0	196	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=6 Yield Curve #=62

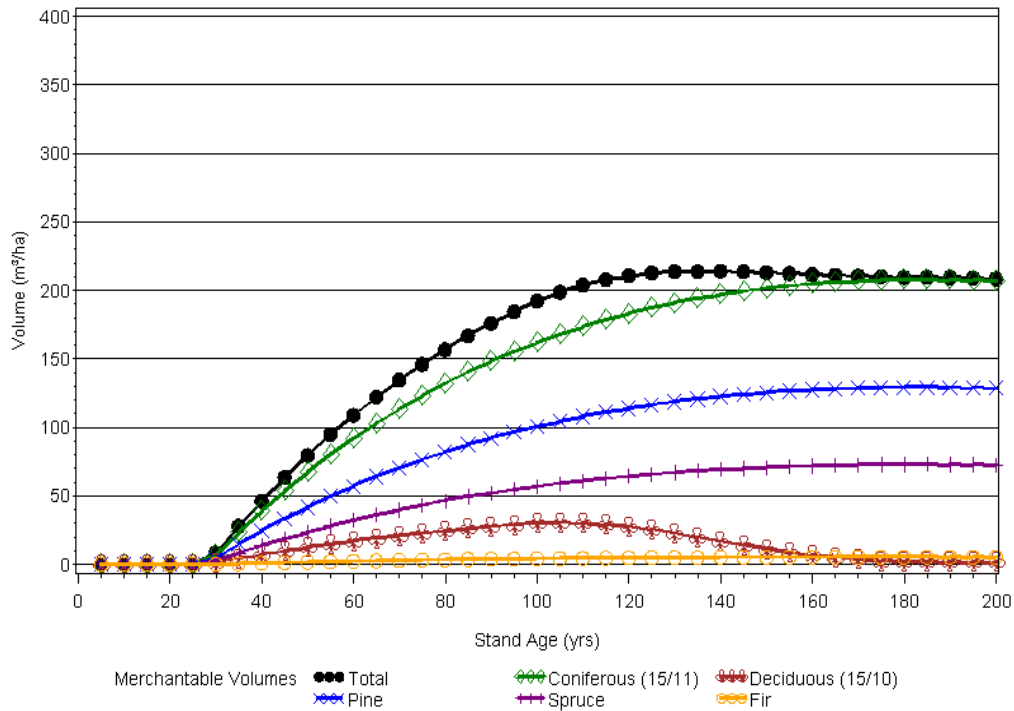


NSR & Site=UFG CC=B %Con=7 Yield Curve #=63

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	7	0.2	1	0.0
40	46	1.2	39	1.0	7	0.2
50	80	1.6	67	1.3	13	0.3
60	109	1.8	92	1.5	17	0.3
70	135	1.9	113	1.6	21	0.3
80	157	2.0	132	1.7	25	0.3
90	176	2.0	148	1.6	28	0.3
100	192	1.9	162	1.6	30	0.3
110	204	1.9	174	1.6	30	0.3
120	211	1.8	183	1.5	28	0.2
130	214	1.6	191	1.5	23	0.2
140	214	1.5	197	1.4	17	0.1
150	213	1.4	202	1.3	11	0.1
160	212	1.3	205	1.3	7	0.0
170	211	1.2	207	1.2	4	0.0
180	210	1.2	208	1.2	2	0.0
190	210	1.1	208	1.1	2	0.0
200	209	1.0	207	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=7 Yield Curve #=63

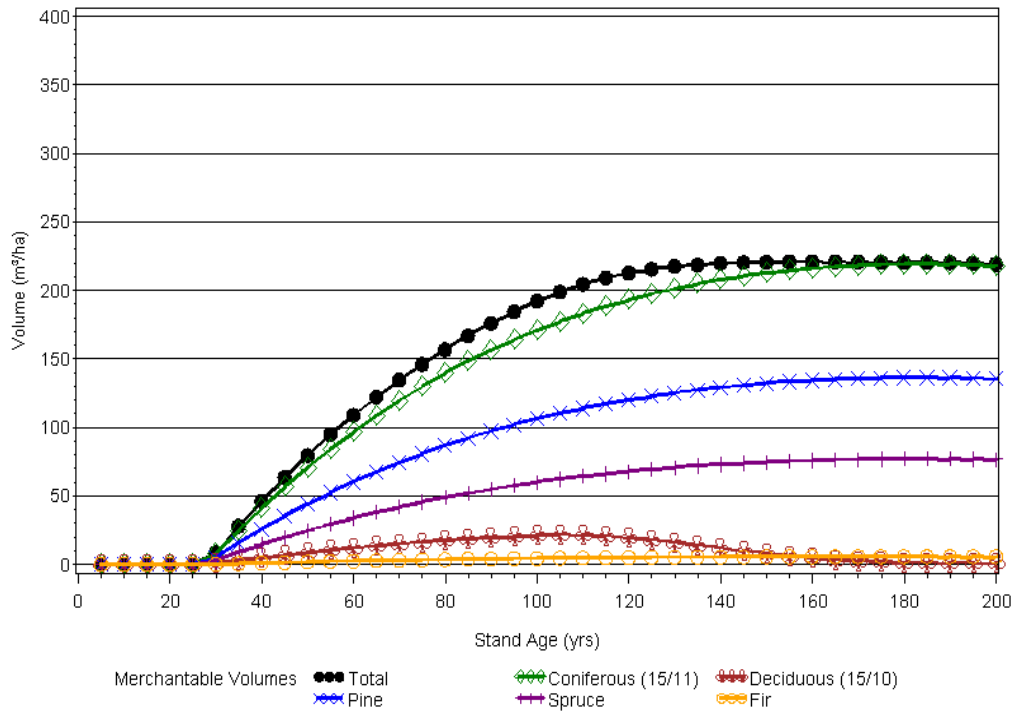


NSR & Site=UFG CC=B %Con=8 Yield Curve #=64

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	8	0.3	1	0.0
40	46	1.2	41	1.0	5	0.1
50	80	1.6	71	1.4	9	0.2
60	109	1.8	97	1.6	12	0.2
70	135	1.9	120	1.7	15	0.2
80	157	2.0	139	1.7	17	0.2
90	176	2.0	156	1.7	20	0.2
100	192	1.9	171	1.7	21	0.2
110	205	1.9	183	1.7	22	0.2
120	213	1.8	193	1.6	20	0.2
130	218	1.7	201	1.5	16	0.1
140	220	1.6	208	1.5	12	0.1
150	221	1.5	213	1.4	8	0.1
160	221	1.4	216	1.4	5	0.0
170	221	1.3	218	1.3	3	0.0
180	220	1.2	219	1.2	1	0.0
190	220	1.2	219	1.2	1	0.0
200	219	1.1	218	1.1	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=8 Yield Curve #=64

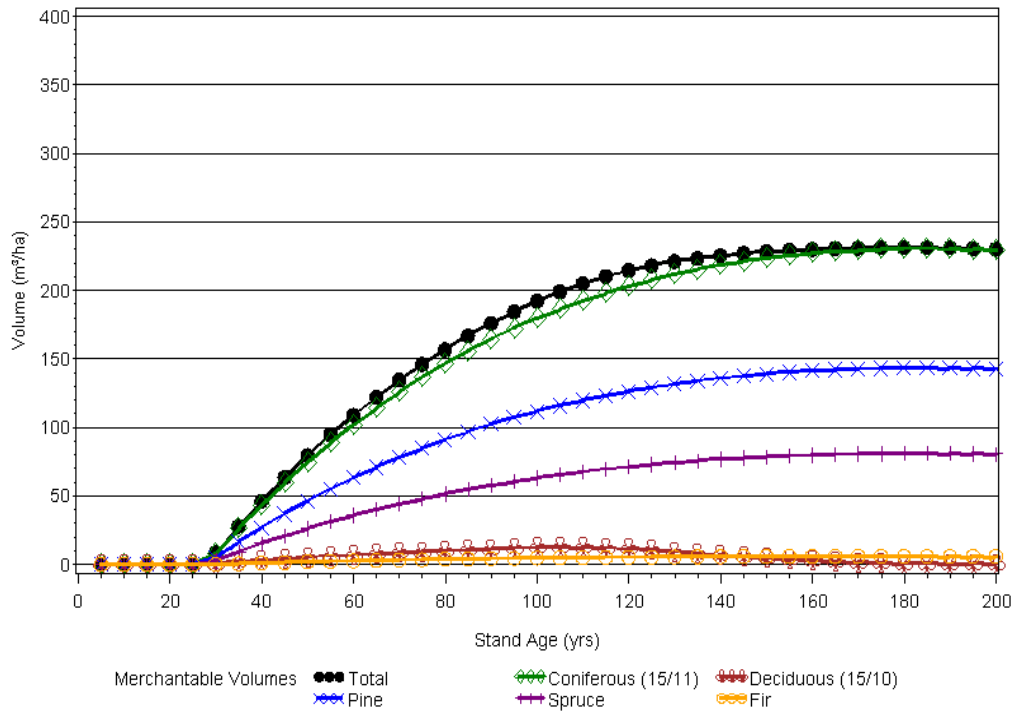


NSR & Site=UFG CC=B %Con=9 Yield Curve #=65

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	8	0.3	1	0.0
40	46	1.2	43	1.1	3	0.1
50	80	1.6	74	1.5	5	0.1
60	109	1.8	102	1.7	7	0.1
70	135	1.9	126	1.8	9	0.1
80	157	2.0	147	1.8	10	0.1
90	176	2.0	165	1.8	11	0.1
100	192	1.9	180	1.8	13	0.1
110	205	1.9	193	1.8	13	0.1
120	215	1.8	203	1.7	12	0.1
130	221	1.7	212	1.6	9	0.1
140	226	1.6	219	1.6	7	0.1
150	228	1.5	224	1.5	5	0.0
160	230	1.4	227	1.4	3	0.0
170	231	1.4	229	1.3	2	0.0
180	231	1.3	231	1.3	1	0.0
190	231	1.2	230	1.2	1	0.0
200	230	1.2	229	1.1	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=9 Yield Curve #=65

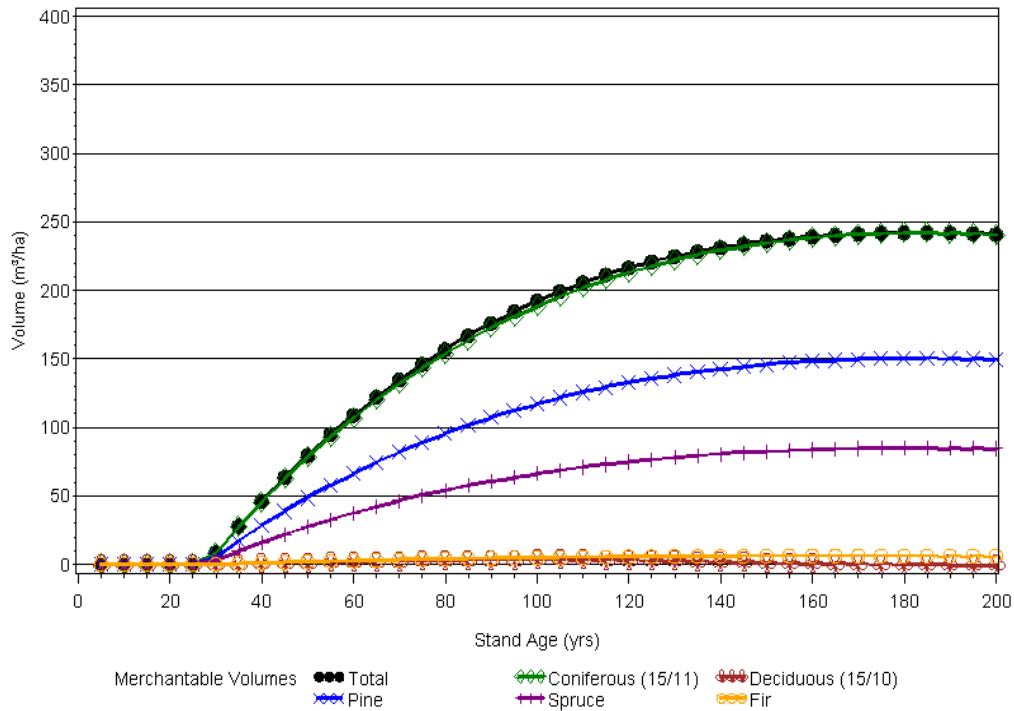


NSR & Site=UFG CC=B %Con=10 Yield Curve #=66

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	9	0.3	8	0.3	0	0.0
40	46	1.2	45	1.1	1	0.0
50	80	1.6	78	1.6	2	0.0
60	109	1.8	107	1.8	2	0.0
70	135	1.9	132	1.9	3	0.0
80	157	2.0	154	1.9	3	0.0
90	176	2.0	173	1.9	3	0.0
100	192	1.9	189	1.9	4	0.0
110	206	1.9	202	1.8	4	0.0
120	217	1.8	213	1.8	3	0.0
130	225	1.7	222	1.7	3	0.0
140	231	1.7	229	1.6	2	0.0
150	236	1.6	235	1.6	1	0.0
160	239	1.5	238	1.5	1	0.0
170	241	1.4	241	1.4	0	0.0
180	242	1.3	242	1.3	0	0.0
190	242	1.3	242	1.3	0	0.0
200	241	1.2	241	1.2	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=B %Con=10 Yield Curve #=66

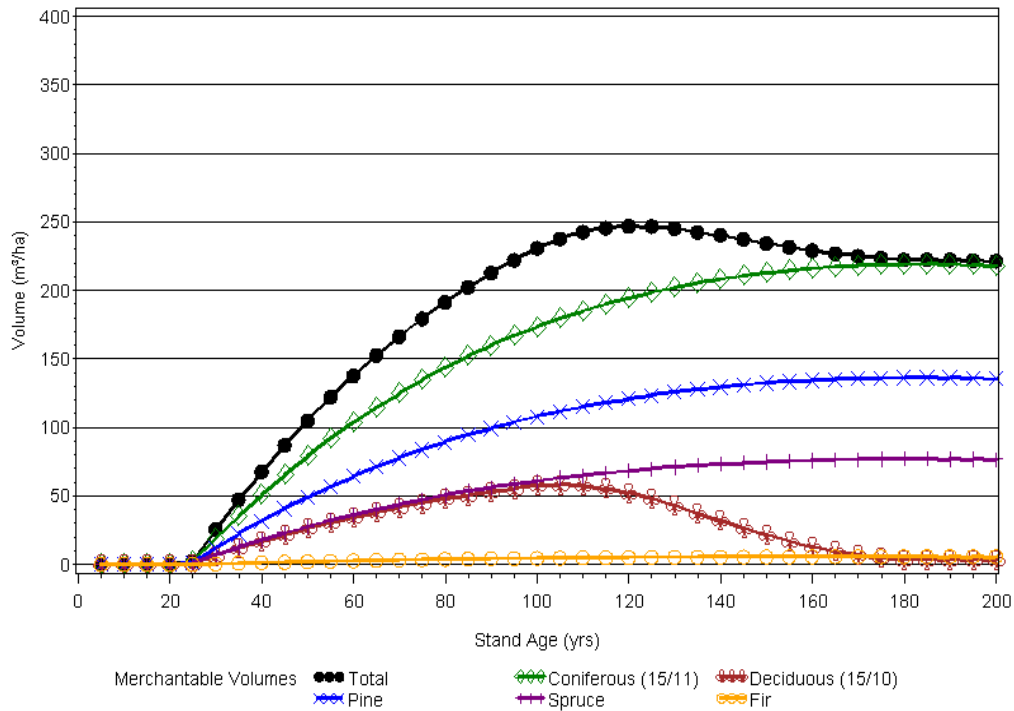


NSR & Site=UFG CC=C %Con=5 Yield Curve #=67

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	19	0.6	6	0.2
40	68	1.7	51	1.3	17	0.4
50	105	2.1	79	1.6	26	0.5
60	138	2.3	104	1.7	34	0.6
70	166	2.4	125	1.8	41	0.6
80	191	2.4	144	1.8	48	0.6
90	213	2.4	160	1.8	53	0.6
100	231	2.3	173	1.7	57	0.6
110	243	2.2	185	1.7	58	0.5
120	247	2.1	194	1.6	52	0.4
130	245	1.9	202	1.6	43	0.3
140	240	1.7	208	1.5	32	0.2
150	234	1.6	213	1.4	22	0.1
160	229	1.4	216	1.4	13	0.1
170	225	1.3	218	1.3	7	0.0
180	222	1.2	219	1.2	3	0.0
190	222	1.2	219	1.2	3	0.0
200	221	1.1	218	1.1	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=5 Yield Curve #=67

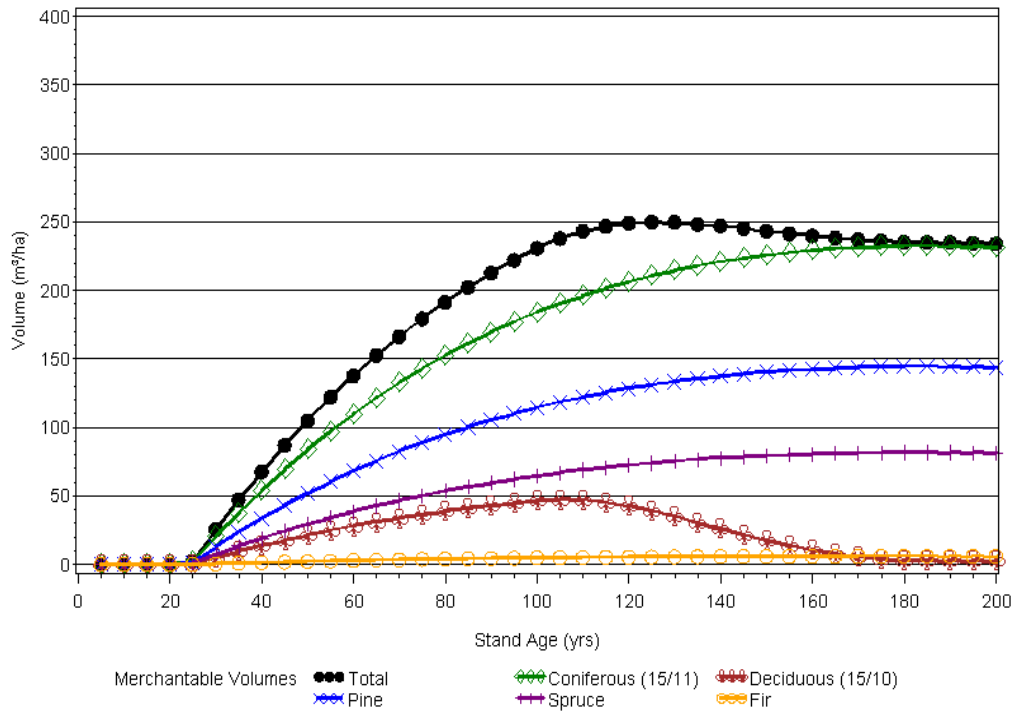


NSR & Site=UFG CC=C %Con=6 Yield Curve #=68

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	20	0.7	5	0.2
40	68	1.7	54	1.4	14	0.3
50	105	2.1	84	1.7	21	0.4
60	138	2.3	110	1.8	28	0.5
70	166	2.4	133	1.9	34	0.5
80	191	2.4	152	1.9	39	0.5
90	213	2.4	170	1.9	43	0.5
100	231	2.3	184	1.8	47	0.5
110	243	2.2	196	1.8	47	0.4
120	249	2.1	206	1.7	43	0.4
130	250	1.9	215	1.7	35	0.3
140	247	1.8	221	1.6	26	0.2
150	243	1.6	226	1.5	18	0.1
160	240	1.5	229	1.4	11	0.1
170	237	1.4	231	1.4	6	0.0
180	235	1.3	232	1.3	3	0.0
190	235	1.2	232	1.2	3	0.0
200	234	1.2	231	1.2	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=6 Yield Curve #=68

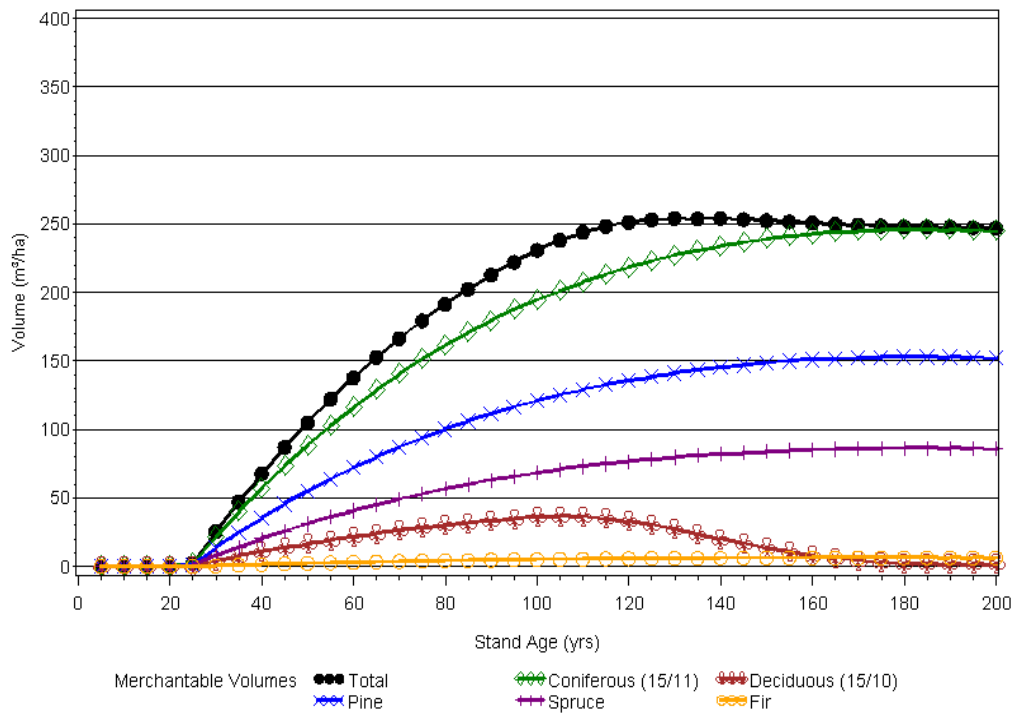


NSR & Site=UFG CC=C %Con=7 Yield Curve #=69

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	22	0.7	4	0.1
40	68	1.7	57	1.4	11	0.3
50	105	2.1	89	1.8	16	0.3
60	138	2.3	116	1.9	22	0.4
70	166	2.4	140	2.0	26	0.4
80	191	2.4	161	2.0	30	0.4
90	213	2.4	179	2.0	33	0.4
100	231	2.3	195	1.9	36	0.4
110	244	2.2	208	1.9	36	0.3
120	251	2.1	218	1.8	33	0.3
130	254	2.0	227	1.7	27	0.2
140	254	1.8	234	1.7	20	0.1
150	252	1.7	239	1.6	14	0.1
160	251	1.6	243	1.5	8	0.1
170	249	1.5	245	1.4	4	0.0
180	248	1.4	246	1.4	2	0.0
190	248	1.3	246	1.3	2	0.0
200	247	1.2	245	1.2	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=7 Yield Curve #=69

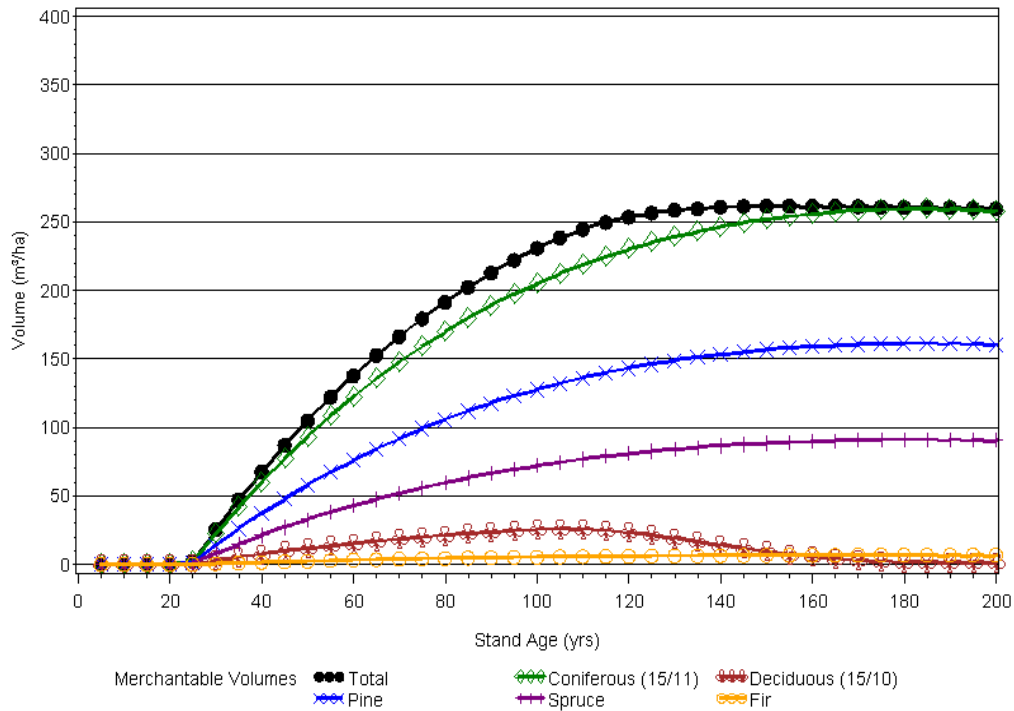


NSR & Site=UFG CC=C %Con=8 Yield Curve #=70

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	23	0.8	3	0.1
40	68	1.7	60	1.5	8	0.2
50	105	2.1	93	1.9	12	0.2
60	138	2.3	123	2.0	15	0.3
70	166	2.4	148	2.1	18	0.3
80	191	2.4	170	2.1	21	0.3
90	213	2.4	189	2.1	24	0.3
100	231	2.3	205	2.1	26	0.3
110	245	2.2	219	2.0	26	0.2
120	254	2.1	230	1.9	23	0.2
130	259	2.0	239	1.8	19	0.1
140	261	1.9	247	1.8	14	0.1
150	262	1.7	252	1.7	10	0.1
160	262	1.6	256	1.6	6	0.0
170	261	1.5	258	1.5	3	0.0
180	261	1.4	259	1.4	1	0.0
190	261	1.4	259	1.4	1	0.0
200	260	1.3	258	1.3	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=8 Yield Curve #=70

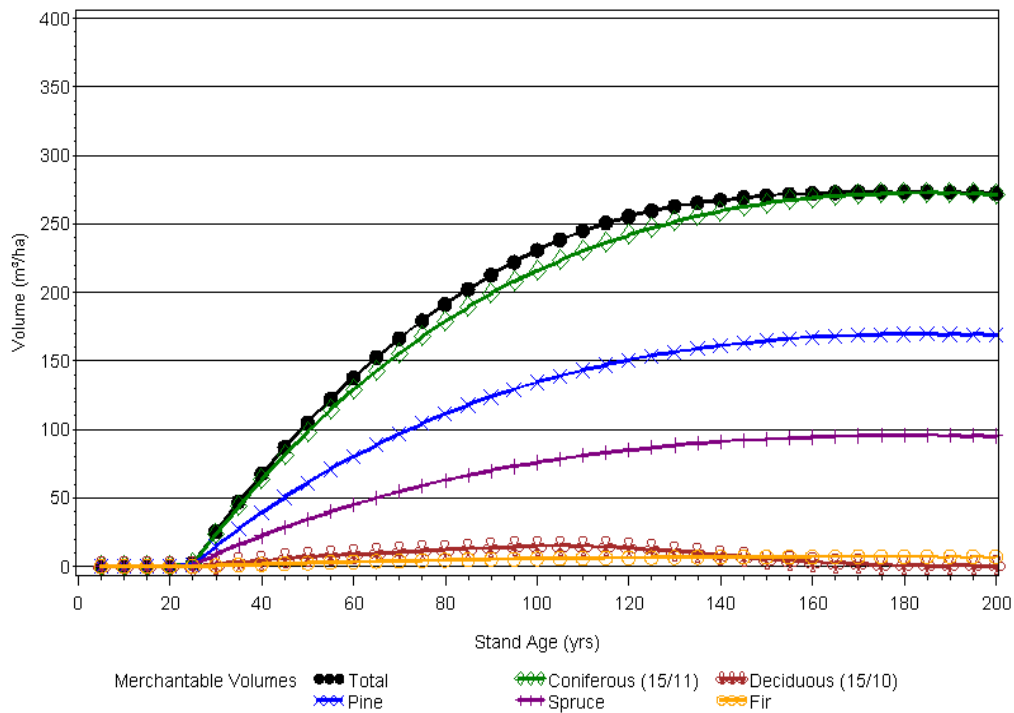


NSR & Site=UFG CC=C %Con=9 Yield Curve #=71

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	24	0.8	2	0.1
40	68	1.7	63	1.6	4	0.1
50	105	2.1	98	2.0	7	0.1
60	138	2.3	129	2.1	9	0.1
70	166	2.4	156	2.2	11	0.2
80	191	2.4	179	2.2	12	0.2
90	213	2.4	199	2.2	14	0.2
100	231	2.3	216	2.2	15	0.2
110	245	2.2	230	2.1	15	0.1
120	256	2.1	242	2.0	14	0.1
130	263	2.0	252	1.9	11	0.1
140	268	1.9	259	1.9	8	0.1
150	271	1.8	265	1.8	6	0.0
160	272	1.7	269	1.7	3	0.0
170	273	1.6	272	1.6	2	0.0
180	274	1.5	273	1.5	1	0.0
190	273	1.4	273	1.4	1	0.0
200	272	1.4	271	1.4	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=9 Yield Curve #=71

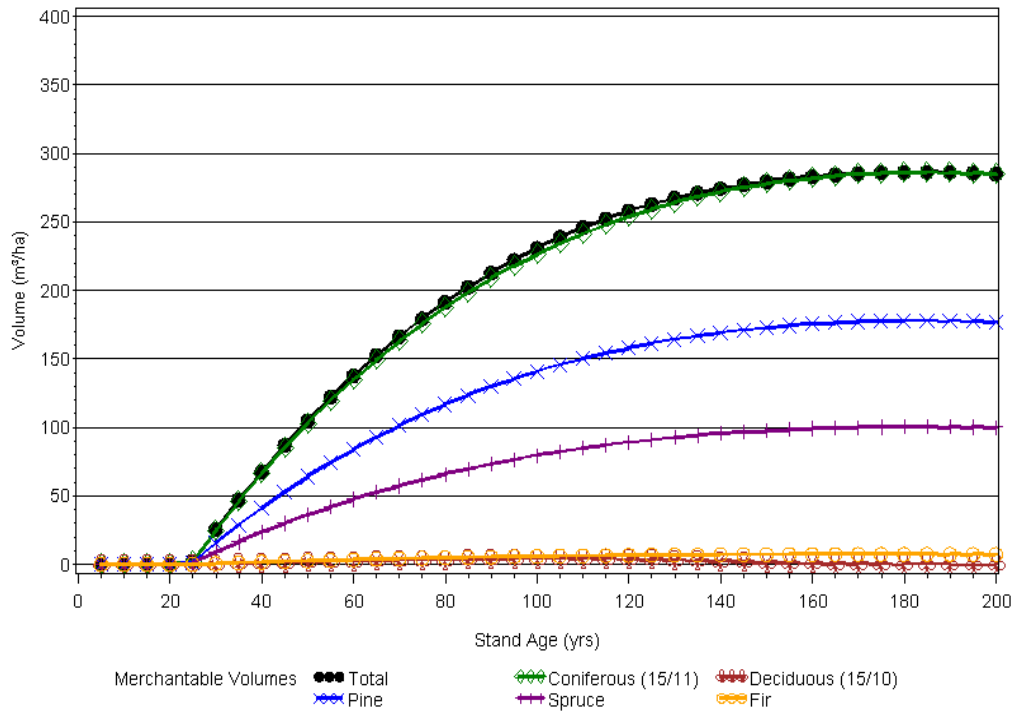


NSR & Site=UFG CC=C %Con=10 Yield Curve #=72

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	26	0.9	25	0.8	0	0.0
40	68	1.7	66	1.7	1	0.0
50	105	2.1	103	2.1	2	0.0
60	138	2.3	135	2.3	3	0.0
70	166	2.4	163	2.3	3	0.0
80	191	2.4	188	2.3	4	0.0
90	213	2.4	209	2.3	4	0.0
100	231	2.3	226	2.3	4	0.0
110	246	2.2	242	2.2	4	0.0
120	258	2.2	254	2.1	4	0.0
130	267	2.1	264	2.0	3	0.0
140	274	2.0	272	1.9	2	0.0
150	280	1.9	278	1.9	2	0.0
160	283	1.8	282	1.8	1	0.0
170	285	1.7	285	1.7	1	0.0
180	286	1.6	286	1.6	0	0.0
190	286	1.5	286	1.5	0	0.0
200	285	1.4	285	1.4	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=C %Con=10 Yield Curve #=72

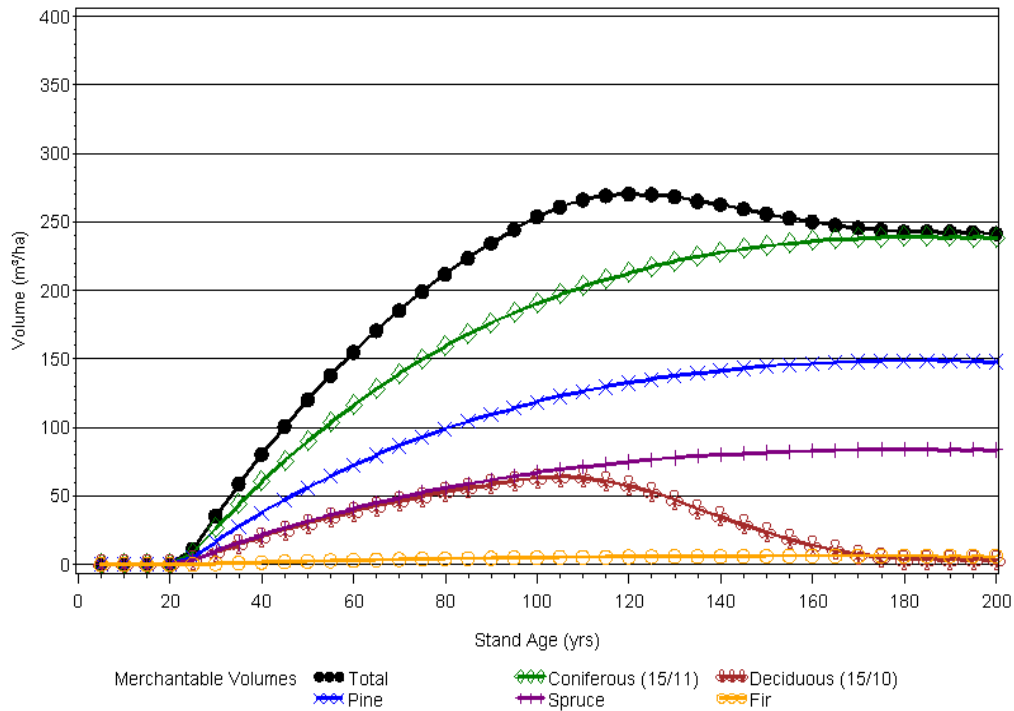


NSR & Site=UFG CC=D %Con=5 Yield Curve #=73

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	27	0.9	9	0.3
40	80	2.0	60	1.5	20	0.5
50	120	2.4	90	1.8	30	0.6
60	155	2.6	116	1.9	39	0.6
70	185	2.6	139	2.0	46	0.7
80	212	2.6	159	2.0	53	0.7
90	234	2.6	176	2.0	58	0.6
100	254	2.5	191	1.9	63	0.6
110	266	2.4	203	1.8	63	0.6
120	270	2.3	213	1.8	57	0.5
130	268	2.1	221	1.7	47	0.4
140	263	1.9	228	1.6	35	0.3
150	256	1.7	233	1.6	24	0.2
160	250	1.6	236	1.5	14	0.1
170	246	1.4	238	1.4	8	0.0
180	243	1.3	239	1.3	4	0.0
190	243	1.3	239	1.3	4	0.0
200	242	1.2	238	1.2	4	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=5 Yield Curve #=73

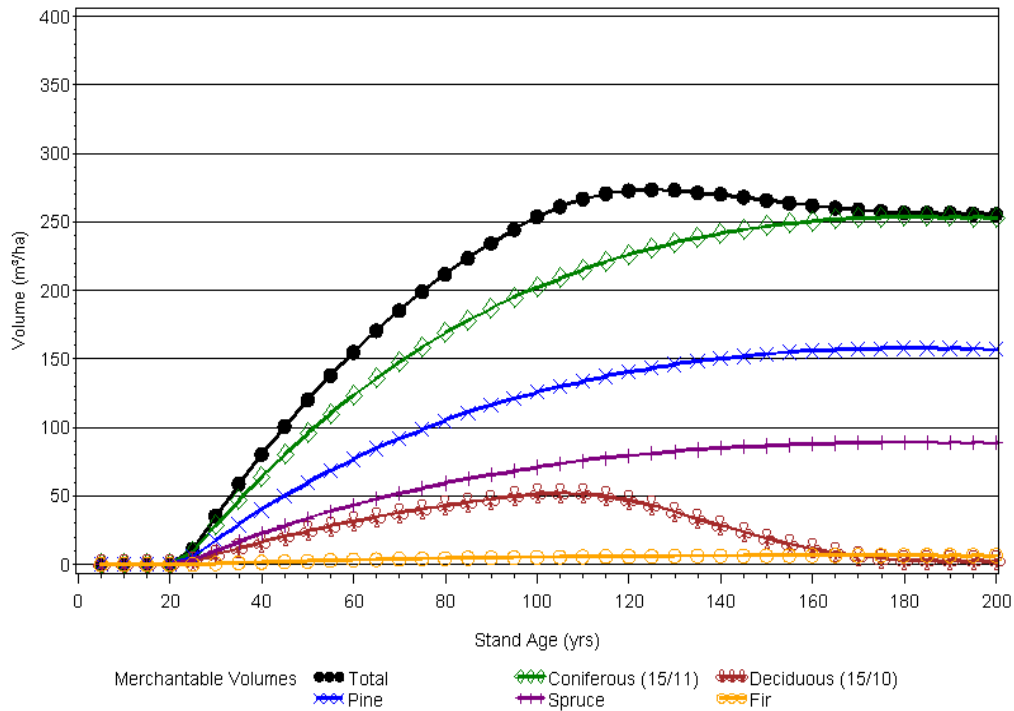


NSR & Site=UFG CC=D %Con=6 Yield Curve #=74

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	28	0.9	7	0.2
40	80	2.0	64	1.6	16	0.4
50	120	2.4	96	1.9	24	0.5
60	155	2.6	123	2.1	31	0.5
70	185	2.6	148	2.1	38	0.5
80	212	2.6	169	2.1	43	0.5
90	234	2.6	187	2.1	48	0.5
100	254	2.5	202	2.0	52	0.5
110	267	2.4	215	2.0	52	0.5
120	273	2.3	226	1.9	47	0.4
130	273	2.1	235	1.8	38	0.3
140	270	1.9	242	1.7	29	0.2
150	266	1.8	247	1.6	19	0.1
160	262	1.6	250	1.6	12	0.1
170	259	1.5	253	1.5	6	0.0
180	257	1.4	254	1.4	3	0.0
190	257	1.4	254	1.3	3	0.0
200	256	1.3	253	1.3	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=6 Yield Curve #=74

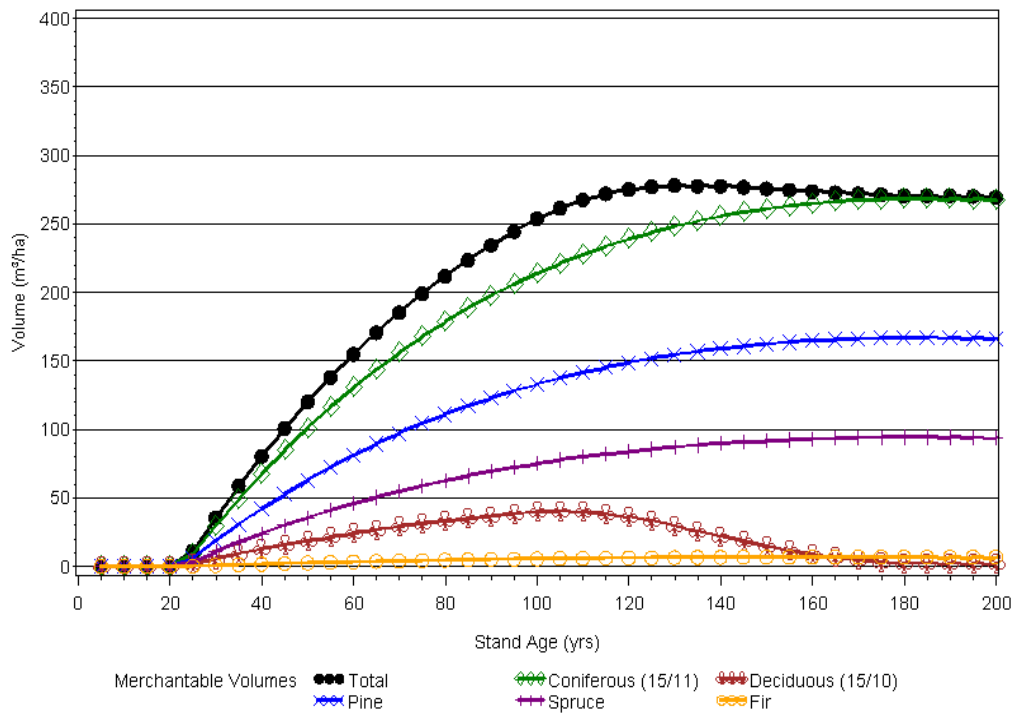


NSR & Site=UFG CC=D %Con=7 Yield Curve #=75

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	30	1.0	6	0.2
40	80	2.0	68	1.7	13	0.3
50	120	2.4	101	2.0	19	0.4
60	155	2.6	131	2.2	24	0.4
70	185	2.6	156	2.2	29	0.4
80	212	2.6	179	2.2	33	0.4
90	234	2.6	198	2.2	37	0.4
100	254	2.5	214	2.1	40	0.4
110	268	2.4	228	2.1	40	0.4
120	275	2.3	239	2.0	36	0.3
130	278	2.1	248	1.9	30	0.2
140	278	2.0	256	1.8	22	0.2
150	276	1.8	261	1.7	15	0.1
160	274	1.7	265	1.7	9	0.1
170	272	1.6	267	1.6	5	0.0
180	271	1.5	268	1.5	2	0.0
190	271	1.4	268	1.4	2	0.0
200	269	1.3	267	1.3	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=7 Yield Curve #=75

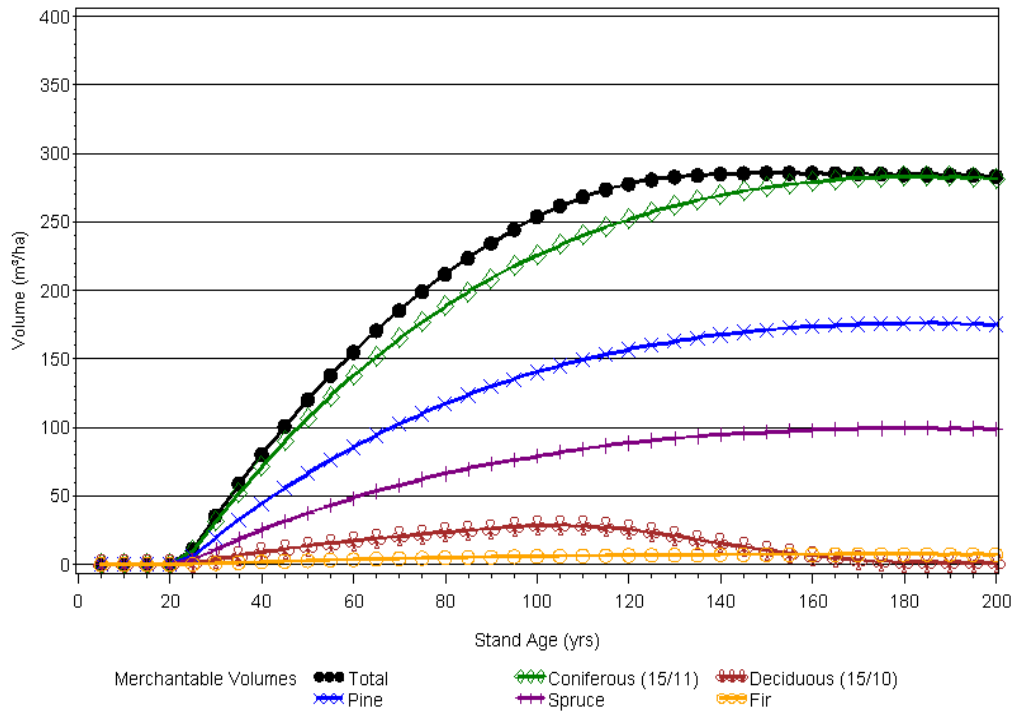


NSR & Site=UFG CC=D %Con=8 Yield Curve #=76

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	32	1.1	4	0.1
40	80	2.0	72	1.8	9	0.2
50	120	2.4	107	2.1	13	0.3
60	155	2.6	138	2.3	17	0.3
70	185	2.6	165	2.4	21	0.3
80	212	2.6	188	2.4	24	0.3
90	234	2.6	208	2.3	26	0.3
100	254	2.5	226	2.3	28	0.3
110	268	2.4	240	2.2	28	0.3
120	278	2.3	252	2.1	26	0.2
130	283	2.2	262	2.0	21	0.2
140	285	2.0	269	1.9	16	0.1
150	286	1.9	275	1.8	10	0.1
160	286	1.8	279	1.7	6	0.0
170	285	1.7	282	1.7	3	0.0
180	285	1.6	283	1.6	2	0.0
190	285	1.5	283	1.5	2	0.0
200	283	1.4	282	1.4	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=8 Yield Curve #=76

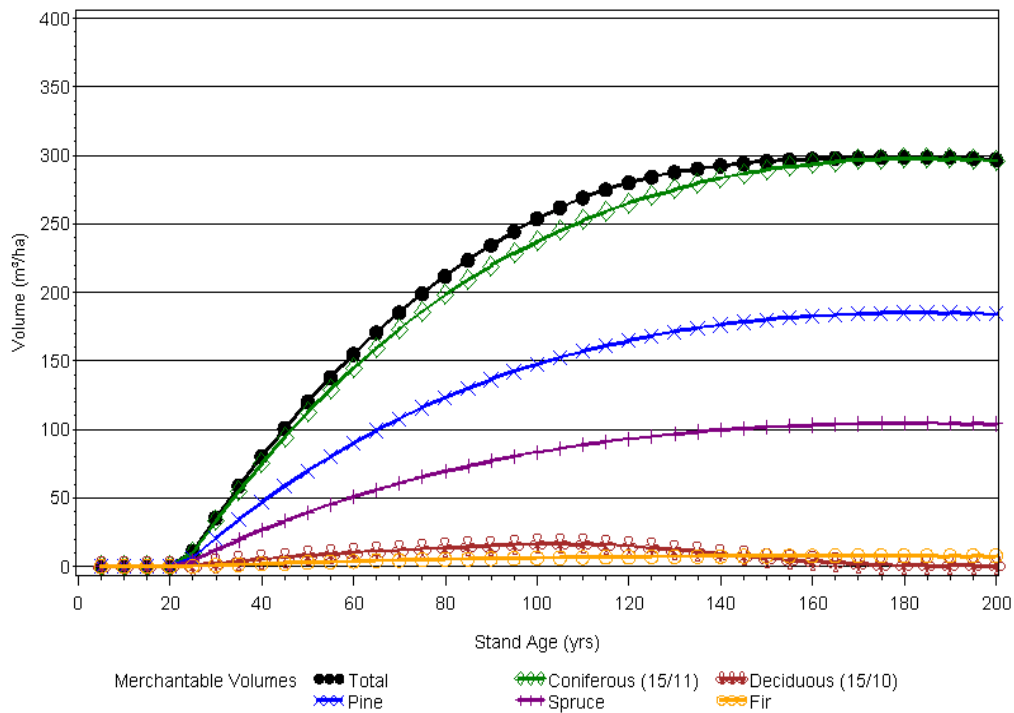


NSR & Site=UFG CC=D %Con=9 Yield Curve #=77

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	33	1.1	2	0.1
40	80	2.0	75	1.9	5	0.1
50	120	2.4	112	2.2	8	0.2
60	155	2.6	145	2.4	10	0.2
70	185	2.6	173	2.5	12	0.2
80	212	2.6	198	2.5	14	0.2
90	234	2.6	219	2.4	15	0.2
100	254	2.5	237	2.4	17	0.2
110	269	2.4	253	2.3	17	0.2
120	280	2.3	265	2.2	15	0.1
130	288	2.2	275	2.1	12	0.1
140	293	2.1	283	2.0	9	0.1
150	296	2.0	289	1.9	6	0.0
160	297	1.9	294	1.8	4	0.0
170	298	1.8	296	1.7	2	0.0
180	299	1.7	298	1.7	1	0.0
190	299	1.6	298	1.6	1	0.0
200	297	1.5	296	1.5	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=9 Yield Curve #=77

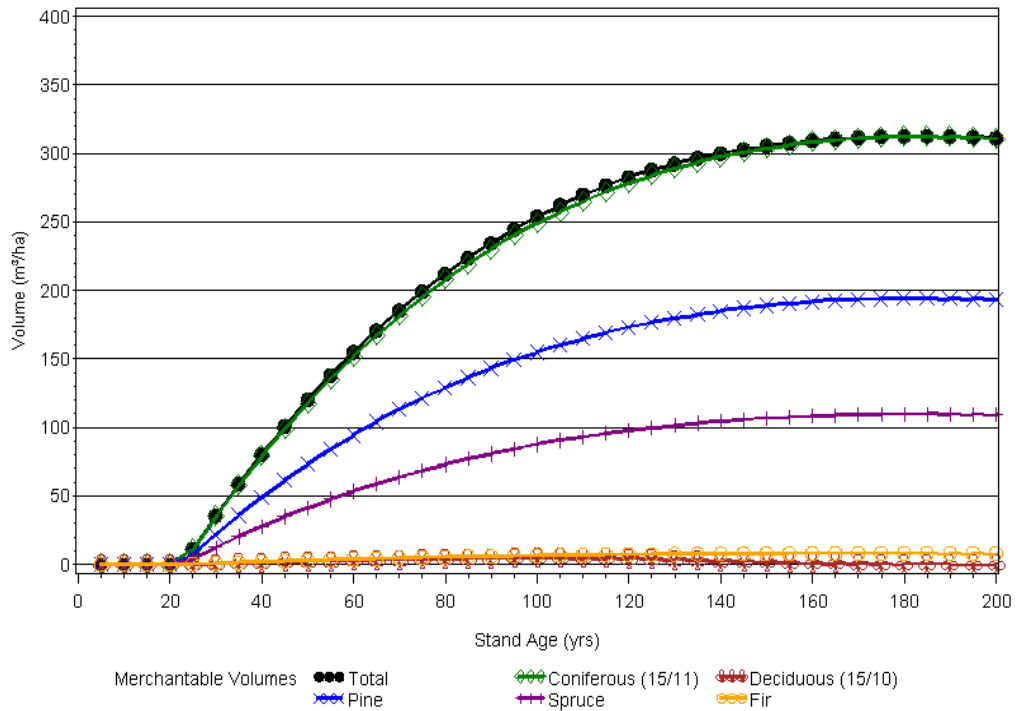


NSR & Site=UFG CC=D %Con=10 Yield Curve #=78

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	35	1.2	1	0.0
40	80	2.0	79	2.0	2	0.0
50	120	2.4	118	2.4	2	0.0
60	155	2.6	152	2.5	3	0.0
70	185	2.6	182	2.6	4	0.1
80	212	2.6	208	2.6	4	0.1
90	234	2.6	230	2.6	4	0.0
100	254	2.5	249	2.5	5	0.0
110	270	2.5	265	2.4	5	0.0
120	283	2.4	278	2.3	4	0.0
130	293	2.3	289	2.2	4	0.0
140	300	2.1	297	2.1	3	0.0
150	305	2.0	304	2.0	2	0.0
160	309	1.9	308	1.9	1	0.0
170	312	1.8	311	1.8	1	0.0
180	313	1.7	312	1.7	0	0.0
190	312	1.6	312	1.6	0	0.0
200	311	1.6	311	1.6	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFG CC=D %Con=10 Yield Curve #=78

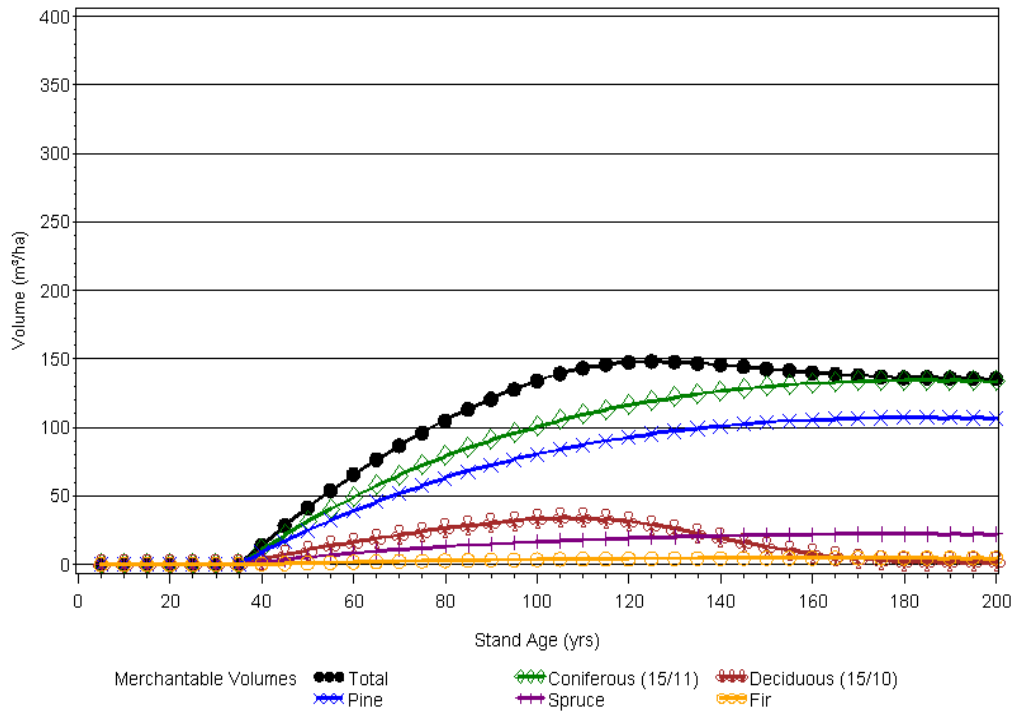


NSR & Site=UFM CC=A %Con=5 Yield Curve #=79

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	11	0.3	4	0.1
50	42	0.8	31	0.6	10	0.2
60	66	1.1	49	0.8	16	0.3
70	87	1.2	65	0.9	22	0.3
80	105	1.3	79	1.0	26	0.3
90	121	1.3	91	1.0	30	0.3
100	134	1.3	101	1.0	33	0.3
110	143	1.3	109	1.0	34	0.3
120	148	1.2	116	1.0	31	0.3
130	148	1.1	122	0.9	26	0.2
140	146	1.0	126	0.9	19	0.1
150	143	1.0	130	0.9	13	0.1
160	140	0.9	132	0.8	8	0.0
170	138	0.8	134	0.8	4	0.0
180	136	0.8	134	0.7	2	0.0
190	136	0.7	134	0.7	2	0.0
200	136	0.7	134	0.7	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=5 Yield Curve #=79

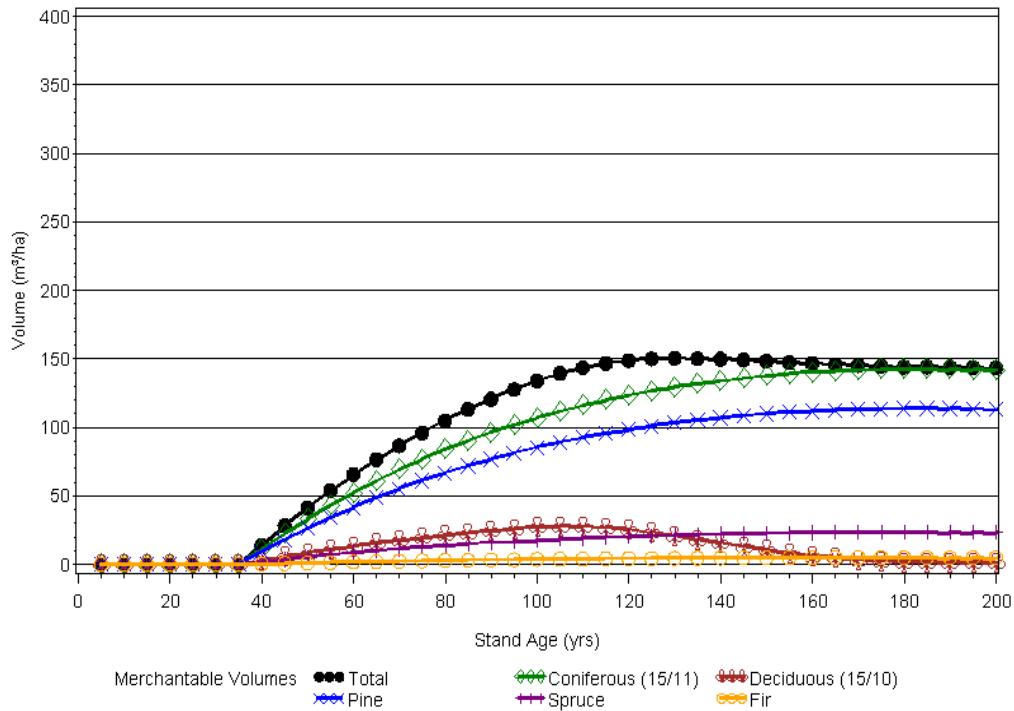


NSR & Site=UFM CC=A %Con=6 Yield Curve #=80

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	11	0.3	3	0.1
50	42	0.8	33	0.7	8	0.2
60	66	1.1	52	0.9	13	0.2
70	87	1.2	69	1.0	18	0.3
80	105	1.3	84	1.0	21	0.3
90	121	1.3	96	1.1	25	0.3
100	134	1.3	107	1.1	27	0.3
110	144	1.3	116	1.1	28	0.3
120	149	1.2	123	1.0	26	0.2
130	151	1.2	129	1.0	21	0.2
140	150	1.1	134	1.0	16	0.1
150	148	1.0	138	0.9	11	0.1
160	147	0.9	140	0.9	6	0.0
170	145	0.9	142	0.8	3	0.0
180	144	0.8	143	0.8	2	0.0
190	144	0.8	142	0.7	2	0.0
200	143	0.7	142	0.7	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=6 Yield Curve #=80

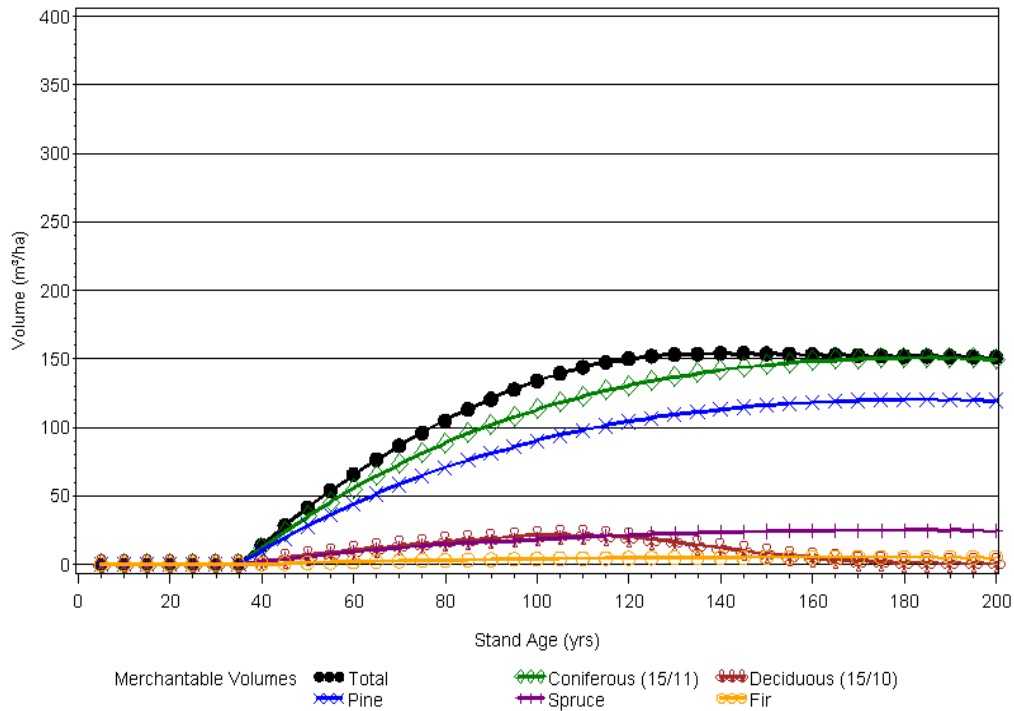


NSR & Site=UFM CC=A %Con=7 Yield Curve #=81

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	12	0.3	2	0.1
50	42	0.8	35	0.7	7	0.1
60	66	1.1	55	0.9	10	0.2
70	87	1.2	73	1.0	14	0.2
80	105	1.3	89	1.1	16	0.2
90	121	1.3	102	1.1	19	0.2
100	134	1.3	113	1.1	21	0.2
110	144	1.3	123	1.1	21	0.2
120	150	1.3	130	1.1	20	0.2
130	153	1.2	137	1.1	16	0.1
140	154	1.1	142	1.0	12	0.1
150	154	1.0	146	1.0	8	0.1
160	153	1.0	148	0.9	5	0.0
170	153	0.9	150	0.9	3	0.0
180	152	0.8	151	0.8	1	0.0
190	152	0.8	151	0.8	1	0.0
200	151	0.8	150	0.7	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=7 Yield Curve #=81

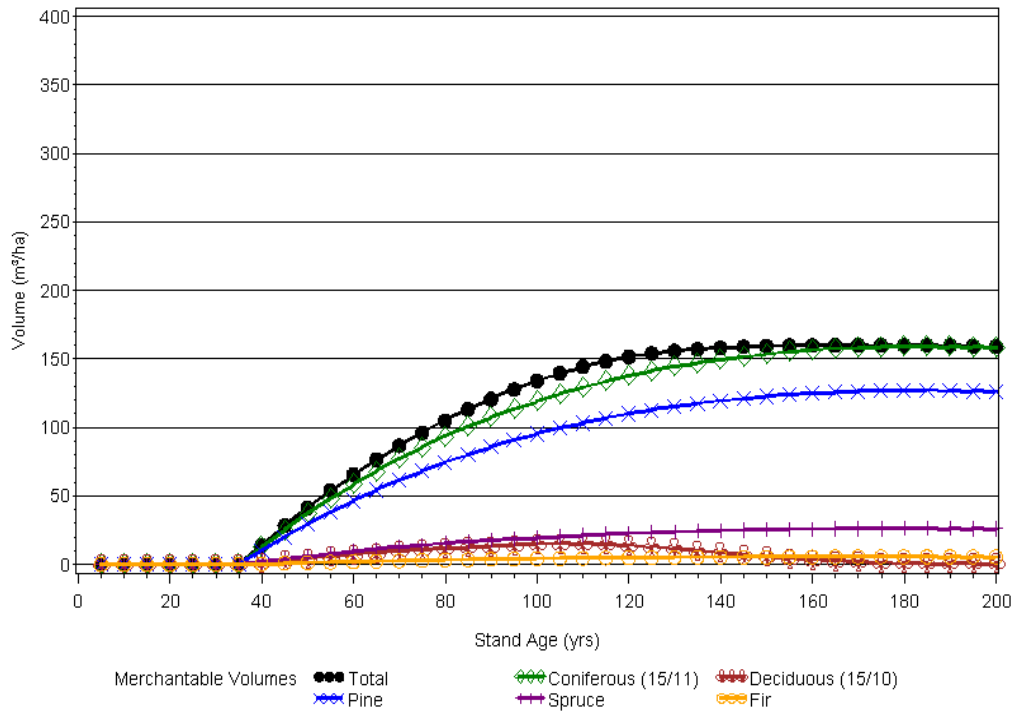


NSR & Site=UFM CC=A %Con=8 Yield Curve #=82

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	13	0.3	2	0.0
50	42	0.8	37	0.7	5	0.1
60	66	1.1	58	1.0	7	0.1
70	87	1.2	77	1.1	10	0.1
80	105	1.3	93	1.2	12	0.1
90	121	1.3	107	1.2	13	0.1
100	134	1.3	119	1.2	15	0.1
110	144	1.3	129	1.2	15	0.1
120	152	1.3	138	1.1	14	0.1
130	156	1.2	144	1.1	12	0.1
140	158	1.1	150	1.1	9	0.1
150	159	1.1	154	1.0	6	0.0
160	160	1.0	156	1.0	4	0.0
170	160	0.9	158	0.9	2	0.0
180	160	0.9	159	0.9	1	0.0
190	160	0.8	159	0.8	1	0.0
200	159	0.8	158	0.8	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=8 Yield Curve #=82

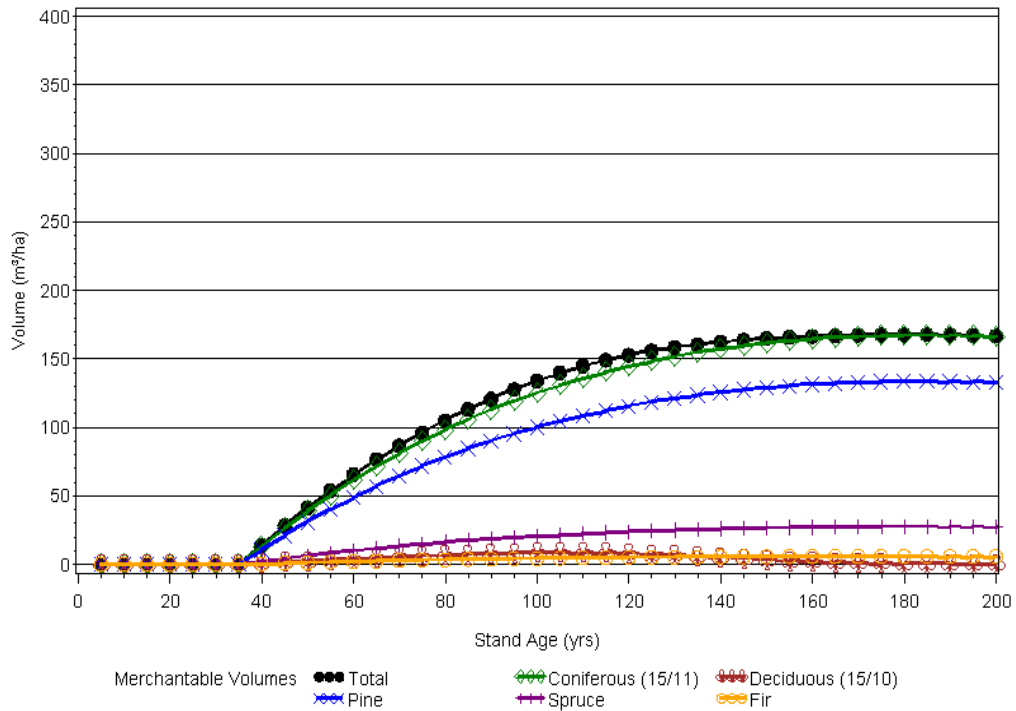


NSR & Site=UFM CC=A %Con=9 Yield Curve #=83

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	13	0.3	1	0.0
50	42	0.8	39	0.8	3	0.1
60	66	1.1	61	1.0	4	0.1
70	87	1.2	81	1.2	6	0.1
80	105	1.3	98	1.2	7	0.1
90	121	1.3	113	1.3	8	0.1
100	134	1.3	125	1.3	9	0.1
110	145	1.3	136	1.2	9	0.1
120	153	1.3	145	1.2	8	0.1
130	159	1.2	152	1.2	7	0.1
140	162	1.2	157	1.1	5	0.0
150	165	1.1	162	1.1	3	0.0
160	167	1.0	164	1.0	2	0.0
170	167	1.0	166	1.0	1	0.0
180	168	0.9	167	0.9	1	0.0
190	168	0.9	167	0.9	1	0.0
200	167	0.8	166	0.8	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=9 Yield Curve #=83

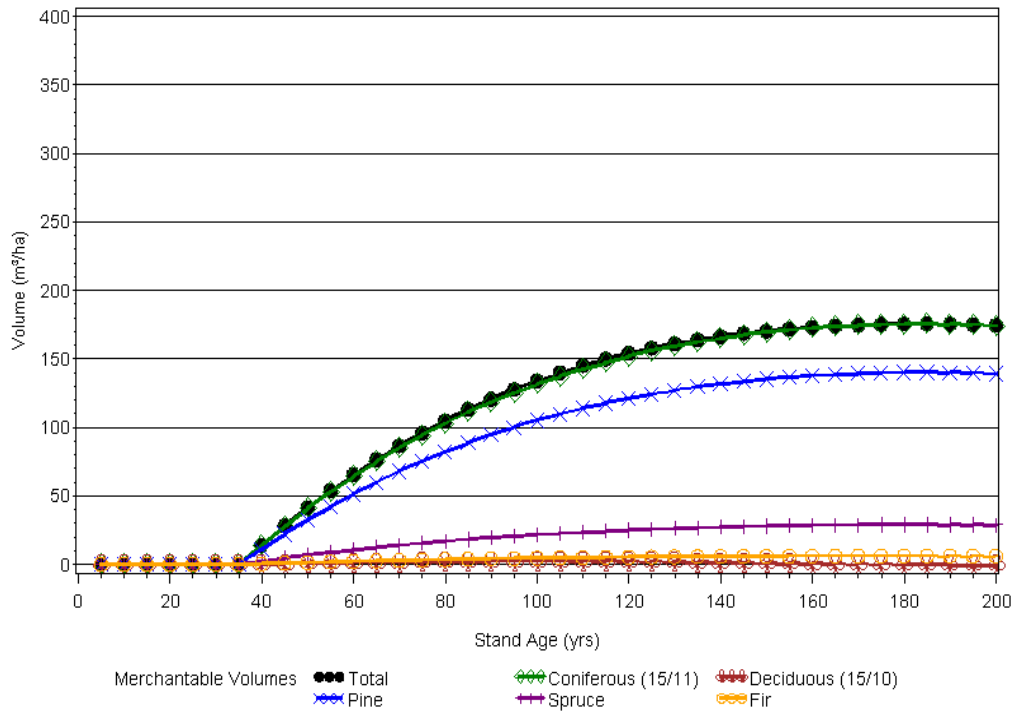


NSR & Site=UFM CC=A %Con=10 Yield Curve #=84

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	14	0.4	14	0.3	0	0.0
50	42	0.8	41	0.8	1	0.0
60	66	1.1	64	1.1	1	0.0
70	87	1.2	85	1.2	2	0.0
80	105	1.3	103	1.3	2	0.0
90	121	1.3	118	1.3	2	0.0
100	134	1.3	132	1.3	3	0.0
110	145	1.3	143	1.3	3	0.0
120	154	1.3	152	1.3	2	0.0
130	161	1.2	159	1.2	2	0.0
140	167	1.2	165	1.2	2	0.0
150	170	1.1	169	1.1	1	0.0
160	173	1.1	173	1.1	1	0.0
170	175	1.0	175	1.0	0	0.0
180	176	1.0	175	1.0	0	0.0
190	175	0.9	175	0.9	0	0.0
200	175	0.9	174	0.9	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=A %Con=10 Yield Curve #=84

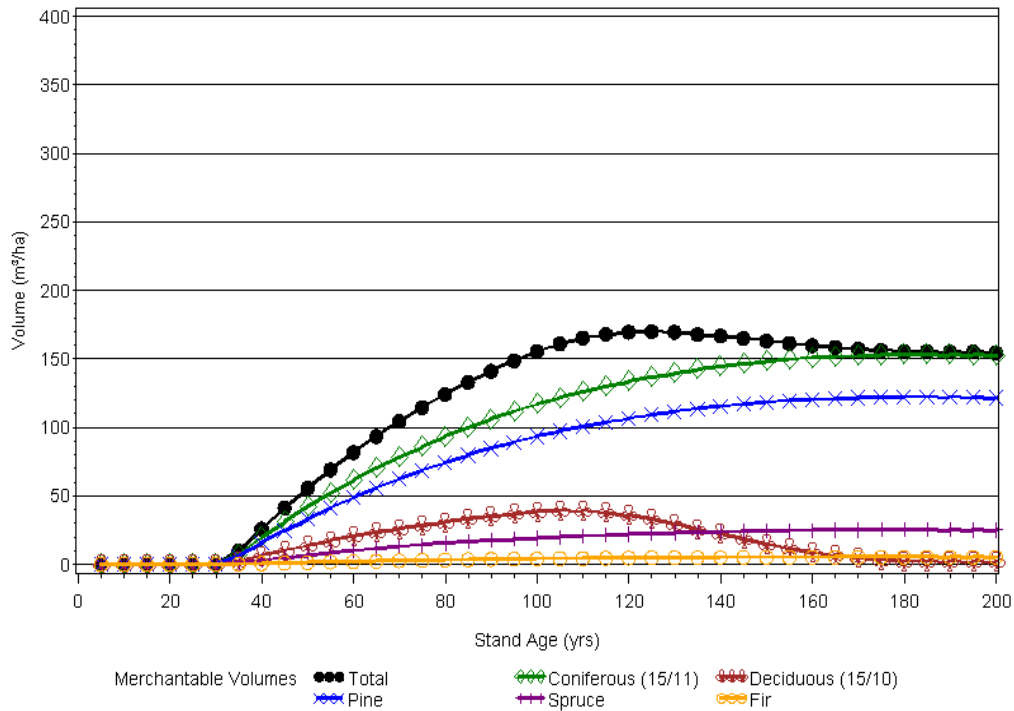


NSR & Site=UFM CC=B %Con=5 Yield Curve #=85

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	20	0.5	6	0.2
50	56	1.1	42	0.8	14	0.3
60	82	1.4	61	1.0	20	0.3
70	104	1.5	78	1.1	26	0.4
80	124	1.6	93	1.2	31	0.4
90	141	1.6	106	1.2	35	0.4
100	156	1.6	117	1.2	39	0.4
110	165	1.5	126	1.1	39	0.4
120	170	1.4	134	1.1	36	0.3
130	170	1.3	140	1.1	30	0.2
140	167	1.2	145	1.0	22	0.2
150	163	1.1	148	1.0	15	0.1
160	160	1.0	151	0.9	9	0.1
170	157	0.9	152	0.9	5	0.0
180	155	0.9	153	0.9	2	0.0
190	155	0.8	153	0.8	2	0.0
200	155	0.8	152	0.8	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=5 Yield Curve #=85

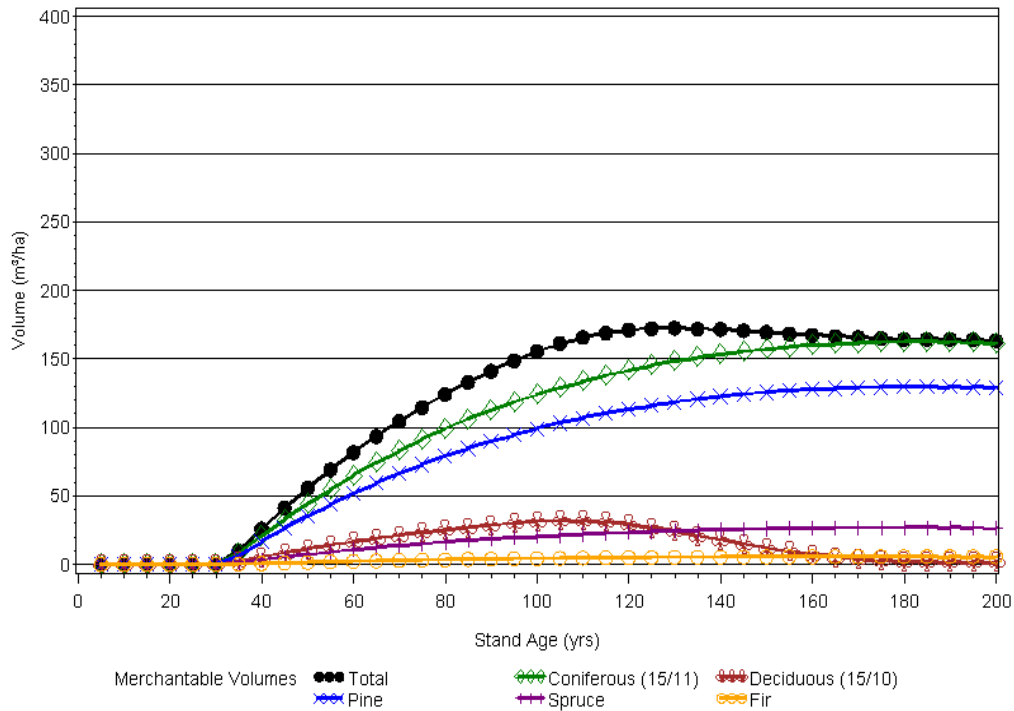


NSR & Site=UFM CC=B %Con=6 Yield Curve #=86

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	21	0.5	5	0.1
50	56	1.1	44	0.9	11	0.2
60	82	1.4	65	1.1	17	0.3
70	104	1.5	83	1.2	21	0.3
80	124	1.6	99	1.2	25	0.3
90	141	1.6	113	1.3	29	0.3
100	156	1.6	124	1.2	32	0.3
110	166	1.5	134	1.2	32	0.3
120	171	1.4	142	1.2	29	0.2
130	173	1.3	148	1.1	24	0.2
140	172	1.2	153	1.1	18	0.1
150	170	1.1	157	1.0	12	0.1
160	167	1.0	160	1.0	7	0.0
170	166	1.0	162	1.0	4	0.0
180	164	0.9	163	0.9	2	0.0
190	164	0.9	162	0.9	2	0.0
200	164	0.8	162	0.8	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=6 Yield Curve #=86

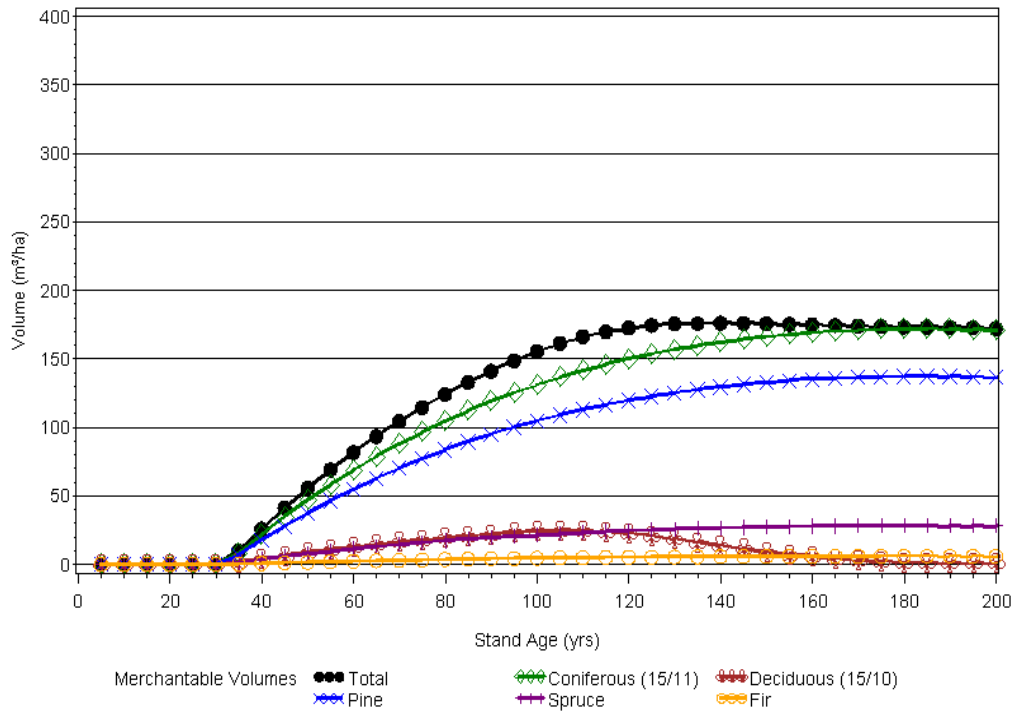


NSR & Site=UFM CC=B %Con=7 Yield Curve #=87

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	22	0.5	4	0.1
50	56	1.1	47	0.9	9	0.2
60	82	1.4	69	1.1	13	0.2
70	104	1.5	88	1.3	16	0.2
80	124	1.6	105	1.3	19	0.2
90	141	1.6	119	1.3	22	0.2
100	156	1.6	131	1.3	24	0.2
110	166	1.5	141	1.3	25	0.2
120	173	1.4	150	1.2	23	0.2
130	176	1.4	157	1.2	19	0.1
140	176	1.3	162	1.2	14	0.1
150	176	1.2	166	1.1	9	0.1
160	175	1.1	169	1.1	6	0.0
170	174	1.0	171	1.0	3	0.0
180	173	1.0	172	1.0	1	0.0
190	173	0.9	172	0.9	1	0.0
200	172	0.9	171	0.9	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=7 Yield Curve #=87

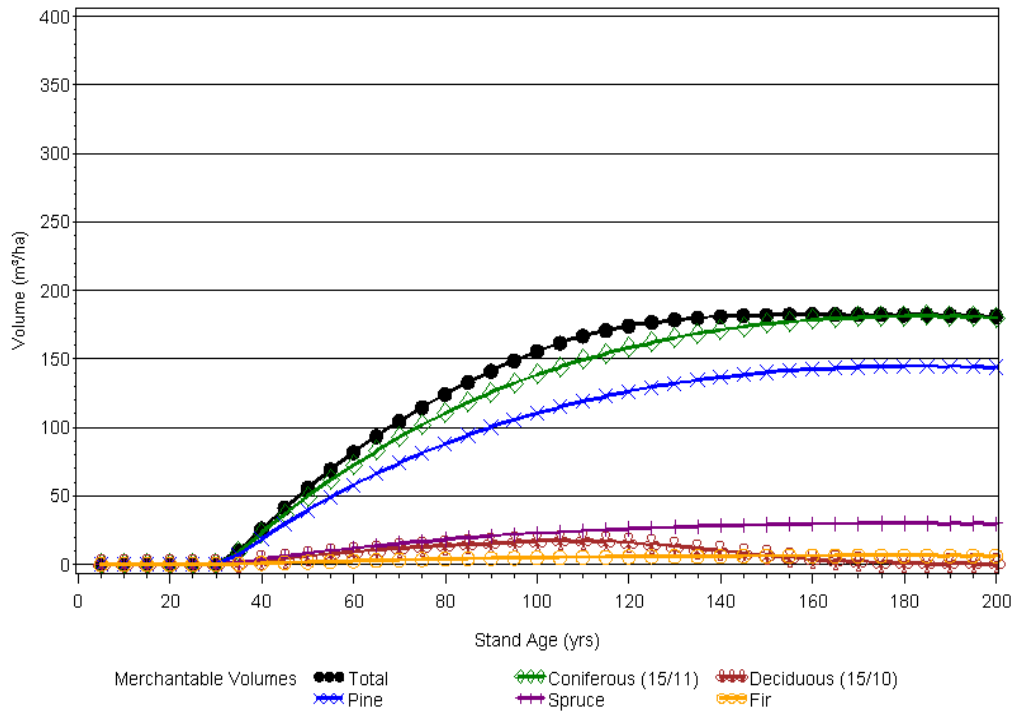


NSR & Site=UFM CC=B %Con=8 Yield Curve #=88

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	23	0.6	3	0.1
50	56	1.1	49	1.0	6	0.1
60	82	1.4	73	1.2	9	0.2
70	104	1.5	93	1.3	12	0.2
80	124	1.6	110	1.4	14	0.2
90	141	1.6	125	1.4	16	0.2
100	156	1.6	138	1.4	17	0.2
110	167	1.5	149	1.4	18	0.2
120	174	1.5	158	1.3	16	0.1
130	179	1.4	165	1.3	13	0.1
140	181	1.3	171	1.2	10	0.1
150	182	1.2	175	1.2	7	0.0
160	183	1.1	178	1.1	4	0.0
170	183	1.1	180	1.1	2	0.0
180	182	1.0	181	1.0	1	0.0
190	182	1.0	181	1.0	1	0.0
200	181	0.9	180	0.9	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=8 Yield Curve #=88

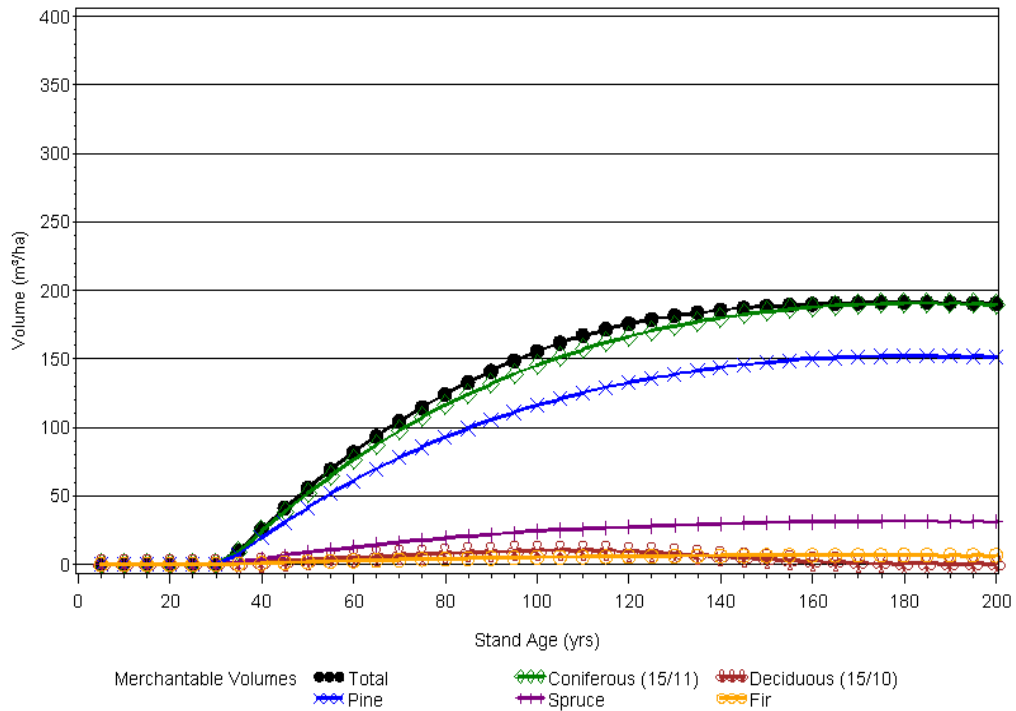


NSR & Site=UFM CC=B %Con=9 Yield Curve #=89

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	24	0.6	2	0.0
50	56	1.1	52	1.0	4	0.1
60	82	1.4	76	1.3	5	0.1
70	104	1.5	98	1.4	7	0.1
80	124	1.6	116	1.5	8	0.1
90	141	1.6	132	1.5	9	0.1
100	156	1.6	146	1.5	10	0.1
110	167	1.5	157	1.4	10	0.1
120	176	1.5	166	1.4	9	0.1
130	182	1.4	174	1.3	8	0.1
140	186	1.3	180	1.3	6	0.0
150	188	1.3	184	1.2	4	0.0
160	190	1.2	188	1.2	2	0.0
170	191	1.1	190	1.1	1	0.0
180	191	1.1	191	1.1	1	0.0
190	191	1.0	191	1.0	1	0.0
200	190	1.0	190	0.9	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=9 Yield Curve #=89

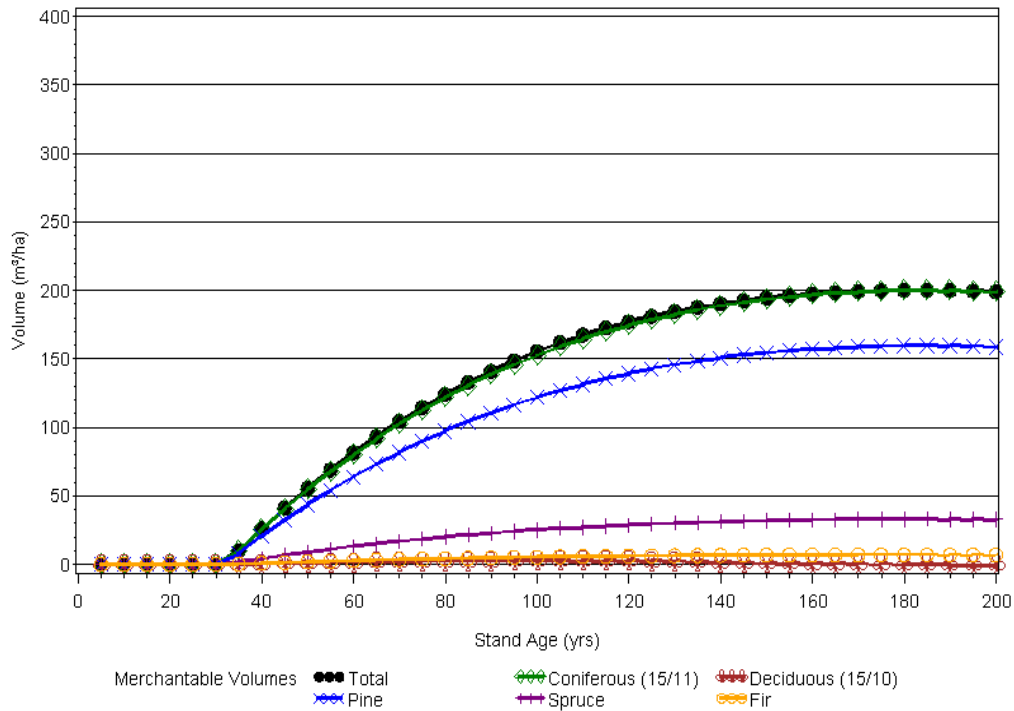


NSR & Site=UFM CC=B %Con=10 Yield Curve #=90

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	26	0.7	26	0.6	0	0.0
50	56	1.1	55	1.1	1	0.0
60	82	1.4	80	1.3	2	0.0
70	104	1.5	102	1.5	2	0.0
80	124	1.6	122	1.5	2	0.0
90	141	1.6	138	1.5	3	0.0
100	156	1.6	153	1.5	3	0.0
110	168	1.5	165	1.5	3	0.0
120	177	1.5	174	1.5	3	0.0
130	185	1.4	182	1.4	2	0.0
140	191	1.4	189	1.3	2	0.0
150	195	1.3	194	1.3	1	0.0
160	198	1.2	197	1.2	1	0.0
170	199	1.2	199	1.2	0	0.0
180	200	1.1	200	1.1	0	0.0
190	200	1.1	200	1.1	0	0.0
200	199	1.0	199	1.0	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=B %Con=10 Yield Curve #=90

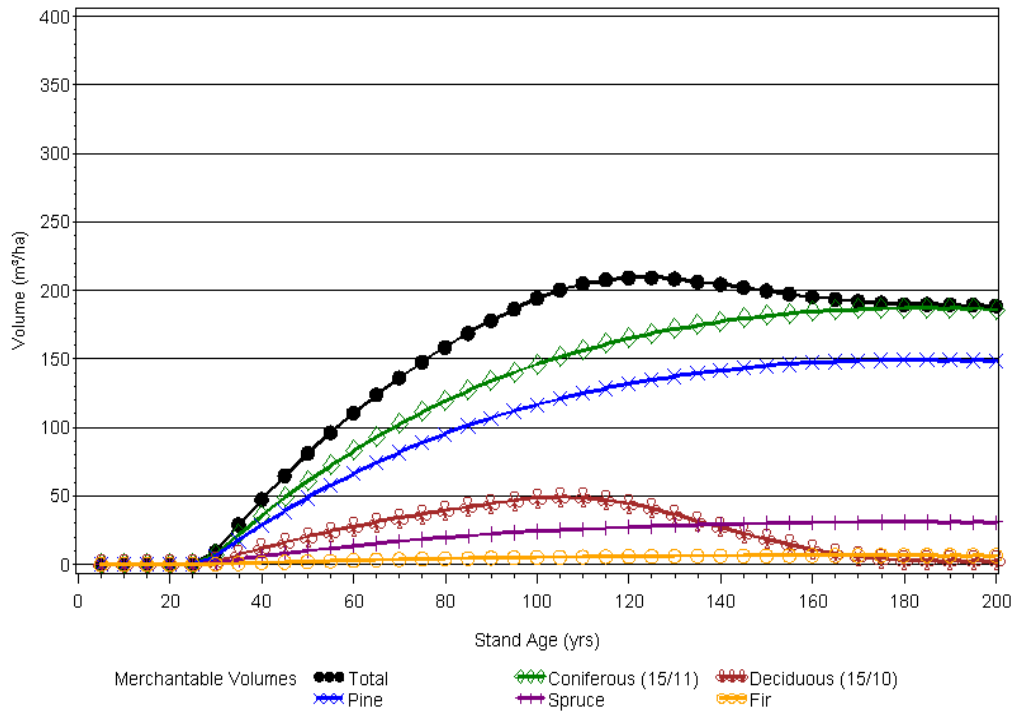


NSR & Site=UFM CC=C %Con=5 Yield Curve #=91

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	7	0.2	2	0.1
40	47	1.2	36	0.9	12	0.3
50	81	1.6	61	1.2	20	0.4
60	111	1.8	83	1.4	28	0.5
70	136	1.9	102	1.5	34	0.5
80	159	2.0	119	1.5	39	0.5
90	178	2.0	134	1.5	44	0.5
100	194	1.9	146	1.5	48	0.5
110	205	1.9	156	1.4	49	0.4
120	209	1.7	165	1.4	44	0.4
130	208	1.6	172	1.3	37	0.3
140	205	1.5	177	1.3	27	0.2
150	200	1.3	181	1.2	18	0.1
160	195	1.2	184	1.2	11	0.1
170	192	1.1	186	1.1	6	0.0
180	190	1.1	187	1.0	3	0.0
190	190	1.0	187	1.0	3	0.0
200	189	0.9	186	0.9	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=5 Yield Curve #=91

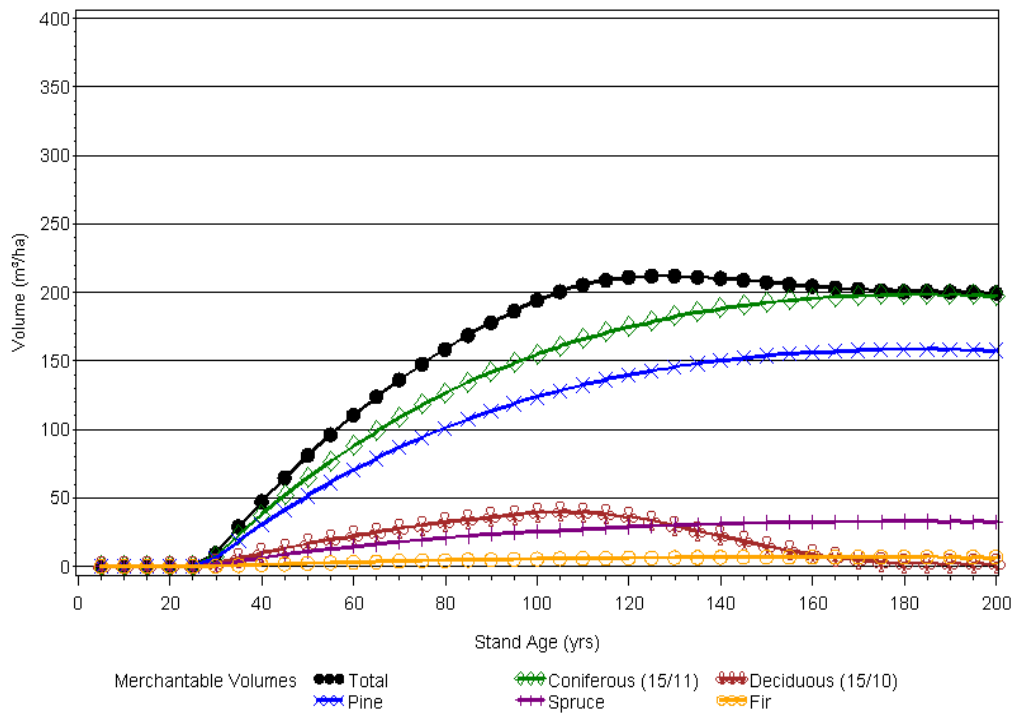


NSR & Site=UFM CC=C %Con=6 Yield Curve #=92

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	8	0.3	2	0.1
40	47	1.2	38	0.9	10	0.2
50	81	1.6	65	1.3	16	0.3
60	111	1.8	88	1.5	22	0.4
70	136	1.9	109	1.6	28	0.4
80	159	2.0	126	1.6	32	0.4
90	178	2.0	142	1.6	36	0.4
100	194	1.9	155	1.5	39	0.4
110	206	1.9	166	1.5	40	0.4
120	211	1.8	175	1.5	36	0.3
130	212	1.6	182	1.4	30	0.2
140	210	1.5	188	1.3	22	0.2
150	207	1.4	193	1.3	15	0.1
160	205	1.3	196	1.2	9	0.1
170	202	1.2	198	1.2	5	0.0
180	201	1.1	198	1.1	2	0.0
190	201	1.1	198	1.0	2	0.0
200	200	1.0	197	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=6 Yield Curve #=92

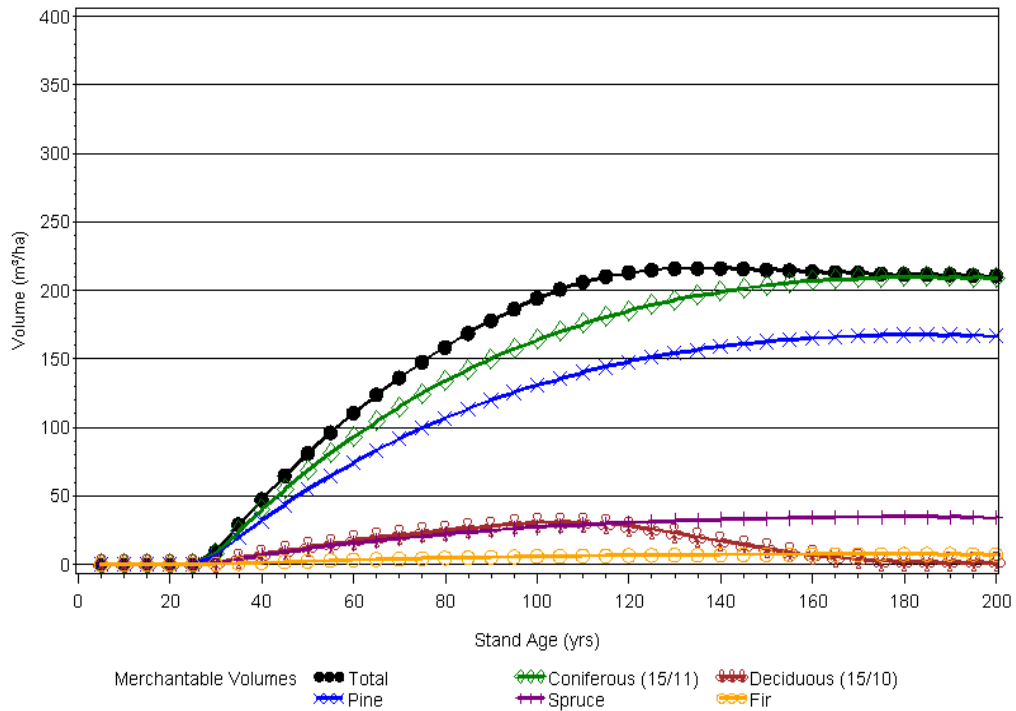


NSR & Site=UFM CC=C %Con=7 Yield Curve #=93

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	8	0.3	1	0.0
40	47	1.2	40	1.0	7	0.2
50	81	1.6	68	1.4	13	0.3
60	111	1.8	93	1.6	17	0.3
70	136	1.9	115	1.6	21	0.3
80	159	2.0	134	1.7	25	0.3
90	178	2.0	150	1.7	28	0.3
100	194	1.9	164	1.6	31	0.3
110	206	1.9	175	1.6	31	0.3
120	213	1.8	185	1.5	28	0.2
130	216	1.7	193	1.5	23	0.2
140	216	1.5	199	1.4	17	0.1
150	215	1.4	204	1.4	12	0.1
160	214	1.3	207	1.3	7	0.0
170	213	1.3	209	1.2	4	0.0
180	212	1.2	210	1.2	2	0.0
190	212	1.1	210	1.1	2	0.0
200	211	1.1	209	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=7 Yield Curve #=93

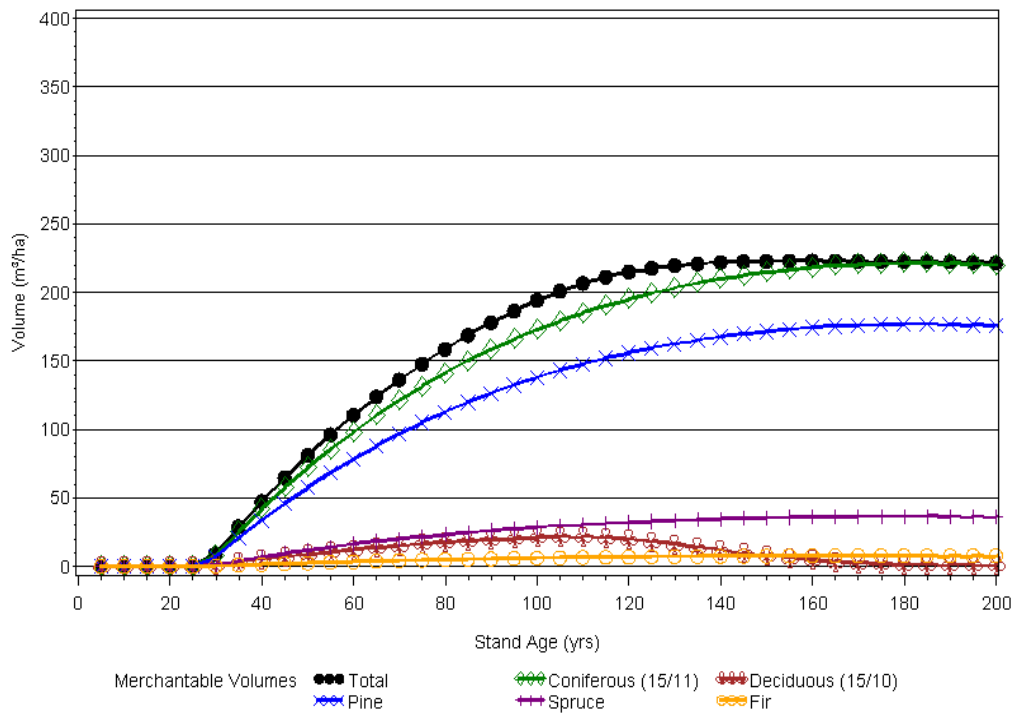


NSR & Site=UFM CC=C %Con=8 Yield Curve #=94

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	8	0.3	1	0.0
40	47	1.2	42	1.1	5	0.1
50	81	1.6	72	1.4	9	0.2
60	111	1.8	98	1.6	12	0.2
70	136	1.9	121	1.7	15	0.2
80	159	2.0	141	1.8	18	0.2
90	178	2.0	158	1.8	20	0.2
100	194	1.9	173	1.7	22	0.2
110	207	1.9	185	1.7	22	0.2
120	215	1.8	195	1.6	20	0.2
130	220	1.7	203	1.6	16	0.1
140	222	1.6	210	1.5	12	0.1
150	223	1.5	215	1.4	8	0.1
160	223	1.4	218	1.4	5	0.0
170	223	1.3	220	1.3	3	0.0
180	223	1.2	221	1.2	1	0.0
190	223	1.2	221	1.2	1	0.0
200	222	1.1	220	1.1	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=8 Yield Curve #=94

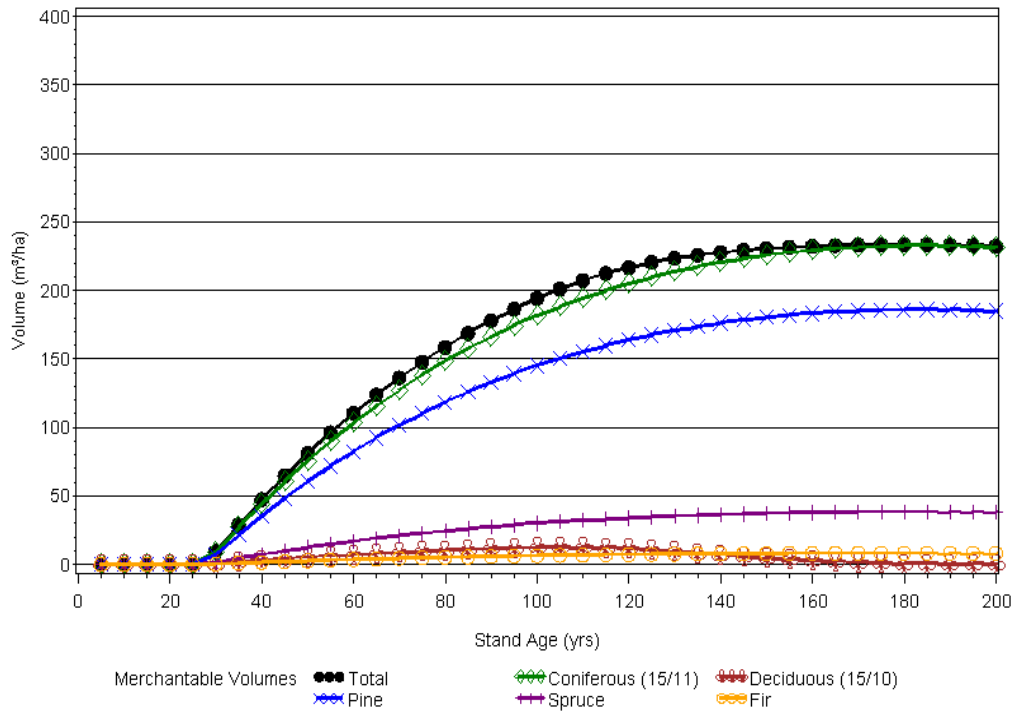


NSR & Site=UFM CC=C %Con=9 Yield Curve #=95

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	9	0.3	1	0.0
40	47	1.2	44	1.1	3	0.1
50	81	1.6	76	1.5	5	0.1
60	111	1.8	103	1.7	7	0.1
70	136	1.9	127	1.8	9	0.1
80	159	2.0	148	1.9	10	0.1
90	178	2.0	166	1.8	12	0.1
100	194	1.9	182	1.8	13	0.1
110	207	1.9	195	1.8	13	0.1
120	217	1.8	205	1.7	12	0.1
130	223	1.7	214	1.6	10	0.1
140	228	1.6	221	1.6	7	0.1
150	231	1.5	226	1.5	5	0.0
160	232	1.5	229	1.4	3	0.0
170	233	1.4	232	1.4	2	0.0
180	234	1.3	233	1.3	1	0.0
190	233	1.2	233	1.2	1	0.0
200	232	1.2	232	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=9 Yield Curve #=95

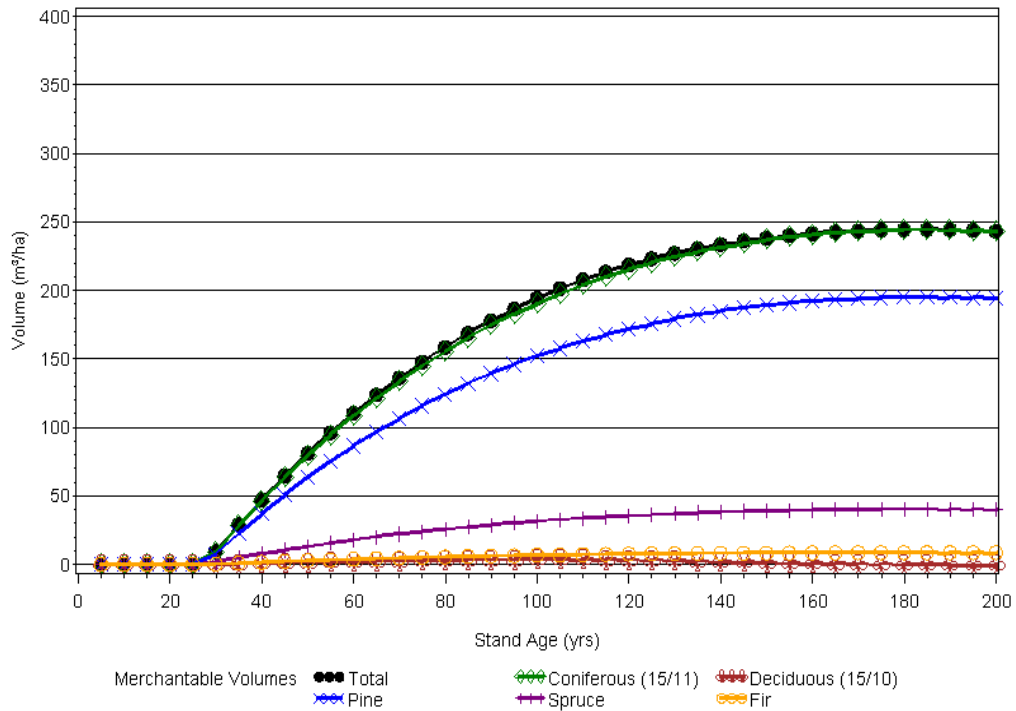


NSR & Site=UFM CC=C %Con=10 Yield Curve #-96

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	10	0.3	9	0.3	0	0.0
40	47	1.2	47	1.2	1	0.0
50	81	1.6	79	1.6	2	0.0
60	111	1.8	108	1.8	2	0.0
70	136	1.9	134	1.9	3	0.0
80	159	2.0	156	1.9	3	0.0
90	178	2.0	174	1.9	3	0.0
100	194	1.9	191	1.9	4	0.0
110	208	1.9	204	1.9	4	0.0
120	219	1.8	215	1.8	3	0.0
130	227	1.7	224	1.7	3	0.0
140	234	1.7	232	1.7	2	0.0
150	238	1.6	237	1.6	1	0.0
160	242	1.5	241	1.5	1	0.0
170	244	1.4	243	1.4	0	0.0
180	244	1.4	244	1.4	0	0.0
190	244	1.3	244	1.3	0	0.0
200	243	1.2	243	1.2	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=C %Con=10 Yield Curve #-96

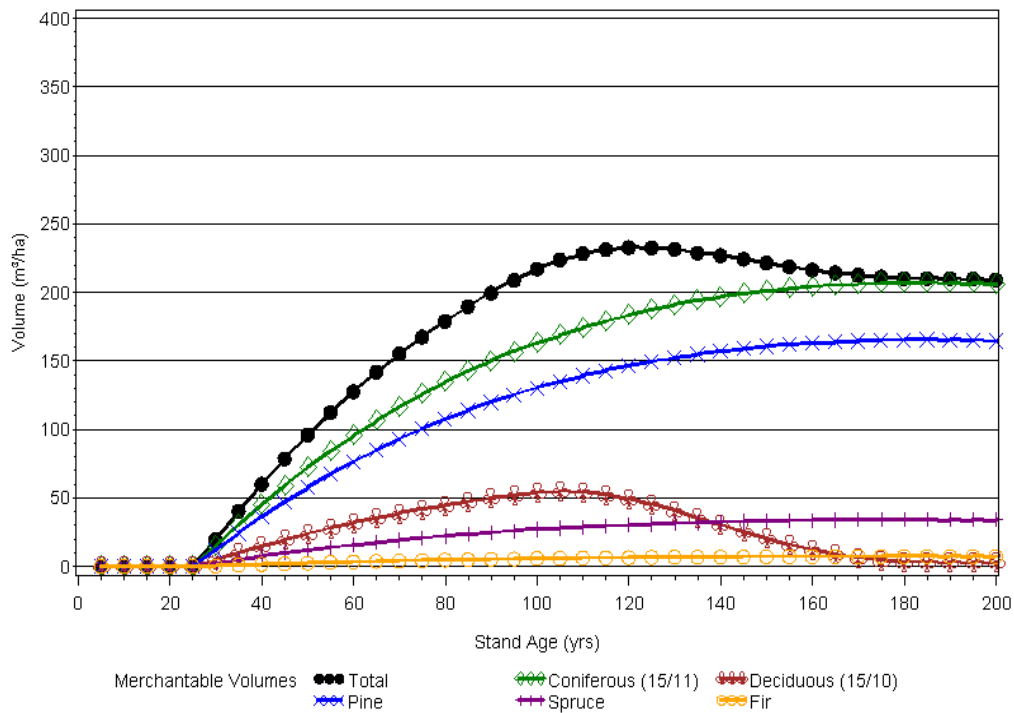


NSR & Site=UFM CC=D %Con=5 Yield Curve #=97

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	15	0.5	5	0.2
40	60	1.5	45	1.1	15	0.4
50	96	1.9	72	1.4	24	0.5
60	128	2.1	96	1.6	32	0.5
70	155	2.2	117	1.7	39	0.6
80	179	2.2	135	1.7	45	0.6
90	200	2.2	150	1.7	50	0.6
100	217	2.2	163	1.6	54	0.5
110	229	2.1	174	1.6	54	0.5
120	233	1.9	183	1.5	49	0.4
130	232	1.8	191	1.5	41	0.3
140	227	1.6	197	1.4	30	0.2
150	221	1.5	201	1.3	20	0.1
160	216	1.4	204	1.3	12	0.1
170	213	1.3	206	1.2	7	0.0
180	210	1.2	207	1.2	3	0.0
190	210	1.1	207	1.1	3	0.0
200	209	1.0	206	1.0	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=5 Yield Curve #=97

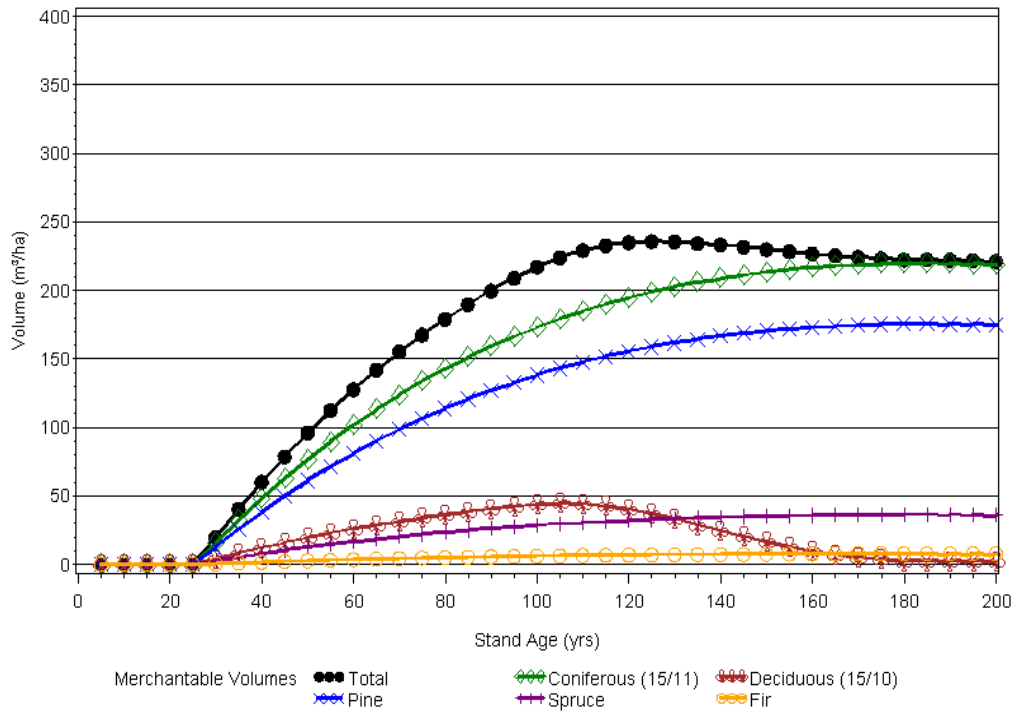


NSR & Site=UFM CC=D %Con=6 Yield Curve #=98

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	16	0.5	4	0.1
40	60	1.5	48	1.2	12	0.3
50	96	1.9	77	1.5	19	0.4
60	128	2.1	102	1.7	26	0.4
70	155	2.2	124	1.8	31	0.4
80	179	2.2	143	1.8	36	0.5
90	200	2.2	159	1.8	41	0.5
100	217	2.2	173	1.7	44	0.4
110	229	2.1	185	1.7	44	0.4
120	235	2.0	195	1.6	40	0.3
130	236	1.8	203	1.6	33	0.3
140	233	1.7	209	1.5	25	0.2
150	230	1.5	213	1.4	17	0.1
160	227	1.4	217	1.4	10	0.1
170	224	1.3	219	1.3	5	0.0
180	222	1.2	220	1.2	3	0.0
190	222	1.2	220	1.2	3	0.0
200	221	1.1	219	1.1	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=6 Yield Curve #=98

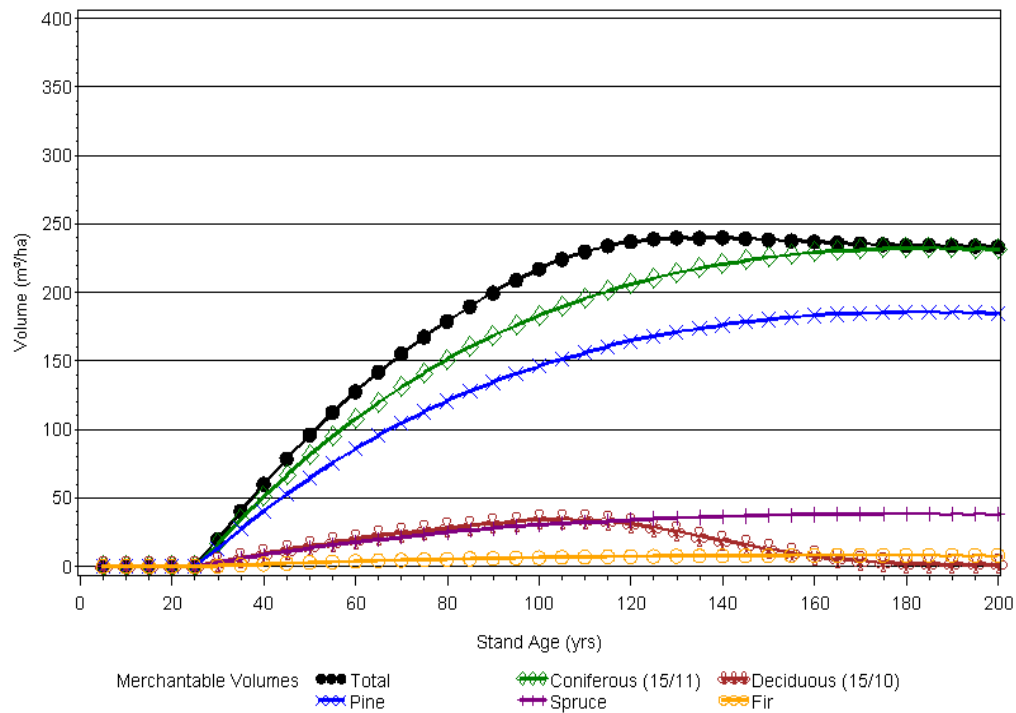


NSR & Site=UFM CC=D %Con=7 Yield Curve #=99

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	16	0.5	3	0.1
40	60	1.5	51	1.3	9	0.2
50	96	1.9	81	1.6	15	0.3
60	128	2.1	108	1.8	20	0.3
70	155	2.2	131	1.9	24	0.3
80	179	2.2	151	1.9	28	0.4
90	200	2.2	168	1.9	31	0.3
100	217	2.2	183	1.8	34	0.3
110	230	2.1	196	1.8	34	0.3
120	237	2.0	206	1.7	31	0.3
130	240	1.8	214	1.6	26	0.2
140	240	1.7	221	1.6	19	0.1
150	239	1.6	226	1.5	13	0.1
160	237	1.5	229	1.4	8	0.0
170	236	1.4	231	1.4	4	0.0
180	234	1.3	232	1.3	2	0.0
190	234	1.2	232	1.2	2	0.0
200	233	1.2	231	1.2	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=7 Yield Curve #=99

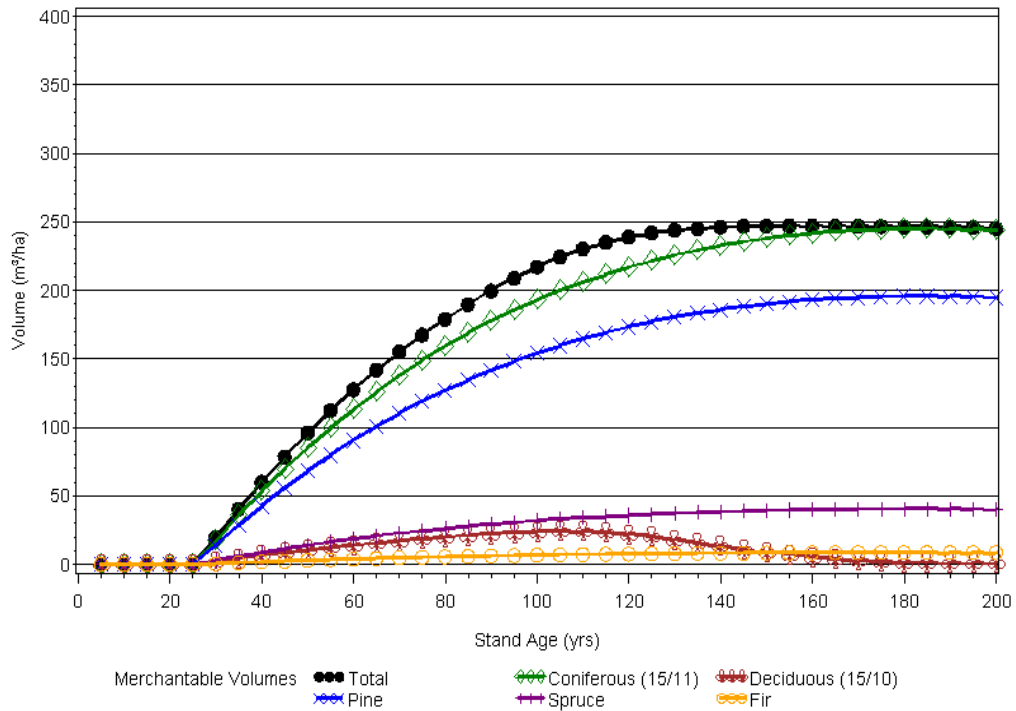


NSR & Site=UFM CC=D %Con=8 Yield Curve #=100

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	17	0.6	2	0.1
40	60	1.5	53	1.3	7	0.2
50	96	1.9	85	1.7	11	0.2
60	128	2.1	113	1.9	14	0.2
70	155	2.2	138	2.0	17	0.2
80	179	2.2	159	2.0	20	0.2
90	200	2.2	178	2.0	22	0.2
100	217	2.2	193	1.9	24	0.2
110	230	2.1	206	1.9	24	0.2
120	239	2.0	217	1.8	22	0.2
130	244	1.9	226	1.7	18	0.1
140	246	1.8	233	1.7	14	0.1
150	247	1.6	238	1.6	9	0.1
160	247	1.5	242	1.5	5	0.0
170	247	1.5	244	1.4	3	0.0
180	246	1.4	245	1.4	1	0.0
190	246	1.3	245	1.3	1	0.0
200	245	1.2	244	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=8 Yield Curve #=100

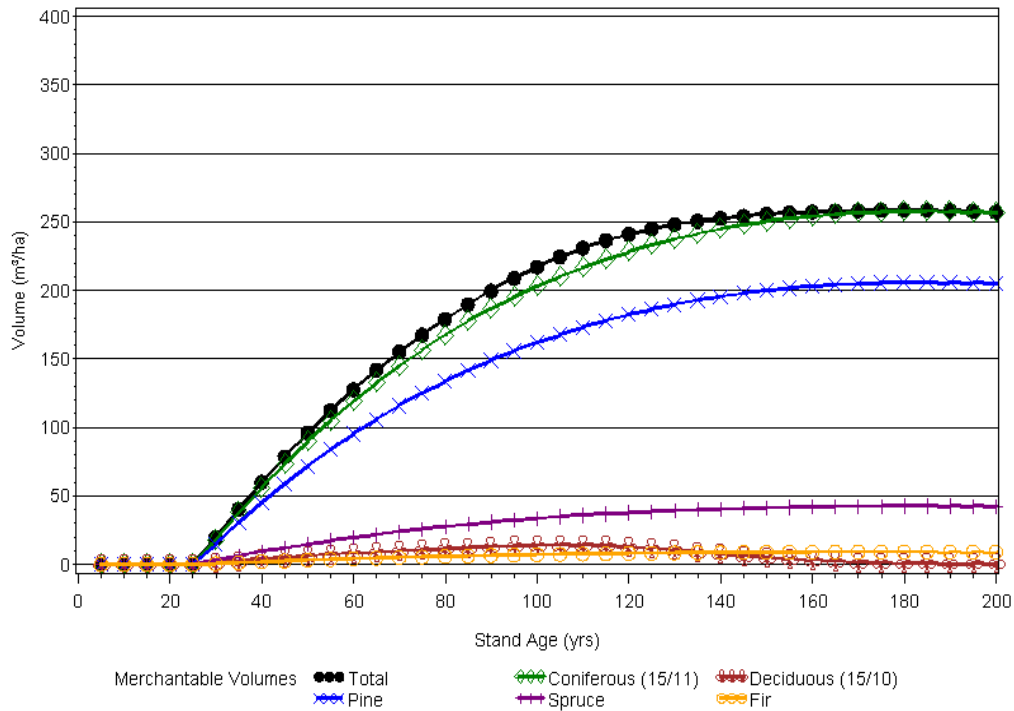


NSR & Site=UFM CC=D %Con=9 Yield Curve #=101

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	18	0.6	1	0.0
40	60	1.5	56	1.4	4	0.1
50	96	1.9	90	1.8	6	0.1
60	128	2.1	119	2.0	8	0.1
70	155	2.2	145	2.1	10	0.1
80	179	2.2	167	2.1	12	0.1
90	200	2.2	187	2.1	13	0.1
100	217	2.2	203	2.0	14	0.1
110	231	2.1	217	2.0	14	0.1
120	241	2.0	228	1.9	13	0.1
130	248	1.9	238	1.8	11	0.1
140	253	1.8	245	1.7	8	0.1
150	256	1.7	250	1.7	5	0.0
160	257	1.6	254	1.6	3	0.0
170	258	1.5	257	1.5	2	0.0
180	259	1.4	258	1.4	1	0.0
190	258	1.4	258	1.4	1	0.0
200	257	1.3	257	1.3	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=9 Yield Curve #=101

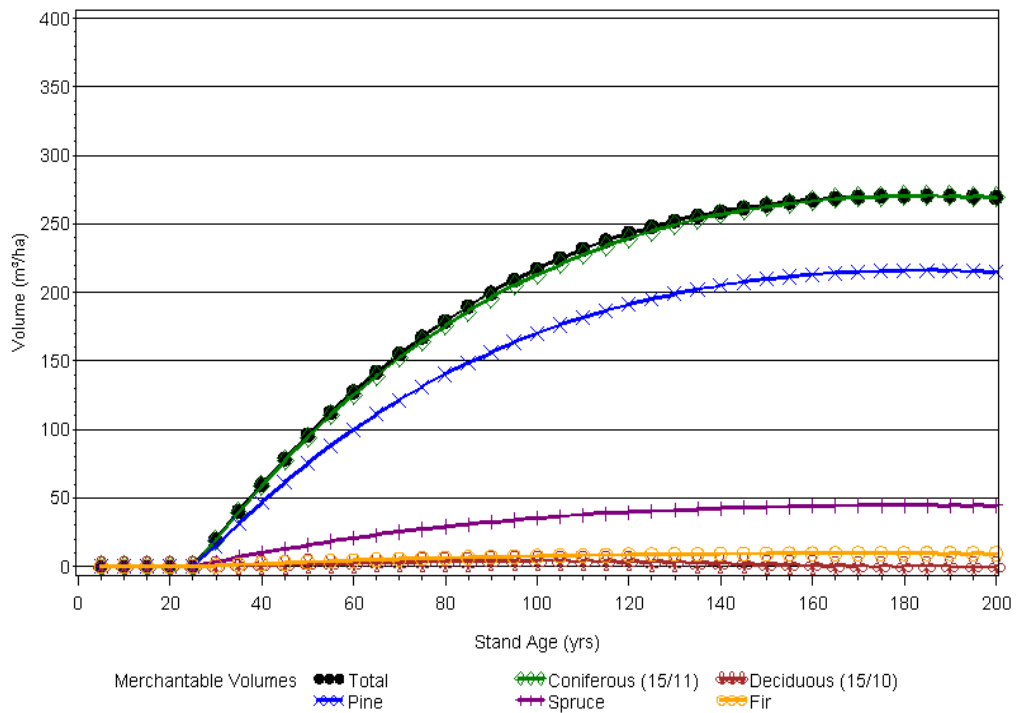


NSR & Site=UFM CC=D %Con=10 Yield Curve #=102

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	20	0.7	19	0.6	0	0.0
40	60	1.5	59	1.5	1	0.0
50	96	1.9	94	1.9	2	0.0
60	128	2.1	125	2.1	2	0.0
70	155	2.2	152	2.2	3	0.0
80	179	2.2	176	2.2	3	0.0
90	200	2.2	196	2.2	4	0.0
100	217	2.2	213	2.1	4	0.0
110	232	2.1	228	2.1	4	0.0
120	243	2.0	240	2.0	4	0.0
130	252	1.9	249	1.9	3	0.0
140	259	1.9	257	1.8	2	0.0
150	264	1.8	263	1.8	2	0.0
160	268	1.7	267	1.7	1	0.0
170	270	1.6	269	1.6	1	0.0
180	271	1.5	270	1.5	0	0.0
190	271	1.4	270	1.4	0	0.0
200	269	1.3	269	1.3	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFM CC=D %Con=10 Yield Curve #=102

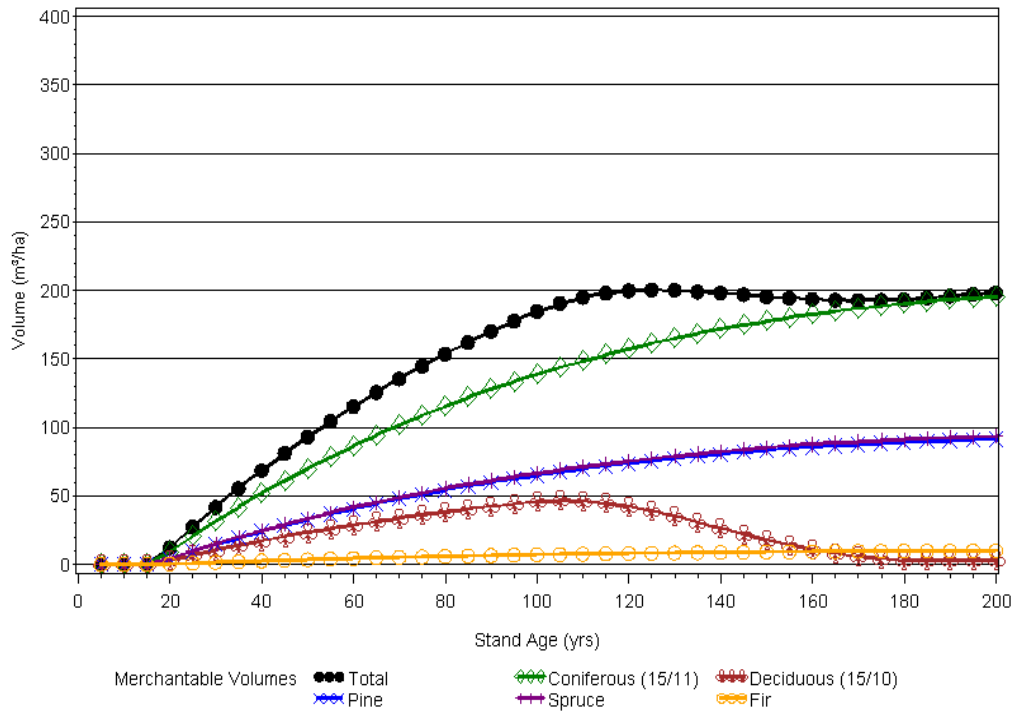


NSR & Site=UFP CC=X %Con=5 Yield Curve #=103

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	9	0.5	3	0.2
30	42	1.4	31	1.0	10	0.3
40	69	1.7	52	1.3	17	0.4
50	93	1.9	70	1.4	23	0.5
60	115	1.9	87	1.4	29	0.5
70	135	1.9	102	1.5	34	0.5
80	154	1.9	115	1.4	38	0.5
90	170	1.9	128	1.4	42	0.5
100	185	1.8	139	1.4	46	0.5
110	195	1.8	149	1.4	46	0.4
120	200	1.7	157	1.3	42	0.4
130	200	1.5	165	1.3	35	0.3
140	198	1.4	172	1.2	26	0.2
150	196	1.3	178	1.2	18	0.1
160	194	1.2	183	1.1	11	0.1
170	193	1.1	187	1.1	6	0.0
180	193	1.1	190	1.1	3	0.0
190	196	1.0	193	1.0	3	0.0
200	198	1.0	195	1.0	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=5 Yield Curve #=103

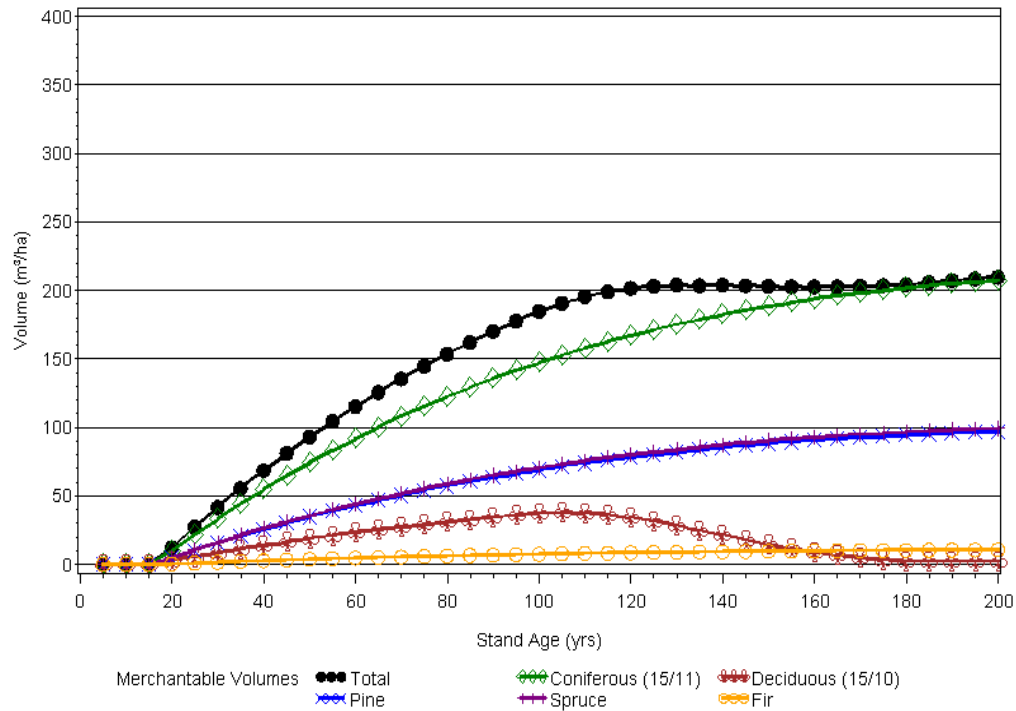


NSR & Site=UFP CC=X %Con=6 Yield Curve #=104

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	10	0.5	3	0.1
30	42	1.4	33	1.1	8	0.3
40	69	1.7	55	1.4	14	0.3
50	93	1.9	74	1.5	19	0.4
60	115	1.9	92	1.5	23	0.4
70	135	1.9	108	1.5	27	0.4
80	154	1.9	123	1.5	31	0.4
90	170	1.9	136	1.5	35	0.4
100	185	1.8	147	1.5	38	0.4
110	196	1.8	158	1.4	38	0.3
120	202	1.7	167	1.4	35	0.3
130	204	1.6	175	1.3	29	0.2
140	204	1.5	182	1.3	22	0.2
150	203	1.4	188	1.3	15	0.1
160	203	1.3	194	1.2	9	0.1
170	203	1.2	198	1.2	5	0.0
180	204	1.1	202	1.1	2	0.0
190	207	1.1	205	1.1	2	0.0
200	210	1.0	207	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=6 Yield Curve #=104

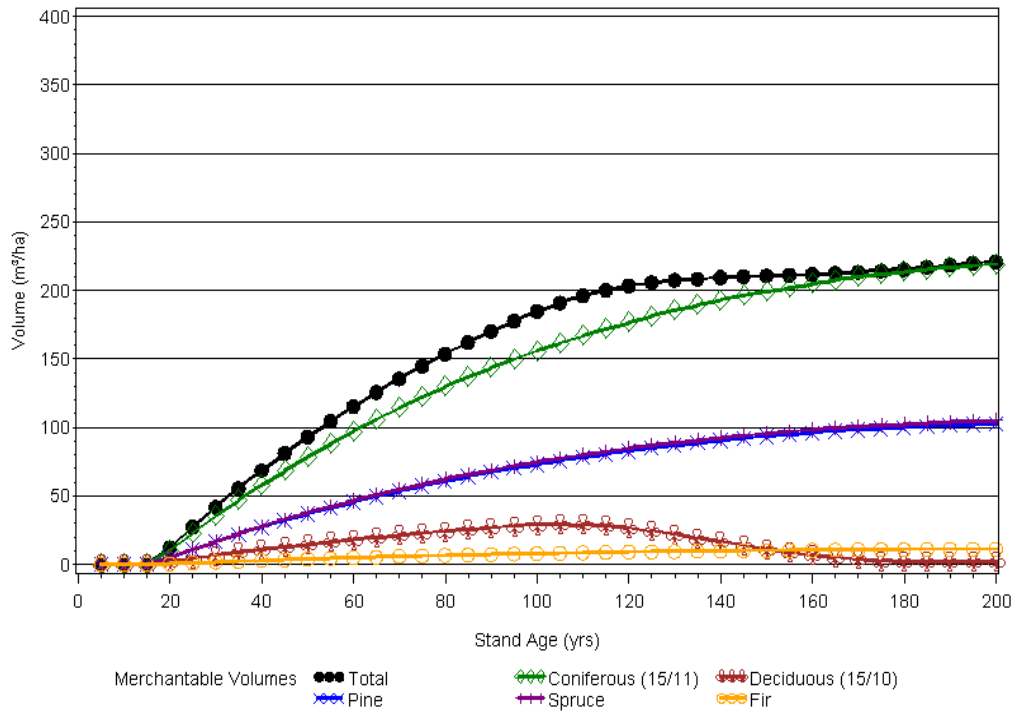


NSR & Site=UFP CC=X %Con=7 Yield Curve #=105

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	10	0.5	2	0.1
30	42	1.4	35	1.2	7	0.2
40	69	1.7	58	1.4	11	0.3
50	93	1.9	78	1.6	15	0.3
60	115	1.9	97	1.6	18	0.3
70	135	1.9	114	1.6	21	0.3
80	154	1.9	130	1.6	24	0.3
90	170	1.9	143	1.6	27	0.3
100	185	1.8	156	1.6	29	0.3
110	196	1.8	167	1.5	29	0.3
120	203	1.7	177	1.5	27	0.2
130	208	1.6	185	1.4	22	0.2
140	210	1.5	193	1.4	17	0.1
150	211	1.4	199	1.3	11	0.1
160	212	1.3	205	1.3	7	0.0
170	213	1.3	210	1.2	4	0.0
180	215	1.2	214	1.2	2	0.0
190	219	1.2	217	1.1	2	0.0
200	221	1.1	219	1.1	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=7 Yield Curve #=105

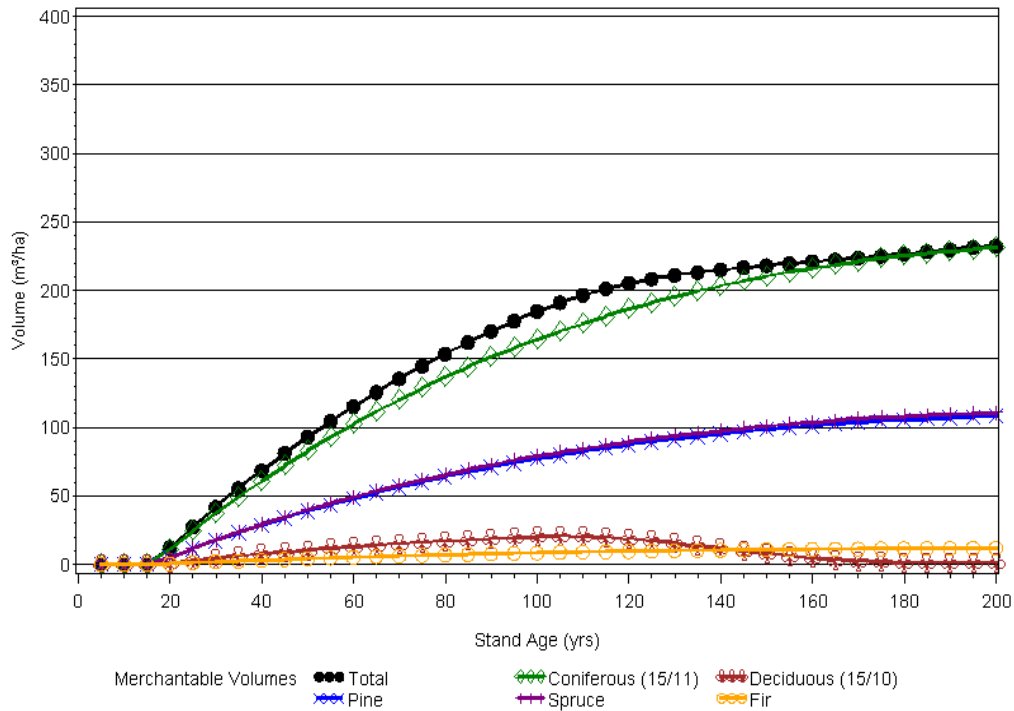


NSR & Site=UFP CC=X %Con=8 Yield Curve #=106

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	11	0.5	1	0.1
30	42	1.4	37	1.2	5	0.2
40	69	1.7	61	1.5	8	0.2
50	93	1.9	83	1.7	10	0.2
60	115	1.9	103	1.7	13	0.2
70	135	1.9	120	1.7	15	0.2
80	154	1.9	137	1.7	17	0.2
90	170	1.9	151	1.7	19	0.2
100	185	1.8	164	1.6	21	0.2
110	197	1.8	176	1.6	21	0.2
120	205	1.7	186	1.6	19	0.2
130	211	1.6	195	1.5	16	0.1
140	215	1.5	203	1.5	12	0.1
150	218	1.5	210	1.4	8	0.1
160	221	1.4	216	1.4	5	0.0
170	224	1.3	221	1.3	3	0.0
180	226	1.3	225	1.3	1	0.0
190	230	1.2	229	1.2	1	0.0
200	232	1.2	231	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=8 Yield Curve #=106

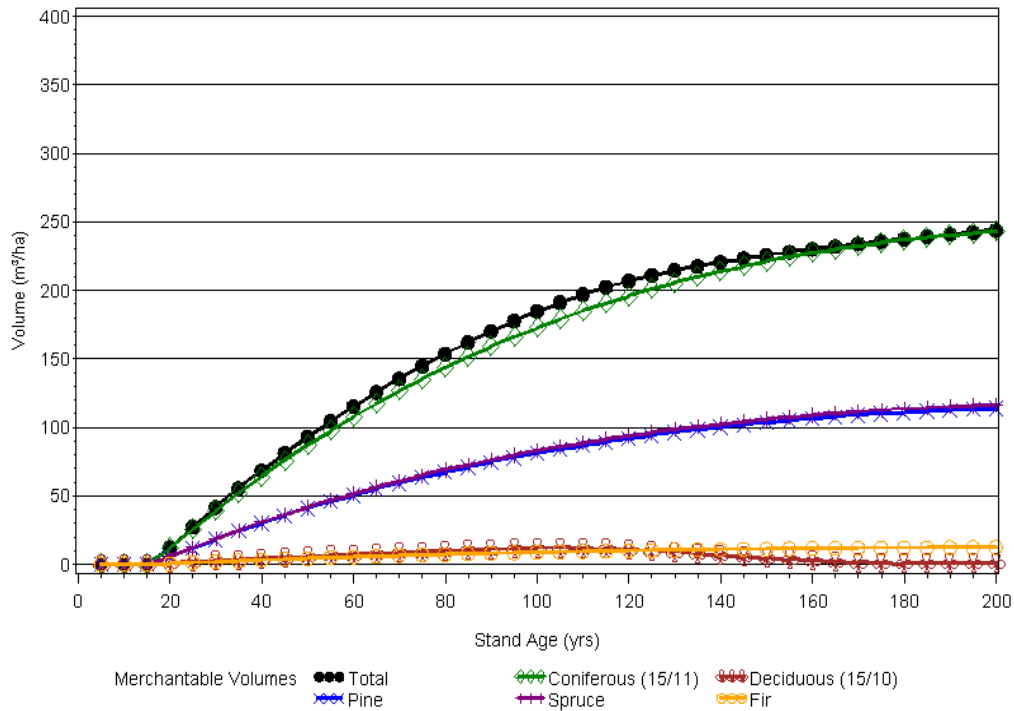


NSR & Site=UFP CC=X %Con=9 Yield Curve #=107

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	12	0.6	1	0.0
30	42	1.4	39	1.3	3	0.1
40	69	1.7	64	1.6	4	0.1
50	93	1.9	87	1.7	6	0.1
60	115	1.9	108	1.8	8	0.1
70	135	1.9	127	1.8	9	0.1
80	154	1.9	144	1.8	10	0.1
90	170	1.9	159	1.8	11	0.1
100	185	1.8	173	1.7	12	0.1
110	197	1.8	185	1.7	12	0.1
120	207	1.7	196	1.6	11	0.1
130	215	1.7	205	1.6	9	0.1
140	221	1.6	214	1.5	7	0.0
150	226	1.5	221	1.5	5	0.0
160	230	1.4	227	1.4	3	0.0
170	234	1.4	233	1.4	2	0.0
180	238	1.3	237	1.3	1	0.0
190	241	1.3	240	1.3	1	0.0
200	244	1.2	243	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=9 Yield Curve #=107

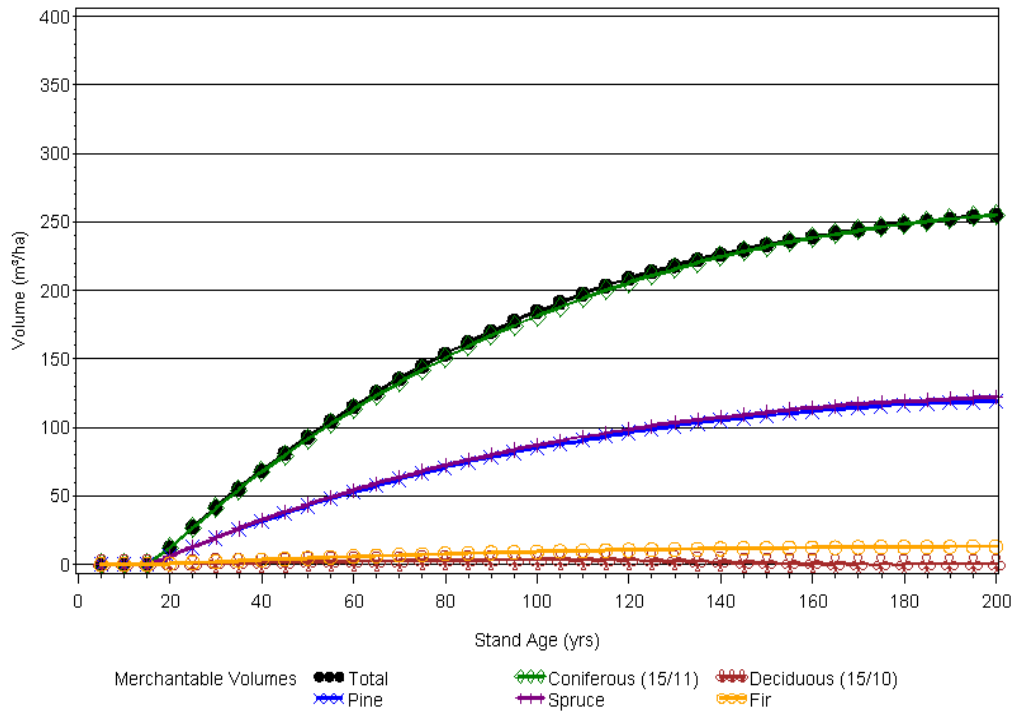


NSR & Site=UFP CC=X %Con=10 Yield Curve #=108

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	12	0.6	0	0.0
30	42	1.4	41	1.4	1	0.0
40	69	1.7	67	1.7	1	0.0
50	93	1.9	91	1.8	2	0.0
60	115	1.9	113	1.9	2	0.0
70	135	1.9	133	1.9	3	0.0
80	154	1.9	151	1.9	3	0.0
90	170	1.9	167	1.9	3	0.0
100	185	1.8	181	1.8	4	0.0
110	198	1.8	194	1.8	4	0.0
120	209	1.7	206	1.7	3	0.0
130	218	1.7	216	1.7	3	0.0
140	226	1.6	224	1.6	2	0.0
150	233	1.6	232	1.5	1	0.0
160	239	1.5	238	1.5	1	0.0
170	244	1.4	244	1.4	0	0.0
180	249	1.4	248	1.4	0	0.0
190	252	1.3	252	1.3	0	0.0
200	255	1.3	255	1.3	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=UFP CC=X %Con=10 Yield Curve #=108

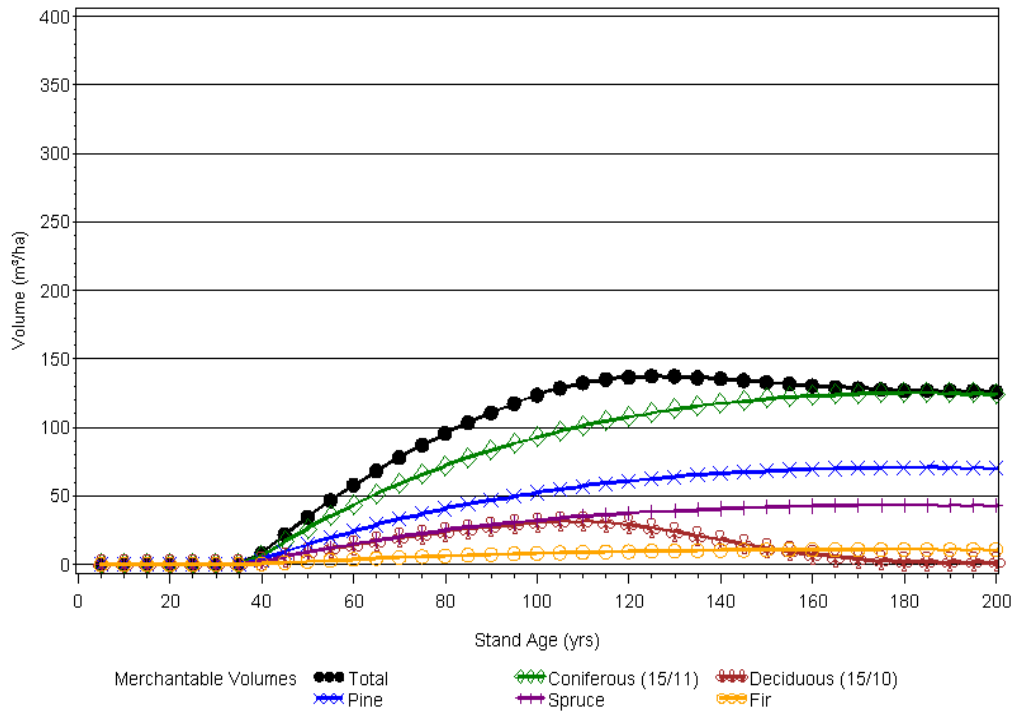


NSR & Site=SAG CC=A %Con=5 Yield Curve #=109

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	6	0.2	2	0.1
50	35	0.7	26	0.5	9	0.2
60	58	1.0	43	0.7	14	0.2
70	78	1.1	59	0.8	19	0.3
80	96	1.2	72	0.9	24	0.3
90	111	1.2	83	0.9	28	0.3
100	124	1.2	93	0.9	31	0.3
110	133	1.2	101	0.9	32	0.3
120	137	1.1	108	0.9	29	0.2
130	137	1.1	113	0.9	24	0.2
140	136	1.0	118	0.8	18	0.1
150	133	0.9	121	0.8	12	0.1
160	130	0.8	123	0.8	7	0.0
170	128	0.8	125	0.7	4	0.0
180	127	0.7	125	0.7	2	0.0
190	127	0.7	125	0.7	2	0.0
200	126	0.6	124	0.6	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=5 Yield Curve #=109

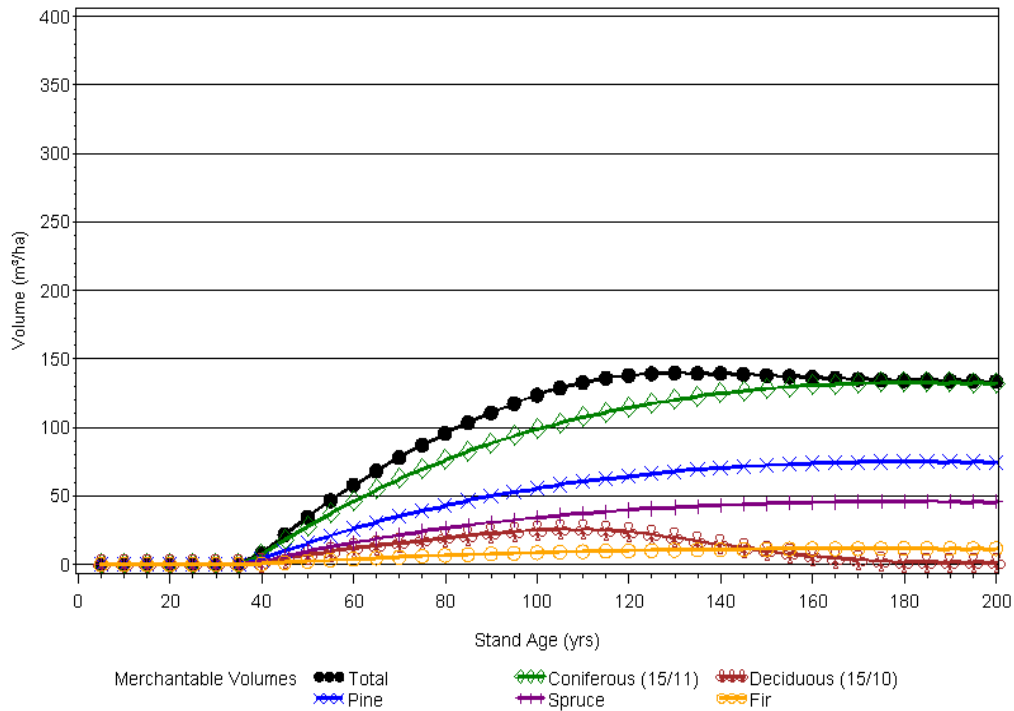


NSR & Site=SAG CC=A %Con=6 Yield Curve #=110

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	7	0.2	2	0.0
50	35	0.7	28	0.6	7	0.1
60	58	1.0	46	0.8	12	0.2
70	78	1.1	62	0.9	16	0.2
80	96	1.2	76	1.0	19	0.2
90	111	1.2	88	1.0	22	0.2
100	124	1.2	99	1.0	25	0.3
110	133	1.2	107	1.0	26	0.2
120	138	1.2	114	1.0	24	0.2
130	140	1.1	120	0.9	20	0.2
140	139	1.0	125	0.9	15	0.1
150	138	0.9	128	0.9	10	0.1
160	137	0.9	131	0.8	6	0.0
170	135	0.8	132	0.8	3	0.0
180	134	0.7	133	0.7	2	0.0
190	134	0.7	133	0.7	2	0.0
200	134	0.7	132	0.7	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=6 Yield Curve #=110

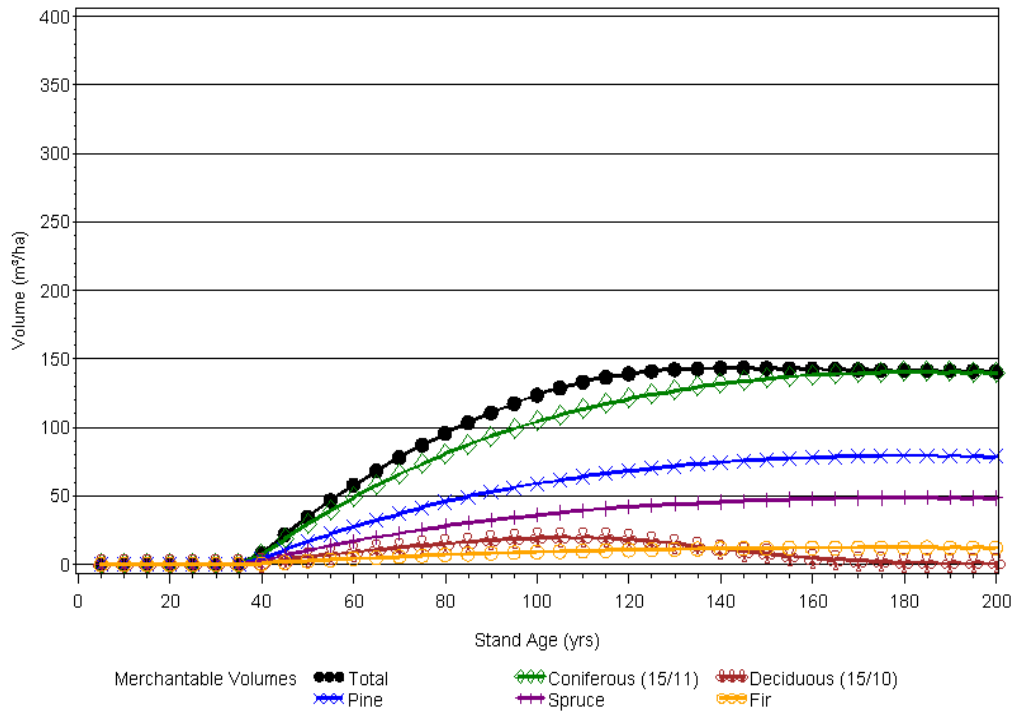


NSR & Site=SAG CC=A %Con=7 Yield Curve #=111

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	7	0.2	1	0.0
50	35	0.7	29	0.6	5	0.1
60	58	1.0	49	0.8	9	0.2
70	78	1.1	66	0.9	12	0.2
80	96	1.2	81	1.0	15	0.2
90	111	1.2	93	1.0	17	0.2
100	124	1.2	104	1.0	19	0.2
110	133	1.2	113	1.0	20	0.2
120	139	1.2	121	1.0	18	0.2
130	142	1.1	127	1.0	15	0.1
140	143	1.0	132	0.9	11	0.1
150	143	1.0	136	0.9	8	0.1
160	143	0.9	138	0.9	5	0.0
170	142	0.8	140	0.8	2	0.0
180	142	0.8	140	0.8	1	0.0
190	142	0.7	140	0.7	1	0.0
200	141	0.7	140	0.7	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=7 Yield Curve #=111

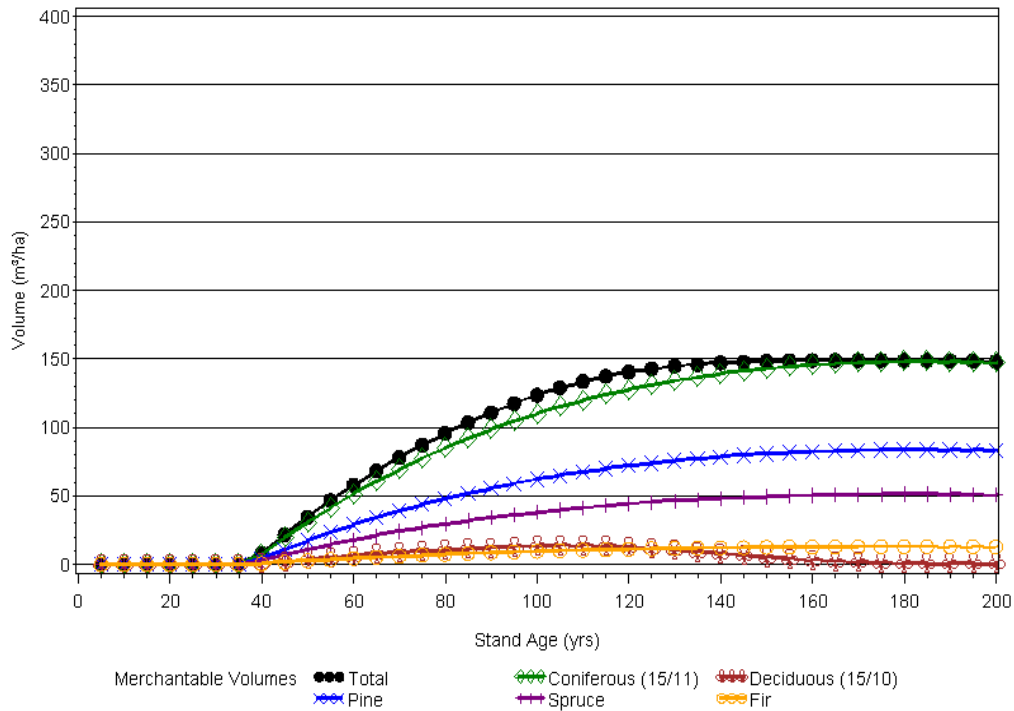


NSR & Site=SAG CC=A %Con=8 Yield Curve #=112

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	7	0.2	1	0.0
50	35	0.7	31	0.6	4	0.1
60	58	1.0	51	0.9	6	0.1
70	78	1.1	69	1.0	9	0.1
80	96	1.2	85	1.1	11	0.1
90	111	1.2	99	1.1	12	0.1
100	124	1.2	110	1.1	14	0.1
110	134	1.2	120	1.1	14	0.1
120	141	1.2	128	1.1	13	0.1
130	145	1.1	134	1.0	11	0.1
140	147	1.1	139	1.0	8	0.1
150	148	1.0	143	1.0	5	0.0
160	149	0.9	146	0.9	3	0.0
170	149	0.9	147	0.9	2	0.0
180	149	0.8	148	0.8	1	0.0
190	149	0.8	148	0.8	1	0.0
200	148	0.7	147	0.7	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=8 Yield Curve #=112

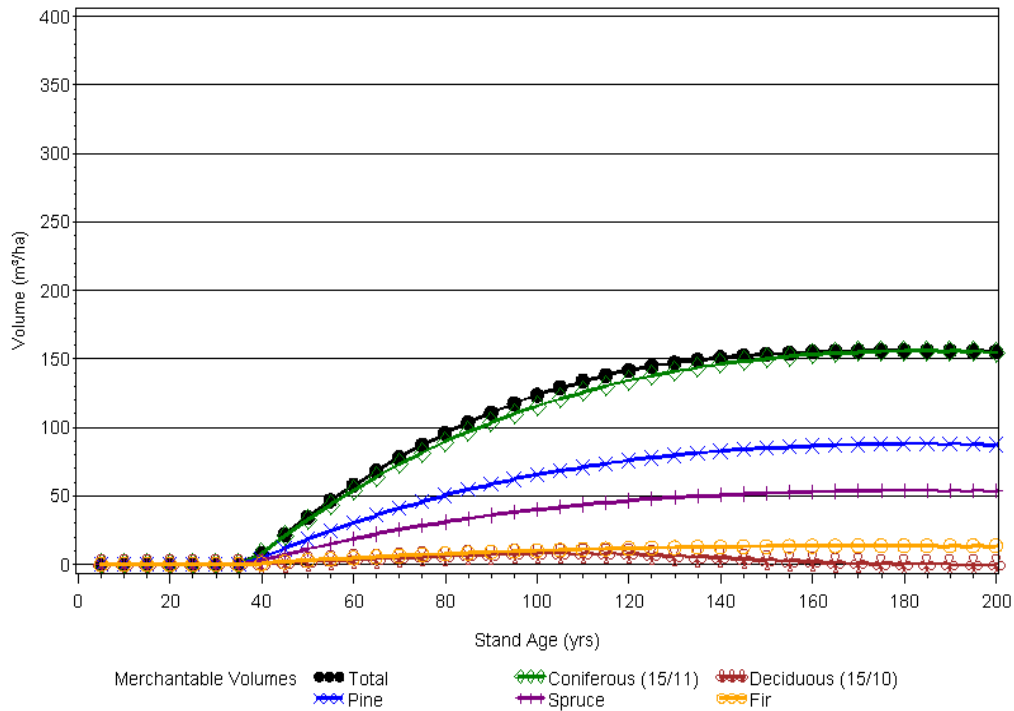


NSR & Site=SAG CC=A %Con=9 Yield Curve #=113

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	8	0.2	1	0.0
50	35	0.7	32	0.6	2	0.0
60	58	1.0	54	0.9	4	0.1
70	78	1.1	73	1.0	5	0.1
80	96	1.2	89	1.1	6	0.1
90	111	1.2	104	1.2	7	0.1
100	124	1.2	116	1.2	8	0.1
110	134	1.2	126	1.1	8	0.1
120	142	1.2	134	1.1	8	0.1
130	147	1.1	141	1.1	6	0.0
140	151	1.1	146	1.0	5	0.0
150	154	1.0	150	1.0	3	0.0
160	155	1.0	153	1.0	2	0.0
170	156	0.9	155	0.9	1	0.0
180	156	0.9	156	0.9	0	0.0
190	156	0.8	156	0.8	0	0.0
200	155	0.8	155	0.8	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=9 Yield Curve #=113

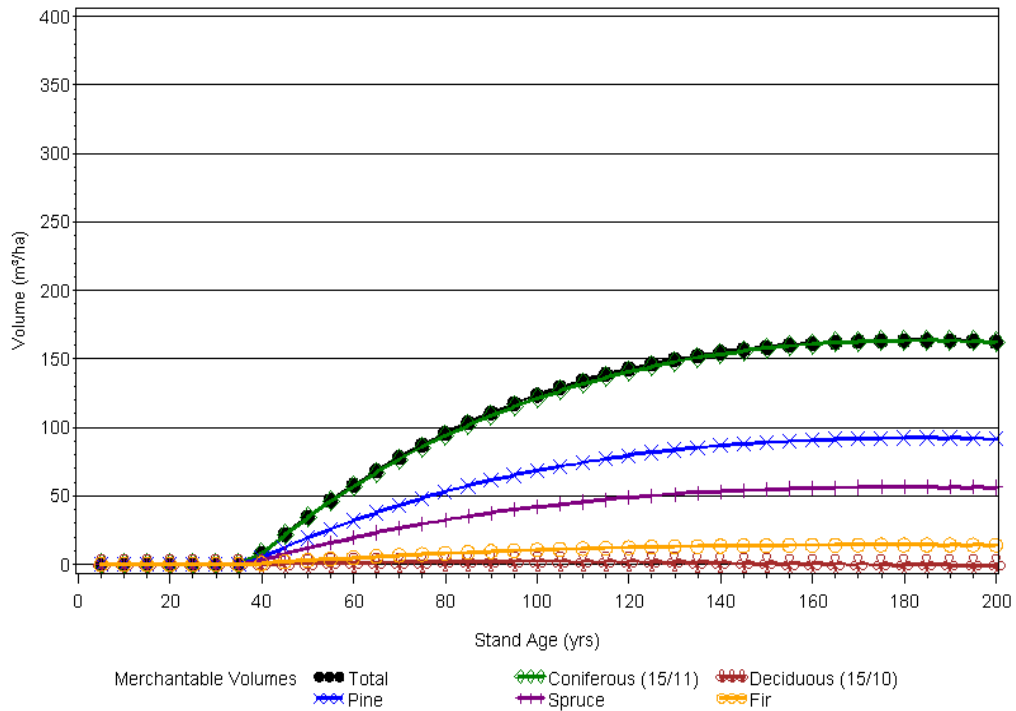


NSR & Site=SAG CC=A %Con=10 Yield Curve #=114

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	8	0.2	8	0.2	0	0.0
50	35	0.7	34	0.7	1	0.0
60	58	1.0	57	0.9	1	0.0
70	78	1.1	77	1.1	1	0.0
80	96	1.2	94	1.2	2	0.0
90	111	1.2	109	1.2	2	0.0
100	124	1.2	121	1.2	2	0.0
110	134	1.2	132	1.2	2	0.0
120	143	1.2	141	1.2	2	0.0
130	150	1.2	148	1.1	2	0.0
140	155	1.1	153	1.1	1	0.0
150	159	1.1	158	1.1	1	0.0
160	161	1.0	161	1.0	1	0.0
170	163	1.0	163	1.0	0	0.0
180	164	0.9	163	0.9	0	0.0
190	164	0.9	163	0.9	0	0.0
200	163	0.8	162	0.8	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=A %Con=10 Yield Curve #=114

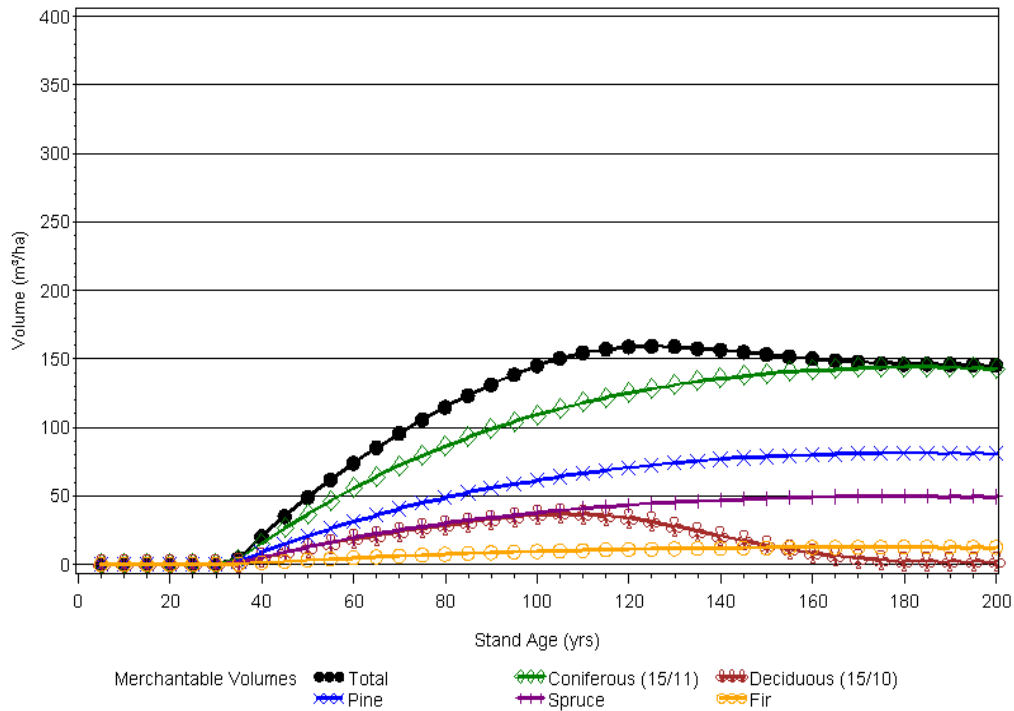


NSR & Site=SAG CC=B %Con=5 Yield Curve #=115

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	15	0.4	5	0.1
50	49	1.0	37	0.7	12	0.2
60	74	1.2	56	0.9	18	0.3
70	96	1.4	72	1.0	24	0.3
80	115	1.4	86	1.1	29	0.4
90	131	1.5	99	1.1	33	0.4
100	145	1.5	109	1.1	36	0.4
110	155	1.4	118	1.1	37	0.3
120	159	1.3	125	1.0	34	0.3
130	159	1.2	131	1.0	28	0.2
140	157	1.1	136	1.0	21	0.1
150	153	1.0	139	0.9	14	0.1
160	150	0.9	142	0.9	8	0.1
170	148	0.9	143	0.8	5	0.0
180	146	0.8	144	0.8	2	0.0
190	146	0.8	144	0.8	2	0.0
200	145	0.7	143	0.7	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=5 Yield Curve #=115

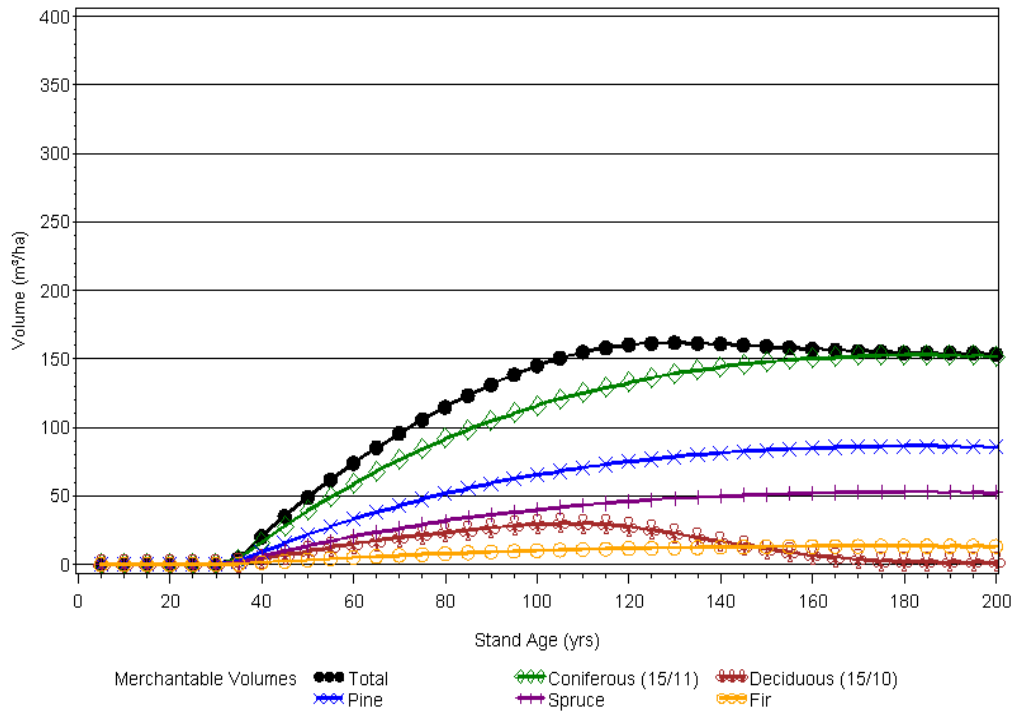


NSR & Site=SAG CC=B %Con=6 Yield Curve #=116

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	16	0.4	4	0.1
50	49	1.0	39	0.8	10	0.2
60	74	1.2	59	1.0	15	0.2
70	96	1.4	76	1.1	19	0.3
80	115	1.4	92	1.1	23	0.3
90	131	1.5	105	1.2	27	0.3
100	145	1.5	116	1.2	29	0.3
110	155	1.4	125	1.1	30	0.3
120	160	1.3	133	1.1	28	0.2
130	162	1.2	139	1.1	23	0.2
140	161	1.2	144	1.0	17	0.1
150	159	1.1	148	1.0	11	0.1
160	157	1.0	150	0.9	7	0.0
170	156	0.9	152	0.9	4	0.0
180	155	0.9	153	0.8	2	0.0
190	155	0.8	153	0.8	2	0.0
200	154	0.8	152	0.8	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=6 Yield Curve #=116

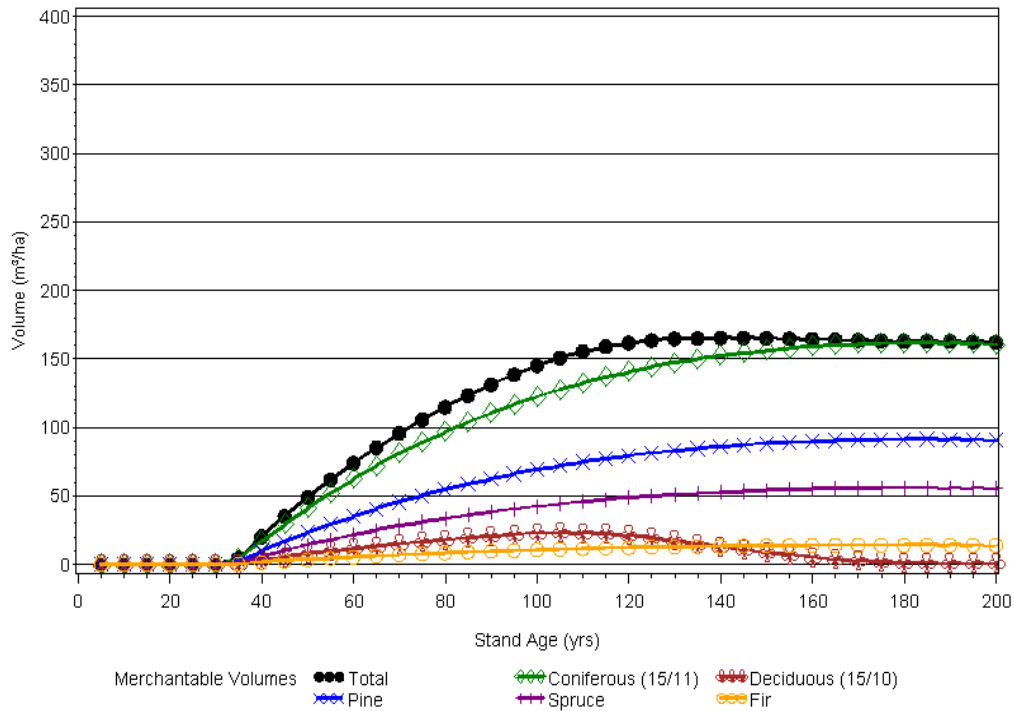


NSR & Site=SAG CC=B %Con=7 Yield Curve #=117

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	17	0.4	3	0.1
50	49	1.0	41	0.8	8	0.2
60	74	1.2	62	1.0	12	0.2
70	96	1.4	81	1.2	15	0.2
80	115	1.4	97	1.2	18	0.2
90	131	1.5	111	1.2	21	0.2
100	145	1.5	122	1.2	23	0.2
110	155	1.4	132	1.2	23	0.2
120	162	1.3	140	1.2	21	0.2
130	165	1.3	147	1.1	18	0.1
140	166	1.2	152	1.1	13	0.1
150	165	1.1	156	1.0	9	0.1
160	164	1.0	159	1.0	5	0.0
170	164	1.0	161	0.9	3	0.0
180	163	0.9	162	0.9	1	0.0
190	163	0.9	162	0.9	1	0.0
200	162	0.8	161	0.8	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=7 Yield Curve #=117

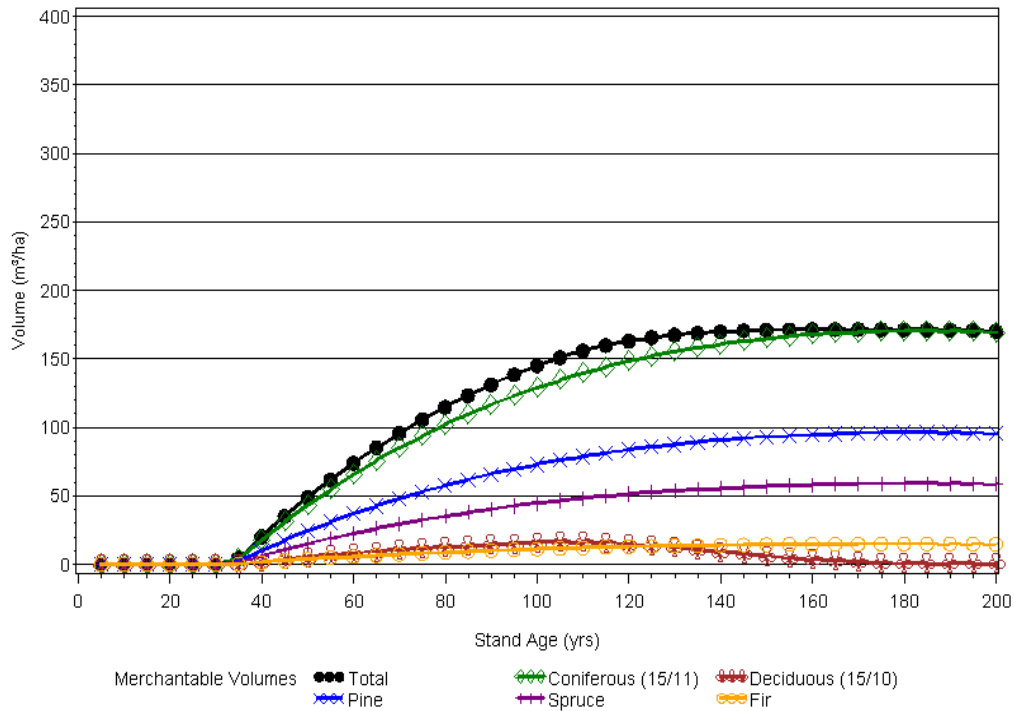


NSR & Site=SAG CC=B %Con=8 Yield Curve #=118

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	18	0.5	2	0.1
50	49	1.0	43	0.9	5	0.1
60	74	1.2	66	1.1	8	0.1
70	96	1.4	85	1.2	11	0.2
80	115	1.4	102	1.3	13	0.2
90	131	1.5	117	1.3	15	0.2
100	145	1.5	129	1.3	16	0.2
110	156	1.4	139	1.3	16	0.1
120	163	1.4	148	1.2	15	0.1
130	168	1.3	155	1.2	12	0.1
140	170	1.2	161	1.1	9	0.1
150	171	1.1	165	1.1	6	0.0
160	172	1.1	168	1.0	4	0.0
170	172	1.0	170	1.0	2	0.0
180	171	1.0	170	0.9	1	0.0
190	171	0.9	170	0.9	1	0.0
200	170	0.9	169	0.8	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=8 Yield Curve #=118

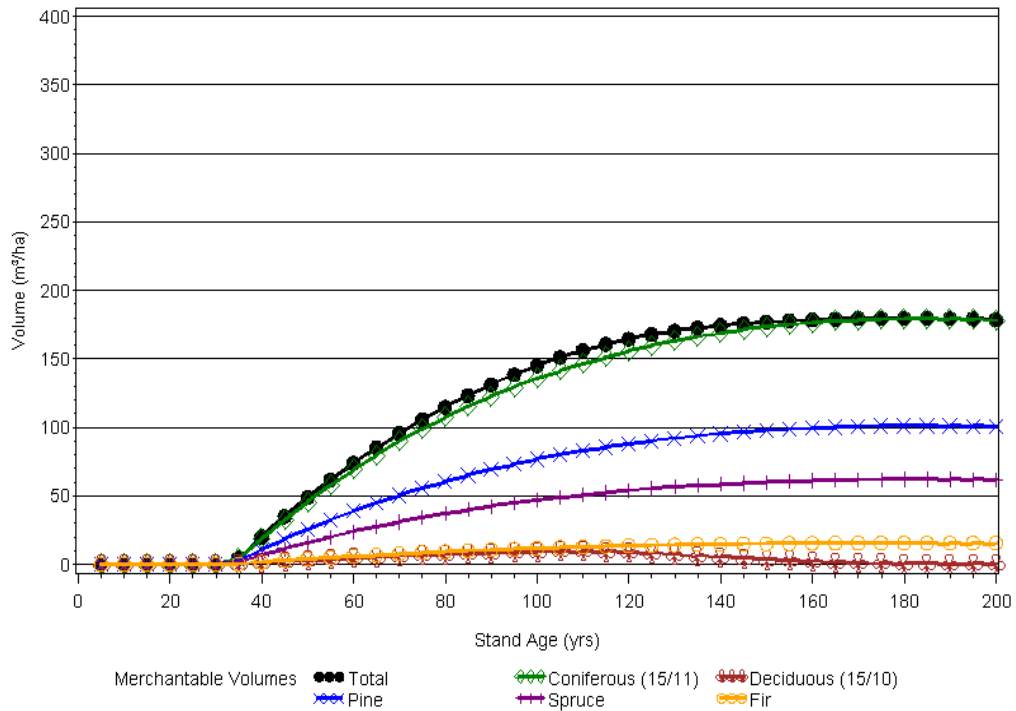


NSR & Site=SAG CC=B %Con=9 Yield Curve #=119

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	19	0.5	1	0.0
50	49	1.0	46	0.9	3	0.1
60	74	1.2	69	1.2	5	0.1
70	96	1.4	90	1.3	6	0.1
80	115	1.4	107	1.3	7	0.1
90	131	1.5	123	1.4	9	0.1
100	145	1.5	136	1.4	9	0.1
110	156	1.4	147	1.3	10	0.1
120	165	1.4	156	1.3	9	0.1
130	170	1.3	163	1.3	7	0.1
140	174	1.2	169	1.2	5	0.0
150	177	1.2	173	1.2	4	0.0
160	179	1.1	176	1.1	2	0.0
170	180	1.1	178	1.0	1	0.0
180	180	1.0	179	1.0	1	0.0
190	180	0.9	179	0.9	1	0.0
200	179	0.9	178	0.9	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=9 Yield Curve #=119

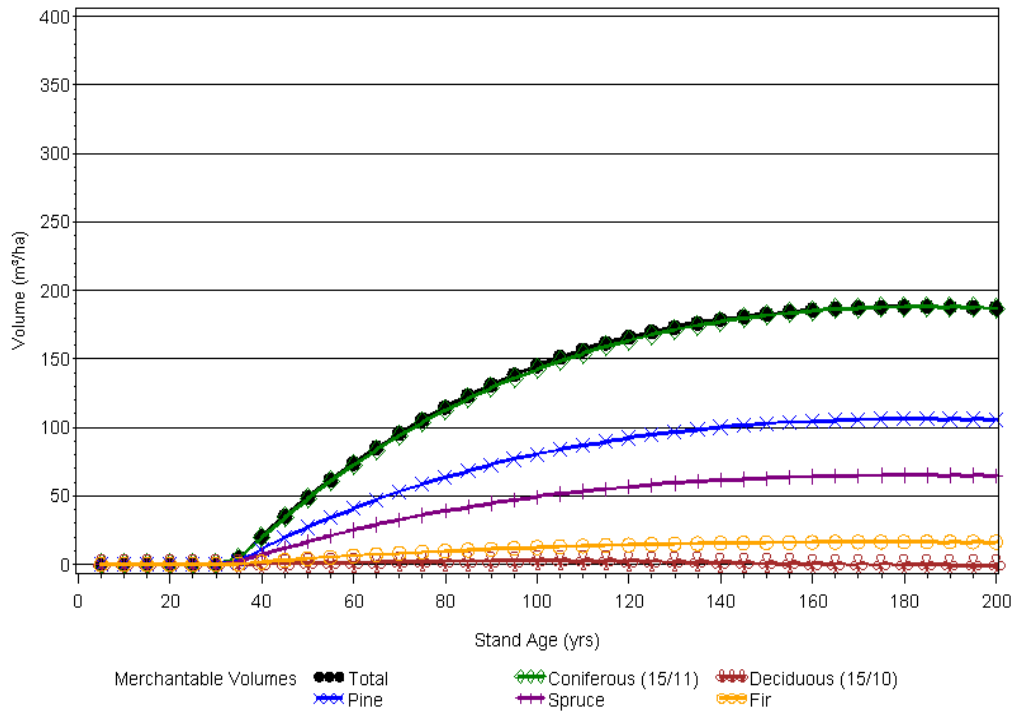


NSR & Site=SAG CC=B %Con=10 Yield Curve #=120

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	20	0.5	20	0.5	0	0.0
50	49	1.0	48	1.0	1	0.0
60	74	1.2	72	1.2	1	0.0
70	96	1.4	94	1.3	2	0.0
80	115	1.4	113	1.4	2	0.0
90	131	1.5	129	1.4	3	0.0
100	145	1.5	142	1.4	3	0.0
110	157	1.4	154	1.4	3	0.0
120	166	1.4	163	1.4	3	0.0
130	173	1.3	171	1.3	2	0.0
140	179	1.3	177	1.3	2	0.0
150	183	1.2	182	1.2	1	0.0
160	186	1.2	185	1.2	1	0.0
170	187	1.1	187	1.1	0	0.0
180	188	1.0	188	1.0	0	0.0
190	188	1.0	188	1.0	0	0.0
200	187	0.9	187	0.9	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=B %Con=10 Yield Curve #=120

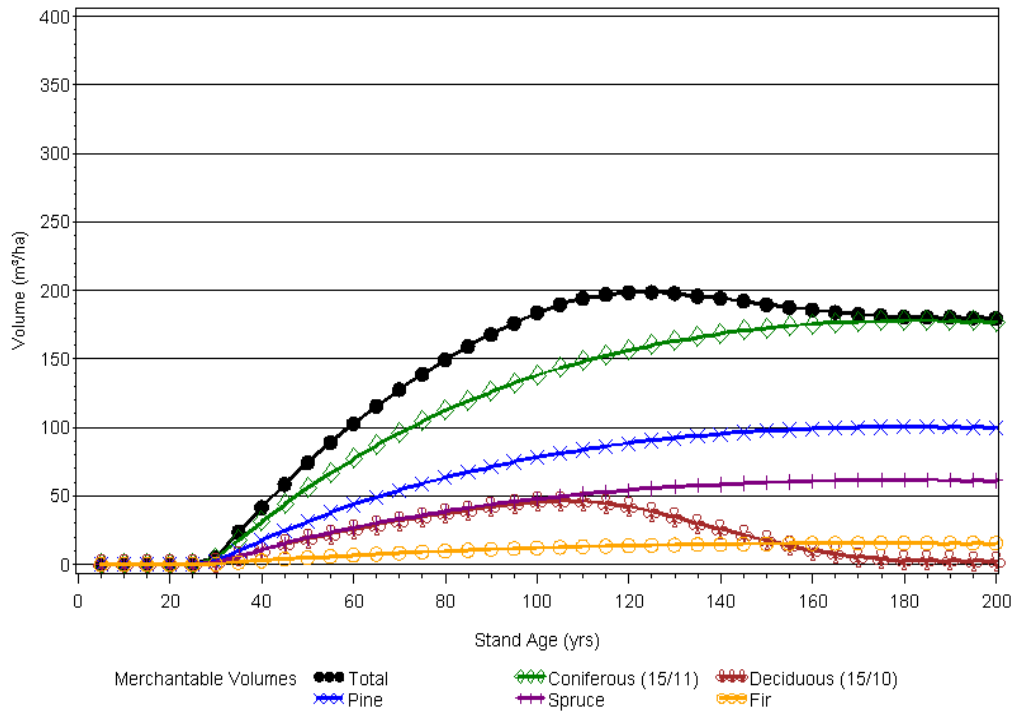


NSR & Site=SAG CC=C %Con=5 Yield Curve #=121

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	4	0.1	1	0.0
40	42	1.0	31	0.8	10	0.3
50	74	1.5	56	1.1	18	0.4
60	103	1.7	77	1.3	26	0.4
70	128	1.8	96	1.4	32	0.5
80	149	1.9	112	1.4	37	0.5
90	168	1.9	126	1.4	42	0.5
100	184	1.8	138	1.4	46	0.5
110	194	1.8	148	1.3	46	0.4
120	199	1.7	156	1.3	42	0.4
130	198	1.5	163	1.3	35	0.3
140	194	1.4	168	1.2	26	0.2
150	190	1.3	172	1.1	17	0.1
160	186	1.2	175	1.1	11	0.1
170	183	1.1	177	1.0	6	0.0
180	181	1.0	178	1.0	3	0.0
190	180	0.9	178	0.9	3	0.0
200	180	0.9	177	0.9	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=5 Yield Curve #=121

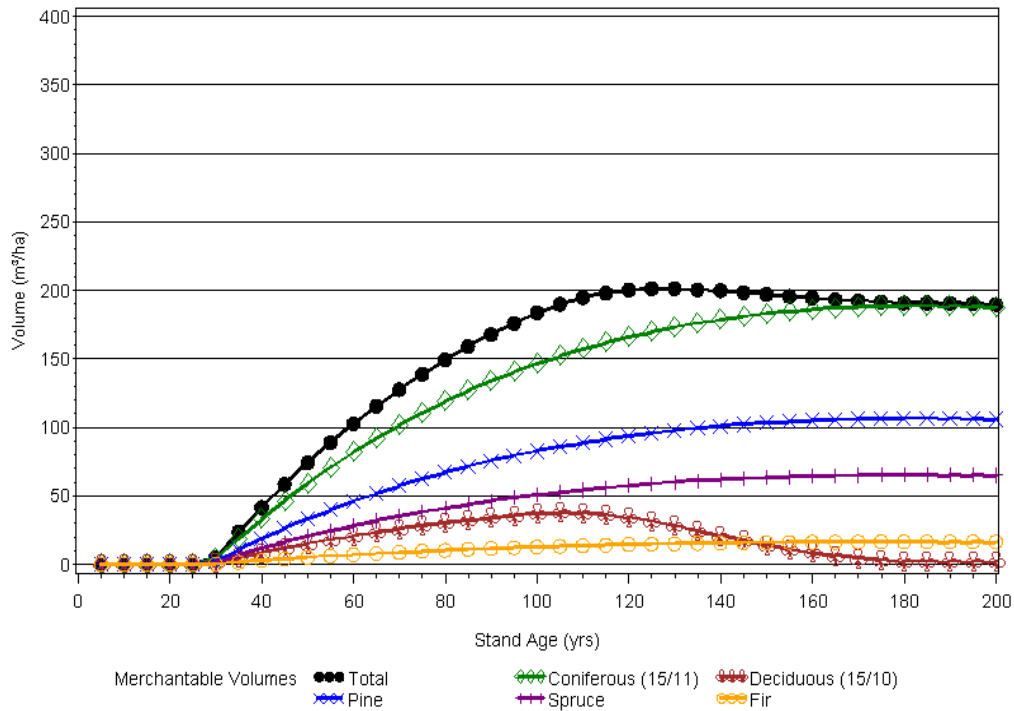


NSR & Site=SAG CC=C %Con=6 Yield Curve #=122

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	4	0.1	1	0.0
40	42	1.0	33	0.8	8	0.2
50	74	1.5	59	1.2	15	0.3
60	103	1.7	82	1.4	21	0.3
70	128	1.8	102	1.5	26	0.4
80	149	1.9	119	1.5	30	0.4
90	168	1.9	134	1.5	34	0.4
100	184	1.8	147	1.5	37	0.4
110	195	1.8	157	1.4	38	0.3
120	200	1.7	166	1.4	34	0.3
130	202	1.6	173	1.3	28	0.2
140	200	1.4	179	1.3	21	0.2
150	197	1.3	183	1.2	14	0.1
160	195	1.2	186	1.2	9	0.1
170	192	1.1	188	1.1	5	0.0
180	191	1.1	189	1.0	2	0.0
190	191	1.0	189	1.0	2	0.0
200	190	0.9	188	0.9	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=6 Yield Curve #=122

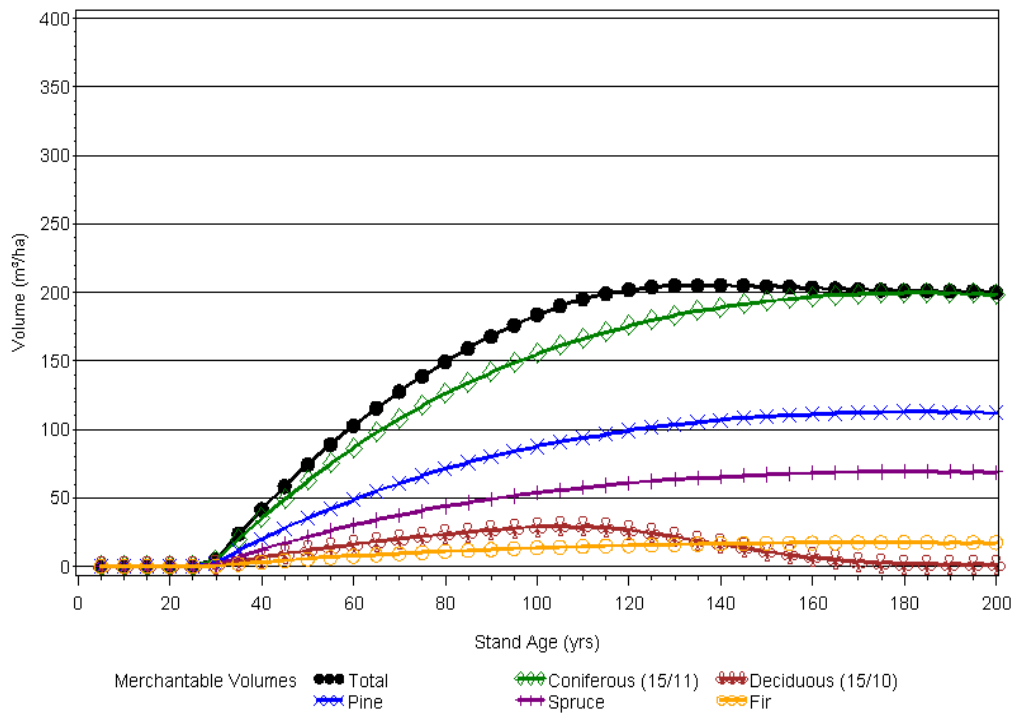


NSR & Site=SAG CC=C %Con=7 Yield Curve #=123

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	4	0.1	1	0.0
40	42	1.0	35	0.9	7	0.2
50	74	1.5	63	1.3	12	0.2
60	103	1.7	87	1.4	16	0.3
70	128	1.8	108	1.5	20	0.3
80	149	1.9	126	1.6	23	0.3
90	168	1.9	142	1.6	26	0.3
100	184	1.8	155	1.5	29	0.3
110	195	1.8	166	1.5	29	0.3
120	202	1.7	176	1.5	27	0.2
130	205	1.6	183	1.4	22	0.2
140	205	1.5	189	1.4	16	0.1
150	205	1.4	194	1.3	11	0.1
160	203	1.3	197	1.2	7	0.0
170	202	1.2	199	1.2	4	0.0
180	201	1.1	200	1.1	2	0.0
190	201	1.1	200	1.1	2	0.0
200	200	1.0	199	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=7 Yield Curve #=123

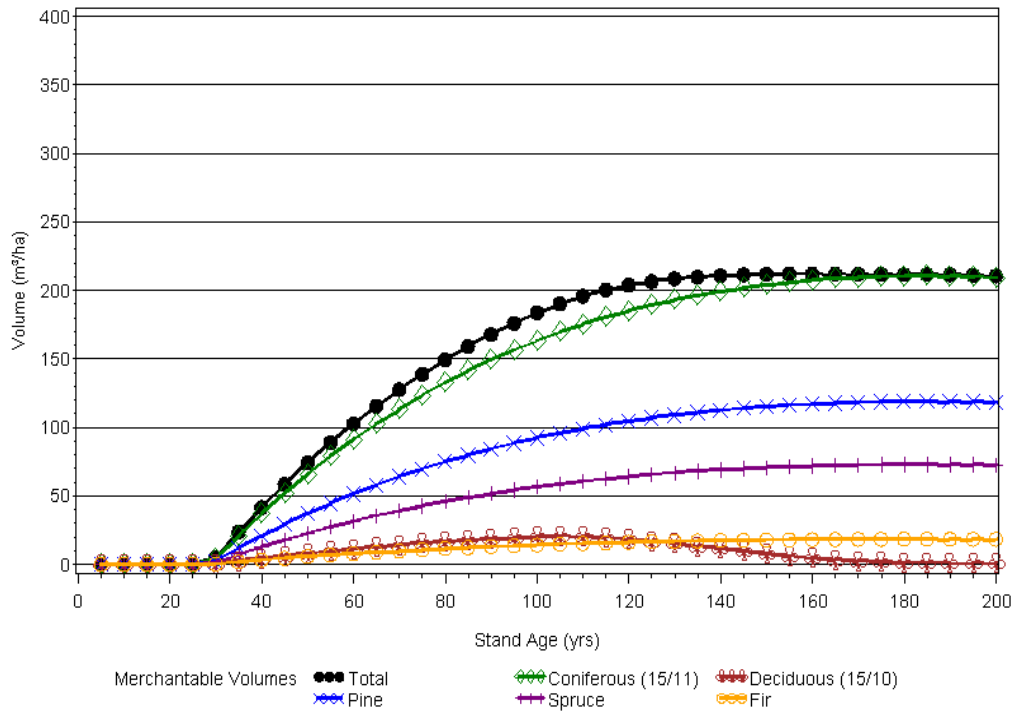


NSR & Site=SAG CC=C %Con=8 Yield Curve #=124

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	4	0.1	1	0.0
40	42	1.0	37	0.9	5	0.1
50	74	1.5	66	1.3	8	0.2
60	103	1.7	91	1.5	11	0.2
70	128	1.8	113	1.6	14	0.2
80	149	1.9	133	1.7	17	0.2
90	168	1.9	149	1.7	19	0.2
100	184	1.8	163	1.6	20	0.2
110	196	1.8	175	1.6	21	0.2
120	204	1.7	185	1.5	19	0.2
130	209	1.6	193	1.5	16	0.1
140	211	1.5	199	1.4	12	0.1
150	212	1.4	204	1.4	8	0.1
160	212	1.3	207	1.3	5	0.0
170	212	1.2	210	1.2	3	0.0
180	212	1.2	210	1.2	1	0.0
190	212	1.1	210	1.1	1	0.0
200	211	1.1	209	1.0	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=8 Yield Curve #=124

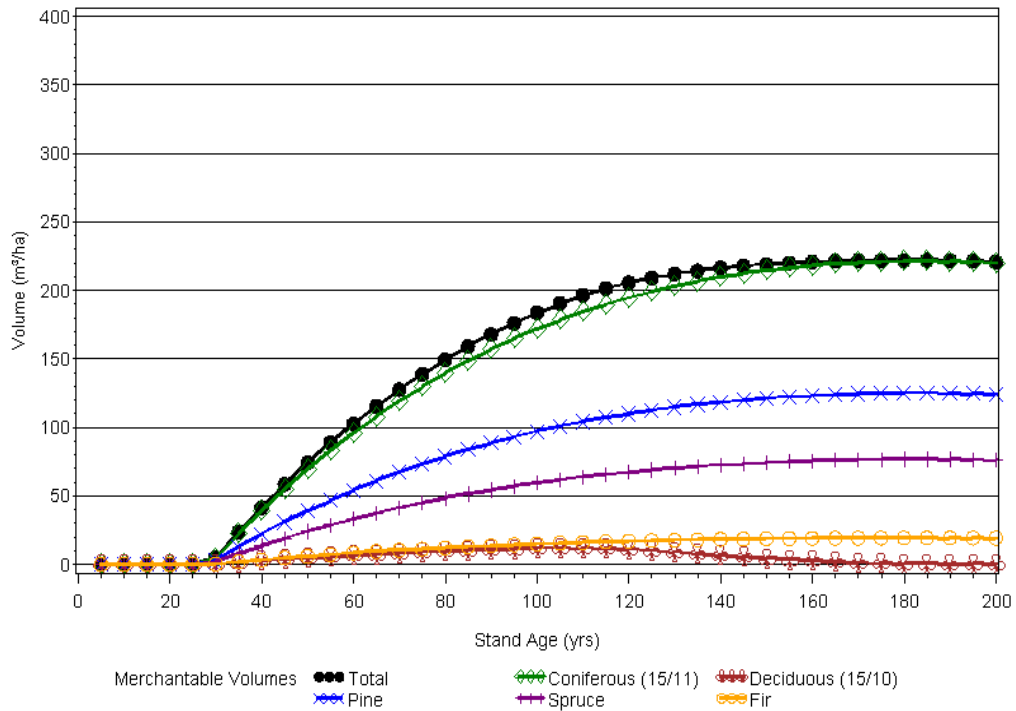


NSR & Site=SAG CC=C %Con=9 Yield Curve #=125

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	5	0.2	0	0.0
40	42	1.0	39	1.0	3	0.1
50	74	1.5	69	1.4	5	0.1
60	103	1.7	96	1.6	7	0.1
70	128	1.8	119	1.7	8	0.1
80	149	1.9	140	1.7	10	0.1
90	168	1.9	157	1.7	11	0.1
100	184	1.8	172	1.7	12	0.1
110	196	1.8	184	1.7	12	0.1
120	206	1.7	195	1.6	11	0.1
130	212	1.6	203	1.6	9	0.1
140	216	1.5	210	1.5	7	0.0
150	219	1.5	215	1.4	5	0.0
160	221	1.4	218	1.4	3	0.0
170	222	1.3	220	1.3	1	0.0
180	222	1.2	221	1.2	1	0.0
190	222	1.2	221	1.2	1	0.0
200	221	1.1	220	1.1	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=9 Yield Curve #=125

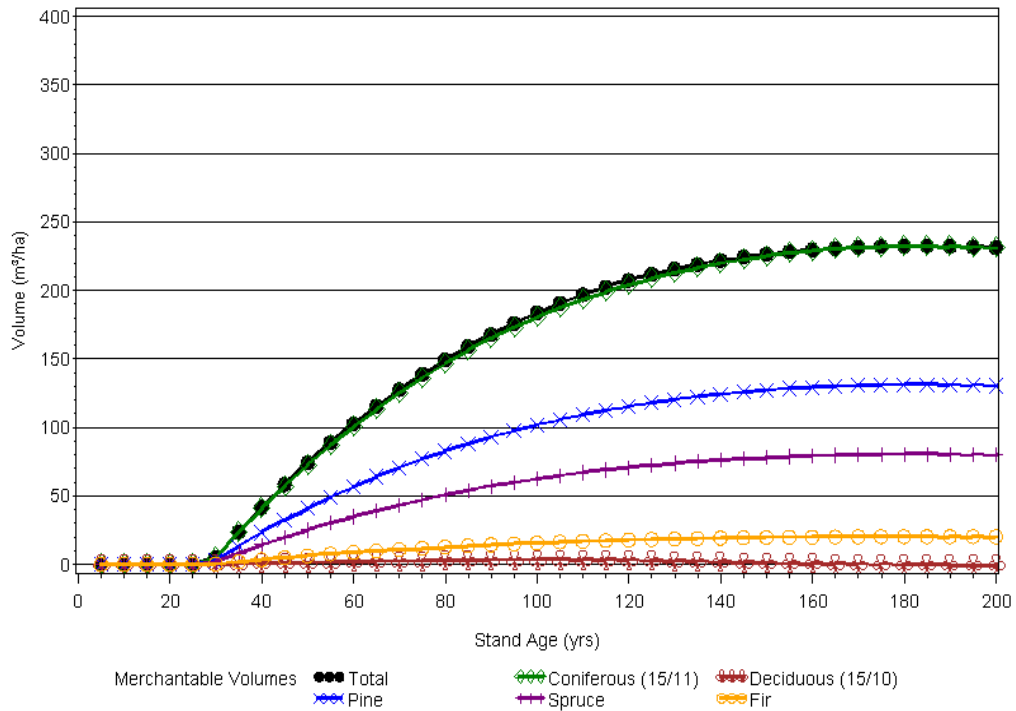


NSR & Site=SAG CC=C %Con=10 Yield Curve #=126

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	5	0.2	5	0.2	0	0.0
40	42	1.0	41	1.0	1	0.0
50	74	1.5	73	1.5	1	0.0
60	103	1.7	101	1.7	2	0.0
70	128	1.8	125	1.8	2	0.0
80	149	1.9	146	1.8	3	0.0
90	168	1.9	165	1.8	3	0.0
100	184	1.8	180	1.8	4	0.0
110	197	1.8	193	1.8	4	0.0
120	207	1.7	204	1.7	3	0.0
130	216	1.7	213	1.6	3	0.0
140	222	1.6	220	1.6	2	0.0
150	227	1.5	225	1.5	1	0.0
160	230	1.4	229	1.4	1	0.0
170	232	1.4	231	1.4	0	0.0
180	232	1.3	232	1.3	0	0.0
190	232	1.2	232	1.2	0	0.0
200	231	1.2	231	1.2	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=C %Con=10 Yield Curve #=126

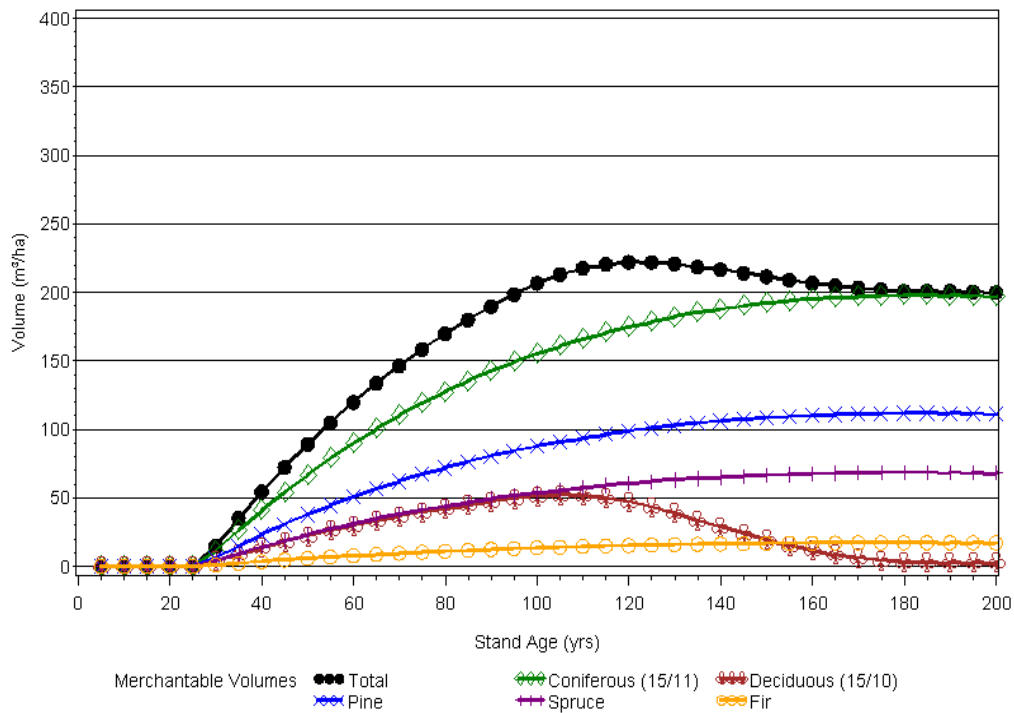


NSR & Site=SAG CC=D %Con=5 Yield Curve #=127

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	11	0.4	4	0.1
40	54	1.4	41	1.0	14	0.3
50	89	1.8	67	1.3	22	0.4
60	120	2.0	90	1.5	30	0.5
70	147	2.1	110	1.6	36	0.5
80	170	2.1	128	1.6	42	0.5
90	190	2.1	143	1.6	47	0.5
100	207	2.1	155	1.6	51	0.5
110	218	2.0	166	1.5	52	0.5
120	222	1.9	175	1.5	47	0.4
130	221	1.7	182	1.4	39	0.3
140	217	1.5	188	1.3	29	0.2
150	212	1.4	192	1.3	19	0.1
160	207	1.3	195	1.2	12	0.1
170	203	1.2	197	1.2	6	0.0
180	201	1.1	198	1.1	3	0.0
190	201	1.1	198	1.0	3	0.0
200	200	1.0	197	1.0	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=5 Yield Curve #=127

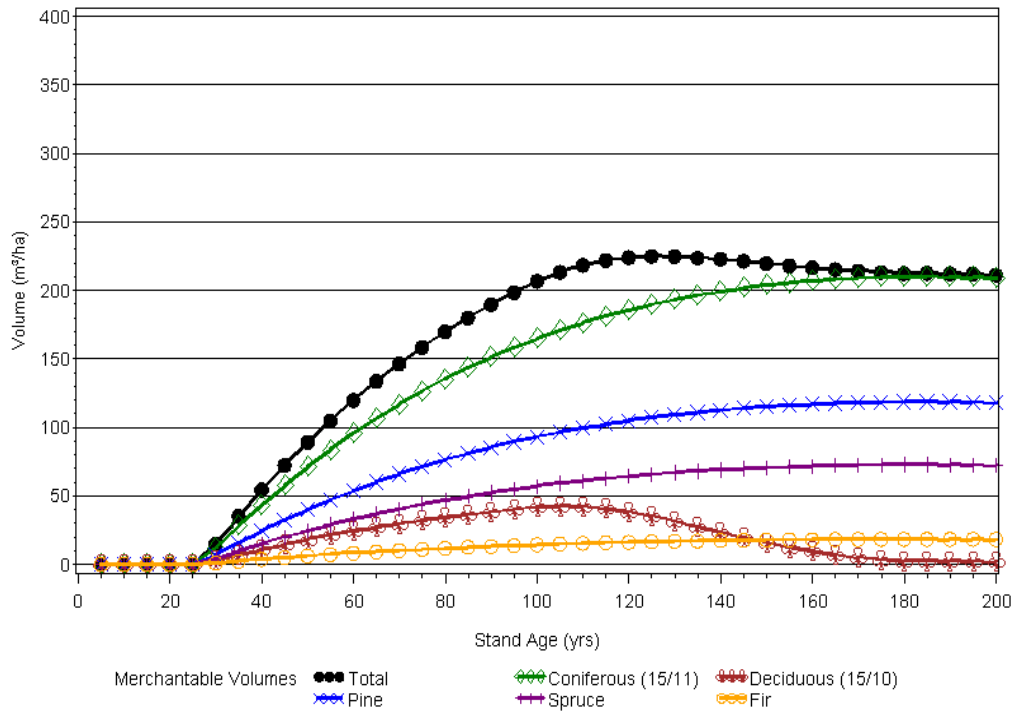


NSR & Site=SAG CC=D %Con=6 Yield Curve #=128

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	12	0.4	3	0.1
40	54	1.4	43	1.1	11	0.3
50	89	1.8	71	1.4	18	0.4
60	120	2.0	95	1.6	24	0.4
70	147	2.1	117	1.7	30	0.4
80	170	2.1	135	1.7	34	0.4
90	190	2.1	151	1.7	39	0.4
100	207	2.1	165	1.6	42	0.4
110	218	2.0	176	1.6	42	0.4
120	224	1.9	186	1.5	38	0.3
130	225	1.7	193	1.5	32	0.2
140	223	1.6	199	1.4	24	0.2
150	220	1.5	204	1.4	16	0.1
160	217	1.4	207	1.3	10	0.1
170	214	1.3	209	1.2	5	0.0
180	212	1.2	210	1.2	2	0.0
190	212	1.1	210	1.1	2	0.0
200	211	1.1	209	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=6 Yield Curve #=128

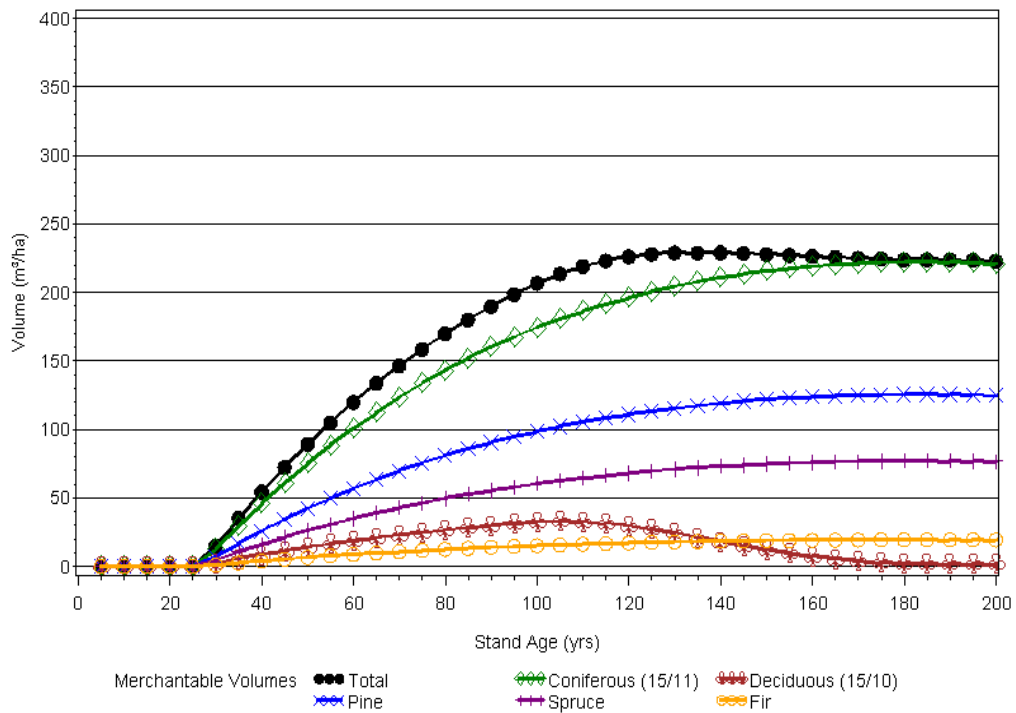


NSR & Site=SAG CC=D %Con=7 Yield Curve #-129

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	13	0.4	2	0.1
40	54	1.4	46	1.1	9	0.2
50	89	1.8	75	1.5	14	0.3
60	120	2.0	101	1.7	19	0.3
70	147	2.1	124	1.8	23	0.3
80	170	2.1	143	1.8	27	0.3
90	190	2.1	160	1.8	30	0.3
100	207	2.1	174	1.7	32	0.3
110	219	2.0	186	1.7	33	0.3
120	226	1.9	196	1.6	30	0.2
130	229	1.8	204	1.6	25	0.2
140	229	1.6	211	1.5	18	0.1
150	228	1.5	216	1.4	12	0.1
160	226	1.4	219	1.4	7	0.0
170	225	1.3	221	1.3	4	0.0
180	224	1.2	222	1.2	2	0.0
190	224	1.2	222	1.2	2	0.0
200	223	1.1	221	1.1	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=7 Yield Curve #-129

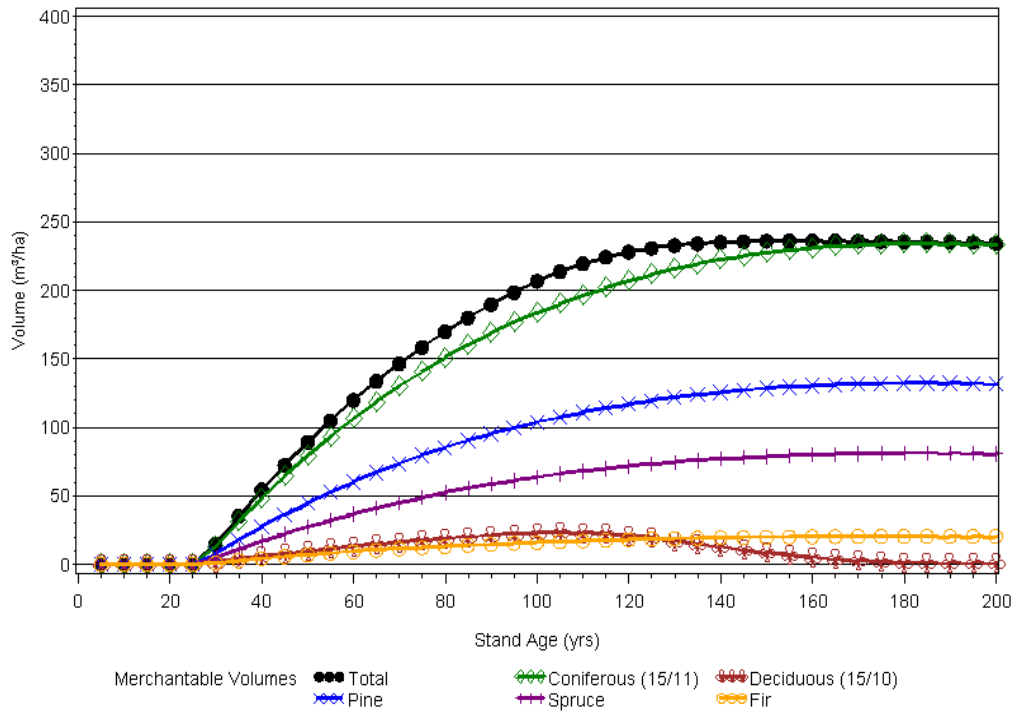


NSR & Site=SAG CC=D %Con=8 Yield Curve #=130

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	13	0.4	2	0.1
40	54	1.4	48	1.2	6	0.2
50	89	1.8	79	1.6	10	0.2
60	120	2.0	106	1.8	13	0.2
70	147	2.1	130	1.9	16	0.2
80	170	2.1	151	1.9	19	0.2
90	190	2.1	169	1.9	21	0.2
100	207	2.1	184	1.8	23	0.2
110	220	2.0	197	1.8	23	0.2
120	228	1.9	207	1.7	21	0.2
130	233	1.8	216	1.7	17	0.1
140	235	1.7	222	1.6	13	0.1
150	236	1.6	227	1.5	9	0.1
160	236	1.5	231	1.4	5	0.0
170	236	1.4	233	1.4	3	0.0
180	236	1.3	234	1.3	1	0.0
190	235	1.2	234	1.2	1	0.0
200	234	1.2	233	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=8 Yield Curve #=130

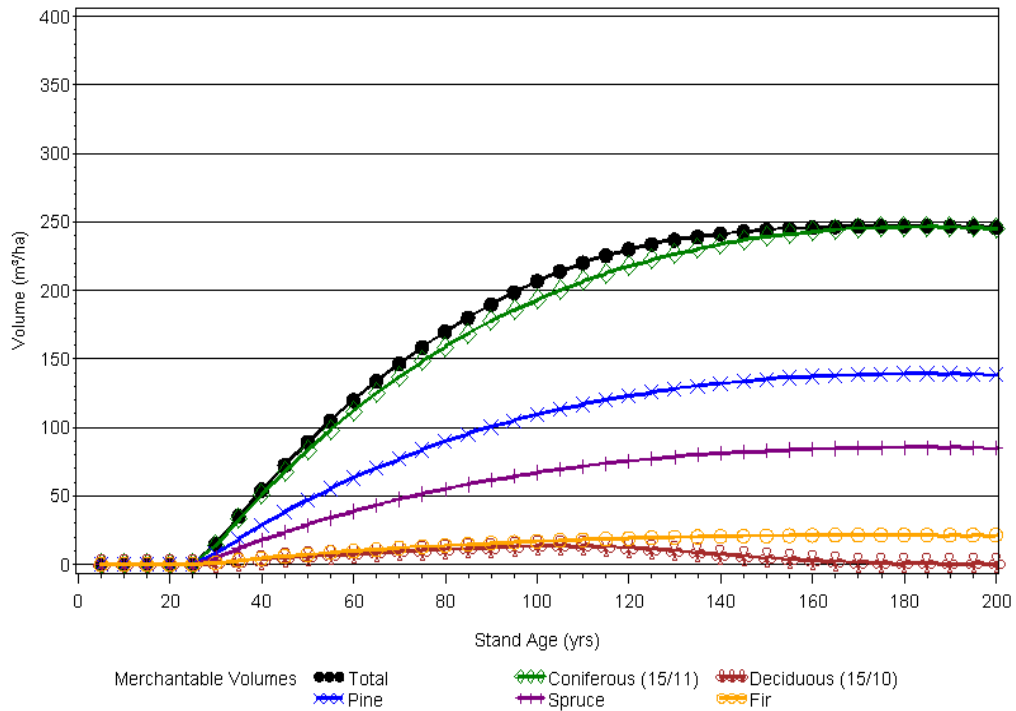


NSR & Site=SAG CC=D %Con=9 Yield Curve #=131

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	14	0.5	1	0.0
40	54	1.4	51	1.3	4	0.1
50	89	1.8	83	1.7	6	0.1
60	120	2.0	112	1.9	8	0.1
70	147	2.1	137	2.0	10	0.1
80	170	2.1	159	2.0	11	0.1
90	190	2.1	177	2.0	12	0.1
100	207	2.1	193	1.9	13	0.1
110	220	2.0	207	1.9	14	0.1
120	230	1.9	218	1.8	12	0.1
130	237	1.8	227	1.7	10	0.1
140	241	1.7	234	1.7	8	0.1
150	244	1.6	239	1.6	5	0.0
160	246	1.5	243	1.5	3	0.0
170	247	1.5	245	1.4	2	0.0
180	247	1.4	246	1.4	1	0.0
190	247	1.3	246	1.3	1	0.0
200	246	1.2	245	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=9 Yield Curve #=131

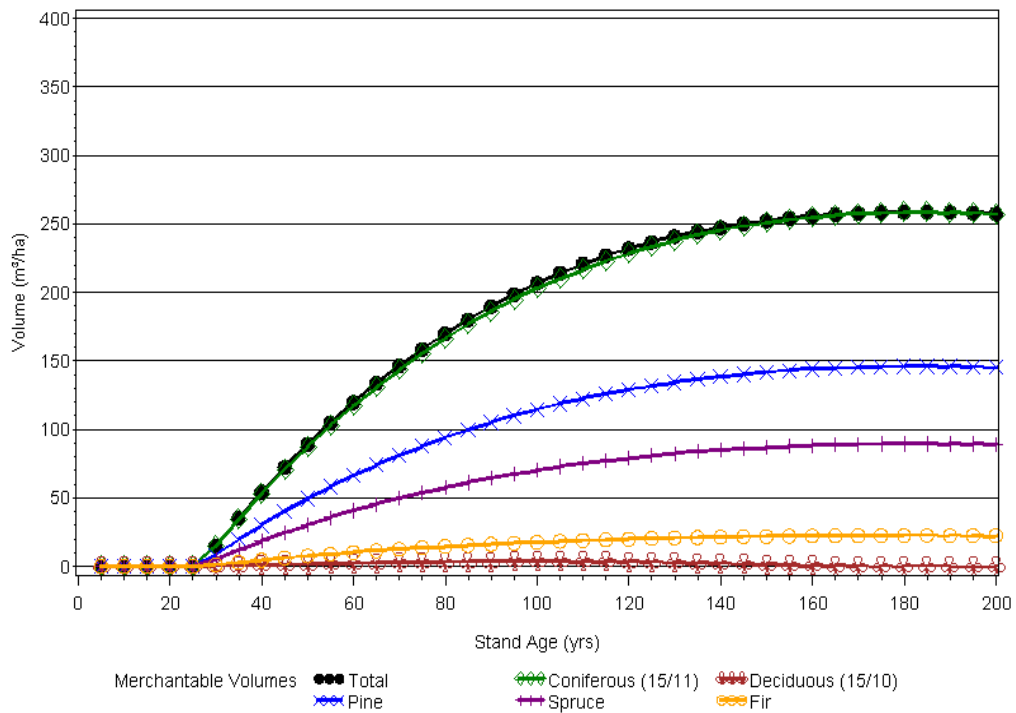


NSR & Site=SAG CC=D %Con=10 Yield Curve #=132

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	15	0.5	15	0.5	0	0.0
40	54	1.4	53	1.3	1	0.0
50	89	1.8	87	1.7	2	0.0
60	120	2.0	117	2.0	2	0.0
70	147	2.1	144	2.1	3	0.0
80	170	2.1	167	2.1	3	0.0
90	190	2.1	186	2.1	4	0.0
100	207	2.1	203	2.0	4	0.0
110	221	2.0	217	2.0	4	0.0
120	232	1.9	228	1.9	4	0.0
130	241	1.9	238	1.8	3	0.0
140	248	1.8	245	1.8	2	0.0
150	252	1.7	251	1.7	1	0.0
160	256	1.6	255	1.6	1	0.0
170	258	1.5	257	1.5	0	0.0
180	259	1.4	258	1.4	0	0.0
190	259	1.4	258	1.4	0	0.0
200	257	1.3	257	1.3	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAG CC=D %Con=10 Yield Curve #=132

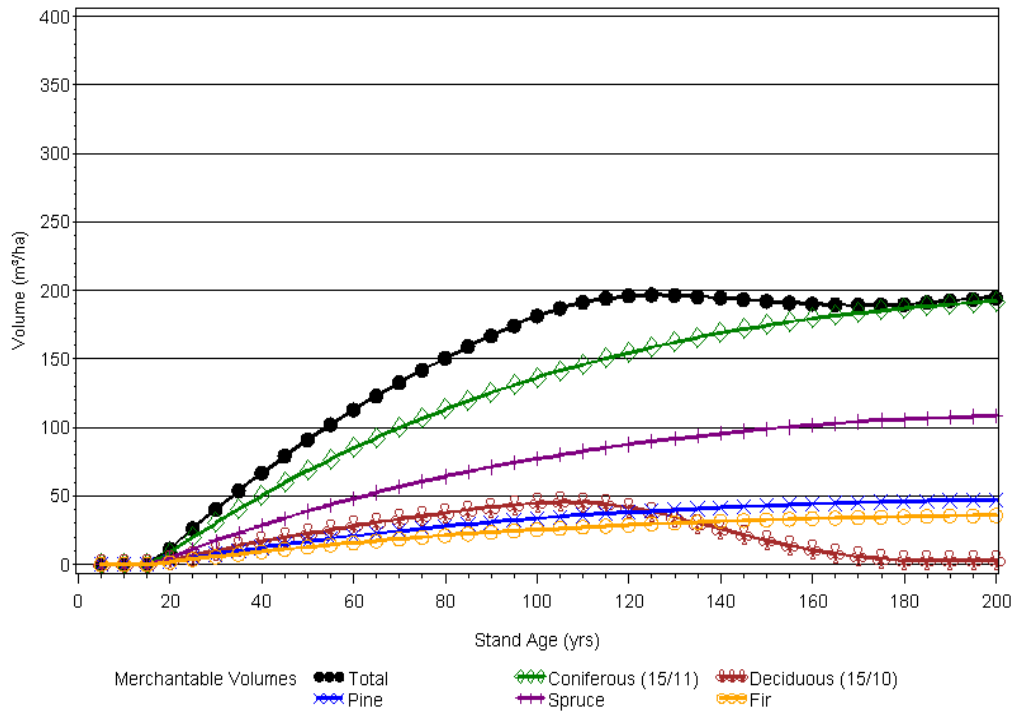


NSR & Site=SAP CC=X %Con=5 Yield Curve #=133

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	9	0.4	3	0.1
30	40	1.3	30	1.0	10	0.3
40	67	1.7	50	1.3	17	0.4
50	91	1.8	68	1.4	23	0.5
60	113	1.9	85	1.4	28	0.5
70	133	1.9	100	1.4	33	0.5
80	151	1.9	113	1.4	38	0.5
90	167	1.9	125	1.4	42	0.5
100	181	1.8	136	1.4	45	0.5
110	191	1.7	146	1.3	45	0.4
120	196	1.6	155	1.3	42	0.3
130	197	1.5	162	1.2	35	0.3
140	195	1.4	169	1.2	26	0.2
150	192	1.3	174	1.2	18	0.1
160	190	1.2	179	1.1	11	0.1
170	189	1.1	184	1.1	6	0.0
180	190	1.1	187	1.0	3	0.0
190	193	1.0	190	1.0	3	0.0
200	195	1.0	192	1.0	3	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=5 Yield Curve #=133

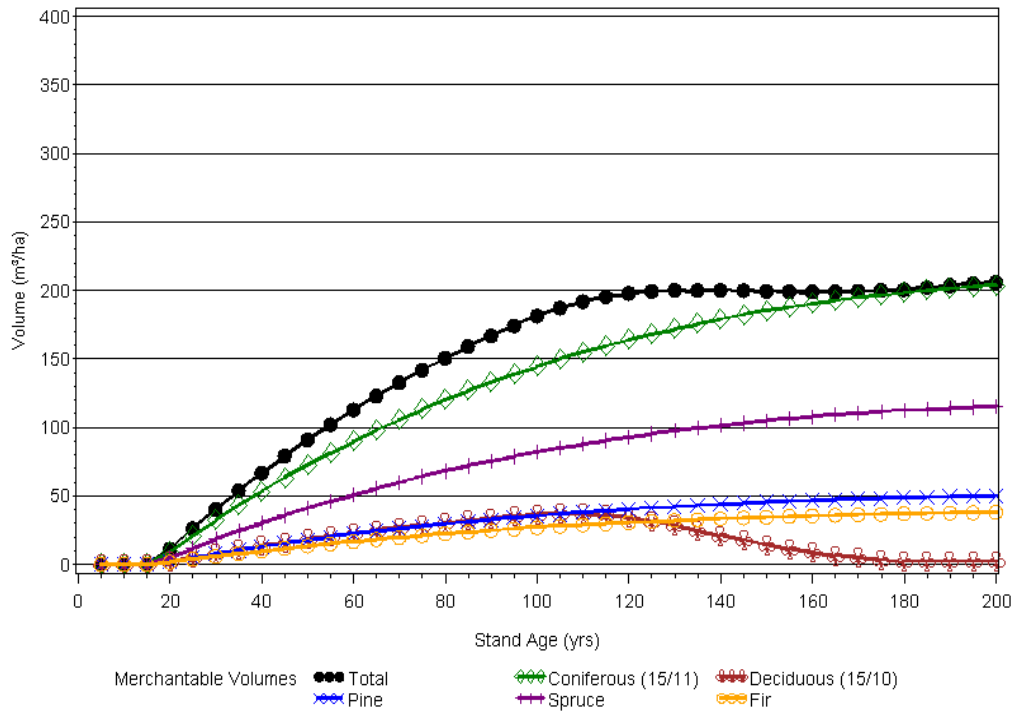


NSR & Site=SAP CC=X %Con=6 Yield Curve #=134

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	9	0.5	2	0.1
30	40	1.3	32	1.1	8	0.3
40	67	1.7	53	1.3	14	0.3
50	91	1.8	72	1.4	18	0.4
60	113	1.9	90	1.5	23	0.4
70	133	1.9	106	1.5	27	0.4
80	151	1.9	120	1.5	31	0.4
90	167	1.9	133	1.5	34	0.4
100	181	1.8	145	1.4	37	0.4
110	192	1.7	155	1.4	37	0.3
120	198	1.6	164	1.4	34	0.3
130	200	1.5	172	1.3	28	0.2
140	200	1.4	179	1.3	21	0.2
150	200	1.3	185	1.2	14	0.1
160	199	1.2	190	1.2	9	0.1
170	199	1.2	195	1.1	5	0.0
180	201	1.1	198	1.1	2	0.0
190	204	1.1	201	1.1	2	0.0
200	206	1.0	204	1.0	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=6 Yield Curve #=134

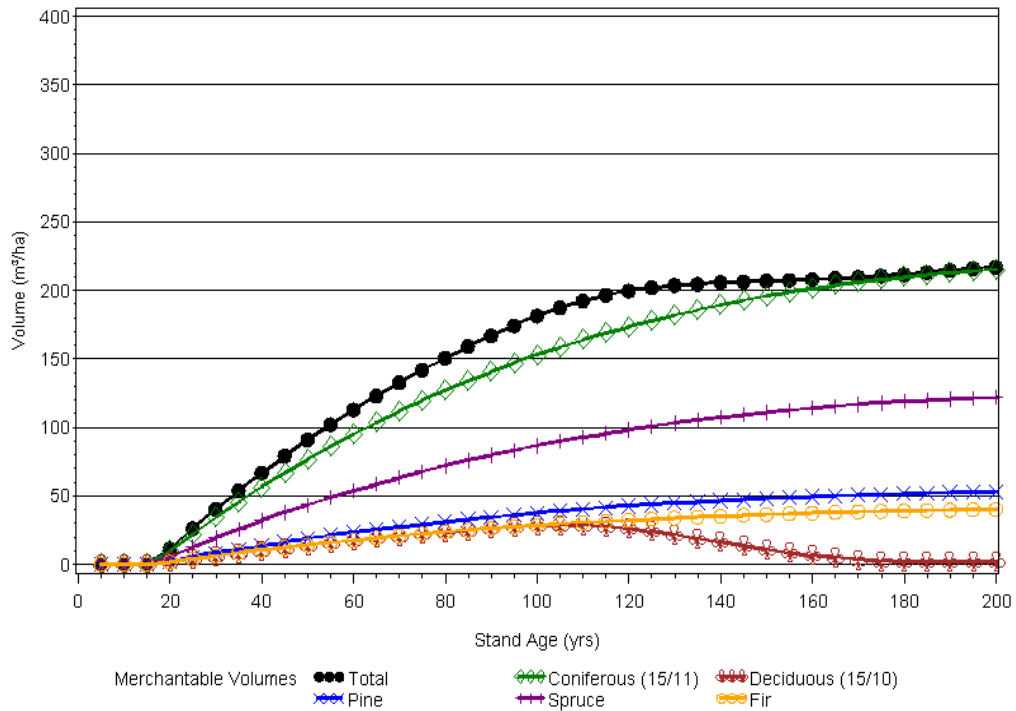


NSR & Site=SAP CC=X %Con=7 Yield Curve #=135

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	10	0.5	2	0.1
30	40	1.3	34	1.1	6	0.2
40	67	1.7	56	1.4	10	0.3
50	91	1.8	77	1.5	14	0.3
60	113	1.9	95	1.6	18	0.3
70	133	1.9	112	1.6	21	0.3
80	151	1.9	127	1.6	24	0.3
90	167	1.9	141	1.6	26	0.3
100	181	1.8	153	1.5	28	0.3
110	192	1.7	164	1.5	29	0.3
120	200	1.7	173	1.4	26	0.2
130	204	1.6	182	1.4	22	0.2
140	206	1.5	189	1.4	16	0.1
150	207	1.4	196	1.3	11	0.1
160	208	1.3	201	1.3	7	0.0
170	210	1.2	206	1.2	4	0.0
180	212	1.2	210	1.2	2	0.0
190	215	1.1	213	1.1	2	0.0
200	217	1.1	215	1.1	2	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=7 Yield Curve #=135

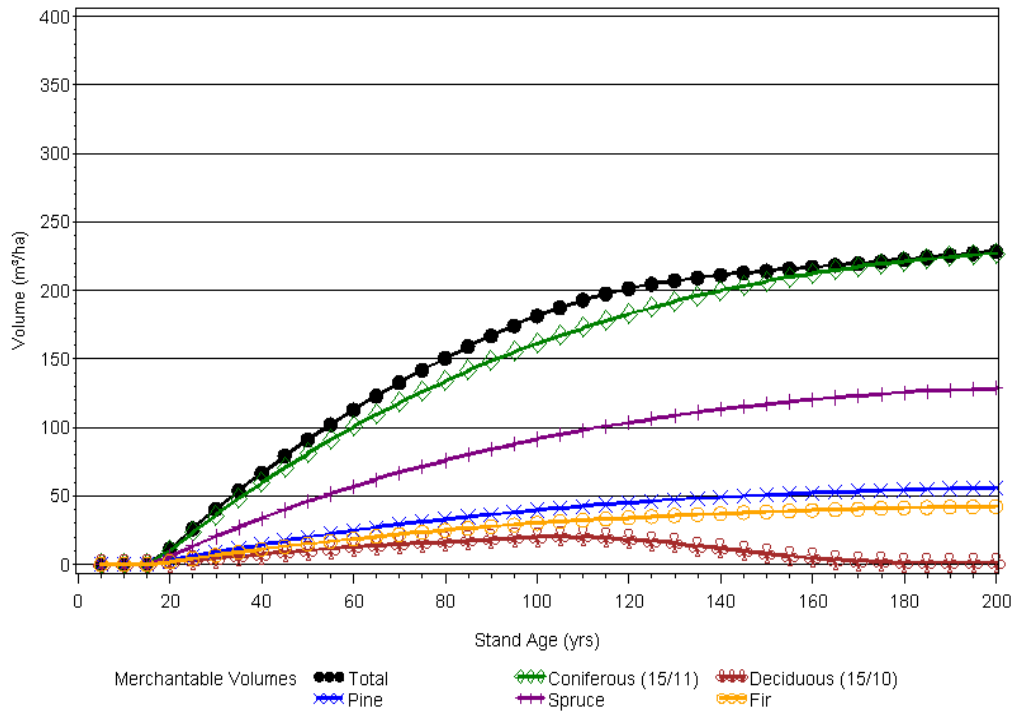


NSR & Site=SAP CC=X %Con=8 Yield Curve #=136

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	10	0.5	1	0.1
30	40	1.3	36	1.2	4	0.1
40	67	1.7	59	1.5	7	0.2
50	91	1.8	81	1.6	10	0.2
60	113	1.9	100	1.7	13	0.2
70	133	1.9	118	1.7	15	0.2
80	151	1.9	134	1.7	17	0.2
90	167	1.9	148	1.6	19	0.2
100	181	1.8	161	1.6	20	0.2
110	193	1.8	173	1.6	20	0.2
120	201	1.7	183	1.5	19	0.2
130	207	1.6	192	1.5	15	0.1
140	211	1.5	200	1.4	12	0.1
150	214	1.4	206	1.4	8	0.1
160	217	1.4	212	1.3	5	0.0
170	220	1.3	217	1.3	3	0.0
180	223	1.2	221	1.2	1	0.0
190	226	1.2	225	1.2	1	0.0
200	228	1.1	227	1.1	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=8 Yield Curve #=136

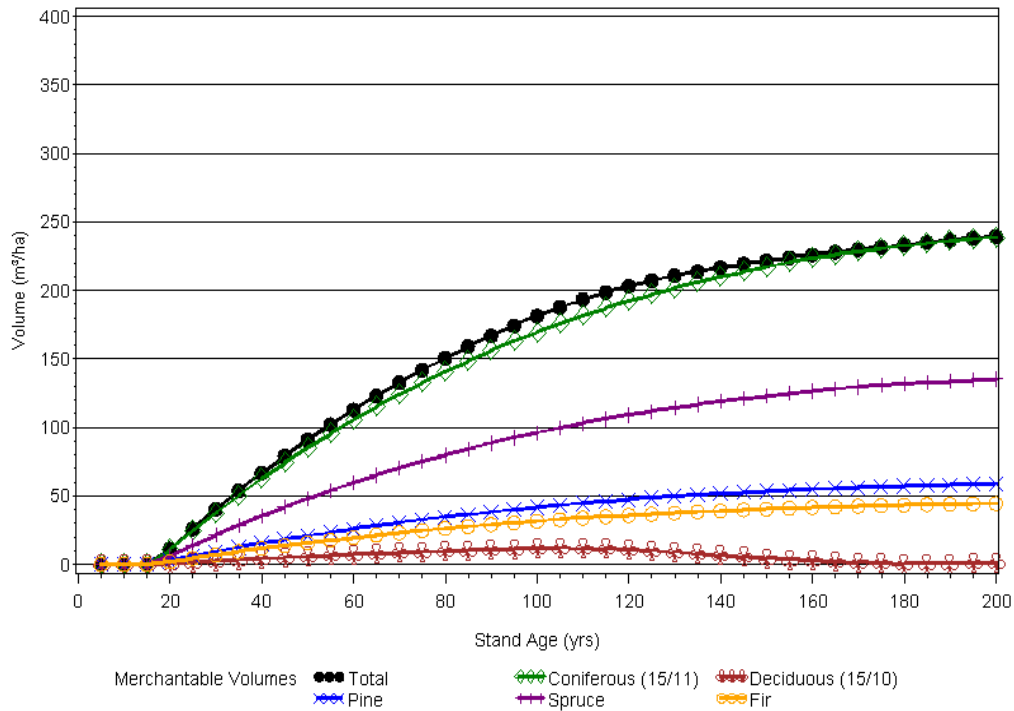


NSR & Site=SAP CC=X %Con=9 Yield Curve #=137

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	11	0.5	1	0.0
30	40	1.3	38	1.3	3	0.1
40	67	1.7	62	1.6	4	0.1
50	91	1.8	85	1.7	6	0.1
60	113	1.9	106	1.8	7	0.1
70	133	1.9	124	1.8	9	0.1
80	151	1.9	141	1.8	10	0.1
90	167	1.9	156	1.7	11	0.1
100	181	1.8	170	1.7	12	0.1
110	194	1.8	182	1.7	12	0.1
120	203	1.7	192	1.6	11	0.1
130	211	1.6	202	1.6	9	0.1
140	217	1.5	210	1.5	7	0.0
150	222	1.5	217	1.4	5	0.0
160	226	1.4	223	1.4	3	0.0
170	230	1.4	228	1.3	2	0.0
180	233	1.3	233	1.3	1	0.0
190	237	1.2	236	1.2	1	0.0
200	240	1.2	239	1.2	1	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=9 Yield Curve #=137

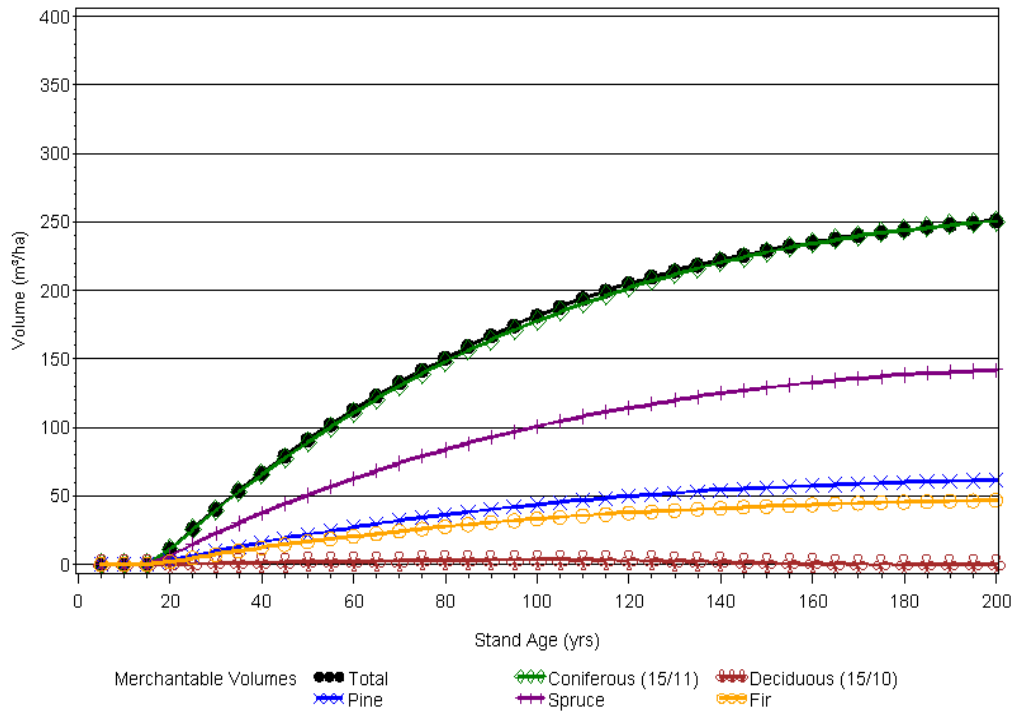


NSR & Site=SAP CC=X %Con=10 Yield Curve #=138

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	11	0.6	0	0.0
30	40	1.3	40	1.3	1	0.0
40	67	1.7	66	1.6	1	0.0
50	91	1.8	89	1.8	2	0.0
60	113	1.9	111	1.8	2	0.0
70	133	1.9	130	1.9	3	0.0
80	151	1.9	148	1.8	3	0.0
90	167	1.9	164	1.8	3	0.0
100	181	1.8	178	1.8	3	0.0
110	194	1.8	191	1.7	4	0.0
120	205	1.7	202	1.7	3	0.0
130	214	1.6	212	1.6	3	0.0
140	222	1.6	220	1.6	2	0.0
150	229	1.5	228	1.5	1	0.0
160	235	1.5	234	1.5	1	0.0
170	240	1.4	240	1.4	0	0.0
180	244	1.4	244	1.4	0	0.0
190	248	1.3	248	1.3	0	0.0
200	251	1.3	251	1.3	0	0.0

Coniferous Merchantable Yield Curves

NSR & Site=SAP CC=X %Con=10 Yield Curve #=138

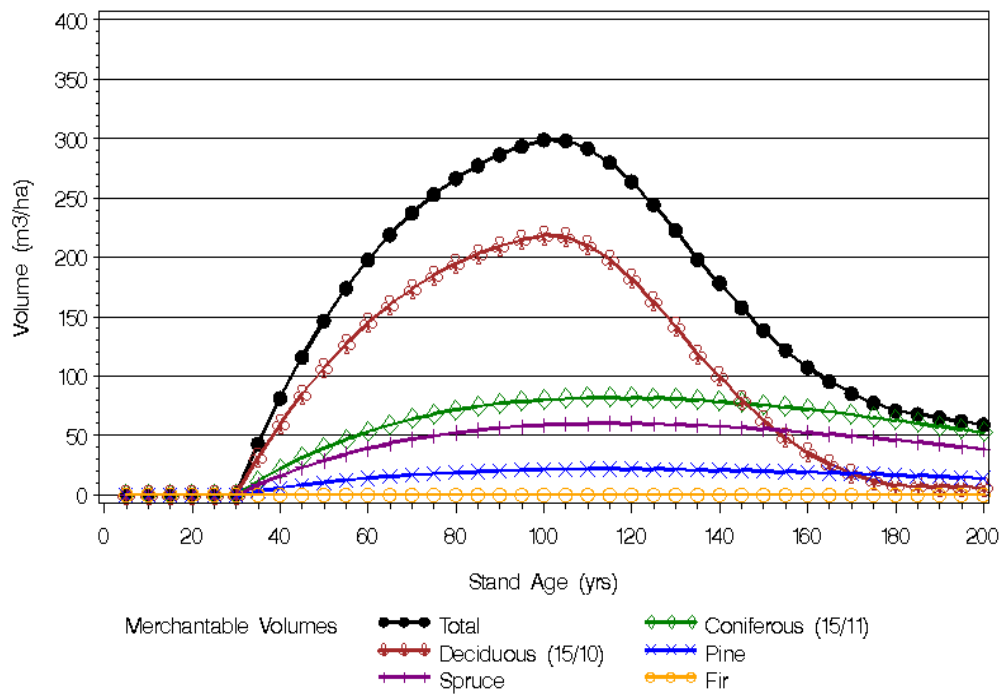


Coniferous Switch Stands Site=G Yield Curve #=139

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	82	2.0	22	0.5	60	1.5
50	147	2.9	39	0.8	107	2.1
60	198	3.3	53	0.9	145	2.4
70	237	3.4	64	0.9	174	2.5
80	266	3.3	71	0.9	195	2.4
90	287	3.2	77	0.9	210	2.3
100	299	3.0	80	0.8	219	2.2
110	292	2.7	82	0.7	210	1.9
120	264	2.2	82	0.7	182	1.5
130	223	1.7	81	0.6	142	1.1
140	178	1.3	79	0.6	100	0.7
150	139	0.9	76	0.5	63	0.4
160	107	0.7	72	0.4	36	0.2
170	85	0.5	68	0.4	18	0.1
180	71	0.4	63	0.3	8	0.0
190	65	0.3	58	0.3	7	0.0
200	59	0.3	52	0.3	7	0.0

Coniferous Merchantable Yield Curves

Site=G Yield Curve #=139

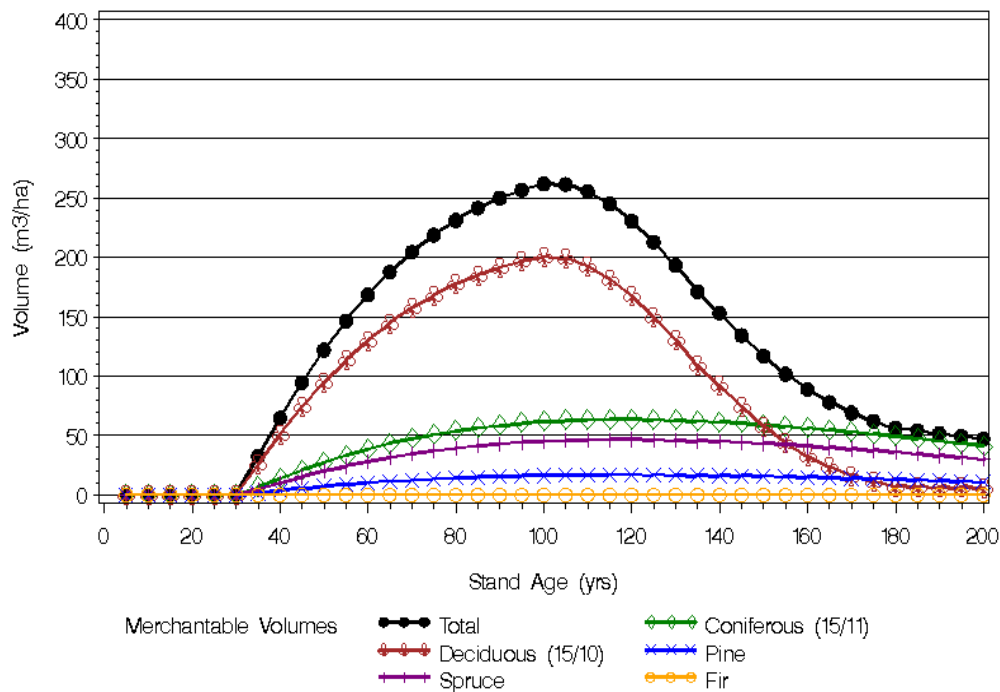


Coniferous Switch Stands Site=M Yield Curve #=140

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	65	1.6	14	0.3	51	1.3
50	122	2.4	27	0.5	95	1.9
60	169	2.8	38	0.6	130	2.2
70	205	2.9	47	0.7	157	2.2
80	231	2.9	54	0.7	177	2.2
90	250	2.8	59	0.7	192	2.1
100	262	2.6	62	0.6	200	2.0
110	256	2.3	63	0.6	193	1.8
120	231	1.9	64	0.5	167	1.4
130	193	1.5	63	0.5	131	1.0
140	153	1.1	61	0.4	92	0.7
150	117	0.8	59	0.4	58	0.4
160	89	0.6	56	0.4	33	0.2
170	69	0.4	53	0.3	16	0.1
180	56	0.3	49	0.3	7	0.0
190	52	0.3	45	0.2	7	0.0
200	47	0.2	41	0.2	6	0.0

Coniferous Merchantable Yield Curves

Site= M Yield Curve #= 140

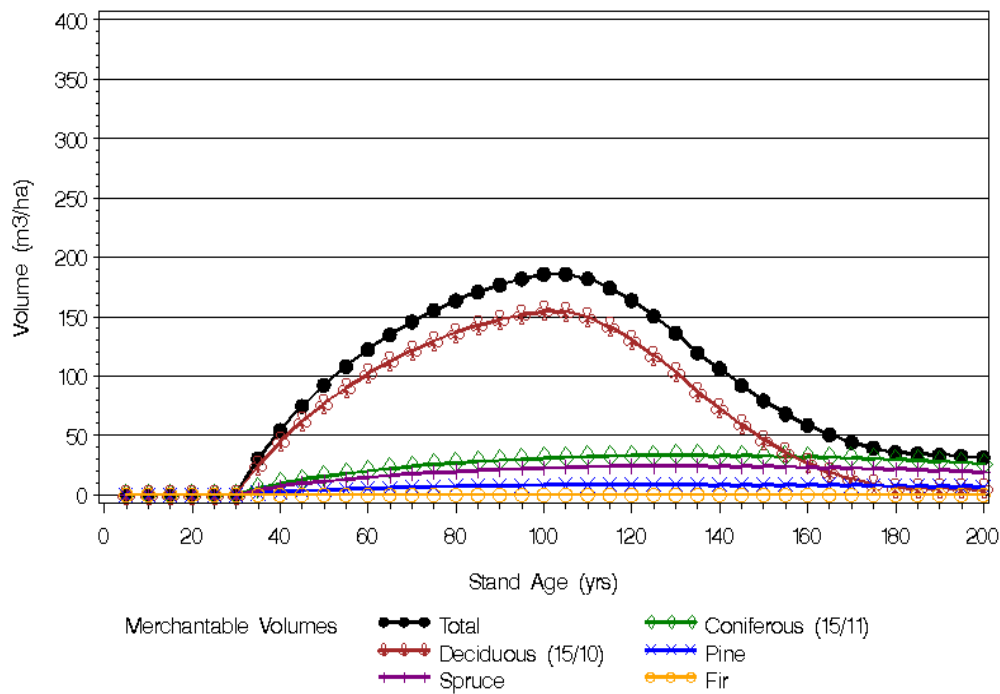


Coniferous Switch Stands Site=P Yield Curve #=141

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	54	1.4	10	0.2	45	1.1
50	93	1.9	16	0.3	77	1.5
60	122	2.0	20	0.3	102	1.7
70	146	2.1	24	0.3	122	1.7
80	164	2.0	27	0.3	137	1.7
90	177	2.0	29	0.3	148	1.6
100	186	1.9	31	0.3	155	1.5
110	182	1.7	32	0.3	150	1.4
120	164	1.4	33	0.3	131	1.1
130	136	1.0	33	0.3	103	0.8
140	106	0.8	33	0.2	73	0.5
150	79	0.5	33	0.2	47	0.3
160	59	0.4	32	0.2	27	0.2
170	44	0.3	31	0.2	13	0.1
180	36	0.2	30	0.2	6	0.0
190	34	0.2	28	0.1	6	0.0
200	31	0.2	26	0.1	5	0.0

Coniferous Merchantable Yield Curves

Site=P Yield Curve # = 141

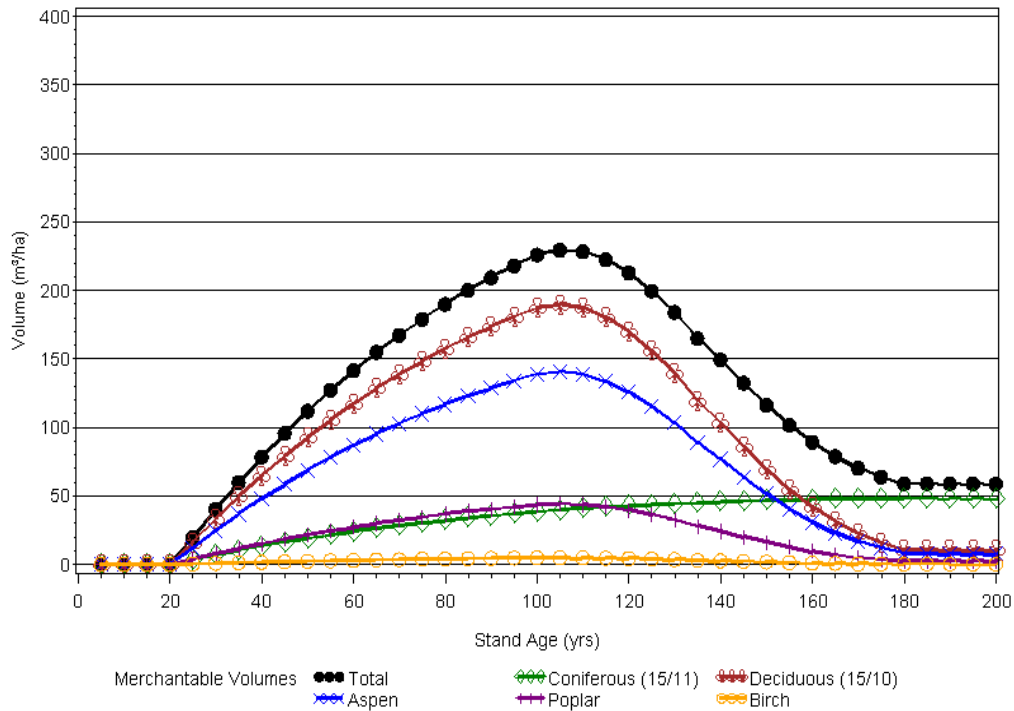


NSR & Site=LFG CC=A %Con=0 Yield Curve #=1

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	7	0.2	34	1.1
40	78	2.0	13	0.3	65	1.6
50	112	2.2	19	0.4	93	1.9
60	142	2.4	24	0.4	117	2.0
70	167	2.4	28	0.4	139	2.0
80	190	2.4	32	0.4	158	2.0
90	209	2.3	36	0.4	174	1.9
100	226	2.3	38	0.4	188	1.9
110	228	2.1	41	0.4	188	1.7
120	213	1.8	43	0.4	170	1.4
130	184	1.4	44	0.3	140	1.1
140	149	1.1	46	0.3	104	0.7
150	116	0.8	47	0.3	70	0.5
160	89	0.6	47	0.3	42	0.3
170	70	0.4	48	0.3	22	0.1
180	59	0.3	48	0.3	11	0.1
190	59	0.3	48	0.3	11	0.1
200	59	0.3	48	0.2	11	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=0 Yield Curve #=1

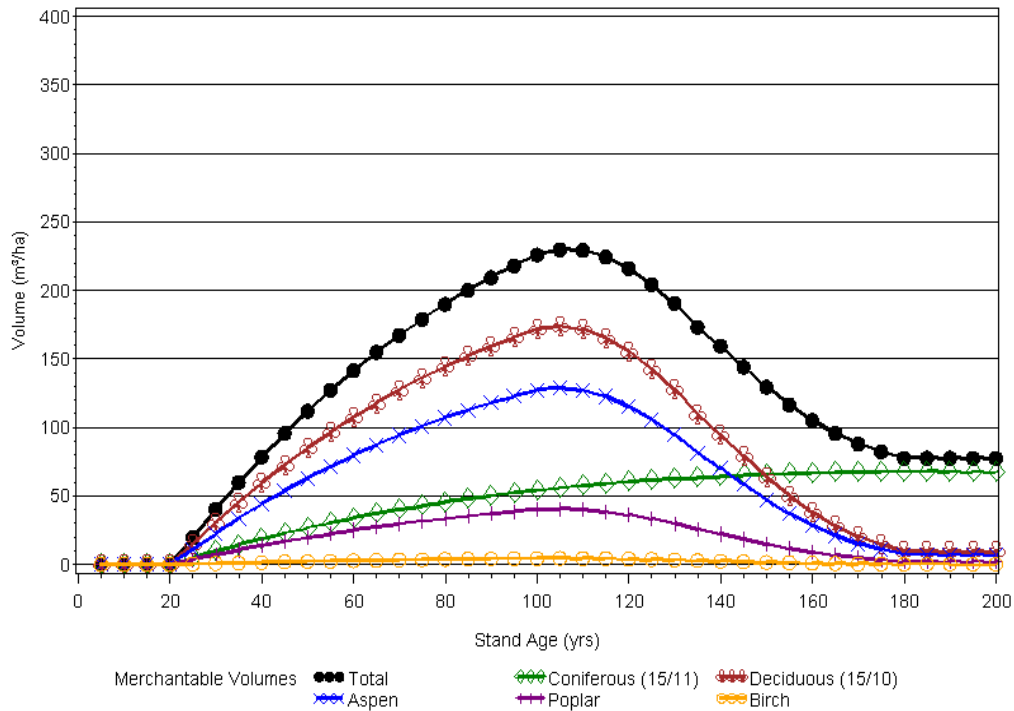


NSR & Site=LFG CC=A %Con=1 Yield Curve #=2

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	10	0.3	31	1.0
40	78	2.0	19	0.5	60	1.5
50	112	2.2	27	0.5	85	1.7
60	142	2.4	34	0.6	108	1.8
70	167	2.4	40	0.6	127	1.8
80	190	2.4	46	0.6	144	1.8
90	209	2.3	50	0.6	159	1.8
100	226	2.3	54	0.5	172	1.7
110	229	2.1	58	0.5	172	1.6
120	216	1.8	60	0.5	156	1.3
130	191	1.5	63	0.5	128	1.0
140	159	1.1	64	0.5	95	0.7
150	130	0.9	66	0.4	64	0.4
160	105	0.7	67	0.4	38	0.2
170	88	0.5	67	0.4	21	0.1
180	78	0.4	68	0.4	10	0.1
190	78	0.4	68	0.4	10	0.1
200	77	0.4	68	0.3	10	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=1 Yield Curve #=2

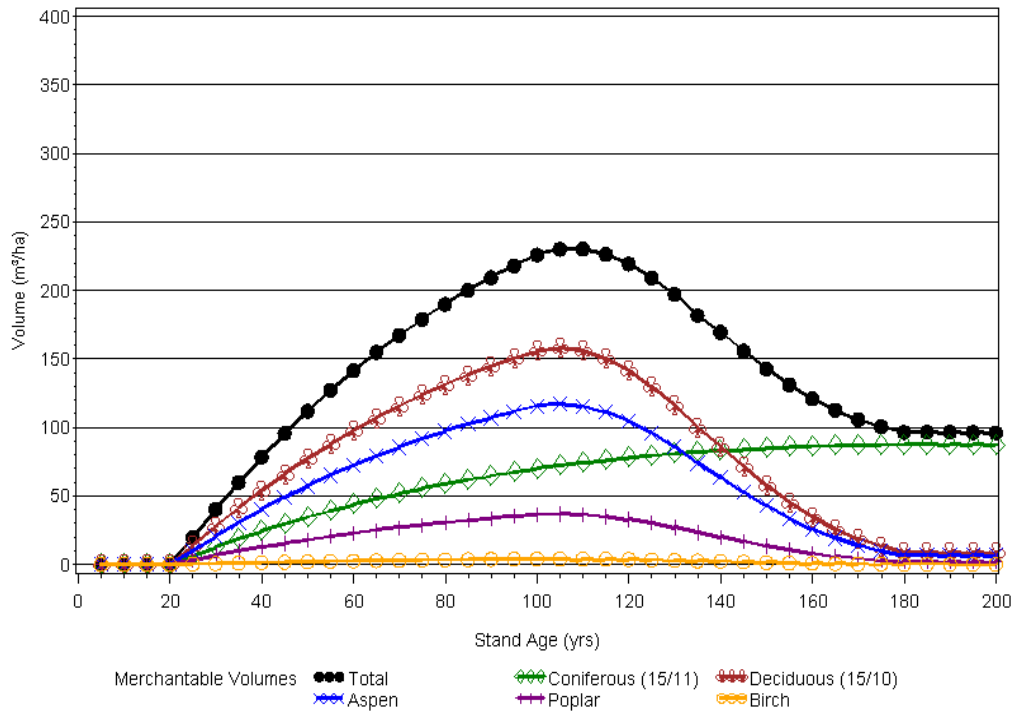


NSR & Site=LFG CC=A %Con=2 Yield Curve #=3

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	12	0.4	28	0.9
40	78	2.0	24	0.6	54	1.4
50	112	2.2	35	0.7	77	1.5
60	142	2.4	44	0.7	98	1.6
70	167	2.4	52	0.7	116	1.7
80	190	2.4	59	0.7	131	1.6
90	209	2.3	65	0.7	145	1.6
100	226	2.3	70	0.7	156	1.6
110	230	2.1	74	0.7	156	1.4
120	219	1.8	78	0.6	142	1.2
130	197	1.5	81	0.6	116	0.9
140	170	1.2	83	0.6	86	0.6
150	143	1.0	85	0.6	58	0.4
160	121	0.8	86	0.5	35	0.2
170	106	0.6	87	0.5	19	0.1
180	96	0.5	87	0.5	9	0.0
190	97	0.5	88	0.5	9	0.0
200	96	0.5	87	0.4	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=2 Yield Curve #=3

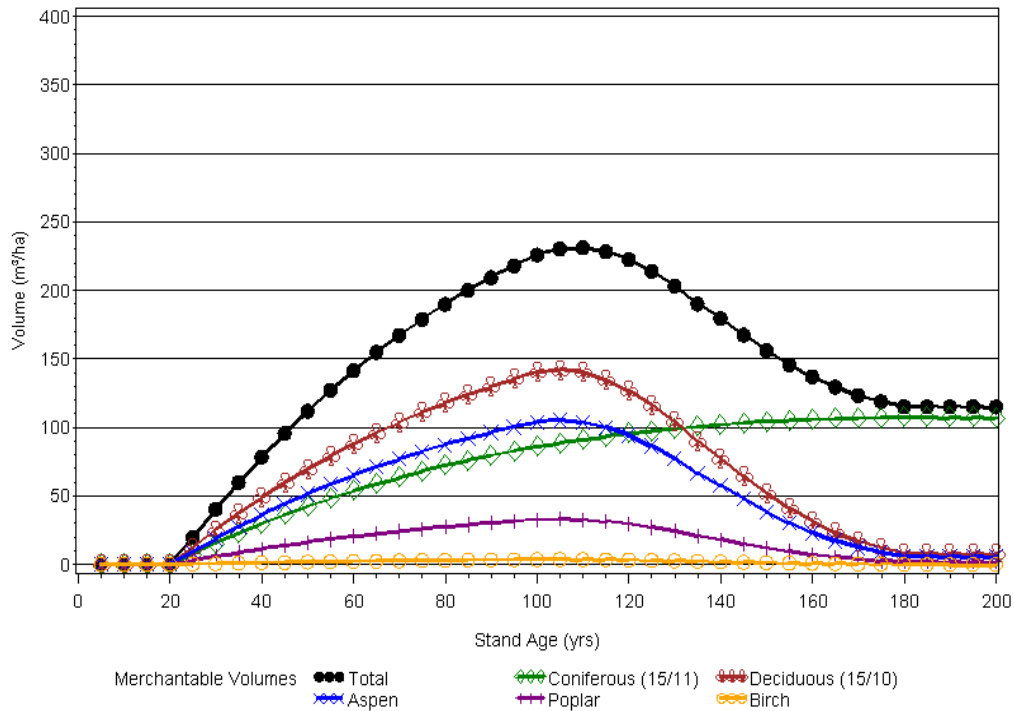


NSR & Site=LFG CC=A %Con=3 Yield Curve #=4

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	15	0.5	25	0.8
40	78	2.0	30	0.7	49	1.2
50	112	2.2	42	0.8	70	1.4
60	142	2.4	54	0.9	88	1.5
70	167	2.4	63	0.9	104	1.5
80	190	2.4	72	0.9	118	1.5
90	209	2.3	79	0.9	130	1.4
100	226	2.3	86	0.9	140	1.4
110	231	2.1	91	0.8	140	1.3
120	223	1.9	95	0.8	127	1.1
130	204	1.6	99	0.8	104	0.8
140	180	1.3	102	0.7	78	0.6
150	156	1.0	104	0.7	52	0.3
160	137	0.9	106	0.7	31	0.2
170	123	0.7	107	0.6	17	0.1
180	115	0.6	107	0.6	8	0.0
190	115	0.6	107	0.6	8	0.0
200	115	0.6	107	0.5	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=3 Yield Curve #=4

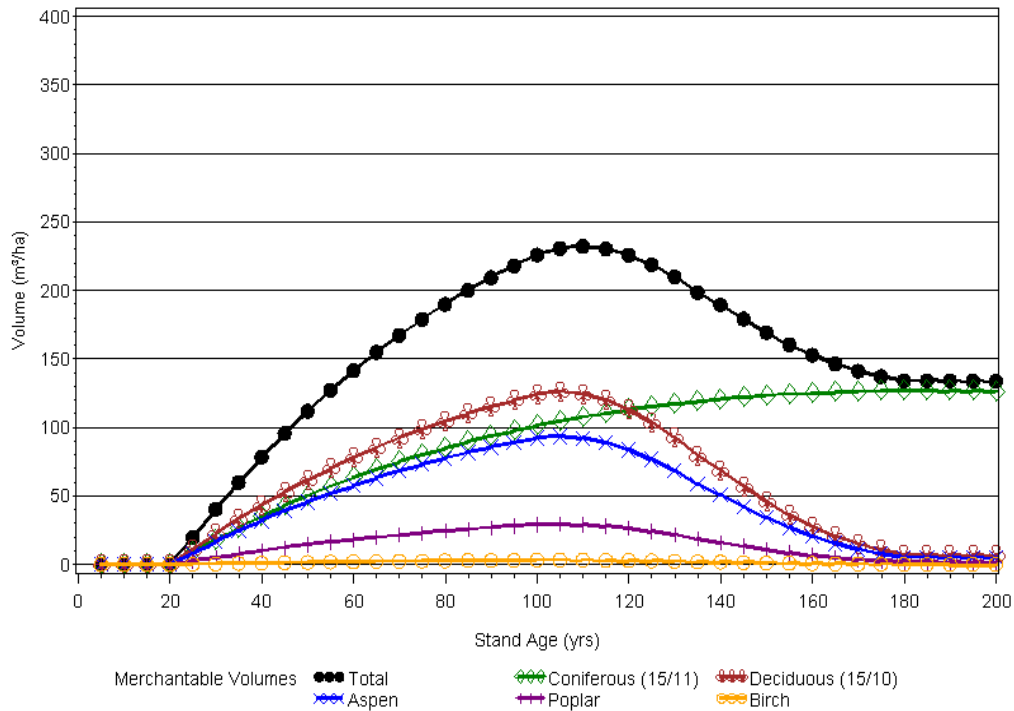


NSR & Site=LFG CC=A %Con=4 Yield Curve #=5

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	18	0.6	22	0.7
40	78	2.0	35	0.9	43	1.1
50	112	2.2	50	1.0	62	1.2
60	142	2.4	64	1.1	78	1.3
70	167	2.4	75	1.1	92	1.3
80	190	2.4	85	1.1	105	1.3
90	209	2.3	94	1.0	115	1.3
100	226	2.3	101	1.0	125	1.2
110	232	2.1	108	1.0	125	1.1
120	226	1.9	113	0.9	113	0.9
130	210	1.6	117	0.9	93	0.7
140	190	1.4	121	0.9	69	0.5
150	169	1.1	123	0.8	46	0.3
160	153	1.0	125	0.8	28	0.2
170	141	0.8	126	0.7	15	0.1
180	134	0.7	127	0.7	7	0.0
190	134	0.7	127	0.7	7	0.0
200	134	0.7	127	0.6	7	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=4 Yield Curve #=5

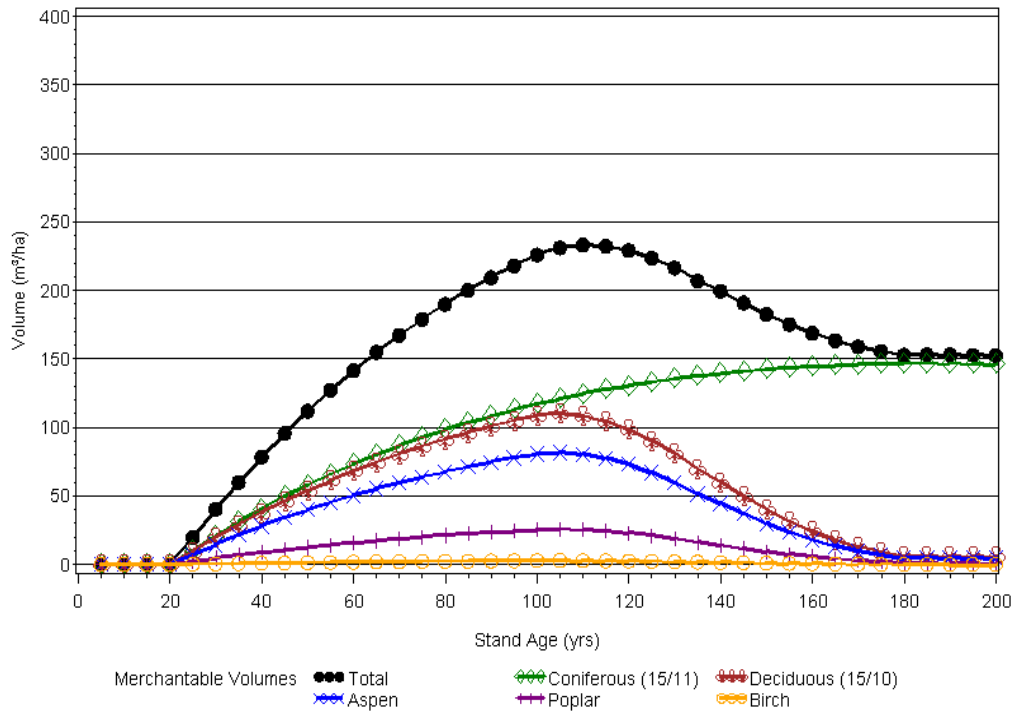


NSR & Site=LFG CC=A %Con=5 Yield Curve #=6

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	40	1.3	21	0.7	19	0.6
40	78	2.0	41	1.0	38	0.9
50	112	2.2	58	1.2	54	1.1
60	142	2.4	73	1.2	68	1.1
70	167	2.4	87	1.2	81	1.2
80	190	2.4	98	1.2	92	1.1
90	209	2.3	109	1.2	101	1.1
100	226	2.3	117	1.2	109	1.1
110	233	2.1	124	1.1	109	1.0
120	229	1.9	131	1.1	99	0.8
130	216	1.7	135	1.0	81	0.6
140	200	1.4	139	1.0	60	0.4
150	183	1.2	142	0.9	40	0.3
160	169	1.1	145	0.9	24	0.2
170	159	0.9	146	0.9	13	0.1
180	153	0.8	147	0.8	6	0.0
190	153	0.8	147	0.8	6	0.0
200	153	0.8	146	0.7	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=A %Con=5 Yield Curve #=6

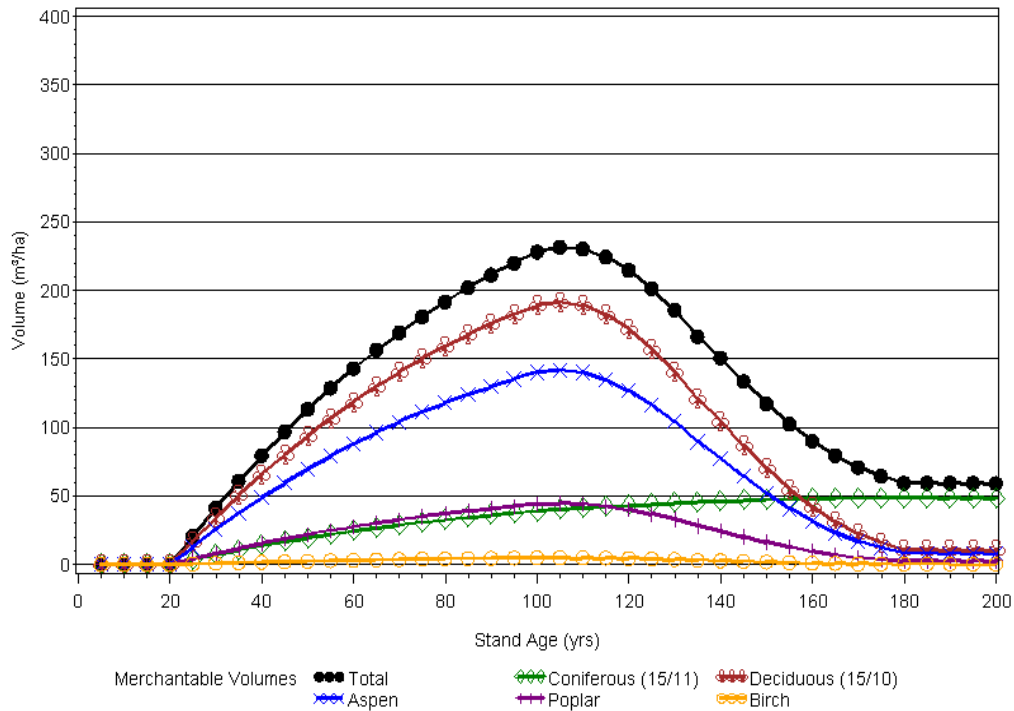


NSR & Site=LFG CC=B %Con=0 Yield Curve #=7

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	7	0.2	34	1.1
40	79	2.0	14	0.3	66	1.6
50	113	2.3	19	0.4	94	1.9
60	143	2.4	24	0.4	119	2.0
70	169	2.4	29	0.4	140	2.0
80	192	2.4	33	0.4	159	2.0
90	211	2.3	36	0.4	175	1.9
100	228	2.3	39	0.4	189	1.9
110	230	2.1	41	0.4	189	1.7
120	215	1.8	43	0.4	172	1.4
130	186	1.4	45	0.3	141	1.1
140	151	1.1	46	0.3	105	0.7
150	117	0.8	47	0.3	70	0.5
160	90	0.6	48	0.3	42	0.3
170	71	0.4	48	0.3	23	0.1
180	59	0.3	48	0.3	11	0.1
190	59	0.3	49	0.3	11	0.1
200	59	0.3	48	0.2	11	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=0 Yield Curve #=7

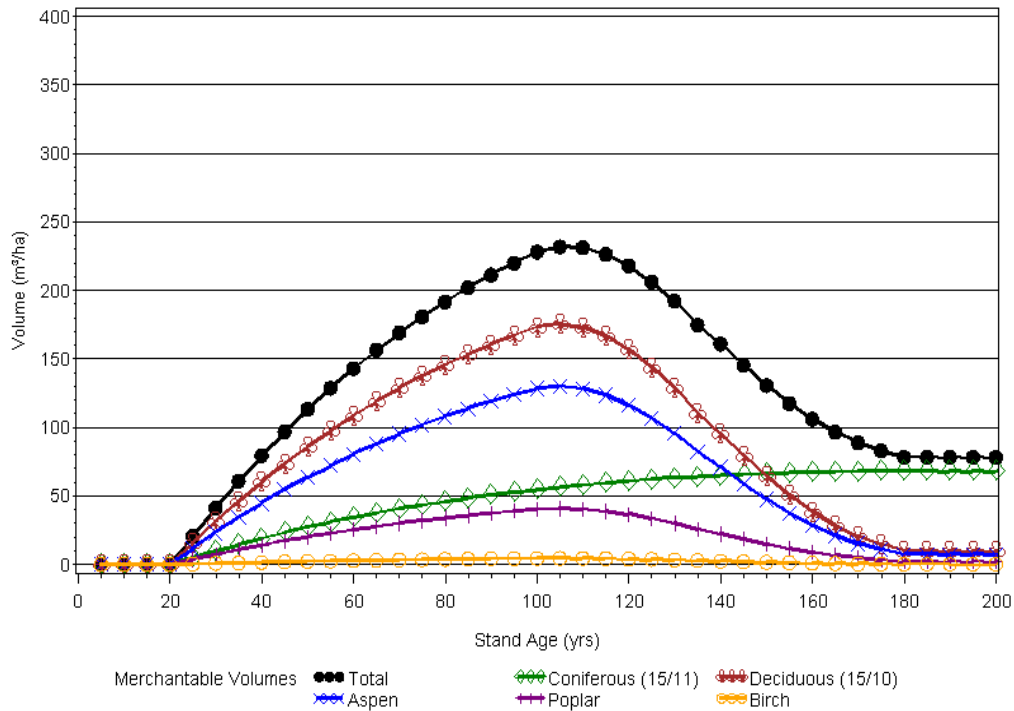


NSR & Site=LFG CC=B %Con=1 Yield Curve #=8

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	10	0.3	31	1.0
40	79	2.0	19	0.5	60	1.5
50	113	2.3	27	0.5	86	1.7
60	143	2.4	34	0.6	109	1.8
70	169	2.4	41	0.6	129	1.8
80	192	2.4	46	0.6	146	1.8
90	211	2.3	51	0.6	161	1.8
100	228	2.3	55	0.5	173	1.7
110	231	2.1	58	0.5	173	1.6
120	218	1.8	61	0.5	157	1.3
130	192	1.5	63	0.5	129	1.0
140	161	1.1	65	0.5	96	0.7
150	131	0.9	66	0.4	64	0.4
160	106	0.7	67	0.4	39	0.2
170	89	0.5	68	0.4	21	0.1
180	78	0.4	68	0.4	10	0.1
190	78	0.4	68	0.4	10	0.1
200	78	0.4	68	0.3	10	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=1 Yield Curve #=8

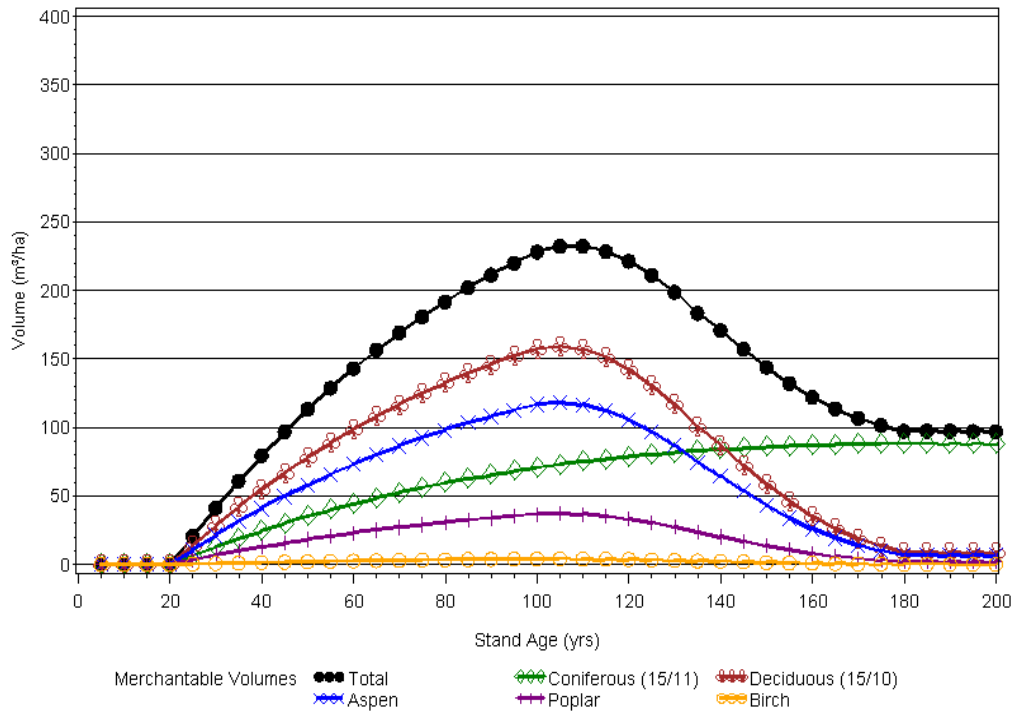


NSR & Site=LFG CC=B %Con=2 Yield Curve #=9

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	13	0.4	29	1.0
40	79	2.0	25	0.6	55	1.4
50	113	2.3	35	0.7	78	1.6
60	143	2.4	44	0.7	99	1.6
70	169	2.4	52	0.7	117	1.7
80	192	2.4	59	0.7	132	1.7
90	211	2.3	65	0.7	146	1.6
100	228	2.3	71	0.7	158	1.6
110	232	2.1	75	0.7	157	1.4
120	221	1.8	79	0.7	143	1.2
130	199	1.5	82	0.6	117	0.9
140	171	1.2	84	0.6	87	0.6
150	144	1.0	86	0.6	58	0.4
160	122	0.8	87	0.5	35	0.2
170	107	0.6	88	0.5	19	0.1
180	97	0.5	88	0.5	9	0.1
190	97	0.5	88	0.5	9	0.0
200	97	0.5	88	0.4	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=2 Yield Curve #=9

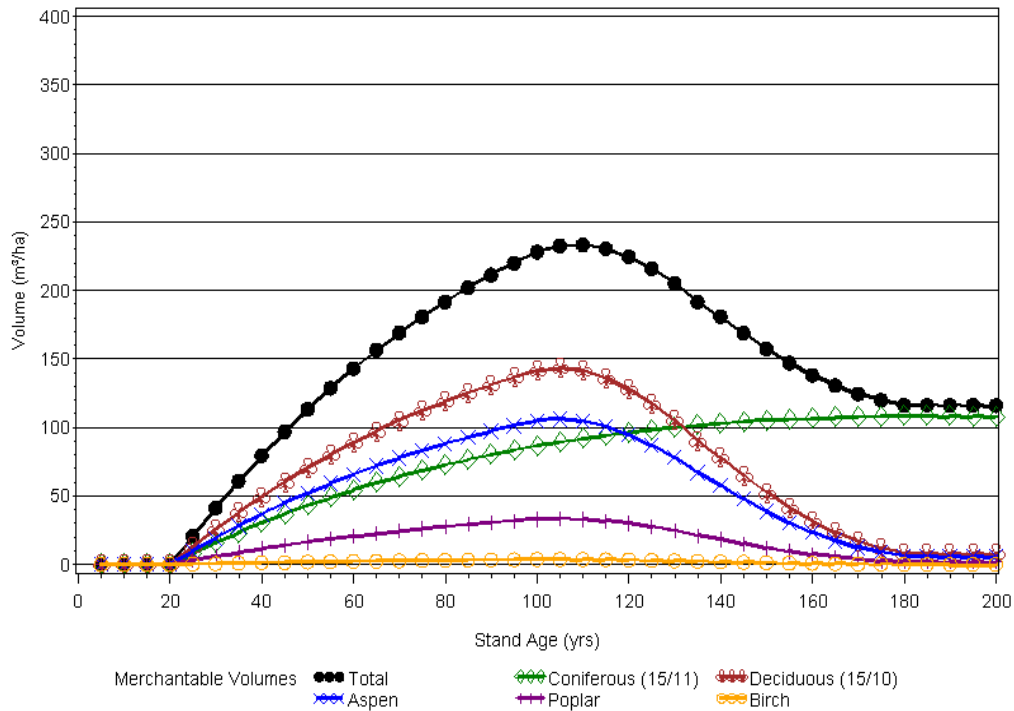


NSR & Site=LFG CC=B %Con=3 Yield Curve #=10

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	16	0.5	26	0.9
40	79	2.0	30	0.8	49	1.2
50	113	2.3	43	0.9	70	1.4
60	143	2.4	54	0.9	89	1.5
70	169	2.4	64	0.9	105	1.5
80	192	2.4	73	0.9	119	1.5
90	211	2.3	80	0.9	131	1.5
100	228	2.3	86	0.9	142	1.4
110	233	2.1	92	0.8	142	1.3
120	225	1.9	96	0.8	128	1.1
130	205	1.6	100	0.8	105	0.8
140	181	1.3	103	0.7	78	0.6
150	157	1.0	105	0.7	52	0.3
160	138	0.9	107	0.7	32	0.2
170	125	0.7	108	0.6	17	0.1
180	116	0.6	108	0.6	8	0.0
190	116	0.6	108	0.6	8	0.0
200	116	0.6	108	0.5	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=3 Yield Curve #=10

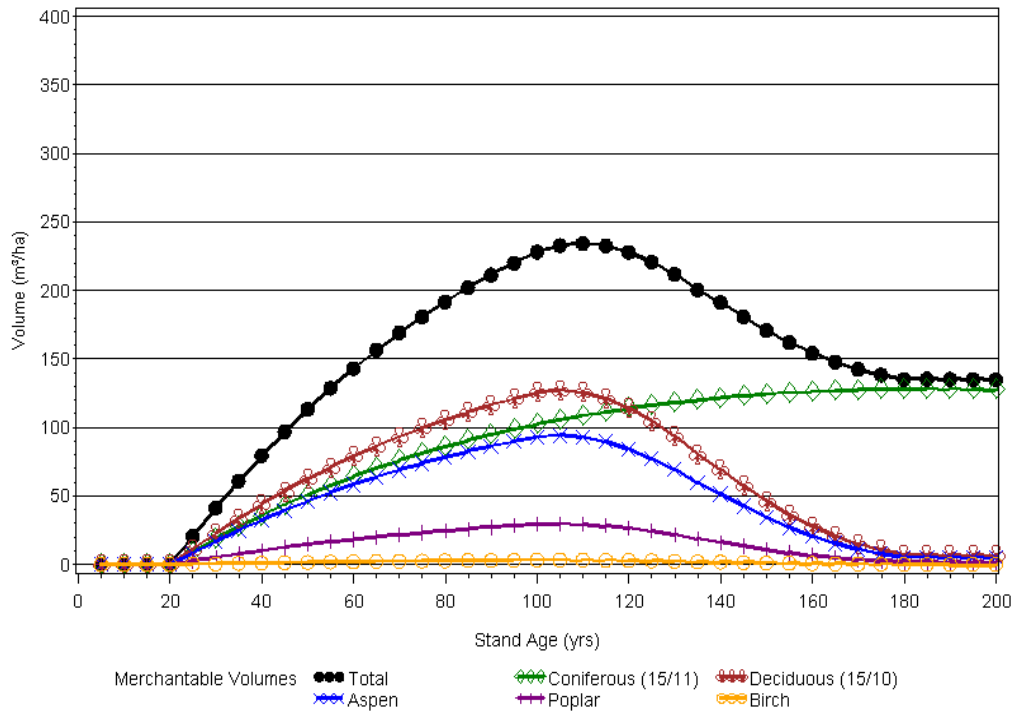


NSR & Site=LFG CC=B %Con=4 Yield Curve #=11

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	19	0.6	23	0.8
40	79	2.0	36	0.9	44	1.1
50	113	2.3	51	1.0	62	1.2
60	143	2.4	64	1.1	79	1.3
70	169	2.4	76	1.1	93	1.3
80	192	2.4	86	1.1	106	1.3
90	211	2.3	95	1.1	117	1.3
100	228	2.3	102	1.0	126	1.3
110	234	2.1	109	1.0	126	1.1
120	228	1.9	114	0.9	114	0.9
130	212	1.6	118	0.9	94	0.7
140	191	1.4	122	0.9	70	0.5
150	171	1.1	124	0.8	47	0.3
160	154	1.0	126	0.8	28	0.2
170	142	0.8	127	0.7	15	0.1
180	135	0.8	128	0.7	7	0.0
190	135	0.7	128	0.7	7	0.0
200	135	0.7	128	0.6	7	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=4 Yield Curve #=11

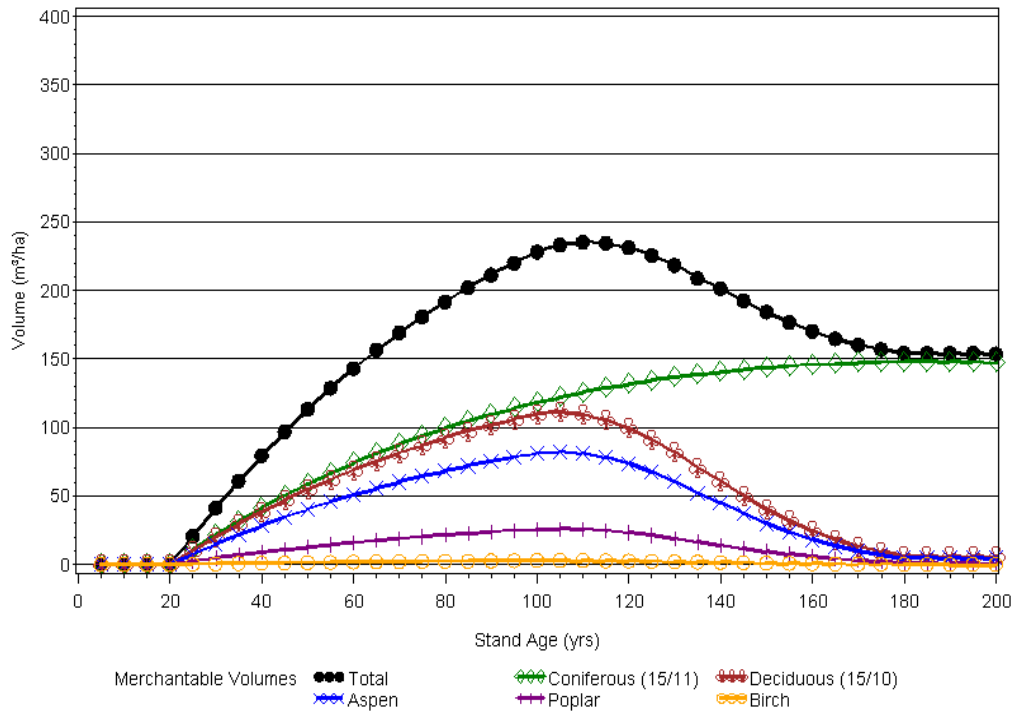


NSR & Site=LFG CC=B %Con=5 Yield Curve #=12

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	41	1.4	21	0.7	20	0.7
40	79	2.0	41	1.0	38	1.0
50	113	2.3	59	1.2	55	1.1
60	143	2.4	74	1.2	69	1.1
70	169	2.4	88	1.3	81	1.2
80	192	2.4	99	1.2	92	1.2
90	211	2.3	110	1.2	102	1.1
100	228	2.3	118	1.2	110	1.1
110	235	2.1	126	1.1	110	1.0
120	231	1.9	132	1.1	100	0.8
130	218	1.7	137	1.1	82	0.6
140	201	1.4	141	1.0	61	0.4
150	184	1.2	144	1.0	41	0.3
160	170	1.1	146	0.9	25	0.2
170	160	0.9	147	0.9	13	0.1
180	154	0.9	148	0.8	6	0.0
190	154	0.8	148	0.8	6	0.0
200	154	0.8	148	0.7	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=B %Con=5 Yield Curve #=12

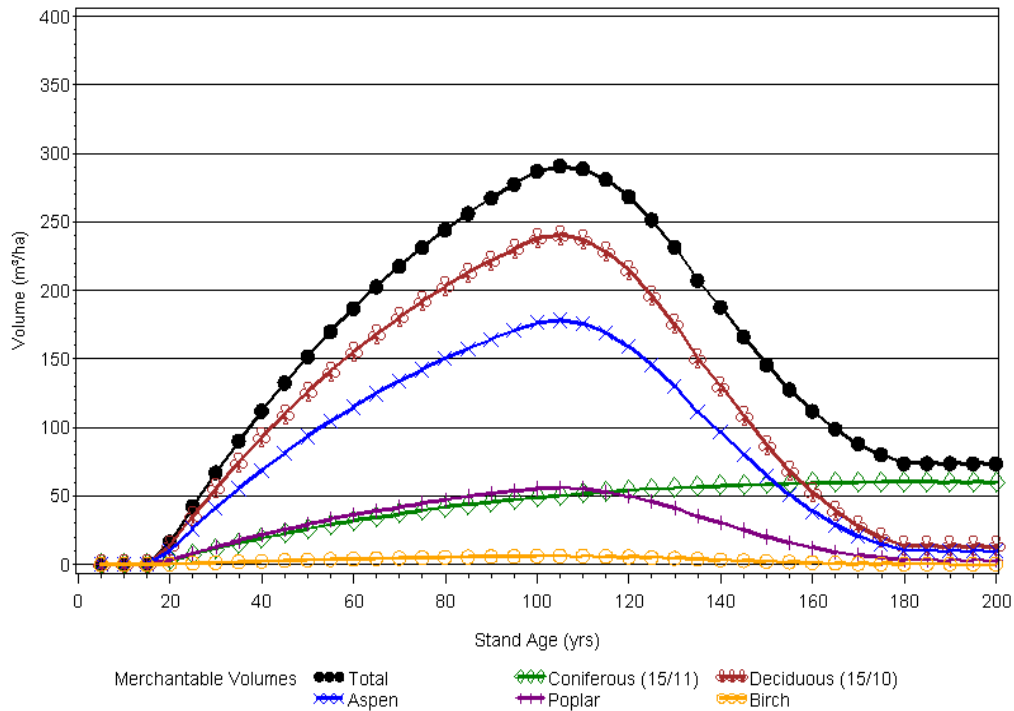


NSR & Site=LFG CC=C %Con=0 Yield Curve #=13

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	3	0.1	14	0.7
30	67	2.2	11	0.4	56	1.9
40	112	2.8	19	0.5	93	2.3
50	152	3.0	26	0.5	126	2.5
60	187	3.1	32	0.5	155	2.6
70	218	3.1	37	0.5	181	2.6
80	244	3.1	42	0.5	203	2.5
90	267	3.0	45	0.5	222	2.5
100	287	2.9	49	0.5	238	2.4
110	289	2.6	52	0.5	237	2.2
120	269	2.2	54	0.4	215	1.8
130	232	1.8	56	0.4	176	1.4
140	188	1.3	57	0.4	130	0.9
150	146	1.0	59	0.4	87	0.6
160	112	0.7	59	0.4	53	0.3
170	88	0.5	60	0.4	28	0.2
180	74	0.4	60	0.3	14	0.1
190	74	0.4	60	0.3	14	0.1
200	74	0.4	60	0.3	13	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=0 Yield Curve #=13

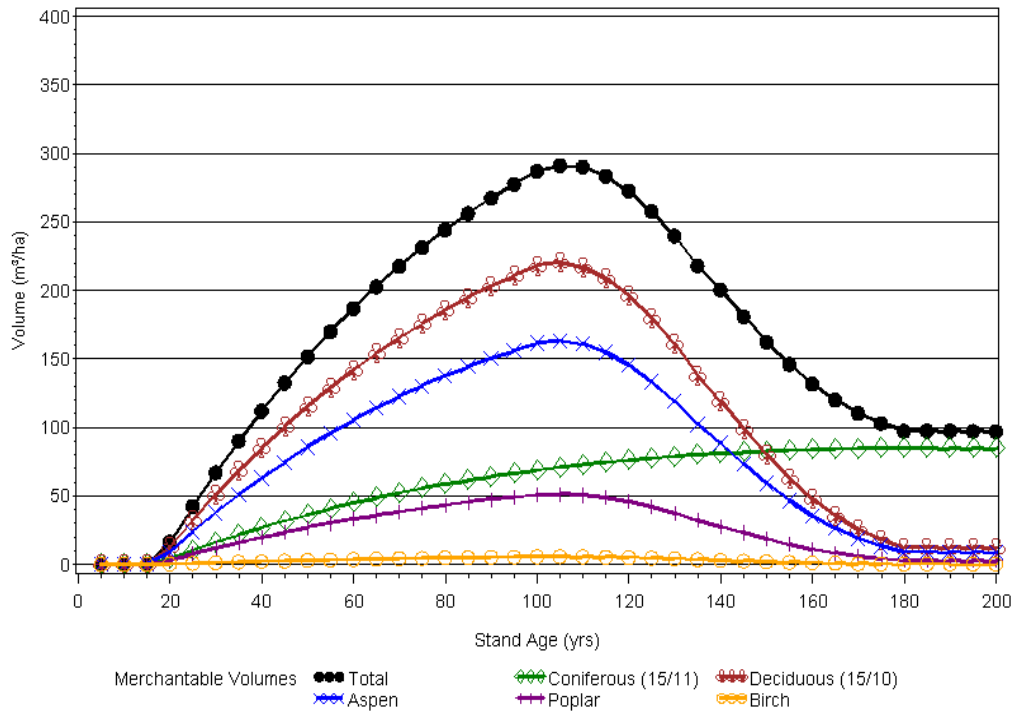


NSR & Site=LFG CC=C %Con=1 Yield Curve #=14

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	4	0.2	13	0.6
30	67	2.2	16	0.5	51	1.7
40	112	2.8	27	0.7	85	2.1
50	152	3.0	36	0.7	115	2.3
60	187	3.1	45	0.7	142	2.4
70	218	3.1	52	0.7	165	2.4
80	244	3.1	59	0.7	186	2.3
90	267	3.0	64	0.7	203	2.3
100	287	2.9	69	0.7	218	2.2
110	290	2.6	73	0.7	217	2.0
120	273	2.3	76	0.6	197	1.6
130	240	1.8	79	0.6	161	1.2
140	200	1.4	81	0.6	119	0.9
150	163	1.1	83	0.6	80	0.5
160	132	0.8	84	0.5	48	0.3
170	110	0.6	85	0.5	26	0.2
180	97	0.5	85	0.5	12	0.1
190	97	0.5	85	0.4	12	0.1
200	97	0.5	85	0.4	12	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=1 Yield Curve #=14

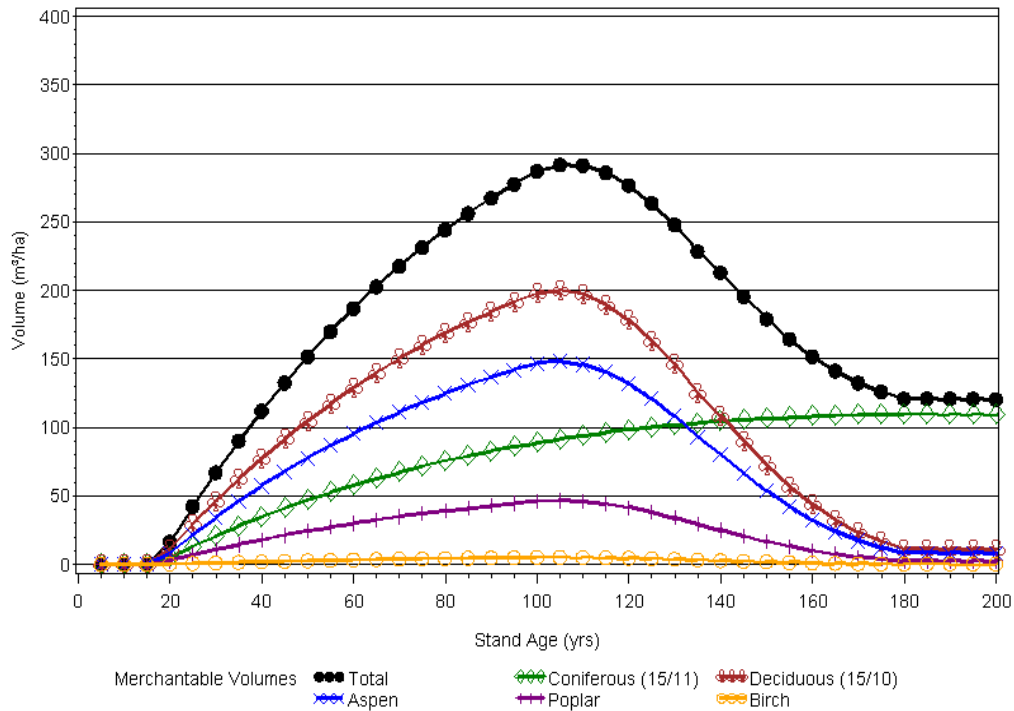


NSR & Site=LFG CC=C %Con=2 Yield Curve #=15

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	5	0.3	11	0.6
30	67	2.2	21	0.7	46	1.5
40	112	2.8	35	0.9	77	1.9
50	152	3.0	47	0.9	105	2.1
60	187	3.1	58	1.0	129	2.2
70	218	3.1	67	1.0	150	2.1
80	244	3.1	76	0.9	169	2.1
90	267	3.0	83	0.9	185	2.1
100	287	2.9	89	0.9	198	2.0
110	291	2.6	94	0.9	197	1.8
120	277	2.3	98	0.8	179	1.5
130	248	1.9	102	0.8	146	1.1
140	213	1.5	104	0.7	108	0.8
150	179	1.2	107	0.7	73	0.5
160	152	0.9	108	0.7	44	0.3
170	133	0.8	109	0.6	23	0.1
180	121	0.7	110	0.6	11	0.1
190	121	0.6	110	0.6	11	0.1
200	121	0.6	109	0.5	11	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=2 Yield Curve #=15

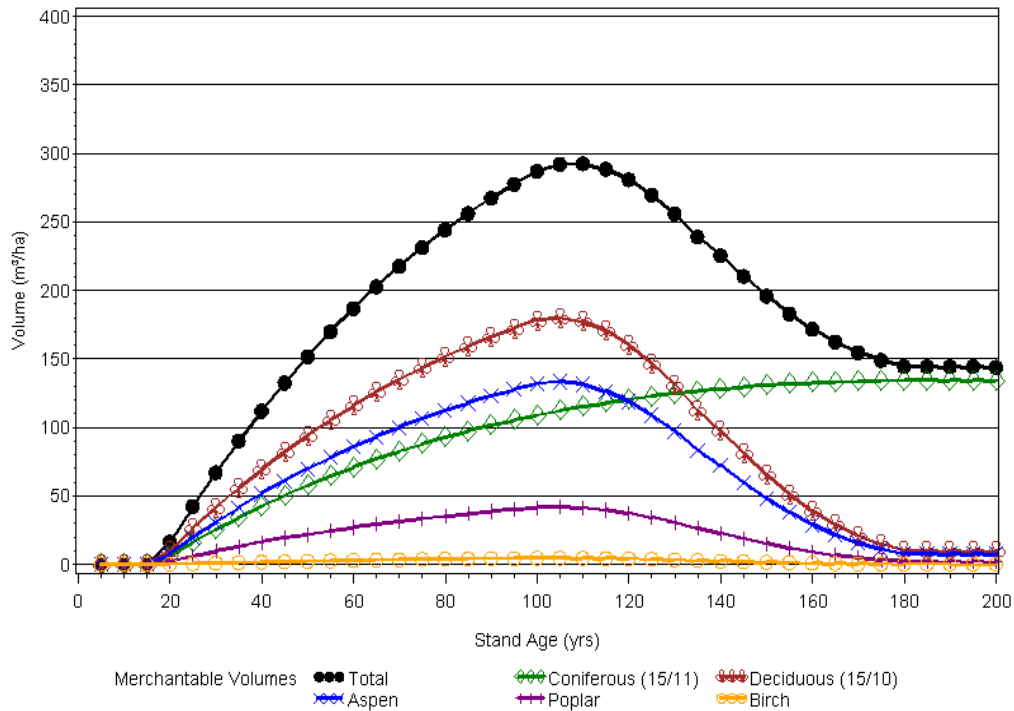


NSR & Site=LFG CC=C %Con=3 Yield Curve #=16

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	6	0.3	10	0.5
30	67	2.2	25	0.8	42	1.4
40	112	2.8	42	1.1	70	1.7
50	152	3.0	58	1.2	94	1.9
60	187	3.1	71	1.2	116	1.9
70	218	3.1	82	1.2	135	1.9
80	244	3.1	93	1.2	152	1.9
90	267	3.0	101	1.1	166	1.8
100	287	2.9	109	1.1	178	1.8
110	293	2.7	115	1.0	177	1.6
120	281	2.3	120	1.0	161	1.3
130	256	2.0	125	1.0	132	1.0
140	226	1.6	128	0.9	98	0.7
150	196	1.3	131	0.9	65	0.4
160	172	1.1	132	0.8	39	0.2
170	155	0.9	134	0.8	21	0.1
180	144	0.8	134	0.7	10	0.1
190	145	0.8	134	0.7	10	0.1
200	144	0.7	134	0.7	10	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=3 Yield Curve #=16

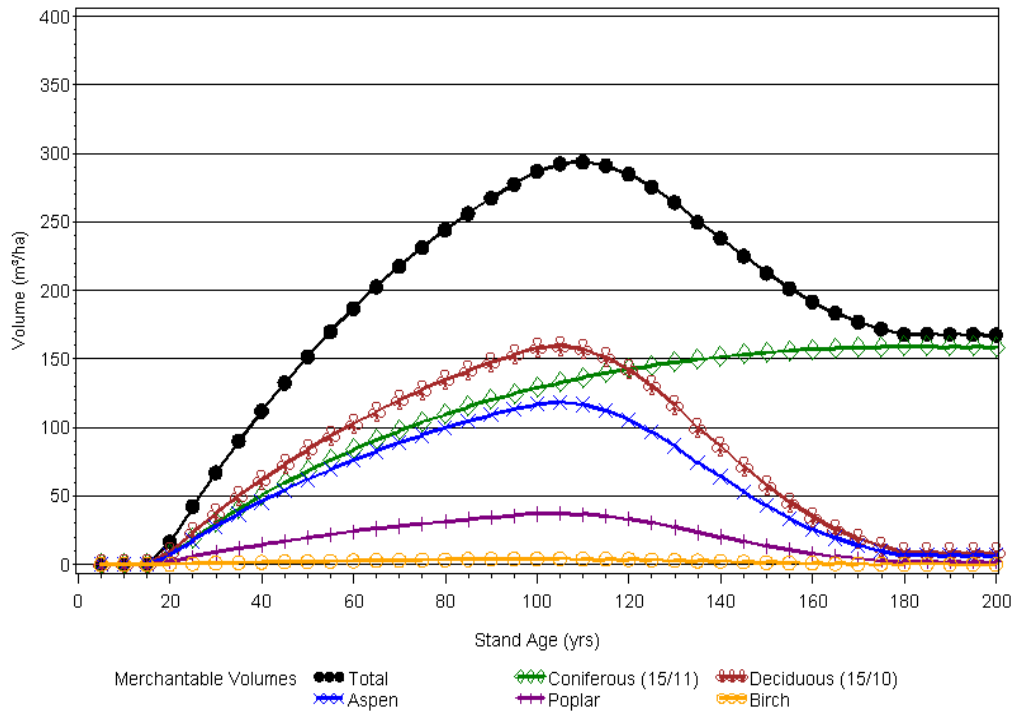


NSR & Site=LFG CC=C %Con=4 Yield Curve #=17

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	7	0.4	9	0.5
30	67	2.2	30	1.0	37	1.2
40	112	2.8	50	1.3	62	1.5
50	152	3.0	68	1.4	84	1.7
60	187	3.1	84	1.4	103	1.7
70	218	3.1	98	1.4	120	1.7
80	244	3.1	110	1.4	135	1.7
90	267	3.0	120	1.3	147	1.6
100	287	2.9	129	1.3	158	1.6
110	294	2.7	136	1.2	158	1.4
120	285	2.4	142	1.2	143	1.2
130	264	2.0	148	1.1	117	0.9
140	238	1.7	152	1.1	87	0.6
150	213	1.4	155	1.0	58	0.4
160	192	1.2	157	1.0	35	0.2
170	177	1.0	158	0.9	19	0.1
180	168	0.9	159	0.9	9	0.0
190	168	0.9	159	0.8	9	0.0
200	168	0.8	159	0.8	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=4 Yield Curve #=17

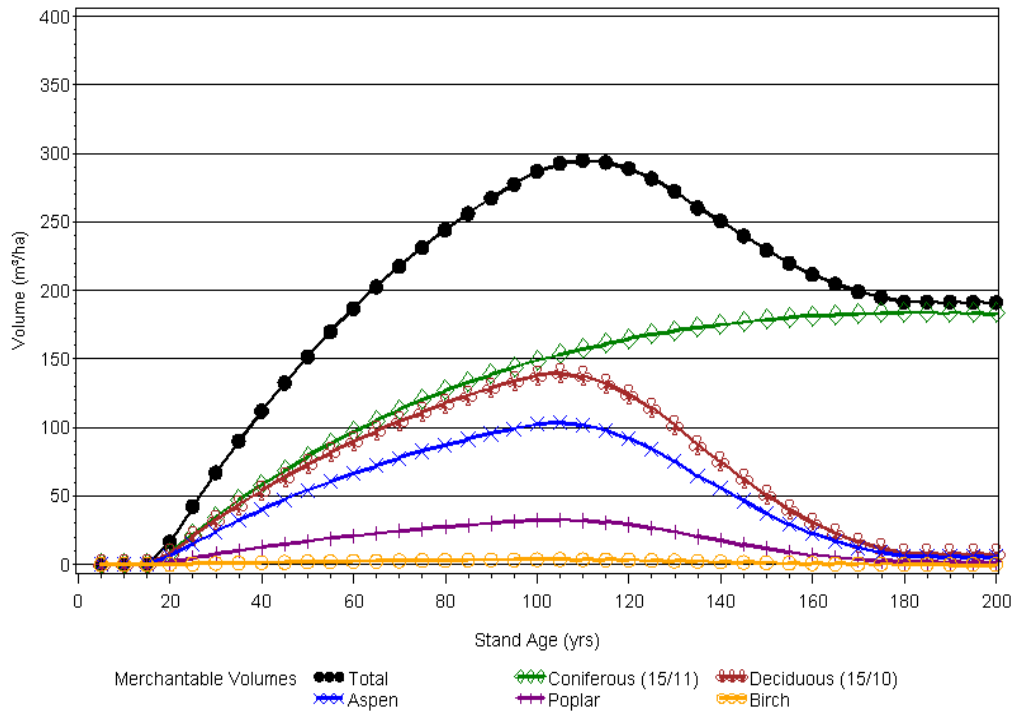


NSR & Site=LFG CC=C %Con=5 Yield Curve #=18

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	16	0.8	9	0.4	8	0.4
30	67	2.2	35	1.2	32	1.1
40	112	2.8	58	1.5	54	1.3
50	152	3.0	79	1.6	73	1.5
60	187	3.1	97	1.6	90	1.5
70	218	3.1	113	1.6	105	1.5
80	244	3.1	127	1.6	118	1.5
90	267	3.0	139	1.5	129	1.4
100	287	2.9	149	1.5	138	1.4
110	295	2.7	157	1.4	138	1.3
120	289	2.4	165	1.4	124	1.0
130	272	2.1	170	1.3	102	0.8
140	251	1.8	175	1.3	76	0.5
150	229	1.5	179	1.2	51	0.3
160	212	1.3	181	1.1	30	0.2
170	199	1.2	183	1.1	16	0.1
180	192	1.1	184	1.0	8	0.0
190	192	1.0	184	1.0	8	0.0
200	191	1.0	183	0.9	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=C %Con=5 Yield Curve #=18

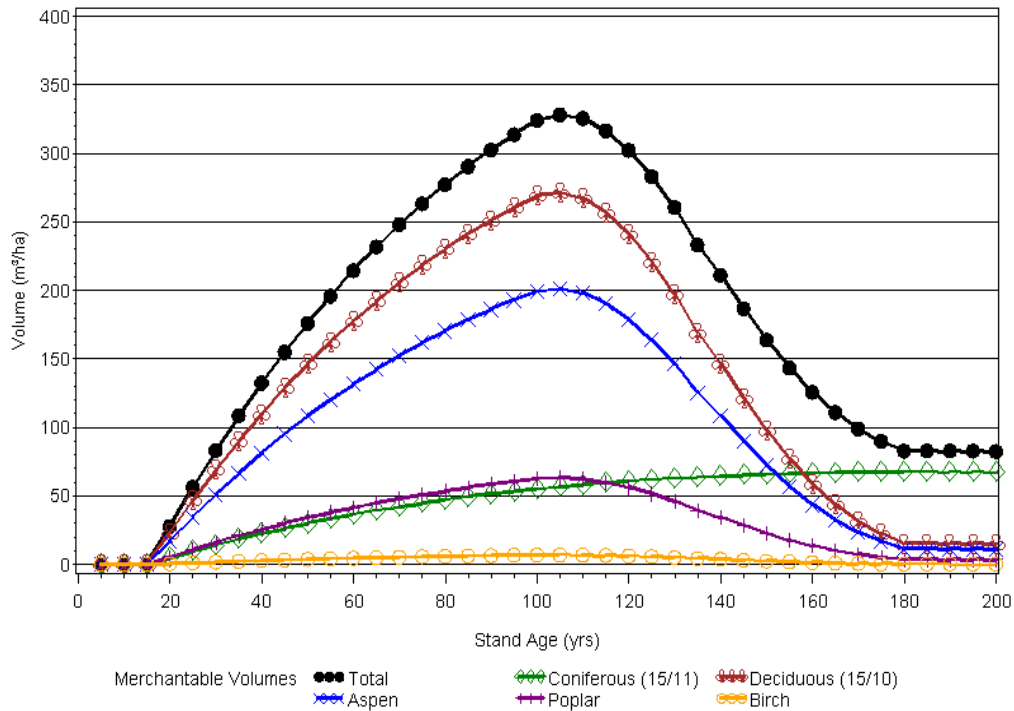


NSR & Site=LFG CC=D %Con=0 Yield Curve #=19

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	5	0.2	23	1.2
30	83	2.8	14	0.5	69	2.3
40	133	3.3	23	0.6	110	2.7
50	176	3.5	30	0.6	146	2.9
60	215	3.6	36	0.6	178	3.0
70	248	3.5	42	0.6	206	2.9
80	277	3.5	47	0.6	230	2.9
90	303	3.4	51	0.6	251	2.8
100	324	3.2	55	0.6	269	2.7
110	326	3.0	58	0.5	267	2.4
120	302	2.5	61	0.5	242	2.0
130	261	2.0	63	0.5	198	1.5
140	211	1.5	65	0.5	147	1.0
150	164	1.1	66	0.4	98	0.7
160	126	0.8	67	0.4	59	0.4
170	99	0.6	67	0.4	32	0.2
180	83	0.5	68	0.4	15	0.1
190	83	0.4	68	0.4	15	0.1
200	83	0.4	67	0.3	15	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=0 Yield Curve #=19

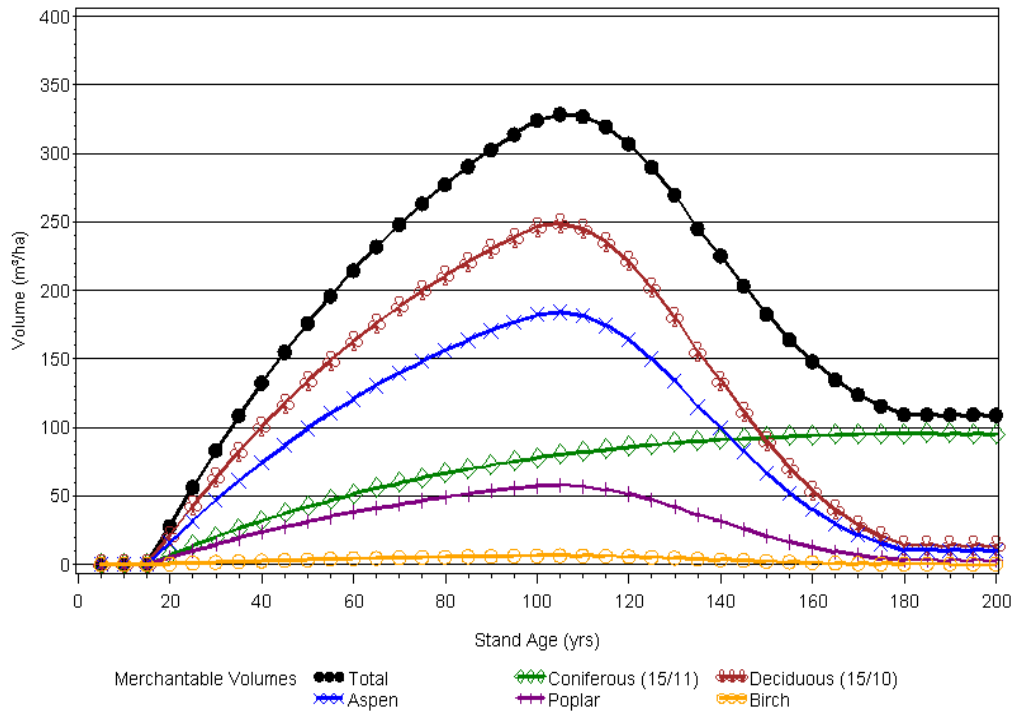


NSR & Site=LFG CC=D %Con=1 Yield Curve #=20

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	7	0.3	21	1.1
30	83	2.8	20	0.7	63	2.1
40	133	3.3	32	0.8	101	2.5
50	176	3.5	42	0.8	134	2.7
60	215	3.6	51	0.9	163	2.7
70	248	3.5	59	0.8	189	2.7
80	277	3.5	66	0.8	211	2.6
90	303	3.4	73	0.8	230	2.6
100	324	3.2	78	0.8	247	2.5
110	327	3.0	82	0.7	245	2.2
120	307	2.6	86	0.7	221	1.8
130	270	2.1	89	0.7	181	1.4
140	225	1.6	91	0.7	134	1.0
150	183	1.2	93	0.6	90	0.6
160	148	0.9	94	0.6	54	0.3
170	124	0.7	95	0.6	29	0.2
180	109	0.6	95	0.5	14	0.1
190	109	0.6	95	0.5	14	0.1
200	109	0.5	95	0.5	14	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=1 Yield Curve #=20

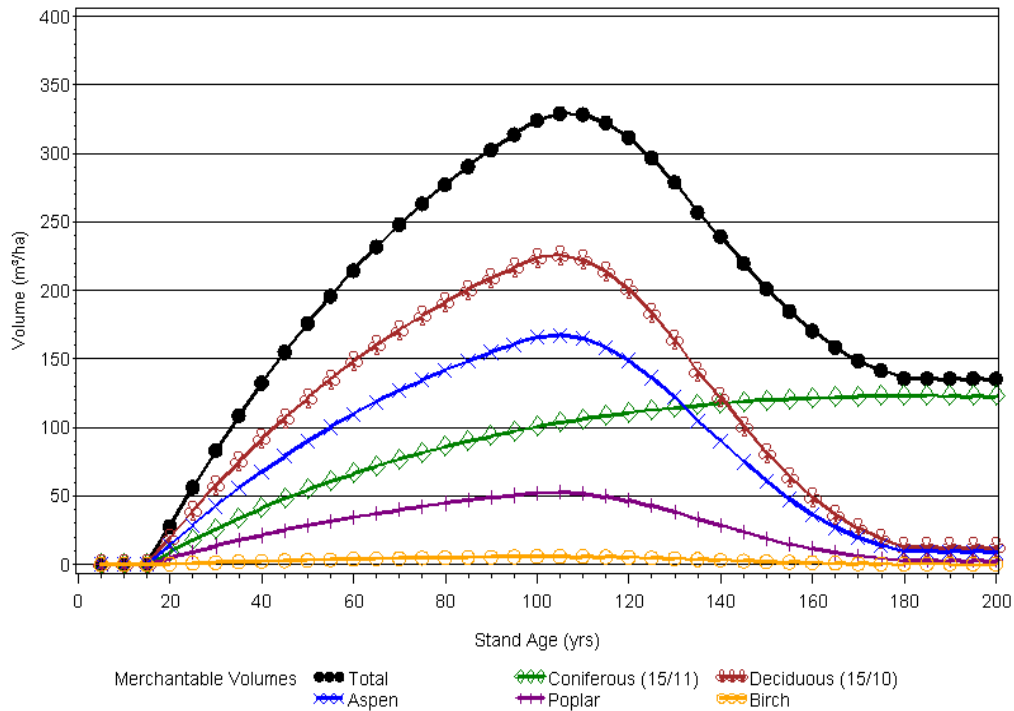


NSR & Site=LFG CC=D %Con=2 Yield Curve #=21

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	9	0.4	19	1.0
30	83	2.8	26	0.9	58	1.9
40	133	3.3	41	1.0	92	2.3
50	176	3.5	54	1.1	122	2.4
60	215	3.6	66	1.1	148	2.5
70	248	3.5	77	1.1	171	2.4
80	277	3.5	86	1.1	192	2.4
90	303	3.4	94	1.0	209	2.3
100	324	3.2	100	1.0	224	2.2
110	328	3.0	106	1.0	223	2.0
120	312	2.6	111	0.9	201	1.7
130	279	2.1	114	0.9	165	1.3
140	239	1.7	117	0.8	122	0.9
150	201	1.3	120	0.8	82	0.5
160	171	1.1	121	0.8	49	0.3
170	149	0.9	123	0.7	26	0.2
180	136	0.8	123	0.7	13	0.1
190	136	0.7	123	0.6	13	0.1
200	135	0.7	123	0.6	13	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=2 Yield Curve #=21

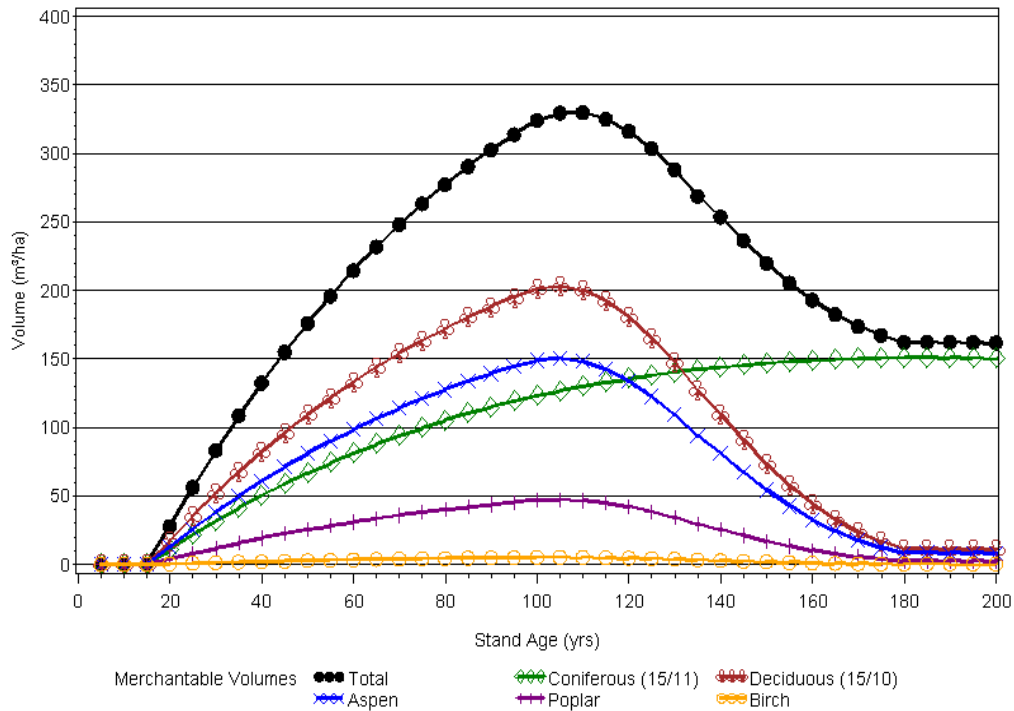


NSR & Site=LFG CC=D %Con=3 Yield Curve #=22

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	11	0.5	17	0.9
30	83	2.8	32	1.1	52	1.7
40	133	3.3	50	1.3	82	2.1
50	176	3.5	67	1.3	109	2.2
60	215	3.6	81	1.4	133	2.2
70	248	3.5	94	1.3	154	2.2
80	277	3.5	105	1.3	172	2.2
90	303	3.4	115	1.3	188	2.1
100	324	3.2	123	1.2	201	2.0
110	330	3.0	130	1.2	200	1.8
120	316	2.6	136	1.1	181	1.5
130	288	2.2	140	1.1	148	1.1
140	254	1.8	144	1.0	110	0.8
150	220	1.5	147	1.0	73	0.5
160	193	1.2	149	0.9	44	0.3
170	174	1.0	150	0.9	24	0.1
180	162	0.9	151	0.8	11	0.1
190	162	0.9	151	0.8	11	0.1
200	162	0.8	150	0.8	11	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=3 Yield Curve #=22

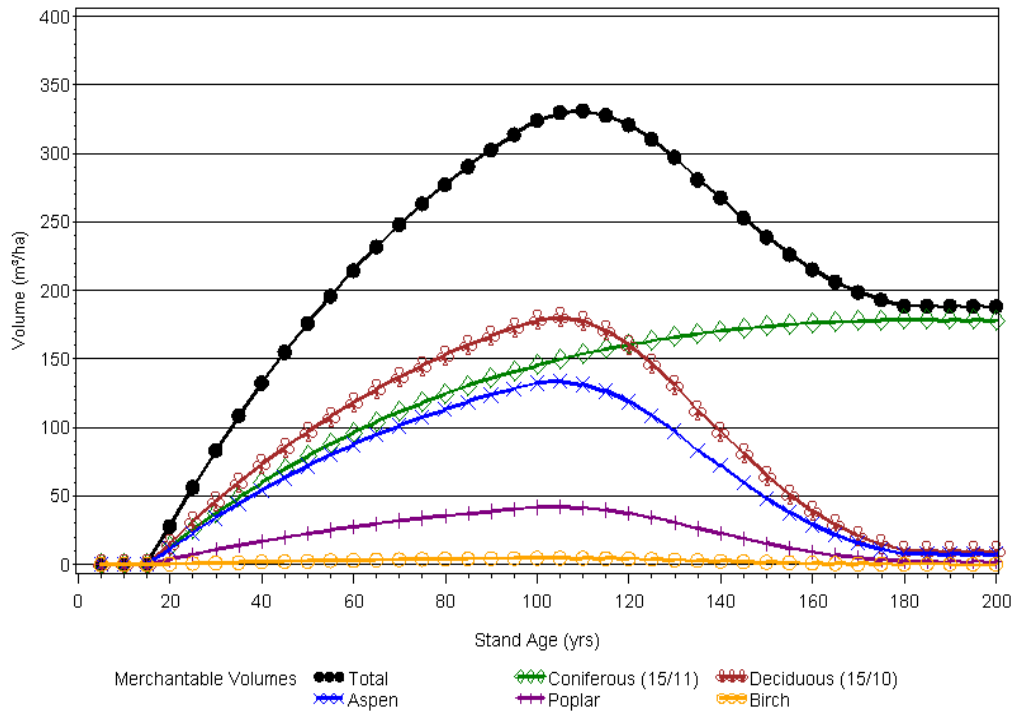


NSR & Site=LFG CC=D %Con=4 Yield Curve #=23

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	13	0.6	15	0.8
30	83	2.8	37	1.2	46	1.5
40	133	3.3	59	1.5	73	1.8
50	176	3.5	79	1.6	97	1.9
60	215	3.6	96	1.6	118	2.0
70	248	3.5	111	1.6	137	2.0
80	277	3.5	124	1.6	153	1.9
90	303	3.4	136	1.5	167	1.9
100	324	3.2	145	1.5	179	1.8
110	331	3.0	154	1.4	178	1.6
120	321	2.7	160	1.3	160	1.3
130	297	2.3	166	1.3	131	1.0
140	268	1.9	170	1.2	97	0.7
150	239	1.6	174	1.2	65	0.4
160	215	1.3	176	1.1	39	0.2
170	199	1.2	178	1.0	21	0.1
180	189	1.0	179	1.0	10	0.1
190	189	1.0	179	0.9	10	0.1
200	188	0.9	178	0.9	10	0.1

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=4 Yield Curve #=23

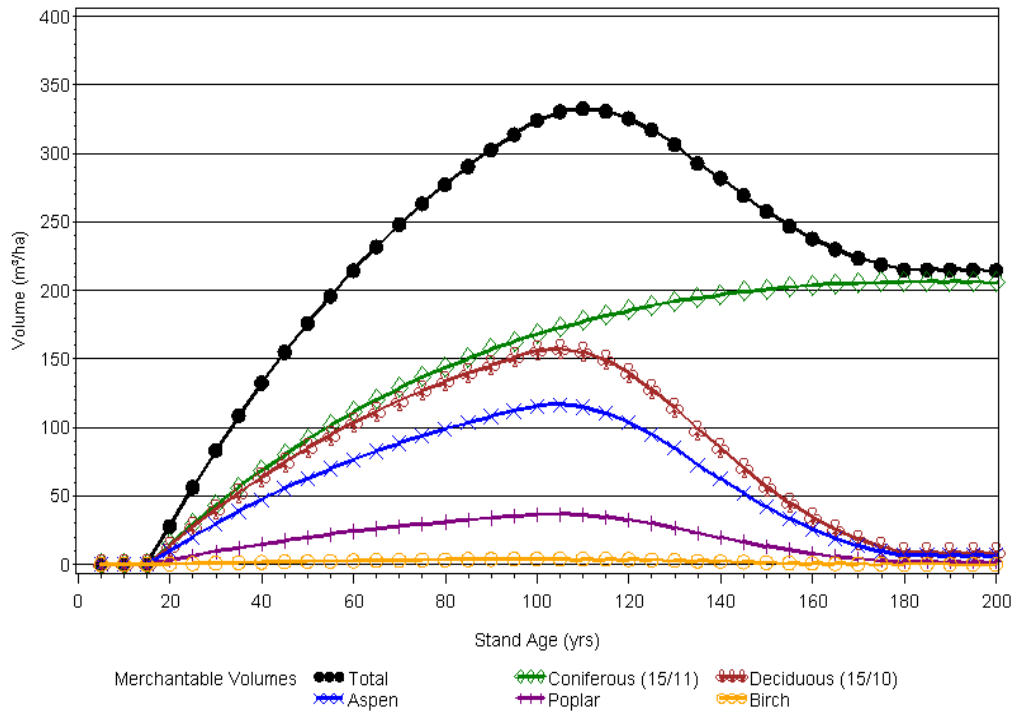


NSR & Site=LFG CC=D %Con=5 Yield Curve #=24

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	28	1.4	14	0.7	13	0.7
30	83	2.8	43	1.4	40	1.3
40	133	3.3	69	1.7	64	1.6
50	176	3.5	91	1.8	85	1.7
60	215	3.6	111	1.9	103	1.7
70	248	3.5	129	1.8	120	1.7
80	277	3.5	144	1.8	134	1.7
90	303	3.4	157	1.7	146	1.6
100	324	3.2	168	1.7	156	1.6
110	333	3.0	178	1.6	155	1.4
120	326	2.7	185	1.5	140	1.2
130	307	2.4	192	1.5	115	0.9
140	282	2.0	197	1.4	85	0.6
150	258	1.7	201	1.3	57	0.4
160	238	1.5	204	1.3	34	0.2
170	224	1.3	205	1.2	18	0.1
180	215	1.2	206	1.1	9	0.0
190	215	1.1	206	1.1	9	0.0
200	215	1.1	206	1.0	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=LFG CC=D %Con=5 Yield Curve #=24

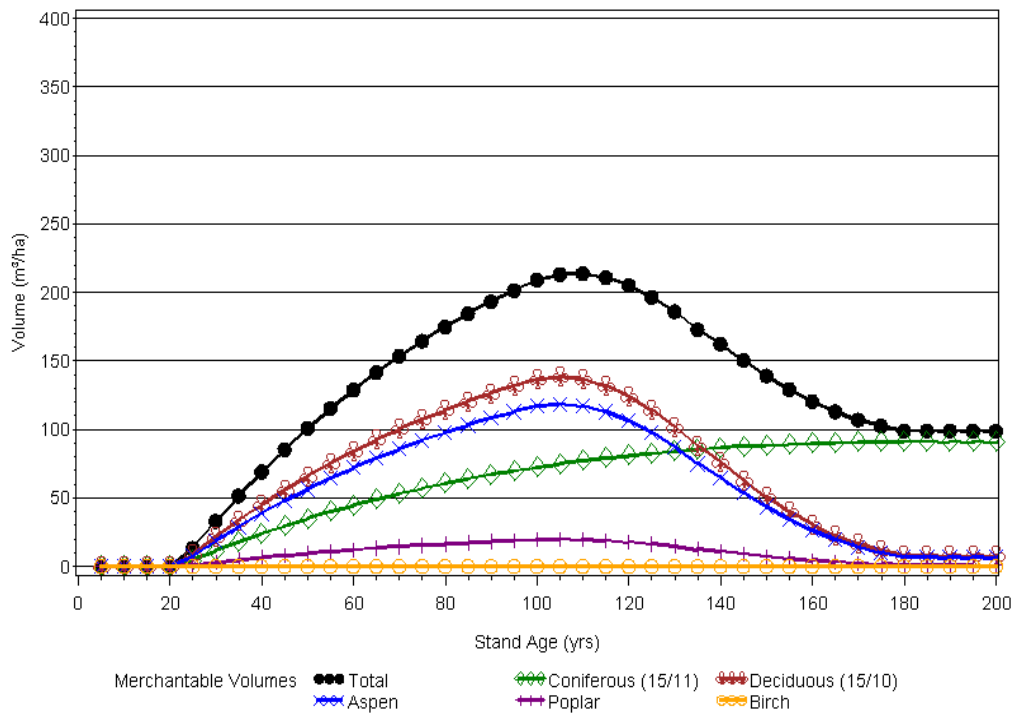


NSR & Site=UFG CC=A %Con=0 Yield Curve #=25

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	11	0.4	22	0.7
40	69	1.7	24	0.6	45	1.1
50	101	2.0	35	0.7	66	1.3
60	129	2.1	45	0.7	84	1.4
70	154	2.2	53	0.8	100	1.4
80	175	2.2	61	0.8	114	1.4
90	193	2.1	67	0.7	126	1.4
100	209	2.1	72	0.7	137	1.4
110	214	1.9	77	0.7	137	1.2
120	205	1.7	81	0.7	124	1.0
130	186	1.4	84	0.6	102	0.8
140	162	1.2	86	0.6	76	0.5
150	139	0.9	88	0.6	51	0.3
160	120	0.8	90	0.6	31	0.2
170	107	0.6	91	0.5	16	0.1
180	99	0.5	91	0.5	8	0.0
190	99	0.5	91	0.5	8	0.0
200	99	0.5	91	0.5	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=0 Yield Curve #=25

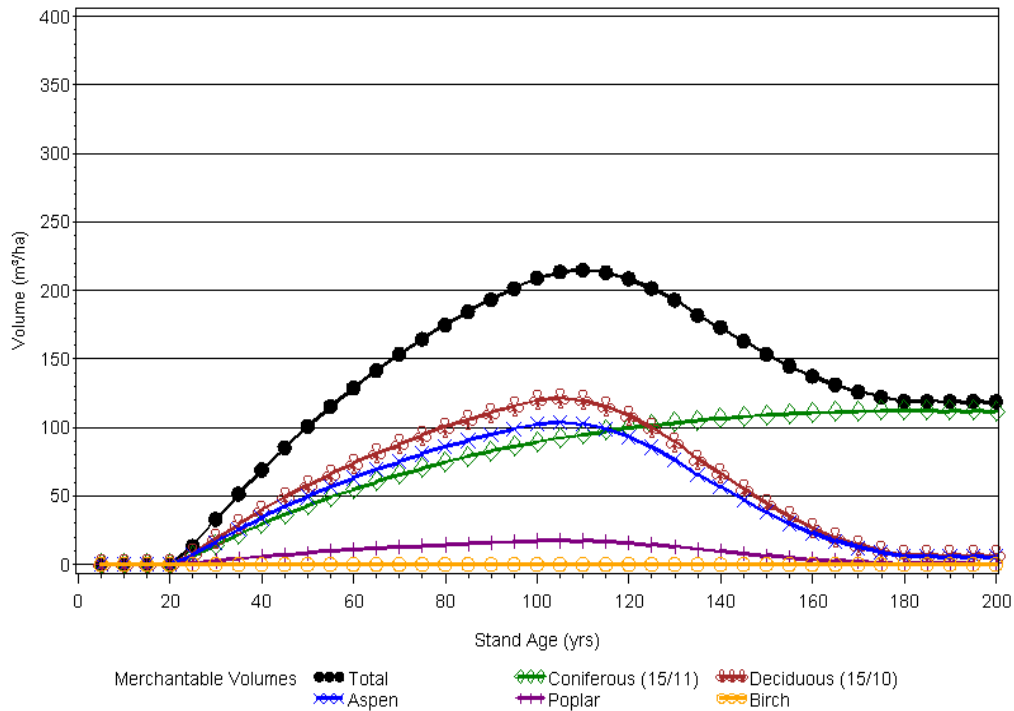


NSR & Site=UFG CC=A %Con=1 Yield Curve #=26

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	14	0.5	19	0.6
40	69	1.7	29	0.7	40	1.0
50	101	2.0	43	0.9	58	1.2
60	129	2.1	55	0.9	74	1.2
70	154	2.2	66	0.9	88	1.3
80	175	2.2	75	0.9	100	1.3
90	193	2.1	83	0.9	111	1.2
100	209	2.1	89	0.9	120	1.2
110	215	2.0	95	0.9	120	1.1
120	209	1.7	100	0.8	109	0.9
130	193	1.5	104	0.8	90	0.7
140	173	1.2	107	0.8	67	0.5
150	154	1.0	109	0.7	45	0.3
160	137	0.9	111	0.7	27	0.2
170	126	0.7	112	0.7	14	0.1
180	119	0.7	112	0.6	7	0.0
190	119	0.6	112	0.6	7	0.0
200	119	0.6	112	0.6	7	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=1 Yield Curve #=26

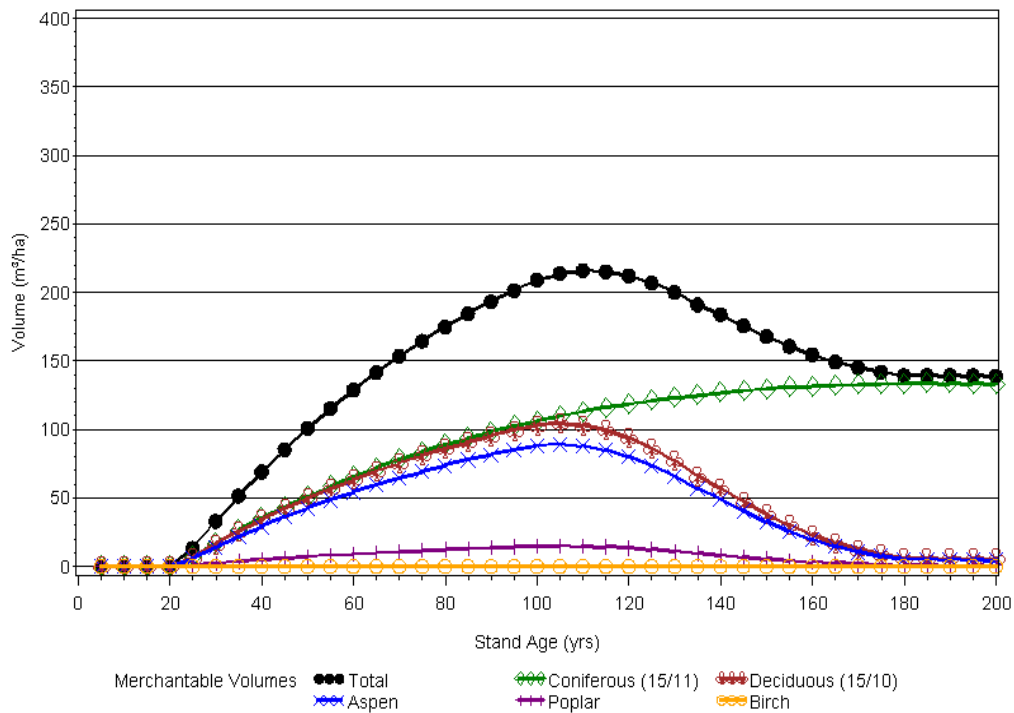


NSR & Site=UFG CC=A %Con=2 Yield Curve #=27

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	17	0.6	16	0.5
40	69	1.7	35	0.9	34	0.8
50	101	2.0	51	1.0	50	1.0
60	129	2.1	65	1.1	64	1.1
70	154	2.2	78	1.1	76	1.1
80	175	2.2	89	1.1	86	1.1
90	193	2.1	98	1.1	95	1.1
100	209	2.1	106	1.1	103	1.0
110	216	2.0	113	1.0	103	0.9
120	212	1.8	119	1.0	94	0.8
130	200	1.5	123	0.9	77	0.6
140	184	1.3	127	0.9	57	0.4
150	168	1.1	130	0.9	38	0.3
160	155	1.0	132	0.8	23	0.1
170	145	0.9	133	0.8	12	0.1
180	139	0.8	133	0.7	6	0.0
190	140	0.7	134	0.7	6	0.0
200	139	0.7	133	0.7	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=2 Yield Curve #=27

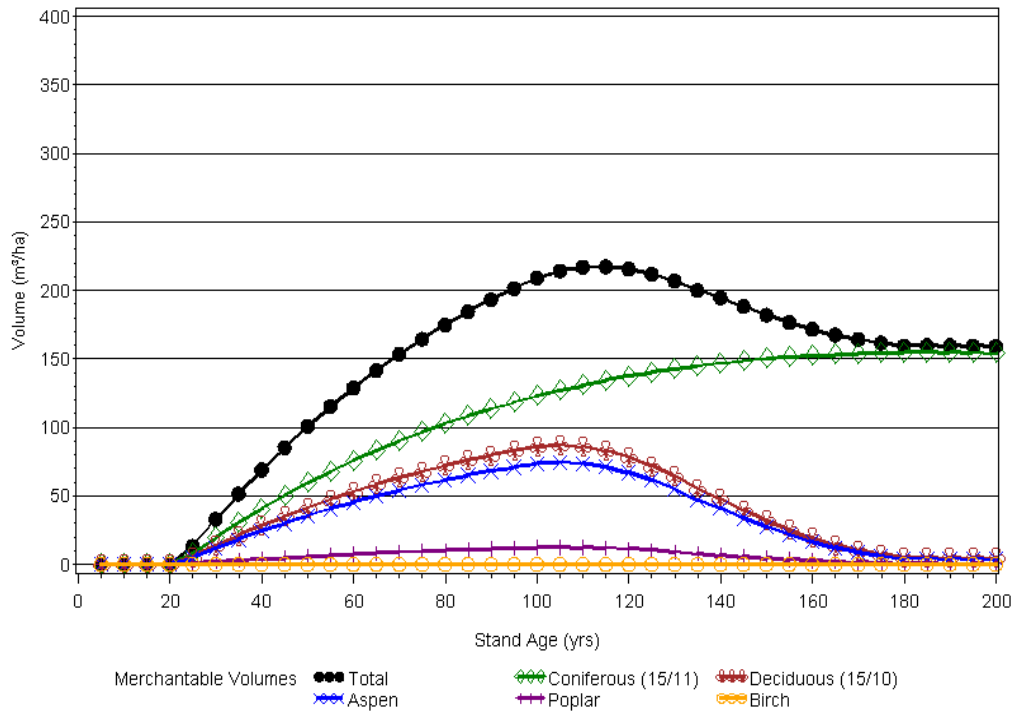


NSR & Site=UFG CC=A %Con=3 Yield Curve #=28

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	19	0.6	14	0.5
40	69	1.7	41	1.0	28	0.7
50	101	2.0	59	1.2	42	0.8
60	129	2.1	76	1.3	53	0.9
70	154	2.2	90	1.3	63	0.9
80	175	2.2	103	1.3	72	0.9
90	193	2.1	114	1.3	80	0.9
100	209	2.1	123	1.2	86	0.9
110	217	2.0	131	1.2	86	0.8
120	216	1.8	137	1.1	78	0.7
130	207	1.6	143	1.1	64	0.5
140	195	1.4	147	1.0	48	0.3
150	182	1.2	150	1.0	32	0.2
160	172	1.1	152	1.0	19	0.1
170	164	1.0	154	0.9	10	0.1
180	160	0.9	155	0.9	5	0.0
190	160	0.8	155	0.8	5	0.0
200	159	0.8	154	0.8	5	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=3 Yield Curve #=28

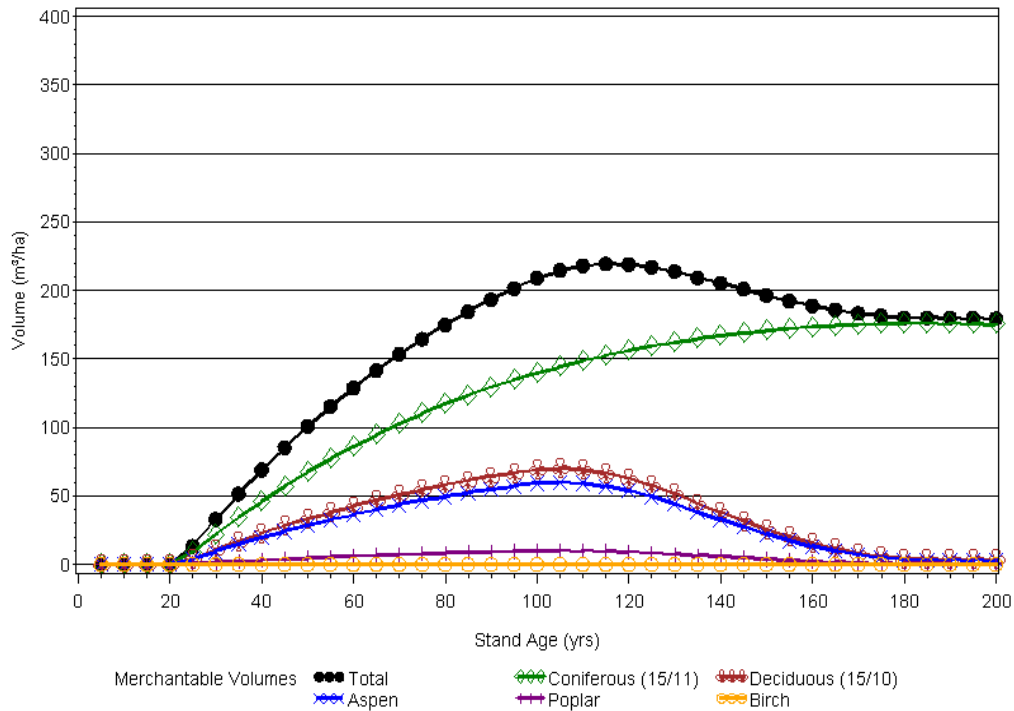


NSR & Site=UFG CC=A %Con=4 Yield Curve #=29

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	22	0.7	11	0.4
40	69	1.7	46	1.2	23	0.6
50	101	2.0	67	1.3	33	0.7
60	129	2.1	86	1.4	43	0.7
70	154	2.2	103	1.5	51	0.7
80	175	2.2	117	1.5	58	0.7
90	193	2.1	129	1.4	64	0.7
100	209	2.1	140	1.4	69	0.7
110	218	2.0	149	1.4	69	0.6
120	219	1.8	156	1.3	63	0.5
130	214	1.6	162	1.2	52	0.4
140	205	1.5	167	1.2	38	0.3
150	196	1.3	171	1.1	26	0.2
160	189	1.2	173	1.1	16	0.1
170	183	1.1	175	1.0	8	0.0
180	180	1.0	176	1.0	4	0.0
190	180	0.9	176	0.9	4	0.0
200	179	0.9	175	0.9	4	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=4 Yield Curve #=29

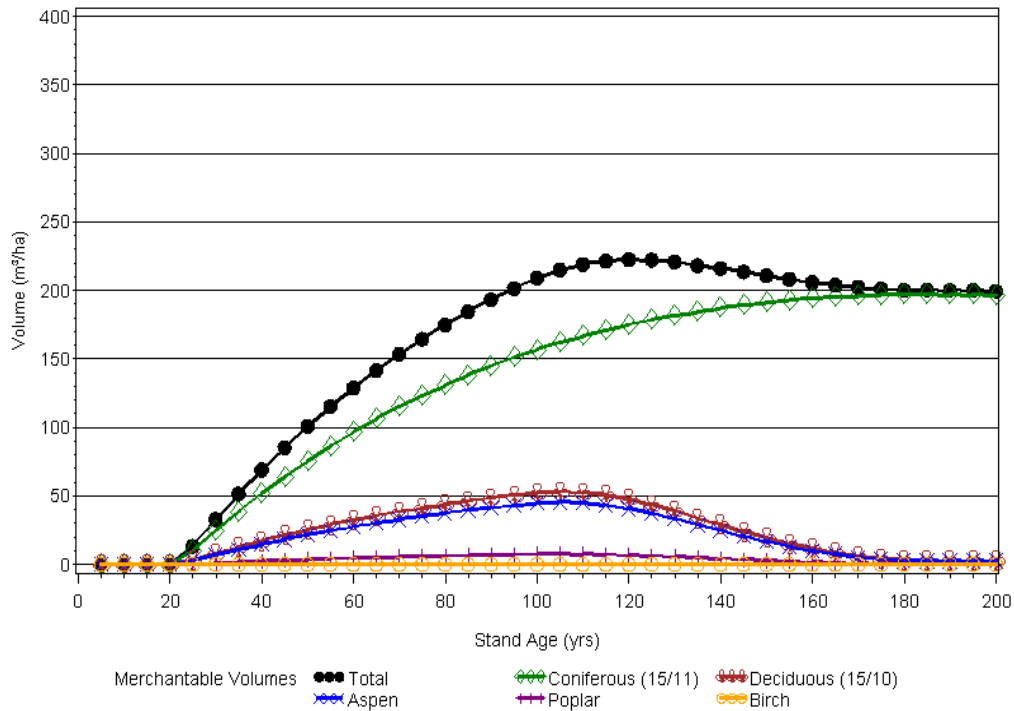


NSR & Site=UFG CC=A %Con=5 Yield Curve #=30

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	33	1.1	25	0.8	8	0.3
40	69	1.7	52	1.3	17	0.4
50	101	2.0	76	1.5	25	0.5
60	129	2.1	97	1.6	32	0.5
70	154	2.2	115	1.6	38	0.5
80	175	2.2	131	1.6	44	0.5
90	193	2.1	145	1.6	48	0.5
100	209	2.1	157	1.6	52	0.5
110	219	2.0	167	1.5	52	0.5
120	223	1.9	175	1.5	48	0.4
130	221	1.7	182	1.4	39	0.3
140	216	1.5	187	1.3	29	0.2
150	211	1.4	191	1.3	19	0.1
160	206	1.3	194	1.2	12	0.1
170	202	1.2	196	1.2	6	0.0
180	200	1.1	197	1.1	3	0.0
190	200	1.1	197	1.0	3	0.0
200	200	1.0	197	1.0	3	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=A %Con=5 Yield Curve #=30

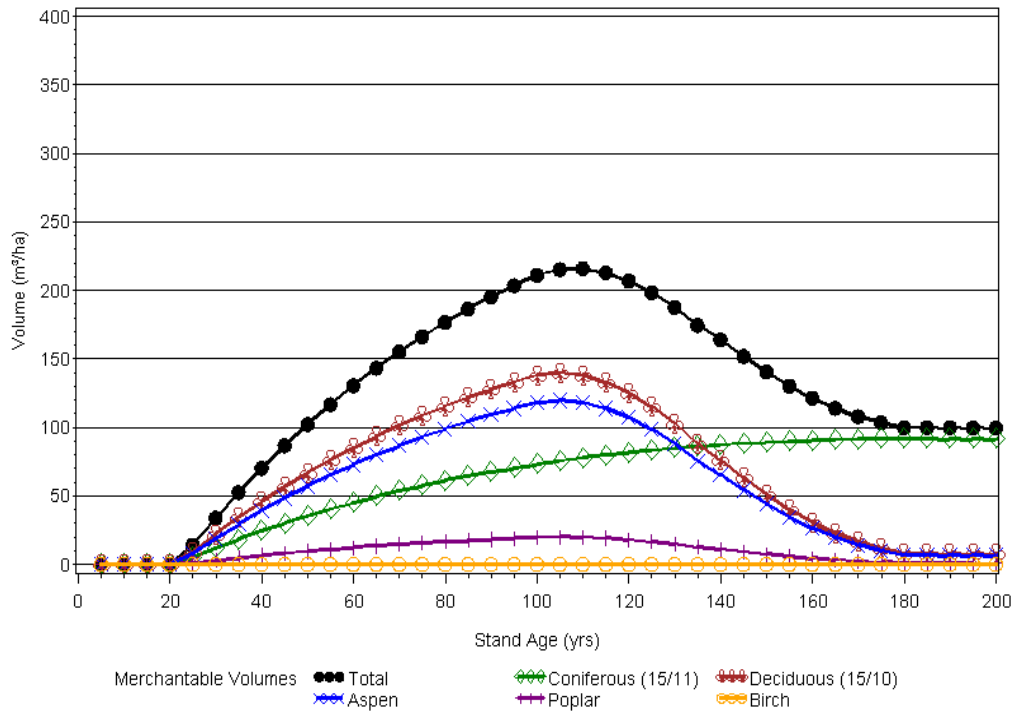


NSR & Site=UFG CC=B %Con=0 Yield Curve #=31

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	12	0.4	22	0.7
40	70	1.8	24	0.6	46	1.1
50	102	2.0	35	0.7	67	1.3
60	130	2.2	45	0.8	85	1.4
70	155	2.2	54	0.8	102	1.5
80	177	2.2	61	0.8	116	1.4
90	195	2.2	68	0.8	128	1.4
100	211	2.1	73	0.7	138	1.4
110	216	2.0	78	0.7	138	1.3
120	207	1.7	82	0.7	125	1.0
130	188	1.4	85	0.7	103	0.8
140	164	1.2	87	0.6	77	0.5
150	141	0.9	89	0.6	51	0.3
160	121	0.8	91	0.6	31	0.2
170	108	0.6	91	0.5	17	0.1
180	100	0.6	92	0.5	8	0.0
190	100	0.5	92	0.5	8	0.0
200	100	0.5	92	0.5	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=0 Yield Curve #=31

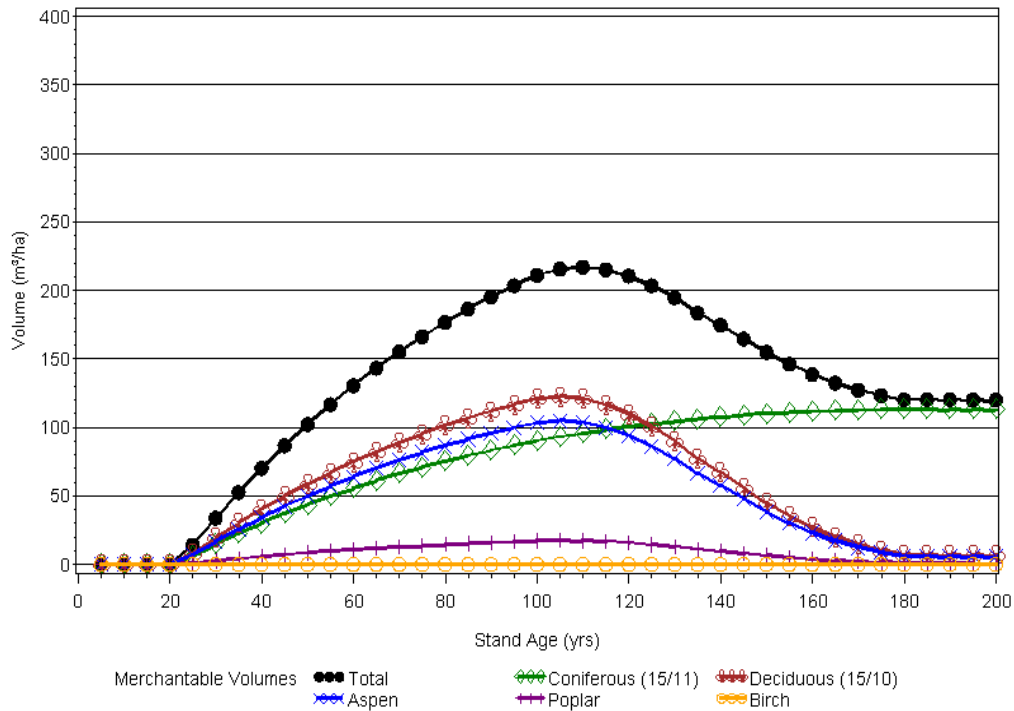


NSR & Site=UFG CC=B %Con=1 Yield Curve #=32

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	14	0.5	19	0.6
40	70	1.8	30	0.7	40	1.0
50	102	2.0	44	0.9	59	1.2
60	130	2.2	56	0.9	75	1.2
70	155	2.2	66	0.9	89	1.3
80	177	2.2	75	0.9	101	1.3
90	195	2.2	83	0.9	112	1.2
100	211	2.1	90	0.9	121	1.2
110	217	2.0	96	0.9	121	1.1
120	211	1.8	101	0.8	110	0.9
130	195	1.5	104	0.8	90	0.7
140	175	1.2	108	0.8	67	0.5
150	155	1.0	110	0.7	45	0.3
160	139	0.9	112	0.7	27	0.2
170	127	0.7	113	0.7	15	0.1
180	120	0.7	113	0.6	7	0.0
190	120	0.6	113	0.6	7	0.0
200	120	0.6	113	0.6	7	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=1 Yield Curve #=32

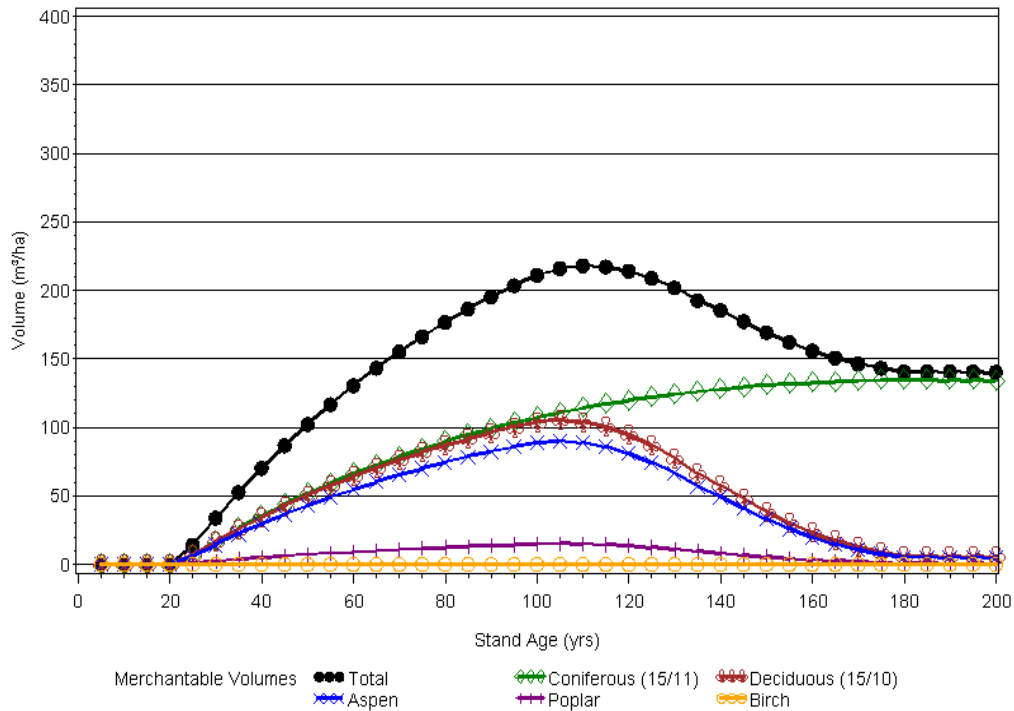


NSR & Site=UFG CC=B %Con=2 Yield Curve #=33

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	17	0.6	17	0.6
40	70	1.8	36	0.9	35	0.9
50	102	2.0	52	1.0	50	1.0
60	130	2.2	66	1.1	64	1.1
70	155	2.2	79	1.1	76	1.1
80	177	2.2	90	1.1	87	1.1
90	195	2.2	99	1.1	96	1.1
100	211	2.1	107	1.1	104	1.0
110	218	2.0	114	1.0	104	0.9
120	214	1.8	120	1.0	95	0.8
130	202	1.6	124	1.0	78	0.6
140	186	1.3	128	0.9	58	0.4
150	169	1.1	131	0.9	39	0.3
160	156	1.0	133	0.8	23	0.1
170	147	0.9	134	0.8	12	0.1
180	141	0.8	135	0.7	6	0.0
190	141	0.7	135	0.7	6	0.0
200	140	0.7	134	0.7	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=2 Yield Curve #=33

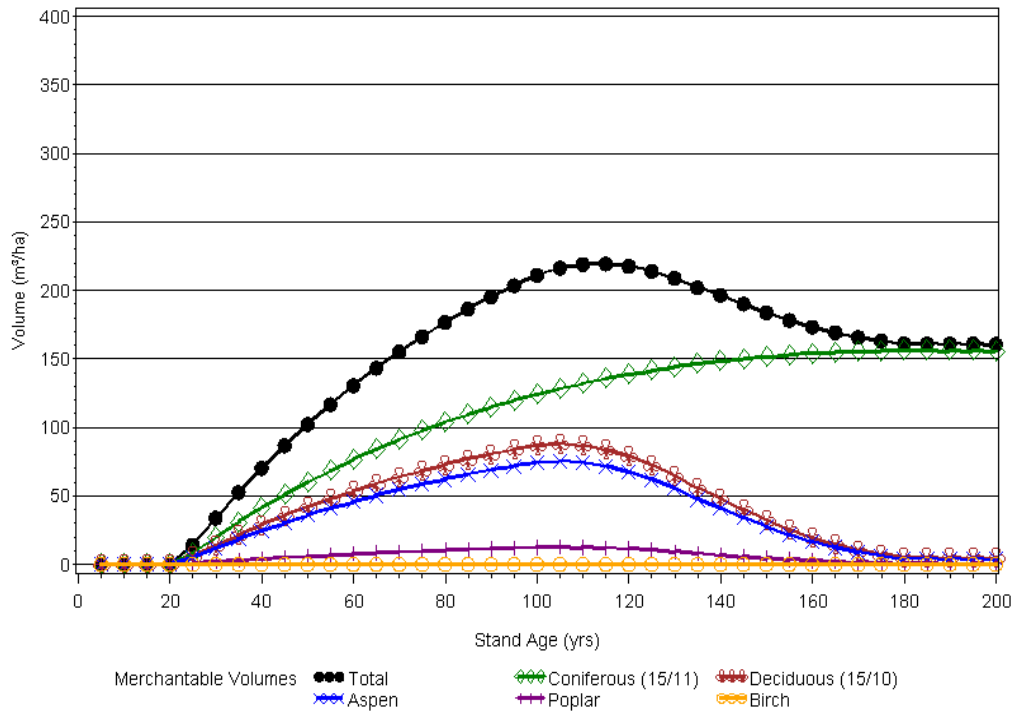


NSR & Site=UFG CC=B %Con=3 Yield Curve #=34

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	20	0.7	14	0.5
40	70	1.8	41	1.0	29	0.7
50	102	2.0	60	1.2	42	0.8
60	130	2.2	77	1.3	54	0.9
70	155	2.2	91	1.3	64	0.9
80	177	2.2	104	1.3	73	0.9
90	195	2.2	115	1.3	80	0.9
100	211	2.1	124	1.2	87	0.9
110	219	2.0	132	1.2	87	0.8
120	218	1.8	139	1.2	79	0.7
130	209	1.6	144	1.1	65	0.5
140	197	1.4	148	1.1	48	0.3
150	184	1.2	152	1.0	32	0.2
160	173	1.1	154	1.0	19	0.1
170	166	1.0	155	0.9	10	0.1
180	161	0.9	156	0.9	5	0.0
190	161	0.8	156	0.8	5	0.0
200	161	0.8	156	0.8	5	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=3 Yield Curve #=34

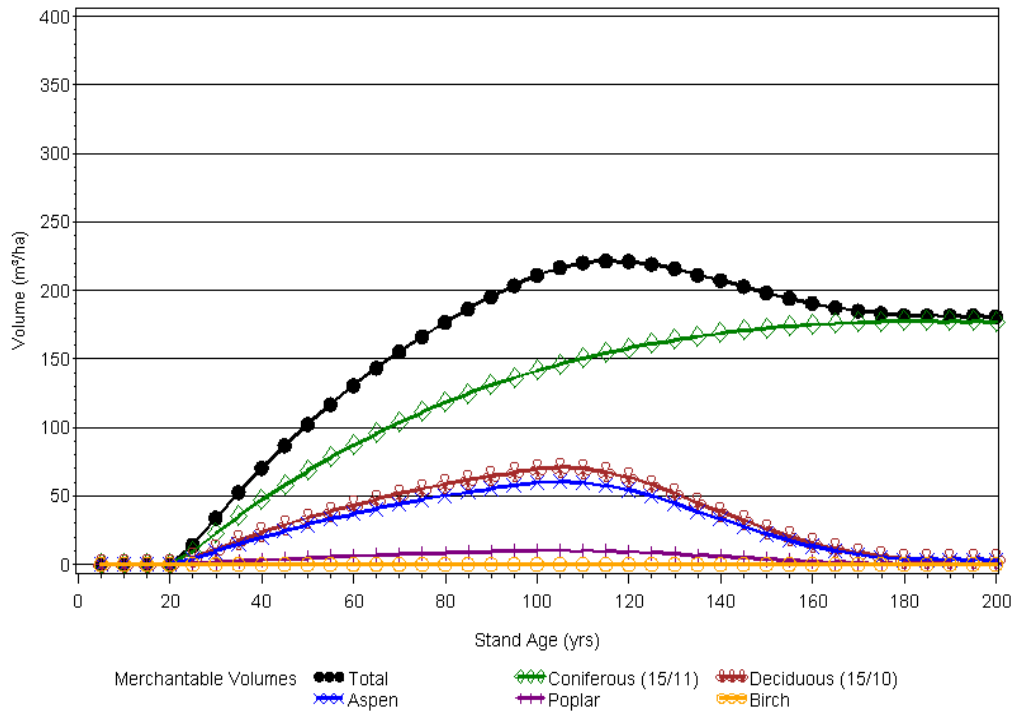


NSR & Site=UFG CC=B %Con=4 Yield Curve #=35

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	23	0.8	11	0.4
40	70	1.8	47	1.2	23	0.6
50	102	2.0	68	1.4	34	0.7
60	130	2.2	87	1.5	43	0.7
70	155	2.2	104	1.5	51	0.7
80	177	2.2	118	1.5	59	0.7
90	195	2.2	131	1.5	65	0.7
100	211	2.1	141	1.4	70	0.7
110	220	2.0	150	1.4	70	0.6
120	221	1.8	158	1.3	64	0.5
130	216	1.7	164	1.3	52	0.4
140	207	1.5	169	1.2	39	0.3
150	198	1.3	172	1.1	26	0.2
160	191	1.2	175	1.1	16	0.1
170	185	1.1	177	1.0	8	0.0
180	182	1.0	178	1.0	4	0.0
190	182	1.0	178	0.9	4	0.0
200	181	0.9	177	0.9	4	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=4 Yield Curve #=35

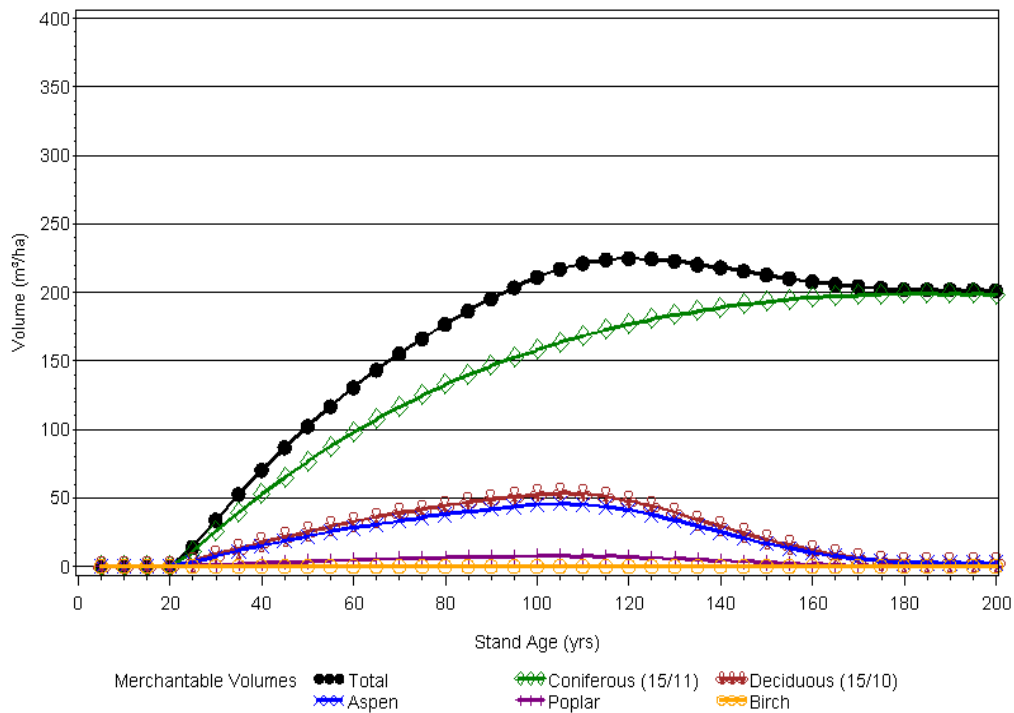


NSR & Site=UFG CC=B %Con=5 Yield Curve #=36

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	34	1.1	25	0.8	8	0.3
40	70	1.8	53	1.3	18	0.4
50	102	2.0	77	1.5	26	0.5
60	130	2.2	98	1.6	33	0.5
70	155	2.2	116	1.7	39	0.6
80	177	2.2	132	1.7	44	0.6
90	195	2.2	146	1.6	49	0.5
100	211	2.1	158	1.6	53	0.5
110	221	2.0	168	1.5	53	0.5
120	225	1.9	177	1.5	48	0.4
130	223	1.7	184	1.4	39	0.3
140	218	1.6	189	1.3	29	0.2
150	213	1.4	193	1.3	20	0.1
160	208	1.3	196	1.2	12	0.1
170	204	1.2	198	1.2	6	0.0
180	202	1.1	199	1.1	3	0.0
190	202	1.1	199	1.0	3	0.0
200	202	1.0	198	1.0	3	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=B %Con=5 Yield Curve #=36

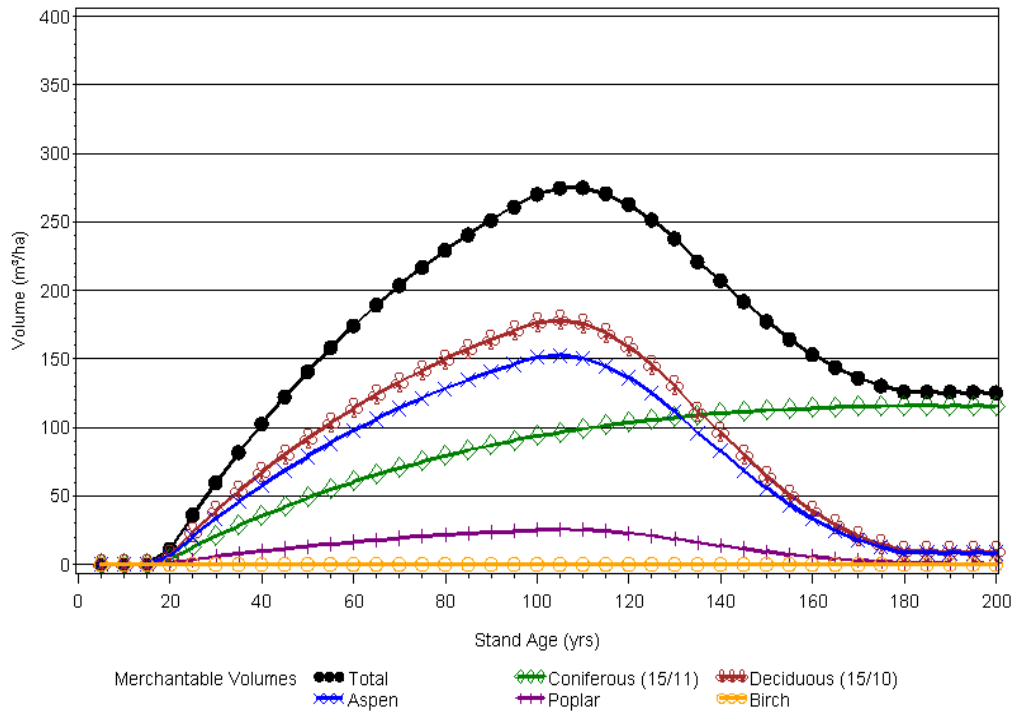


NSR & Site=UFG CC=C %Con=0 Yield Curve #=37

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	4	0.2	7	0.4
30	60	2.0	21	0.7	39	1.3
40	103	2.6	36	0.9	67	1.7
50	141	2.8	49	1.0	92	1.8
60	174	2.9	60	1.0	114	1.9
70	204	2.9	70	1.0	133	1.9
80	229	2.9	79	1.0	150	1.9
90	251	2.8	87	1.0	164	1.8
100	270	2.7	93	0.9	177	1.8
110	275	2.5	99	0.9	176	1.6
120	263	2.2	104	0.9	159	1.3
130	238	1.8	107	0.8	131	1.0
140	207	1.5	110	0.8	97	0.7
150	177	1.2	113	0.8	65	0.4
160	153	1.0	114	0.7	39	0.2
170	136	0.8	115	0.7	21	0.1
180	126	0.7	116	0.6	10	0.1
190	126	0.7	116	0.6	10	0.1
200	126	0.6	115	0.6	10	0.1

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=0 Yield Curve #=37

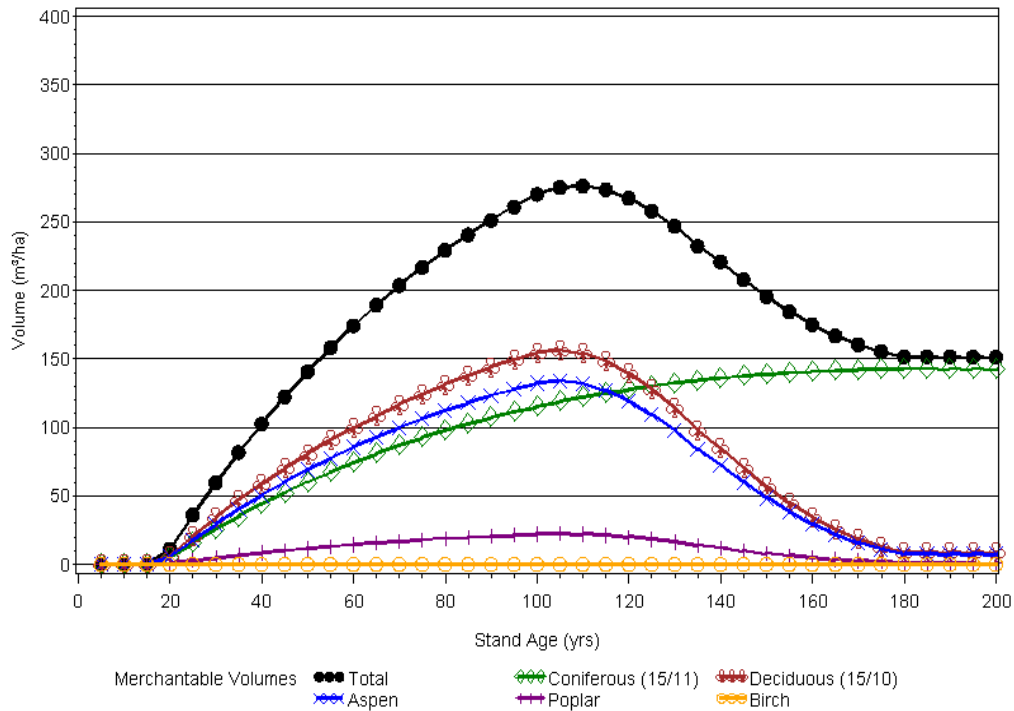


NSR & Site=UFG CC=C %Con=1 Yield Curve #=38

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	5	0.2	6	0.3
30	60	2.0	25	0.8	34	1.1
40	103	2.6	44	1.1	59	1.5
50	141	2.8	60	1.2	81	1.6
60	174	2.9	74	1.2	100	1.7
70	204	2.9	87	1.2	117	1.7
80	229	2.9	98	1.2	131	1.6
90	251	2.8	107	1.2	144	1.6
100	270	2.7	115	1.2	155	1.5
110	276	2.5	122	1.1	154	1.4
120	267	2.2	128	1.1	140	1.2
130	247	1.9	132	1.0	114	0.9
140	221	1.6	136	1.0	85	0.6
150	196	1.3	139	0.9	57	0.4
160	175	1.1	141	0.9	34	0.2
170	160	0.9	142	0.8	18	0.1
180	152	0.8	143	0.8	9	0.0
190	152	0.8	143	0.8	9	0.0
200	151	0.8	142	0.7	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=1 Yield Curve #=38

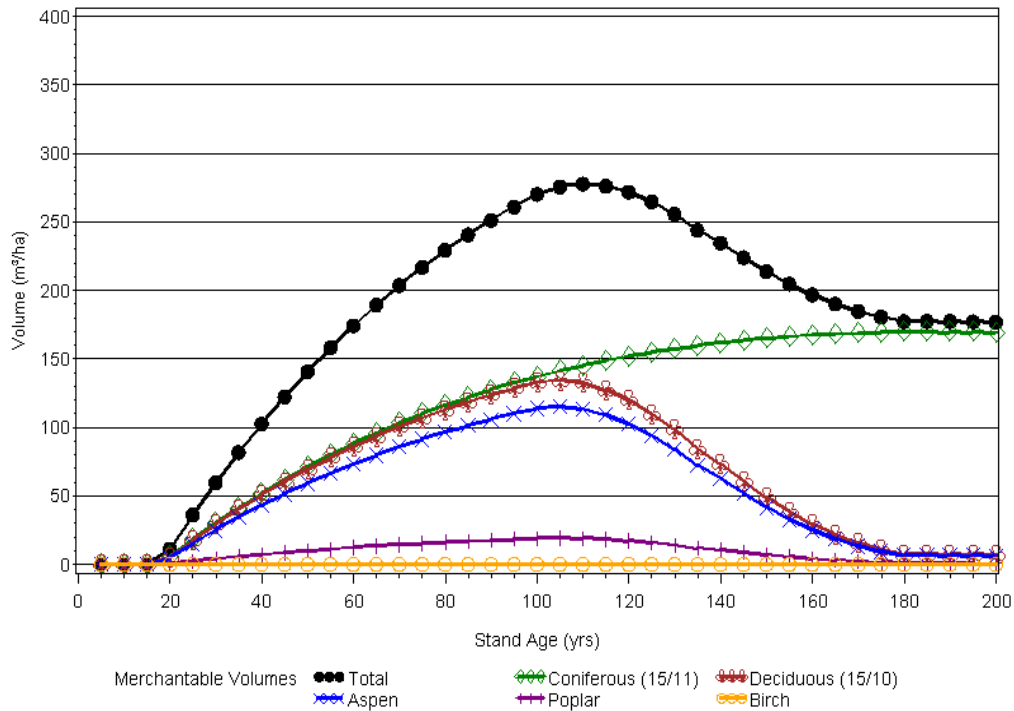


NSR & Site=UFG CC=C %Con=2 Yield Curve #=39

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	6	0.3	6	0.3
30	60	2.0	30	1.0	29	1.0
40	103	2.6	52	1.3	51	1.3
50	141	2.8	71	1.4	69	1.4
60	174	2.9	88	1.5	86	1.4
70	204	2.9	103	1.5	100	1.4
80	229	2.9	116	1.5	113	1.4
90	251	2.8	128	1.4	124	1.4
100	270	2.7	137	1.4	133	1.3
110	278	2.5	145	1.3	133	1.2
120	272	2.3	152	1.3	120	1.0
130	256	2.0	157	1.2	98	0.8
140	235	1.7	162	1.2	73	0.5
150	214	1.4	165	1.1	49	0.3
160	197	1.2	167	1.0	29	0.2
170	185	1.1	169	1.0	16	0.1
180	177	1.0	170	0.9	8	0.0
190	177	0.9	170	0.9	8	0.0
200	177	0.9	169	0.8	8	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=2 Yield Curve #=39

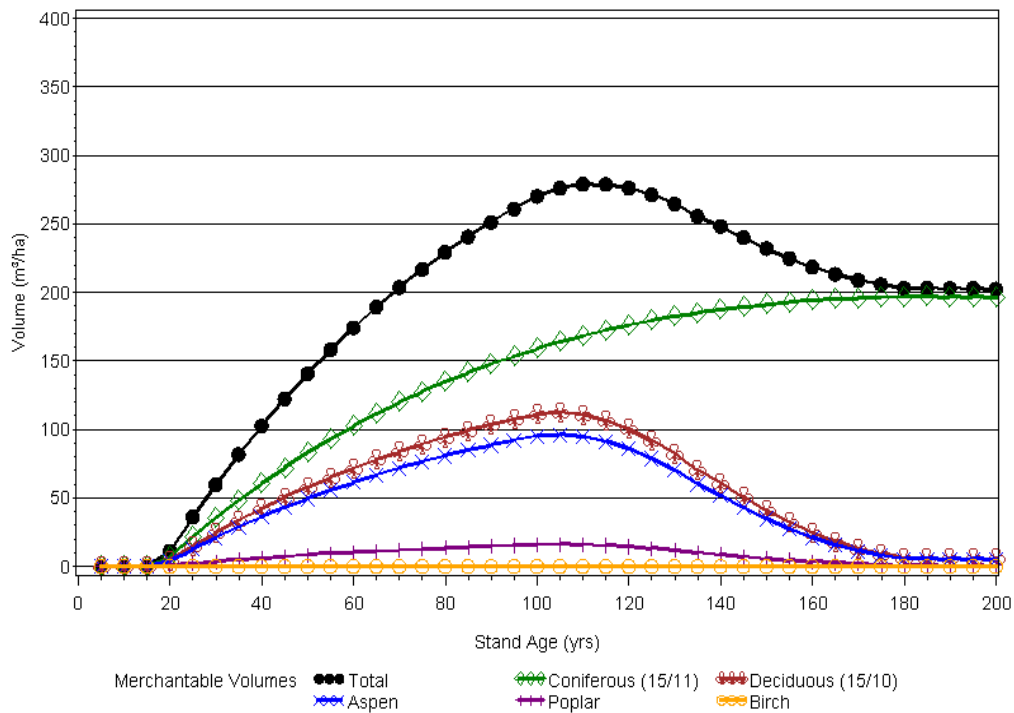


NSR & Site=UFG CC=C %Con=3 Yield Curve #=40

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	7	0.3	5	0.2
30	60	2.0	35	1.2	25	0.8
40	103	2.6	60	1.5	42	1.1
50	141	2.8	83	1.7	58	1.2
60	174	2.9	103	1.7	72	1.2
70	204	2.9	120	1.7	84	1.2
80	229	2.9	135	1.7	94	1.2
90	251	2.8	148	1.6	103	1.1
100	270	2.7	159	1.6	111	1.1
110	279	2.5	168	1.5	111	1.0
120	276	2.3	176	1.5	100	0.8
130	265	2.0	182	1.4	82	0.6
140	248	1.8	187	1.3	61	0.4
150	232	1.5	191	1.3	41	0.3
160	219	1.4	194	1.2	25	0.2
170	209	1.2	196	1.2	13	0.1
180	203	1.1	197	1.1	6	0.0
190	203	1.1	197	1.0	6	0.0
200	203	1.0	196	1.0	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=3 Yield Curve #=40

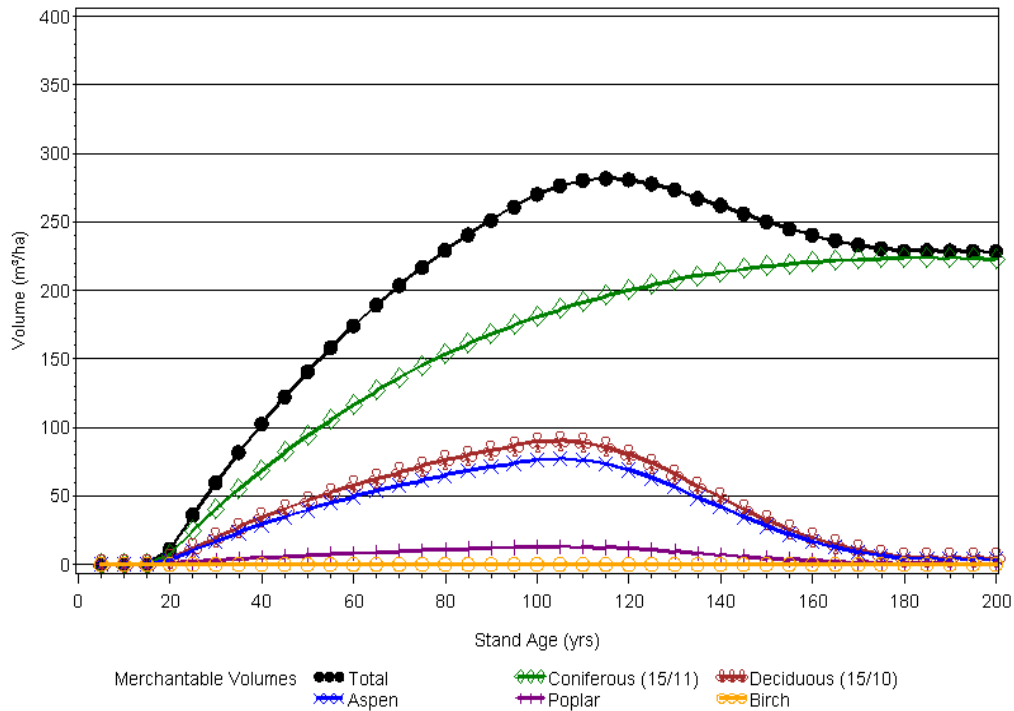


NSR & Site=UFG CC=C %Con=4 Yield Curve #=41

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	8	0.4	4	0.2
30	60	2.0	40	1.3	20	0.7
40	103	2.6	69	1.7	34	0.8
50	141	2.8	94	1.9	47	0.9
60	174	2.9	117	1.9	58	1.0
70	204	2.9	136	1.9	67	1.0
80	229	2.9	153	1.9	76	0.9
90	251	2.8	168	1.9	83	0.9
100	270	2.7	181	1.8	89	0.9
110	280	2.5	191	1.7	89	0.8
120	281	2.3	200	1.7	81	0.7
130	274	2.1	207	1.6	66	0.5
140	262	1.9	213	1.5	49	0.4
150	250	1.7	218	1.5	33	0.2
160	240	1.5	221	1.4	20	0.1
170	233	1.4	223	1.3	11	0.1
180	229	1.3	224	1.2	5	0.0
190	229	1.2	224	1.2	5	0.0
200	228	1.1	223	1.1	5	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=4 Yield Curve #=41

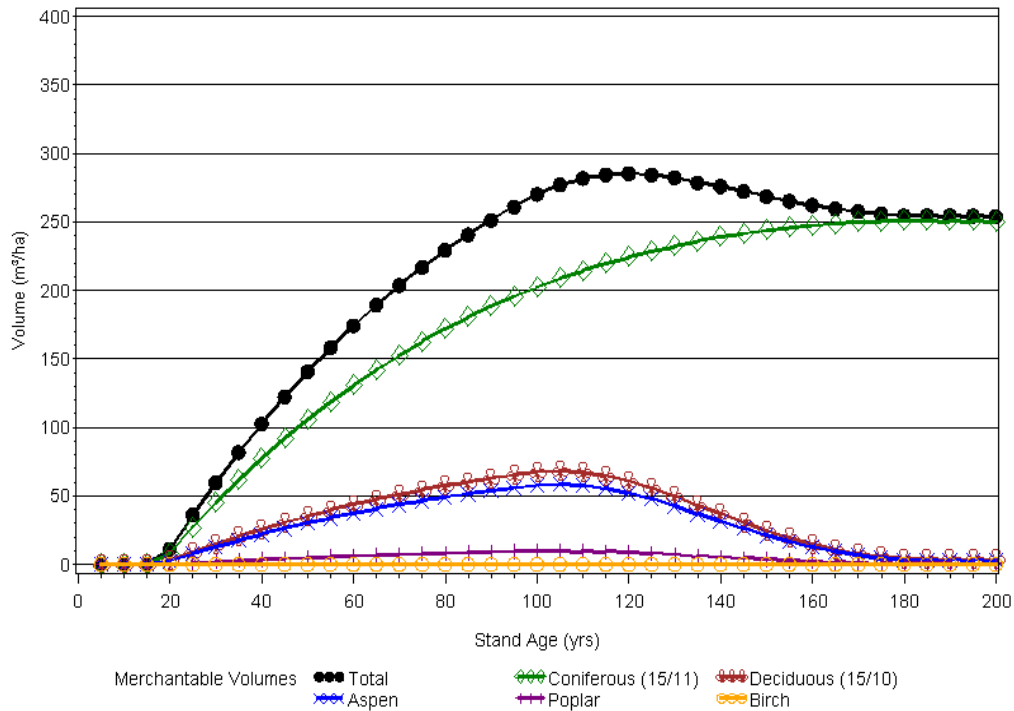


NSR & Site=UFG CC=C %Con=5 Yield Curve #=42

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	11	0.6	8	0.4	3	0.1
30	60	2.0	45	1.5	15	0.5
40	103	2.6	77	1.9	26	0.6
50	141	2.8	106	2.1	35	0.7
60	174	2.9	131	2.2	44	0.7
70	204	2.9	153	2.2	51	0.7
80	229	2.9	172	2.1	57	0.7
90	251	2.8	188	2.1	63	0.7
100	270	2.7	203	2.0	68	0.7
110	282	2.6	214	1.9	67	0.6
120	285	2.4	224	1.9	61	0.5
130	282	2.2	232	1.8	50	0.4
140	276	2.0	239	1.7	37	0.3
150	269	1.8	244	1.6	25	0.2
160	262	1.6	247	1.5	15	0.1
170	258	1.5	250	1.5	8	0.0
180	255	1.4	251	1.4	4	0.0
190	255	1.3	251	1.3	4	0.0
200	254	1.3	250	1.3	4	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=C %Con=5 Yield Curve #=42

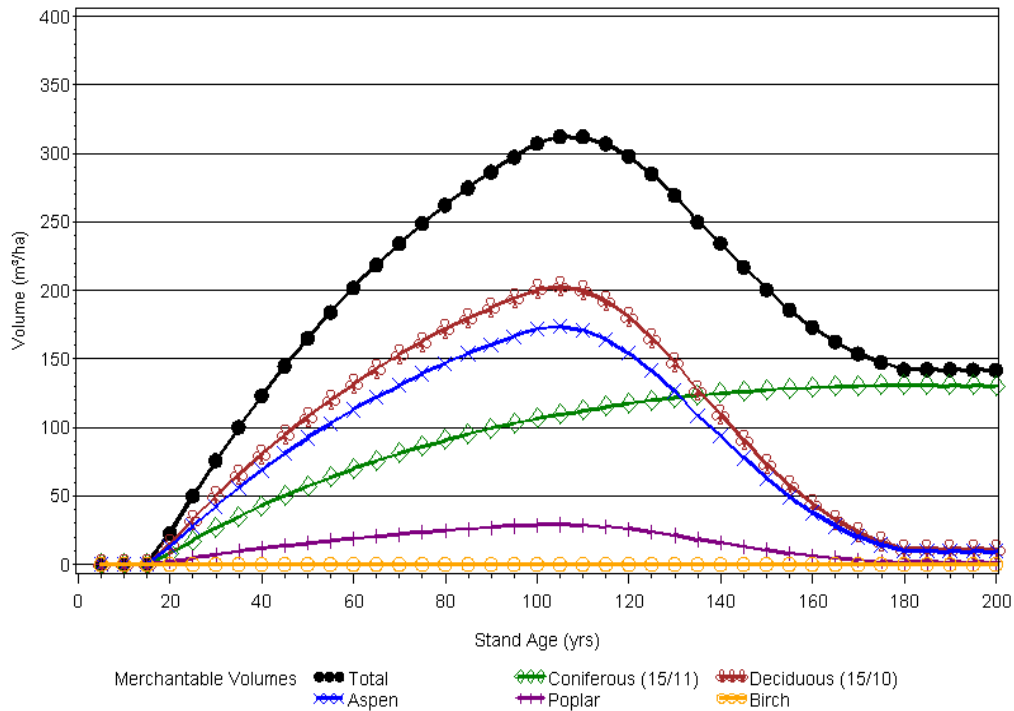


NSR & Site=UFG CC=D %Con=0 Yield Curve #=43

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	8	0.4	15	0.7
30	76	2.5	26	0.9	50	1.7
40	123	3.1	43	1.1	81	2.0
50	165	3.3	57	1.1	108	2.2
60	202	3.4	70	1.2	132	2.2
70	234	3.3	81	1.2	153	2.2
80	262	3.3	91	1.1	172	2.1
90	287	3.2	99	1.1	187	2.1
100	307	3.1	106	1.1	201	2.0
110	312	2.8	112	1.0	200	1.8
120	298	2.5	117	1.0	181	1.5
130	269	2.1	122	0.9	148	1.1
140	234	1.7	125	0.9	110	0.8
150	201	1.3	127	0.8	73	0.5
160	173	1.1	129	0.8	44	0.3
170	154	0.9	130	0.8	24	0.1
180	142	0.8	131	0.7	11	0.1
190	142	0.7	131	0.7	11	0.1
200	142	0.7	131	0.7	11	0.1

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=0 Yield Curve #=43

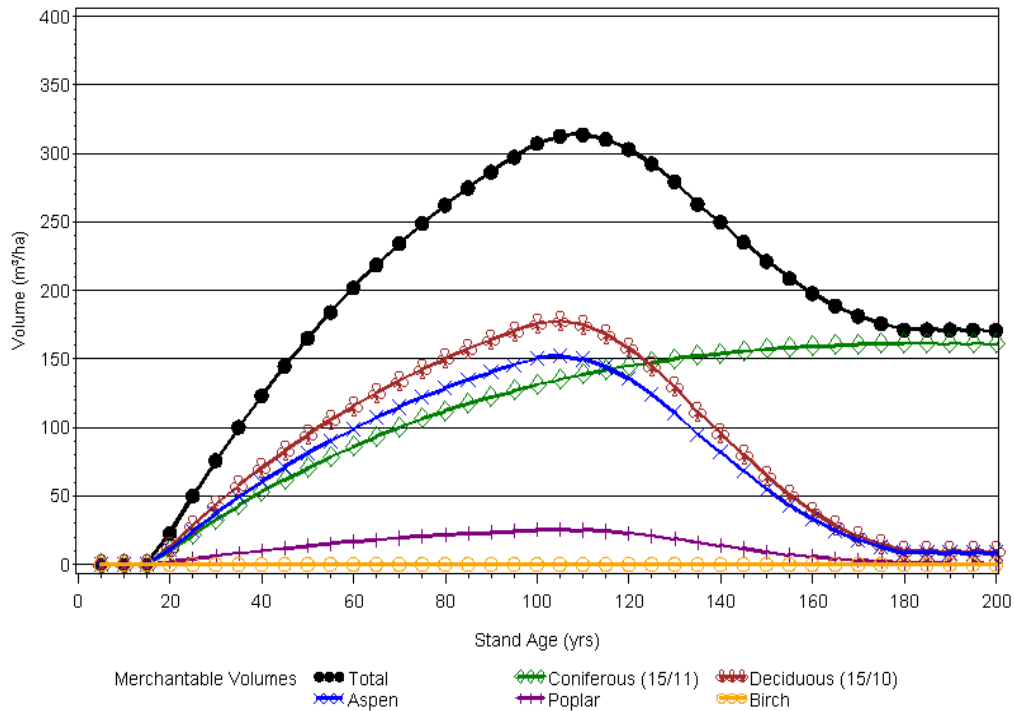


NSR & Site=UFG CC=D %Con=1 Yield Curve #=44

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	10	0.5	13	0.6
30	76	2.5	32	1.1	43	1.4
40	123	3.1	53	1.3	71	1.8
50	165	3.3	70	1.4	95	1.9
60	202	3.4	86	1.4	116	1.9
70	234	3.3	100	1.4	134	1.9
80	262	3.3	112	1.4	150	1.9
90	287	3.2	122	1.4	164	1.8
100	307	3.1	131	1.3	176	1.8
110	314	2.9	139	1.3	175	1.6
120	303	2.5	145	1.2	158	1.3
130	280	2.2	150	1.2	130	1.0
140	250	1.8	154	1.1	96	0.7
150	221	1.5	157	1.0	64	0.4
160	198	1.2	159	1.0	39	0.2
170	181	1.1	161	0.9	21	0.1
180	171	1.0	161	0.9	10	0.1
190	171	0.9	161	0.8	10	0.1
200	171	0.9	161	0.8	10	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=1 Yield Curve #=44

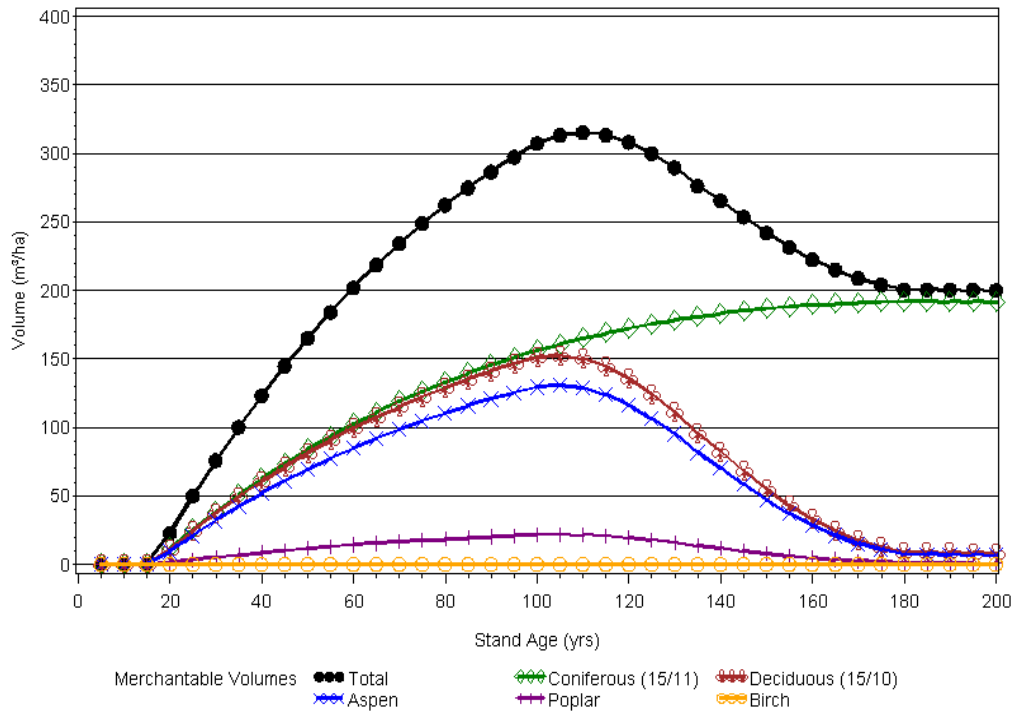


NSR & Site=UFG CC=D %Con=2 Yield Curve #=45

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	12	0.6	11	0.6
30	76	2.5	38	1.3	37	1.2
40	123	3.1	62	1.6	61	1.5
50	165	3.3	84	1.7	81	1.6
60	202	3.4	102	1.7	99	1.7
70	234	3.3	119	1.7	115	1.6
80	262	3.3	133	1.7	129	1.6
90	287	3.2	145	1.6	141	1.6
100	307	3.1	156	1.6	151	1.5
110	315	2.9	165	1.5	151	1.4
120	308	2.6	172	1.4	136	1.1
130	290	2.2	178	1.4	111	0.9
140	266	1.9	183	1.3	83	0.6
150	242	1.6	187	1.2	55	0.4
160	223	1.4	189	1.2	33	0.2
170	209	1.2	191	1.1	18	0.1
180	200	1.1	192	1.1	9	0.0
190	201	1.1	192	1.0	9	0.0
200	200	1.0	191	1.0	9	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=2 Yield Curve #=45

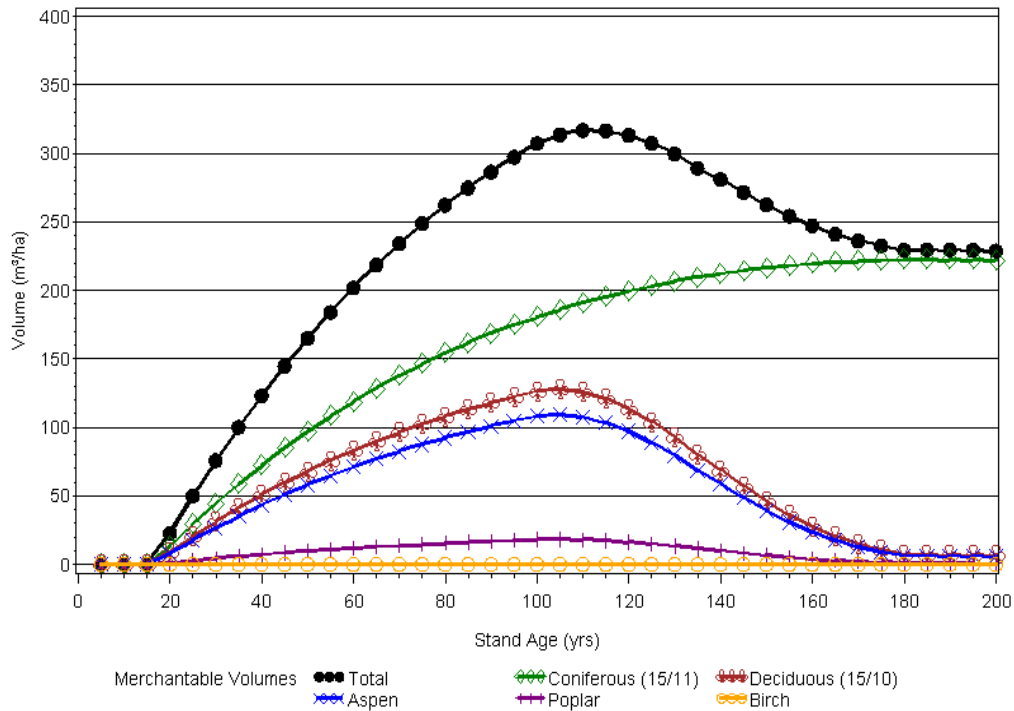


NSR & Site=UFG CC=D %Con=3 Yield Curve #=46

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	13	0.7	9	0.5
30	76	2.5	45	1.5	31	1.0
40	123	3.1	72	1.8	51	1.3
50	165	3.3	97	1.9	68	1.4
60	202	3.4	119	2.0	83	1.4
70	234	3.3	138	2.0	96	1.4
80	262	3.3	154	1.9	108	1.4
90	287	3.2	169	1.9	118	1.3
100	307	3.1	181	1.8	127	1.3
110	317	2.9	191	1.7	126	1.1
120	313	2.6	200	1.7	114	0.9
130	300	2.3	207	1.6	93	0.7
140	281	2.0	212	1.5	69	0.5
150	263	1.8	216	1.4	46	0.3
160	247	1.5	219	1.4	28	0.2
170	236	1.4	221	1.3	15	0.1
180	230	1.3	222	1.2	7	0.0
190	230	1.2	223	1.2	7	0.0
200	229	1.1	222	1.1	7	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=3 Yield Curve #=46

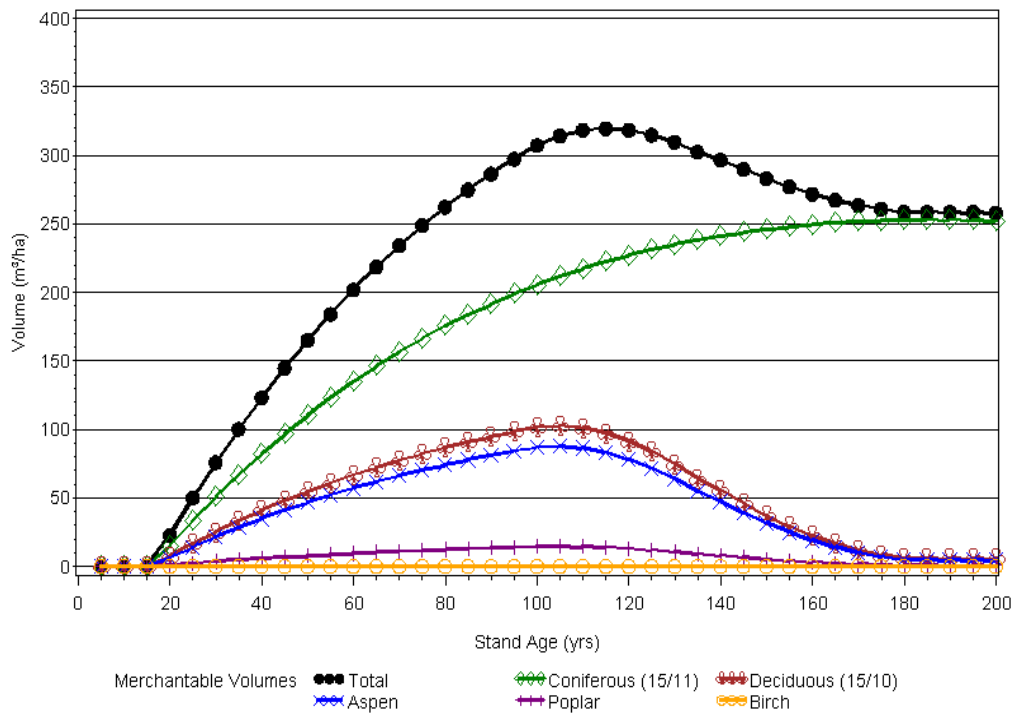


NSR & Site=UFG CC=D %Con=4 Yield Curve #=47

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	15	0.8	8	0.4
30	76	2.5	51	1.7	25	0.8
40	123	3.1	82	2.1	41	1.0
50	165	3.3	110	2.2	55	1.1
60	202	3.4	135	2.3	67	1.1
70	234	3.3	157	2.2	78	1.1
80	262	3.3	175	2.2	87	1.1
90	287	3.2	192	2.1	95	1.1
100	307	3.1	206	2.1	102	1.0
110	318	2.9	217	2.0	101	0.9
120	318	2.7	227	1.9	91	0.8
130	310	2.4	235	1.8	75	0.6
140	297	2.1	241	1.7	56	0.4
150	283	1.9	246	1.6	37	0.2
160	272	1.7	249	1.6	22	0.1
170	264	1.6	252	1.5	12	0.1
180	259	1.4	253	1.4	6	0.0
190	259	1.4	253	1.3	6	0.0
200	258	1.3	252	1.3	6	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=4 Yield Curve #=47

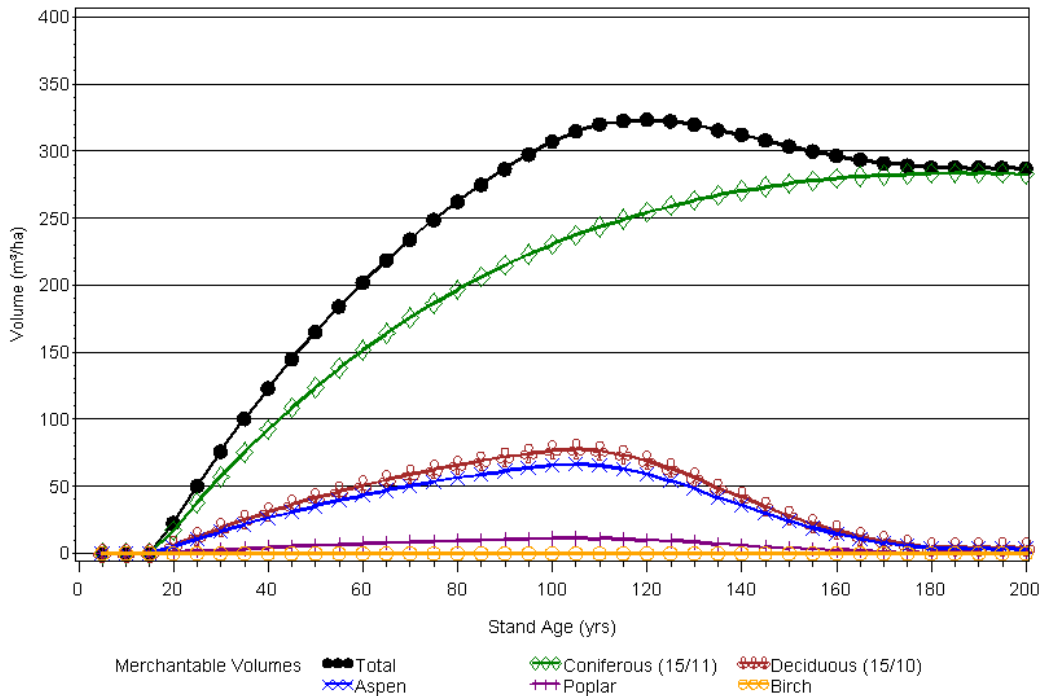


NSR & Site=UFG CC=D %Con=5 Yield Curve #=48

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	23	1.1	17	0.8	6	0.3
30	76	2.5	57	1.9	19	0.6
40	123	3.1	92	2.3	31	0.8
50	165	3.3	124	2.5	41	0.8
60	202	3.4	151	2.5	51	0.8
70	234	3.3	176	2.5	59	0.8
80	262	3.3	197	2.5	66	0.8
90	287	3.2	215	2.4	72	0.8
100	307	3.1	230	2.3	77	0.8
110	320	2.9	243	2.2	77	0.7
120	324	2.7	254	2.1	69	0.6
130	320	2.5	263	2.0	57	0.4
140	312	2.2	270	1.9	42	0.3
150	304	2.0	276	1.8	28	0.2
160	297	1.9	280	1.7	17	0.1
170	291	1.7	282	1.7	9	0.1
180	288	1.6	283	1.6	4	0.0
190	288	1.5	284	1.5	4	0.0
200	287	1.4	283	1.4	4	0.0

Deciduous Merchantable Yield Curve

NSR & Site=UFG CC=D %Con=5 Yield Curve #=48

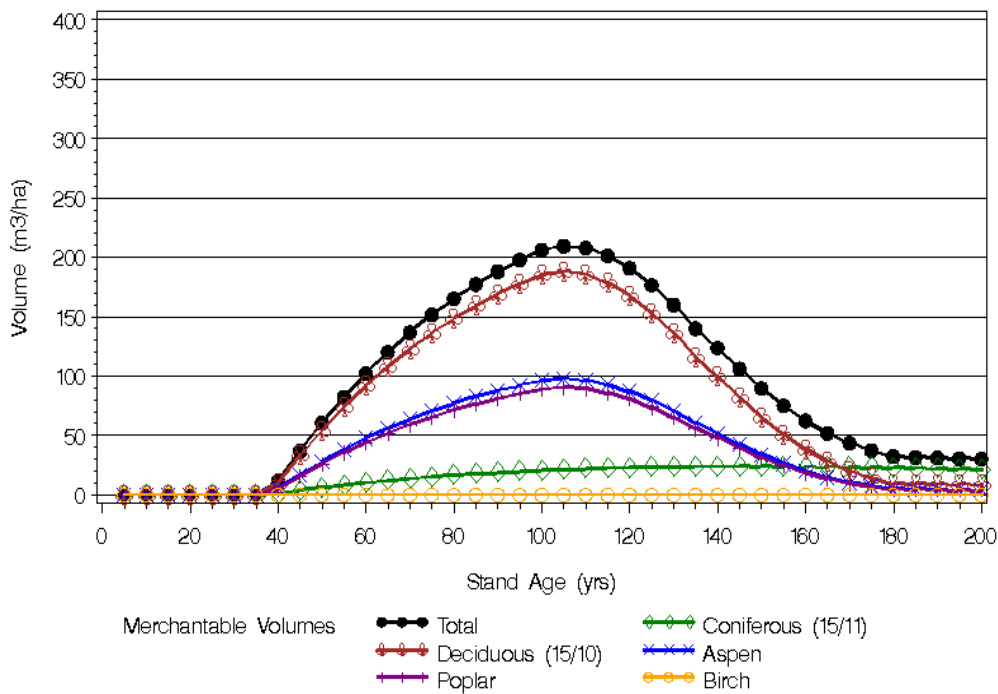


Cover Type=DX Yield Curve #-49

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	11	0.3	1	0.0	10	0.3
50	61	1.2	6	0.1	55	1.1
60	102	1.7	10	0.2	92	1.5
70	137	2.0	14	0.2	123	1.8
80	165	2.1	17	0.2	149	1.9
90	188	2.1	19	0.2	169	1.9
100	206	2.1	21	0.2	186	1.9
110	208	1.9	22	0.2	186	1.7
120	191	1.6	23	0.2	168	1.4
130	160	1.2	24	0.2	137	1.1
140	124	0.9	24	0.2	100	0.7
150	90	0.6	24	0.2	66	0.4
160	62	0.4	24	0.1	39	0.2
170	44	0.3	23	0.1	20	0.1
180	32	0.2	23	0.1	9	0.1
190	31	0.2	22	0.1	9	0.0
200	30	0.2	21	0.1	9	0.0

Poor Site Deciduous Merchantable Yield Curve

Cover Type=DX Yield Curve #-49

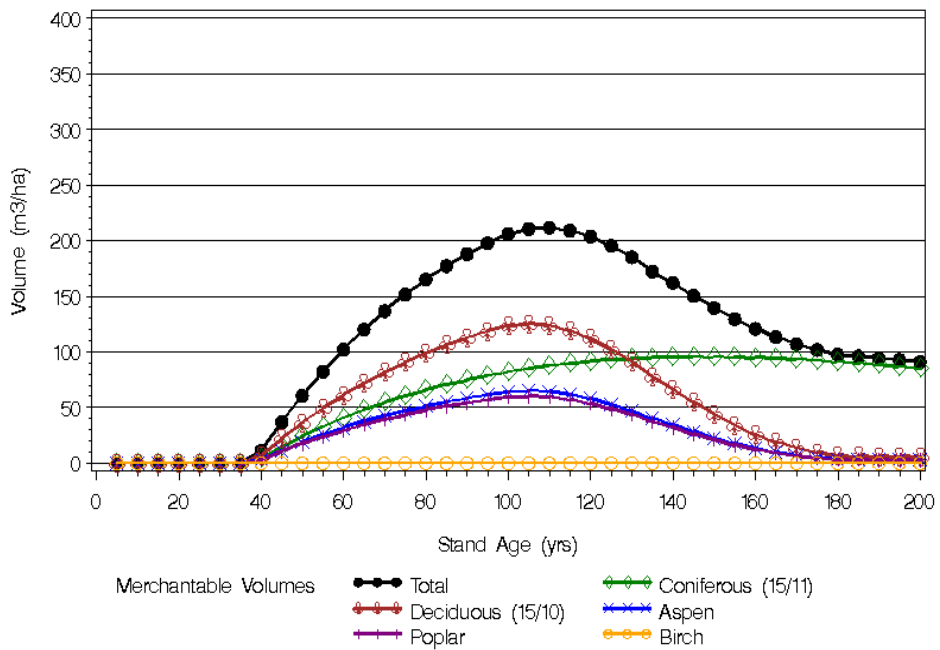


Cover Type=DC Yield Curve #=50

Stand Age (years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume(15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	0	0.0	0	0.0	0	0.0
40	11	0.3	5	0.1	7	0.2
50	61	1.2	24	0.5	36	0.7
60	102	1.7	41	0.7	61	1.0
70	137	2.0	55	0.8	82	1.2
80	165	2.1	66	0.8	99	1.2
90	188	2.1	75	0.8	113	1.3
100	206	2.1	82	0.8	124	1.2
110	212	1.9	88	0.8	124	1.1
120	204	1.7	92	0.8	112	0.9
130	185	1.4	94	0.7	91	0.7
140	162	1.2	96	0.7	67	0.5
150	140	0.9	96	0.6	44	0.3
160	121	0.8	95	0.6	26	0.2
170	107	0.6	94	0.6	13	0.1
180	98	0.5	91	0.5	6	0.0
190	95	0.5	89	0.5	6	0.0
200	91	0.5	85	0.4	6	0.0

Poor Site Deciduous Merchantable Yield Curve

Cover Type=DC Yield Curve #=50



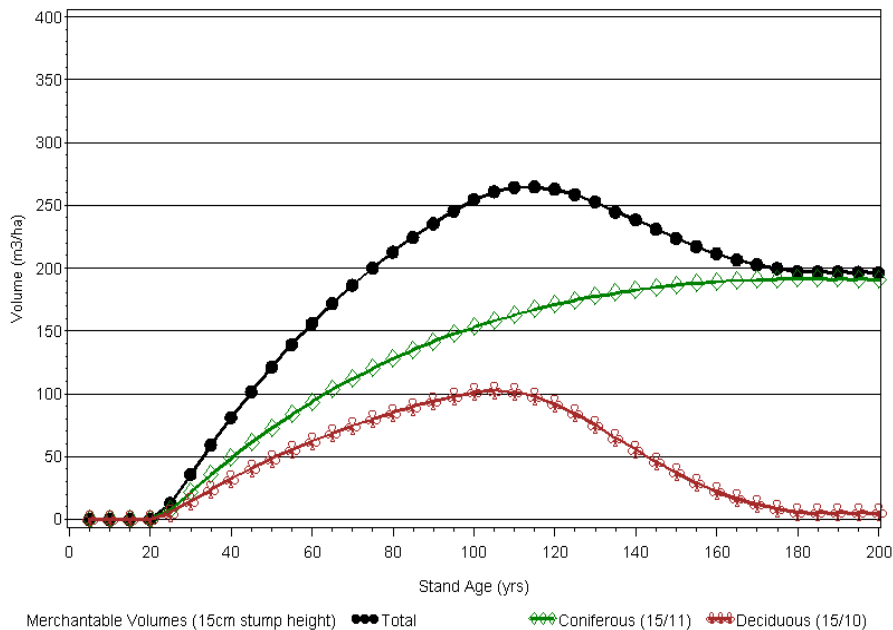
APPENDIX V – AREA-WEIGHTED YIELD CURVES

Broad Cover Group = CD

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume (15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	0	0.0	0	0.0	0	0.0
30	36	1.2	22	0.7	14	0.5
40	81	2.0	49	1.2	32	0.8
50	121	2.4	73	1.5	48	1.0
60	156	2.6	94	1.6	62	1.0
70	187	2.7	112	1.6	75	1.1
80	213	2.7	128	1.6	85	1.1
90	235	2.6	141	1.6	94	1.0
100	255	2.5	153	1.5	102	1.0
110	264	2.4	163	1.5	101	0.9
120	263	2.2	171	1.4	92	0.8
130	253	1.9	177	1.4	75	0.6
140	239	1.7	183	1.3	56	0.4
150	224	1.5	186	1.2	37	0.2
160	212	1.3	189	1.2	22	0.1
170	203	1.2	191	1.1	12	0.1
180	197	1.1	191	1.1	6	0.0
190	197	1.0	191	1.0	6	0.0
200	196	1.0	191	1.0	6	0.0

Area Weighted Merchantable Yield Curves

Broad Covergroup = CD

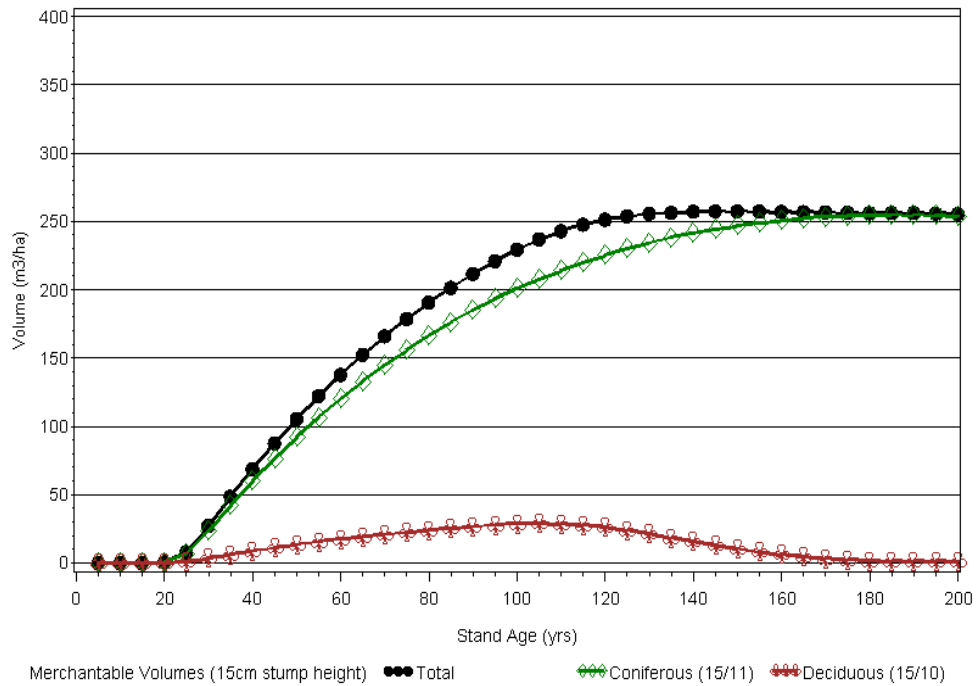


Broad Cover Group = CX

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume (15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	1	0.0	1	0.0	0	0.0
30	27	0.9	24	0.8	4	0.1
40	69	1.7	60	1.5	9	0.2
50	106	2.1	92	1.8	14	0.3
60	138	2.3	120	2.0	18	0.3
70	166	2.4	145	2.1	21	0.3
80	191	2.4	167	2.1	24	0.3
90	212	2.4	185	2.1	27	0.3
100	230	2.3	201	2.0	29	0.3
110	243	2.2	214	1.9	29	0.3
120	251	2.1	225	1.9	26	0.2
130	256	2.0	234	1.8	21	0.2
140	257	1.8	241	1.7	16	0.1
150	258	1.7	247	1.6	11	0.1
160	257	1.6	251	1.6	6	0.0
170	257	1.5	253	1.5	3	0.0
180	256	1.4	255	1.4	2	0.0
190	256	1.3	255	1.3	2	0.0
200	256	1.3	254	1.3	2	0.0

Area Weighted Merchantable Yield Curves

Broad Covergroup = CX

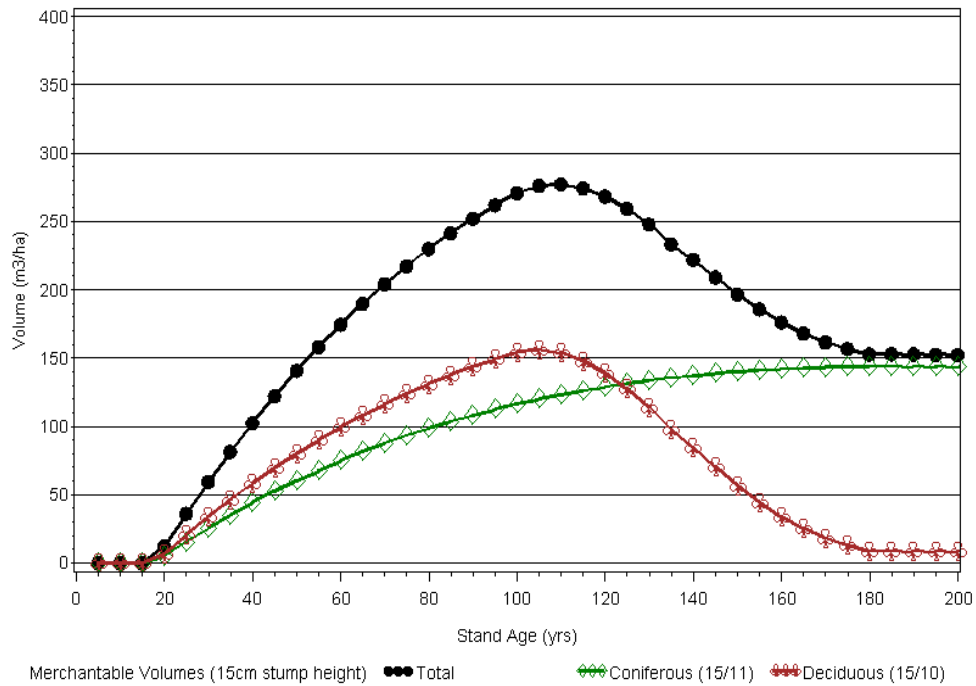


Broad Cover Group = DC

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume (15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	12	0.6	5	0.3	7	0.4
30	60	2.0	26	0.9	34	1.1
40	102	2.6	44	1.1	58	1.5
50	141	2.8	60	1.2	80	1.6
60	175	2.9	75	1.3	100	1.7
70	204	2.9	88	1.3	116	1.7
80	230	2.9	99	1.2	131	1.6
90	252	2.8	108	1.2	144	1.6
100	271	2.7	116	1.2	155	1.5
110	277	2.5	123	1.1	154	1.4
120	268	2.2	129	1.1	139	1.2
130	248	1.9	134	1.0	114	0.9
140	222	1.6	137	1.0	85	0.6
150	197	1.3	140	0.9	57	0.4
160	176	1.1	142	0.9	34	0.2
170	162	1.0	143	0.8	18	0.1
180	153	0.8	144	0.8	9	0.0
190	153	0.8	144	0.8	9	0.0
200	152	0.8	144	0.7	9	0.0

Area Weighted Merchantable Yield Curves

Broad Covergroup = DC

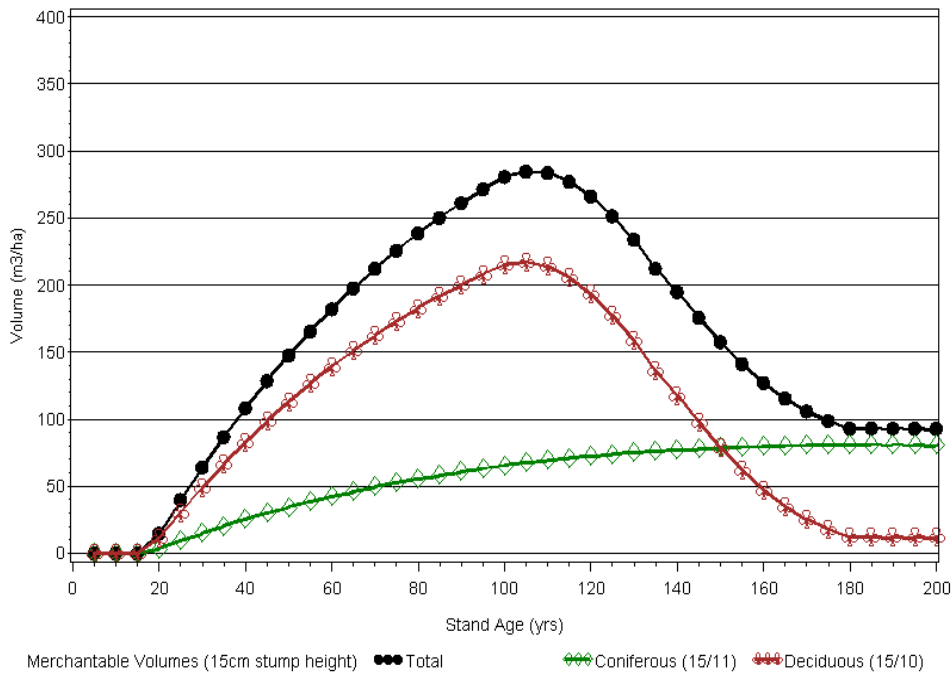


Broad Cover Group = DX

Stand Age (Years)	Total Volume (m3/ha)	Total MAI (m3/ha/yr)	Coniferous Volume (15/11) (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume (15/10) (m3/ha)	Deciduous MAI (m3/ha/yr)
10	0	0.0	0	0.0	0	0.0
20	15	0.7	3	0.2	11	0.6
30	64	2.1	15	0.5	49	1.6
40	108	2.7	25	0.6	83	2.1
50	148	3.0	34	0.7	113	2.3
60	182	3.0	42	0.7	140	2.3
70	212	3.0	50	0.7	163	2.3
80	239	3.0	56	0.7	183	2.3
90	261	2.9	61	0.7	200	2.2
100	281	2.8	65	0.7	215	2.2
110	284	2.6	69	0.6	214	1.9
120	266	2.2	72	0.6	194	1.6
130	234	1.8	75	0.6	159	1.2
140	195	1.4	77	0.6	118	0.8
150	158	1.1	79	0.5	79	0.5
160	127	0.8	80	0.5	47	0.3
170	106	0.6	81	0.5	25	0.1
180	93	0.5	81	0.4	12	0.1
190	93	0.5	81	0.4	12	0.1
200	93	0.5	81	0.4	12	0.1

Area Weighted Merchantable Yield Curves

Broad Covergroup = DX



APPENDIX VI – ESTIMATE PIECE SIZE

Recent planning standards require an estimate of piece size to be included in yield table development (Section 5.5.8 in Draft Alberta Forest Management Planning Manual). While the requirement has theoretical validity, it is difficult to model with temporary sample plot (TSP) data as the model will have to be built based on multiple trees on multiple sites. It is widely acknowledged that individual tree volume is impacted by stand competition (Husch et al 2003) and stand density is weakly related to stand age. Therefore, even in the best case the relationship between piece size and age will be weakly related.

Caveats

This statistic is to be used as a reporting tool only; therefore, the frailty of this relationship will not impact the final results. If there is any desire in the future to use piece size as a model constraint then a more rigorous process that uses PSP data will need to be developed.

The piece size versus age model presented below was built from TSPs located in natural stands only. There was no data available for regenerating stands; therefore because managed stands tend to regenerate from lower densities than natural stands, the estimates provided from this model should only be applied to natural stands.

Background

We compared two potential piece size models during preliminary testing:³

- Option 1: Piece size (trees/m³) modelled as a function of AVI stand age
- Option 2: Piece size modeled through a surrogate variable quadratic mean diameter (DBHq) as it is closely correlated to piece size

We observed that the piece size estimate using DBHq (Option 2) was stronger than the piece size estimate using trees/m³ for all of the major strata. Therefore, we decided to model piece size through the surrogate variable DBHq.

Program: *Model_Piece_Size.sas*

Description of Process

The SAS program performs the following steps:

- Calculate DBHq for each TSP plot
- Assign each plot to a major strata
- Model DBHq as a function of AVI stand age

Each of the steps is described in the following section.

³ J.S Thrower and Associates. 2004. Modeling piece size. Memo to Weyerhaeuser. September 30, 2004.

Calculate DBHq for every plot

DBHq for coniferous and deciduous trees was calculated separately for each TSP. Each TSP with a valid DBHq, major strata assignment, and AVI stand age was used as an observation in the modeling process.

Assignment to major strata

We identified ten preliminary strata in the Drayton Valley FMA area according to broad cover group, natural subregion, and site productivity group (Table 25).

The coniferous landbase included the C + CD broad cover groups, and the deciduous landbase included the DC + D broad cover groups. Broad cover group was assigned to each plot according to the leading species in the AVI.

Sitologix ecosite-based productivity groups were assigned to each plot. For modeling purposes, good and medium site productivity groups in the coniferous landbase were combined and poor site productivity stands were kept separate.

Table 25. Preliminary strata in the Drayton Valley FMA.

Major Strata	Conifer / Decid landbase	Site Productivity	Natural Subregion	Observations
1	Conifer	G,M	Upper Foothills	322
2	Conifer	P	Upper Foothills	5
3	Conifer	G,M	Lower Foothills	673
4	Conifer	P	Lower Foothills	40
5	Conifer	G,M	Subalpine	21
6	Conifer	P	Subalpine	28
7	Decid	G,M	Upper Foothills	34
8	Decid	P	Upper Foothills	1
9	Decid	G,M	Lower Foothills	771
10	Decid	P	Lower Foothills	4

^aShaded areas indicated preliminary strata which were pooled with larger strata.

Preliminary strata with low observations were pooled into larger strata (Table 26).

Table 26. Major strata in the Drayton Valley FMA.

Piece Size Stratum	Conifer / Decid landbase	Site Productivity	Natural Subregion	Observations
C1	Conifer	G,M	Upper Foothills and Subalpine	343
C2	Conifer	G,M	Lower Foothills	673
C3	Conifer	P	All	73
D1	Decid	G,M,P	Upper & Lower Foothills	810

Model coniferous and deciduous DBHq * AVI age by major strata

We modelled DBHq for coniferous and deciduous species separately for all the major strata as a function of AVI stand age:

Equation: $DBHq = q_0 * AVI_age * exp(q_1 * AVI_age)$

- where = Quadratic mean
- DBHq = diameter (cm)
- AVI_age = AVI stand age (years)
- q_0, q_1 = Coefficients

Coniferous DBHq

While the model fit statistics were significant for each of the major strata, there was wide variation in stand-level coniferous DBHq by AVI stand age (Table 27). This is illustrated in the predicted model and residual plots (Figure 46 - Figure 49, Table 29). This demonstrates the issue that the relationship between piece size and age is weakly related, and the resulting model should only be used for reporting purposes.

Table 27. Parameter estimates for coniferous tree DBHq model.

Piece Size Stratum	Conifer / Decid Landbase	Site Productivity	NSR	q_0	q_1
C1	Conifer	GM	LF	0.5314	-0.00799
C2	Conifer	GM	UF+SA	0.4074	-0.00625
C3	Conifer	P	UF+LF	0.3814	-0.00549
D1	Deciduous	GM	UF+LF	0.8728	-0.0124

^aBold parameters are significant (p<0.05).

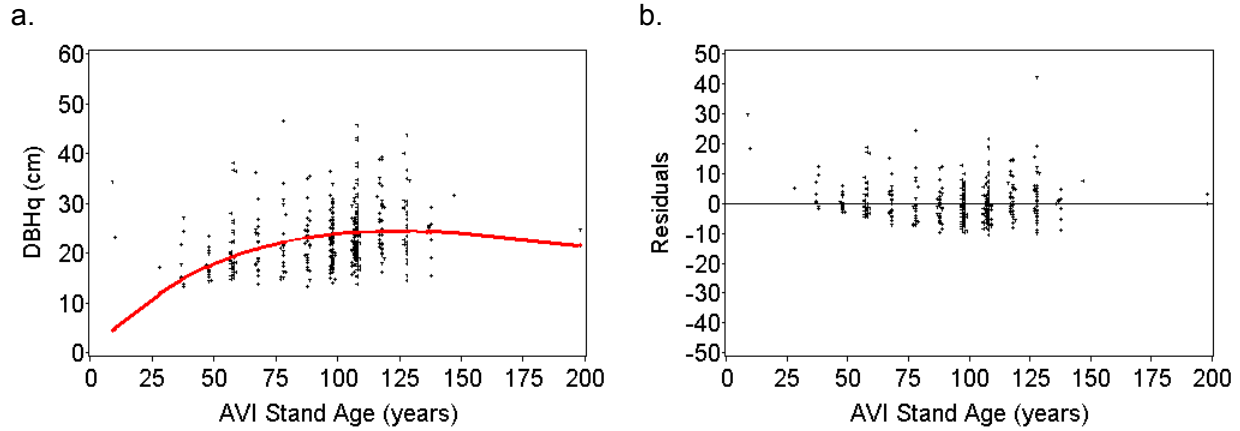


Figure 46. DBHq model (a) and residual plot (b) for Conifer-GM-Lower Foothills stratum (coniferous trees).

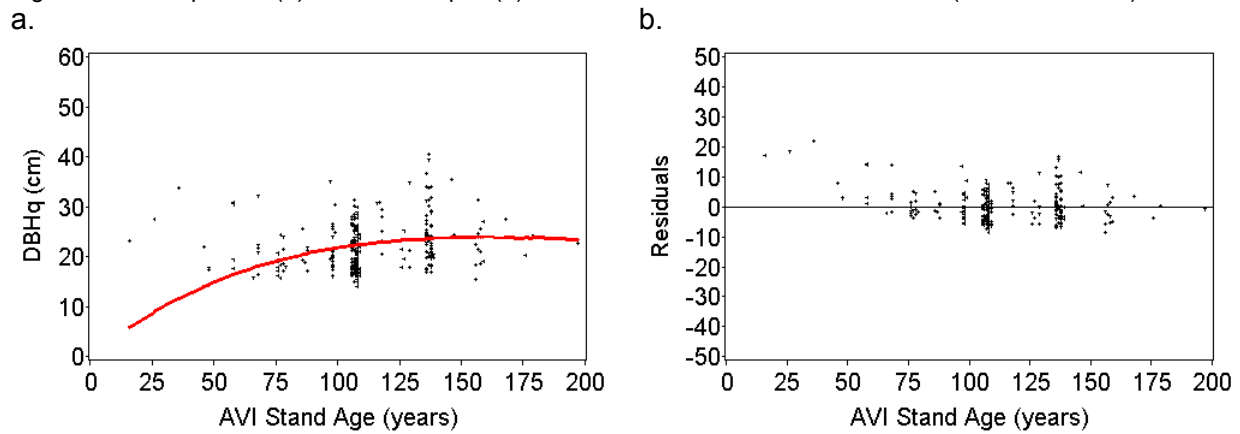


Figure 47. DBHq model (a) and residual plot (b) for Conifer-GM-Upper Foothills/Subalpine stratum (coniferous trees).

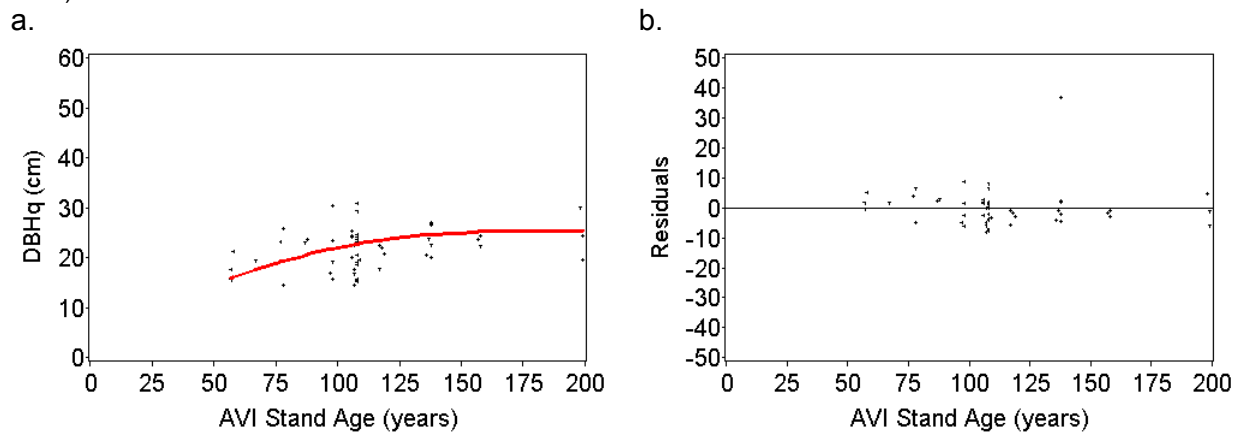


Figure 48. DBHq model (a) and residual plot (b) for Conifer-P-Upper Foothills/Lower Foothills/Subalpine stratum (coniferous trees).

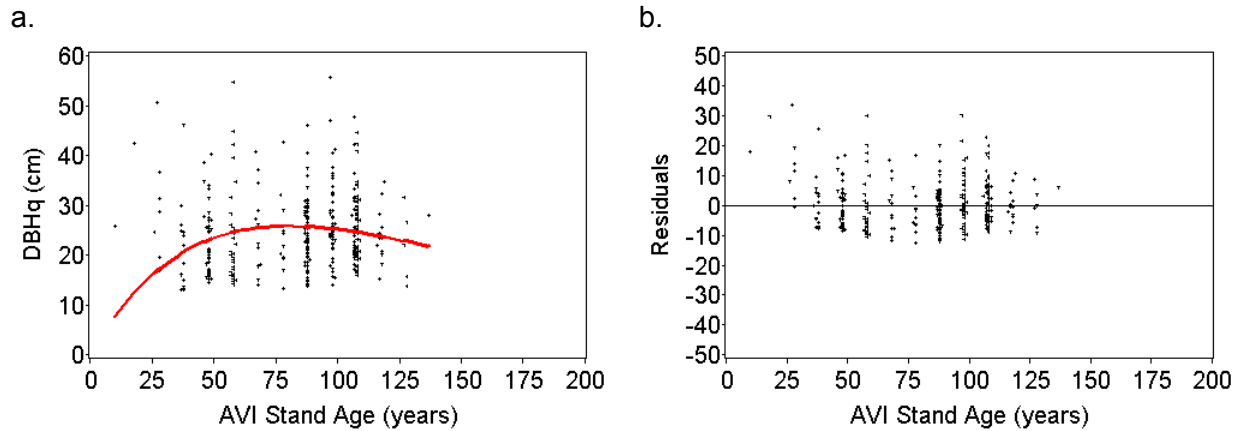


Figure 49. DBHq model (a) and residual plot (b) for Deciduous-GMP-Upper Foothills/Lower Foothills stratum (coniferous trees).

Deciduous DBHq

Similar to the coniferous DBHq model, there was wide variation in stand-level deciduous DBHq by AVI stand age (Table 28). This is illustrated in the predicted model and residual plots (Figure 50 - Figure 53, Table 29). Again, the resulting model should only be used for reporting purposes.

Table 28. Parameter estimates for deciduous tree DBHq model.

Piece Size Stratum	Conifer / Decid Landbase	Site Productivity	NSR	q ₀	q ₁
C1	Conifer	GM	LF	0.5764	-0.00701
C2	Conifer	GM	UF	0.3619	-0.00243
C3	Conifer	P	UF+LF	1.1858	-0.0157
D1	Decid	GM	UF+LF	0.6043	-0.00694

^aBold parameters are significant (p<0.05).

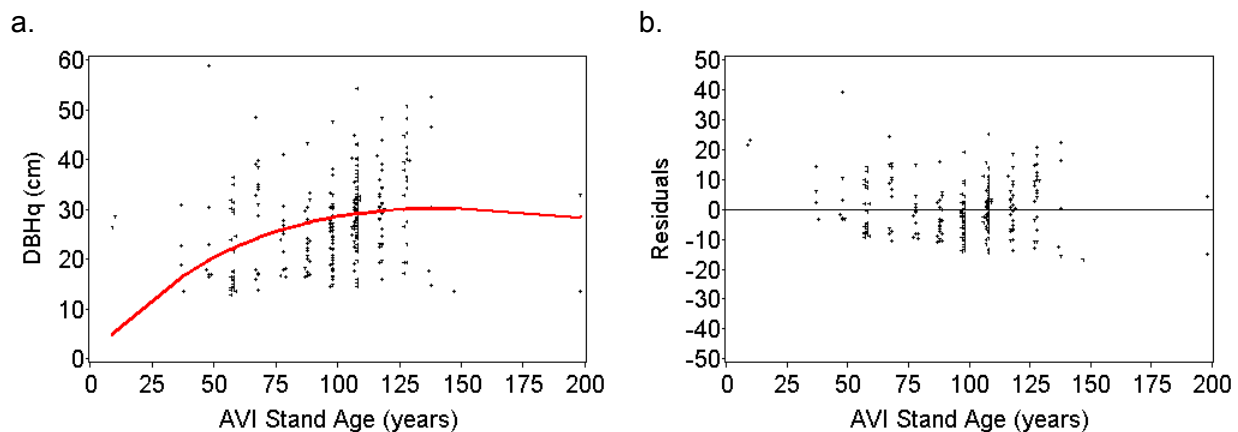


Figure 50. DBHq model (a) and residual plot (b) for Conifer-GM-Lower Foothills stratum (deciduous trees).

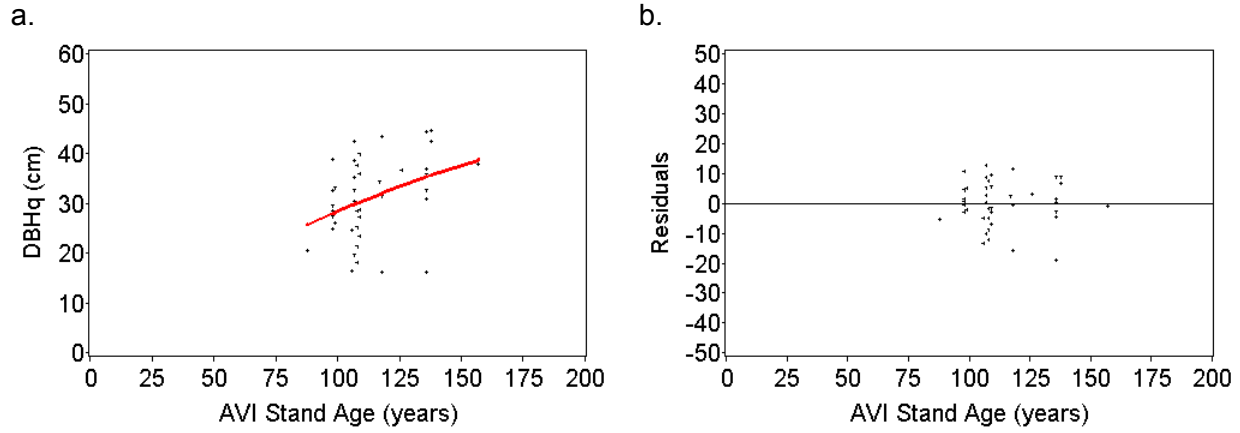


Figure 51. DBHq model (a) and residual plot (b) for Conifer-GM-Upper Foothills stratum (deciduous trees).

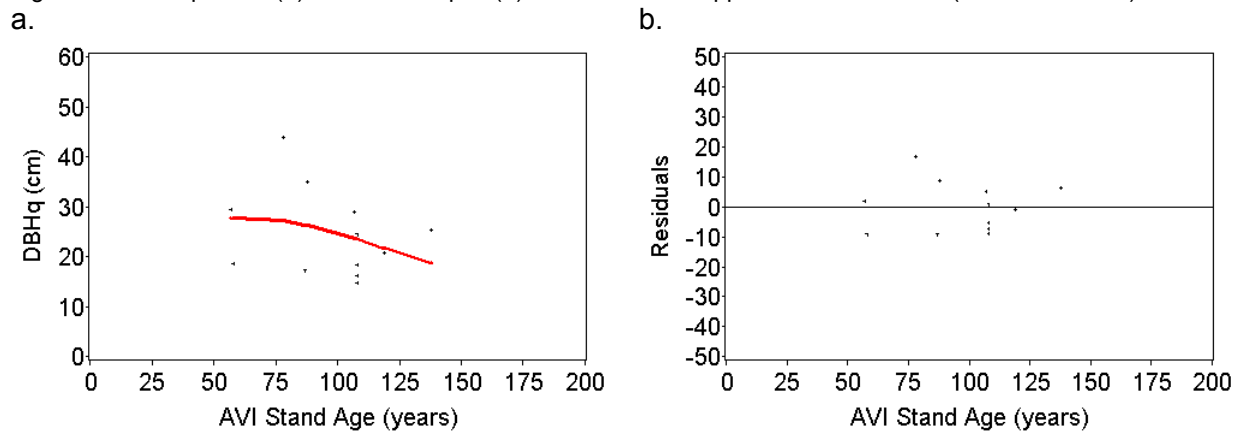


Figure 52. DBHq model (a) and residual plot (b) for Conifer-P-Upper Foothills / Lower Foothills stratum (deciduous trees).

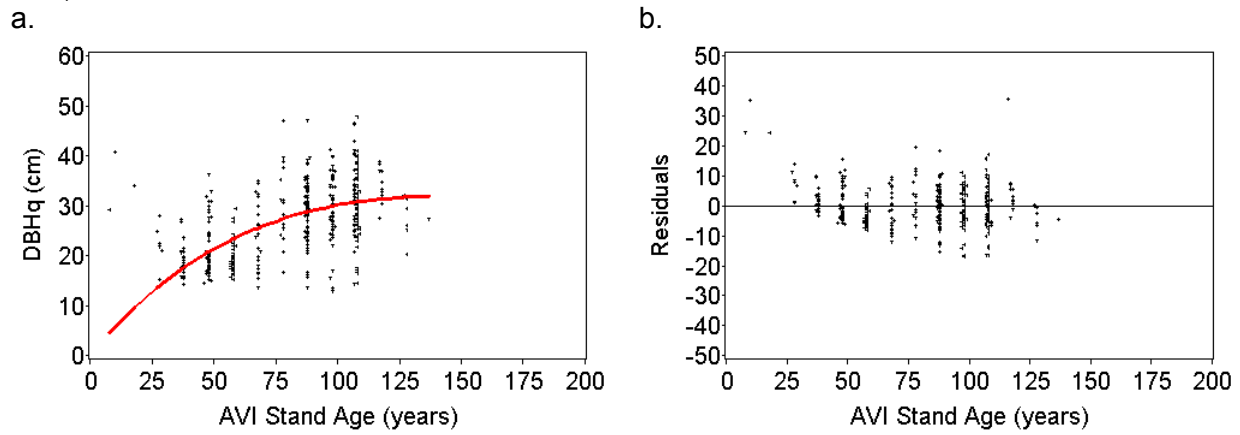


Figure 53. DBHq model (a) and residual plot (b) for Deciduous-GMP-Upper Foothills / Lower Foothills stratum (deciduous trees).

Table 29. DBHq estimates for conifer and deciduous dominated stands.

Stand age (years)	Conifer piece size strata						Deciduous piece size stratum	
	C1		C2		C3		D1	
	Conif. DBHq (cm)	Decid. DBHq (cm)	Conif. DBHq (cm)	Decid. DBHq (cm)	Conif. DBHq (cm)	Decid. DBHq (cm)	Conif. DBHq (cm)	Decid. DBHq (cm)
5	2.6	2.8	2.0	1.8	1.9	5.5	4.1	2.9
10	4.9	5.4	3.8	3.5	3.6	10.1	7.7	5.6
15	7.1	7.8	5.6	5.2	5.3	14.1	10.9	8.2
20	9.1	10.0	7.2	6.9	6.8	17.3	13.6	10.5
25	10.9	12.1	8.7	8.5	8.3	20.0	16.0	12.7
30	12.5	14.0	10.1	10.1	9.7	22.2	18.1	14.7
35	14.1	15.8	11.5	11.6	11.0	24.0	19.8	16.6
40	15.4	17.4	12.7	13.1	12.2	25.3	21.3	18.3
45	16.7	18.9	13.8	14.6	13.4	26.4	22.5	19.9
50	17.8	20.3	14.9	16.0	14.5	27.1	23.5	21.4
55	18.8	21.6	15.9	17.4	15.5	27.5	24.3	22.7
60	19.7	22.7	16.8	18.8	16.5	27.8	24.9	23.9
65	20.6	23.8	17.6	20.1	17.3	27.8	25.4	25.0
70	21.3	24.7	18.4	21.4	18.2	27.7	25.7	26.0
75	21.9	25.6	19.1	22.6	18.9	27.4	25.9	26.9
80	22.4	26.3	19.8	23.8	19.7	27.1	25.9	27.7
85	22.9	27.0	20.4	25.0	20.3	26.6	25.9	28.5
90	23.3	27.6	20.9	26.2	20.9	26.0	25.8	29.1
95	23.6	28.1	21.4	27.3	21.5	25.4	25.6	29.7
100	23.9	28.6	21.8	28.4	22.0	24.7	25.3	30.2
105	24.1	29.0	22.2	29.5	22.5	24.0	25.0	30.6
110	24.3	29.3	22.5	30.5	22.9	23.2	24.6	31.0
115	24.4	29.6	22.8	31.5	23.3	22.5	24.2	31.3
120	24.5	29.8	23.1	32.5	23.7	21.7	23.7	31.5
125	24.5	30.0	23.3	33.4	24.0	20.9	23.2	31.7
130	24.5	30.1	23.5	34.3	24.3	20.1	22.7	31.9
135	24.4	30.2	23.7	35.2	24.5	19.3	22.1	32.0
140	24.3	30.2	23.8	36.1	24.7	18.5	21.6	32.0
145	24.2	30.2	23.9	36.9	24.9	17.7	21.0	32.0
150	24.0	30.2	23.9	37.7	25.1	16.9	20.4	32.0
155	23.9	30.1	24.0	38.5	25.2	16.2	19.8	31.9
160	23.7	30.0	24.0	39.3	25.3	15.4	19.3	31.8
165	23.5	29.9	24.0	40.0	25.4	14.7	18.7	31.7
170	23.2	29.8	23.9	40.7	25.5	14.0	18.1	31.6
175	23.0	29.6	23.9	41.4	25.5	13.3	17.5	31.4
180	22.7	29.4	23.8	42.1	25.5	12.7	16.9	31.2
185	22.4	29.2	23.7	42.7	25.5	12.1	16.3	31.0
190	22.1	28.9	23.6	43.4	25.5	11.5	15.8	30.7
195	21.8	28.6	23.5	44.0	25.5	10.9	15.2	30.4
200	21.5	28.4	23.3	44.6	25.4	10.3	14.7	30.2

APPENDIX VII – TEMPORARY SAMPLE PLOT FIELD PROCEDURES

1997 VOLUME SAMPLING PROGRAM⁴

The intent of the program is to sample stands that may be included in the productive land base for timber management purposes.

Number of plots

A program consisting of approximately 800 plots is proposed.

Stratification

The population on which stratification will be based excludes only those stands which are very unlikely to be considered for harvest. Stands to be excluded are as follows:

- Stands with a TPR of U;
- Stands with a larch content of 30% or more;
- Stands with a black spruce content of 50% or more and a density of 'A'.

Stands will be stratified on the basis of broad cover group, dominant species, density and height class of the overstorey cover type. Four broad cover groups will be considered: C, CD, DC and D. In the C, and CD cover types the dominant species is defined as the dominant conifer. In the D, and DC cover types the dominant species is the leading deciduous species. Stands with trembling aspen and balsam poplar as the dominant species were combined. Four five metre height classes will be defined (5 to 9m, 10 to 14m, 15 to 19m and 20 metres or more). In general, plots will be distributed in proportion to area.

Stand and Plot Selection

Weyerhaeuser Canada will provide AVI maps with stand and plot locations. Where access is extremely poor, plots may be replaced with alternates. Relocating the plots will be at the approval of Weyerhaeuser Canada personnel.

Plot Configuration

The plots will be distributed in clusters of three plots per stand. Plots will be located on a transect with 100 m between plots. The plots will be fixed area plots (circular) of 160 m² (7.14m radius).

Measurements

Compass Declination

For all compass work required the declination will be set at 22° E. Compass line from tie point to plot centre shall be flagged to ensure that WeyCan reps are able to locate the plots to perform quality checks.

Plot Establishment

All plots are to be marked with an aluminum stake to facilitate check cruising. GPS will be used to record the location of plot centre. Plots are not to be moved for natural features such as openings in stands and creeks. If the plot falls on a seismic line then the plot should be moved 20 m perpendicular to the direction of the seismic line (all other

⁴ 1996 temporary plot field sampling procedures area not available.

plots should remain in the same locations). Plots should not be established on newly constructed features that would be typed out in AVI such as roads and well sites.

Tree Measurements:

All trees of 7.0 cm dbh or greater are to be tallied. The following measurements are to be recorded on all trees:

- species (see table 3 for codes)
- dbh
- condition code (see table 5 for codes)
- crown class (see table 4 for codes)
- total height (to be measured on every fifth tree tallied on plot) regardless of crown class
- height to live crown of trees sampled for height

Ages are to be recorded **on every plot** (for dominant and codominant trees which also have a height taken). A minimum of 3 trees of coniferous species are to be aged in pure conifer stands. Similarly 3 age trees are necessary in pure deciduous stands. If decay is detected in all three trees, then sample an additional 3 more, if the same is noted then do not continue boring the trees. In mixedwood stands, aging will be done on 3 conifer and 3 deciduous trees. In plots with less than the required number of trees, age trees are to be taken from trees outside of the plot (but within the same stand)⁵. All cores are to be placed in straws and taken to an office environment for counting.

Plot Description

- AVI field type (overstorey and understorey)
- Overstorey condition
 - P1, P2, P3, P4 depending on the species involved. See table 7 for description of codes.
- Evidence of previous harvesting
- Ecosite and community classification based on the Field Guide to Ecosites of West Central Alberta (Beckingham, Corns and Archibald. 1996).

Coniferous Understorey

Coniferous understorey will be surveyed with sub-plots of 100 m² (centered at the plot centre of the tree plot). A dot tally of the coniferous stems greater than 0.3m in height and less than 7 cm dbh will be conducted. Coniferous understorey stems are to be counted by species and height class (0.3m-2m, 2.1m-4m, 4.1m-6m, 6.1+).

⁵ Species, height and dbh are to be measured on age trees outside of the plot. The trees selected from outside the plot will be the trees closest to plot centre.

Quality Control

Tables 1 and 2, following, outline the quality control parameters to be used by Weyerhaeuser Canada staff. The amount of quality plots will be based on a 10% intensity level. Weyerhaeuser Canada reserves the right to adjust the intensity level based on contractor's performance.

Allowable errors

table 1

Measurement	Allowable Error
Directions from Tie-Point	directions from the tie-point to the witness tree must be complete enough to facilitate plot relocation (specific allowance has not been defined because of variability in distances, etc.)
Plot Centre Location	bearing and horizontal distance to the plot centre must be within 2° of the bearing and within ± 2% of the distance;
Ages	ages must be within ± 4 years for conifers and ± 10 years for deciduous trees
No. of Trees	no error allowed; all stems 7.1 cm dbh or greater within the plot boundary must be numbered
No. of Understorey Stems	total number of stems by species must be within 10% of check cruise
Tree/Sapling Species	no error allowed, all species must be identified correctly
Tree DBH	must be within ± 0.5 cm
Height	must be within ± 5%
Edatopic Grid	must be in correct moisture and nutrient regime class.

Check cruise standards

table 2

Measurement	Standard
Tree DBH	if more than 5% of the total tagged trees checked are incorrect (not within 0.5 cm), all plots established by the crew in the entire day will have to be remeasured for diameter.
Height	if more than 20% of the heights checked are incorrect (not within 5%) the heights in all plots established by the crew in the entire day will have to be remeasured
No. of Trees	if any trees (of 7.1cm or greater) are incorrectly tallied as being in or out of the plot, then all plots established by the crew in the entire day will have to be remeasured.
Ecosite Classification	if both the moisture regime and the nutrient regime are incorrect, then all plots established by the crew in the entire day will have to be re-classified. If moisture and nutrient regime are repeatedly misclassified then the crew will be prohibited from working on the contract.
Completeness of Tally Sheets	all appropriate fields on the tally sheets should be filled in. Field crews with missing entries will be required to revisit plots to fill in missing entries. Correct codes are to be used.

Tally Cards

Tables have been created to explain the sections in the tally cards. Please refer to them for further information.

Species Codes

table 3

Species	Common Name	Code
<i>Abies balsamea</i>	balsam fir	FB
<i>Abies lasiocarpa</i>	alpine fir	FA
<i>Betula papyrifera</i>	white (paper) birch	BW
<i>Larix laricina</i>	tamarack	LT
<i>Larix occidentalis</i>	western larch	LW
<i>Picea engelmannii</i>	Engelmann spruce	SE
<i>Picea glauca</i>	white spruce	SW
<i>Picea mariana</i>	black spruce	SB
<i>Pinus banksiana</i>	jack pine	PJ
<i>Pinus contorta</i>	lodgepole pine	PL
<i>Populus balsamifera</i>	balsam poplar	PB
<i>Populus tremuloides</i>	trembling aspen	AW
<i>Pseudotsuga menziesii</i>	Douglas-fir	FD

Crown class is defined as the position of an individual tree within the canopy of the stand inside the plot.

Crown class codes

table 4

Crown Class	Characteristics	Code
Dominant	- crown extends above the general level of the copy canopy	D
Codominant	- crown forms the general level of the canopy	C
Intermediate	- crown below but extending into the bottom of the general level of the canopy	I
Suppressed	- crown entirely below the general level of the canopy	S
Open-grown	- used only in very open stands, where the tree is not really part of a canopy	O

Condition codes (Record in order of priority.) table 5

Code	Condition
25	Standing dead (no crown class)
01	Conks
30	Stem insects
31	Stem disease
32	Foliar insects
33	Foliar disease
91-96	Hawksworth mistletoe rating
24	Broken stem; => 10 cm DIB at break (no crown class)
02	Open scars
19	Broken top; =< DIB at break (no crown class)
34	Stem form defect; => 7 cm DIB at point where defect begins
35	Dead top, dieback
14	Pronounced crook
13	Fork
36	Closed scars
23	Leaning
22	Limby
28	Same stump (forked below breast height)
12	Burls and galls
37	Unknown
00	No defect

Additional characteristics

table 6

Tally Sheet Attribute	Description
AVI overstorey	The AVI field call for the overstorey (e.g., C15Sw6Pb4)
AVI understorey	The AVI field call for the understorey (e.g., A6Sw6Aw2)
Harvesting Evidence	record Y is stumps from harvesting indicate that the stand has been completely or partially logged previously
Overstorey Condition	<p>Decadent: stand showing volume decline; opening in crown are developing, mortality of dominants and co-dominants is relatively high.</p> <p>Overmature: stable stand but growth rate is declining.</p> <p>Immature to mature: stand is stable and is growing satisfactorily for site conditions.</p>
Damage	<p>indicates extensive damage from</p> <p>F fire</p> <p>W wind</p> <p>D insects/disease</p>
Site Information	
Elevation	no need to record
Slope Position	page 16-11 (C, US, MS, LS, T, D, L)
Moisture Regime	page 16-12 (1 to 9)
Nutrient Regime	page 16-14 (A, B, C, D, E)
Parent Material	page 16-21 (C, E, F, FE, FL, CF, GL, L, LT, M, O, R, P)
Drainage Class	page 16-8 (1 to 7)
Humus form	page 16-14
Organic Soils	page 16-16
Texture	page 16-4

Harvest Priority Codes

table 7

<u>CONIFER</u>	
P1	<p>DAMAGED</p> <ul style="list-style-type: none"> -stand is extensively damaged by fire, wind, disease, etc.
P2	<p>OVERMATURE TO DECADENT</p> <ul style="list-style-type: none"> - high risk stands showing volume decline. - extensive openings in upper crown due to mortality and windblown, weakened trees. -dieback, disease, mortality and/or instability existing in standing dominant or co-dominant trees.
P3	<p>MATURE TO OVERMATURE</p> <ul style="list-style-type: none"> - stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown due to mortality on windblown, weakened trees. -mortality or instability restricted to sub-dominant trees. -stand is expected to survive until next cutting cycle without significant loss.
P4	<p>IMMATURE TO MATURE</p> <ul style="list-style-type: none"> -growth is normal and expected to continue until next cutting cycle. -few signs of instability or mortality. -overall stand condition is thrifty and vigorous.

<u>ASPEN</u>	
P1	<p>DECADENT OR DAMAGED</p> <ul style="list-style-type: none"> -stand showing signs of extensive, rapid decline. e.g. 25% plus of stems are dry or snapped. -stand is extensively damaged by fire, wind, diseases, etc. -stand should not be considered as eligible second cut.
P2	<p>OVERMATURE TO DECADENT</p> <ul style="list-style-type: none"> -high risk stands showing volume decline due to mortality and cull. -extensive openings in upper crown, understory or second growth deciduous or heavy brush is developing. -cull indicators are prevalent, e.g. conks, scars, flat-topping. -lesser % of dominant trees are dry, snapped or down.
P3	<p>MATURE TO OVERMATURE</p> <ul style="list-style-type: none"> -stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown. -mortality restricted to sub-dominant trees, cull indicators are not prevalent.
P4	<p>IMMATURE TO MATURE</p> <ul style="list-style-type: none"> - stand is presently merchantable, but growth is expected to continue until second cycle. - overall stand condition is thrifty and vigorous.

1998 VOLUME SAMPLING PROGRAM

OBJECTIVES

The objectives of the volume sampling are:

1. To provide data suitable for development of yield relationships and stratum level stand volume tables.
2. To provide stratum level estimates of stand tables (distribution of stems/ha by dbh class) for use in SAWSIM and stratum level estimates of tree size
3. To provide stand level estimates of volume and a stand table for short-term harvest design areas.
4. To provide a sampling design for ongoing data collection associated with operational planning.

DESIGN

Transects will be established for the entire FMA at an azimuth of 60° every 250 m. (A square grid of 250 m × 250 m results in 1 intersection for every 6.25 ha.) The grid of transects was overlaid (using GIS) onto the AVI polygon base. The linear distance of each transect within each polygon was determined and three plots within each polygon were randomly placed on the transect(s) within each stand. Not all polygons are intersected by the transects.

The plots are not established as clusters and consequently can be considered as independent observation from a statistical view point.

A stratified sampling design was employed. Stratification consisted of combinations of eco-district, broad cover group (pure coniferous, mixedwood and pure deciduous), density and six metre height classes. Strata with less than 0.1% of total area were excluded from sampling. A total of 142 strata are intended to be sampled.

In eco-districts with less than 5.0 % of the total eligible FMA land base were assigned 5.0% of the sample plots. With the exception noted above, the distribution of plots by stratum was in proportion to area. A minimum number of six plots per stratum was established⁶.

Table 1 indicates the stratification and distribution of plots by stratum.

Harvest Design Areas: In operating areas, sampled stands will include all mature stands in the harvest design area (assuming that all stands have plots located within the stands from the sampling grid). As operating areas are planned in future years, exactly the same protocol for plot location should be adopted.

Filling the Sampling Matrix: Other plots required to fill the sampling matrix, will be randomly selected by stratum, in proportion to area from the list of stands in which plots were located. The plots collected from the operating areas will be used to fill the sampling matrix as well.

Stands will be selected for sampling from strata with relatively little area first. To minimize travel distance, stands adjacent to the initial stand selection will be examined to see if they need to be sampled. The intent is to group stands to be sampled so that, in general, a minimum of 6 plots are located in the same vicinity.

Plot Establishment

⁶ The low number of plots per stratum are not intended to provide adequate averages (e.g., volume averages) within each stratum, but the plots will contribute to the development of relationships which can be applied to each stratum.

All plots are to be marked with an aluminum stake to facilitate check cruising. GPS will be used to record the location of plot centre.

Compass Declination

For all compass work required the declination will be set at 22° E. Compass line from tie point to plot centre shall be flagged to ensure that WeyCan reps are able to locate the plots to perform quality checks.

Moving Plots:

- Plots are **not** be moved for natural features such as openings in stands and creeks not typed as separate AVI polygons.
- **Seismic lines:** If the plot falls on a seismic line then the plot should be moved 20 m perpendicular to the direction of the seismic line (all other plots should remain in the same locations).
- **Features not mapped in AVI:** Plots should not be established on newly constructed features that would be interpreted in AVI such as roads, well sites and clear cuts.

Overstory Tree Plot

The plot size for tree measurements is 160 m² (a circular plot with a radius of 7.14 m). **All trees greater than 10.0 cm are to be tallied.** Species, dbh, crown class, condition code, and cull suspect class are to be recorded for every tallied tree.

Height Trees: A minimum of 3 trees by species in each plot should be measured for height in the plot. The first tree and every 5th tree thereafter should be measured. The height trees should **not** be restricted to dominant or codominant trees. All trees measured for height should also have height to live crown recorded.

Understory Tree Plot

The understory plot is 100 m² (a radius of 5.64 m) using the same plot centre as the Overstory Tree Plot. **All** understory stems are to be dot tallied by species (**both coniferous and deciduous**) and height class. Only trees greater than 0.3 m and less than 10.0 cm dbh need to be tallied in the understory plot.

Ecological Plot

Ecological data is to be collected on the first plot measured in each stand regardless of the location of the first plot. Data to be collected includes slope position, nutrient regime, moisture regime, parent material, drainage class, humus form, presence of organic soils and soil texture. The site is to be classified to the plant community level.

If the eco-site, appears to change in any of the other two plots in the stand, then the eco-site should be reclassified on the plot.

Ages

Ages are to be recorded on a sample of the height trees. Only dominant or codominant trees are to be aged. Do not age trees with broken tops.

In pure conifer stands, a minimum of 2 conifer trees are to be aged.

In pure deciduous stands, a minimum of 2 deciduous trees are to be aged.

In mixedwood stands, aging will be done on 2 conifer and 2 deciduous species. The map covertype should be used in determining the stand type for aging. Mixedwood stands are any stands with greater than 20% of both conifer and deciduous.

In plots with less than the required number of trees, age trees are to be taken from trees outside of the plot (but within the same stand). If trees outside the plot are aged, the species, dbh, and height should be recorded for these trees. If it is necessary to select age trees outside the plot, the trees selected should be the dominant or codominant trees closest to plot centre.

Quality Control

Tables 1 and 2, following, outline the quality control parameters to be used by Weyerhaeuser Canada staff. The amount of quality plots will be based on a 10% intensity level. Weyerhaeuser Canada reserves the right to adjust the intensity level based on contractor's performance.

Allowable errors

table 1

Measurement	Allowable Error
Directions from Tie-Point	directions from the tie-point to the witness tree must be complete enough to facilitate plot relocation (specific allowance has not been defined because of variability in distances, etc.)
Plot Centre Location	bearing and horizontal distance to the plot centre must be within 2° of the bearing and within $\pm 2\%$ of the distance;
Ages	ages must be within ± 4 years for conifers and ± 10 years for deciduous trees
No. of Trees	no error allowed; all stems 10.0 cm dbh or greater within the plot boundary must be numbered
No. of Understorey Stems	total number of stems by species must be within 10% of check cruise
Tree/Sapling Species	no error allowed, all species must be identified correctly
Tree DBH	must be within ± 0.5 cm
Height	must be within $\pm 5\%$
Edatopic Grid	must be in correct moisture and nutrient regime class.

Check cruise standards

table 2

Measurement	Standard
Tree DBH	if more than 5% of the total tagged trees checked are incorrect (not within 0.5 cm), all plots established by the crew in the entire day will have to be remeasured for diameter.
Height	if more than 20% of the heights checked are incorrect (not within 5%) the heights in all plots established by the crew in the entire day will have to be remeasured
No. of Trees	if any trees (of 10.0 cm or greater) are incorrectly tallied as being in or out of the plot, then all plots established by the crew in the entire day will have to be remeasured.

Ecosite Classification	if both the moisture regime and the nutrient regime are incorrect, then all plots established by the crew in the entire day will have to be re-classified. If moisture and nutrient regime are repeatedly misclassified then the crew will be prohibited from working on the contract.
Completeness of Tally Sheets	all appropriate fields on the tally sheets should be filled in. Field crews with missing entries will be required to revisit plots to fill in missing entries. Correct codes are to be used.

Tally Sheet Attribute	Description	
AVI overstory	The AVI field call for the overstory (e.g., C15Sw6Pb4)	
AVI understory	The AVI field call for the understory (e.g., A6Sw6Aw2Pb2)	
Species	Common Name	Code
Abies balsamea	balsam fir	FB
Abies lasiocarpa	alpine fir	FA
Betula papyrifera	white (paper) birch	BW
Larix laricina	tamarack	LT
Larix occidentalis	western larch	LW
Picea engelmannii	Engelmann spruce	SE
Picea glauca	white spruce	SW
Picea mariana	black spruce	SB
Pinus banksiana	jack pine	PJ
Pinus contorta	lodgepole pine	PL
Populus balsamifera	balsam poplar	PB
Populus tremuloides	trembling aspen	AW
Pseudotsuga menziesii	Douglas-fir	FD

CC – Crown Class	D - dominant (above the general level of canopy) C - codominant (forms the general layer of canopy) I - intermediate (extends into the bottom of canopy) S - suppressed (crown entirely below the general level of the canopy)
Condition Code	01 - Conks

	<p>02 - Open Scars 12 - Burls and Galls 13 - Fork 14 - Pronounced Crook 19 - Broken Top 22 - Limby 23 - Leaning 24 - Broken Stem 25 - Standing Dead 26 - Missing 27 - Dead and Down 28 - Same Stump 29 - Cut Down 30 - Stem Insects 31 - Stem Disease 32 - Foliar Insects 33 - Foliar Disease 34 - Stem Form Defects 35 - Dead Top/Dieback 36 - Closed Scars 37 - Unknown 91 - 96 Dwarf Mistletoe</p>
Harvesting Evidence	Record Y is stumps from harvesting indicate that the stand has been completely or partially logged previously
Overstory Condition	<p>P1 – Damaged P2 – Overmature to decadent P3 – Mature to overmature P4 – Immature to mature</p>
Damage	<p>Indicates extensive damage from F - fire W - wind I – insects/disease H – water damage</p>

Site Information

Slope Position	
Moisture Regime	
Nutrient Regime	
Parent Material	
Drainage Class	
Humus form	
Organic Soils	
Soil Texture	
Shrubs Mosses/Lichens Herbs Grasses/Sedges	Cover composition by species
Natural Subregion Ecosite Phase Plant Community	

<i>Conifer</i>	
P1	DAMAGED -stand is extensively damaged by fire, wind, disease, etc.
P2	OVERMATURE TO DECADENT - high risk stands showing volume decline. - extensive openings in upper crown due to mortality and windblown, weakened trees. -dieback, disease, mortality and/or instability existing in standing dominant or co-dominant trees.
P3	MATURE TO OVERMATURE - stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown due to mortality on windblown, weakened trees. -mortality or instability restricted to sub-dominant trees. -stand is expected to survive until next cutting cycle without significant loss.
P4	IMMATURE TO MATURE -growth is normal and expected to continue until next cutting cycle. -few signs of instability or mortality. -overall stand condition is thrifty and vigorous.
<i>Deciduous</i>	
P1	DECADENT OR DAMAGED -stand showing signs of extensive, rapid decline. e.g. 25% plus of stems are dry or snapped. -stand is extensively damaged by fire, wind, diseases, etc. -stand should not be considered as eligible second cut
P2	OVERMATURE TO DECADENT -high risk stands showing volume decline due to mortality and cull. -extensive openings in upper crown, understory or second growth deciduous or heavy brush is developing. -cull indicators are prevalent, e.g. conks, scars, flat-topping -lesser % of dominant trees are dry, snapped or down.
P3	MATURE TO OVERMATURE -stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown. -mortality restricted to sub-dominant trees, cull indicators are not prevalent.
P4	IMMATURE TO MATURE - stand is presently merchantable, but growth is expected to continue until second cycle. - overall stand condition is thrifty and vigorous.

Drayton Valley

1999 VOLUME SAMPLING PROGRAM

Objectives

The objectives of the volume sampling are:

1. Complete the volume sampling requirements for the Detailed Forest Management Plan.
2. To provide additional data suitable for development of yield relationships and stratum level stand volume tables.
3. To provide stratum level estimates of stand tables (distribution of stems/ha by dbh class) for use in SAWSIM and stratum level estimates of tree size
4. To provide stand level estimates of volume and a stand table for short-term harvest design areas.
5. To provide a sampling design for ongoing data collection associated with operational planning.

Design

Transects have been established for the entire FMA at an azimuth of 60° every 250 m. (A square grid of 250 m × 250 m results in 1 intersection for every 6.25 ha.) The grid of transects was overlaid (using GIS) onto the AVI polygon base. The linear distance of each transect within each polygon was determined and three plots within each polygon were randomly placed on the transect(s) within each stand. Not all polygons are intersected by the transects.

The plots are not established as clusters and consequently can be considered as independent observation from a statistical view point.

A stratified sampling design was employed. Stratification consisted of combinations of eco-district, broad cover group (pure coniferous, mixedwood and pure deciduous), density and six metre height classes. Strata with less than 0.1% of total area were excluded from sampling. A total of 142 strata were sampled in the previous programs. For the 1999 program only 32 strata require plot data.

In eco-districts with less than 5.0 % of the total eligible FMA land base were assigned 5.0% of the sample plots. With the exception noted above, the distribution of plots by stratum was in proportion to area. A minimum number of six plots per stratum was established⁷.

Table 1 indicates the stratification and distribution of plots by stratum.

⁷ The low number of plots per stratum are not intended to provide adequate averages (e.g., volume averages) within each stratum, but the plots will contribute to the development of relationships which can be applied to each stratum.

Plot Stratification

Table 1

Strata	Twp	Rge	Mer	PID	Area
1	47	10	5	621	5.1
2	46	10	5	278	8.2
3	47	10	5	187	59.9
3	47	10	5	44	31.8
3	48	10	5	22	33.4
4	46	10	5	425	15.7
5	48	10	5	105	10.5
6	46	9	5	536	4.7
7	47	9	5	230	13.6
7	46	9	5	530	9.1
8	45	10	5	64	9.6
9	42	8	5	698	26.9
9	46	11	5	93	9.5
10	47	11	5	583	14.9
10	44	9	5	719	7.3
10	48	13	5	30	23.0
10	45	11	5	98	1.0
11	41	8	5	887	4.2
12	47	9	5	594	5.5
12	40	8	5	534	4.9
13	41	17	5	168	33.8
13	41	17	5	244	73.8
13	41	17	5	72	165.8
14	42	18	5	33	26.1
15	41	18	5	30	538.3
16	40	10	5	335	72.6
17	47	12	5	195	29.2
18	44	14	5	525	13.1
18	41	8	5	771	19.0
18	42	9	5	651	24.6
19	44	13	5	243	11.6
20	44	14	5	154	8.0
21	44	10	5	330	13.9
22	41	9	5	943	13.2
22	44	11	5	56	8.8
22	44	10	5	68	6.3
23	44	14	5	281	71.4
24	41	17	5	359	47.9
24	44	18	5	288	34.7
24	42	18	5	95	48.1

25	42	16	5	130	207.3
25	42	17	5	9	66.5
26	44	20	5	36	50.4
26	41	17	5	121	38.4
26	41	16	5	107	116.0
26	44	19	5	117	4.9
26	43	19	5	54	280.8
26	42	20	5	34	233.9

Plot Stratification, cont

Table 1

Strata	Twp	Rge	Mer	PID	Area
26	43	20	5	201	8.5
26	42	18	5	197	99.0
26	43	19	5	56	37.0
27	41	17	5	180	75.9
27	42	17	5	420	11.8
27	44	18	5	328	86.1
27	43	17	5	23	122.3
28	42	7	5	437	5.0
29	44	6	5	1956	5.5
30	47	14	5	203	3.0
30	47	13	5	108	16.7
31	47	14	5	362	16.1
31	43	15	5	72	6.3
31	43	16	5	165	14.7
31	47	13	5	727	4.9
31	44	15	5	71	11.9
31	43	14	5	1	25.1
31	44	14	5	78	41.5
32	44	15	5	168	50.0
32	43	15	5	137	18.9
32	47	14	5	153	12.0

PLOT ESTABLISHMENT

All plots are to be marked with an aluminum stake to facilitate check cruising. GPS will be used to record the location of plot centre.

Compass Declination

For all compass work required the declination will be set at 22° E. Compass line from tie point to plot centre shall be flagged to ensure that WeyCan reps are able to locate the plots to perform quality checks.

MOVING PLOTS:

- Plots are **not** to be moved for natural features such as openings in stands and creeks not typed as separate AVI polygons.
- **Seismic lines:** If the plot falls on a seismic line then the plot should be moved 20 m perpendicular to the direction of the seismic line (all other plots should remain in the same locations).
- **Features not mapped in AVI:** Plots should not be established on newly constructed features that would be interpreted in AVI such as roads, well sites and clear cuts.

Overstory Tree Plot

The plot size for tree measurements is 160 m² (a circular plot with a radius of 7.14 m). **All trees greater than 10.0 cm are to be tallied.** Species, dbh, crown class, condition code, and cull suspect class are to be recorded for every tallied tree.

Height Trees: A minimum of 3 trees by species in each plot should be measured for height in the plot. The first tree and every 5th tree thereafter should be measured. The height trees should **not** be restricted to dominant or codominant trees. All trees measured for height should also have height to live crown recorded.

Understory Tree Plot

The understory plot is 100 m² (a radius of 5.64 m) using the same plot centre as the Overstory Tree Plot. **All** understory stems are to be dot tallied by species (**both coniferous and deciduous**) and height class. Only trees greater than 0.3 m and less than 10.0 cm dbh need to be tallied in the understory plot.

Ecological Plot

Ecological data is to be collected on the first plot measured in each stand regardless of the location of the first plot. Data to be collected includes slope position, nutrient regime, moisture regime, parent material, drainage class, humus form, presence of organic soils and soil texture. The site is to be classified to the plant community level. Refer to the Weyerhaeuser *Pre-Harvest Assessment Best Practices Manual*.

If the eco-site, appears to change in any of the other two plots in the stand, then the eco-site should be reclassified on the plot.

AGES

Ages are to be recorded on a sample of the height trees. Only dominant or codominant trees are to be aged. Do not age trees with broken tops.

In pure conifer stands, a minimum of 2 conifer trees are to be aged.

In pure deciduous stands, a minimum of 2 deciduous trees are to be aged.

In mixedwood stands, aging will be done on 2 conifer and 2 deciduous species. The map covertime should be used in determining the stand type for aging. Mixedwood stands are any stands with greater than 20% of both conifer and deciduous.

In plots with less than the required number of trees, age trees are to be taken from trees outside of the plot (but within the same stand). If trees outside the plot are aged, the species, dbh, and height should be recorded for these trees. If it is necessary to select age trees outside the plot, the trees selected should be the dominant or codominant trees closest to plot centre.

QUALITY CONTROL

Tables 2 and 3, following, outline the quality control parameters to be used by Weyerhaeuser Canada staff. The amount of quality plots will be based on a 10% intensity level. Weyerhaeuser Canada reserves the right to adjust the intensity level based on contractor's performance.

Allowable errors

Table 2

Measurement	Allowable Error
Directions from Tie-Point	directions from the tie-point to the witness tree must be complete enough to facilitate plot relocation (specific allowance has not been defined because of variability in distances, etc.)
Plot Centre Location	bearing and horizontal distance to the plot centre must be within 2° of the bearing and within $\pm 2\%$ of the distance;
Ages	ages must be within ± 4 years for conifers and ± 10 years for deciduous trees
No. of Trees	no error allowed; all stems 10.0 cm dbh or greater within the plot boundary must be numbered
No. of Understorey Stems	total number of stems by species must be within 10% of check cruise
Tree/Sapling Species	no error allowed, all species must be identified correctly
Tree DBH	must be within ± 0.5 cm
Height	must be within $\pm 5\%$
Edatopic Grid	must be in correct moisture and nutrient regime class.

Check cruise standards

Table 3

Measurement	Standard
Tree DBH	if more than 5% of the total tagged trees checked are incorrect (not within 0.5 cm), all plots established by the crew in the entire day will have to be re-measured for diameter.
Height	if more than 20% of the heights checked are incorrect (not within 5%) the heights in all plots established by the crew in the entire day will have to be re-measured
No. of Trees	if any trees (of 10.0 cm or greater) are incorrectly tallied as being in or out of the plot, then all plots established by the crew in the entire day will have to be re-measured.
Ecosite Classification	if both the moisture regime and the nutrient regime are incorrect, then all plots established by the crew in the entire day will have to be re-classified. If moisture and nutrient regime are repeatedly misclassified then the crew will be prohibited from working on the contract.
Completeness of Tally Sheets	all appropriate fields on the tally sheets should be filled in. Field crews with missing entries will be required to revisit plots to fill in missing entries. Correct codes are to be used.

Tally Sheet Attribute	Description	
AVI overstory	The AVI field call for the overstory (e.g., C15Sw6Pb4)	
AVI understory	The AVI field call for the understory (e.g., A6Sw6Aw2Pb2)	
Species	Common Name	Code
Abies balsamea	balsam fir	FB
Abies lasiocarpa	alpine fir	FA
Betula papyrifera	white (paper) birch	BW
Larix laricina	tamarack	LT
Larix occidentalis	western larch	LW
Picea engelmannii	Engelmann spruce	SE
Picea glauca	white spruce	SW
Picea mariana	black spruce	SB
Pinus banksiana	jack pine	PJ
Pinus contorta	lodgepole pine	PL
Populus balsamifera	balsam poplar	PB
Populus tremuloides	trembling aspen	AW
Pseudotsuga menziesii	Douglas-fir	FD

CC – Crown Class	<p>D - dominant (above the general level of canopy)</p> <p>C - codominant (forms the general layer of canopy)</p> <p>I - intermediate (extends into the bottom of canopy)</p> <p>S - suppressed (crown entirely below the general level of the canopy)</p>
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<p>Condition Code</p>	<p>01 - Conks 02 - Open Scars 12 - Burls and Galls 13 - Fork 14 - Pronounced Crook 19 - Broken Top 22 - Limby 23 - Leaning 24 - Broken Stem 25 - Standing Dead 26 - Missing 27 - Dead and Down 28 - Same Stump 29 - Cut Down 30 - Stem Insects 31 - Stem Disease 32 - Foliar Insects 33 - Foliar Disease 34 - Stem Form Defects 35 - Dead Top/Dieback 36 - Closed Scars 37 - Unknown 91 - 96 Dwarf Mistletoe</p>
<p>Harvesting Evidence</p>	<p>Record Y is stumps from harvesting indicate that the stand has been completely or partially logged previously</p>
<p>Overstory Condition</p>	<p>P1 – Damaged P2 – Overmature to decadent P3 – Mature to overmature P4 – Immature to mature</p>
<p>Damage</p>	<p>Indicates extensive damage from F - fire W - wind I – insects/disease H – water damage</p>

<i>Conifer</i>	
P1	DAMAGED -stand is extensively damaged by fire, wind, disease, etc.
P2	OVERMATURE TO DECADENT - high risk stands showing volume decline. - extensive openings in upper crown due to mortality and windblown, weakened trees. -dieback, disease, mortality and/or instability existing in standing dominant or co-dominant trees.
P3	MATURE TO OVERMATURE - stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown due to mortality on windblown, weakened trees. -mortality or instability restricted to sub-dominant trees. -stand is expected to survive until next cutting cycle without significant loss.
P4	IMMATURE TO MATURE -growth is normal and expected to continue until next cutting cycle. -few signs of instability or mortality. -overall stand condition is thrifty and vigorous.
<i>Deciduous</i>	
P1	DECADENT OR DAMAGED -stand showing signs of extensive, rapid decline. e.g. 25% plus of stems are dry or snapped. -stand is extensively damaged by fire, wind, diseases, etc. -stand should not be considered as eligible second cut
P2	OVERMATURE TO DECADENT -high risk stands showing volume decline due to mortality and cull. -extensive openings in upper crown, understory or second growth deciduous or heavy brush is developing. -cull indicators are prevalent, e.g. conks, scars, flat-topping -lesser % of dominant trees are dry, snapped or down.
P3	MATURE TO OVERMATURE -stable stands where growth appears to be decelerating and net volume has maximized. -few openings in upper crown. -mortality restricted to sub-dominant trees, cull indicators are not prevalent.
P4	IMMATURE TO MATURE - stand is presently merchantable, but growth is expected to continue until second cycle. - overall stand condition is thrifty and vigorous.

APPENDIX VIII – PLOTS EXCLUDED FROM TOTAL VOLUME MODELS

We excluded plots less than age 40 years with greater than 200 m³/ha total volume and plots with greater than 900 m³/ha (Table 30 and Table 31). We excluded switch stand plots greater than age 80 years with less than 120 m³/ha total volume and plots with greater than 500 m³/ha as they greatly influenced the model (Table 32).

Table 30. Plots excluded from conifer stand total volume model.

KEY_NEW	Age (years)	CC	Conifer %	Total volume (m ³ /ha)	NSR	Site	Conifer stratum number
V0001440950686C	128	B	7	927	LF	G	2
V0002471050274B	37	C	4	250	LF	G	deciduous
V0001430950026C	10	C	5	384	LF	G	3
V0001390850362C	28	C	6	216	LF	G	3
V0002440950638A	127	C	7	971	LF	G	3
V0001430950026A	10	D	7	228	LF	G	4
V0001430950026B	10	D	7	453	LF	G	4
V0001430750201B	38	B	4	248	LF	M	deciduous
V0005431650404A	26	B	4	470	UF	G	deciduous
V0005441650326A	16	B	6	434	UF	G	11
V0005441650329A	16	B	6	291	UF	G	11
V0005431650536A	26	B	8	438	UF	G	11
V0005431550542A	36	C	6	373	UF	G	12
V0002441550457C	107	D	9	926	UF	G	13
V0005431650569B	106	D	10	1,109	UF	G	13

Table 31. Plots excluded from deciduous stand total volume model.

KEY_NEW	Age (years)	CC	Conifer %	Total volume (m ³ /ha)	NSR	Site	Deciduous stratum number
V0002440950472B	27	A	0	548	LF	G	1
V0001470950176B	8	B	0	300	LF	G	2
V0002481350089A	107	B	0	1,161	LF	G	2
V0001430750201B	38	B	4	248	LF	G	2
V0001470850826B	108	C	1	925	LF	G	3
V0001420750352C	38	C	2	224	LF	G	3
V0001471050048A	28	C	2	248	LF	G	3
V0002461250412B	37	C	3	409	LF	G	3
V0001471050380A	38	C	4	531	LF	G	3
V0002471050274B	37	C	4	250	LF	G	3
V0001430950026C	10	C	5	384	LF	G	3
V0001390850362C	28	C	6	216	LF	G	conifer
V0001420750495C	38	D	0	263	LF	G	4
V0001420750746A	38	D	0	212	LF	G	4
V0001450850305B	98	D	0	932	LF	G	4
V0001470850926A	28	D	0	251	LF	G	4
V0001430850167B	28	D	1	237	LF	G	4
V0001451050371B	18	D	1	310	LF	G	4
V0005431650404A	26	B	4	470	UF	G	6
V0005441650326A	16	B	6	434	UF	G	conifer
V0005441650329A	16	B	6	291	UF	G	conifer
V0002471450341B	117	C	1	929	UF	G	7
V0005431550563B	36	C	3	413	UF	G	7
V0005431550542A	36	C	6	373	UF	G	conifer

Table 32. Plots excluded from conifer switch stand total volume model.

KEY_NEW	Age (years)	CC	Conifer %	Total volume (m ³ /ha)	NSR	Site	Conifer stratum number
V0001460950041C	78	C	5	584	LF	G	24
V0001471150860B	58	C	8	566	LF	G	24
V0004410850887A	89	C	8	111	LF	G	24