



Yield Curves

2007 – 2017 Forest Management Plan for FMA 0200041

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The Forestry Corp.**



2007 – 2017 FMP FOR FMA 0200041

Monitoring and Research forms one of 10 sections of the 2007 – 2017 Forest Management Plan for Manning Diversified Forest Products Ltd.'s Forest Management Agreement (FMA) 0200041. The Forest Management Plan (FMP) includes the following sections:

1. **Introduction and Plan Development** – Introduces the companies operating on the FMA and describes the FMP development process, including the public consultation process. Includes the FMP Standards Checklist.
 2. **FMA Area** – Describes the physical environment of the FMA Area.
 3. **FMA Resources** – Describes the natural resources within the FMA Area.
 4. **Values, Objectives, Indicators and Targets (VOITs)** – Details the values, objectives, indicators and targets that were instrumental in selecting the Preferred Forest Management Strategy and in developing forest management strategies for the FMP.
 5. **Forest Landscape Metrics** – Presents specific information regarding forest vegetation composition and natural disturbance within the FMA Area and/or northwestern Alberta to address VOIT requirements.
 6. **Landbase Netdown** – Provides a detailed description of the landbase netdown process, in preparation for the Timber Supply Analysis.
 7. **Yield Curves** – Documents the volume sampling and yield curve development process.
 8. **Timber Supply Analysis** – Describes how the Preferred Forest Management Strategy, which was selected to meet Values and Objectives, was incorporated into the Timber Supply Analysis and provides an Annual Allowable Cut for both the coniferous and deciduous landbases.
 9. **Implementation** – Describes the forest management strategies and operations that will be used to implement the FMP and help ensure that indicators and targets are met.
 10. **Monitoring and Research** – Describes monitoring commitments required to ensure indicators and targets are tracked and describes Manning Diversified's approach to supporting research
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1. Overview

1.1 Background

Manning Diversified Forest Products (MDFP) Ltd.'s *Forest Management Agreement*¹ (FMA) 0200041 applies to Forest Management Unit (FMU) P16 (comprised of two FMUs, referred to as FMU P6 and FMU P9). Manning Diversified Forest Products Ltd. (MDFP) has coniferous timber rights within the FMA area while Daishowa-Marubeni International Ltd. (DMI) holds a deciduous quota.

In preparation for the *timber supply analysis* (TSA) that will be conducted as part of the FMA 0200041 2007-2017 Forest Management Plan (FMP) submission, The Forestry Corp. has developed a set of *yield curves* for the *active landbase*. This document describes the methods utilized for yield curve development and presents the results.

1.2 Yield Stratification for the 2007-2017 FMP

Yield strata form the basis for development of the yield curves that are used in timber supply analysis for the 2007-2017 FMP. Fifteen yield strata were identified for the FMP. *Stands* were grouped based on *broad cover group*, overstory and/or understory species composition and crown closure class. There are nine combined yield strata (FMA area-wide) and six FMU-specific yield strata.

There are five main *stand types* described by the *stratification* process:

Deciduous Stands. Yield strata are divided by crown closure class and combined by FMU:

- D-B-COMB
- D-CD-COMB

¹ Terms that are defined in the glossary will be shown in italics the first time they are presented in this document. The glossary is provided in Appendix I. To help clarify the relationship between types of volume, yield strata, yield curves, and landbase-related terms, a structure of terminology is also provided. See Appendix II.

Deciduous Stands with Coniferous Understory. Yield strata are divided by understory crown closure class, and combined by FMU:

- DU-A-COMB²
- DU-BCD-COMB

Mixedwood Stands. Yield strata are combined by FMU:

- DC-BCD-COMB
- CD-BCD-COMB

Mixedwood Stands with Coniferous Understory. Yield strata are divided by crown closure class and combined by FMU:

- MXU-B-COMB
- MXU-CD-COMB

Coniferous Stands. Yield strata are divided by leading coniferous species, crown closure class and/or FMU (varies depending on leading coniferous species):

- PL-BCD-P6
- PL-BCD-P9
- SB-BCD-COMB
- SW-B-P6
- SW-B-P9
- SW-CD-P6
- SW-CD-P9

Yield strata are described in Table 1-1, and the yield stratification process is described in Chapter 2.

Table 1-1. Description of yield strata used in the 2007-2017 FMP.

Yield Stratum	Description
D-B-COMB	Deciduous stand, B density defining layer ¹ , combined FMUs
D-CD-COMB	Deciduous stand, CD density defining layer, combined FMUs
DU-A-COMB	Deciduous stand with A density SW or BCD density non-SW conifer understory, combined FMUs
DU-BCD-COMB	Deciduous stand with BCD density SW coniferous understory, combined FMUs
DC-BCD-COMB	Mixedwood stand, deciduous leading, BCD density defining layer, combined FMUs
MXU-B-COMB	Mixedwood stand with coniferous understory, B density defining layer, combined FMUs
MXU-CD-COMB	Mixedwood stand with coniferous understory, CD density defining layer, combined FMUs
CD-BCD-COMB	Mixedwood stand, coniferous leading, BCD density defining layer, combined FMUs
PL-BCD-P6	Pine-leading coniferous stand, BCD density defining layer, FMU P6
PL-BCD-P9	Pine-leading coniferous stand, BCD density defining layer, FMU P9
SB-BCD-COMB	Black spruce-leading coniferous stand, BCD density defining layer, combined FMUs
SW-B-P6	White spruce-leading coniferous stand, B density defining layer, FMU P6
SW-B-P9	White spruce-leading coniferous stand, B density defining layer, FMU P9
SW-CD-P6	White spruce-leading coniferous stand, CD density defining layer, FMU P6
SW-CD-P9	White spruce-leading coniferous stand, CD density defining layer, FMU P9

¹ The defining layer may be the overstory or understory layer, as described in Chapter 2.

² Includes a small amount of BCD density conifer understory that is non-white spruce leading.



1.3 Yield Curves for the 2007-2017 FMP

A series of yield curves³ were fit for each yield stratum. Certain yield curves are specific to selected yield strata (e.g., *tree improvement* and *understory protection* yield curves). The following is a summary of the yield curves that were developed for the 2007-2017 FMP; detailed descriptions of yield curve development are provided in Chapters 3 to 6.

Base Natural Stand Yield Curves. *Natural stand yield curves* were empirically-fit for each yield stratum using data collected within the FMA area (*base yield curves*). Deciduous and coniferous volume were fit as a function of stand age. Stand age was taken from the *defining layer*, except for the DU-BCD yield stratum, where volume was fit as a function of understory age.

Natural Stand Yield Curves With Cull. Base natural stand yield curves were reduced to reflect losses due to *cull*. A percent reduction was applied separately to coniferous and deciduous volumes. Additional reductions were applied to the deciduous component of the D-B-COMB, D-CD-COMB and DU-A-COMB yield curves to reflect expected decline in deciduous volumes at older ages.

Pre-91 Managed Stand Yield Curves. Natural stand yield curves with cull were modified to reflect regeneration delay in stands harvested prior to May 1, 1991. A 2-year *regeneration lag* was applied to deciduous yield strata (D-B-COMB and D-CD-COMB) and a 5-year regeneration lag was applied to coniferous yield strata (all other strata).

Post-91 Managed Stand Yield Curves. Natural stand yield curves with cull were modified to reflect regeneration delay in stands harvested on or after to May 1, 1991. A 0-year regeneration lag was applied to deciduous yield strata (D-B_COMB and D-CD-COMB) and a 2-year regeneration lag was applied to coniferous yield strata (all other strata).

Tree Improvement Yield Curves. The coniferous component of base natural stand yield curves were modified to produce an increase in coniferous volume for the PL, CD, DC and SW yield strata at target ages (2% at 90 years for PL and 5% at 110 years for CD, DC and SW yield strata). Cull percentages and post-91 managed stand regeneration lag values were then applied to coniferous volume. Deciduous volume for tree improvement curves was obtained from post-91 managed stand yield curves. Tree improvement yield curves will replace post-91 managed stand yield curves where improved stock is deployed.

Understory Protection Yield Curves. Understory protection yield curves were developed to reflect growing stock left from understory protection (strip shelterwood) harvesting both before and after harvest. Due to the complexity of the strip shelterwood harvesting systems, no one yield curve could be used to represent volume over time. Different yield curves at varying ages were used to represent treatments (wind buffers, removal areas, and skid trails) within understory protection blocks.

Composite Yield Curves. *Composite yield curves* were developed to reflect average yields for natural stands on the active landbase. Six composite yield curves were developed for natural stands on the active landbase: one for each broad cover group, one for the combined coniferous landbase (C/CD/DC) and one

³ The term yield curve is used to represent a set of three separate curves: a volume-age curve for coniferous volume, a volume-age curve for deciduous volume, and a volume-age curve for total volume.



for the total landbase (C/CD/DC/D). Composite yield curves were created by area-weighting natural stand yield curves with cull by the area of natural stands in the active landbase.

Piece Size Curves. *Piece size* curves were empirically-fit for each yield stratum using data collected within the FMA area. Trees per cubic meter was fit as a function of stand age for deciduous and coniferous species separately. Stand age was taken from the defining layer, except for the DU-BCD yield stratum, where piece size was fit as a function of understory age.



2. Yield Stratum Assignment

2.1 Background

Assigning yield strata underpins the process of developing yield curves. This process partitions the FMA into smaller areas that have similar characteristics (*e.g.*, cover, density and productivity). Yield curves project average conditions for each yield stratum over time. As such, stratification is important to ensure that stands are grouped based on similarities relevant to timber yield and planned management practices.

This section describes how Alberta Vegetation Inventory (AVI) *polygons* are assigned to yield strata. It does not, however, discuss how the landbase is classified into the active vs. *passive landbase*, nor how the update process for *cutblocks* is applied. For information on landbase classification, see the **Landbase Netdown**.

2.2 Stratification

Yield stratum assignment was based on AVI attributes, as described in the AVI 2.1 manual (AFLW 1991). Stratification was only applied to forested stands (stands with valid forested AVI codes). For both the AVI overstory and understorey layers (if present), species were combined to form *species groups*. Species group by *species type* is presented in Table 2-1.

Table 2-1. Species group assignment.

Species Type	Species Group	AVI Species Codes	Description
Deciduous	AW	Aw	Trembling aspen
	BW	Bw	White birch
	PB	Pb	Balsam poplar
Coniferous	FB	Fb, Fa	True firs
	LT	Lt	Larches
	PL	P, Pl, Pj	Pines
	SB	Sb	Black spruce
	SW	Sw	White and Engelmann spruce

The total percent composition by species type (coniferous vs. deciduous) was used to assign a broad cover group (BCG) to each AVI layer (Table 2-2).

Table 2-2. Broad cover group assignment.

Broad Cover Group	Percent Deciduous	Percent Coniferous	Description
D	≥ 80	≤ 20	Deciduous
DC	51-79	21-49	Deciduous-leading mixedwood
CD	21-50	50-79	Coniferous-leading mixedwood
C	≤ 20	≥ 80	Coniferous

A defining layer was then selected for each polygon. Generally, layer 1 (overstory layer) was deemed the defining layer, except polygons with:

- A density overstory with a productive forested understory: use layer 2 (understory)
- B, C or D density overstory and a D, DC or CD overstory broad cover group with a DC, CD, or C understory broad cover group: use layer 3⁴ (overstory with understory modifier)

Yield strata were assigned based on FMU, defining layer, broad cover group, crown closure class, and leading coniferous species group (Table 2-3). In AVI polygons with a defining layer = 3, understory layer attributes were also used for assignment.

Note that yield stratification is a complex process and is simplified for this document. For full details, please see the **Landbase Netdown**.

Table 2-3. Yield strata for the 2007-2017 FMP.

Yield Stratum	FMU(s)	Defining Layer ¹	Defining Layer Attributes			Understory Layer Attributes		
			Broad Cover Group	Crown Closure Class	Leading Coniferous Species	Broad Cover Group	Crown Closure Class	Leading Coniferous Species
D-B-COMB	P6, P9	1 or 2	D	B	-	-	-	-
D-CD-COMB	P6, P9	1 or 2	D	CD	-	-	-	-
DU-A-COMB	P6, P9	3	D	BCD	-	C, CD, DC	A	SW
	P6, P9	3	D	BCD	-	C, CD, DC	BCD	FB, PL, SB
DU-BCD-COMB	P6, P9	3	D	BCD	-	C, CD, DC	BCD	SW
DC-BCD-COMB	P6, P9	1 or 2	DC	BCD	-	-	-	-
MXU-B-COMB	P6, P9	3	DC, CD	B	-	C, CD, DC	-	FB, PL, SB, SW
MXU-CD-COMB	P6, P9	3	DC, CD	CD	-	C, CD, DC	-	FB, PL, SB, SW
CD-BCD-COMB	P6, P9	1 or 2	CD	BCD	-	-	-	-
PL-BCD-P6	P6	1 or 2	C	BCD	PL	-	-	-
PL-BCD-P9	P9	1 or 2	C	BCD	PL	-	-	-
SB-BCD-COMB	P6, P9	1 or 2	C	BCD	SB	-	-	-
SW-B-P6	P6	1 or 2	C	B	FB, SW	-	-	-
SW-B-P9	P9	1 or 2	C	B	FB, SW	-	-	-
SW-CD-P6	P6	1 or 2	C	CD	FB, SW	-	-	-
SW-CD-P9	P9	1 or 2	C	CD	FB, SW	-	-	-

¹ Layer 1 = overstory, layer 2 = understory, layer 3 = overstory with understory modifier.

⁴ Polygons with layer 3 as the defining layer were subjected to deletions based on understory attributes. Where these polygons were deleted based on understory deletion rules, the polygon was reassigned to a defining layer based on overstory attributes (layer 1) and subjected to overstory selection criteria.



Stands that did not fit within these criteria (*e.g.*, A density overstory with no understory or A density understory, larch-leading coniferous stands, *etc.*) were not assigned a yield stratum (unassigned).

Area within the active landbase by yield stratum and stand type is presented in Table 2-4.

The majority of these yield strata are FMA area-wide, that is, represent the combined FMUs (P6 and P9). It is important to note that:

- D and DU strata are differentiated by the presence of a valid coniferous understory in DU stands. Separating yield strata based on the presence of an understory was necessary to reflect the competing needs resulting from both coniferous and deciduous harvesting operations within the FMA area and is consistent with the direction provided in the Forest Management Agreement.
- The naming convention for the DU-A and DU-BCD yield strata is distinctive: crown closure class reflects understory crown closure class rather than the defining layer crown closure class.
- MXU yield strata are distinguished from the DC and CD yield strata by the presence of a valid understory layer in MXU stands.
- In the MXU (mixedwood with coniferous understory) yield strata, strata were separated into B and CD crown closure classes, but combined by broad cover group (CD and DC). Due to the small areas that these strata comprise, the yield strata could not be divided by both crown closure class and broad cover group, and the management strategy for these stand types were driven more by crown closure class than by broad cover group.
- Separate FMU-specific yield strata were developed for the PL and SW yield strata. In the case of SW, yield strata were also split into B and CD crown closure classes. Separation of yield strata by FMU and crown closure class were intended to reflect productivity differences in these stand types and intended management strategies.

Table 2-4. Areas within the active landbase by stand origin and yield stratum.

Yield Stratum	Stand Type			Total
	Natural	Managed Pre-91 ¹	Managed Post-91 ² Understory Protection ³	
D-B-COMB	15,513	189	223	15,924
D-CD-COMB	54,170	498	1,160	55,829
DU-A-COMB	58,041	1,027	819	60,137
DU-BCD-COMB	34,989	3,502	511	39,003
DC-BCD-COMB	5,383	167	655	6,205
MXU-B-COMB	9,308	5	4	9,317
MXU-CD-COMB	12,211	-	35	12,247
CD-BCD-COMB	5,744	3,935	1,092	10,771
PL-BCD-P6	7,090	89	505	7,684
PL-BCD-P9	18,726	-	-	18,726
SB-BCD-COMB	4,196	44	20	4,260
SW-B-P6	22,213	223	1,780	24,216
SW-B-P9	5,189	-	-	5,189
SW-CD-P6	20,542	354	1,122	22,019
SW-CD-P9	3,765	-	-	3,765
Total	277,081	10,033	7,927	295,291

¹ Stands harvested prior to May 1, 1991.

² Stands harvested on or after May 1, 1991.

³ Stands harvested using understory protection methods.



3. Data Preparation

3.1 Data Sources

Two data sources were used for yield curve development. First measurements from permanent sample plots (PSPs) were collected in early 2000 under protocols developed by Olympic Resource Management (referred to as ORM PSP plots) (Appendix III). Only first measurements were available from the ORM PSP plots, and as such data were considered a static *observation* (temporary sample plot or TSP) for purposes of yield curve development. Supplemental temporary sample plot data were collected in the 2004 field season. TSP data were collected specifically to increase sample size for target yield strata (referred to as MDFP TSP plots); see Appendix IV and Appendix V for full details.

3.1.1 ORM PSP Plots

A permanent sampling program was initiated by Manning Diversified in 2000. A systematic grid of sample plots was installed across FMUs P9 and P6 on a 2.8 km by 2.8 km spacing. From within this grid, only productive stands were sampled, using AVI-based criteria for defining productive versus non-productive stands.

Field data were collected over three field seasons, between 2000 and 2002. Although the sample plots were intended for volume sampling, the design was also intended to provide the option of converting some or all of the plots to permanent sample plots at a later date.

Sample plots were comprised of a fixed-area, 15.96 m radius tree plot, within which a 7.98 m radius sapling plot and a 3.99 m radius regeneration plot were nested. In “dense” plots (based on field tree counts), plot sizes were decreased to 11.28/5.64/2.82 m radii, and in “super dense” plots, plot sizes were decreased to 7.98/3.99/1.99 m radii. The plot center was permanently marked and spatially documented (GPS) for relocation purposes.

All trees and saplings were tagged and measured within their respective plots, while regeneration was tallied (no tagging) within the regeneration plot. Species, DBH and condition codes were recorded for all

live and dead trees in the tree (≥ 9.1 cm DBH) and sapling (> 1.3 m tall and < 9.1 cm DBH) plots. Crown class was also recorded for live trees, while decay class was recorded for dead trees. A subsample of 20% of live trees were measured for total height, height to base of live crown, and crown width. Within the regeneration plot (≤ 1.3 m tall), regeneration was tallied by species and height class. A subsample of trees (two trees per species and canopy layer) was selected for age sampling.

See Appendix III for further details on sampling protocols

3.1.2 MDFP TSP Plots

MDFP TSP sampling was used to intensify the number of plots available for empirical yield curve development in target yield strata. The sampling frame was all merchantable stands ≥ 41 years of age within FMUs P6 and P9. Stands were classified by stratum and age class, with a goal of sampling 15 plots per stratum/age class combination.

Three plots were randomly located within selected stands. Plot locations were moved to randomly selected alternates if the plot area was intersected by a mappable disturbance. Mappable disturbances included seismic lines ≥ 5 m in width, well sites, or harvested areas. If the plot was intersected by an unmappable disturbance (< 5 m in width, primarily seismic lines), then the plot was offset rather than moved. Prior to moving or offsetting plots, measurements of the area of the plot disturbed by seismic lines or other disturbance were made.

To maintain some similarity in plot sizes, the minimum plot size from grid-based ORM PSP sampling was used for additional MDFP TSP sampling (7.98 m radius) for trees ≥ 9.1 cm DBH. In order to obtain information relevant to understanding understory stand dynamics, a sapling (> 1.3 m tall with a DBH < 9.1 cm) plot was also established, using the minimum plot size from grid-based ORM sampling (3.99 m radius). No regeneration plots were established.

While trees and saplings were not tagged and dead trees were not measured, MDFP TSP measurements on live trees were compatible with the initial ORM sampling manual. Species, DBH, crown class, and condition code were measured for each live tree or sapling. In order to create a link between ground sampled data and inventory labels, each sampled stem was assigned to a canopy layer, as defined by the AVI 2.1 inventory label. Tree heights were not measured, since good DBH-height equations already exist (*e.g.*, Huang 1994a) and could be used to predict height for volume calculations. Because of the interest in understory trees, combined with the potential variability in height growth expected in non-dominant canopy positions, total height of saplings was subsampled within the 3.99 m radius plot.

Age stems were subsampled (two per leading species per layer based on AVI label information) from each identified canopy layer within the 7.98 m radius plot.

See Appendix IV for further details on sampling protocols.

3.2 Plot Assignment

Plot spatial data were located in three shapefiles: two for ORM PSPs (*p6_all_plots.shp* and *p9_all_plots.shp*) and one for MDFP TSPs (*mdfp_used_tsps_plotdata_112304_v2.shp*). Attributes were assigned to each plot by intersecting the plot shapefiles with the MDFP spatial landbase, version 4 (*p16_lb4_tsa.shp*). This version of the landbase did not include spatial locations of seismic lines; rather, individual polygon areas were reduced to account for losses to seismic.



ORM shapefiles with appended landbase information were combined into a single shapefile called *ORM_plots_landbase.shp* and the MDFP shapefile with appended landbase information was output as *MDFP_plots_landbase.shp*. For each plot, yield stratum was assigned using landbase attribute fields to ensure consistency with landbase assignment. Rules for yield stratum assignment are shown in Table 3-1.

Table 3-1. Yield stratum assignment based on landbase attributes.

Yield Stratum	Landbase Field		
	THEME3 ¹	F DEN ²	MUENSITY ³
D-B-COMB	D	B	-
D-CD-COMB	D	CD	-
DU-A-COMB	DUSW	B, CD	A
	DUX	B, CD	B, CD
DU-BCD-COMB	DUSW	B, CD	B, CD
DC-BCD-COMB	DC	B, CD	-
MXU-B-COMB	DCU, CDU	B	-
MXU-CD-COMB	DCU, CDU	CD	-
CD-BCD-COMB	CD	B, CD	-
PL-BCD-P6	PL	B, CD	-
PL-BCD-P9	PL	B, CD	-
SB-BCD-COMB	SB	B, CD	-
SW-B-P6	SW	B	-
SW-B-P9	SW	B	-
SW-CD-P6	SW	CD	-
SW-CD-P9	SW	CD	-

¹ Broad cover group + understory modifier + leading coniferous species (X=non-SW).

² Defining layer crown closure class group.

³ Understory crown closure class.

Stand age for each observation at the year of measurement was calculated as stand age in 2005 (the reference year) minus the number of years between 2005 and the measurement year using:

$$Age_{Obs} = Age_{2005} - (2005 - MmtYear)$$

Where: Age_{Obs} = stand age at year of measurement based on the defining layer

Age_{2005} = stand age in 2005 (F_AGE)

$MmtYear$ = measurement year

For plots in the DU-BCD-COMB yield stratum, stand age was calculated based on the understory age, which required a slightly different formulation:

$$Age_{Obs} = MmtYear - MUORIGIN$$

Where: Age_{Obs} = stand age at year of measurement based on the understory layer

$MUORIGIN$ = understory origin year

The total number of plots by yield stratum, FMU and sampling program is presented in Table 3-2.

Table 3-2. Number of plots by yield stratum, FMU and sampling program⁵.

Yield Stratum	FMU P6			FMU P9			Total		
	ORM	MDFP	Total	ORM	MDFP	Total	ORM	MDFP	Total
D-B-COMB	5	22	27	20	13	33	25	35	60
D-CD-COMB	16	21	37	50	-	50	66	21	87
DU-A-COMB	64	21	85	13	2	15	77	23	100
DU-BCD-COMB	44	21	65	14	6	20	58	27	85
DC-BCD-COMB	4	11	15	2	13	15	6	24	30
MXU-B-COMB	13	30	43	2	18	20	15	48	63
MXU-CD-COMB	9	21	30	6	21	27	15	42	57
CD-BCD-COMB	16	27	43	2	8	10	18	35	53
PL-BCD-P6	10	51	61	-	-	-	10	51	61
PL-BCD-P9	-	-	-	25	20	45	25	20	45
SB-BCD-COMB	18	35	53	12	18	30	30	53	83
SW-B-P6	31	36	67	-	-	-	31	36	67
SW-B-P9	-	-	-	3	60	63	3	60	63
SW-CD-P6	34	30	64	-	-	-	34	30	64
SW-CD-P9	-	-	-	2	59	61	2	59	61
Unassigned ¹	25	-	25	27	-	27	52	-	52
Total	289	326	615	178	238	416	467	564	1,031

¹ No yield stratum assigned; either 1) nonforested stands or 2) undesirable stand type (e.g., A/A density, larch-leading coniferous).

3.3 Plot Deletions

Plots were eligible for empirical yield curve development if they were:

1. Within the active landbase;
2. In *natural stands* that have not been burned since sampling, and have not been harvested either before or after sampling; and
3. Not in other deletion areas (e.g., stream and road buffers, but not seismic disturbance)⁶.

Plots were deemed eligible if there was no landbase deletion assigned to the polygon (F_DEL1='NONE') and the polygon was in a natural stand or planned block (THEME6='NONE' or 'PLANNED'). Landbase deletions effectively removed all areas not within the active landbase, and theme selection retained only plots within natural stands.

Two small fires have occurred in the FMA area since ORM sampling commenced (in 2002 and 2004), however no ORM plots fell in these stands (D_BURN='' for all).

MDFP plots were offset from seismic disturbance, therefore no additional deletions were required from this dataset. ORM plots were established at grid points without offsetting from seismic disturbance;

⁵ The ORM shapefile did not contain the same unique plot ID as the plot (tree) database, therefore plot attributes were appended to the database via an aspatial linkage using polygon number. Only plots that were successfully linked are shown in this table.

⁶ The active landbase excludes all deletion areas. As such, plots in the active landbase have already been screened for these attributes.



however, plots were not deleted from the dataset. As such, there is an assumption that some *plot volumes* may be underestimated due to an unknown quantity of seismic disturbance within plots.

Eleven *influential points* were also deleted (Table 3-3). These points were identified during the process of yield curve development. These plots exhibited highly atypical volumes and negatively affected curve form (e.g., undesirable curve shape such as increasing volume trends following a decreasing volume trend).

Table 3-3. Influential points and reason for deletion.

FMU	Polygon	Plot	Yield Stratum	Age	Volume (m ³ /ha)			Deletion	Reason for Deletion
					Coniferous	Deciduous	Total		
P9	1040560082	1	DU-BCD-COMB	154	0.0	468.6	468.6	Both	Outlier - Dec
P9	1040560082	2	DU-BCD-COMB	154	22.3	343.7	366.0	Both	Outlier - Dec
P9	1040560082	3	DU-BCD-COMB	154	7.7	250.8	258.5	Both	Outlier - Dec
P6	952550253	2	MIXU-CD-COMB	154	715.7	0.0	715.7	Both	Outlier - Con
P6	950260213	1	PL-BCD-P6	174	8.0	223.1	231.1	Both	Outlier - Dec
P6	950260378	3	PL-BCD-P6	174	98.5	404.3	502.8	Both	Outlier - Dec
P6	940360086	2	SW-B-P6	124	691.8	0.0	691.8	Both	Outlier - Con
P9	1040560173	1	SW-B-P9	184	508.4	47.2	555.6	Both	Outlier - Con
P9	1040560173	3	SW-B-P9	184	512.4	0.0	512.4	Both	Outlier - Con
P9	1040860402	3	SW-B-P9	144	611.5	113.7	725.1	Both	Outlier - Con
P9	1040160248	2	SW-CD-P9	144	228.7	384.8	613.5	Both	Outlier - Dec

The final number of plots used in empirical yield curve development are presented in Table 3-4.

Table 3-4. Number of eligible and ineligible plots, and influential points by yield stratum.

Yield Stratum	Number of Plots			Total
	Eligible	Ineligible	Outliers	
D-B-COMB	45	15	-	60
D-CD-COMB	68	19	-	87
DU-A-COMB	91	9	-	100
DU-BCD-COMB	77	5	3	85
DC-BCD-COMB	21	9	-	30
MXU-B-COMB	60	3	-	63
MXU-CD-COMB	53	3	1	57
CD-BCD-COMB	39	14	-	53
PL-BCD-P6	58	1	2	61
PL-BCD-P9	44	1	-	45
SB-BCD-COMB	57	26	-	83
SW-B-P6	56	10	1	67
SW-B-P9	53	7	3	63
SW-CD-P6	61	3	-	64
SW-CD-P9	59	1	1	61
Unassigned	-	52	-	52
Total	842	178	11	1,031

3.4 Data Distribution

The number of plots by yield stratum and height class, with associated natural stand areas, is presented in Table 3-5. The percent of plots and landbase by yield stratum and height class are provided in Table 3-6. Plots show a reasonable distribution relative to the distribution of landbase areas. Note that shorter heights are expected to be underrepresented in plot data, since a minimum age class was used for supplemental MDFP TSP sampling (therefore likely excluding lower heights).

Table 3-5. Number of plots and natural stand area, active landbase, by yield stratum and height class.

Yield Stratum	Height Class (m)						Total	
	1-10		11-20		21 +		Plots	Area (ha)
	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)		
D-B-COMB	2	1,405	25	11,694	18	2,413	45	15,513
D-CD-COMB	-	662	42	48,374	26	5,134	68	54,170
DU-A-COMB	-	151	36	28,636	55	29,254	91	58,041
DU-BCD-COMB	1	335	36	16,673	40	17,981	77	34,989
DC-BCD-COMB	-	371	14	3,323	7	1,689	21	5,383
MXU-B-COMB	-	52	31	3,402	29	5,854	60	9,308
MXU-CD-COMB	-	17	20	4,177	33	8,017	53	12,211
CD-BCD-COMB	1	953	22	2,975	16	1,815	39	5,744
PL-BCD-P6	1	1,417	36	3,322	21	2,350	58	7,090
PL-BCD-P9	1	263	40	18,333	3	130	44	18,726
SB-BCD-COMB	21	1,804	27	2,307	9	85	57	4,196
SW-B-P6	16	911	18	6,687	22	14,615	56	22,213
SW-B-P9	15	560	6	1,781	32	2,848	53	5,189
SW-CD-P6	6	1,790	39	13,140	16	5,612	61	20,542
SW-CD-P9	15	799	13	1,515	31	1,451	59	3,765
Total	79	11,491	405	166,341	358	99,249	842	277,081

Table 3-6. Percent of plots and natural stand area, active landbase, by yield stratum and height class.

Yield Stratum	Height Class (m)						Total	
	1-10		11-20		21 +		Plots	Area (ha)
	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)		
D-B-COMB	4%	9%	56%	75%	40%	16%	100%	100%
D-CD-COMB	0%	1%	62%	89%	38%	9%	100%	100%
DU-A-COMB	0%	0%	40%	49%	60%	50%	100%	100%
DU-BCD-COMB	1%	1%	47%	48%	52%	51%	100%	100%
DC-BCD-COMB	0%	7%	67%	62%	33%	31%	100%	100%
MXU-B-COMB	0%	1%	52%	37%	48%	63%	100%	100%
MXU-CD-COMB	0%	0%	38%	34%	62%	66%	100%	100%
CD-BCD-COMB	3%	17%	56%	52%	41%	32%	100%	100%
PL-BCD-P6	2%	20%	62%	47%	36%	33%	100%	100%
PL-BCD-P9	2%	1%	91%	98%	7%	1%	100%	100%
SB-BCD-COMB	37%	43%	47%	55%	16%	2%	100%	100%
SW-B-P6	29%	4%	32%	30%	39%	66%	100%	100%
SW-B-P9	28%	11%	11%	34%	60%	55%	100%	100%
SW-CD-P6	10%	9%	64%	64%	26%	27%	100%	100%
SW-CD-P9	25%	21%	22%	40%	53%	39%	100%	100%
Total	9%	4%	48%	60%	43%	36%	100%	100%



The number of plots by yield stratum and age class, with associated natural stand areas, is presented in Table 3-7⁷. The percent of plots and landbase by yield stratum and age class is presented in Table 3-8. Note that the number of plots is not necessarily in proportion to the landbase area. The intent of sampling was to obtain equal numbers of plots by age class (excluding non-merchantable ages⁸) in order to provide a sufficient number of observations along the yield curves at all merchantable ages.

Table 3-7. Number of plots and natural stand area, active landbase, by yield stratum and age class.

Yield Stratum	Age Class (years)										Total	
	1-40		41-60		61-100		101-140		141 +			
	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)
D-B-COMB	-	387	14	8,556	12	5,605	12	895	7	69	45	15,513
D-CD-COMB	-	306	30	36,716	17	14,950	12	2,155	9	43	68	54,170
DU-A-COMB	-	144	10	9,101	42	33,182	19	14,817	20	796	91	58,041
DU-BCD-COMB	1	390	13	4,614	34	22,487	20	7,186	9	313	77	34,989
DC-BCD-COMB	-	274	8	1,912	4	1,900	9	1,021	-	276	21	5,383
MXU-B-COMB	-	125	13	743	16	3,417	15	4,133	16	890	60	9,308
MXU-CD-COMB	-	5	15	1,449	15	5,591	15	4,798	8	369	53	12,211
CD-BCD-COMB	1	805	8	1,255	10	1,604	6	1,264	14	816	39	5,744
PL-BCD-P6	1	1,415	15	56	15	1,657	14	3,438	13	524	58	7,090
PL-BCD-P9	-	45	15	12,411	13	6,008	16	263	-	-	44	18,726
SB-BCD-COMB	-	16	15	1,365	15	1,818	15	905	12	91	57	4,196
SW-B-P6	-	254	15	286	15	3,977	13	9,481	13	8,215	56	22,213
SW-B-P9	-	36	15	650	13	2,462	16	1,658	9	384	53	5,189
SW-CD-P6	-	417	15	923	19	10,787	12	6,412	15	2,003	61	20,542
SW-CD-P9	-	39	15	860	16	1,670	14	1,054	14	142	59	3,765
Total	3	4,657	216	80,897	256	117,114	208	59,482	159	14,930	842	277,081

Table 3-8. Percent of plots and natural stand area, active landbase, by yield stratum and age class.

Yield Stratum	Age Class (years)										Total	
	1-40		41-60		61-100		101-140		141 +			
	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)	Plots	Area (ha)
D-B-COMB	0%	2%	31%	55%	27%	36%	27%	6%	16%	0%	100%	100%
D-CD-COMB	0%	1%	44%	68%	25%	28%	18%	4%	13%	0%	100%	100%
DU-A-COMB	0%	0%	11%	16%	46%	57%	21%	26%	22%	1%	100%	100%
DU-BCD-COMB	1%	1%	17%	13%	44%	64%	26%	21%	12%	1%	100%	100%
DC-BCD-COMB	0%	5%	38%	36%	19%	35%	43%	19%	0%	5%	100%	100%
MXU-B-COMB	0%	1%	22%	8%	27%	37%	25%	44%	27%	10%	100%	100%
MXU-CD-COMB	0%	0%	28%	12%	28%	46%	28%	39%	15%	3%	100%	100%
CD-BCD-COMB	3%	14%	21%	22%	26%	28%	15%	22%	36%	14%	100%	100%
PL-BCD-P6	2%	20%	26%	1%	26%	23%	24%	48%	22%	7%	100%	100%
PL-BCD-P9	0%	0%	34%	66%	30%	32%	36%	1%	0%	0%	100%	100%
SB-BCD-COMB	0%	0%	26%	33%	26%	43%	26%	22%	21%	2%	100%	100%
SW-B-P6	0%	1%	27%	1%	27%	18%	23%	43%	23%	37%	100%	100%
SW-B-P9	0%	1%	28%	13%	25%	47%	30%	32%	17%	7%	100%	100%
SW-CD-P6	0%	2%	25%	4%	31%	53%	20%	31%	25%	10%	100%	100%
SW-CD-P9	0%	1%	25%	23%	27%	44%	24%	28%	24%	4%	100%	100%
Total	0%	2%	26%	29%	30%	42%	25%	21%	19%	5%	100%	100%

⁷ Age is based on the defining layer age. Understory age was NOT used for the DU-BCD-COMB yield stratum.

⁸ A minimum age cutoff was used to limit sampling in stands where zero volumes were expected to occur most or all of the time. A minimum height cutoff was not used, since it could cause bias in yield curve volumes at younger ages by only sampling the tallest young stands.

3.5 Plot Volume Compilation

Plot volumes were required to fit yield curves for volume as a function of stand age. Each eligible observation from the combined ORM/MDFP dataset was used to compile gross merchantable volume estimates. Use of the term *gross* indicates that there has been no deduction for *cull*.

For each sample plot, the merchantable length of each live tree with a minimum stump diameter of 15.0 cm was calculated. This calculation was based on the height of the tree⁹, a 30.0 cm stump height and minimum stump diameter, top diameter (by species type) and log length as defined in Table 3-9.

Calculations involved the iterative process presented in ‘Ecologically based individual tree volume estimation for major Alberta tree species’ (Huang 1994b). Larch was deemed a merchantable tree species and was included in data compilation; however, birch was not considered a merchantable tree species and was excluded from the dataset. Trees not meeting utilization limits were also deleted from the dataset.

Table 3-9. Minimum utilization standards by species type.

Species Type	Log Length (m)	Stump Diameter (cm)	Top Diameter (cm)	Stump Height (m)
Coniferous	2.6	15.0	11.0	0.3
Deciduous	2.6	15.0	10.0	0.3

To calculate individual gross *merchantable tree volumes*, the merchantable length of each tree was divided into 30 sections of equal length. Diameters were determined for the top, middle and bottom of each section using Kozak’s variable exponent taper equation (Kozak 1988) and ecoregion/tree species-specific coefficients for the Province of Alberta were utilized (Huang 1994a):

$$d_{ib} = a_0 D^{a_1} a_2^D X^{b_1 Z^2 + b_2 \ln(Z + 0.001) + b_3 \sqrt{Z} + b_4 e^Z + b_5 \left(\frac{D}{H}\right)}$$

Where: d_{ib} = stem diameter inside bark (cm) at height h_i (m)

D = diameter at breast height (cm)

H = total tree height (m)

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

$$Z = h_i / H$$

h_i = height from ground, $0 \leq h_i \leq H$

p = relative height of inflection point from the ground

⁹ Equations from Huang (1994a) were used to estimate total height if no measured height was available.



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

For each tree, section volumes were calculated using Newton's equation (Husch *et al.* 1982):

$$MV = \frac{ML/10}{6} * (0.00007854) * (d_0^2 + 4d_1^2 + d_2^2)$$

Where: MV = merchantable volume (m^3)

ML = merchantable length (m)

d_0 = diameter at bottom of section (cm)

d_1 = diameter at middle of section (cm)

d_2 = diameter at top of section (cm)

Gross merchantable tree volumes were then determined by summing individual section volumes for each tree. Tree volumes were converted to gross *merchantable stand volume* (volume per hectare) using the appropriate plot size expansion factor. Plots with no merchantable trees were assigned zero gross merchantable stand volume ($0 m^3/ha$) and retained within the dataset.

For each observation, the total coniferous gross merchantable stand volume was calculated by summing the m^3/ha estimates for each live coniferous tree within the plot. The total deciduous gross merchantable stand volume was calculated by summing the m^3/ha estimates for each live deciduous tree within the plot.



4. Base Yield Curves

4.1 Background

Natural stand yield curves were empirically-fit for each yield stratum using data collected within the FMA area. Deciduous and coniferous volume were fit as a function of stand age. Stand age was taken from the defining layer, except for the DU-BCD-COMB yield stratum, where volume was fit as a function of understory age.

All base natural stand yield curves are presented in Appendix VIII. This section outlines the models and methods for yield curve derivation, and provides results in tabular format only.

4.2 Base Natural Stand Yield Curves

Compiled data from the combined ORM/MDFP dataset (collected within both FMUs) were used to fit base natural stand yield curves. For FMA area-wide yield strata (“COMB” suffix), data from both FMUs were used in yield curve development. For FMU-specific yield strata (either “P6” or “P9” suffix), only those data from the FMU of interest were used. Base natural stand yield curves were fit using *nonlinear regression* techniques. One of two models was selected based on model fit:

2-parameter model (2P):

$$Volume = a(age)^b e^{(-a*age)}$$

2-parameter model with constant (2P+k):

$$Volume = a(age)^b e^{(-age/k)}$$

Where: $Volume$ = gross merchantable stand volume (m³/ha)

age = stand age at year of measurement (based on understory for DU-BCD)

a, b, k = coefficients

Where the constant *k* was required to achieve biologically reasonable curve form, values between 10 and 100 were tested to achieve the most biologically reasonable fit that also fit to the data. Model suitability was determined quantitatively based on goodness-of-fit and visually using graphical analysis. Sample size, model form and model coefficients by yield curve are presented in Table 4-1.

Table 4-1. Sample size, model form and coefficients for base natural stand yield curves.

Yield Curve	Number of Plots	Species Type	Model Form	Model Coefficients			R ²
				a	b	k	
D-B-COMB	45	Coniferous	2P	7.05751E-03	1.92659357	-	0.10
		Deciduous	2P	1.63643E-02	2.27103222	-	0.11
D-CD-COMB	68	Coniferous	2P	1.00001E-02	1.91040065	-	0.08
		Deciduous	2P	1.69783E-02	2.38413622	-	0.30
DU-A-COMB	91	Coniferous	2P+k	3.02975E-09	5.88112425	30	0.35
		Deciduous	2P+k	2.96260E-04	3.64067119	30	0.13
DU-BCD-COMB	77	Coniferous	2P+k	9.29729E-05	3.55012005	50	0.37
		Deciduous	2P	3.25482E-02	2.54356385	-	0.20
DC-BCD-COMB	21	Coniferous	2P	1.40945E-02	2.24976266	-	0.37
		Deciduous	2P	1.83995E-02	2.35202078	-	0.12
MXU-B-COMB	60	Coniferous	2P	1.30703E-02	2.30217866	-	0.28
		Deciduous	2P	1.91872E-02	2.21243590	-	0.08
MXU-CD-COMB	53	Coniferous	2P	1.32015E-02	2.25715933	-	0.16
		Deciduous	2P	1.96021E-02	2.28788295	-	0.15
CD-BCD-COMB	39	Coniferous	2P	1.19788E-02	2.37167381	-	0.45
		Deciduous	2P	2.34763E-02	2.30839301	-	0.02
PL-BCD-P6	58	Coniferous	2P	1.80802E-02	2.38785681	-	0.13
		Deciduous	2P	8.71831E-03	1.86521365	-	-0.01
PL-BCD-P9	44	Coniferous	2P+k	1.19788E-02	2.37167381	50	0.31
		Deciduous	2P	2.34763E-02	2.30839301	-	0.05
SB-BCD-COMB	57	Coniferous	2P+k	3.28426E-08	5.45112077	30	0.22
		Deciduous	2P	1.58934E-02	2.02219841	-	0.01
SW-B-P6	56	Coniferous	2P	1.32557E-02	2.35571260	-	0.26
		Deciduous	2P	2.19563E-02	2.22771701	-	0.00
SW-B-P9	53	Coniferous	2P	7.05751E-03	1.92659357	-	0.24
		Deciduous	2P	1.63643E-02	2.27103222	-	0.03
SW-CD-P6	61	Coniferous	2P+k	1.07906E-06	4.60085933	40	0.63
		Deciduous	2P	2.01299E-02	2.18265864	-	-0.02
SW-CD-P9	59	Coniferous	2P	1.00001E-02	1.91040065	-	0.32
		Deciduous	2P+k	1.69783E-02	2.38413622	30	0.10
Total	842						



5. Modified Yield Curves

5.1 Background

Base natural stand yield curves were modified to develop a series of curves for use in timber supply analysis. This included the addition of cull, deciduous decline, and/or regeneration lag. Two special yield curves were also created to reflect use of improved stock (tree improvement) and understory protection harvesting.

5.2 Natural Stand Yield Curves With Cull

Each base natural stand yield curve was modified to reflect cull deductions. Percent coniferous cull was calculated using Manning Diversified scale data (Table 5-1). A 4.6% cull reduction was applied to the coniferous component of all base natural stand yield curves, across all ages.

Table 5-1. Coniferous cull calculation based on MDFP scale data.

Timber Year	Number of Scale Loads	Calculated Percent Cull
2000/2001	801	3.5
2001/2002	901	3.9
2002/2003	101	5.1
2003/3004	201	5.7
2004/2005	301	5.0
Average Percent Cull		4.6

Average percent deciduous cull was provided by DMI¹⁰. A 9% cull reduction was applied to the deciduous component of base natural stand yield curves across all ages. In three of the strata (D-B-COMB, D-CD-COMB, DU-A-COMB), cull also included an additional percentage at older ages to reflect deciduous decline¹¹. In these cases, the 9% deciduous cull was applied to the deciduous component of the base natural stand yield curves until age 110. At age 110, a 10% deciduous decline was also applied (9% cull plus 10% deciduous decline). Deciduous decline was increased by 10% for each successive 5-year period (29% at 115 years, 39% at 120 years, *etc.*) until deciduous volume reached zero.

Total volume for natural stands with cull and deciduous decline was obtained by summing cull-deducted deciduous and coniferous volumes across all ages. Natural stand yield curves with cull are presented in Appendix IX.

5.3 Managed Stand Yield Curves

Managed stand yield curves were developed for all yield strata. Managed stand yield curves were created by taking natural stand yield curves with cull and deciduous decline and applying a regeneration lag. Regeneration lag varied depending on year of harvest (skid clearance date). Thus, two sets of managed stand yield curves were developed. Determination of regeneration lag is described in Appendix VI.

5.3.1 Pre-91 Managed Stand Yield Curves

For stands harvested prior to May 1, 1991¹² (referred to as pre-91 stands), a 5-year coniferous and 2-year deciduous regeneration lag was applied to natural stand yield curves following the reduction for cull. Regeneration lag was applied to yield curves depending on yield stratum (deciduous regeneration lag was applied to the D-B-COMB and D-CD-COMB strata and coniferous regeneration lag was applied to all other strata). Total volume for pre-91 managed stand yield curves was then obtained by summing deciduous and coniferous volumes across all ages. Pre-91 managed stand yield curves are presented in Appendix X.

5.3.2 Post-91 Managed Stand Yield Curves

For stands harvested May 1, 1991 or later (referred to as post-91 stands), a 2-year coniferous and 0-year deciduous regeneration lag was applied to natural stand yield curve following the reduction for cull. Regeneration lag was applied to yield curves depending on yield stratum (deciduous regeneration lag was applied to the D-B-COMB and D-CD-COMB strata and coniferous regeneration lag was applied to all other strata). Total volume for post-91 managed stand yield curves was then obtained by summing deciduous and coniferous volumes across all ages. Post-91 managed stand yield curves are presented in Appendix XI.

¹⁰ The 9% cull percentage is based on the reduction applied in the document "Timber Supply Analysis For Daishowa's Forest Management Agreement Area" prepared by W.R Dempster And Associates Ltd. on August 12, 1992. This percentage was based on volume scaling data.

¹¹ The DU_BCD_COMB yield stratum did not require additional reductions, since deciduous decline on existing curves was appropriate.

¹² Year of harvest was used to classify stands. If year of harvest was 1990 or earlier, the cutblock was deemed a pre-91 block; if the year of harvest was 1991 or later, the block was deemed a post-1991 cutblock.



5.4 Tree Improvement Yield Curves

Tree improvement yield curves were developed to reflect the effects of planting improved stock (seedlings grown using improved seed from intensive tree selection) on volume yields. A 1% height gain for pine and a 2.5% height gain for white spruce were approved for improved stock in the FMA area.

Initial analyses were undertaken to convert tree-level height increase to stand-level volume increase; a summary of analyses is presented in Appendix VII. However, Alberta SRD indicated that an acceptable conversion to volume gain would be twice the height gain percentage. A copy of the letter from Alberta SRD is also included in Appendix VII. A restriction to applying the volume increase was that the increase could be applied to obtain increased volume at the average harvest age, but maximum total volume could not be higher than in the original curve.

Tree improvement curves were created for the pine- and white spruce-leading coniferous and mixedwood yield strata¹³. A 2% volume increase in coniferous volume was applied to PL yield curves at 90 years and a 5% volume increase in coniferous volume was applied to SW and mixedwood (CD and DC¹⁴) yield curves at 110 years. Increases were only applied to the coniferous portion of yield curves.

Volume increase was applied by inserting the original coefficients for the empirically-fit base natural stand yield curves for coniferous volume into the selected equation form. The equation was then modified by inserting a constant multiplier:

2-parameter model (2P):

$$Volume = a(age * x)^b e^{-a*(age*x)}$$

2-parameter model with constant (2P+k):

$$Volume = a(age * x)^b e^{\left(\frac{-a*age*x}{k}\right)}$$

Where: $Volume$ = net merchantable stand volume (m³/ha)

age = stand age at year of measurement

x = constant

a, b, k = coefficients

An iterative routine was run to obtain a multiplier that resulted in the specified increase in volume above base natural stand yields at the target age (2% at 90 years for PL yield strata and 5% at 110 years for all

¹³ Mixedwood strata were defined as DC-BCD-COMB and CD-BCD-COMB. The mixedwood with understory protection (MXU-B-COMB and MXU-CD-COMB) yield strata were not included, since these stand types are not expected to develop after harvesting based on current management practices (e.g., future cutblocks).

¹⁴ Mixedwood stands were assumed to be white spruce leading, therefore the 5% volume increase was applied.

other yield strata), while maintaining the same maximum gross merchantable volume yield. Multipliers by yield stratum are presented in Table 5-2.

Table 5-2. Multipliers used to develop tree improvement yield curves for selected yield strata.

Yield Stratum	Equation Form	Multiplier
DC-BCD-COMB	2P	1.0793951
CD-BCD-COMB	2P	1.0488955
PL-BCD-P6	2P	1.0271727
PL-BCD-P9	2P+k	1.0154028
SW-CD-P6	2P+k	1.0272685
SW-CD-P9	2P	1.0664109

Once the tree improvement yield curve for coniferous volume was developed from base natural yield curves, coniferous cull reduction (4.6%) and post-91 managed stand regeneration lag (2 years) were applied. The post-91 deciduous yield curve was used to represent deciduous volume, and total volume was obtained by summing the two volumes across all ages.

Tree improvement yield curves will represent yields in managed stands where improved seed is deployed, replacing post-91 managed stand yield curves. Yield curves are presented in Appendix XII.

5.5 Understory Protection Yield Curves

Understory protection curves were created to help model the effects of understory protection partial harvesting systems applied to DU stands with an A density white spruce-leading coniferous understory (DU-A-COMB). Understory protection involves a strip shelterwood harvesting system, where timber removal occurs over two entries in the same stand. During the first pass, skid trails are completely cleared for machine travel. Overstory deciduous species are then removed on either side of the skid trail, with care taken to minimize damage to understory conifers (removal areas). Strips of deciduous trees are often left between removal areas to reduce windthrow in residual conifer trees (wind buffers).

Due to the complexity of the strip shelterwood harvesting system and a lack of specific data, no one yield curve could be used to represent volume over time therefore a yield curve was created based on several other yield curves. Different yield curves were used to represent the various treatments (wind buffers, removal areas, and skid trails) within understory protection blocks. Understory yield curves were developed to reflect:

1. From 0-99 years, the volume that would be left following understory protection harvesting (unharvested or partially harvested portions of the block).
2. From 100 years onwards, volume that would be expected to develop after understory protection harvesting (unharvested/partially harvested portions of the block plus regenerating portions of the block).

Figure 1 illustrates how this curve will be used in timber supply analysis. The DU-A-COMB yield curve represents natural stand volume with cull. From 0 to 99 years, the understory protection curve (DU-A-US-COMB) represents the volume that would be left after understory protection harvesting (unharvested portions of the block). As such, the volume removed by understory protection harvesting can be calculated at any point in time by subtracting DU-A-US-COMB from DU-A-COMB. For example, the red arrow in Figure 1 shows the volume of deciduous timber removed during understory protection

harvesting at 85 years. From 100 years onwards, the understory protection curve models volume growth after partial harvesting (unharvested portions of the block plus regenerating portions of the block).

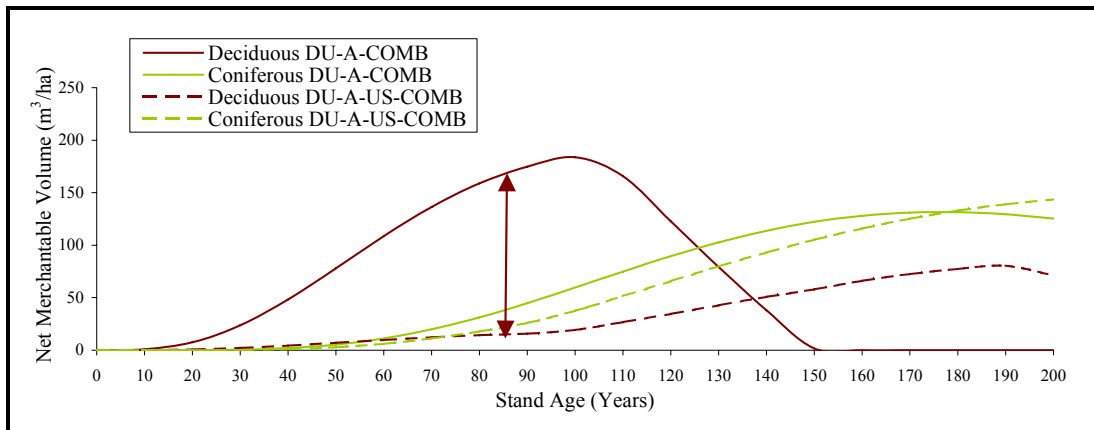


Figure 1. Example of the relationship between the understory protection yield curve (DU-A-US-COMB) and the natural stand (DU-A-COMB) yield curve.

The development of understory protection yield curves was a complex formulation. First, the proportion of the areas in each treatment was determined in consultation with MDFP, DMI and expert opinion (Dan MacIsaac, Canadian Forest Service). The sequence of strips within understory protection blocks was:

- Wind Buffer (5 m);
- Removal Area (7 m);
- Skid Trail (6 m);
- Removal Area (7 m);
- Removal Area (7 m);
- Skid Trail (6 m);
- Removal Area (7 m); and
- The sequence starts over with Wind Buffer.

With one complete sequence occupying 45 m (5+7+6+7+7+6+7), the proportion of each treatment within a block was then calculated as:

- Wind Buffer: $5/45 = 11\%$;
- Removal Area: $(4*7)/45 = 62\%$;
- Skid Trail: $(2*6)/45 = 27\%$;

Landings were assumed to take up 13% of the block area. The wind buffer, removal area and skid trail percentages were adjusted in proportion to the remaining 87% of the block area, resulting in the following distribution of areas within each understory protection block:

- Landings: 13% of block area;
- Wind Buffer: $(11*.87) = 10\%$ of block area;
- Removal Area: $(62*.87) = 54\%$ of block area; and
- Skid Trail: $(27*.87) = 23\%$ of block area.

The following assumptions define the amount of timber removed from each treatment at time of harvest:

- Landings: 100% of the coniferous and deciduous timber;
- Wind buffer: 0% of coniferous and deciduous timber;
- Removal Area: 0% of coniferous and 100% of deciduous timber; and
- Skid Trail: 100% of coniferous and deciduous timber.

The total removal from the stand during understory protection harvesting was therefore:

- Coniferous: $(0.13+0.23) = 36\%$ of coniferous timber for the block; and
- Deciduous: $(0.13+0.54+0.23) = 90\%$ of deciduous timber for the block.

The total remaining growing stock in the stand was:

- Coniferous: $(0.10+0.54) = 64\%$ of coniferous timber for the block; and
- Deciduous: $(0.10) = 10\%$ of deciduous timber for the block.

Stand Development, 0-99 Years

From 0-99 years, the understory protection yield curve represents the growing stock that would be left if the DU-A stand was harvested at that time. Essentially, this involved a percent reduction of the existing DU-A-COMB curve to reflect the removal of growing stock. Based on the calculations above, volume for stand age 0-99 years was calculated as follows:

- Deciduous volume = $(DU-A-COMB_{decid} * 0.10)$ at (F_AGE)
- Coniferous volume = $(DU-A-COMB_{conif} * 0.64)$ at (F_AGE)

Stand Development, 100 Years Onwards

From 100 years onwards, the understory protection yield curve represents the development of growing stock after understory protection harvesting. The curve was created by compositing yield curves specific to each treatment based on the percent of coniferous and deciduous timber removed and expected development after treatment (*e.g.*, landings are represented by the D-CD-COMB yield curve, *etc.*). In treatment areas with timber removal, stand age was adjusted to reflect the effects of disturbance. Post-entry stand development was modelled for stand age 100 + years as follows:

Landings represent 13% of the block area; 100% of both coniferous and deciduous volume was removed.

- Assume 100% of landings regenerate successfully by root suckering to C or D density deciduous species:
 - Deciduous volume = $(0.13 * D-CD-COMB_{decid})$ at (F_AGE-85 years¹⁵)
 - Coniferous volume = $(0.13 * D-CD-COMB_{conif})$ at (F_AGE-85 years)

Wind buffers represent 10% of block area; 0% of both coniferous and deciduous volume was removed.

- Assume 75% of wind buffers continue along the same trajectory (25% loss to blowdown, falling apart by the time of the final removal harvest):

¹⁵ Landings are essentially clearcut areas within the understory protection block, which means that stand age is reset to zero in terms of volume accumulation. Since average year of understory protection harvest is 85 years, volume in regenerating areas was “lagged” by 85 years.



- o Deciduous volume = $(0.10 \cdot 0.75 \cdot \text{DU-A-COMB}_{\text{decid}})$ at (F_AGE)
- o Coniferous volume = $(0.10 \cdot 0.75 \cdot \text{DU-A-COMB}_{\text{conif}})$ at (F_AGE)

Removal areas represent 54% of block area; 100% of deciduous volume was removed.

- Assume 100% of removal areas grow along a B density white spruce trajectory:
 - o Deciduous volume = $(0.54 \cdot \text{SW-B-P6}_{\text{decid}})$ at (F_AGE-85)
 - o Coniferous volume = $(0.54 \cdot \text{SW-B-P6}_{\text{conif}})$ at (F_AGE-50¹⁶)

Skid trails represent 23% of block area; 100% of both coniferous and deciduous volume was removed.

- Assume 100% of the skid trail areas regenerate successfully to B density deciduous species:
 - o Deciduous volume = $(0.23 \cdot \text{D-B-COMB}_{\text{decid}})$ at (F_AGE-85)
 - o Coniferous volume = $(0.23 \cdot \text{D-B-COMB}_{\text{conif}})$ at (F_AGE-85)

In all cases, the post-91 managed stand yield curves were used to represent volume over age. Coniferous volume for the understory protection yield curve was obtained by summing all coniferous volume components across all stand ages. Deciduous volume was obtained by summing all deciduous volume components, and total volume was obtained by summing coniferous and deciduous volumes. The understory protection yield curve is presented in Appendix XIII. Table 5-3 summarizes the formulation for the understory protection yield curve.

Table 5-3. Summary of actions used to develop the understory protection yield curve.

Description	Calculation	Line	Understory Protection Substratum				Total
			Landings	Wind Buffer	Removal	Skid Trail	
Width of each strip at partial harvest							
Total width (m)		1		5	28	12	45
Percent width (%)	Line 1 / total width (45 m)	2		11%	62%	27%	100%
Add in reductions for Landings							
Percent width (%)	Line 2 adjusted for landings	3	13%	10%	54%	23%	100%
Timber removal at partial harvest							
Coniferous area removed		4	all	none	none	all	
Coniferous area removed (%)	If line 4 = "all" then % area = line 3	5	13%	0%	0%	23%	36%
Deciduous area removed		6	all	none	all	all	
Deciduous area removed (%)	If line 6 = "all" then % area = line 3	7	13%	0%	54%	23%	90%
Pre-entry development of areas that will be left after harvesting (0-99 years)							
Initial yield trajectory			DU-A-COMB	DU-A-COMB	DU-A-COMB	DU-A-COMB	
Coniferous area	Opposite of line 4	8	none	all	all	none	
Coniferous area (%)	Line 3 minus line 5	9	0%	10%	54%	0%	64%
Coniferous age			F AGE	F AGE	F AGE	F AGE	
Deciduous area	Opposite of line 6	10	none	all	none	none	
Deciduous area (%)	Line 3 minus line 7	11	0%	10%	0%	0%	10%
Deciduous age			F AGE	F AGE	F AGE	F AGE	
Coniferous volume	Line 9 * yield stratum volume at coniferous age						
Deciduous volume	Line 11 * yield stratum volume at deciduous age						
Post-entry development of areas left after harvesting (100 years onwards)							
New yield trajectory			D-CD-COMB	DU-A-COMB	SW-B-P6	D-B-COMB	
Percent success (%)		12	100%	75%	100%	100%	
Percent area (%)	Line 3 * line 12	13	13.0%	7.5%	54.0%	23.0%	97.5%
Coniferous age			F AGE - 85	F AGE	F AGE - 50	F AGE - 85	
Deciduous age			F AGE - 85	F AGE	F AGE - 85	F AGE - 85	
Coniferous volume	Line 13 * yield stratum volume at coniferous age						
Deciduous volume	Line 13 * yield stratum volume at deciduous age						

¹⁶ Understory conifers in removal areas are expected to have lower volumes than B density SW stands at the same age; as such, these treatment areas were placed on the SW-B-P6 trajectory, but at a younger age (F_AGE-50).



6. Composite Yield Curves

6.1 Background

Composite yield curves provide an area-weighted estimate of volume over time across existing stands within the active landbase. These curves are necessary to provide a basis for comparison from one FMP to the next.

6.2 Composite Yield Curves

Six composite yield curves were developed for natural stands on the active landbase: one for each broad cover group, one for the combined coniferous landbase (C/CD/DC) and one for the total landbase (C/CD/DC/D).

The coniferous and deciduous component of each natural stand yield curve with cull identified in Section 8 (Yield Curves for Timber Supply Analysis) was weighted by the proportion of total area of natural stands within the active landbase. Yield strata were assigned to broad cover groups as outlined in Table 6-1, which also shows landbase areas used for area-weighting. Polygon areas were reduced to account for losses to seismic (landbase field AREAHA_PW). Composite yield curves were developed by summing all area-weighted yield curves at each age for coniferous and deciduous volume, respectively. Total volume was obtained by summing deciduous and coniferous volumes across all ages.

Composite yield curves are presented in Appendix XIV.

Table 6-1. Areas for composite yield curve development by yield stratum and broad cover group.

Broad Cover Group	Yield Stratum	Natural Stand Area (ha)
D	D-B-COMB	15,513
	D-CD-COMB	54,170
	Total	69,683
DC	DC-BCD-COMB	5,383
	DU-A-COMB ¹	58,041
	DU-BCD-COMB ¹	34,989
	MXU-B-COMB ²	5,103
	MXU-CD-COMB ²	8,670
	Total	112,186
CD	CD-BCD-COMB	5,744
	MXU-B-COMB ²	4,205
	MXU-CD-COMB ²	3,541
	Total	13,490
C	PL-BCD-P6	7,090
	PL-BCD-P9	18,726
	SB-BCD-COMB	4,196
	SW-B-P6	22,213
	SW-B-P9	5,189
	SW-CD-P6	20,542
	SW-CD-P9	3,765
	Total	81,721
C/CD/DC Total		207,398
C/CD/DC/D Total		277,081

¹ DU stands are part of the conifer landbase and transition to DC after harvesting.

² Same yield curve was applied to both CD and DC composite curves, proportional to area in that broad cover group.



7. Piece Size Curves

7.1 Background

Piece size curves were required to provide an estimate of how piece size (number of trees per cubic meter of gross merchantable tree volume) changes over time. This information is used in timber supply modelling to assess the economics of stands selected for harvest.

7.2 Piece Size Yield Curves

Coniferous and deciduous piece size curves were developed for each yield stratum. The same dataset used in yield curve development (eligible plots from the ORM/MDFP datasets) was used for piece size curve development. Influential points that were removed from the dataset during yield curve development were included in piece size development. Plot attributes (yield stratum, stand age) were the same as previously defined (Section 3.2), and volumes compiled for yield curve development (Section 3.5) were retained for use in this analysis.

For each plot, piece size (the number of trees per m³) was calculated by dividing total number of merchantable trees in the plot by the gross merchantable plot volume. An equation to predict trees per m³ as a function of age was then fit directly using plot data:

$$PieceSize = a_0 + \frac{a_1}{age}$$

Where: *PieceSize* = number of trees per m³ of gross merchantable tree volume

age = stand age at year of measurement

*a*₀, *a*₁ = coefficients

Plots with no merchantable volume were excluded from analysis, since piece size could not be calculated (dividing by zero). Several influential points were also removed. These were extreme values that affected curve fit.

The final number of observations by yield stratum was different for coniferous and deciduous curves, since plots could have coniferous volume but no deciduous volume, or vice versa. The number of observations used in developing piece size curves is summarized in Table 7-1.

Table 7-1. Number of plots used for fitting coniferous and deciduous piece size curves.

Yield Stratum	Initial Number of Plots	Coniferous Curves				Deciduous Curves			
		Ineligible Plots	Influent. Points	Volume Plots	Final Number of Plots	Ineligible Plots	Influent. Points	Volume Plots	Final Number of Plots
D-B-COMB	60	15	3	25	17	15	-	8	37
D-CD-COMB	87	19	-	46	22	19	-	7	61
DU-A-COMB	100	9	-	21	70	9	-	2	89
DU-BCD-COMB	85	5	3	9	68	5	3	9	68
DC-BCD-COMB	30	9	-	3	18	9	-	8	13
MXU-B-COMB	63	3	-	7	53	3	-	21	39
MXU-CD-COMB	57	3	1	4	49	3	1	10	43
CD-BCD-COMB	53	14	-	2	37	14	-	9	30
PL-BCD-P6	61	1	2	4	54	1	2	39	19
PL-BCD-P9	45	1	-	5	39	1	-	30	14
SB-BCD-COMB	83	26	-	13	44	26	-	31	26
SW-B-P6	67	10	1	3	53	10	1	24	32
SW-B-P9	63	7	3	7	46	7	3	40	13
SW-CD-P6	64	3	-	6	55	3	-	23	38
SW-CD-P9	61	1	1	3	56	1	1	29	30
Unassigned	52	52	-	-	-	52	-	-	-
Grand Total	1,031	178	14	158	681	178	11	290	552

Model coefficients are presented in Table 7-2.

Initial analysis indicated that piece size was high for SW yield strata, particularly for the SW-CD-P6 yield stratum. In order to reduce the variability in coniferous piece size between SW yield strata, an average of all four piece size yield curves was calculated. Both coniferous and deciduous piece size were averaged to create a single piece size curve for SW stands.

Graphs showing piece size curves are provided in Appendix XV.

**Table 7-2. Piece size curve coefficients by species type, yield stratum and FMU.**

Yield Stratum	Species Type	Model Coefficients	
		a_0	a_1
D-B-COMB	Coniferous	3.30006	17.21683
	Deciduous	-0.66463	436.51207
D-CD-COMB	Coniferous	2.23018	270.58321
	Deciduous	-2.69984	546.10723
DU-A-COMB	Coniferous	1.16290	354.90311
	Deciduous	0.86950	281.19504
DU-BCD-COMB	Coniferous	0.91126	292.38396
	Deciduous	0.11934	236.04232
DC-BCD-COMB	Coniferous	-2.23880	587.73067
	Deciduous	-4.73079	701.37962
MXU-B-COMB	Coniferous	2.44061	215.20175
	Deciduous	0.11815	391.38305
MXU-CD-COMB	Coniferous	2.00482	306.13964
	Deciduous	-0.32011	451.59139
CD-BCD-COMB	Coniferous	0.75378	218.85831
	Deciduous	-0.38787	388.37035
PL-BCD-P6	Coniferous	3.56938	153.41946
	Deciduous	0.13156	444.55023
PL-BCD-P9	Coniferous	1.86094	319.96173
	Deciduous	2.06988	272.73327
SB-BCD-COMB	Coniferous	4.41467	260.39510
	Deciduous	0.26672	556.70143
SW-B-P6	Coniferous	1.39287	278.77602
	Deciduous	3.52438	57.57224
SW-B-P9	Coniferous	-0.20534	455.30186
	Deciduous	-2.18364	670.68446
SW-CD-P6	Coniferous	-2.90757	822.71129
	Deciduous	0.10534	288.25197
SW-CD-P9	Coniferous	-0.05838	409.03198
	Deciduous	-0.58028	370.53623



8. Yield Curves for Timber Supply Analysis

Not all yield curves presented in this document will be used in timber supply analysis. Yield curves to be used in timber supply analysis are presented in Table 8-1. Natural stands will be represented by natural stand yield curves with cull. Managed stands will be represented by pre-91 managed stand yield curves if harvested prior to 1991, and by post-91 managed stand yield curves if harvested after 1991, except where they are replaced by tree improvement or understory protection yield curves.

Table 8-1. Yield curves to be used in timber supply analysis by stand type.

Yield Stratum	FMU(s)	Natural Stand	Pre-91 Managed Stand ²	Post-91 Managed Stand
D-B-COMB ¹	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
D-CD-COMB	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
DU-A-COMB ¹	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Mgd. Stand/Underst. Prot. ³
DU-BCD-COMB ¹	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
DC-BCD-COMB	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
MXU-B-COMB ¹	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
MXU-CD-COMB ¹	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
CD-BCD-COMB	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
PL-BCD-P6	P6	Natural with cull	Pre-91 Managed Stand	Post-91 Mgd. Stand/Tree Imp. ⁴
PL-BCD-P9	P9	Natural with cull	Pre-91 Managed Stand	Post-91 Mgd. Stand/Tree Imp. ⁴
SB-BCD-COMB	P6, P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
SW-B-P6 ¹	P6	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
SW-B-P9 ¹	P9	Natural with cull	Pre-91 Managed Stand	Post-91 Managed Stand
SW-CD-P6	P6	Natural with cull	Pre-91 Managed Stand	Post-91 Mgd. Stand/Tree Imp. ⁴
SW-CD-P9	P9	Natural with cull	Pre-91 Managed Stand	Post-91 Mgd. Stand/Tree Imp. ⁴

¹ Existing cutblocks only; future cutblocks are not expected to regenerate to this yield stratum under current management practices.

² Existing cutblocks only.

³ The post-91 managed stand yield curve will be replaced by the understory protection yield curve where these activities are undertaken.

⁴ The post-91 managed stand yield curve will be replaced by the tree improvement yield curve where improved stock are deployed.



9. References

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Appendix I Glossary



Glossary Term	Definition
Active landbase	Areas that are available for forest management activities. Comprised of the combined coniferous and deciduous landbases. Also referred to as the timber harvesting landbase, net landbase, contributing landbase, active landbase.
AVI polygon	A polygon delineated based on aerial photography using Alberta Vegetation Inventory rules (AFLW 1991, Nesby 1996). For vegetated areas, areas must be sufficiently similar in terms of structure, moisture regime, crown closure, height, species composition, and origin year to be considered a single unit, or polygon. For nonvegetated areas, areas must have a similar nonvegetated classification.
Base yield curve	The "standard" set of yield curves developed for yield strata, representing the main stand types within the FMA area. Base yield curves may or may not be used to represent these stand types in the final timber supply analysis.
Broad cover group	A classification of forest types based on coniferous and deciduous components of the AVI species composition. The broad cover groups are coniferous (C), coniferous-leading mixedwood (CD), deciduous-leading mixedwood (DC) and deciduous (D).
Clearcut	A regeneration system where all or most of the merchantable trees in a defined area are harvested in one cutting with reproduction obtained through artificial or natural means. [SRD 2006]
Composite yield curve	Area-weighted composite yield curves developed from empirically-fit natural stand yield curves; generally by broad cover group or groupings thereof.
Convergence	Nonlinear regression involves an iterative process in SAS TM . An initial set of parameters is provided for the model, and the program attempts to improve the fit of the model to the data by modifying these values. Once the model can no longer be improved by changing these values, the model is said to have achieved convergence. Occasionally, convergence cannot be achieved, often due to the presence of influential points.
Cull	Trees or portions thereof that are merchantable but are removed because of defect.
Cutblock	A specified area that is either designated for harvest or has already been harvested.
Defining layer	The inventory layer used to assign strata. The defining layer may be the overstory or the understory.
Forest management agreement	A contract between the province of Alberta and the FMA holder whereby the province provides an area-based Crown timber supply. In return, the FMA holder commits to the following: Managing the timber resource on a perpetual sustained yield basis, taking into consideration a broad range of forest values in determining forest management practices. Meeting defined economic objectives, including capital investment and job creation, and seeking out new business opportunities that provide measurable economic benefits for both the province and the FMA holder. The FMA gives the FMA holder the right to access Crown fibre. In return, the FMA holder commits to forest management responsibilities, which may change from time to time. [SRD 2006]
Forested landscape	Areas within the gross landbase currently supporting, or being regenerated to, forested tree species.
Fully stocked	All potential growing space is effectively occupied by merchantable tree species.
Gross landbase	Entire area in ha within the boundaries of both Manning Diversified FMUs. Includes areas within the outer boundaries of the FMUs that are normally excluded from the FMU area, such as parks.
Gross volume	Indicates that no defect/cull deduction has been applied; this term can be applied to tree-level, plot-level or stand-level volumes (e.g., gross total tree volume, gross merchantable tree volume, gross total plot volume, gross merchantable plot volume, gross total stand volume, gross merchantable stand volume).
Influential point	An extreme data point that negatively influences model performance, resulting in failure to converge or an unacceptable curve shape.
Landbase polygon	A polygon within the (classified, TSA, or modelling) landbase derived during spatial processing to incorporate various spatial layers and attributes of interest.
Managed stand	Stand initiation is caused by anthropogenic disturbance such as harvesting.

Glossary Term	Definition
Managed stand yield curve	Managed stand yield curves were created by applying regeneration lag to natural stand yield curves with cull. Regeneration lag varied depending on whether cutblocks were harvested prior to 1991 or after 1991. Thus two sets of managed stand yield curves were developed: pre-91 managed stand yield curves and post-91 managed stand yield curves.
Mean annual increment	The average annual increase in volume of individual trees or stands up to the specified point in time. The MAI changes with different growth phases in a tree's life, being highest in the middle years and then slowly decreasing with age. The point at which the MAI peaks is commonly used to identify the biological maturity of the stand and its readiness for harvesting. [SRD 2006]
Merchantable stand volume	Merchantable tree volume summed to represent volume on a per hectare basis.
Merchantable tree volume	A tree-level term; the volume of those portions of a tree bole that meet utilization requirements (stump height, top and bottom diameter limits, log length).
Modified yield curve	Base yield curves modified to reflect specific applied silvicultural treatments (e.g., tree improvement, understory protection), cull, and/or regeneration lag.
Natural stand	Natural stands developed under natural (non-anthropogenic) disturbance regimes. Stand initiation was due to natural disturbances such as fire, pest or pathogen outbreak, etc.
Natural stand yield curve	Empirical yield curves fit using data from all sampled natural stands within the active landbase.
Net volume	Indicates that a defect/cull deduction has been applied; this term can be applied to tree-level, plot-level or stand-level volumes (e.g., net total tree volume, net merchantable tree volume, net total plot volume, net merchantable plot volume, net total stand volume, net merchantable stand volume).
Non-forested landscape	Areas within the gross landbase currently not supporting or being regenerated to forested tree species.
Nonlinear regression	The practice of fitting a model where the dependant variable is a nonlinear function of one or more independent variables. Nonlinear regression is differentiated from curvilinear regression by the fact that derivatives of a nonlinear regression equation with respect to a given parameter depend on more than one parameter. One benefit of nonlinear models is that they are often derived on the basis of physical and/or biological considerations.
Observation	One plot measurement at a specific point in time. All temporary sample plots have only one associated observation. Permanent sample plots may have one or more observations (remeasured data) for a single plot.
Passive landbase	Areas that are unavailable for forest management activities. Also referred to as the unmanaged or non-contributing landbase.
Piece size	The number of trees required to obtain one cubic meter of gross merchantable tree volume.
Plot	Unit of area, within which variables of interest are assessed.
Plot volume	Gross merchantable tree volume within a plot, converted to a per hectare basis (m ³ /ha).
Polygon	A closed geometric entity used to spatially represent area features with associated attributes.
Post-91 managed stand yield curve	A managed stand yield curve with a 2-year regeneration lag applied to coniferous volume and a 0-year regeneration lag applied to deciduous volume.
Pre-91 managed stand yield curve	A managed stand yield curve with a 5-year regeneration lag applied to coniferous volume and a 2-year regeneration lag applied to deciduous volume.
Regeneration lag	The period of time between harvest and establishment of the regenerated stand.
Site index	A relative measure of forest site quality based on the height of top height trees at a specific age (usually 50 years).
Species group	A single species code used to represent one or more AVI species. For example, the AW species group is comprised of AVI species A and Aw; the LT species group is comprised of La, Lt, and Lw.
Species type	There are two species types: deciduous and coniferous. Species belonging to the deciduous type include aspen, birch and poplar; species belonging to the coniferous type include fir, pine, larch and spruce.
Stand	A community of trees sufficiently uniform in species, age, arrangement or condition as to be distinguishable as a group in the forest or other growth in the area. A stand may also be that polygon as defined in the AVI or Phase III inventory. [SRD 2006]
Stand type	Stand type is not equivalent to stand origin. Stand type reflects stand origin and any silvicultural modifiers applied to that stand. For example, a natural stand that has been thinned is considered a thinned stand type.
Stand volume	Gross merchantable volume within a stand on a per hectare basis (m ³ /ha); aka gross merchantable stand volume.
Strata/Stratification	A classification scheme for defining polygons within the active landbase.



Glossary Term	Definition
Timber productivity rating	The potential timber productivity of a stand based on the height and age of the first listed species in the AVI overstory string. TPR reflects factors affecting tree growth including soil, topography, climate, elevation, moisture, etc. [AFLW 1991].
Timber supply analysis	Calculations/computer models with built-in assumptions regarding forest growth patterns, used to determine the annual allowable cut. (Also calculates the spatial harvest sequence and other non-timber values.) [SRD 2006]
Total stand volume	Total tree volume summed to represent volume on a per ha basis.
Total tree volume	A tree-level term; the volume of the entire bole (excluding branches, roots, leaves) of a tree.
Tree improvement	Practices carried out on a tree or group of trees designed to improve them for any purpose. In the Manning Diversified FMA area, tree improvement involves the intensive selection of trees based on desired traits, in order to obtain improved seed for seedling programs.
Tree improvement yield curve	A modified yield curve for the PL and SW yield strata whereby the managed stand is adjusted such that volume increase (a fixed percent) occurs at approximately the average harvest age but the maximum total volume across all ages is unaffected.
Understory protection	Harvesting applied to deciduous stands with a coniferous understory. Harvesting activities are carried out with an emphasis on minimizing damage to the residual understory.
Understory protection yield curve	A modified yield curve created by compositing yields from a number of yield curves at different ages to represent development of different substrata (landings, skid trails, buffers and removal areas) following understory protection in the DU-A yield stratum.
Yield curve	A graphical representation of a predictive yield equation. One yield curve is in fact comprised of three curves: a conifer curve, a deciduous curve and a total curve.
Yield equation	Mathematically describes the relationship between predictor variables (e.g., age, site index) and the response variable (e.g., yield in terms of volume or piece size).
Yield table	A summary table showing yield (e.g., volume, piece size) as a function of varying levels of predictor variables (e.g., age) and classification criteria (e.g., yield stratum).
Yield strata	A system of stratification applied to the forested landscape. Assignment is based upon FMU, defining layer and defining layer and/or understory layer attributes (broad cover group, crown closure class, leading conifer species). Yield strata form the basis for the development of yield curves; each yield stratum has one or more associated yield curves.



Appendix II Glossary Terminology Structure





This section provides an overview of how landbase and growth and yield terms relate to each other. For example, there are two main type of volume: tree volume and stand volume. Tree volume can be classified as total tree volume (top and stump volume included) or merchantable tree volume (portions that meet utilization criteria only). These volumes are further classified as having cull reductions applied (net) or no cull reductions applied (gross).

Volumes

- Tree Volume
 - Total Tree Volume
 - Gross Total Tree Volume
 - Net Total Tree Volume
 - Merchantable Tree Volume
 - Gross Merchantable Tree Volume
 - Net Merchantable Tree Volume
- Stand Volume
 - Total Stand Volume
 - Gross Total Stand Volume
 - Net Total Stand Volume
 - Merchantable Stand Volume
 - Gross Merchantable Stand Volume
 - Net Merchantable Stand Volume

Areas

- Gross Landbase
 - Active Landbase
 - Forested Landscape
 - Stand Types
 - Managed Stands
 - Natural Stands
 - Passive Landbase
 - Forested Landscape
 - Stand Types
 - Managed Stands (pre-existing clearcuts only)
 - Natural Stands
 - Non-forested Landscape

Strata and Yield Curves

- Yield Strata
- Yield Curves
 - Base
 - Natural Stand
 - Modified
 - Natural with Cull
 - Pre-91 Managed with Cull
 - Post-91 Managed with Cull
 - Tree Improvement
 - Understory Protection
 - Composite
 - Broad Cover Group (C, CD, DC, D)
 - Coniferous Landbase
 - Total (Active) Landbase



**Appendix IV Manning Diversified Forest Products Ltd.
Volume Sampling Field Manual**



**Appendix V Manning Diversified Forest Products Ltd.
Volume Sampling Plan**



Appendix VI Regeneration Lag Calculations



Regeneration lag (regen lag) is the time in years following harvesting that is required for the harvested area to become stocked with desirable tree species. Regeneration lag calculations employ historic data to project anticipated regeneration lag in forecasting.

Regeneration lag calculations were required for the FMA area for the 2007-2017 FMP. Coniferous regeneration lag was calculated for post-91 cutblocks only, using MDFP block information; default regeneration lag values were used for deciduous regeneration lag and coniferous regeneration lag in pre-91 cutblocks.

Regeneration lag calculations were applied in accordance with the document 'Regeneration Lag Assessment', provided by Alberta SRD, with some minor adjustments to the methodology to reflect local conditions and the FMA area's specific reforestation programs. Methods used were as follows:

Methods

Regeneration lag was not calculated by yield stratum since cutovers used in calculations had not been assigned to yield strata. It would have been possible to subdivide the blocks into broad cover group (DC, CD and C); however, the treatment regimes used by MDFP were the same for all three strata. As such, it was felt that regeneration lag would be the same as well. In addition, subdividing the data would have resulted in relatively small sample sizes by broad cover group.

Eligible Harvest Areas

MDFP did not use 1991 as the start year, since they did not operate until the fall of 1993. Upon examination of the first five years of MDFP's cutblocks, it became obvious that the first years' blocks were problematic due to application of multiple treatments prior to surveys, and several double surveys that were the result of changing regeneration standards. This made it quite difficult to determine the block-by-block regeneration lag. MDFP therefore chose to use cutblocks from the 1994/95 to 1998/99 timber years. From this five-year period, a total of 205 blocks (2673.1 hectares) in FMU P6 were eligible for regeneration lag calculations, all of which had been surveyed. No blocks in FMU P9 were harvested within the 1994/1995 to 1998/1999 period, therefore no data were available from this FMU.

Regeneration Lag Assignment for SR Blocks

Regeneration lag was calculated for blocks that were deemed SR on their first survey (187 out of 205 blocks). All blocks were winter harvested and planted within the first summer of harvest. One of three different planting regimes were applied, as follows:

- Spring planted 1-0 trees. Blocks were planted within a few months of harvest with seedlings that came out of cold storage. Blocks were assigned a regen lag of 0 years due to the fact that they were 1 year old at plant and they grew in the first season.
- Summer planted 2-0 trees. Blocks were planted within the first summer with two-year old trees, but seedlings did not grow in the first season. Blocks were assigned a regen lag of 0 years. There were very few blocks in this category.
- Summer planted 1-0 trees. Blocks were planted in the first summer with one-year old trees, but seedlings did not grow in the first season. Blocks were assigned a regen lag of 1 year.

Regeneration Lag Assignment for NSR Blocks

Regeneration lag was calculated for blocks that were deemed NSR on their first survey (18 out of 205 blocks). All blocks were winter harvested and planted within the first summer of harvest. Regeneration lag was assigned based upon retreatment¹⁷ history for each block.

- For blocks that were resurveyed without further treatment and deemed SR, the assignment procedure used for the SR blocks was applied.
- For blocks that were retreated, resurveyed and deemed SR, the number of years to second treatment was incorporated into the calculated regeneration lag. For example, if a block was replanted 3 years after harvest with spring 1-0 stock, regen lag would be 2 years: 3 years to retreatment minus 1 year for planting spring 1-0 stock.
- For blocks that were retreated but not resurveyed, a 10-year regen lag was assigned.
- There were no NSR blocks lacking both retreatment and resurveying.

Regeneration lag was calculated by area-weighting the regeneration lag for each cutblock by cutblock area, then summing across all cutblocks. Both SR and NSR blocks were included in the calculations.

The calculated regeneration lag for conifers is 1.074 years. Rounded upwards, the regeneration lag for post-91 coniferous stands is 2 years. For post-91 deciduous stands, a default regeneration lag of 0 years was used. For pre-91 cutblocks, a default regeneration lag of 5 and 2 years was used for coniferous and deciduous stands, respectively, as directed by Alberta SRD.

¹⁷ The SRD Regeneration Lag Assessment document states that “The most recent (last treatment date) silvicultural treatments (planting, seeding or site preparation) applied to 20 percent or more of the cutblock area are applicable.”. The 20% area rule was not applied to MDFP’s regeneration lag calculation, as re-treatments often involved replanting less than 20% of the original number of seedlings, but scattered over a relatively large area. This made the 20% area rule difficult to apply. Instead, MDFP used a 10% replant rule for re-treatment after an NSR survey (*i.e.*, if more than 10% of the original number of seedlings was replanted, this was considered a re-treatment).



Appendix VII Tree Improvement Background Materials



Tree improvement yield curves were developed to reflect the effects of planting improved stock (seedlings grown using improved seed from intensive tree selection) on volume yields. A 1% height gain for pine and a 2.5% height gain for white spruce were approved for improved stock in the FMA area.

In order to apply tree improvement gains to volume-age yield curves, tree-level height gain had to be converted to stand-level volume gains. This section summarizes initial analysis undertaken to determine the appropriate percent volume increase for PL and SW yield strata.

In order to convert tree-level height gain to stand-level volume gain, percent increase in gross merchantable tree volume was used as a proxy for percent increase in gross merchantable stand volume. The following methods were used:

All pine trees were extracted from the PL-BCD-P6 and PL-BCD-P9 datasets, and all white spruce trees were extracted from the SW-CD-P6 and SW-CD-P9 datasets. Analysis was undertaken separately for each of the four yield strata.

Gross merchantable tree volume increase was calculated using three methods:

- Height gain only. Trees were assumed to increase in height, but to have no associated increase in diameter. Tree heights were predicted based on measured diameter, then individual tree volume was calculated using the methods described in Section 3.5. Predicted tree height was then incremented by 1% for PL and 2.5% for SW and gross merchantable tree volumes were recalculated.
- Height gain plus DBH gain. Trees were assumed to gain height, and to have an associated gain in diameter. Tree heights were predicted based on measured diameter, then gross merchantable tree volume was calculated using the methods described in Section 3.5. Predicted tree height was then incremented by 1% for PL and 2.5% for SW. The new tree height was used to calculate a new diameter for each tree using equations in Huang (1994b). Individual gross merchantable tree volumes were then recalculated using the new height and diameter¹⁸.
- Height gain plus ½ DBH gain. SRD indicated that one-half the diameter gain would result in volume gains more acceptable to the Province. Tree heights were predicted based on measured diameter, then individual tree volume was calculated using the methods described in Section 3.5. Predicted tree height was then incremented by 1% for PL and 2.5% for SW. The new tree height was used to calculate a new diameter for each tree. Individual tree volumes were then recalculated using the new height and ½ of the diameter increase (*i.e.*, $(DBH_{new} - DBH_{old})/2 + DBH_{old}$).

Percent volume increase was calculated across all trees by yield stratum using:

¹⁸ Predicted tree heights were used even where measured heights were available, in order to improve consistency in results. In initial analyses, when height increase was calculated using measured height, then a new DBH was determined from the increased height, the new DBH could be less than the previous DBH due to a measured height that was shorter than expected.

$$\%VolIncrease = \frac{\sum \left(\frac{NewVol - OldVol}{OldVol} \right)}{n_{trees}} * 100$$

Where: *%VolIncrease* = average percent increase in gross merchantable tree volume

NewVol = gross merchantable tree volume based on increased tree height/DBH

OldVol = gross merchantable tree volume based on original tree height/DBH

n_{trees} = number of (PL or SW) trees in the plot data

Results are presented in Table IV-1.

Table IV-1. Results from tree improvement analysis.

Yield Stratum	Species	n	Percent Height Increase	Percent Volume Increase		
				Height Only	Height + DBH	Height + 1/2 DBH
PL-P6-BCD	PL	553	1%	1.2	5.1	3.1
PL-P9-BCD	PL	697	1%	1.2	5.3	3.2
SW-P6-CD	SW	632	2.5%	2.8	12.1	7.5
SW-P9-CD	SW	447	2.5%	2.8	12.7	7.7

The “height plus ½ DBH” method was proposed as the most appropriate method for determining volume gain. However, Alberta SRD felt that these numbers were too high, and instructed that values of 2% for PL strata and 5% for SW were acceptable to the Province and should be used instead. A copy of the letter from Alberta SRD is included in this Appendix.



MAR-24-2006 10:54

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Alberta
SUSTAINABLE RESOURCE
DEVELOPMENT



Public Lands and Forests Division
Forest Management Branch

8th Floor 9920 - 108 Street
Edmonton, Alberta
Canada T5K 2M4

Telephone (780) 427-8474
Fax (780) 427-0084

March 23, 2006

Ref: 06302 - F02 - 04
06302 - R01 - 01

Mr. Jean-Paul Bielech
Woodlands Manager
Manning Diversified Forest Products Ltd.
Box 370
Manning, Alberta
T0H 2M0

Dear Mr. Bielech:

RE: VOLUME BASED GENETIC GAIN ESTIMATES

On March 8th, MDFP proposed a 3% volume gain for P1 and 7.5% volume gain for Sw in their genetically improved post-harvest strata. The estimates were based on approved height gains of 1% for the region J P1 orchard (at 90 years) and 2.5% for the G2 Sw orchard (at 110 years).

To assess the suitability of these proposed volume gains, the department's Biometrics Group investigated the relationship between anticipated height gain and volume gain at rotation, using available growth and yield modeling tools.

A two step analysis was used to conduct the review.

The first step investigated the individual tree height gain / volume gain relationship based on the anticipated height gain and on a range of probable diameter gains. The Forestry Corp use a similar rationale for the proposed 3% and 7.5% gains. This provided a cursory look at the broad potential range of volume gains at an individual tree level.

In the second step, a suite of runs in GYPSY and MGM were conducted to evaluate the stand level height gain to volume gain relationship. The runs tested a series of broadly defined starting densities. This second step is crucial as it attempts to approximate the interactions between height gain, diameter gain, and mortality. The Biometrics Group will document this analysis in a brief summary document that will be made available at its completion.

.../2

MAR-24-2006 10:55

AB LAND & FOREST SVC.

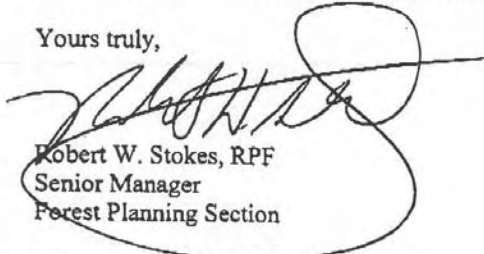
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- 2 -

Based on the findings of this investigation we require that a more conservative volume gain estimate be used to represent the yields of these genetically improved strata. Specifically, a volume gain of 2% at 90 years for Pl in region J, and a volume gain of 5% at 110 years for Sw in region G2. Please ensure these values are used to adjust coniferous yield projections for the genetically improved post-harvest strata in the MDFP Detailed Forest Management Plan.

For further information or discussion, contact Darren Aitkin at (780) 644-5581.

Yours truly,



Robert W. Stokes, RPF
Senior Manager
Forest Planning Section

cc: Daryl Price, Senior Manager, Resource Analysis Section
Dave Morgan, Manager, Forest Biometrics Unit
Narinder Dhir, Manager, Genetics and Forest Improvement Unit
Willi Fast, Senior Consultant, Growth & Yield, The Forestry Corp
Glen Gaehe, Area Manager, Peace Forest Area
Kari White, Area Forester, Peace Forest Area
Vicky Bossé, Forest Management Planning Forester

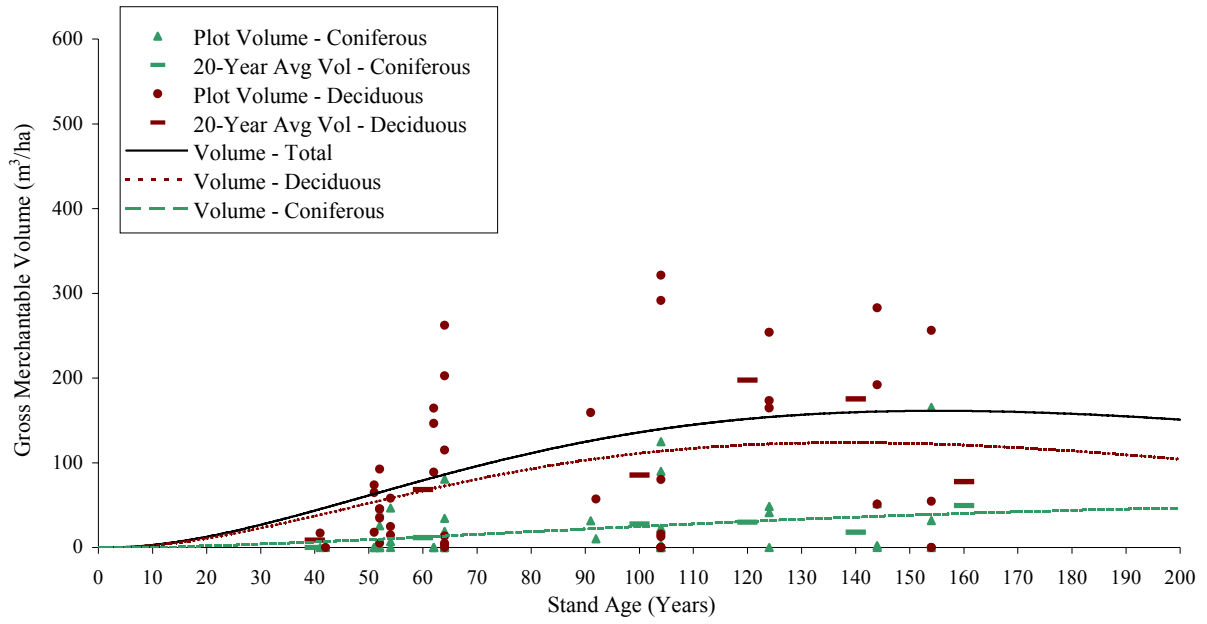
TOTAL P.03



Appendix VIII Yield Curves: Natural Stand



FMU P6 & P9 Combined / D-B-COMB / Base Natural Stand Yield Curve



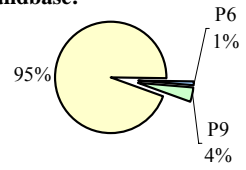
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a \cdot \text{age})}$

Parameter Estimates:			
Coniferous Eqn: 2P	a	7.058E-03	
	b	1.9265936	
	k	0	
Deciduous Eqn: 2P	a	1.636E-02	
	b	2.2710322	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

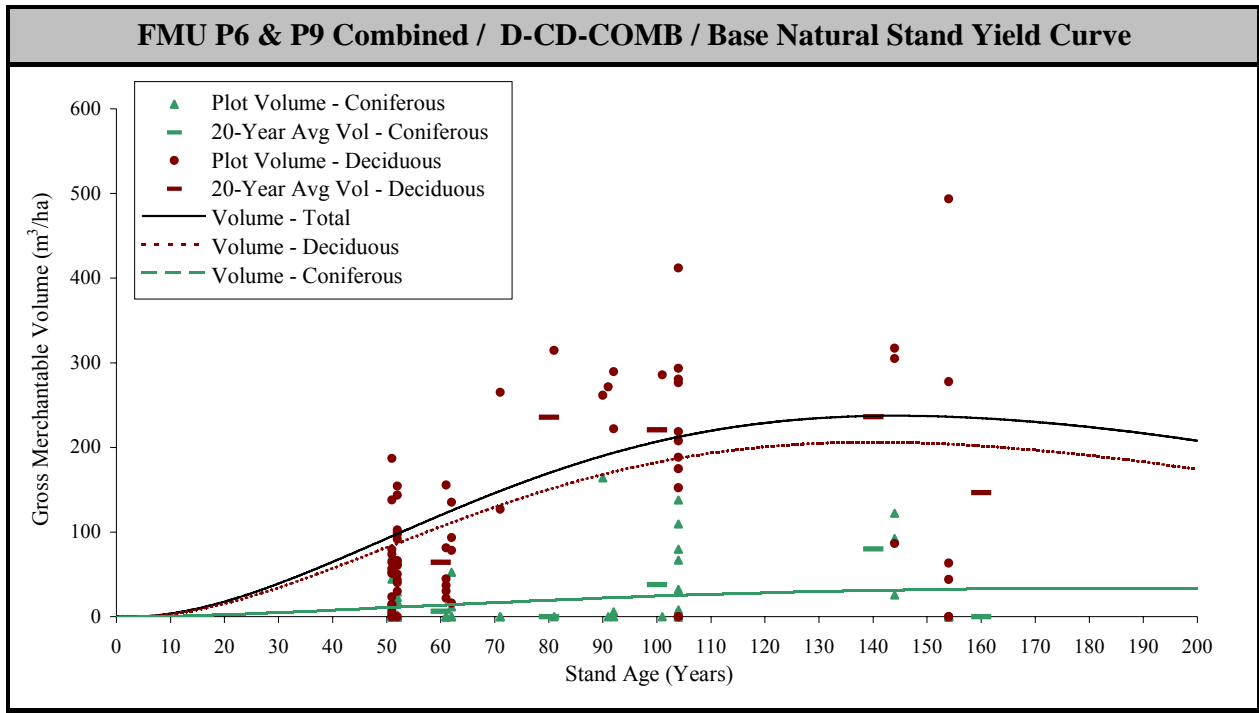
Stratum Summary:	
Total Number of Plots:	45
P6 Area (ha):	2,921
P9 Area (ha):	12,592

Stratum as a % of the active landbase:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.6	2.6	3.1	0.056	0.259	0.315
20	0	2.0	10.6	12.6	0.098	0.531	0.630
30	0	4.0	22.7	26.7	0.133	0.755	0.889
40	2	6.5	37.0	43.5	0.162	0.924	1.087
50	12	9.3	52.1	61.4	0.186	1.042	1.228
60	10	12.3	66.9	79.3	0.205	1.116	1.321
70	0	15.4	80.7	96.1	0.221	1.152	1.373
80	0	18.6	92.8	111.4	0.233	1.159	1.392
90	2	21.8	102.9	124.7	0.242	1.143	1.385
100	9	24.9	111.0	135.8	0.249	1.110	1.358
110	0	27.8	117.0	144.8	0.253	1.064	1.317
120	3	30.7	121.0	151.7	0.256	1.009	1.264
130	0	33.3	123.3	156.6	0.256	0.948	1.205
140	3	35.8	123.8	159.7	0.256	0.885	1.140
150	4	38.1	123.0	161.1	0.254	0.820	1.074
160	0	40.2	120.9	161.1	0.252	0.756	1.007
170	0	42.1	117.8	159.9	0.248	0.693	0.941
180	0	43.8	113.9	157.7	0.244	0.633	0.876
190	0	45.3	109.3	154.7	0.239	0.575	0.814
200	0	46.6	104.3	150.9	0.233	0.521	0.755

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



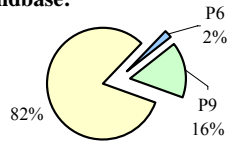
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a \cdot \text{age})}$

Parameter Estimates:			
Coniferous Eqn: 2P	a	1.000E-02	
	b	1.9104007	
	k	0	
Deciduous Eqn: 2P	a	1.698E-02	
	b	2.3841362	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	68
P6 Area (ha):	6,881
P9 Area (ha):	47,289

Stratum as a % of the active landbase:

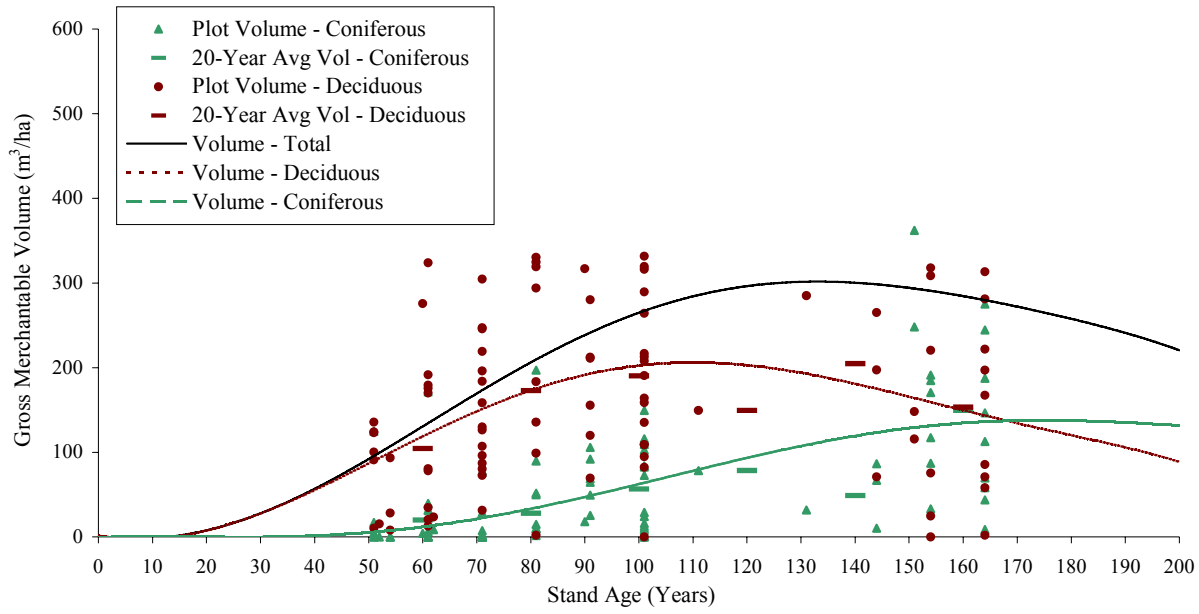


Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.7	3.5	4.2	0.074	0.347	0.421
20	0	2.5	15.3	17.8	0.125	0.764	0.889
30	0	4.9	33.9	38.8	0.164	1.130	1.294
40	0	7.7	56.8	64.5	0.193	1.420	1.613
50	30	10.7	81.6	92.3	0.214	1.632	1.846
60	10	13.7	106.4	120.1	0.228	1.773	2.001
70	2	16.6	129.6	146.3	0.238	1.852	2.089
80	1	19.4	150.4	169.8	0.243	1.880	2.123
90	4	22.0	168.1	190.1	0.245	1.867	2.112
100	12	24.4	182.3	206.7	0.244	1.823	2.067
110	0	26.4	193.1	219.5	0.240	1.755	1.996
120	0	28.2	200.5	228.7	0.235	1.671	1.906
130	0	29.8	204.8	234.5	0.229	1.575	1.804
140	3	31.0	206.2	237.2	0.222	1.473	1.694
150	6	32.0	205.1	237.1	0.214	1.367	1.581
160	0	32.8	201.9	234.7	0.205	1.262	1.467
170	0	33.3	196.8	230.1	0.196	1.158	1.354
180	0	33.6	190.3	224.0	0.187	1.057	1.244
190	0	33.7	182.7	216.5	0.178	0.962	1.139
200	0	33.7	174.2	207.9	0.168	0.871	1.040

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



FMU P6 & P9 Combined / DU-A-COMB / Base Natural Stand Yield Curve



2-PARAMETER EQUATION WITH CONSTANT (2P+k): volume = a(age)^be^(-age/k)

Parameter Estimates:

Coniferous	a	3.030E-09
Eqn: 2P+k	b	5.8811242
	k	30
Deciduous	a	2.963E-04
Eqn: 2P+k	b	3.6406712
	k	30

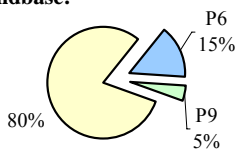
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Total Number of Plots:	91
P6 Area (ha):	44,547
P9 Area (ha):	13,494

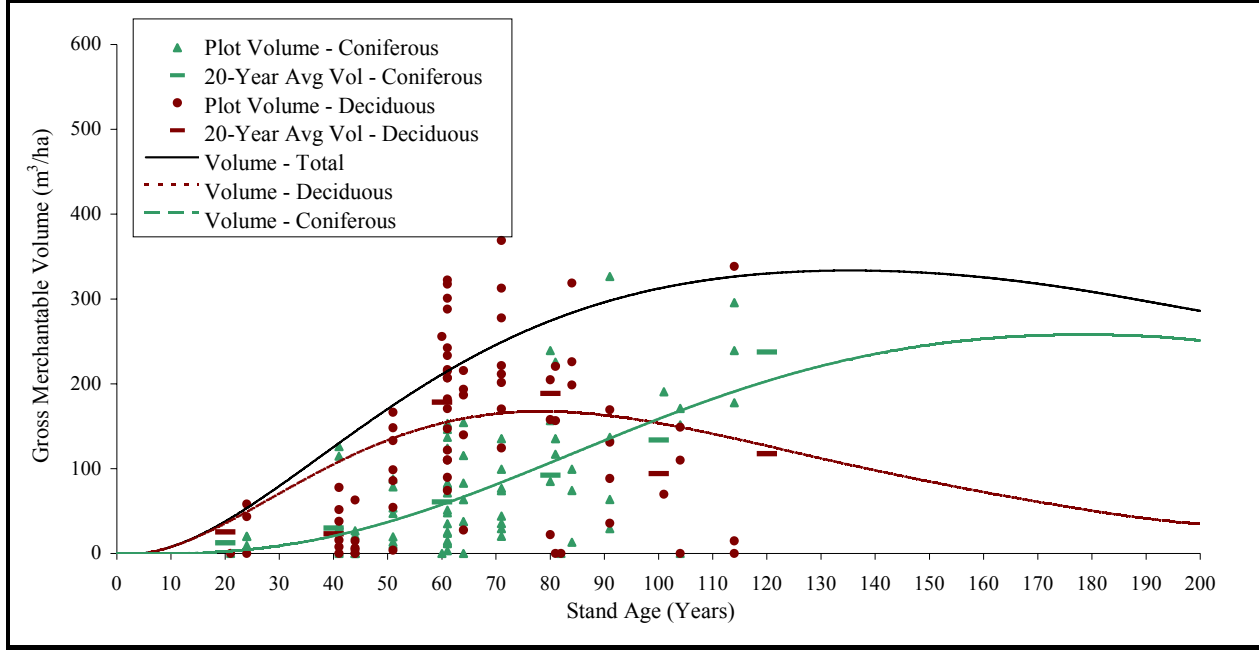
Stratum as a % of the active landbase:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.0	0.9	0.9	0.000	0.093	0.093
20	0	0.1	8.3	8.4	0.003	0.415	0.418
30	0	0.5	26.0	26.5	0.018	0.867	0.885
40	0	2.1	53.1	55.2	0.053	1.328	1.381
50	10	5.6	85.8	91.4	0.112	1.715	1.827
60	12	11.8	119.3	131.1	0.196	1.989	2.185
70	15	20.9	149.9	170.7	0.298	2.141	2.439
80	8	32.8	174.6	207.4	0.410	2.183	2.592
90	7	47.0	192.1	239.1	0.522	2.135	2.656
100	17	62.5	202.0	264.5	0.625	2.020	2.645
110	1	78.5	204.8	283.3	0.713	1.862	2.575
120	0	93.8	201.4	295.2	0.782	1.679	2.460
130	1	107.6	193.2	300.8	0.828	1.486	2.314
140	3	119.2	181.3	300.5	0.852	1.295	2.146
150	8	128.2	167.0	295.1	0.854	1.113	1.968
160	9	134.2	151.3	285.6	0.839	0.946	1.785
170	0	137.4	135.2	272.6	0.808	0.795	1.604
180	0	137.8	119.3	257.1	0.765	0.663	1.428
190	0	135.7	104.1	239.7	0.714	0.548	1.262
200	0	131.4	89.9	221.3	0.657	0.449	1.107

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.

FMU P6 & P9 Combined / DU-BCD-COMB / Base Natural Stand Yield Curve



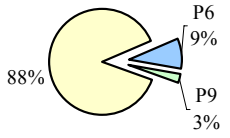
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a \cdot \text{age})}$
2-PARAMETER EQUATION WITH CONSTANT (2P+k): $\text{volume} = a(\text{age})^b e^{(-\text{age}/k)}$

Parameter Estimates:			
Coniferous	a	9.297E-05	
Eqn: 2P+k	b	3.5501201	
	k	50	
Deciduous	a	3.255E-02	
Eqn: 2P	b	2.5435639	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	77
P6 Area (ha):	26,950
P9 Area (ha):	8,039

Stratum as a % of the active landbase:

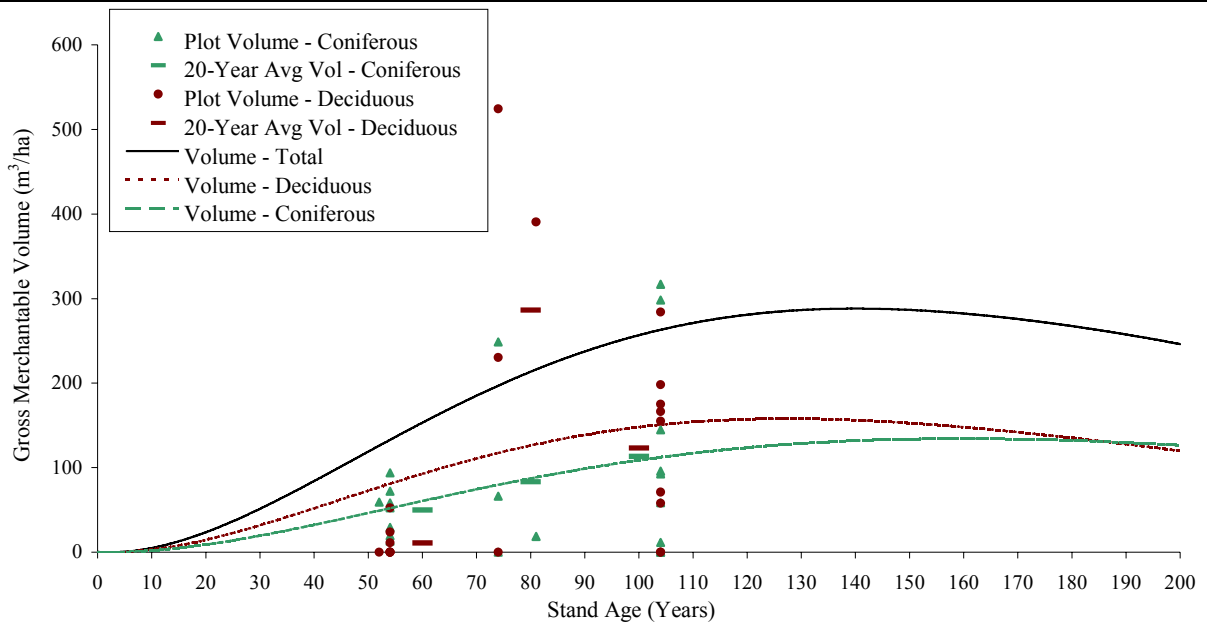


Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.3	8.2	8.5	0.027	0.822	0.849
20	4	2.6	34.6	37.2	0.130	1.730	1.860
30	0	8.9	70.1	79.0	0.298	2.336	2.634
40	12	20.3	105.2	125.6	0.509	2.630	3.139
50	7	36.8	134.0	170.8	0.736	2.681	3.416
60	25	57.5	153.9	211.4	0.959	2.565	3.524
70	8	81.4	164.5	245.9	1.163	2.350	3.513
80	10	107.1	166.8	273.9	1.338	2.086	3.424
90	4	133.2	162.6	295.8	1.480	1.806	3.286
100	4	158.5	153.5	312.0	1.585	1.535	3.120
110	3	182.0	141.3	323.3	1.655	1.284	2.939
120	0	203.0	127.3	330.2	1.691	1.061	2.752
130	0	220.8	112.7	333.5	1.698	0.867	2.565
140	0	235.1	98.3	333.4	1.680	0.702	2.381
150	0	246.0	84.6	330.5	1.640	0.564	2.204
160	0	253.2	72.0	325.2	1.583	0.450	2.032
170	0	257.1	60.6	317.8	1.512	0.357	1.869
180	0	257.9	50.6	308.5	1.433	0.281	1.714
190	0	255.8	42.0	297.8	1.346	0.221	1.567
200	0	251.3	34.5	285.8	1.256	0.173	1.429

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



FMU P6 & P9 Combined / DC-BCD-COMB / Base Natural Stand Yield Curve



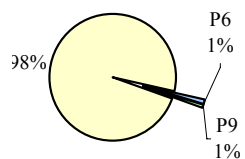
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a^* \text{age})}$

Parameter Estimates:			
Coniferous	a	1.409E-02	
	b	2.2497627	
	k	0	
Deciduous	a	1.840E-02	
	b	2.3520208	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	21
P6 Area (ha):	2,793
P9 Area (ha):	2,591

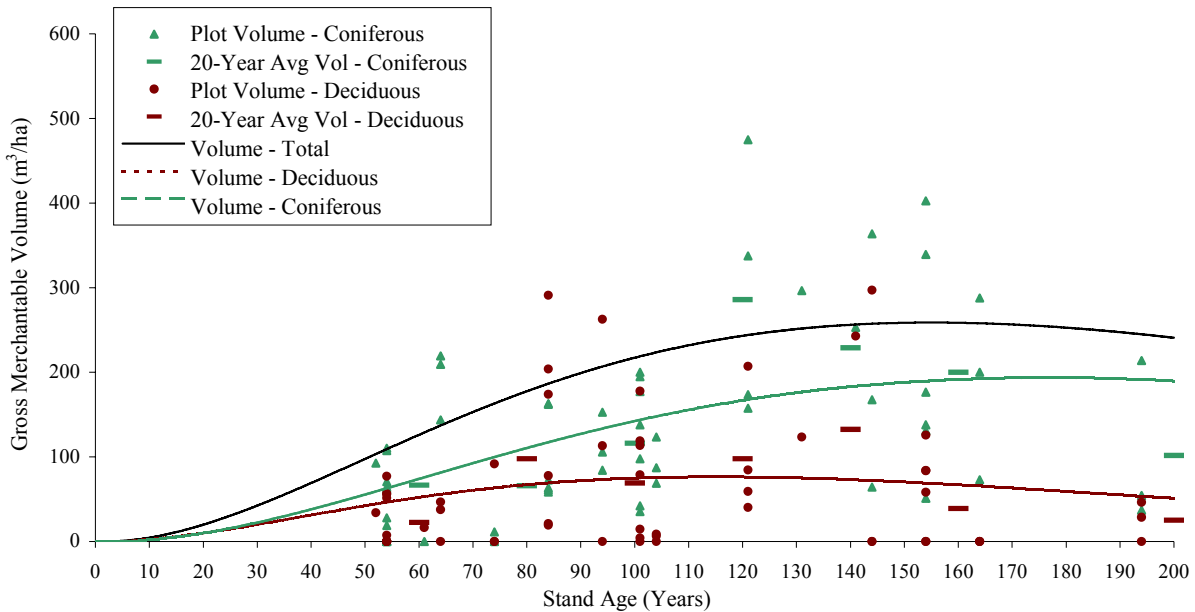
Stratum as a % of the active landbase:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.2	3.4	5.6	0.218	0.344	0.562
20	0	9.0	14.6	23.6	0.449	0.731	1.181
30	0	19.4	31.6	51.0	0.648	1.052	1.700
40	0	32.2	51.7	83.9	0.806	1.292	2.098
50	8	46.3	72.7	118.9	0.925	1.453	2.378
60	0	60.6	92.8	153.4	1.009	1.547	2.556
70	3	74.4	111.0	185.4	1.063	1.585	2.648
80	1	87.3	126.4	213.6	1.091	1.580	2.670
90	0	98.8	138.7	237.5	1.098	1.541	2.639
100	9	108.8	147.8	256.6	1.088	1.478	2.566
110	0	117.0	153.9	270.9	1.064	1.399	2.463
120	0	123.6	157.1	280.7	1.030	1.309	2.340
130	0	128.6	157.8	286.4	0.989	1.214	2.203
140	0	131.9	156.3	288.2	0.942	1.116	2.059
150	0	133.8	152.9	286.7	0.892	1.019	1.912
160	0	134.4	148.1	282.5	0.840	0.925	1.765
170	0	133.8	142.0	275.8	0.787	0.836	1.623
180	0	132.2	135.2	267.3	0.734	0.751	1.485
190	0	129.6	127.7	257.3	0.682	0.672	1.354
200	0	126.4	119.9	246.2	0.632	0.599	1.231

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.

FMU P6 & P9 Combined / MXU-B-COMB / Base Natural Stand Yield Curve



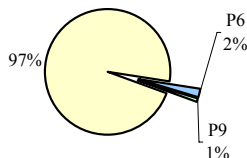
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a*\text{age})}$

Parameter Estimates:			
Coniferous Eqn: 2P	a	1.307E-02	
	b	2.3021787	
	k	0	
Deciduous Eqn: 2P	a	1.919E-02	
	b	2.2124359	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	60
P6 Area (ha):	7,063
P9 Area (ha):	2,245

Stratum as a % of the active landbase.



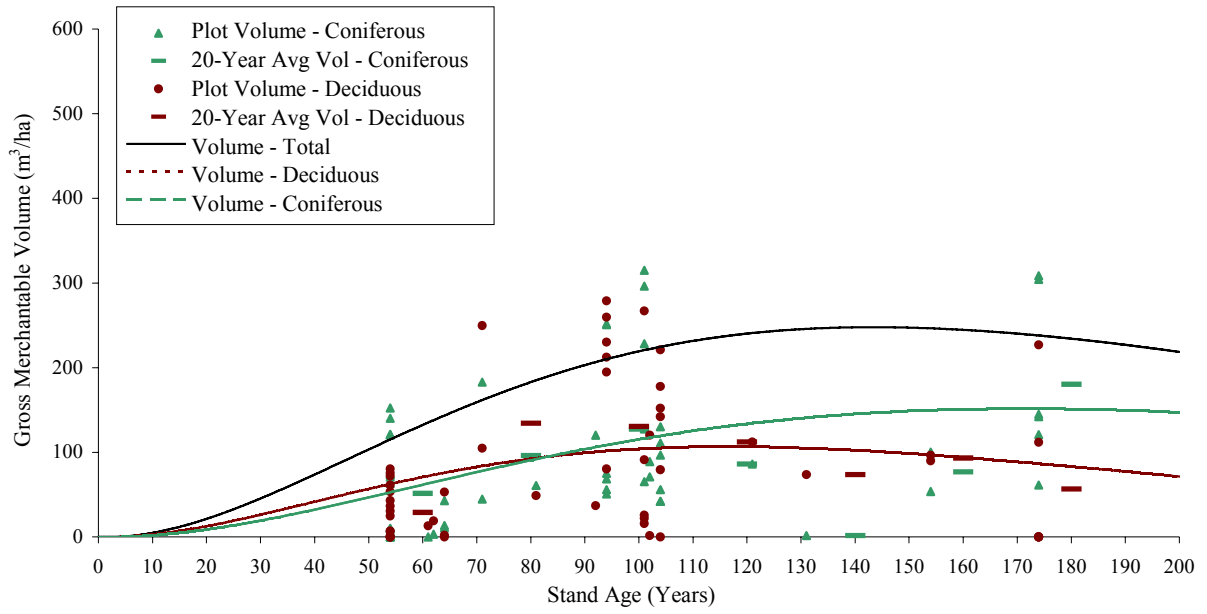
Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.3	2.6	4.9	0.230	0.258	0.488
20	0	10.0	9.9	19.8	0.498	0.494	0.992
30	0	22.2	20.0	42.2	0.740	0.667	1.407
40	0	37.8	31.2	69.0	0.945	0.780	1.725
50	13	55.4	42.2	97.6	1.109	0.844	1.953
60	4	74.0	52.1	126.1	1.234	0.869	2.102
70	3	92.6	60.5	153.1	1.323	0.865	2.188
80	6	110.5	67.1	177.6	1.381	0.839	2.220
90	3	127.2	71.9	199.1	1.413	0.799	2.212
100	10	142.2	74.9	217.2	1.422	0.749	2.172
110	0	155.4	76.4	231.8	1.413	0.694	2.107
120	4	166.6	76.4	243.0	1.389	0.637	2.025
130	1	175.8	75.3	251.1	1.352	0.579	1.931
140	4	183.0	73.2	256.2	1.307	0.523	1.830
150	6	188.2	70.4	258.6	1.255	0.469	1.724
160	3	191.6	67.0	258.6	1.197	0.419	1.616
170	0	193.3	63.3	256.5	1.137	0.372	1.509
180	0	193.5	59.3	252.7	1.075	0.329	1.404
190	3	192.3	55.1	247.4	1.012	0.290	1.302
200	0	189.8	51.0	240.8	0.949	0.255	1.204

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 Combined / MXU-CD-COMB / Base Natural Stand Yield Curve



2-PARAMETER EQUATION (2P): volume = a(age)^be^(-a*age)

Parameter Estimates:

Coniferous	a	1.320E-02
Eqn: 2P	b	2.2571593
	k	0
Deciduous	a	1.960E-02
Eqn: 2P	b	2.2878829
	k	0

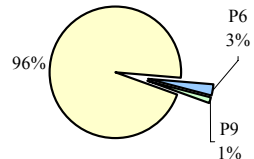
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

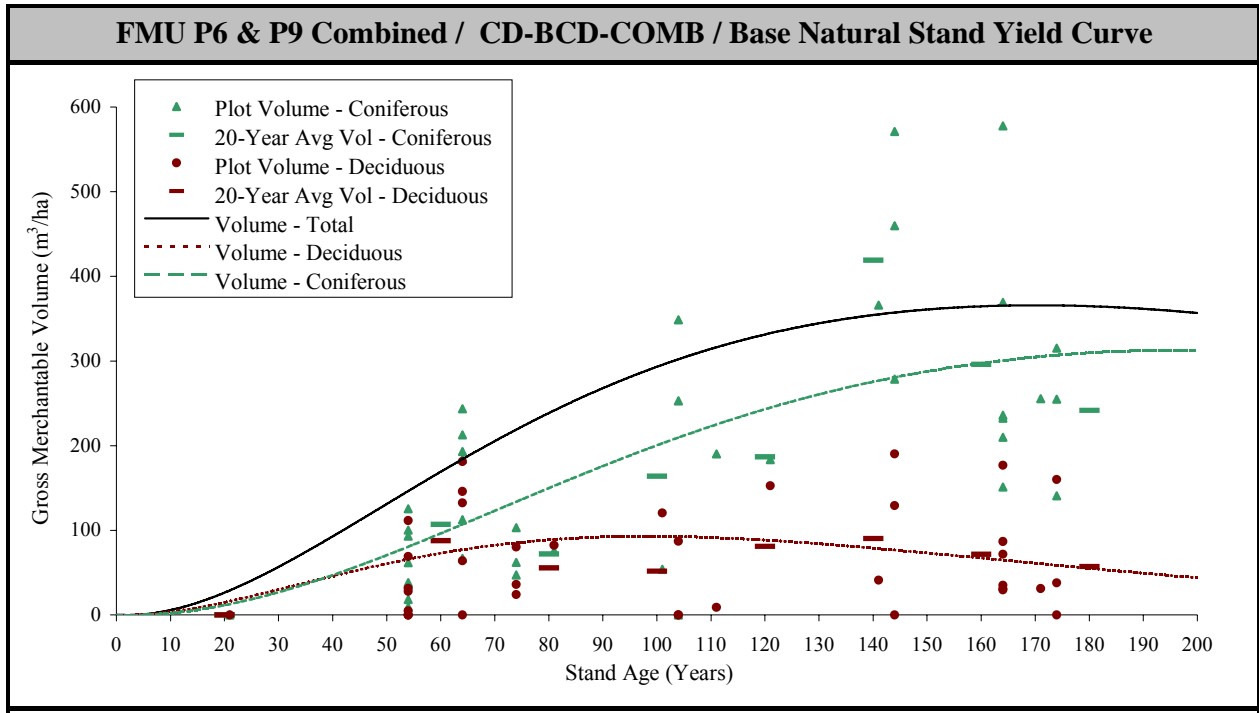
Total Number of Plots:	53
P6 Area (ha):	7,838
P9 Area (ha):	4,374

Stratum as a % of the active landbase:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.1	3.1	5.2	0.209	0.313	0.522
20	0	8.8	12.6	21.3	0.438	0.628	1.066
30	0	19.2	26.1	45.3	0.639	0.869	1.509
40	0	32.2	41.4	73.6	0.804	1.035	1.839
50	15	46.6	56.7	103.4	0.933	1.134	2.067
60	5	61.7	70.7	132.4	1.028	1.179	2.207
70	2	76.6	82.7	159.3	1.094	1.182	2.276
80	1	90.7	92.3	183.0	1.134	1.154	2.288
90	7	103.7	99.4	203.0	1.152	1.104	2.256
100	13	115.2	103.9	219.2	1.152	1.039	2.192
110	0	125.2	106.3	231.5	1.138	0.966	2.104
120	1	133.6	106.6	240.1	1.113	0.888	2.001
130	1	140.2	105.2	245.4	1.079	0.809	1.888
140	0	145.2	102.5	247.7	1.037	0.732	1.769
150	2	148.7	98.6	247.4	0.992	0.657	1.649
160	0	150.8	94.0	244.7	0.942	0.587	1.530
170	6	151.5	88.7	240.2	0.891	0.522	1.413
180	0	151.1	83.1	234.2	0.839	0.462	1.301
190	0	149.6	77.3	226.9	0.787	0.407	1.194
200	0	147.1	71.5	218.6	0.736	0.357	1.093

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



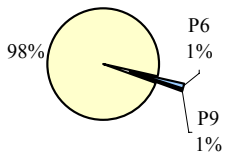
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a^* \text{age})}$

Parameter Estimates:			
Coniferous Eqn: 2P	a	1.198E-02	
	b	2.3716738	
	k	0	
Deciduous Eqn: 2P	a	2.348E-02	
	b	2.3083930	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	39
P6 Area (ha):	3,699
P9 Area (ha):	2,045

Stratum as a % of the active landbase:

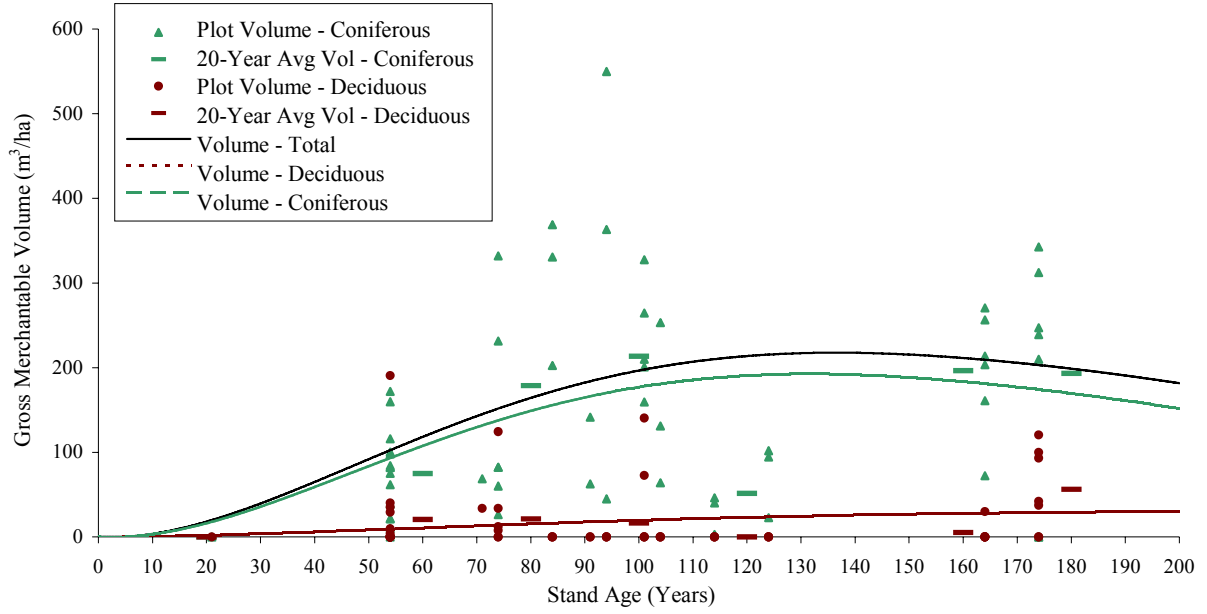


Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.5	3.8	6.3	0.250	0.378	0.628
20	1	11.5	14.8	26.3	0.574	0.740	1.314
30	0	26.6	29.8	56.5	0.888	0.994	1.882
40	0	46.8	45.8	92.6	1.169	1.145	2.314
50	8	70.4	60.6	131.1	1.408	1.213	2.621
60	6	96.3	73.0	169.3	1.604	1.217	2.822
70	3	123.1	82.4	205.5	1.758	1.178	2.936
80	1	149.9	88.7	238.6	1.873	1.109	2.983
90	0	175.8	92.1	267.9	1.953	1.023	2.977
100	4	200.2	92.9	293.1	2.002	0.929	2.931
110	1	222.7	91.5	314.2	2.024	0.832	2.856
120	1	242.8	88.5	331.3	2.023	0.737	2.761
130	0	260.4	84.1	344.6	2.003	0.647	2.651
140	4	275.4	78.9	354.4	1.967	0.564	2.531
150	0	287.8	73.2	361.0	1.918	0.488	2.407
160	6	297.5	67.2	364.7	1.859	0.420	2.279
170	4	304.7	61.1	365.8	1.793	0.359	2.152
180	0	309.6	55.1	364.7	1.720	0.306	2.026
190	0	312.2	49.4	361.6	1.643	0.260	1.903
200	0	312.8	44.0	356.8	1.564	0.220	1.784

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



FMU P6 / PL-BCD-P6 / Base Natural Stand Yield Curve



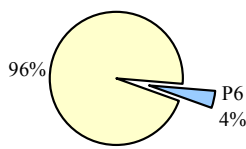
2-PARAMETER EQUATION (2P): volume = a(age)^be^(-a*age)

Parameter Estimates:			
Coniferous Eqn: 2P	a	1.808E-02	
	b	2.3878568	
	k	0	
Deciduous Eqn: 2P	a	8.718E-03	
	b	1.8652137	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	58
Stratum Area (ha):	7,090

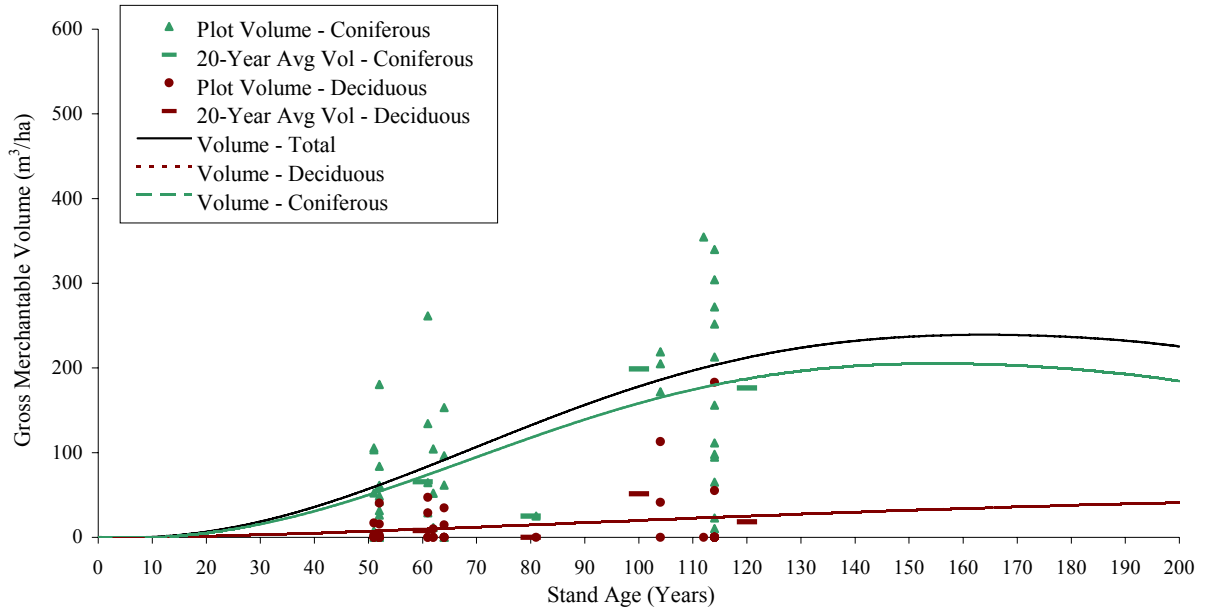
Stratum as a % of the active landbase, FMU P6:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	3.7	0.6	4.3	0.369	0.059	0.427
20	1	16.1	2.0	18.1	0.805	0.098	0.903
30	0	35.4	3.8	39.2	1.179	0.127	1.307
40	0	58.7	6.0	64.7	1.467	0.150	1.617
50	15	83.5	8.3	91.8	1.669	0.166	1.836
60	0	107.7	10.7	118.4	1.794	0.179	1.973
70	7	129.8	13.1	142.9	1.855	0.187	2.042
80	3	149.1	15.4	164.4	1.863	0.192	2.056
90	5	164.8	17.6	182.4	1.831	0.195	2.026
100	8	176.9	19.6	196.5	1.769	0.196	1.965
110	3	185.4	21.5	206.8	1.685	0.195	1.880
120	3	190.4	23.1	213.6	1.587	0.193	1.780
130	0	192.4	24.6	217.0	1.480	0.189	1.669
140	0	191.7	25.9	217.6	1.369	0.185	1.554
150	0	188.6	27.0	215.6	1.257	0.180	1.437
160	6	183.6	27.9	211.6	1.148	0.174	1.322
170	7	177.1	28.6	205.8	1.042	0.168	1.211
180	0	169.5	29.2	198.7	0.941	0.162	1.104
190	0	160.9	29.6	190.5	0.847	0.156	1.003
200	0	151.8	29.9	181.7	0.759	0.149	0.908

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.

FMU P9 / PL-BCD-P9 / Base Natural Stand Yield Curve



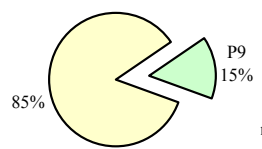
2-PARAMETER EQUATION (2P): volume = a(age)^be^(-a*age)
2-PARAMETER EQUATION WITH CONSTANT (2P+k): volume = a(age)^be^(-age/k)

Parameter Estimates:		
Coniferous	a	7.062E-04
Eqn: 2P+k	b	3.1093521
	k	50
	Deciduous	
	a	5.896E-03
Eqn: 2P	b	1.8923463
	k	0

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	44
Stratum Area (ha) :	18,726

Stratum as a % of the active landbase, FMU P9:

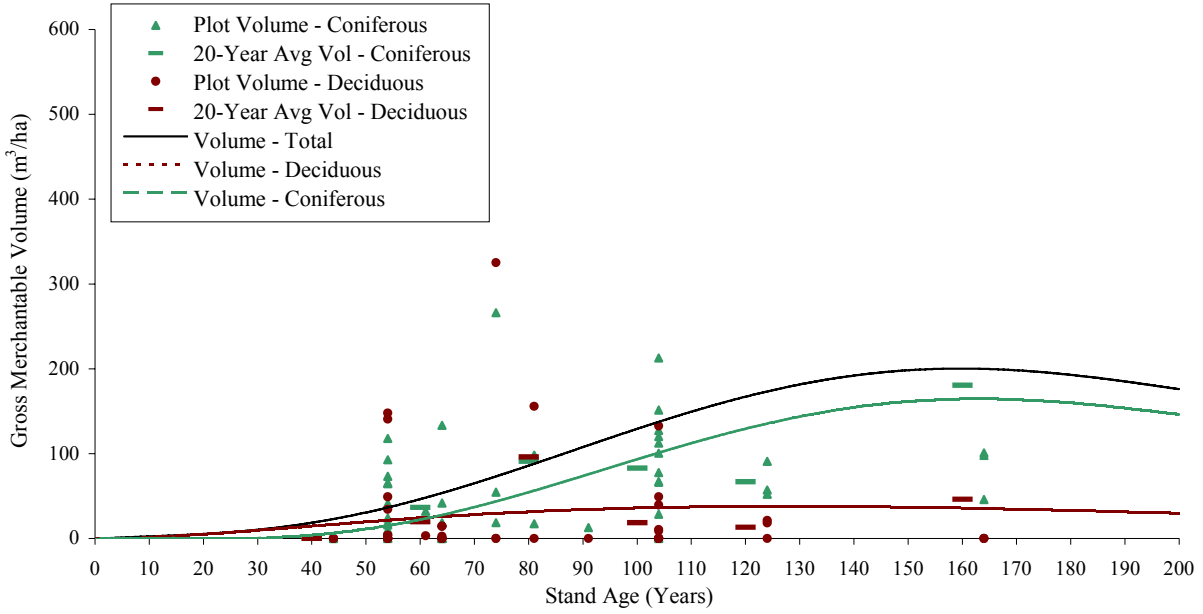


Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.7	0.4	1.2	0.074	0.043	0.118
20	0	5.3	1.5	6.8	0.263	0.076	0.339
30	0	15.2	3.1	18.3	0.506	0.103	0.609
40	0	30.4	5.0	35.4	0.760	0.125	0.885
50	15	49.8	7.2	57.0	0.996	0.144	1.140
60	12	71.9	9.6	81.5	1.198	0.160	1.358
70	0	95.1	12.1	107.2	1.358	0.173	1.531
80	1	117.9	14.7	132.6	1.473	0.184	1.657
90	0	139.2	17.3	156.5	1.547	0.192	1.739
100	3	158.1	19.9	178.1	1.581	0.199	1.781
110	13	174.1	22.5	196.6	1.583	0.204	1.787
120	0	186.9	25.0	211.9	1.557	0.208	1.765
130	0	196.2	27.4	223.6	1.509	0.211	1.720
140	0	202.3	29.7	232.0	1.445	0.212	1.657
150	0	205.2	31.9	237.2	1.368	0.213	1.581
160	0	205.4	34.0	239.4	1.284	0.213	1.496
170	0	203.0	36.0	239.0	1.194	0.212	1.406
180	0	198.6	37.8	236.4	1.103	0.210	1.313
190	0	192.3	39.5	231.8	1.012	0.208	1.220
200	0	184.7	41.0	225.7	0.923	0.205	1.128

¹ Gross stand volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



FMU P6 & P9 / SB-BCD-COMB / Base Natural Stand Yield Curve



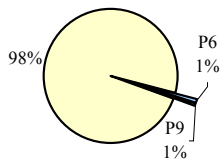
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a \cdot \text{age})}$
2-PARAMETER EQUATION WITH CONSTANT (2P+k): $\text{volume} = a(\text{age})^b e^{(-\text{age}/k)}$

Parameter Estimates:		
Coniferous	a	3.284E-08
Eqn: 2P+k	b	5.4511208
	k	30
Deciduous	a	1.589E-02
Eqn: 2P	b	2.0221984
	k	0

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

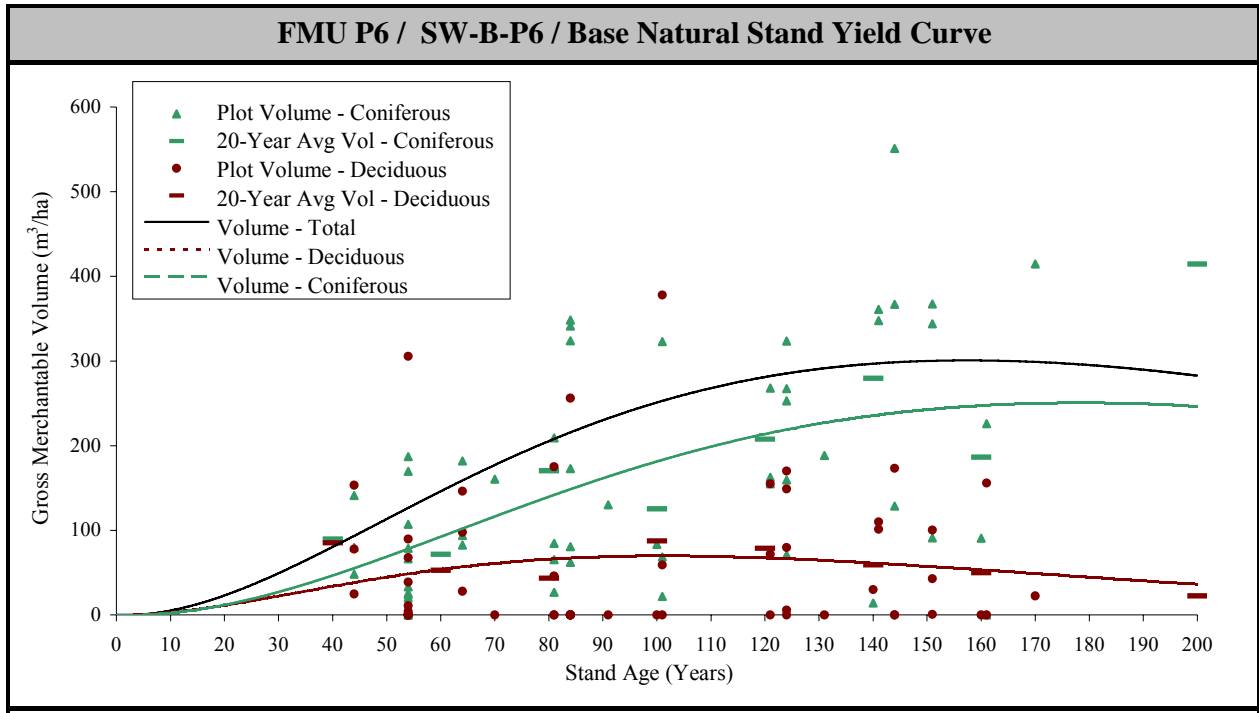
Stratum Summary:	
Total Number of Plots:	57
P6 Area (ha):	2,350
P9 Area (ha):	1,847

Stratum as a % of the active landbase:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.0	1.4	1.4	0.001	0.143	0.143
20	0	0.2	4.9	5.2	0.010	0.247	0.258
30	0	1.4	9.6	10.9	0.045	0.319	0.365
40	3	4.7	14.6	19.3	0.117	0.365	0.482
50	12	11.3	19.6	30.9	0.226	0.392	0.618
60	9	21.9	24.1	46.1	0.365	0.402	0.768
70	3	36.4	28.1	64.5	0.520	0.402	0.922
80	2	54.0	31.4	85.4	0.675	0.393	1.068
90	1	73.5	34.0	107.5	0.817	0.378	1.195
100	12	93.5	35.9	129.5	0.935	0.359	1.295
110	0	112.7	37.2	149.9	1.024	0.338	1.362
120	3	129.8	37.8	167.6	1.081	0.315	1.396
130	0	143.8	37.9	181.7	1.106	0.292	1.398
140	0	154.4	37.6	191.9	1.103	0.268	1.371
150	9	161.1	36.8	197.9	1.074	0.246	1.320
160	3	164.1	35.8	199.9	1.026	0.224	1.249
170	0	163.6	34.5	198.2	0.963	0.203	1.166
180	0	160.1	33.1	193.2	0.890	0.184	1.073
190	0	154.1	31.5	185.5	0.811	0.166	0.976
200	0	146.0	29.8	175.8	0.730	0.149	0.879

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



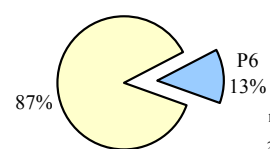
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a^* \text{age})}$

Parameter Estimates:			
Coniferous Eqn: 2P	a	1.326E-02	
	b	2.3557126	
	k	0	
Deciduous Eqn: 2P	a	2.196E-02	
	b	2.2277170	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

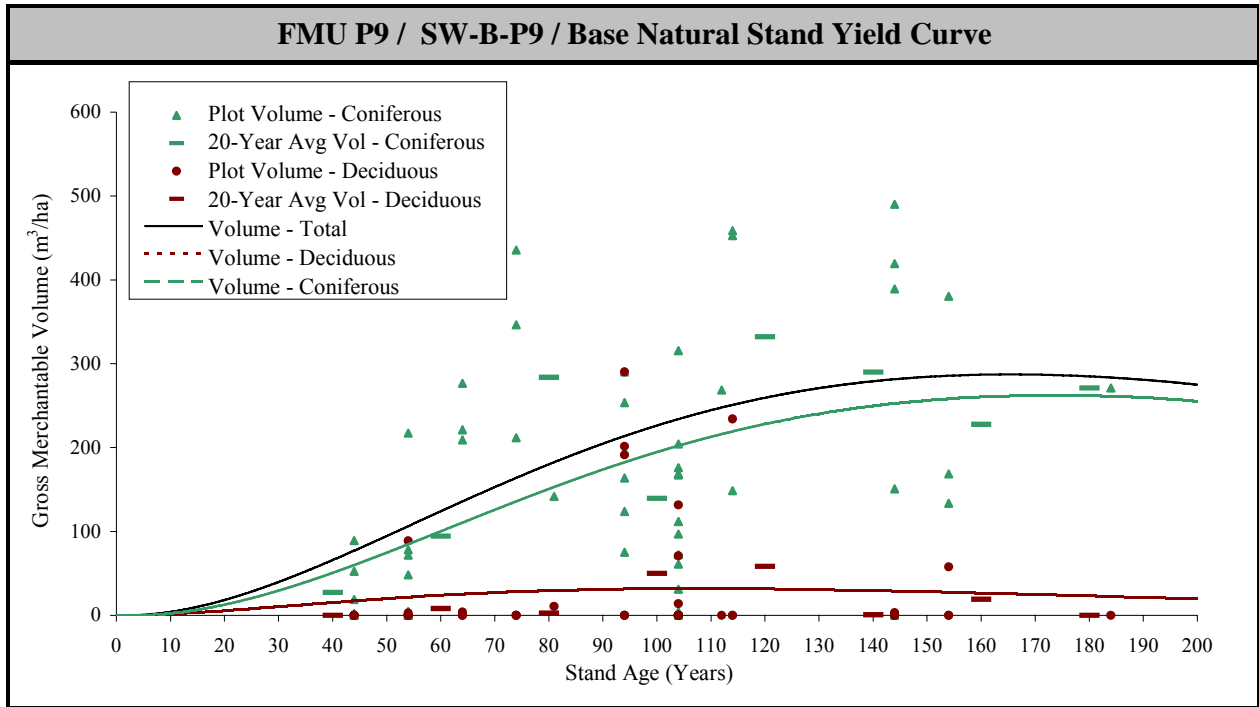
Stratum Summary:	
Total Number of Plots:	56
Stratum Area (ha):	22,213

Stratum as a % of the active landbase, FMU P6:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.6	3.0	5.6	0.263	0.298	0.561
20	0	11.8	11.2	23.0	0.590	0.560	1.150
30	0	26.9	22.2	49.1	0.896	0.740	1.635
40	3	46.4	33.8	80.2	1.159	0.845	2.004
50	12	68.7	44.6	113.3	1.374	0.893	2.266
60	3	92.4	53.8	146.2	1.540	0.896	2.437
70	1	116.4	60.9	177.3	1.663	0.870	2.532
80	10	139.6	65.8	205.4	1.745	0.823	2.568
90	1	161.4	68.7	230.1	1.793	0.763	2.557
100	4	181.2	69.7	250.9	1.812	0.697	2.509
110	0	198.6	69.2	267.9	1.806	0.629	2.435
120	8	213.6	67.5	281.0	1.780	0.562	2.342
130	1	225.9	64.7	290.6	1.737	0.498	2.235
140	6	235.6	61.3	296.9	1.683	0.438	2.121
150	3	242.7	57.4	300.1	1.618	0.383	2.001
160	3	247.5	53.2	300.7	1.547	0.333	1.879
170	1	250.1	48.9	299.0	1.471	0.288	1.759
180	0	250.6	44.6	295.2	1.392	0.248	1.640
190	0	249.3	40.4	289.7	1.312	0.213	1.525
200	0	246.4	36.3	282.7	1.232	0.182	1.414

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.



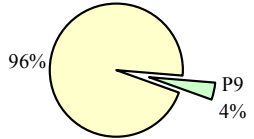
2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{(-a \cdot \text{age})}$

Parameter Estimates:			
Coniferous	a	1.373E-02	
Eqn: 2P	b	2.3738528	
	k	0	
Deciduous	a	1.880E-02	
Eqn: 2P	b	2.0215489	
	k	0	

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Total Number of Plots:	53
Stratum Area (ha) :	5,189

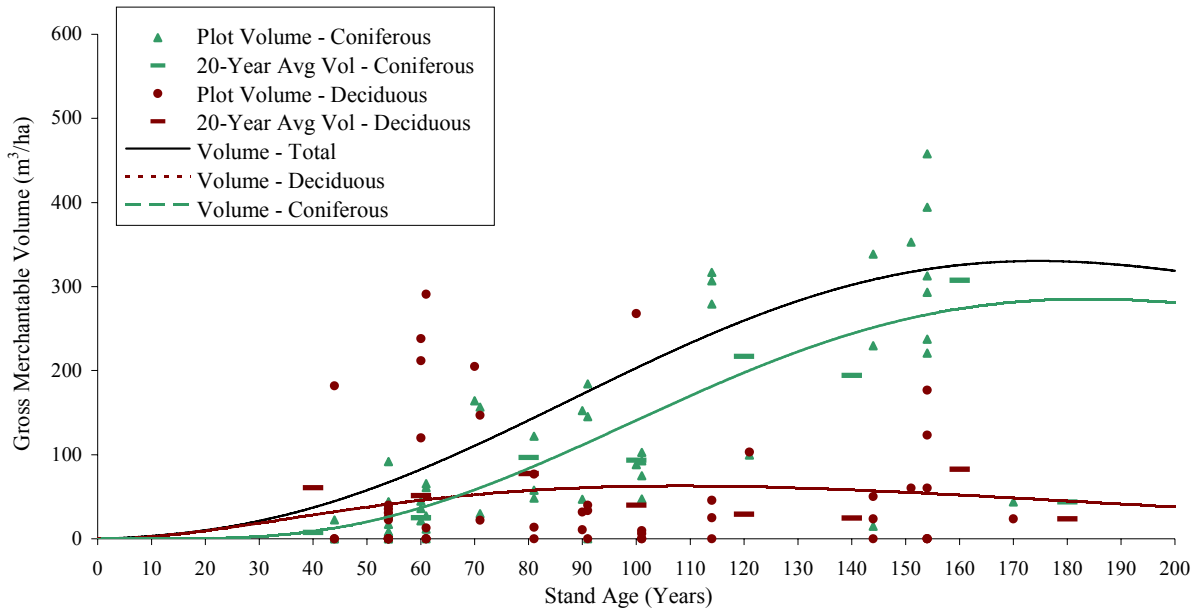
Stratum as a % of the active landbase, FMU P9:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	2.8	1.6	4.5	0.283	0.164	0.447
20	0	12.8	5.5	18.3	0.640	0.275	0.915
30	0	29.2	10.4	39.6	0.973	0.345	1.318
40	6	50.4	15.4	65.7	1.259	0.384	1.643
50	9	74.6	20.0	94.6	1.492	0.399	1.891
60	3	100.2	23.9	124.2	1.670	0.399	2.069
70	3	126.0	27.1	153.0	1.800	0.387	2.186
80	1	150.8	29.4	180.1	1.885	0.367	2.252
90	6	173.8	30.9	204.7	1.931	0.343	2.275
100	12	194.6	31.7	226.2	1.946	0.317	2.262
110	4	212.7	31.8	244.5	1.933	0.289	2.223
120	0	227.9	31.4	259.3	1.899	0.262	2.161
130	0	240.2	30.6	270.9	1.848	0.236	2.084
140	5	249.7	29.5	279.2	1.783	0.211	1.994
150	3	256.4	28.1	284.5	1.709	0.187	1.896
160	0	260.5	26.5	287.0	1.628	0.166	1.794
170	0	262.2	24.8	287.0	1.542	0.146	1.688
180	1	261.8	23.1	284.9	1.454	0.128	1.583
190	0	259.4	21.4	280.8	1.365	0.112	1.478
200	0	255.4	19.6	275.1	1.277	0.098	1.375

¹ Gross stand volume is calculated at the utilization standards specified on this page with no deductions for cull.
² Maximum MAI highlighted in blue.

FMU P6 / SW-CD-P6 / Base Natural Stand Yield Curve



2-PARAMETER EQUATION (2P): $\text{volume} = a(\text{age})^b e^{-a \cdot \text{age}}$

2-PARAMETER EQUATION WITH CONSTANT (2P+k): $\text{volume} = a(\text{age})^b e^{-(\text{age}/k)}$

Parameter Estimates:

Coniferous	a	1.079E-06
Eqn: 2P+k	b	4.6008593
	k	40
Deciduous	a	2.013E-02
Eqn: 2P	b	2.1826586
	k	0

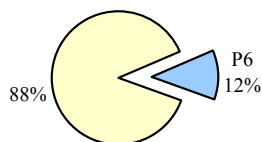
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Total Number of Plots:	61
Stratum Area (ha):	20,542

Stratum as a % of the active landbase, FMU P6:



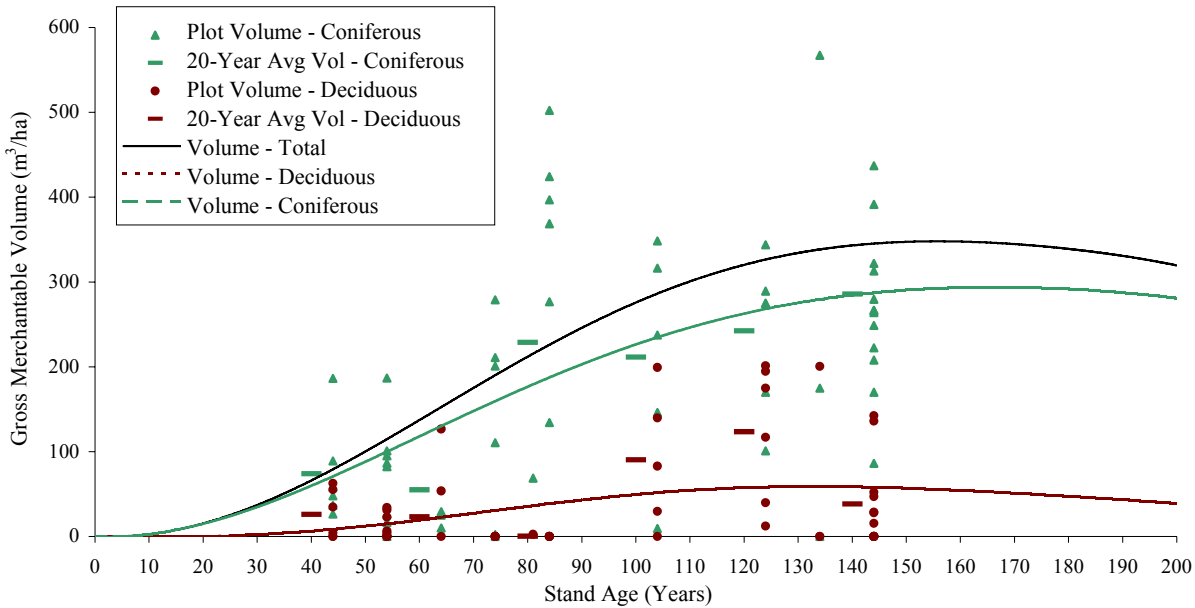
Stand Age	Number of Plots	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	0.0	2.5	2.5	0.003	0.251	0.254
20	0	0.6	9.3	9.9	0.032	0.465	0.497
30	0	3.2	18.4	21.6	0.106	0.614	0.721
40	3	9.3	28.2	37.6	0.233	0.706	0.939
50	12	20.3	37.6	57.9	0.405	0.752	1.157
60	8	36.5	45.8	82.3	0.609	0.763	1.371
70	3	57.8	52.4	110.2	0.826	0.748	1.574
80	3	83.2	57.3	140.5	1.040	0.716	1.757
90	5	111.4	60.6	172.0	1.238	0.673	1.912
100	5	140.9	62.4	203.3	1.409	0.624	2.033
110	6	170.2	62.8	233.0	1.547	0.571	2.118
120	1	197.8	62.1	259.9	1.648	0.517	2.165
130	0	222.6	60.4	283.1	1.712	0.465	2.177
140	3	243.8	58.1	301.9	1.741	0.415	2.156
150	7	260.8	55.2	316.0	1.739	0.368	2.107
160	4	273.3	52.0	325.3	1.708	0.325	2.033
170	1	281.4	48.5	329.9	1.655	0.285	1.941
180	0	285.0	44.9	330.0	1.584	0.250	1.833
190	0	284.7	41.4	326.0	1.498	0.218	1.716
200	0	280.7	37.8	318.6	1.404	0.189	1.593

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.



FMU P9 / SW-CD-P9 / Base Natural Stand Yield Curve



2-PARAMETER EQUATION (2P): volume = a(age)^be^(-a*age)
2-PARAMETER EQUATION WITH CONSTANT (2P+k): volume = a(age)^be^(-age/k)

Parameter Estimates:

Coniferous	a	1.455E-02
Eqn: 2P	b	2.4117590
	k	0
Deciduous	a	1.681E-06
Eqn: 2P+k	b	4.4583468
	k	30

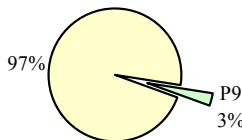
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Total Number of Plots:	59
Stratum Area (ha):	3,765

Stratum as a % of the active landbase, FMU P9:



Stand Age	Number of Plots	Predicted Gross Merchantable Volume ² (m³/ha)			Mean Annual Increment (m³/ha/year) ³		
		Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0	0.0	0.0	0.0	0.000	0.000	0.000
10	0	3.2	0.0	3.3	0.325	0.003	0.328
20	0	14.9	0.5	15.5	0.747	0.027	0.774
30	0	34.3	2.4	36.7	1.144	0.079	1.224
40	6	59.4	6.2	65.6	1.485	0.154	1.639
50	9	88.0	11.9	99.9	1.760	0.238	1.998
60	3	118.1	19.3	137.3	1.968	0.321	2.289
70	6	148.1	27.4	175.5	2.115	0.392	2.507
80	7	176.7	35.7	212.3	2.208	0.446	2.654
90	0	202.9	43.2	246.1	2.255	0.480	2.735
100	5	226.2	49.5	275.7	2.262	0.495	2.757
110	0	246.1	54.3	300.4	2.237	0.493	2.731
120	6	262.5	57.3	319.8	2.187	0.478	2.665
130	3	275.3	58.7	333.9	2.117	0.451	2.569
140	14	284.6	58.5	343.1	2.033	0.418	2.450
150	0	290.6	57.0	347.6	1.937	0.380	2.317
160	0	293.5	54.5	348.0	1.835	0.340	2.175
170	0	293.8	51.1	344.9	1.728	0.301	2.029
180	0	291.5	47.3	338.8	1.620	0.263	1.882
190	0	287.2	43.1	330.3	1.511	0.227	1.738
200	0	281.0	38.8	319.8	1.405	0.194	1.599

¹ One plot has a volume of 638.6 m³/ha and is not displayed on the graph.

² Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

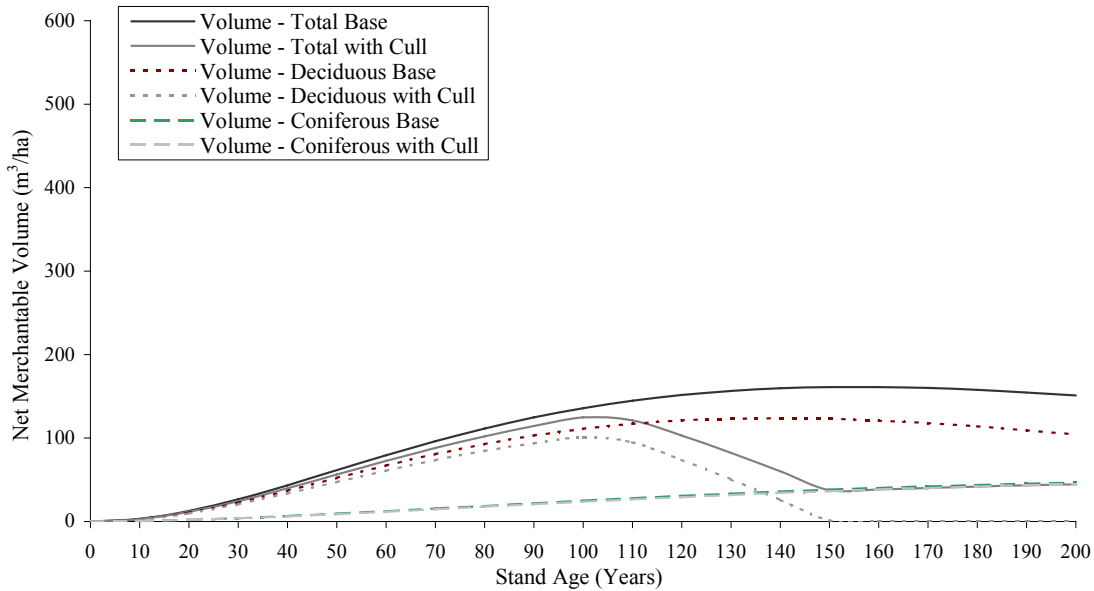
³ Maximum MAI highlighted in blue.



Appendix IX Yield Curves: Natural Stand With Cull



FMU P6 & P9 / D-B-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

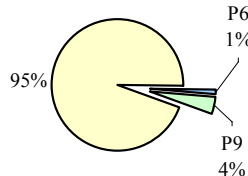
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	2,921
P9 Area (ha):	12,592

Stratum as a % of the active landbase:

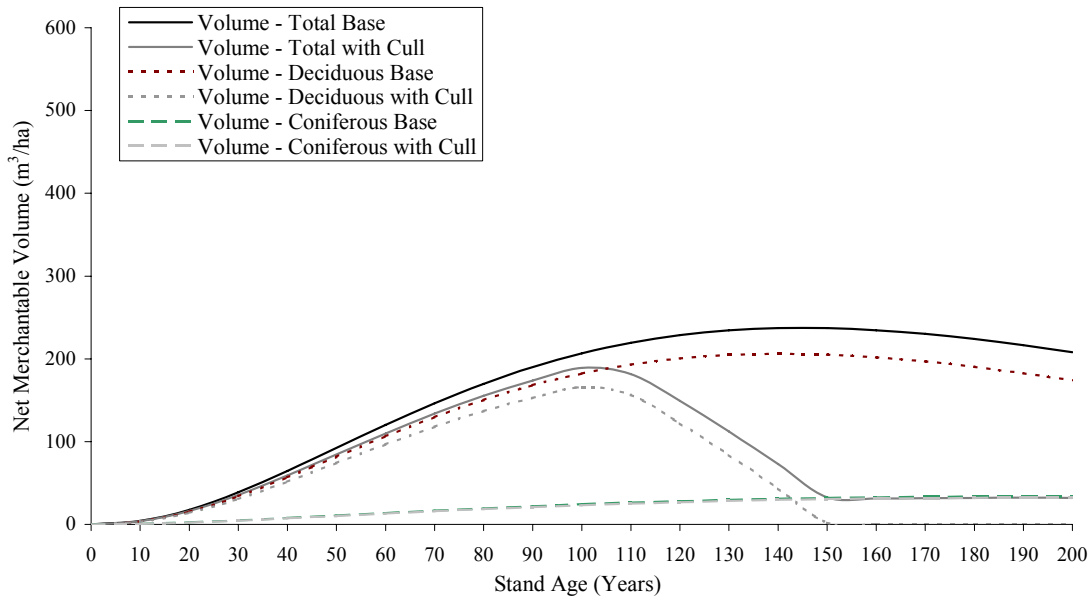


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	2.4	2.9	0.053	0.236	0.289
20	1.9	9.7	11.5	0.094	0.484	0.577
30	3.8	20.6	24.4	0.127	0.687	0.815
40	6.2	33.7	39.8	0.155	0.841	0.996
50	8.9	47.4	56.3	0.178	0.949	1.126
60	11.8	60.9	72.7	0.196	1.015	1.211
70	14.7	73.4	88.1	0.211	1.049	1.259
80	17.8	84.4	102.2	0.222	1.055	1.277
90	20.8	93.6	114.4	0.231	1.040	1.271
100	23.7	101.0	124.7	0.237	1.010	1.247
110	26.5	94.8	121.3	0.241	0.862	1.103
120	29.3	73.8	103.1	0.244	0.615	0.859
130	31.8	50.5	82.3	0.245	0.389	0.633
140	34.2	26.0	60.2	0.244	0.186	0.430
150	36.4	1.2	37.6	0.243	0.008	0.251
160	38.4	0.0	38.4	0.240	0.000	0.240
170	40.2	0.0	40.2	0.237	0.000	0.237
180	41.8	0.0	41.8	0.232	0.000	0.232
190	43.3	0.0	43.3	0.228	0.000	0.228
200	44.5	0.0	44.5	0.222	0.000	0.222

FMU P6 & P9 / D-CD-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

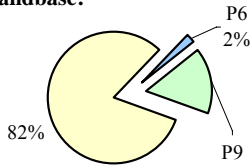
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

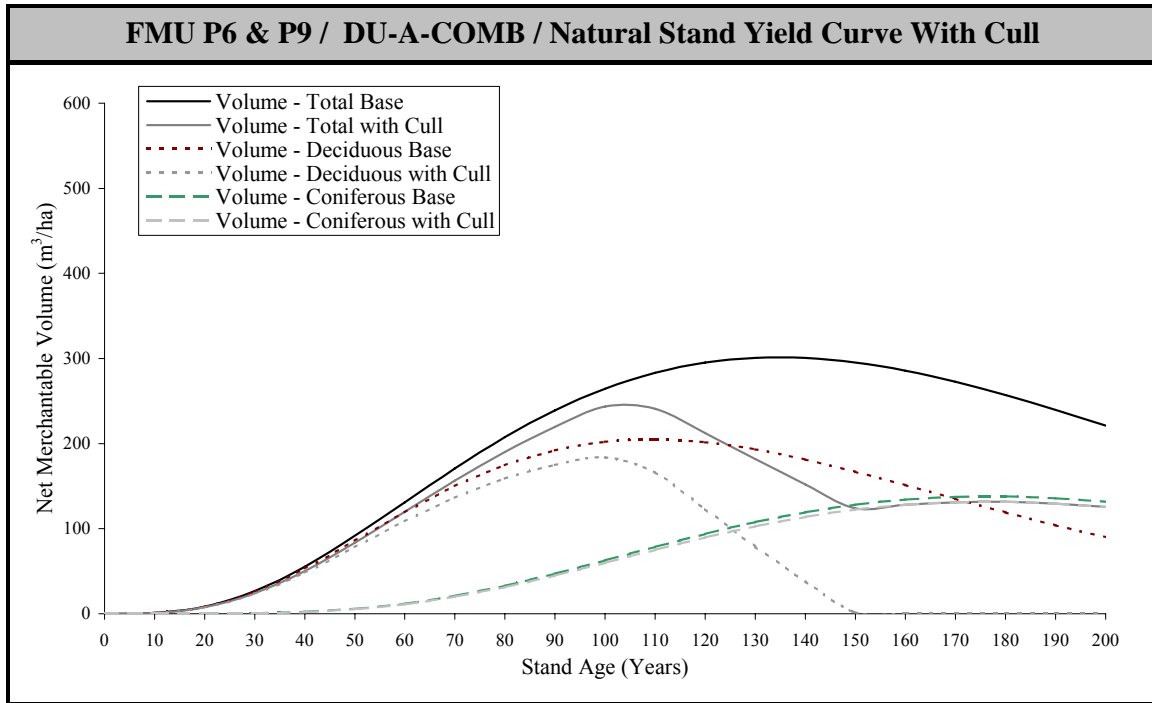
P6 Area (ha):	6,881
P9 Area (ha):	47,289

Stratum as a % of the active landbase:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.7	3.2	3.9	0.070	0.316	0.386
20	2.4	13.9	16.3	0.119	0.695	0.815
30	4.7	30.9	35.5	0.156	1.029	1.185
40	7.4	51.7	59.1	0.184	1.293	1.476
50	10.2	74.3	84.5	0.204	1.485	1.689
60	13.1	96.8	109.9	0.218	1.613	1.831
70	15.9	118.0	133.8	0.227	1.685	1.912
80	18.5	136.9	155.4	0.232	1.711	1.942
90	21.0	152.9	173.9	0.233	1.699	1.932
100	23.2	165.9	189.1	0.232	1.659	1.891
110	25.2	156.4	181.6	0.229	1.422	1.651
120	26.9	122.3	149.2	0.225	1.019	1.244
130	28.4	84.0	112.4	0.219	0.646	0.864
140	29.6	43.3	72.9	0.212	0.309	0.521
150	30.6	2.1	32.6	0.204	0.014	0.217
160	31.3	0.0	31.3	0.196	0.000	0.196
170	31.8	0.0	31.8	0.187	0.000	0.187
180	32.1	0.0	32.1	0.178	0.000	0.178
190	32.2	0.0	32.2	0.169	0.000	0.169
200	32.1	0.0	32.1	0.161	0.000	0.161

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

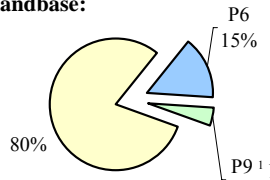


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
P6 Area (ha):	44,547
P9 Area (ha):	13,494

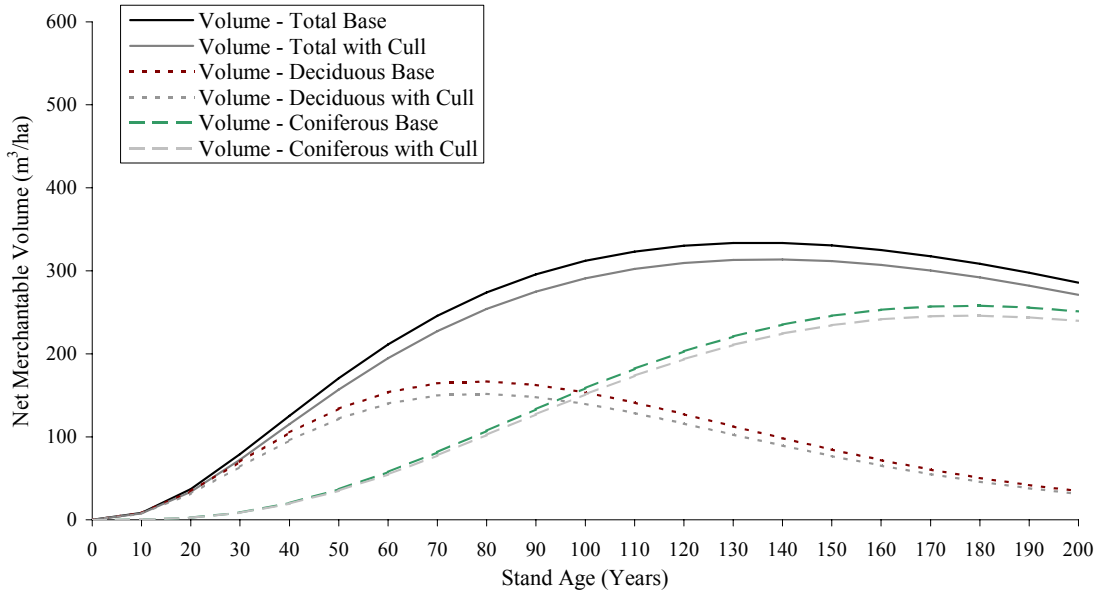
Stratum as a % of the active landbase:



P9¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
5%² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Stand Volume ² (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.8	0.8	0.000	0.084	0.085
20	0.1	7.5	7.6	0.003	0.377	0.381
30	0.5	23.7	24.2	0.017	0.789	0.806
40	2.0	48.3	50.3	0.050	1.208	1.259
50	5.4	78.0	83.4	0.107	1.561	1.668
60	11.2	108.6	119.8	0.187	1.810	1.997
70	19.9	136.4	156.3	0.284	1.948	2.233
80	31.3	158.9	190.2	0.391	1.986	2.377
90	44.8	174.8	219.6	0.498	1.942	2.440
100	59.6	183.8	243.5	0.596	1.838	2.435
110	74.9	165.9	240.7	0.681	1.508	2.188
120	89.5	122.9	212.3	0.746	1.024	1.770
130	102.7	79.2	181.8	0.790	0.609	1.399
140	113.7	38.1	151.8	0.812	0.272	1.084
150	122.3	1.7	123.9	0.815	0.011	0.826
160	128.1	0.0	128.1	0.800	0.000	0.800
170	131.1	0.0	131.1	0.771	0.000	0.771
180	131.4	0.0	131.4	0.730	0.000	0.730
190	129.4	0.0	129.4	0.681	0.000	0.681
200	125.4	0.0	125.4	0.627	0.000	0.627

FMU P6 & P9 / DU-BCD-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

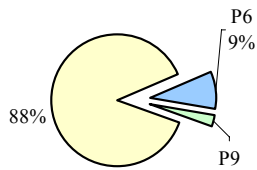
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	26,950
P9 Area (ha):	8,039

Stratum as a % of the active landbase:



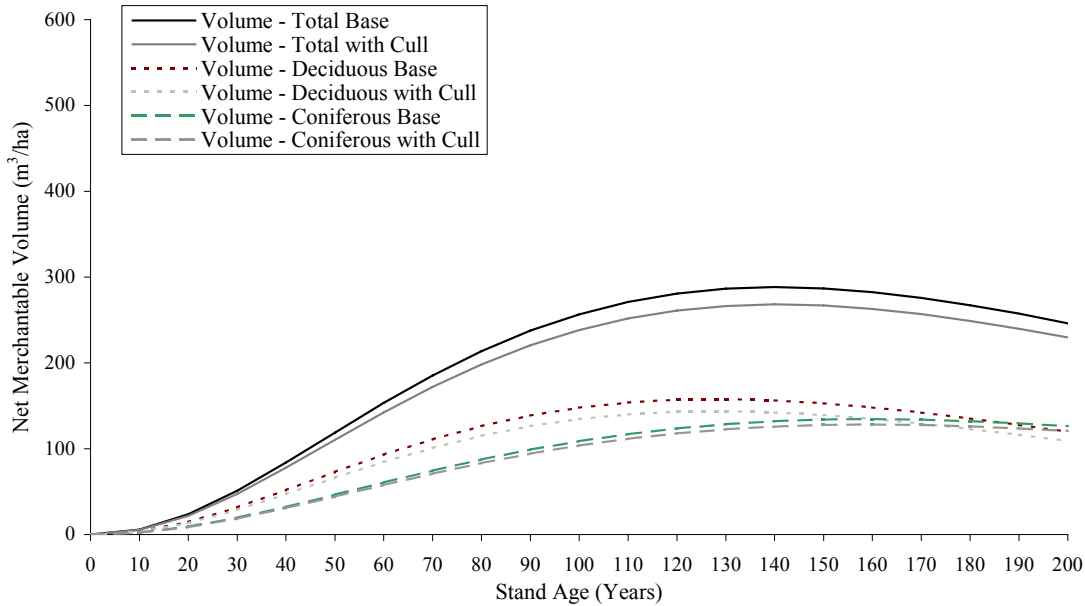
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.3	7.5	7.7	0.026	0.748	0.774
20	2.5	31.5	34.0	0.124	1.574	1.698
30	8.5	63.8	72.3	0.285	2.126	2.410
40	19.4	95.7	115.1	0.485	2.393	2.879
50	35.1	122.0	157.1	0.702	2.439	3.141
60	54.9	140.0	194.9	0.915	2.334	3.249
70	77.7	149.7	227.4	1.109	2.139	3.248
80	102.1	151.8	254.0	1.277	1.898	3.175
90	127.0	147.9	275.0	1.412	1.644	3.056
100	151.2	139.7	290.9	1.512	1.397	2.909
110	173.6	128.6	302.2	1.579	1.169	2.747
120	193.6	115.8	309.5	1.613	0.965	2.579
130	210.6	102.5	313.2	1.620	0.789	2.409
140	224.3	89.4	313.7	1.602	0.639	2.241
150	234.6	77.0	311.6	1.564	0.513	2.077
160	241.6	65.5	307.1	1.510	0.409	1.919
170	245.3	55.2	300.5	1.443	0.325	1.767
180	246.0	46.1	292.1	1.367	0.256	1.623
190	244.0	38.2	282.2	1.284	0.201	1.485
200	239.7	31.4	271.1	1.198	0.157	1.356

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / DC-BCD-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

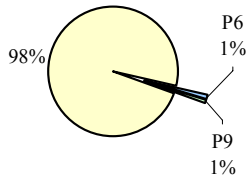
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	2,793
P9 Area (ha):	2,591

Stratum as a % of the active landbase:

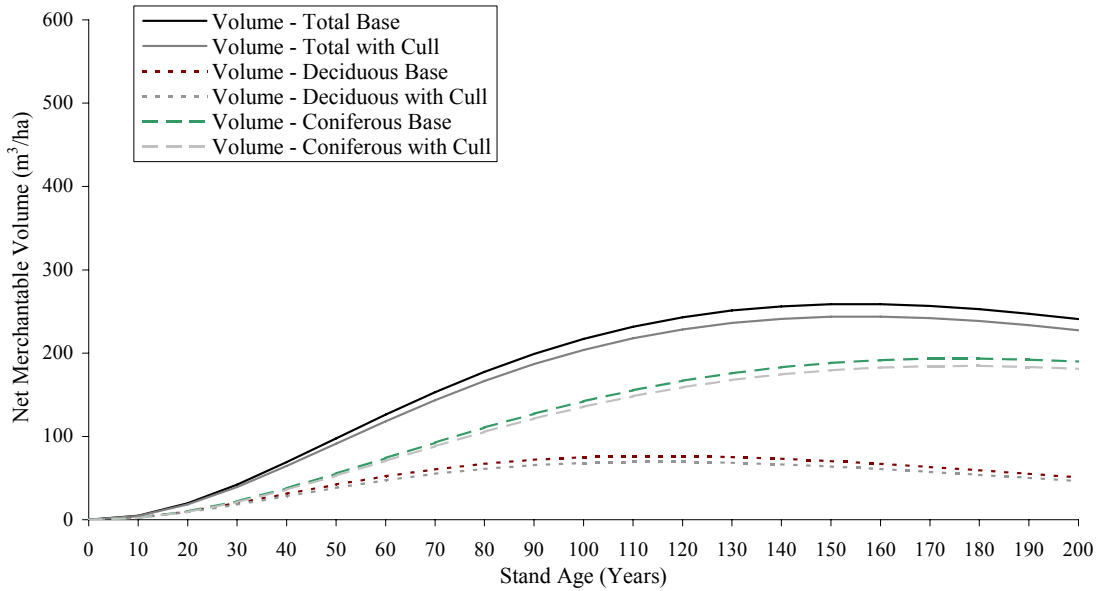


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.1	3.1	5.2	0.208	0.313	0.521
20	8.6	13.3	21.9	0.429	0.665	1.094
30	18.5	28.7	47.3	0.618	0.958	1.576
40	30.8	47.0	77.8	0.769	1.176	1.945
50	44.1	66.1	110.3	0.883	1.322	2.205
60	57.8	84.5	142.2	0.963	1.408	2.371
70	71.0	101.0	172.0	1.014	1.442	2.456
80	83.3	115.0	198.3	1.041	1.437	2.478
90	94.2	126.2	220.5	1.047	1.402	2.450
100	103.8	134.5	238.3	1.038	1.345	2.383
110	111.7	140.0	251.7	1.015	1.273	2.288
120	118.0	143.0	260.9	0.983	1.191	2.174
130	122.7	143.6	266.2	0.944	1.104	2.048
140	125.9	142.2	268.1	0.899	1.016	1.915
150	127.7	139.1	266.8	0.851	0.928	1.779
160	128.2	134.7	262.9	0.801	0.842	1.643
170	127.6	129.3	256.9	0.751	0.760	1.511
180	126.1	123.0	249.1	0.700	0.683	1.384
190	123.7	116.2	239.9	0.651	0.612	1.263
200	120.5	109.1	229.6	0.603	0.545	1.148

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / MXU-B-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

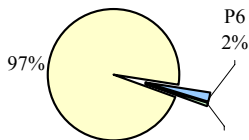
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	7,063
P9 Area (ha):	2,245

Stratum as a % of the active landbase:

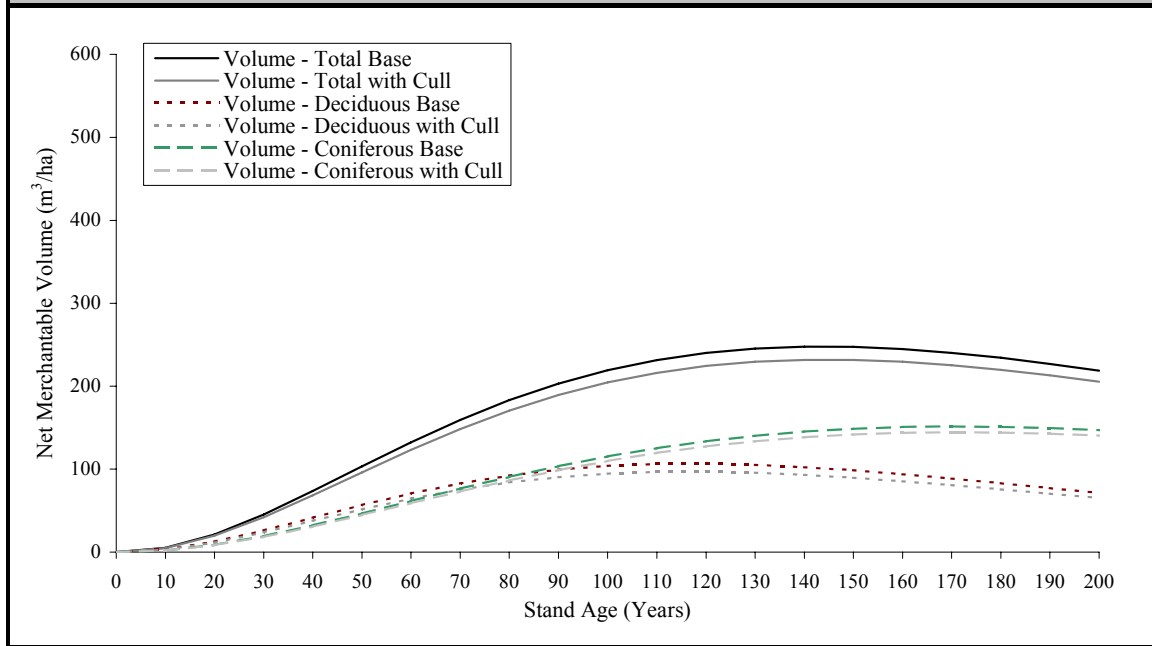


P9 ¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
 1% ² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.2	2.4	4.5	0.219	0.235	0.454
20	9.5	9.0	18.5	0.475	0.450	0.924
30	21.2	18.2	39.4	0.706	0.607	1.313
40	36.1	28.4	64.5	0.901	0.710	1.611
50	52.9	38.4	91.3	1.058	0.768	1.826
60	70.6	47.4	118.0	1.177	0.791	1.967
70	88.4	55.1	143.4	1.262	0.787	2.049
80	105.4	61.1	166.5	1.318	0.763	2.081
90	121.3	65.4	186.8	1.348	0.727	2.075
100	135.7	68.2	203.9	1.357	0.682	2.039
110	148.3	69.5	217.8	1.348	0.632	1.980
120	159.0	69.5	228.5	1.325	0.579	1.904
130	167.7	68.5	236.2	1.290	0.527	1.817
140	174.5	66.6	241.2	1.247	0.476	1.723
150	179.5	64.1	243.6	1.197	0.427	1.624
160	182.8	61.0	243.8	1.142	0.381	1.523
170	184.4	57.6	242.0	1.085	0.339	1.423
180	184.6	53.9	238.5	1.025	0.300	1.325
190	183.4	50.2	233.6	0.965	0.264	1.229
200	181.1	46.4	227.5	0.906	0.232	1.137



FMU P6 & P9 / MXU-CD-COMB / Natural Stand Yield Curve With Cull

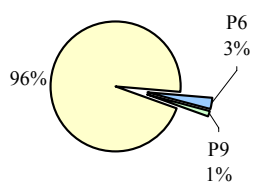


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
P6 Area (ha):	7,838
P9 Area (ha):	4,374

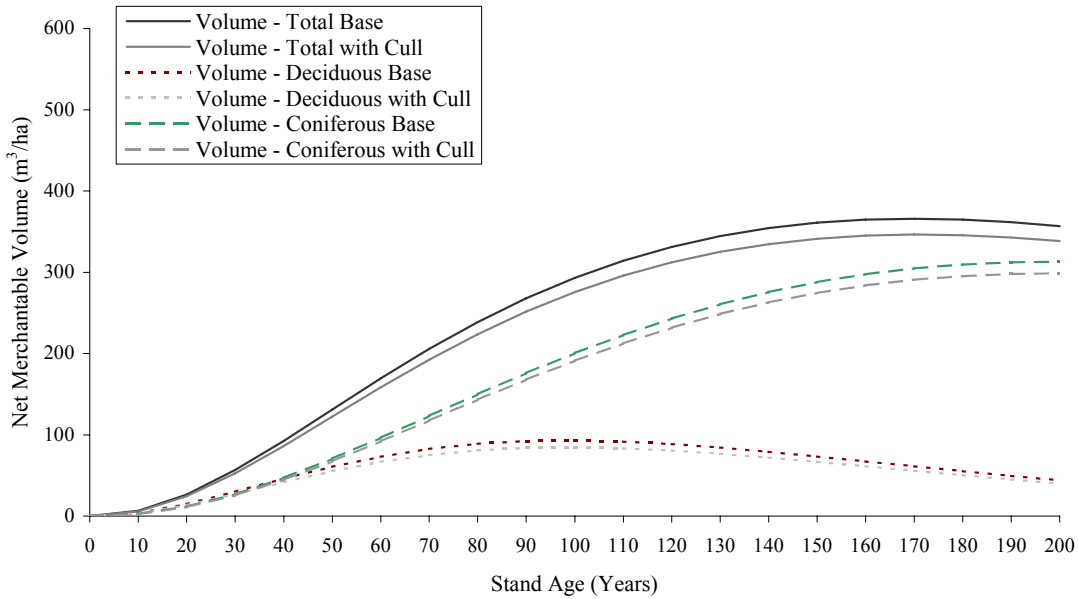
Stratum as a % of the active landbase:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.0	2.8	4.8	0.200	0.285	0.484
20	8.4	11.4	19.8	0.418	0.571	0.989
30	18.3	23.7	42.0	0.610	0.791	1.401
40	30.7	37.7	68.4	0.767	0.942	1.709
50	44.5	51.6	96.1	0.890	1.032	1.922
60	58.8	64.4	123.2	0.981	1.073	2.054
70	73.0	75.3	148.3	1.043	1.076	2.119
80	86.5	84.0	170.5	1.081	1.050	2.132
90	98.9	90.4	189.3	1.099	1.005	2.104
100	109.9	94.6	204.5	1.099	0.946	2.045
110	119.5	96.7	216.2	1.086	0.879	1.965
120	127.4	97.0	224.4	1.062	0.808	1.870
130	133.8	95.7	229.5	1.029	0.736	1.765
140	138.6	93.2	231.8	0.990	0.666	1.656
150	141.9	89.7	231.6	0.946	0.598	1.544
160	143.8	85.5	229.4	0.899	0.534	1.433
170	144.5	80.7	225.3	0.850	0.475	1.325
180	144.1	75.6	219.8	0.801	0.420	1.221
190	142.7	70.4	213.0	0.751	0.370	1.121
200	140.4	65.0	205.4	0.702	0.325	1.027

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

FMU P6 & P9 / CD-BCD-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

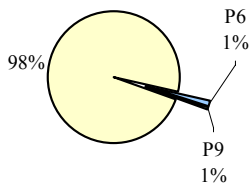
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	3,699
P9 Area (ha):	2,045

Stratum as a % of the active landbase:



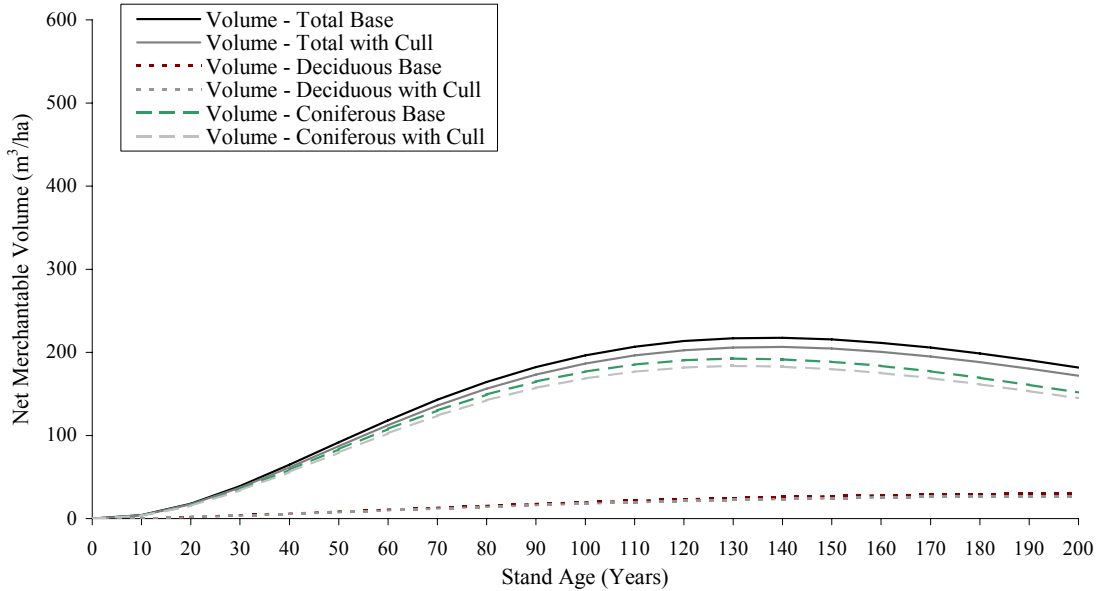
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.4	3.4	5.8	0.239	0.344	0.582
20	11.0	13.5	24.4	0.548	0.673	1.221
30	25.4	27.1	52.6	0.847	0.905	1.752
40	44.6	41.7	86.3	1.115	1.042	2.157
50	67.2	55.2	122.4	1.344	1.104	2.447
60	91.8	66.5	158.3	1.531	1.108	2.638
70	117.4	75.0	192.4	1.678	1.072	2.749
80	143.0	80.7	223.7	1.787	1.009	2.797
90	167.7	83.8	251.5	1.864	0.931	2.795
100	191.0	84.5	275.5	1.910	0.845	2.755
110	212.4	83.3	295.7	1.931	0.757	2.688
120	231.6	80.5	312.1	1.930	0.671	2.601
130	248.5	76.6	325.0	1.911	0.589	2.500
140	262.8	71.8	334.6	1.877	0.513	2.390
150	274.5	66.6	341.2	1.830	0.444	2.274
160	283.8	61.1	345.0	1.774	0.382	2.156
170	290.7	55.6	346.3	1.710	0.327	2.037
180	295.3	50.2	345.5	1.641	0.279	1.920
190	297.8	45.0	342.8	1.568	0.237	1.804
200	298.4	40.0	338.4	1.492	0.200	1.692

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 / PL-BCD-P6 / Natural Stand Yield Curve With Cull

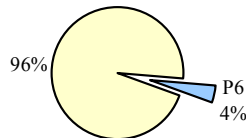


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	7,090

Stratum as a % of the active landbase, FMU P6:

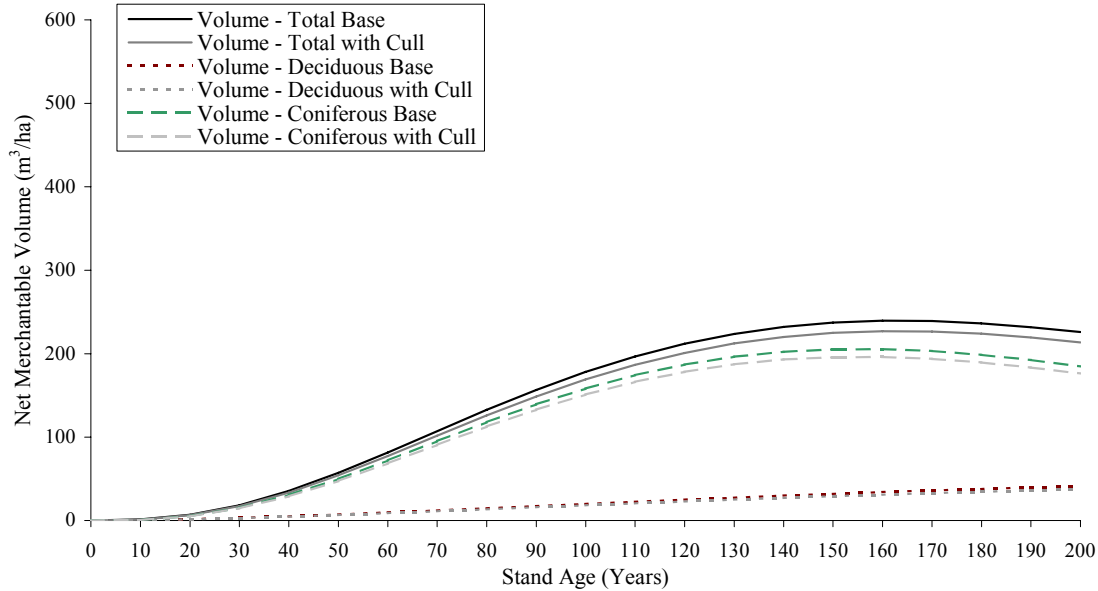


Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	3.5	0.5	4.0	0.352	0.053	0.405
20	15.4	1.8	17.1	0.768	0.089	0.857
30	33.8	3.5	37.2	1.125	0.116	1.241
40	56.0	5.4	61.4	1.400	0.136	1.536
50	79.6	7.6	87.2	1.592	0.151	1.744
60	102.7	9.7	112.5	1.712	0.162	1.874
70	123.9	11.9	135.8	1.769	0.170	1.940
80	142.2	14.0	156.2	1.777	0.175	1.952
90	157.2	16.0	173.2	1.747	0.178	1.925
100	168.8	17.8	186.6	1.688	0.178	1.866
110	176.8	19.5	196.4	1.608	0.178	1.785
120	181.7	21.0	202.7	1.514	0.175	1.689
130	183.6	22.4	206.0	1.412	0.172	1.584
140	182.9	23.6	206.4	1.306	0.168	1.474
150	179.9	24.6	204.5	1.200	0.164	1.363
160	175.2	25.4	200.6	1.095	0.159	1.254
170	169.0	26.1	195.1	0.994	0.153	1.147
180	161.7	26.6	188.2	0.898	0.148	1.046
190	153.5	26.9	180.5	0.808	0.142	0.950
200	144.8	27.2	172.0	0.724	0.136	0.860

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P9 / PL-BCD-P9 / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

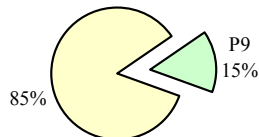
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	18,726
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Stratum as a % of the active landbase, FMU P9:



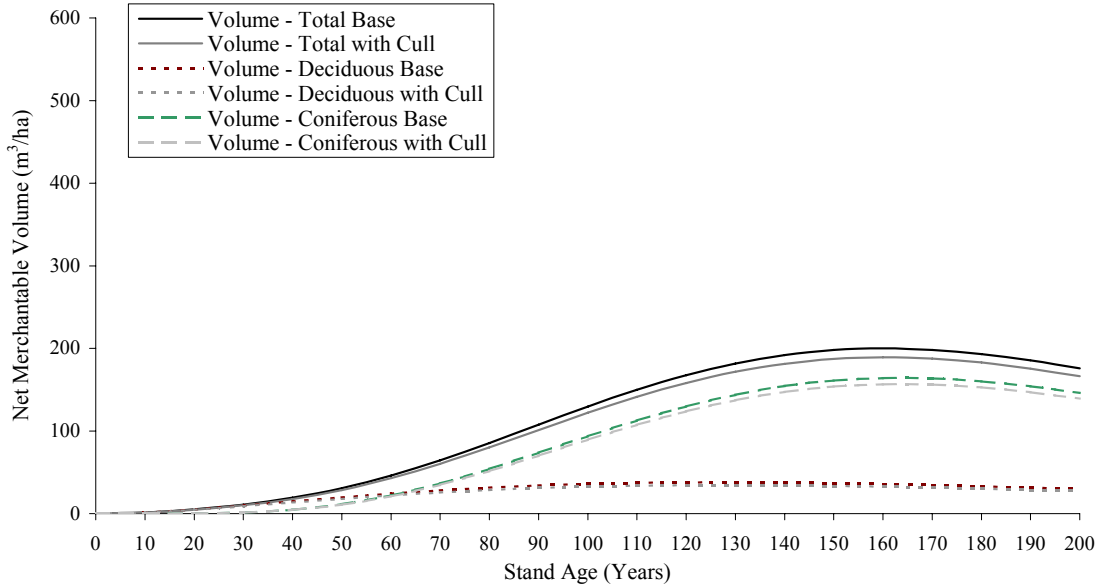
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.7	0.4	1.1	0.071	0.039	0.110
20	5.0	1.4	6.4	0.251	0.069	0.320
30	14.5	2.8	17.3	0.483	0.094	0.576
40	29.0	4.6	33.6	0.725	0.114	0.839
50	47.5	6.6	54.1	0.950	0.131	1.081
60	68.6	8.7	77.3	1.143	0.145	1.288
70	90.7	11.0	101.7	1.295	0.157	1.453
80	112.5	13.4	125.8	1.406	0.167	1.573
90	132.8	15.7	148.5	1.475	0.175	1.650
100	150.9	18.1	169.0	1.509	0.181	1.690
110	166.1	20.5	186.6	1.510	0.186	1.696
120	178.3	22.7	201.0	1.486	0.190	1.675
130	187.2	24.9	212.1	1.440	0.192	1.632
140	193.0	27.1	220.0	1.378	0.193	1.572
150	195.8	29.1	224.9	1.305	0.194	1.499
160	195.9	31.0	226.9	1.225	0.194	1.418
170	193.7	32.7	226.4	1.139	0.193	1.332
180	189.4	34.4	223.8	1.052	0.191	1.243
190	183.5	35.9	219.4	0.966	0.189	1.155
200	176.2	37.3	213.5	0.881	0.187	1.068

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / SB-BCD-COMB / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

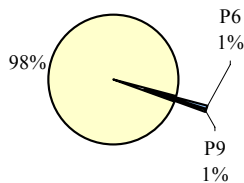
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	2,350
P9 Area (ha):	1,847

Stratum as a % of the active landbase:

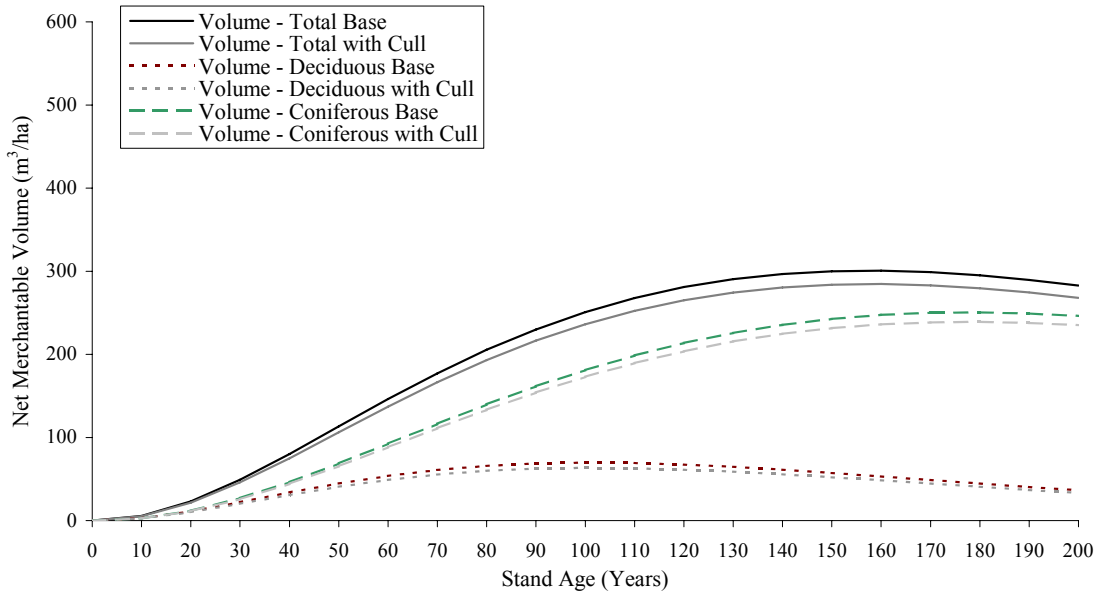


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	1.3	1.3	0.001	0.130	0.130
20	0.2	4.5	4.7	0.010	0.225	0.235
30	1.3	8.7	10.0	0.043	0.290	0.334
40	4.5	13.3	17.8	0.112	0.332	0.444
50	10.8	17.8	28.6	0.216	0.356	0.572
60	20.9	22.0	42.9	0.348	0.366	0.715
70	34.7	25.6	60.3	0.496	0.366	0.862
80	51.5	28.6	80.1	0.644	0.358	1.001
90	70.1	31.0	101.1	0.779	0.344	1.123
100	89.2	32.7	121.9	0.892	0.327	1.219
110	107.5	33.8	141.3	0.977	0.307	1.285
120	123.8	34.4	158.2	1.032	0.287	1.318
130	137.2	34.5	171.7	1.056	0.265	1.321
140	147.3	34.2	181.4	1.052	0.244	1.296
150	153.7	33.5	187.2	1.025	0.224	1.248
160	156.6	32.6	189.1	0.978	0.204	1.182
170	156.1	31.4	187.5	0.918	0.185	1.103
180	152.8	30.1	182.8	0.849	0.167	1.016
190	147.0	28.6	175.6	0.774	0.151	0.924
200	139.3	27.1	166.4	0.696	0.135	0.832

FMU P6 / SW-B-P6 / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

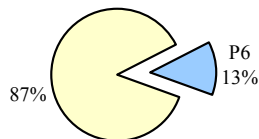
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	22,213
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Stratum as a % of the active landbase, FMU P6:



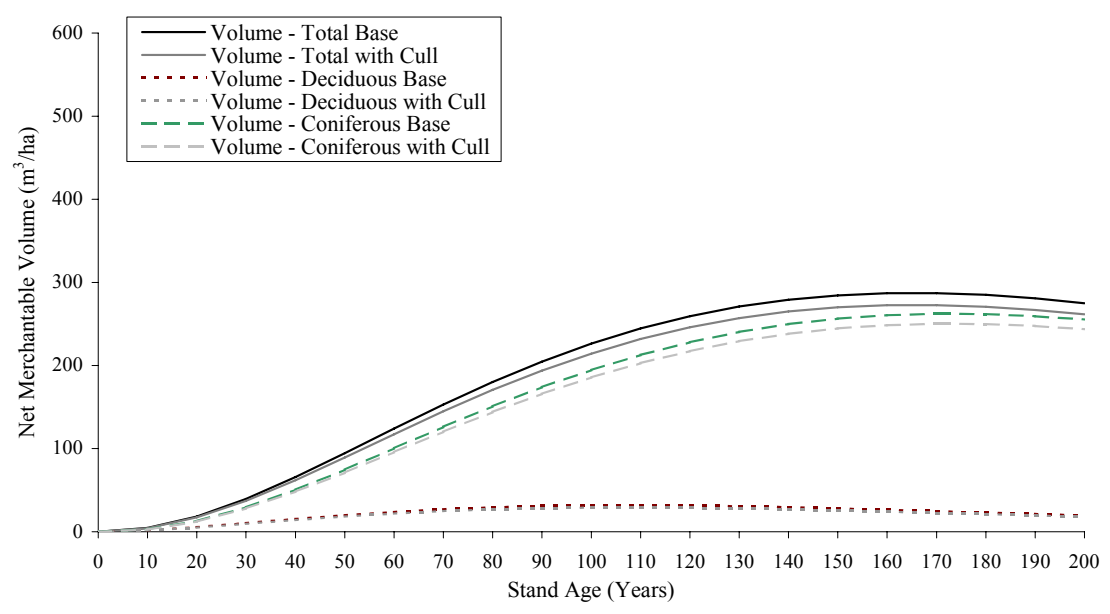
Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.5	2.7	5.2	0.251	0.271	0.522
20	11.3	10.2	21.5	0.563	0.510	1.073
30	25.6	20.2	45.8	0.855	0.673	1.528
40	44.2	30.8	75.0	1.106	0.769	1.875
50	65.5	40.6	106.1	1.310	0.812	2.123
60	88.2	48.9	137.1	1.470	0.816	2.285
70	111.0	55.4	166.4	1.586	0.791	2.378
80	133.2	59.9	193.1	1.665	0.749	2.414
90	154.0	62.5	216.5	1.711	0.694	2.405
100	172.9	63.5	236.3	1.729	0.635	2.363
110	189.5	63.0	252.5	1.723	0.573	2.296
120	203.7	61.4	265.1	1.698	0.512	2.210
130	215.5	58.9	274.4	1.658	0.453	2.111
140	224.7	55.8	280.5	1.605	0.399	2.004
150	231.6	52.2	283.8	1.544	0.348	1.892
160	236.1	48.4	284.5	1.476	0.303	1.778
170	238.5	44.5	283.1	1.403	0.262	1.665
180	239.0	40.6	279.6	1.328	0.225	1.553
190	237.8	36.8	274.6	1.252	0.193	1.445
200	235.0	33.1	268.1	1.175	0.165	1.341

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P9 / SW-B-P9 / Natural Stand Yield Curve With Cull

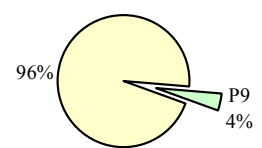


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	5,189

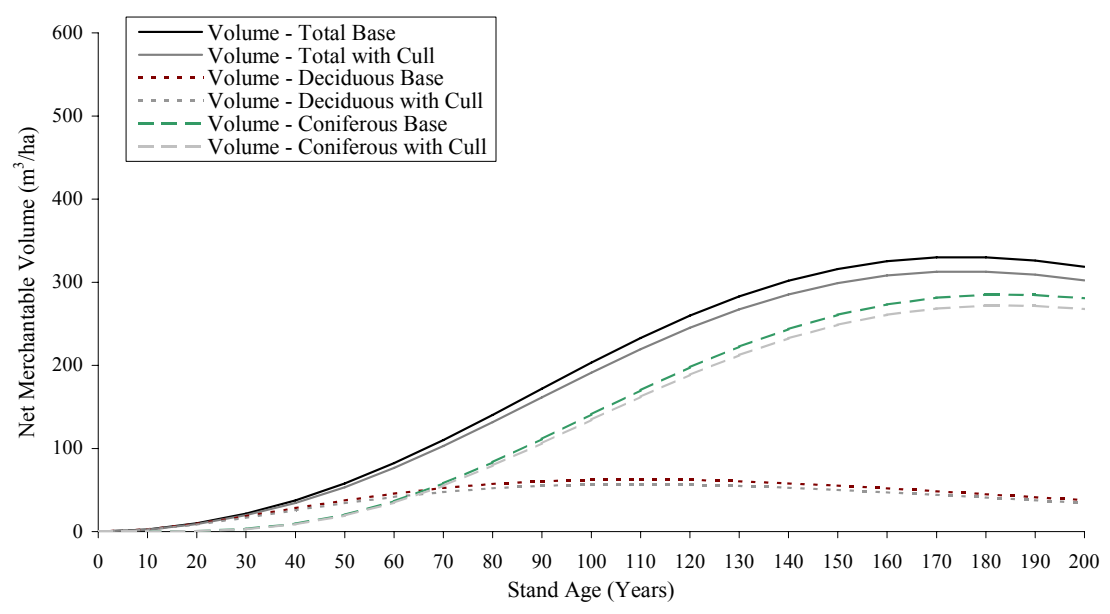
Stratum as a % of the active landbase, FMU P9:



Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.7	1.5	4.2	0.270	0.149	0.419
20	12.2	5.0	17.2	0.610	0.251	0.861
30	27.9	9.4	37.3	0.928	0.314	1.243
40	48.1	14.0	62.0	1.202	0.349	1.551
50	71.2	18.2	89.3	1.423	0.364	1.787
60	95.6	21.8	117.4	1.594	0.363	1.956
70	120.2	24.6	144.8	1.717	0.352	2.069
80	143.8	26.7	170.6	1.798	0.334	2.132
90	165.8	28.1	193.9	1.842	0.312	2.155
100	185.6	28.8	214.4	1.856	0.288	2.144
110	202.9	29.0	231.8	1.844	0.263	2.108
120	217.4	28.6	246.0	1.812	0.238	2.050
130	229.2	27.9	257.1	1.763	0.214	1.977
140	238.2	26.8	265.0	1.701	0.192	1.893
150	244.6	25.6	270.1	1.631	0.170	1.801
160	248.5	24.1	272.6	1.553	0.151	1.704
170	250.1	22.6	272.7	1.471	0.133	1.604
180	249.7	21.0	270.8	1.387	0.117	1.504
190	247.5	19.4	266.9	1.303	0.102	1.405
200	243.7	17.9	261.5	1.218	0.089	1.308

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

FMU P6 / SW-CD-P6 / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

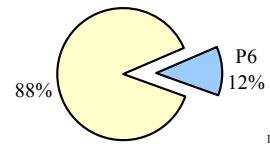
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	20,542
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Stratum as a % of the active landbase, FMU P6:

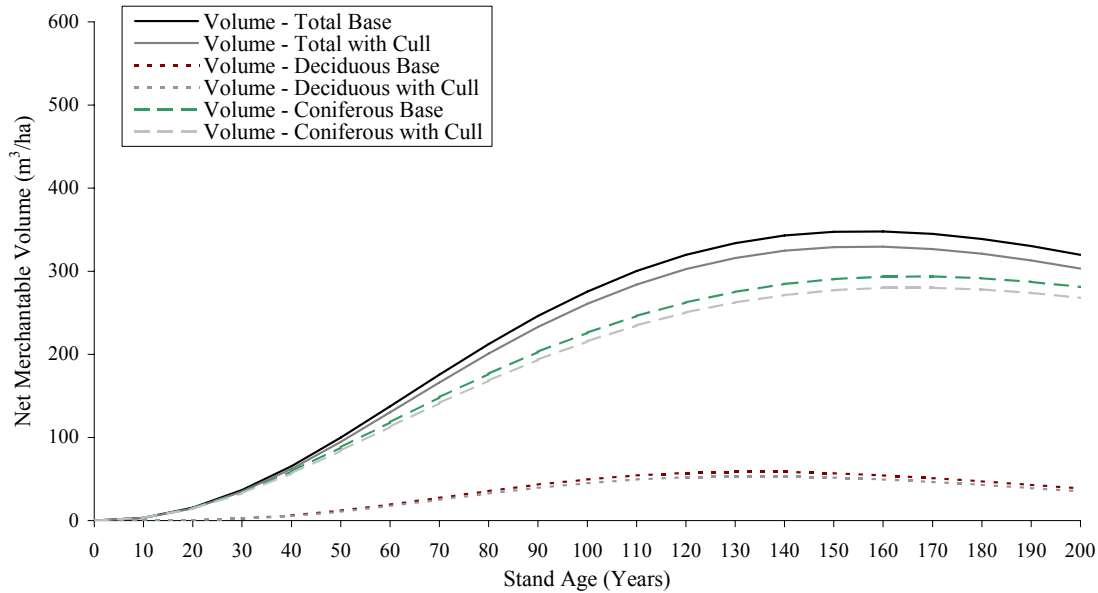


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	2.3	2.3	0.003	0.228	0.231
20	0.6	8.5	9.1	0.030	0.423	0.454
30	3.0	16.8	19.8	0.101	0.559	0.661
40	8.9	25.7	34.6	0.222	0.643	0.865
50	19.3	34.2	53.5	0.387	0.684	1.071
60	34.8	41.6	76.5	0.581	0.694	1.275
70	55.2	47.7	102.8	0.788	0.681	1.469
80	79.4	52.2	131.6	0.993	0.652	1.645
90	106.3	55.1	161.5	1.181	0.613	1.794
100	134.5	56.8	191.2	1.345	0.568	1.912
110	162.3	57.1	219.5	1.476	0.519	1.995
120	188.7	56.5	245.2	1.572	0.471	2.043
130	212.4	55.0	267.4	1.634	0.423	2.057
140	232.6	52.9	285.5	1.661	0.378	2.039
150	248.8	50.3	299.1	1.659	0.335	1.994
160	260.8	47.3	308.1	1.630	0.296	1.926
170	268.4	44.2	312.6	1.579	0.260	1.839
180	271.9	40.9	312.8	1.511	0.227	1.738
190	271.6	37.6	309.2	1.429	0.198	1.628
200	267.8	34.4	302.2	1.339	0.172	1.511

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.



FMU P9 / SW-CD-P9 / Natural Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	0 y
Regen Lag - Deciduous:	0 y

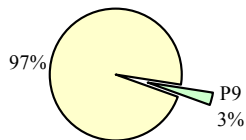
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	3,765
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Stratum as a % of the active landbase, FMU P9:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	3.1	0.0	3.1	0.310	0.003	0.313
20	14.2	0.5	14.7	0.712	0.025	0.737
30	32.8	2.2	34.9	1.092	0.072	1.164
40	56.7	5.6	62.3	1.417	0.140	1.557
50	83.9	10.9	94.8	1.679	0.217	1.896
60	112.7	17.5	130.2	1.878	0.292	2.170
70	141.3	25.0	166.2	2.018	0.357	2.375
80	168.5	32.5	201.0	2.107	0.406	2.512
90	193.6	39.3	232.9	2.151	0.437	2.588
100	215.8	45.1	260.9	2.158	0.451	2.609
110	234.8	49.4	284.2	2.135	0.449	2.583
120	250.4	52.1	302.6	2.087	0.435	2.521
130	262.6	53.4	316.0	2.020	0.411	2.431
140	271.5	53.2	324.7	1.939	0.380	2.319
150	277.2	51.9	329.1	1.848	0.346	2.194
160	280.0	49.6	329.6	1.750	0.310	2.060
170	280.2	46.5	326.8	1.648	0.274	1.922
180	278.1	43.0	321.1	1.545	0.239	1.784
190	273.9	39.2	313.2	1.442	0.206	1.648
200	268.0	35.3	303.4	1.340	0.177	1.517

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

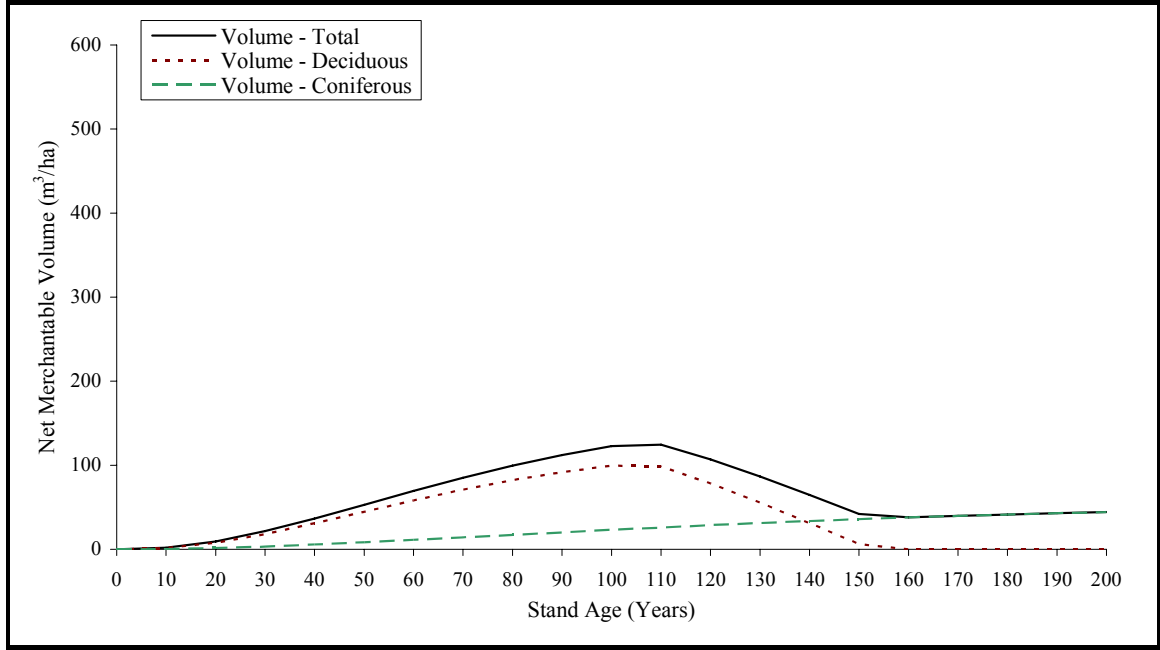
² Maximum MAI highlighted in blue.



Appendix X Yield Curves: Pre-91 Managed Stand



FMU P6 & P9 / D-B-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	N/A
Regen Lag - Deciduous:	2 y

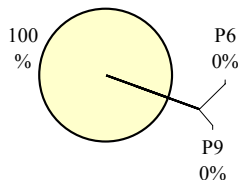
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	189
P9 Area (ha):	0

Stratum as a % of the active landbase:

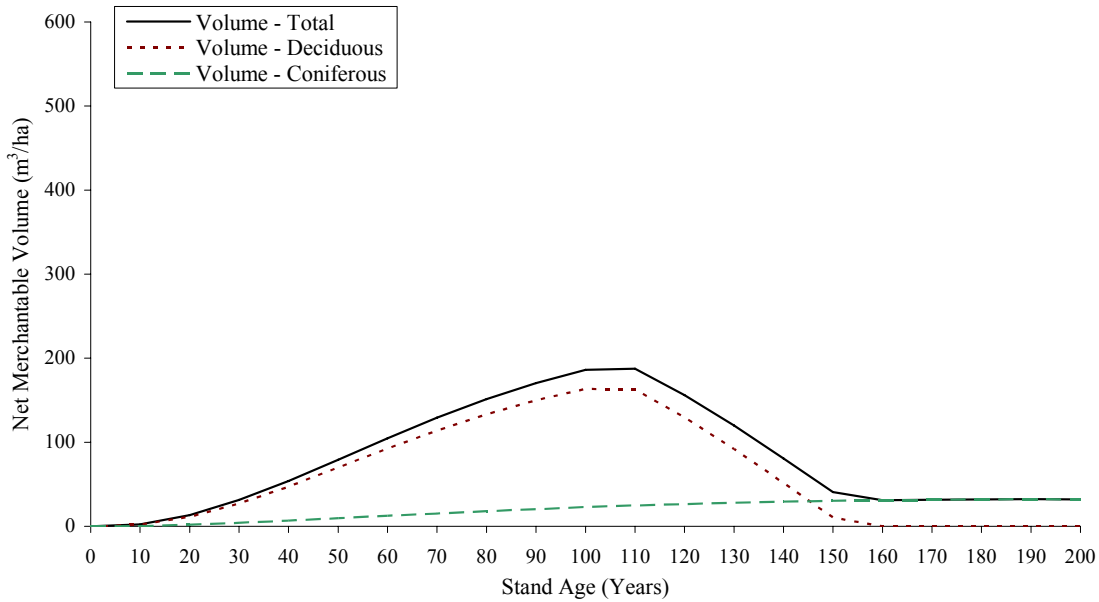


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.3	1.5	1.8	0.035	0.147	0.182
20	1.6	7.9	9.4	0.078	0.393	0.471
30	3.4	18.2	21.6	0.113	0.607	0.720
40	5.7	30.9	36.6	0.142	0.774	0.916
50	8.3	44.7	53.0	0.166	0.893	1.060
60	11.2	58.3	69.4	0.186	0.971	1.157
70	14.1	71.0	85.2	0.202	1.015	1.216
80	17.2	82.3	99.5	0.214	1.029	1.244
90	20.2	91.9	112.1	0.224	1.022	1.246
100	23.1	99.7	122.8	0.231	0.997	1.228
110	26.0	98.6	124.6	0.236	0.896	1.132
120	28.7	78.3	107.0	0.239	0.652	0.891
130	31.3	55.3	86.6	0.241	0.426	0.666
140	33.7	31.0	64.7	0.241	0.221	0.462
150	36.0	6.2	42.1	0.240	0.041	0.281
160	38.0	0.0	38.0	0.238	0.000	0.238
170	39.9	0.0	39.9	0.234	0.000	0.234
180	41.5	0.0	41.5	0.231	0.000	0.231
190	43.0	0.0	43.0	0.226	0.000	0.226
200	44.3	0.0	44.3	0.221	0.000	0.221

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / D-CD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	N/A
Regen Lag - Deciduous:	2 y

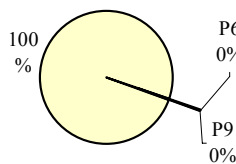
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	498
P9 Area (ha):	0

Stratum as a % of the active landbase:

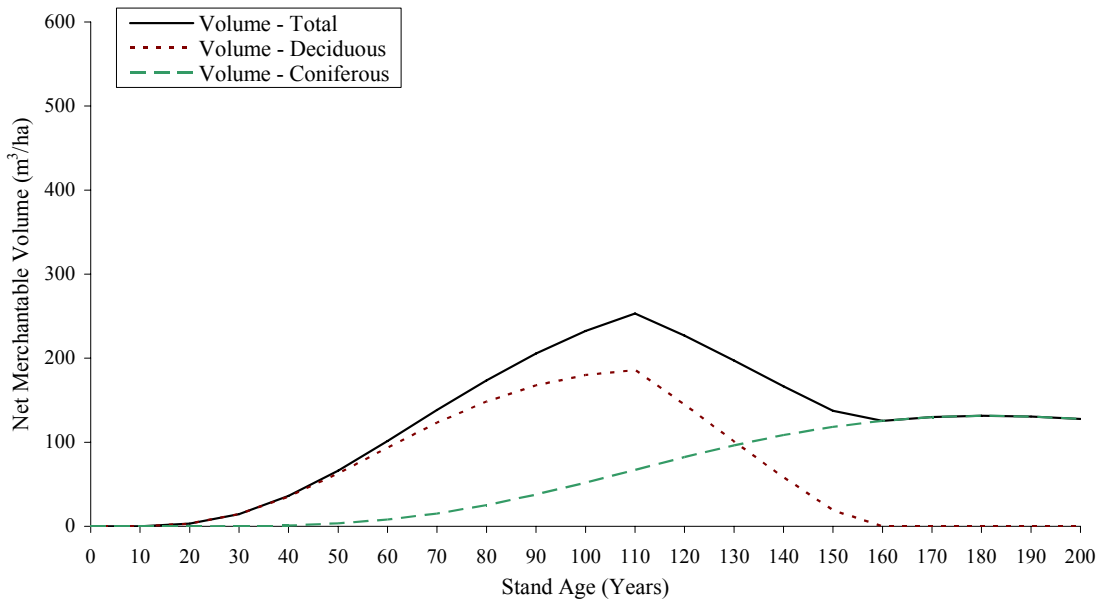


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	1.9	2.4	0.047	0.192	0.239
20	2.0	11.2	13.2	0.100	0.560	0.659
30	4.2	27.1	31.3	0.140	0.903	1.043
40	6.8	47.3	54.1	0.170	1.183	1.353
50	9.6	69.7	79.3	0.192	1.394	1.587
60	12.5	92.4	104.9	0.208	1.539	1.748
70	15.3	113.9	129.2	0.219	1.627	1.846
80	18.0	133.3	151.3	0.225	1.666	1.891
90	20.5	150.0	170.5	0.228	1.666	1.894
100	22.8	163.6	186.4	0.228	1.636	1.864
110	24.8	162.5	187.4	0.226	1.478	1.703
120	26.6	129.5	156.2	0.222	1.079	1.301
130	28.1	91.9	120.0	0.216	0.707	0.923
140	29.4	51.5	80.9	0.210	0.368	0.578
150	30.4	10.3	40.7	0.203	0.068	0.271
160	31.2	0.0	31.2	0.195	0.000	0.195
170	31.7	0.0	31.7	0.187	0.000	0.187
180	32.0	0.0	32.0	0.178	0.000	0.178
190	32.2	0.0	32.2	0.169	0.000	0.169
200	32.2	0.0	32.2	0.161	0.000	0.161



FMU P6 & P9 / DU-A-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

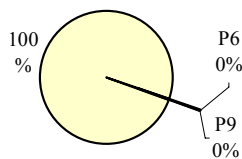
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	1,027
P9 Area (ha):	0

Stratum as a % of the active landbase:

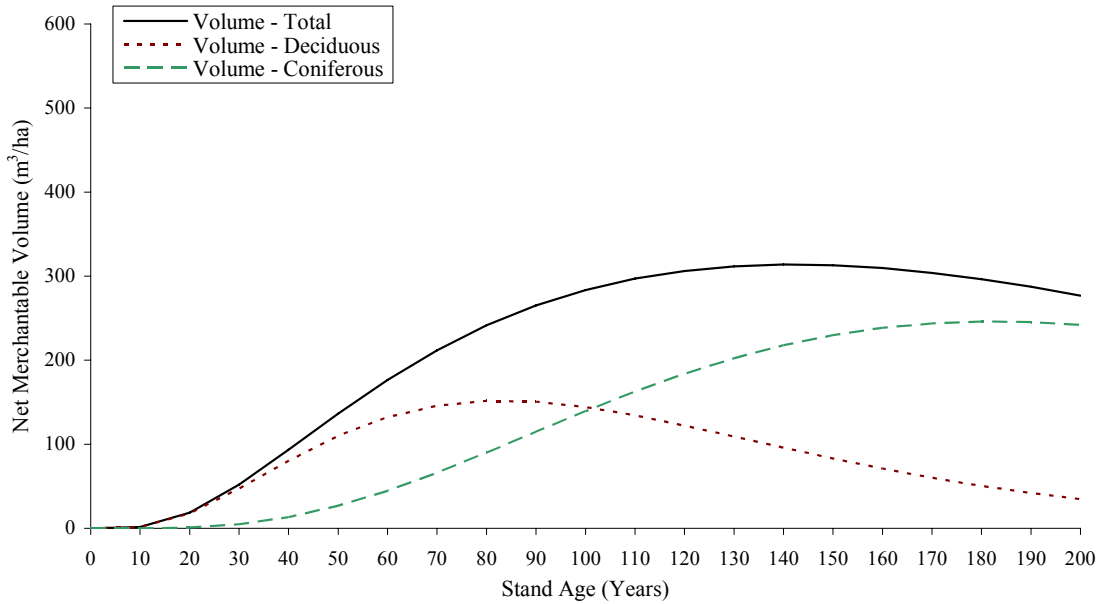


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.1	0.1	0.000	0.008	0.008
20	0.0	3.1	3.1	0.001	0.156	0.157
30	0.2	14.4	14.6	0.007	0.480	0.487
40	1.1	35.1	36.2	0.027	0.878	0.905
50	3.4	62.8	66.2	0.068	1.256	1.324
60	7.9	93.5	101.4	0.132	1.558	1.690
70	15.2	123.0	138.2	0.217	1.757	1.975
80	25.3	148.4	173.7	0.316	1.855	2.171
90	37.8	167.7	205.5	0.420	1.864	2.284
100	52.1	180.2	232.3	0.521	1.802	2.323
110	67.3	185.9	253.1	0.612	1.690	2.301
120	82.3	144.7	227.0	0.686	1.206	1.892
130	96.3	100.9	197.2	0.741	0.776	1.517
140	108.5	58.2	166.6	0.775	0.415	1.190
150	118.3	19.2	137.5	0.789	0.128	0.917
160	125.5	0.0	125.5	0.785	0.000	0.785
170	129.9	0.0	129.9	0.764	0.000	0.764
180	131.6	0.0	131.6	0.731	0.000	0.731
190	130.7	0.0	130.7	0.688	0.000	0.688
200	127.6	0.0	127.6	0.638	0.000	0.638

FMU P6 & P9 / DU-BCD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

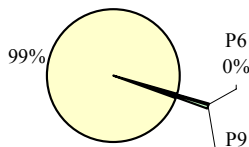
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	1,086
P9 Area (ha):	2,416

Stratum as a % of the active landbase:

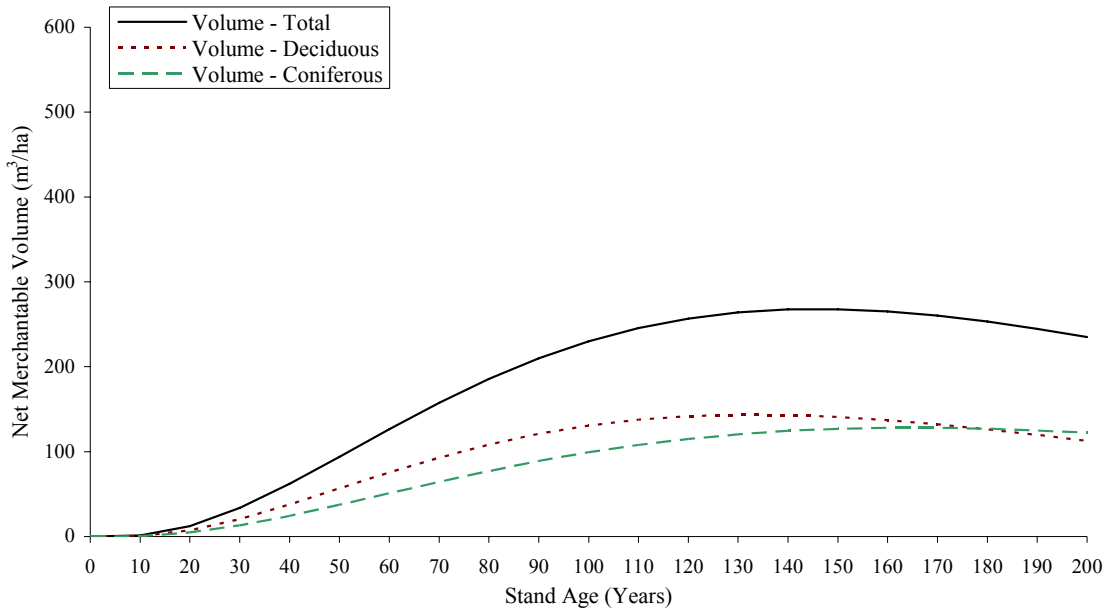


P9 ¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
 1% ² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	1.5	1.5	0.002	0.151	0.153
20	1.0	17.8	18.8	0.049	0.891	0.940
30	4.9	47.2	52.1	0.165	1.573	1.738
40	13.4	80.2	93.6	0.334	2.005	2.339
50	26.7	109.8	136.5	0.534	2.196	2.729
60	44.5	132.1	176.6	0.742	2.201	2.944
70	66.0	145.9	211.9	0.943	2.084	3.027
80	89.8	151.6	241.4	1.122	1.895	3.017
90	114.6	150.5	265.2	1.274	1.673	2.946
100	139.3	144.3	283.5	1.393	1.443	2.835
110	162.7	134.4	297.1	1.479	1.222	2.701
120	184.0	122.3	306.3	1.533	1.019	2.552
130	202.5	109.2	311.7	1.558	0.840	2.398
140	217.9	95.9	313.8	1.556	0.685	2.242
150	229.9	83.1	313.0	1.533	0.554	2.087
160	238.5	71.1	309.6	1.491	0.444	1.935
170	243.8	60.2	304.0	1.434	0.354	1.788
180	246.0	50.5	296.5	1.367	0.280	1.647
190	245.3	42.0	287.3	1.291	0.221	1.512
200	242.1	34.7	276.8	1.211	0.173	1.384



FMU P6 & P9 / DC-BCD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

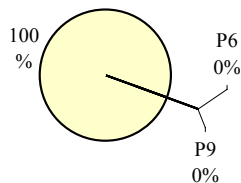
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	167
P9 Area (ha):	0

Stratum as a % of the active landbase:

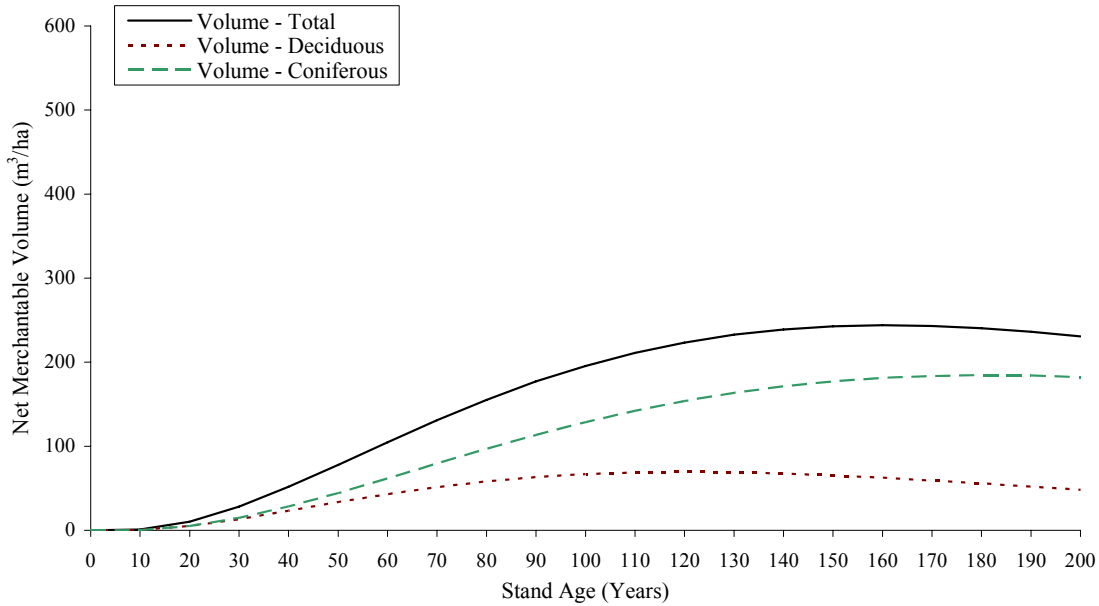


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	0.7	1.1	0.047	0.067	0.114
20	4.8	7.4	12.2	0.241	0.371	0.612
30	13.2	20.5	33.7	0.440	0.684	1.124
40	24.4	37.7	62.1	0.611	0.941	1.552
50	37.4	56.6	93.9	0.747	1.132	1.879
60	51.0	75.5	126.4	0.850	1.258	2.107
70	64.5	93.0	157.5	0.921	1.328	2.249
80	77.3	108.3	185.6	0.966	1.354	2.320
90	88.9	121.0	209.9	0.988	1.344	2.332
100	99.2	130.7	229.9	0.992	1.307	2.299
110	107.9	137.6	245.5	0.981	1.251	2.232
120	115.0	141.8	256.8	0.958	1.182	2.140
130	120.5	143.5	264.0	0.927	1.104	2.031
140	124.4	143.1	267.6	0.889	1.022	1.911
150	126.9	140.9	267.8	0.846	0.939	1.785
160	128.1	137.1	265.2	0.801	0.857	1.657
170	128.1	132.1	260.2	0.753	0.777	1.530
180	127.0	126.2	253.2	0.705	0.701	1.407
190	125.0	119.7	244.6	0.658	0.630	1.288
200	122.2	112.7	234.9	0.611	0.563	1.174

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / MXU-B-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

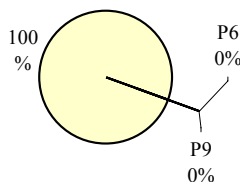
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	5
P9 Area (ha):	0

Stratum as a % of the active landbase:



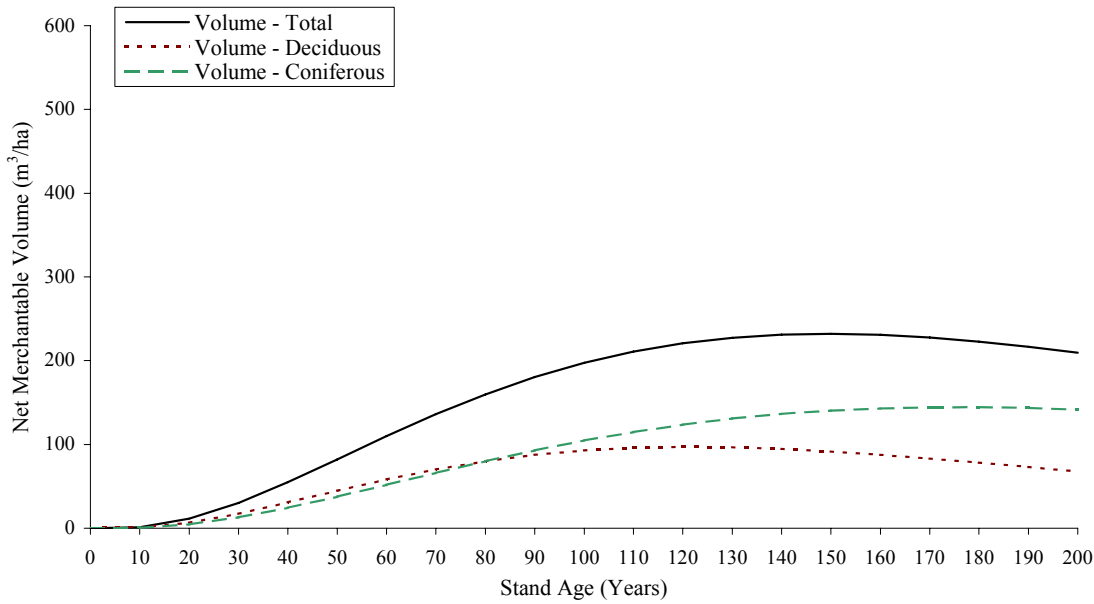
¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	0.6	1.0	0.047	0.056	0.103
20	5.2	5.2	10.5	0.261	0.262	0.523
30	14.9	13.4	28.3	0.496	0.446	0.942
40	28.3	23.3	51.6	0.708	0.581	1.289
50	44.3	33.5	77.8	0.886	0.669	1.555
60	61.7	43.1	104.8	1.028	0.718	1.746
70	79.5	51.4	131.0	1.136	0.735	1.871
80	97.0	58.3	155.3	1.213	0.729	1.941
90	113.6	63.5	177.0	1.262	0.705	1.967
100	128.7	67.0	195.7	1.287	0.670	1.957
110	142.2	69.0	211.2	1.293	0.627	1.920
120	153.9	69.7	223.5	1.282	0.580	1.863
130	163.6	69.1	232.7	1.258	0.532	1.790
140	171.4	67.7	239.0	1.224	0.483	1.707
150	177.3	65.4	242.7	1.182	0.436	1.618
160	181.4	62.6	243.9	1.133	0.391	1.525
170	183.8	59.3	243.1	1.081	0.349	1.430
180	184.6	55.8	240.4	1.026	0.310	1.336
190	184.1	52.1	236.2	0.969	0.274	1.243
200	182.4	48.3	230.7	0.912	0.241	1.153



FMU P6 & P9 / MXU-CD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

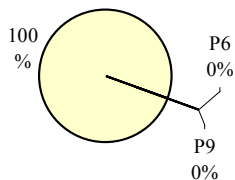
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	0
P9 Area (ha):	0

Stratum as a % of the active landbase:

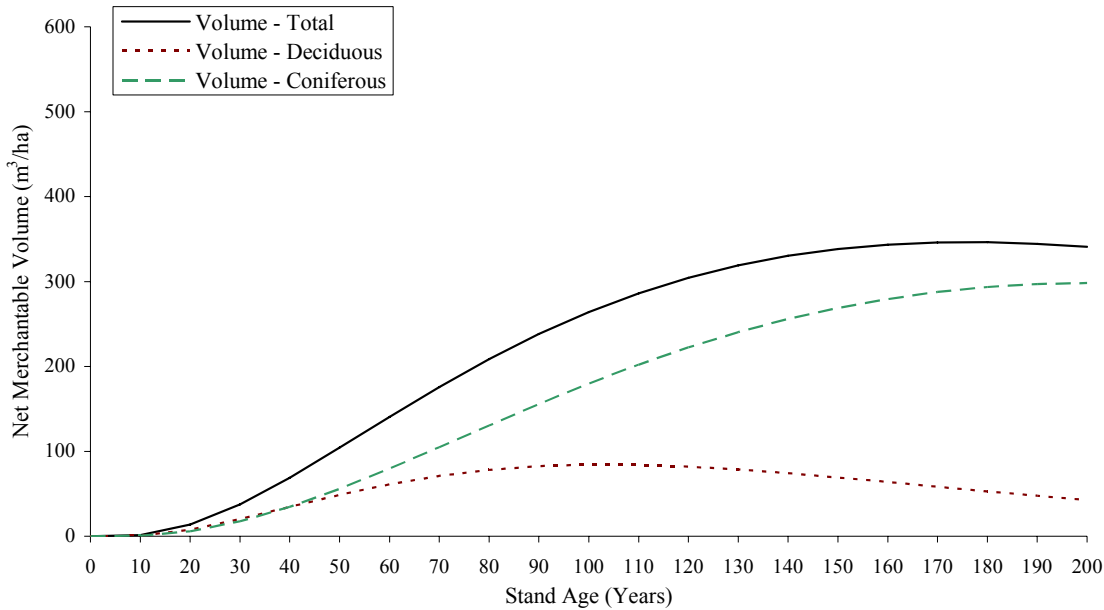


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.4	0.6	1.1	0.045	0.064	0.109
20	4.7	6.5	11.2	0.233	0.326	0.559
30	12.9	17.3	30.2	0.432	0.575	1.007
40	24.3	30.6	54.9	0.606	0.766	1.372
50	37.5	44.7	82.2	0.749	0.895	1.644
60	51.7	58.2	109.8	0.861	0.970	1.831
70	66.0	70.1	136.1	0.943	1.001	1.944
80	79.9	79.9	159.8	0.999	0.999	1.998
90	92.9	87.5	180.4	1.032	0.972	2.004
100	104.6	92.8	197.4	1.046	0.928	1.974
110	114.9	95.9	210.8	1.045	0.872	1.916
120	123.6	97.0	220.7	1.030	0.809	1.839
130	130.8	96.5	227.3	1.006	0.743	1.749
140	136.4	94.6	231.0	0.974	0.676	1.650
150	140.4	91.6	232.0	0.936	0.611	1.547
160	143.0	87.7	230.7	0.894	0.548	1.442
170	144.3	83.2	227.5	0.849	0.489	1.338
180	144.5	78.2	222.7	0.803	0.435	1.237
190	143.5	73.0	216.5	0.755	0.384	1.140
200	141.6	67.7	209.3	0.708	0.339	1.047

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / CD-BCD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

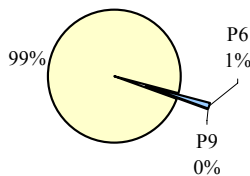
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	3,935
P9 Area (ha):	0

Stratum as a % of the active landbase:



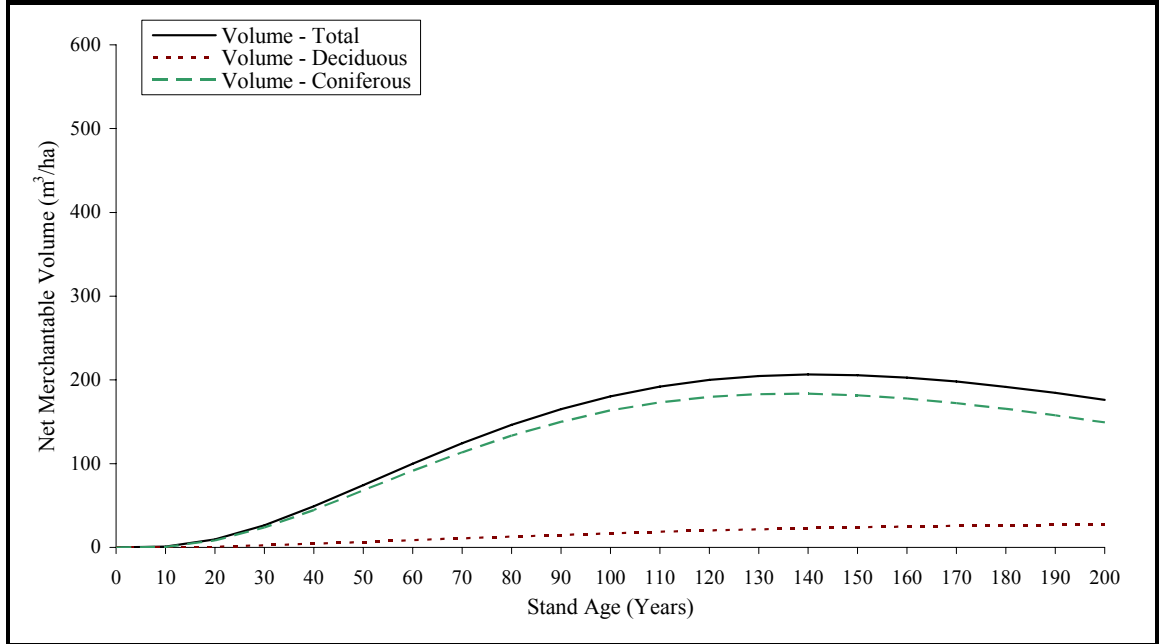
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	0.8	1.3	0.049	0.078	0.127
20	5.9	7.8	13.7	0.294	0.390	0.683
30	17.5	20.0	37.5	0.584	0.668	1.252
40	34.5	34.4	69.0	0.863	0.861	1.724
50	55.6	48.7	104.2	1.111	0.973	2.084
60	79.3	61.1	140.5	1.322	1.019	2.341
70	104.6	71.1	175.7	1.494	1.016	2.510
80	130.3	78.2	208.5	1.628	0.978	2.606
90	155.5	82.6	238.1	1.728	0.918	2.645
100	179.6	84.4	264.0	1.796	0.844	2.640
110	202.0	84.1	286.1	1.836	0.765	2.601
120	222.3	82.0	304.4	1.853	0.684	2.536
130	240.4	78.7	319.0	1.849	0.605	2.454
140	255.9	74.3	330.2	1.828	0.531	2.359
150	269.0	69.3	338.2	1.793	0.462	2.255
160	279.5	63.9	343.4	1.747	0.399	2.146
170	287.6	58.4	345.9	1.692	0.343	2.035
180	293.3	52.9	346.2	1.629	0.294	1.923
190	296.8	47.5	344.4	1.562	0.250	1.812
200	298.3	42.4	340.8	1.492	0.212	1.704

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 / PL-BCD-P6 / Pre-91 Managed Stand Yield Curve With Cull

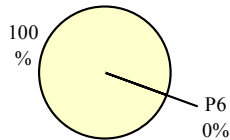


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	89

Stratum as a % of the active landbase, FMU P6:

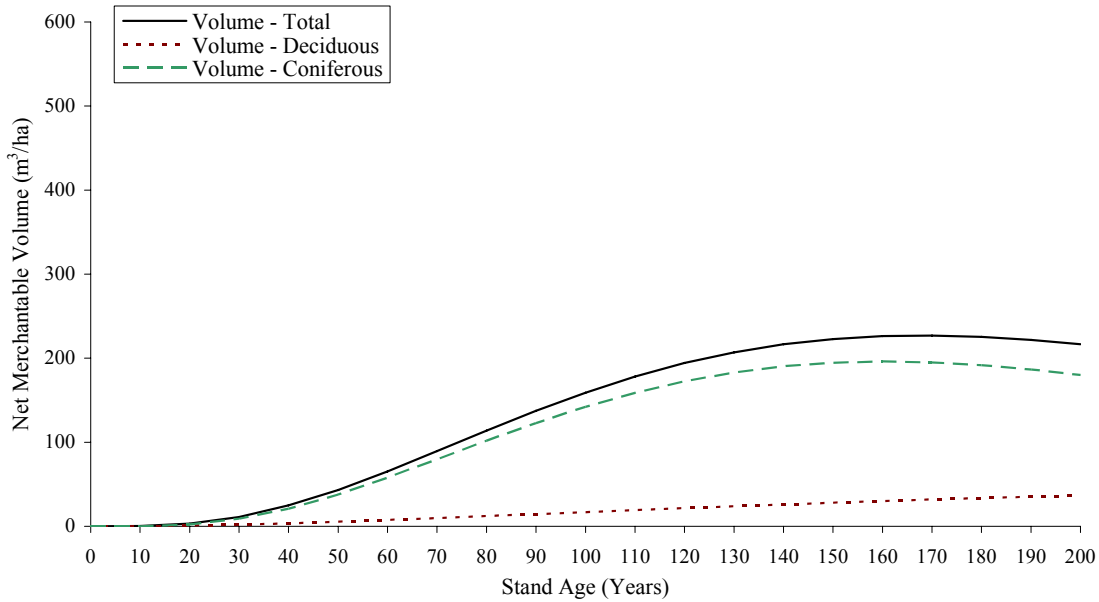


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.7	0.2	0.9	0.074	0.015	0.089
20	8.5	1.1	9.5	0.423	0.054	0.477
30	23.9	2.6	26.5	0.797	0.086	0.883
40	44.6	4.4	49.0	1.114	0.111	1.225
50	67.8	6.5	74.3	1.355	0.130	1.485
60	91.3	8.7	100.0	1.522	0.144	1.666
70	113.6	10.8	124.4	1.623	0.155	1.778
80	133.4	13.0	146.4	1.668	0.162	1.830
90	150.1	15.0	165.2	1.668	0.167	1.835
100	163.4	16.9	180.4	1.634	0.169	1.804
110	173.2	18.7	191.9	1.575	0.170	1.745
120	179.6	20.3	200.0	1.497	0.169	1.666
130	183.0	21.7	204.7	1.407	0.167	1.575
140	183.5	23.0	206.5	1.311	0.164	1.475
150	181.6	24.1	205.7	1.211	0.161	1.372
160	177.8	25.0	202.8	1.111	0.156	1.267
170	172.3	25.8	198.0	1.013	0.151	1.165
180	165.5	26.3	191.8	0.919	0.146	1.066
190	157.7	26.8	184.5	0.830	0.141	0.971
200	149.2	27.1	176.3	0.746	0.135	0.882

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P9 / PL-BCD-P9 / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

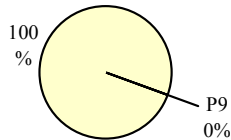
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:



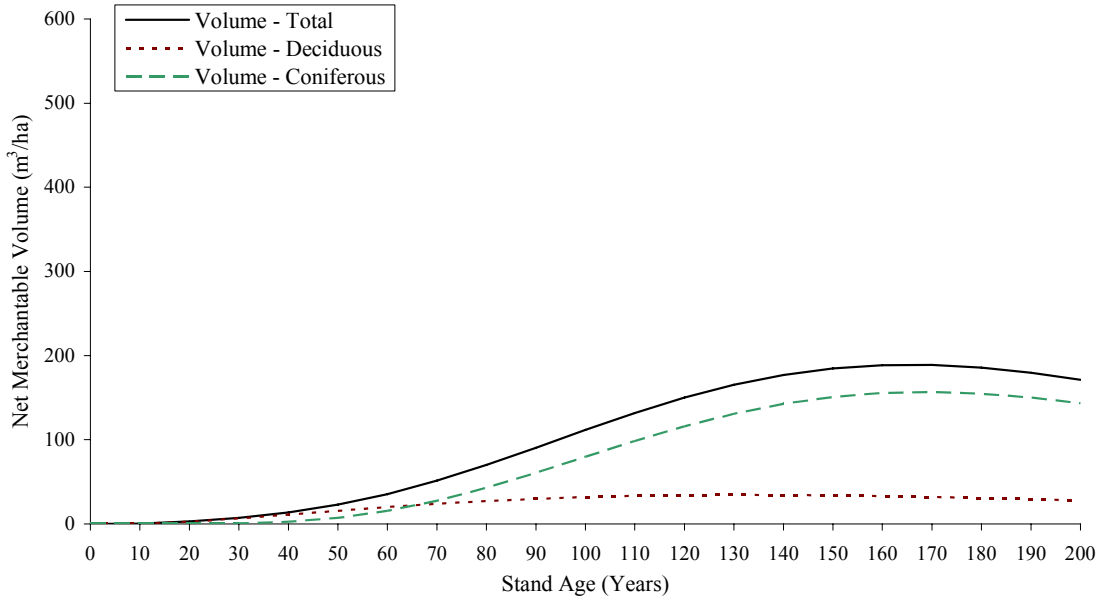
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.1	0.1	0.2	0.009	0.011	0.020
20	2.3	0.8	3.1	0.113	0.041	0.155
30	9.1	2.0	11.1	0.303	0.068	0.371
40	21.2	3.6	24.8	0.529	0.091	0.620
50	37.8	5.5	43.4	0.757	0.111	0.868
60	57.8	7.6	65.5	0.964	0.127	1.091
70	79.6	9.9	89.5	1.137	0.141	1.278
80	101.7	12.2	113.9	1.271	0.152	1.423
90	122.9	14.6	137.4	1.365	0.162	1.527
100	142.2	16.9	159.1	1.422	0.169	1.591
110	158.9	19.3	178.2	1.444	0.175	1.620
120	172.6	21.6	194.2	1.438	0.180	1.618
130	183.1	23.9	207.0	1.409	0.184	1.592
140	190.5	26.0	216.5	1.361	0.186	1.546
150	194.7	28.1	222.8	1.298	0.187	1.485
160	196.2	30.0	226.2	1.226	0.188	1.414
170	195.1	31.9	227.0	1.148	0.187	1.335
180	191.8	33.6	225.4	1.066	0.187	1.252
190	186.6	35.2	221.8	0.982	0.185	1.167
200	180.0	36.6	216.6	0.900	0.183	1.083

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / SB-BCD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

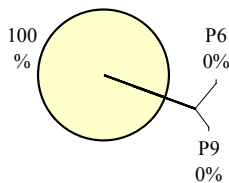
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	44
P9 Area (ha):	0

Stratum as a % of the active landbase:

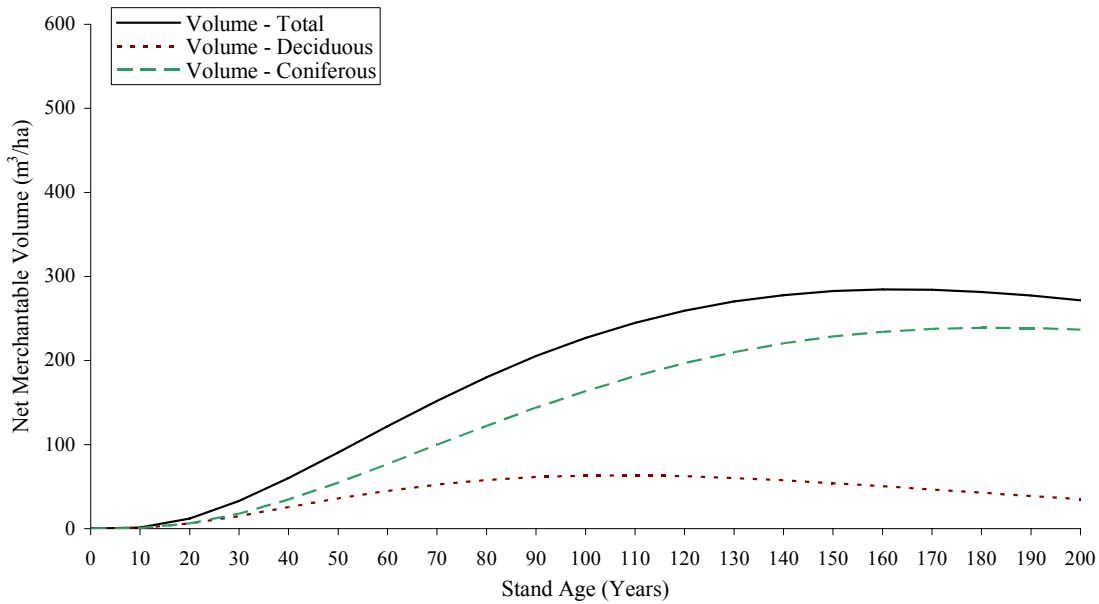


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.3	0.3	0.000	0.035	0.035
20	0.0	2.7	2.8	0.002	0.136	0.139
30	0.6	6.5	7.1	0.019	0.218	0.236
40	2.5	11.0	13.5	0.064	0.275	0.339
50	7.2	15.6	22.8	0.144	0.312	0.455
60	15.4	20.0	35.3	0.256	0.333	0.589
70	27.4	23.9	51.2	0.391	0.341	0.732
80	42.8	27.2	70.0	0.535	0.340	0.875
90	60.7	29.9	90.5	0.674	0.332	1.006
100	79.7	31.9	111.6	0.797	0.319	1.116
110	98.6	33.3	131.9	0.896	0.303	1.199
120	116.0	34.2	150.1	0.966	0.285	1.251
130	130.9	34.5	165.4	1.007	0.265	1.272
140	142.7	34.4	177.1	1.019	0.246	1.265
150	150.9	33.9	184.8	1.006	0.226	1.232
160	155.6	33.1	188.6	0.972	0.207	1.179
170	156.7	32.0	188.8	0.922	0.188	1.110
180	154.8	30.8	185.5	0.860	0.171	1.031
190	150.1	29.4	179.5	0.790	0.155	0.945
200	143.3	27.9	171.2	0.717	0.139	0.856

FMU P6 / SW-B-P6 / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

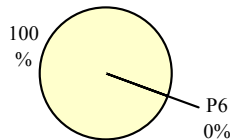
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	223
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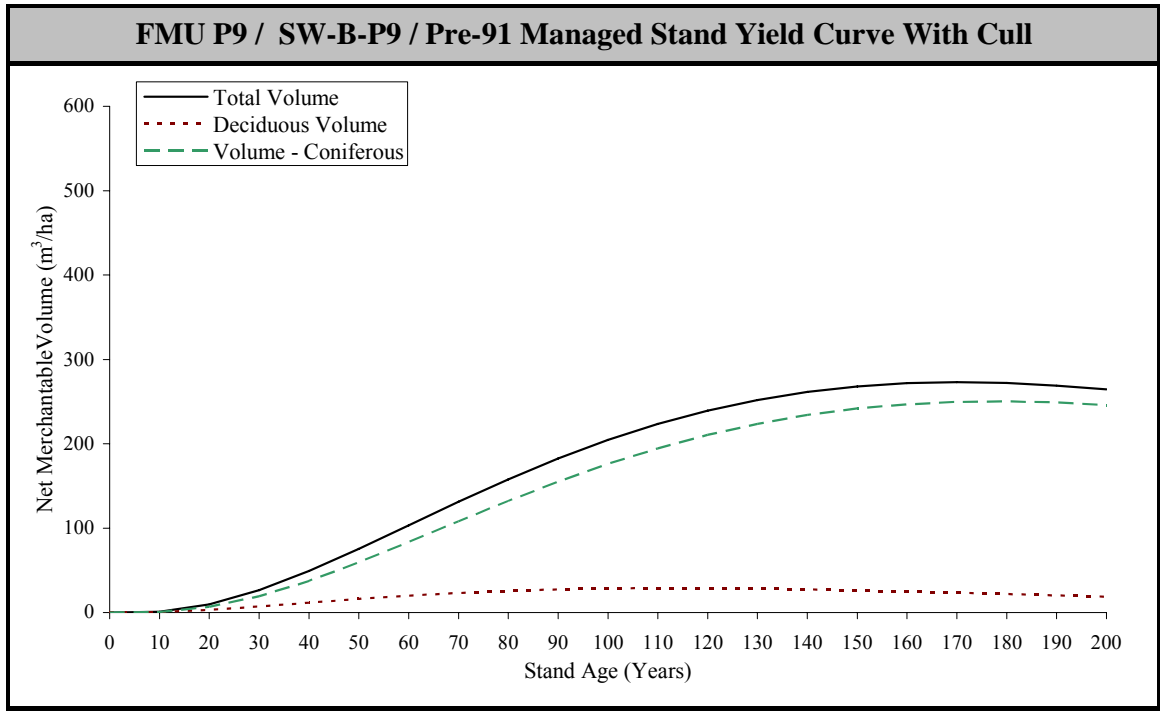
Stratum as a % of the active landbase, FMU P6:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	0.6	1.2	0.052	0.065	0.117
20	6.1	6.0	12.1	0.306	0.300	0.605
30	17.8	15.0	32.8	0.594	0.500	1.095
40	34.5	25.5	60.0	0.863	0.638	1.500
50	54.6	35.8	90.5	1.092	0.717	1.809
60	76.8	45.0	121.8	1.279	0.750	2.029
70	99.6	52.4	152.1	1.424	0.749	2.172
80	122.3	57.9	180.1	1.528	0.724	2.252
90	143.8	61.4	205.2	1.598	0.682	2.280
100	163.7	63.2	226.9	1.637	0.632	2.269
110	181.5	63.4	244.9	1.650	0.576	2.226
120	196.9	62.3	259.3	1.641	0.519	2.161
130	209.9	60.3	270.2	1.615	0.463	2.078
140	220.4	57.4	277.8	1.574	0.410	1.985
150	228.4	54.1	282.5	1.523	0.360	1.883
160	234.1	50.4	284.5	1.463	0.315	1.778
170	237.6	46.5	284.1	1.398	0.273	1.671
180	239.0	42.5	281.6	1.328	0.236	1.564
190	238.6	38.6	277.3	1.256	0.203	1.459
200	236.6	34.9	271.5	1.183	0.174	1.357

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

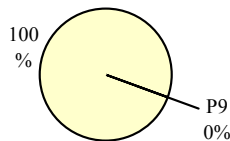
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:

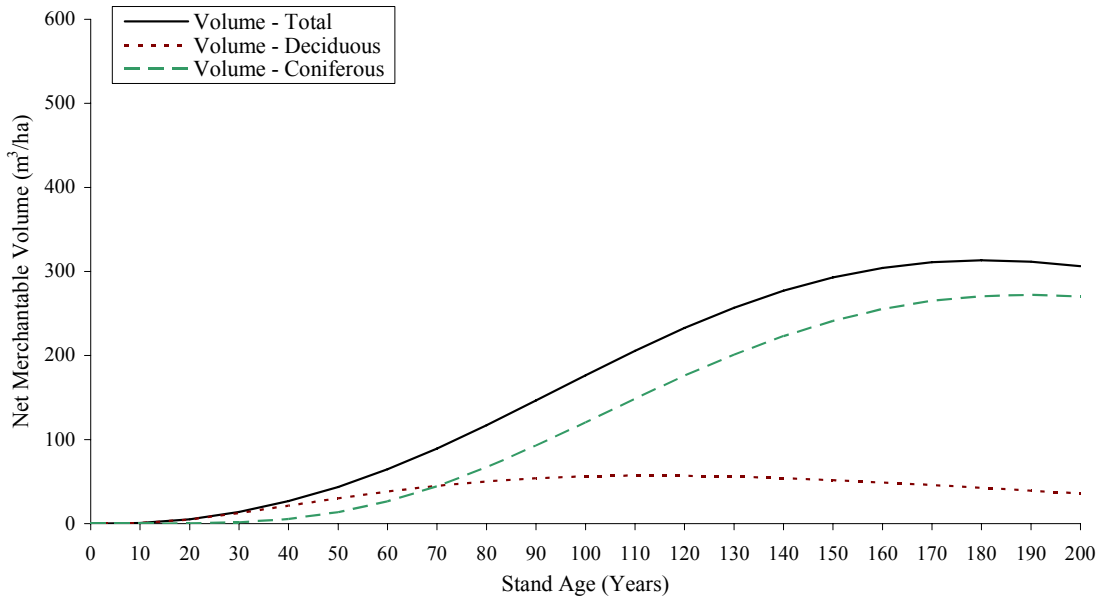


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.6	0.4	1.0	0.056	0.040	0.096
20	6.6	3.1	9.7	0.330	0.154	0.484
30	19.4	7.2	26.5	0.645	0.239	0.884
40	37.5	11.7	49.2	0.937	0.293	1.230
50	59.3	16.1	75.5	1.187	0.323	1.510
60	83.3	20.1	103.4	1.388	0.334	1.723
70	108.0	23.3	131.3	1.542	0.333	1.875
80	132.2	25.8	158.0	1.652	0.322	1.974
90	155.1	27.5	182.6	1.723	0.306	2.029
100	176.0	28.6	204.6	1.760	0.286	2.046
110	194.6	29.0	223.5	1.769	0.263	2.032
120	210.5	28.8	239.3	1.754	0.240	1.994
130	223.6	28.3	251.9	1.720	0.218	1.938
140	234.0	27.4	261.4	1.672	0.196	1.867
150	241.7	26.2	267.9	1.611	0.175	1.786
160	246.8	24.9	271.7	1.543	0.155	1.698
170	249.6	23.4	273.0	1.468	0.138	1.606
180	250.2	21.8	272.0	1.390	0.121	1.511
190	248.8	20.2	269.1	1.310	0.106	1.416
200	245.8	18.6	264.4	1.229	0.093	1.322

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 / SW-CD-P6 / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

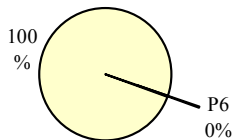
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	354
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Stratum as a % of the active landbase, FMU P6:



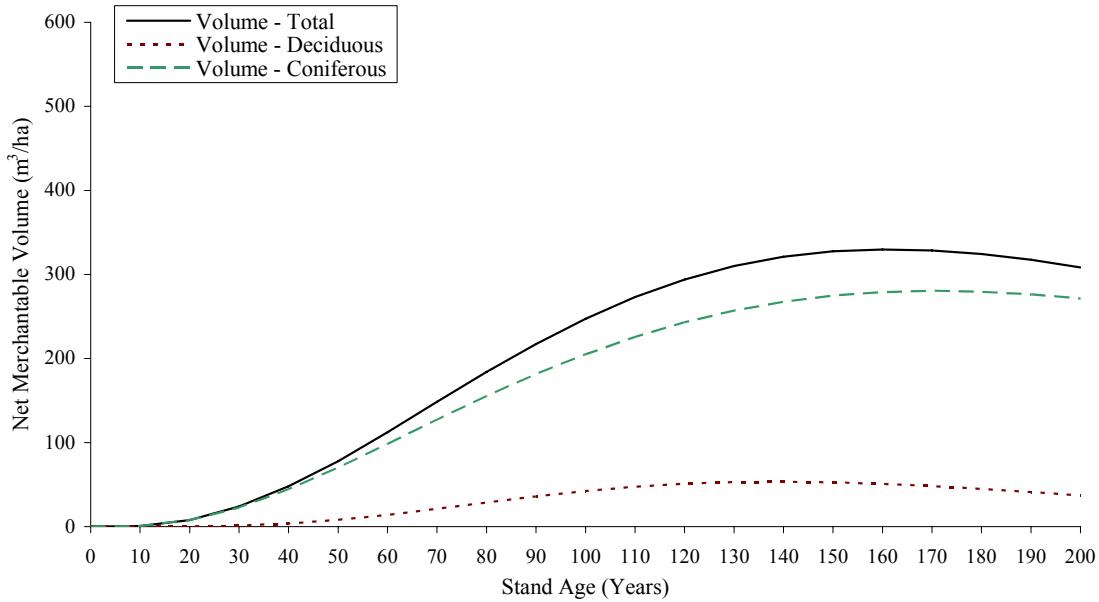
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.6	0.6	0.000	0.056	0.056
20	0.2	5.0	5.2	0.009	0.250	0.259
30	1.5	12.5	13.9	0.050	0.415	0.465
40	5.5	21.2	26.7	0.136	0.531	0.667
50	13.5	30.1	43.5	0.270	0.601	0.871
60	26.5	38.1	64.5	0.441	0.635	1.076
70	44.4	44.8	89.3	0.635	0.640	1.275
80	66.9	50.1	117.0	0.836	0.626	1.462
90	92.6	53.8	146.5	1.029	0.598	1.627
100	120.3	56.1	176.4	1.203	0.561	1.764
110	148.5	57.1	205.6	1.350	0.519	1.869
120	175.8	56.9	232.7	1.465	0.474	1.939
130	200.9	55.8	256.8	1.545	0.430	1.975
140	223.0	54.0	277.0	1.593	0.386	1.978
150	241.2	51.6	292.8	1.608	0.344	1.952
160	255.3	48.8	304.2	1.596	0.305	1.901
170	265.1	45.8	310.9	1.560	0.269	1.829
180	270.7	42.5	313.2	1.504	0.236	1.740
190	272.2	39.3	311.5	1.433	0.207	1.639
200	270.1	36.0	306.1	1.351	0.180	1.531

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P9 / SW-CD-P9 / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	5 y
Regen Lag - Deciduous:	N/A

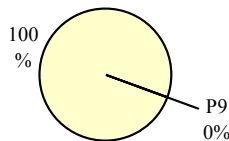
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.6	0.0	0.6	0.063	0.000	0.063
20	7.7	0.2	7.8	0.383	0.008	0.391
30	22.7	1.1	23.8	0.756	0.038	0.794
40	44.2	3.6	47.8	1.104	0.091	1.196
50	70.0	8.0	78.0	1.400	0.160	1.561
60	98.2	14.0	112.3	1.637	0.234	1.871
70	127.1	21.2	148.3	1.815	0.303	2.118
80	155.1	28.8	183.9	1.939	0.359	2.298
90	181.4	36.0	217.4	2.015	0.400	2.415
100	205.1	42.3	247.4	2.051	0.423	2.474
110	225.7	47.4	273.1	2.052	0.431	2.483
120	243.0	51.0	294.0	2.025	0.425	2.450
130	256.9	53.0	309.9	1.976	0.407	2.384
140	267.4	53.5	320.9	1.910	0.382	2.292
150	274.7	52.7	327.4	1.831	0.351	2.183
160	279.0	50.8	329.8	1.744	0.318	2.061
170	280.5	48.1	328.6	1.650	0.283	1.933
180	279.5	44.8	324.3	1.553	0.249	1.802
190	276.3	41.2	317.4	1.454	0.217	1.671
200	271.2	37.3	308.5	1.356	0.186	1.542

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

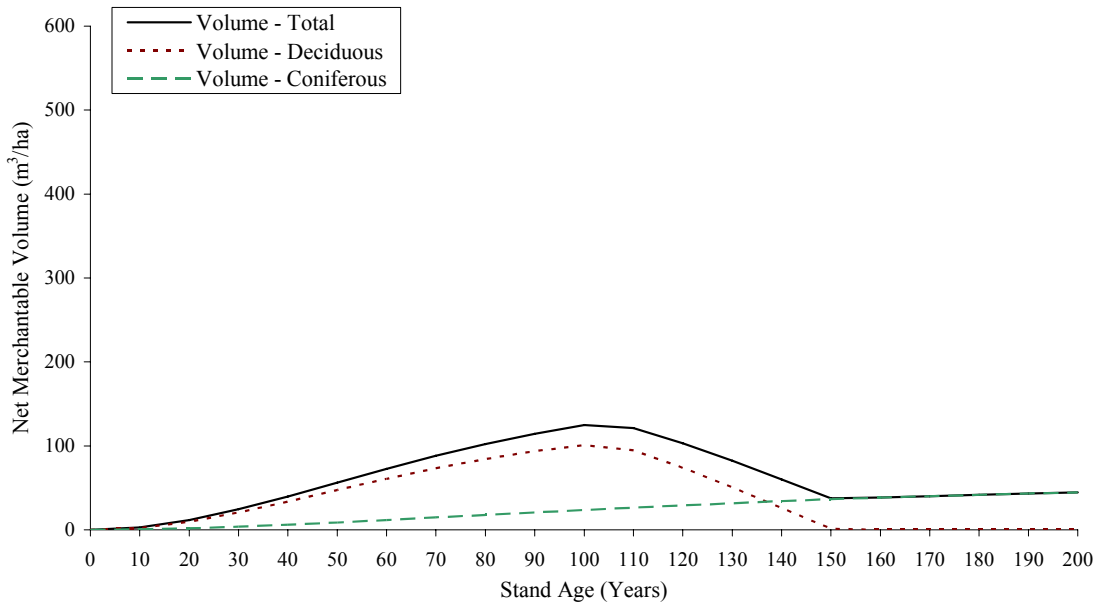
² Maximum MAI highlighted in blue.



Appendix XI Yield Curves: Post-91 Managed Stand



FMU P6 & P9 / D-B-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	N/A
Regen Lag - Deciduous:	0 y

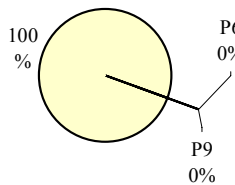
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	223
P9 Area (ha):	0

Stratum as a % of the active landbase:

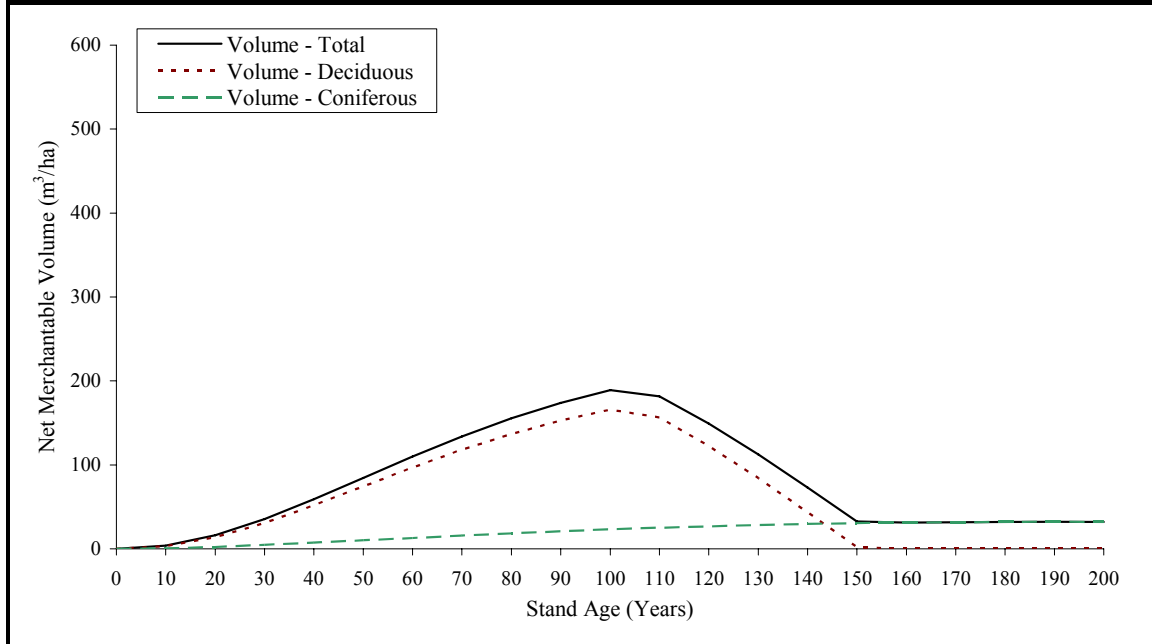


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.5	2.4	2.9	0.053	0.236	0.289
20	1.9	9.7	11.5	0.094	0.484	0.577
30	3.8	20.6	24.4	0.127	0.687	0.815
40	6.2	33.7	39.8	0.155	0.841	0.996
50	8.9	47.4	56.3	0.178	0.949	1.126
60	11.8	60.9	72.7	0.196	1.015	1.211
70	14.7	73.4	88.1	0.211	1.049	1.259
80	17.8	84.4	102.2	0.222	1.055	1.277
90	20.8	93.6	114.4	0.231	1.040	1.271
100	23.7	101.0	124.7	0.237	1.010	1.247
110	26.5	94.8	121.3	0.241	0.862	1.103
120	29.3	73.8	103.1	0.244	0.615	0.859
130	31.8	50.5	82.3	0.245	0.389	0.633
140	34.2	26.0	60.2	0.244	0.186	0.430
150	36.4	1.2	37.6	0.243	0.008	0.251
160	38.4	0.0	38.4	0.240	0.000	0.240
170	40.2	0.0	40.2	0.237	0.000	0.237
180	41.8	0.0	41.8	0.232	0.000	0.232
190	43.3	0.0	43.3	0.228	0.000	0.228
200	44.5	0.0	44.5	0.222	0.000	0.222

FMU P6 & P9 / D-CD-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	N/A
Regen Lag - Deciduous:	0 y

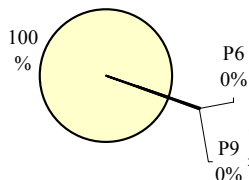
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	1,160
P9 Area (ha):	0

Stratum as a % of the active landbase:

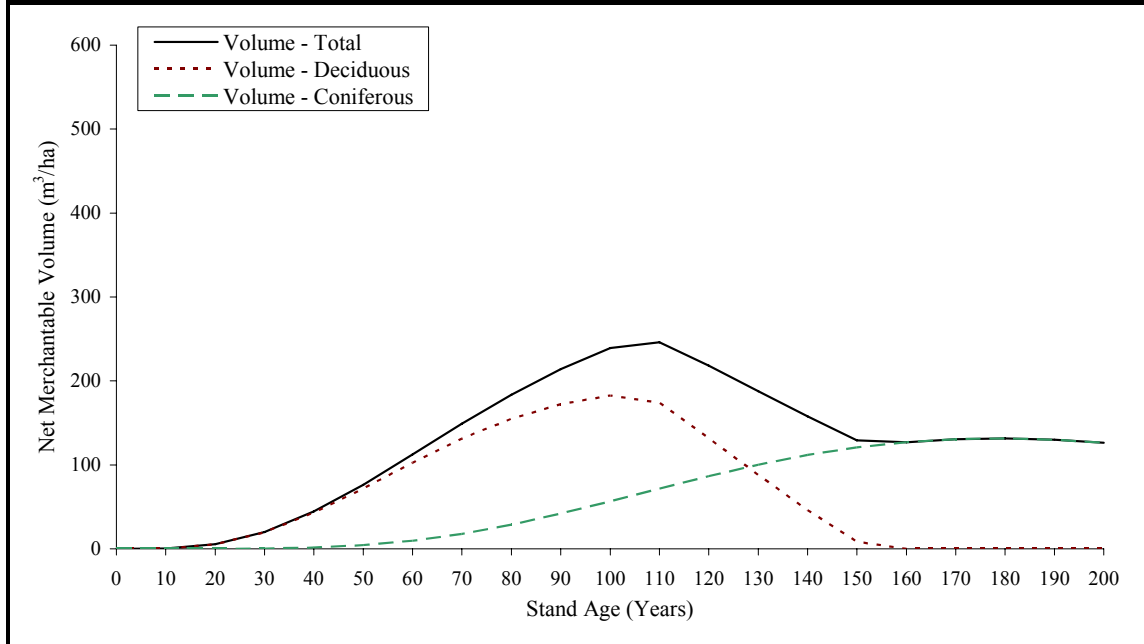


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.7	3.2	3.9	0.070	0.316	0.386
20	2.4	13.9	16.3	0.119	0.695	0.815
30	4.7	30.9	35.5	0.156	1.029	1.185
40	7.4	51.7	59.1	0.184	1.293	1.476
50	10.2	74.3	84.5	0.204	1.485	1.689
60	13.1	96.8	109.9	0.218	1.613	1.831
70	15.9	118.0	133.8	0.227	1.685	1.912
80	18.5	136.9	155.4	0.232	1.711	1.942
90	21.0	152.9	173.9	0.233	1.699	1.932
100	23.2	165.9	189.1	0.232	1.659	1.891
110	25.2	156.4	181.6	0.229	1.422	1.651
120	26.9	122.3	149.2	0.225	1.019	1.244
130	28.4	84.0	112.4	0.219	0.646	0.864
140	29.6	43.3	72.9	0.212	0.309	0.521
150	30.6	2.1	32.6	0.204	0.014	0.217
160	31.3	0.0	31.3	0.196	0.000	0.196
170	31.8	0.0	31.8	0.187	0.000	0.187
180	32.1	0.0	32.1	0.178	0.000	0.178
190	32.2	0.0	32.2	0.169	0.000	0.169
200	32.1	0.0	32.1	0.161	0.000	0.161



FMU P6 & P9 / DU-A-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	10% @ 110 y +10% every 5 y thereafter
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

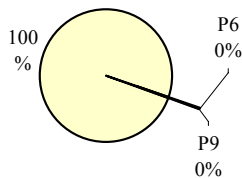
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	819
P9 Area (ha):	0

Stratum as a % of the active landbase:

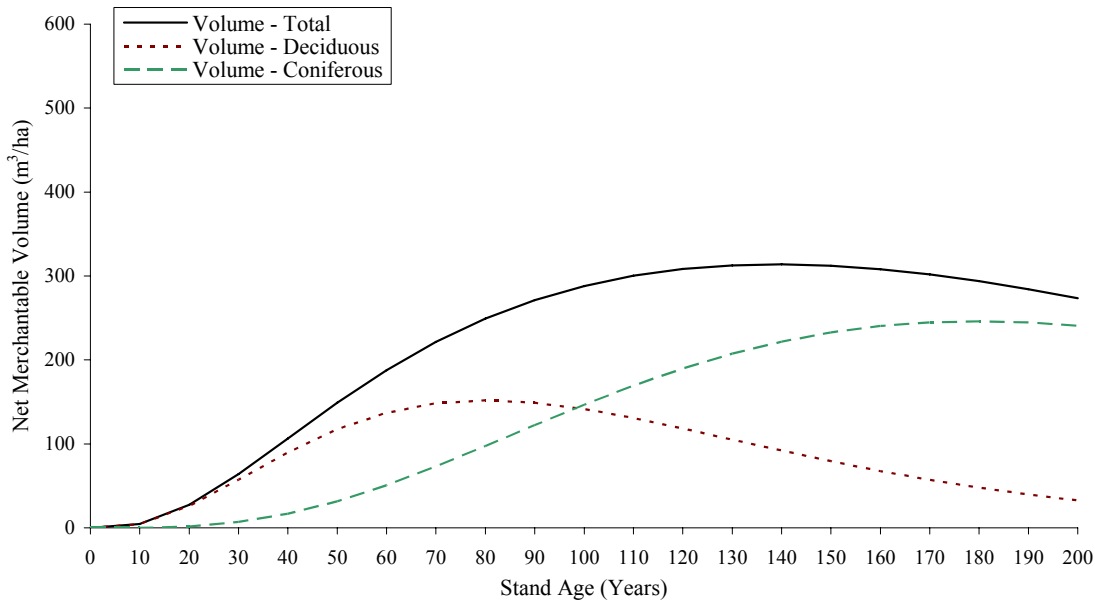


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.4	0.4	0.000	0.040	0.040
20	0.0	5.5	5.5	0.002	0.275	0.277
30	0.4	19.7	20.0	0.012	0.656	0.668
40	1.6	42.9	44.5	0.040	1.072	1.111
50	4.5	71.9	76.4	0.090	1.438	1.528
60	9.8	102.6	112.4	0.164	1.710	1.874
70	17.9	131.2	149.1	0.256	1.874	2.130
80	28.8	154.9	183.7	0.360	1.936	2.296
90	42.0	172.2	214.1	0.466	1.913	2.379
100	56.6	182.6	239.2	0.566	1.826	2.392
110	71.8	174.0	245.9	0.653	1.582	2.235
120	86.6	131.6	218.3	0.722	1.097	1.819
130	100.2	87.8	188.0	0.771	0.675	1.446
140	111.7	46.0	157.7	0.798	0.328	1.126
150	120.8	8.5	129.3	0.805	0.057	0.862
160	127.1	0.0	127.1	0.795	0.000	0.795
170	130.7	0.0	130.7	0.769	0.000	0.769
180	131.6	0.0	131.6	0.731	0.000	0.731
190	130.0	0.0	130.0	0.684	0.000	0.684
200	126.4	0.0	126.4	0.632	0.000	0.632

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / DU-BCD-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

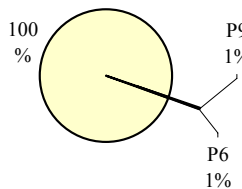
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	511
P9 Area (ha):	0

Stratum as a % of the active landbase:



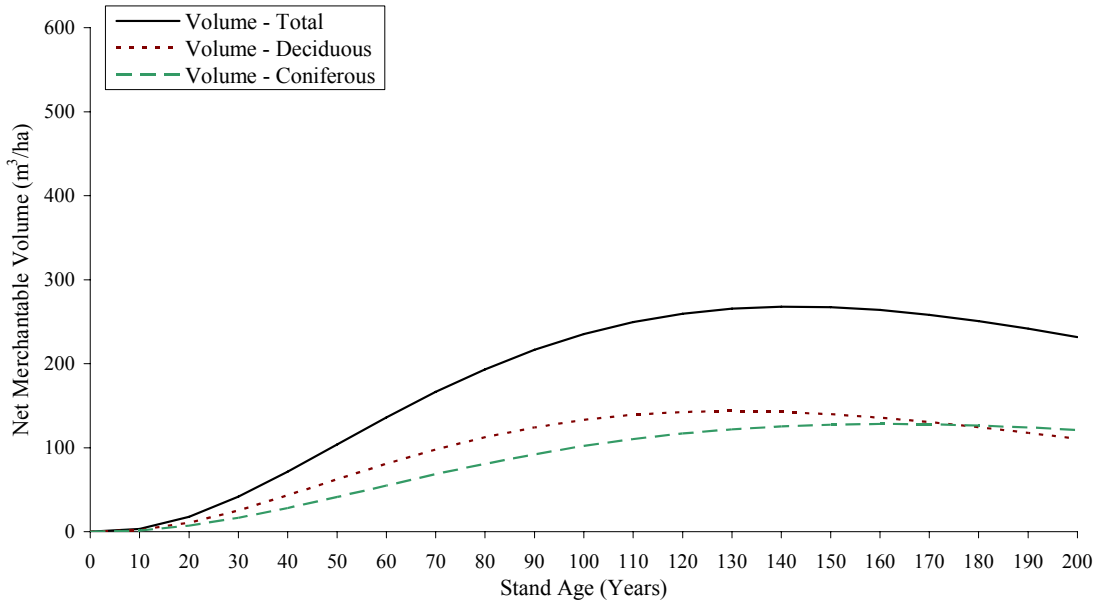
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.1	4.5	4.6	0.012	0.452	0.465
20	1.8	25.7	27.5	0.088	1.285	1.374
30	7.0	57.1	64.1	0.232	1.904	2.135
40	16.8	89.7	106.5	0.421	2.242	2.663
50	31.6	117.3	148.9	0.632	2.347	2.978
60	50.6	137.1	187.8	0.844	2.285	3.129
70	72.9	148.4	221.3	1.042	2.120	3.162
80	97.2	151.9	249.1	1.215	1.899	3.114
90	122.1	149.1	271.2	1.357	1.657	3.014
100	146.5	141.6	288.1	1.465	1.416	2.881
110	169.3	130.9	300.3	1.539	1.190	2.730
120	189.8	118.5	308.3	1.582	0.987	2.569
130	207.5	105.2	312.7	1.596	0.809	2.405
140	221.9	92.0	313.9	1.585	0.657	2.242
150	232.9	79.4	312.2	1.552	0.529	2.082
160	240.5	67.7	308.2	1.503	0.423	1.926
170	244.8	57.2	301.9	1.440	0.336	1.776
180	246.1	47.8	293.9	1.367	0.266	1.633
190	244.6	39.7	284.3	1.287	0.209	1.496
200	240.7	32.7	273.4	1.204	0.163	1.367

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / DC-BCD-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

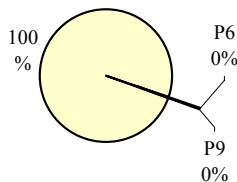
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	631
P9 Area (ha):	24

Stratum as a % of the active landbase:

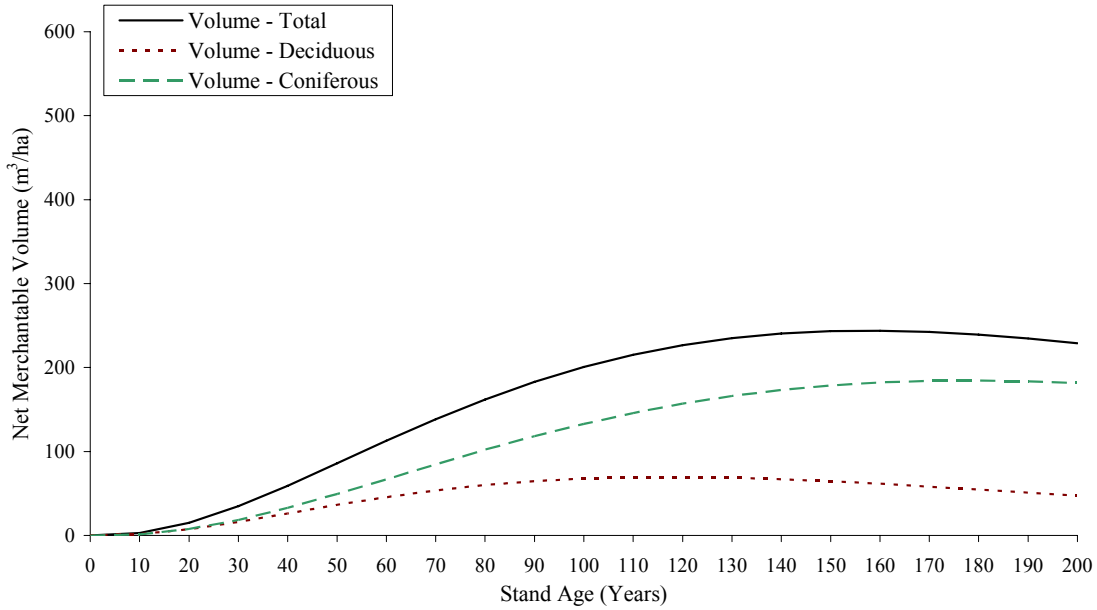


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.3	1.9	3.2	0.129	0.192	0.322
20	7.0	10.8	17.7	0.348	0.539	0.887
30	16.3	25.3	41.7	0.544	0.845	1.389
40	28.2	43.2	71.4	0.705	1.081	1.786
50	41.4	62.3	103.7	0.828	1.246	2.075
60	55.1	80.9	136.0	0.918	1.348	2.266
70	68.4	97.9	166.3	0.977	1.398	2.375
80	80.9	112.4	193.3	1.011	1.405	2.416
90	92.2	124.2	216.4	1.024	1.380	2.404
100	102.0	133.1	235.1	1.020	1.331	2.351
110	110.2	139.2	249.4	1.002	1.265	2.267
120	116.8	142.6	259.4	0.974	1.188	2.162
130	121.8	143.6	265.5	0.937	1.105	2.042
140	125.3	142.6	268.0	0.895	1.019	1.914
150	127.4	139.9	267.3	0.849	0.932	1.782
160	128.2	135.7	263.9	0.801	0.848	1.649
170	127.8	130.4	258.3	0.752	0.767	1.519
180	126.5	124.3	250.8	0.703	0.691	1.393
190	124.2	117.6	241.8	0.654	0.619	1.273
200	121.2	110.5	231.7	0.606	0.553	1.159

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / MXU-B-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

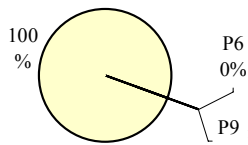
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	4
P9 Area (ha):	0

Stratum as a % of the active landbase:



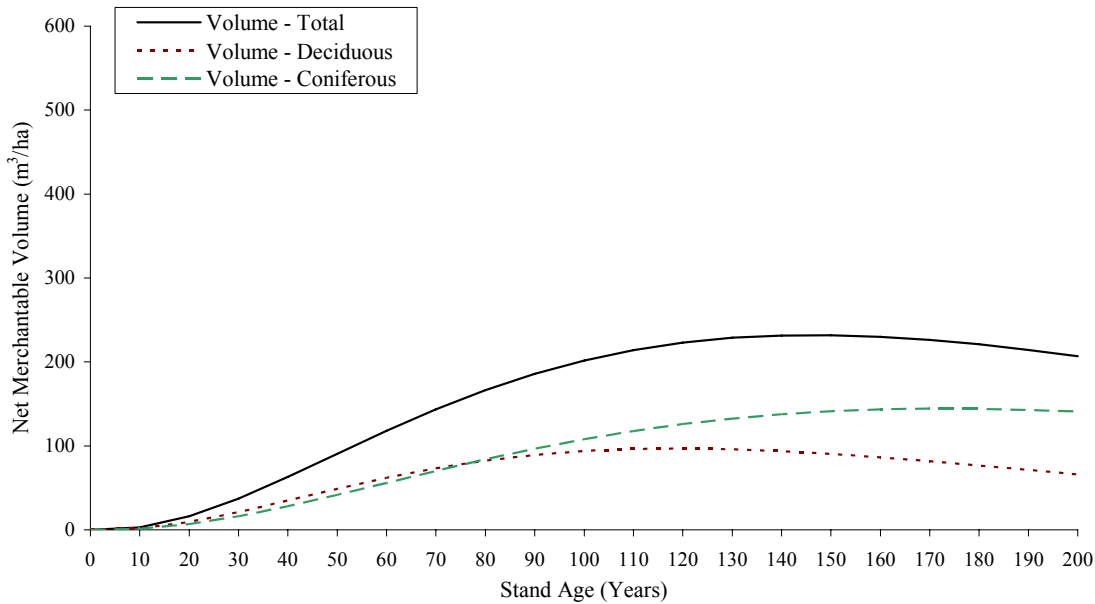
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.3	1.5	2.8	0.135	0.149	0.284
20	7.6	7.4	15.0	0.382	0.370	0.752
30	18.6	16.2	34.8	0.619	0.541	1.160
40	32.9	26.3	59.2	0.822	0.658	1.481
50	49.4	36.5	85.9	0.988	0.729	1.717
60	67.0	45.7	112.8	1.117	0.762	1.880
70	84.8	53.7	138.5	1.212	0.767	1.979
80	102.1	60.0	162.1	1.276	0.750	2.026
90	118.3	64.7	183.0	1.314	0.719	2.033
100	133.0	67.7	200.7	1.330	0.677	2.007
110	145.9	69.3	215.2	1.326	0.630	1.957
120	157.0	69.6	226.6	1.308	0.580	1.888
130	166.1	68.8	234.9	1.278	0.529	1.807
140	173.3	67.1	240.4	1.238	0.479	1.717
150	178.7	64.6	243.3	1.191	0.431	1.622
160	182.3	61.6	243.9	1.139	0.385	1.524
170	184.2	58.3	242.5	1.083	0.343	1.426
180	184.6	54.7	239.3	1.026	0.304	1.329
190	183.7	50.9	234.7	0.967	0.268	1.235
200	181.7	47.1	228.8	0.908	0.236	1.144

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / MXU-CD-COMB / Pre-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

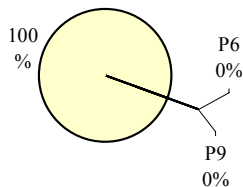
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	35
P9 Area (ha):	0

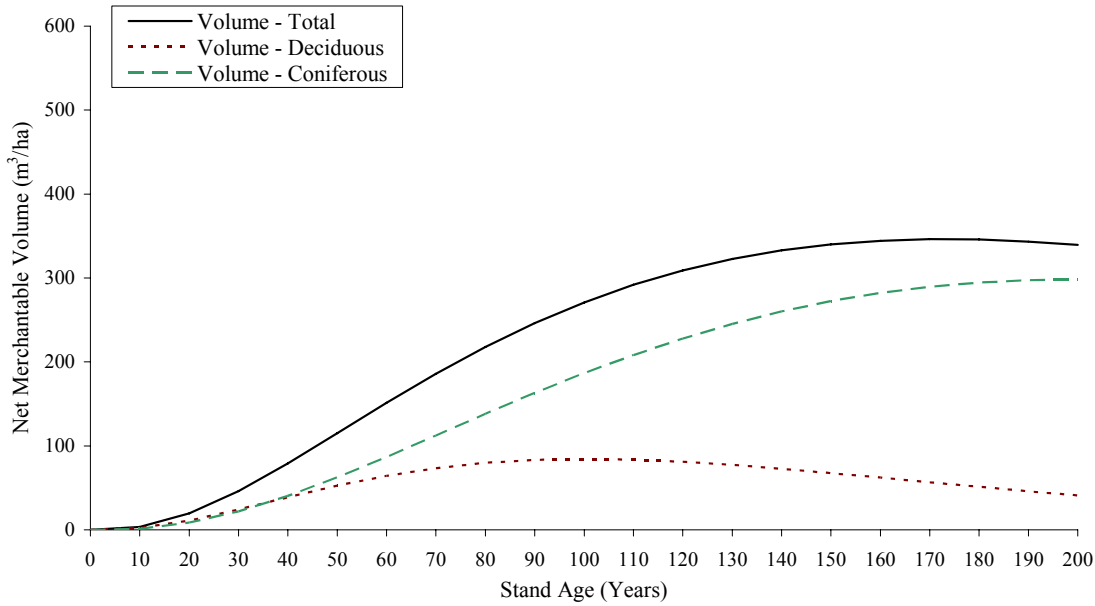
Stratum as a % of the active landbase:



¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.2	1.8	3.0	0.124	0.178	0.301
20	6.8	9.3	16.1	0.338	0.467	0.805
30	16.1	21.1	37.2	0.536	0.703	1.238
40	28.1	34.9	62.9	0.702	0.871	1.573
50	41.7	48.9	90.6	0.833	0.978	1.811
60	56.0	62.0	117.9	0.933	1.033	1.966
70	70.2	73.3	143.5	1.003	1.047	2.050
80	83.9	82.5	166.3	1.049	1.031	2.079
90	96.5	89.3	185.8	1.073	0.992	2.065
100	107.8	93.9	201.8	1.078	0.939	2.018
110	117.7	96.4	214.1	1.070	0.877	1.946
120	126.0	97.1	223.0	1.050	0.809	1.858
130	132.6	96.1	228.7	1.020	0.739	1.759
140	137.7	93.8	231.6	0.984	0.670	1.654
150	141.3	90.5	231.9	0.942	0.603	1.546
160	143.6	86.4	230.0	0.897	0.540	1.437
170	144.5	81.7	226.2	0.850	0.481	1.331
180	144.3	76.7	221.0	0.802	0.426	1.228
190	143.0	71.4	214.5	0.753	0.376	1.129
200	140.9	66.1	207.0	0.704	0.331	1.035

FMU P6 & P9 / CD-BCD-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	NA

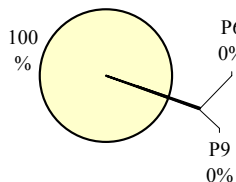
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	1,092
P9 Area (ha):	0

Stratum as a % of the active landbase:

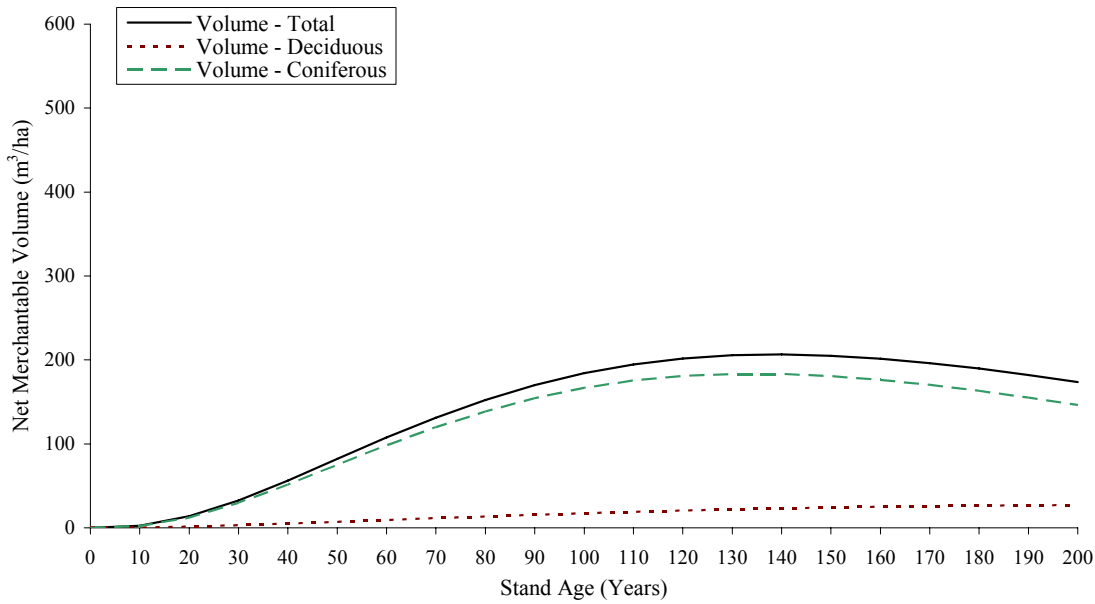


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.4	2.2	3.6	0.144	0.215	0.359
20	8.7	11.1	19.8	0.437	0.553	0.990
30	22.1	24.3	46.4	0.737	0.809	1.545
40	40.5	38.8	79.3	1.011	0.970	1.982
50	62.5	52.6	115.1	1.249	1.053	2.302
60	86.8	64.4	151.2	1.447	1.074	2.520
70	112.3	73.5	185.8	1.604	1.051	2.655
80	137.9	79.8	217.7	1.724	0.998	2.722
90	162.9	83.4	246.3	1.810	0.926	2.736
100	186.5	84.5	271.0	1.865	0.845	2.710
110	208.3	83.7	292.0	1.894	0.760	2.654
120	228.0	81.2	309.1	1.900	0.676	2.576
130	245.3	77.4	322.7	1.887	0.596	2.482
140	260.1	72.8	332.9	1.858	0.520	2.378
150	272.4	67.7	340.1	1.816	0.451	2.267
160	282.2	62.2	344.4	1.763	0.389	2.153
170	289.5	56.7	346.2	1.703	0.334	2.037
180	294.6	51.3	345.8	1.637	0.285	1.921
190	297.5	46.0	343.5	1.566	0.242	1.808
200	298.4	41.0	339.4	1.492	0.205	1.697



FMU P6 / PL-BCD-P6 / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

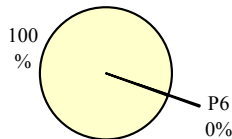
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	505
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Stratum as a % of the active landbase, FMU P6:

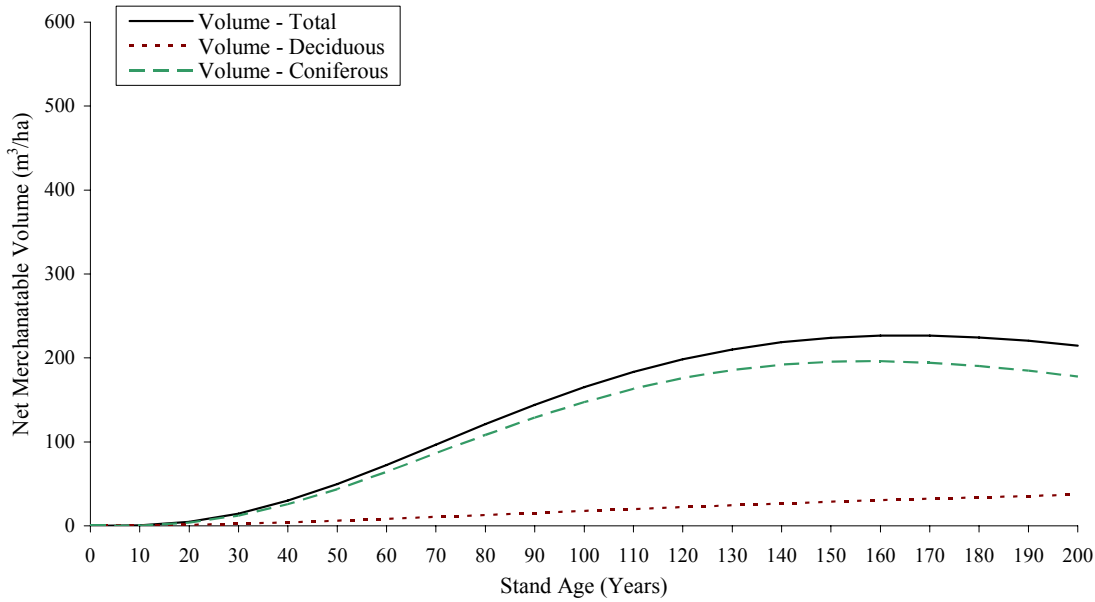


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.1	0.4	2.5	0.214	0.036	0.250
20	12.4	1.5	13.9	0.619	0.074	0.694
30	29.7	3.1	32.8	0.989	0.104	1.093
40	51.4	5.0	56.4	1.284	0.126	1.410
50	74.9	7.1	82.0	1.498	0.143	1.641
60	98.2	9.3	107.5	1.637	0.155	1.792
70	119.8	11.5	131.3	1.712	0.164	1.876
80	138.8	13.6	152.4	1.735	0.170	1.905
90	154.5	15.6	170.1	1.717	0.173	1.890
100	166.7	17.5	184.2	1.667	0.175	1.842
110	175.5	19.2	194.7	1.595	0.175	1.770
120	180.9	20.8	201.7	1.508	0.173	1.681
130	183.4	22.1	205.5	1.411	0.170	1.581
140	183.2	23.4	206.5	1.308	0.167	1.475
150	180.7	24.4	205.1	1.205	0.163	1.367
160	176.3	25.2	201.5	1.102	0.158	1.260
170	170.3	25.9	196.3	1.002	0.153	1.155
180	163.2	26.5	189.7	0.907	0.147	1.054
190	155.2	26.9	182.1	0.817	0.141	0.958
200	146.6	27.1	173.7	0.733	0.136	0.869

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P9 / PL-BCD-P9 / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

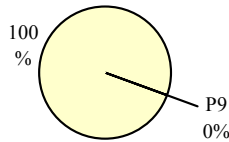
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:



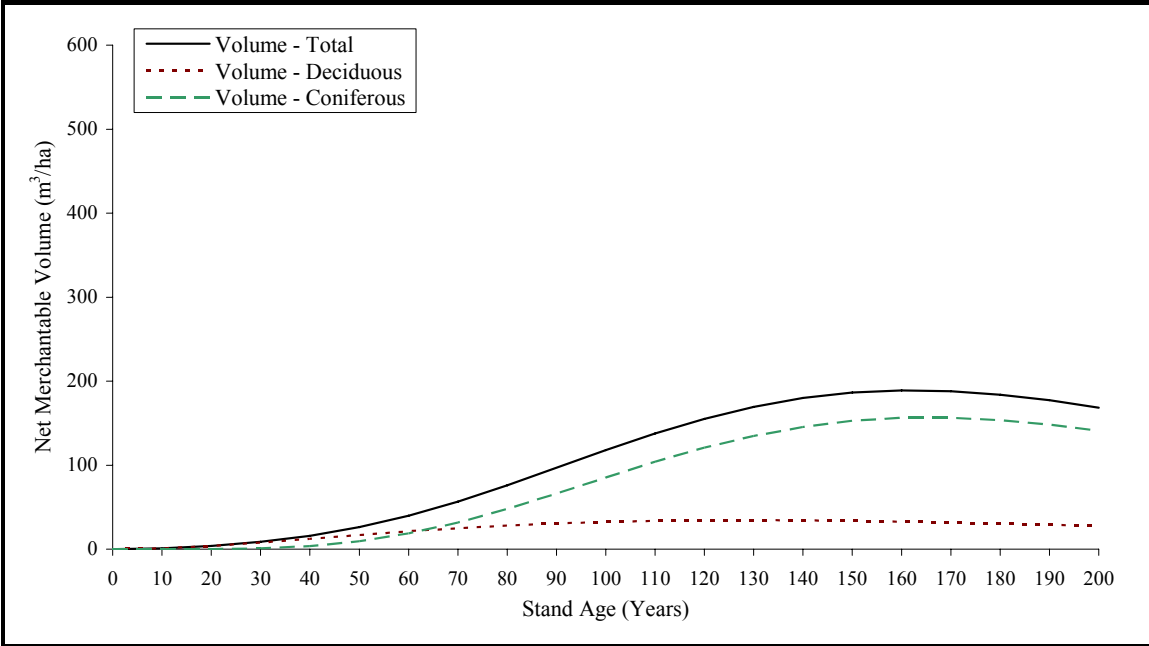
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.4	0.3	0.6	0.037	0.026	0.063
20	3.8	1.1	4.9	0.188	0.057	0.245
30	12.2	2.5	14.7	0.405	0.083	0.488
40	25.7	4.2	29.9	0.643	0.105	0.748
50	43.6	6.1	49.7	0.871	0.123	0.994
60	64.2	8.3	72.5	1.071	0.138	1.209
70	86.2	10.5	96.8	1.232	0.151	1.383
80	108.2	12.9	121.1	1.352	0.161	1.513
90	128.9	15.3	144.2	1.432	0.170	1.602
100	147.5	17.7	165.1	1.475	0.177	1.651
110	163.3	20.0	183.3	1.485	0.182	1.666
120	176.1	22.3	198.4	1.467	0.186	1.653
130	185.7	24.5	210.2	1.428	0.189	1.617
140	192.1	26.6	218.7	1.372	0.190	1.562
150	195.5	28.7	224.1	1.303	0.191	1.494
160	196.1	30.6	226.7	1.226	0.191	1.417
170	194.3	32.4	226.7	1.143	0.191	1.334
180	190.4	34.1	224.5	1.058	0.189	1.247
190	184.8	35.6	220.4	0.973	0.187	1.160
200	177.7	37.0	214.8	0.889	0.185	1.074

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / SB-BCD-COMB / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

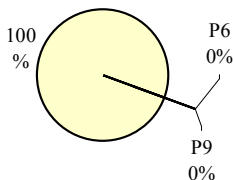
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	20
P9 Area (ha):	0

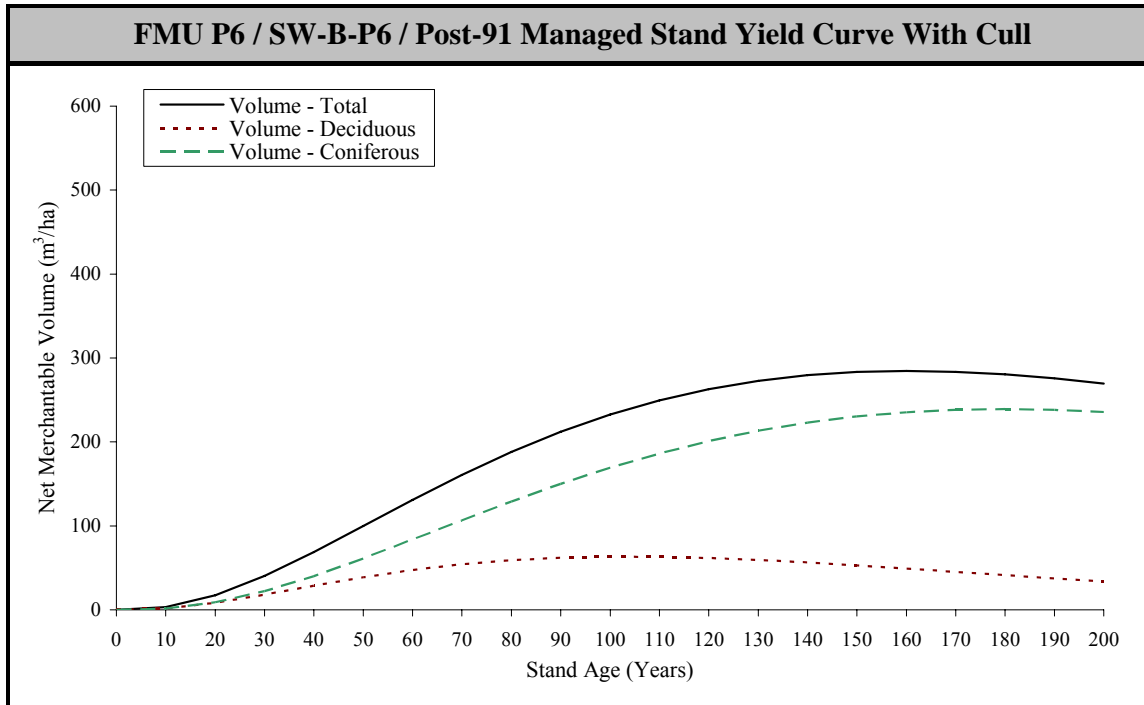
Stratum as a % of the active landbase:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0	0.0	0.000	0.000	0.000
10	0.0	0.854	0.9	0.000	0.085	0.086
20	0.1	3.753	3.9	0.006	0.188	0.194
30	1.0	7.824	8.8	0.032	0.261	0.293
40	3.6	12.38	16.0	0.090	0.309	0.400
50	9.2	16.93	26.2	0.185	0.339	0.524
60	18.6	21.18	39.8	0.310	0.353	0.663
70	31.7	24.92	56.6	0.453	0.356	0.809
80	48.0	28.06	76.0	0.599	0.351	0.950
90	66.3	30.55	96.9	0.737	0.339	1.076
100	85.4	32.39	117.8	0.854	0.324	1.178
110	104.0	33.63	137.6	0.945	0.306	1.251
120	120.7	34.32	155.1	1.006	0.286	1.292
130	134.8	34.51	169.3	1.037	0.265	1.302
140	145.5	34.28	179.8	1.040	0.245	1.284
150	152.7	33.68	186.4	1.018	0.225	1.243
160	156.3	32.79	189.1	0.977	0.205	1.182
170	156.4	31.67	188.1	0.920	0.186	1.107
180	153.6	30.37	184.0	0.854	0.169	1.022
190	148.3	28.93	177.2	0.780	0.152	0.933
200	140.9	27.41	168.4	0.705	0.137	0.842

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

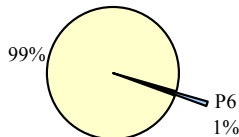
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	1,780
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Stratum as a % of the active landbase, FMU P6:



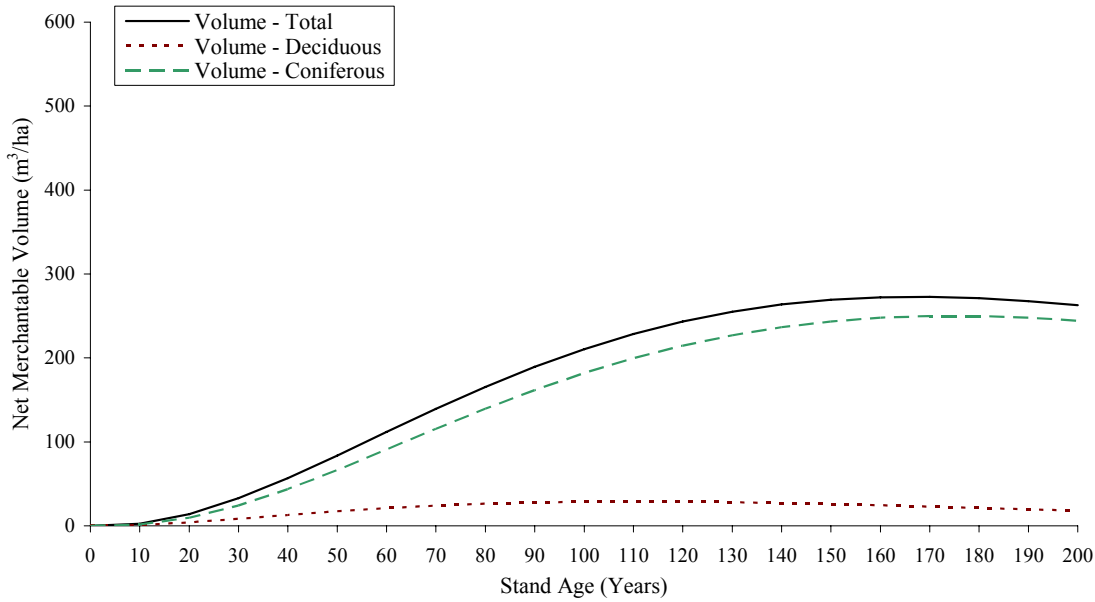
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.5	1.7	3.2	0.153	0.172	0.325
20	9.0	8.4	17.4	0.451	0.421	0.872
30	22.4	18.1	40.5	0.746	0.603	1.349
40	40.2	28.7	68.9	1.006	0.717	1.723
50	61.1	38.7	99.9	1.222	0.775	1.997
60	83.6	47.4	131.0	1.393	0.790	2.184
70	106.5	54.3	160.8	1.521	0.775	2.297
80	128.9	59.1	188.0	1.611	0.739	2.350
90	150.0	62.1	212.1	1.666	0.690	2.356
100	169.3	63.4	232.6	1.693	0.634	2.326
110	186.4	63.2	249.6	1.694	0.574	2.269
120	201.1	61.8	262.9	1.676	0.515	2.191
130	213.3	59.5	272.8	1.641	0.457	2.098
140	223.1	56.5	279.5	1.593	0.403	1.997
150	230.4	53.0	283.4	1.536	0.353	1.889
160	235.4	49.2	284.6	1.471	0.308	1.779
170	238.2	45.3	283.5	1.401	0.266	1.668
180	239.1	41.4	280.5	1.328	0.230	1.558
190	238.2	37.5	275.7	1.254	0.197	1.451
200	235.7	33.8	269.5	1.179	0.169	1.348

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P9 / SW-B-P9 / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

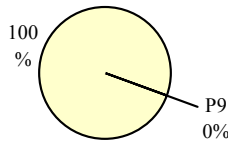
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:

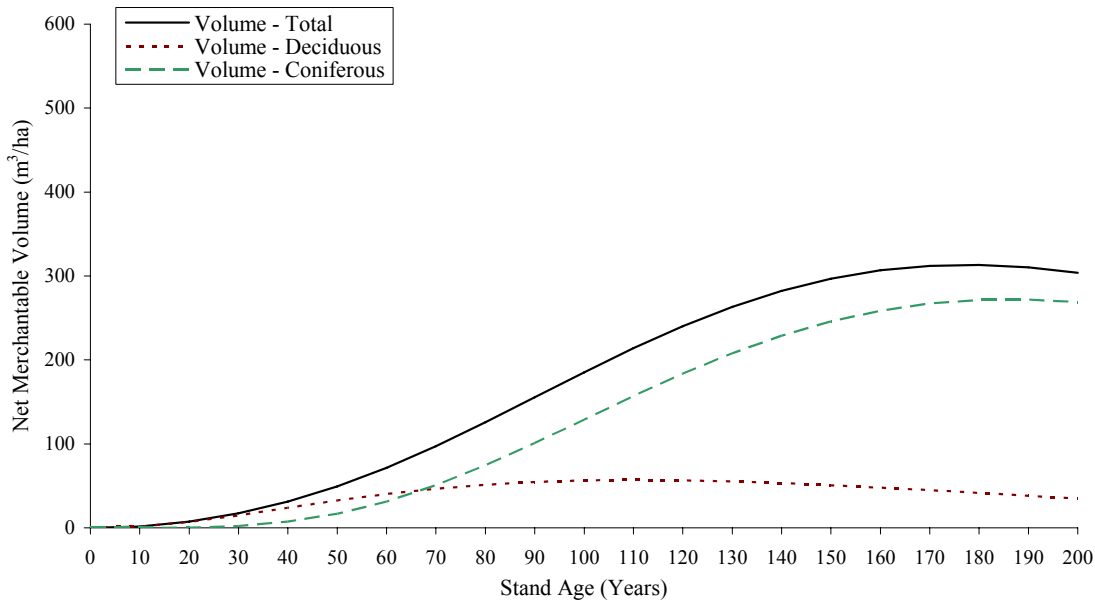


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.6	1.0	2.6	0.163	0.099	0.262
20	9.8	4.2	14.0	0.488	0.210	0.699
30	24.3	8.5	32.8	0.810	0.284	1.094
40	43.7	13.1	56.8	1.093	0.327	1.420
50	66.4	17.4	83.8	1.328	0.348	1.675
60	90.7	21.1	111.8	1.511	0.352	1.863
70	115.3	24.1	139.4	1.647	0.345	1.992
80	139.2	26.4	165.6	1.740	0.330	2.070
90	161.6	27.9	189.5	1.795	0.310	2.105
100	181.8	28.7	210.6	1.818	0.287	2.106
110	199.6	29.0	228.6	1.815	0.263	2.078
120	214.7	28.7	243.4	1.789	0.239	2.029
130	227.0	28.1	255.1	1.747	0.216	1.962
140	236.6	27.1	263.7	1.690	0.193	1.883
150	243.5	25.8	269.3	1.623	0.172	1.796
160	247.9	24.4	272.3	1.549	0.153	1.702
170	250.0	22.9	272.9	1.470	0.135	1.605
180	250.0	21.3	271.3	1.389	0.119	1.507
190	248.1	19.7	267.8	1.306	0.104	1.410
200	244.6	18.2	262.7	1.223	0.091	1.314

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.

FMU P6 / SW-CD-P6 / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

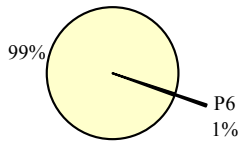
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	1,122
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Stratum as a % of the active landbase, FMU P6:



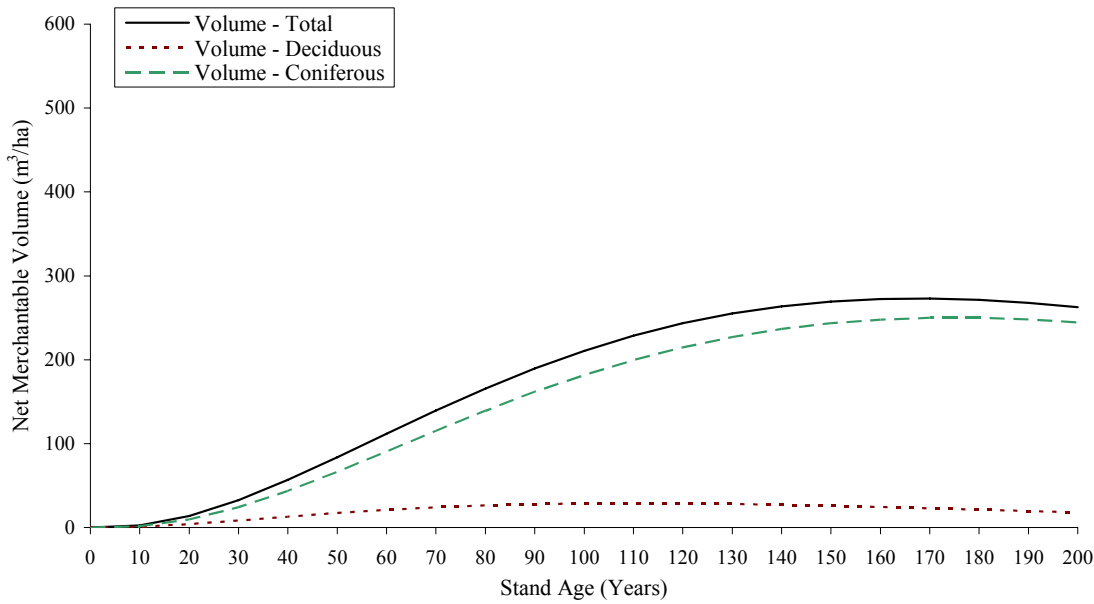
Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	1.5	1.5	0.001	0.146	0.147
20	0.4	7.0	7.4	0.020	0.350	0.370
30	2.3	15.0	17.3	0.078	0.501	0.578
40	7.4	23.9	31.3	0.185	0.598	0.783
50	16.8	32.6	49.4	0.337	0.651	0.988
60	31.3	40.3	71.6	0.522	0.671	1.193
70	50.7	46.6	97.3	0.725	0.665	1.390
80	74.3	51.4	125.7	0.929	0.642	1.571
90	100.8	54.7	155.5	1.120	0.607	1.727
100	128.8	56.5	185.3	1.288	0.565	1.853
110	156.9	57.1	214.0	1.426	0.520	1.945
120	183.6	56.7	240.3	1.530	0.472	2.002
130	207.9	55.4	263.2	1.599	0.426	2.025
140	228.9	53.3	282.2	1.635	0.381	2.016
150	245.9	50.8	296.7	1.639	0.339	1.978
160	258.7	47.9	306.6	1.617	0.299	1.917
170	267.2	44.8	312.0	1.572	0.264	1.835
180	271.5	41.6	313.1	1.509	0.231	1.739
190	271.9	38.3	310.2	1.431	0.202	1.633
200	268.8	35.1	303.9	1.344	0.175	1.519

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

² Maximum MAI highlighted in blue.



FMU P9 / SW-B-P9 / Post-91 Managed Stand Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	0%
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

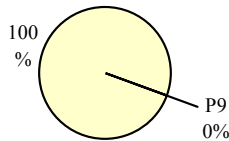
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Stratum Area (ha) :	0
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Stratum as a % of the active landbase, FMU P9:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.6	1.0	2.6	0.163	0.099	0.262
20	9.8	4.2	14.0	0.488	0.210	0.699
30	24.3	8.5	32.8	0.810	0.284	1.094
40	43.7	13.1	56.8	1.093	0.327	1.420
50	66.4	17.4	83.8	1.328	0.348	1.675
60	90.7	21.1	111.8	1.511	0.352	1.863
70	115.3	24.1	139.4	1.647	0.345	1.992
80	139.2	26.4	165.6	1.740	0.330	2.070
90	161.6	27.9	189.5	1.795	0.310	2.105
100	181.8	28.7	210.6	1.818	0.287	2.106
110	199.6	29.0	228.6	1.815	0.263	2.078
120	214.7	28.7	243.4	1.789	0.239	2.029
130	227.0	28.1	255.1	1.747	0.216	1.962
140	236.6	27.1	263.7	1.690	0.193	1.883
150	243.5	25.8	269.3	1.623	0.172	1.796
160	247.9	24.4	272.3	1.549	0.153	1.702
170	250.0	22.9	272.9	1.470	0.135	1.605
180	250.0	21.3	271.3	1.389	0.119	1.507
190	248.1	19.7	267.8	1.306	0.104	1.410
200	244.6	18.2	262.7	1.223	0.091	1.314

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

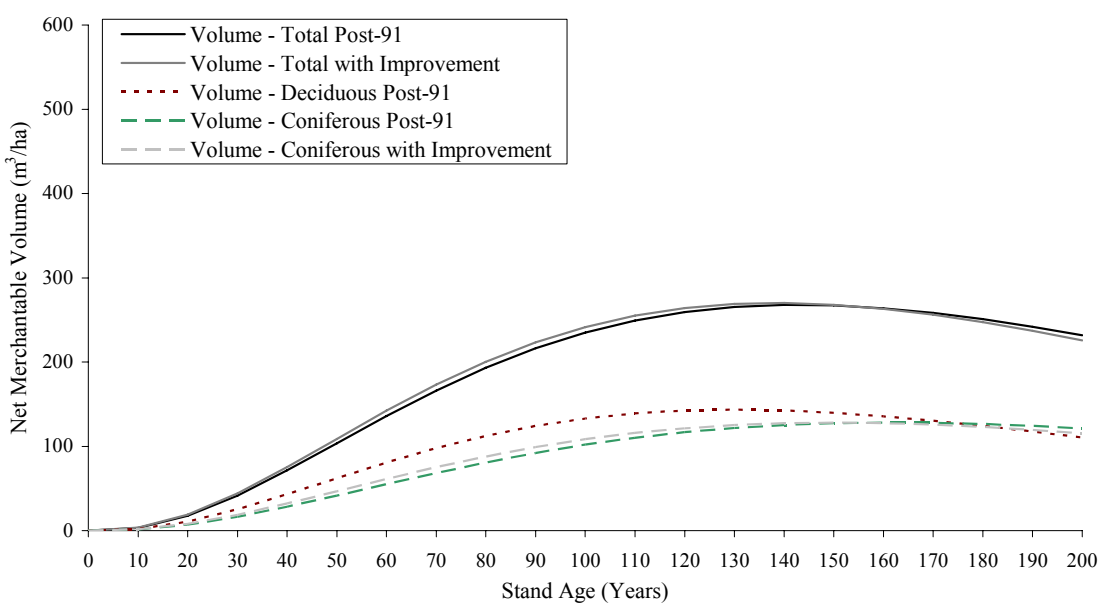
² Maximum MAI highlighted in blue.



Appendix XII Yield Curves: Tree Improvement



FMU P6 & P9 / DC-BCD-COMB / Tree Improvement Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	5% @ 110 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

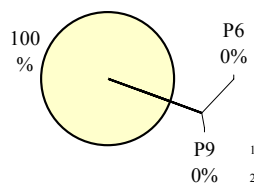
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	0
P9 Area (ha):	0

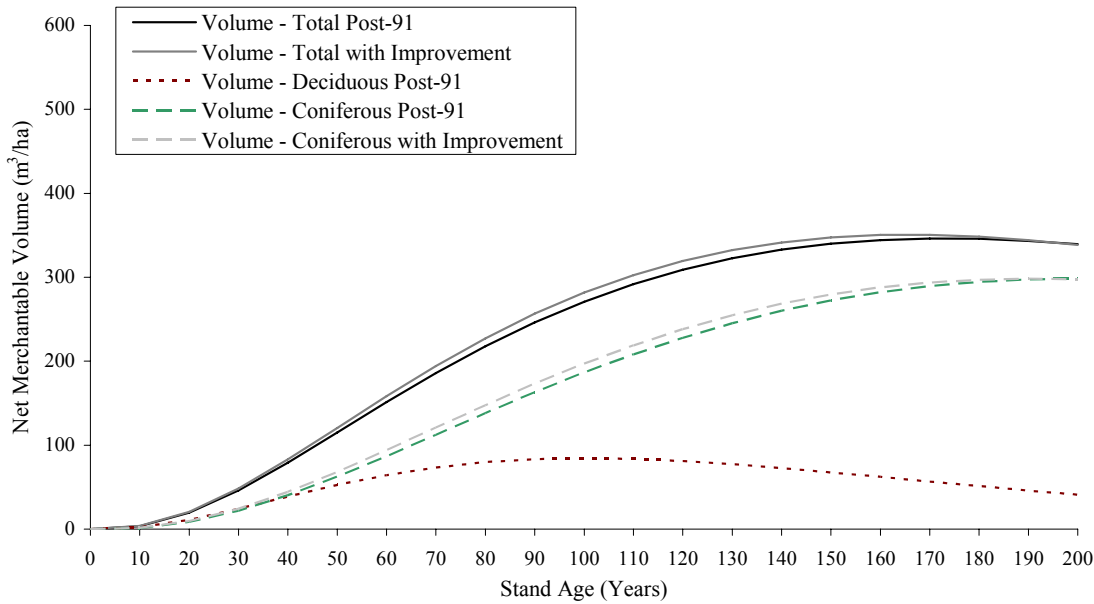
Stratum as a % of the active landbase:



¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.5	1.9	3.4	0.152	0.192	0.344
20	8.1	10.8	18.9	0.405	0.539	0.944
30	18.8	25.3	44.1	0.626	0.845	1.471
40	32.1	43.2	75.3	0.802	1.081	1.883
50	46.6	62.3	108.9	0.932	1.246	2.179
60	61.3	80.9	142.2	1.021	1.348	2.370
70	75.3	97.9	173.1	1.075	1.398	2.473
80	88.0	112.4	200.4	1.100	1.405	2.506
90	99.2	124.2	223.4	1.102	1.380	2.482
100	108.5	133.1	241.6	1.085	1.331	2.416
110	116.0	139.2	255.1	1.054	1.265	2.319
120	121.6	142.6	264.1	1.013	1.188	2.201
130	125.4	143.6	269.0	0.965	1.105	2.069
140	127.5	142.6	270.2	0.911	1.019	1.930
150	128.2	139.9	268.1	0.855	0.932	1.787
160	127.6	135.7	263.3	0.797	0.848	1.645
170	125.8	130.4	256.2	0.740	0.767	1.507
180	123.1	124.3	247.4	0.684	0.691	1.374
190	119.5	117.6	237.1	0.629	0.619	1.248
200	115.3	110.5	225.9	0.577	0.553	1.129

FMU P6 & P9 / CD-BCD-COMB / Tree Improvement Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	5% @ 110 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

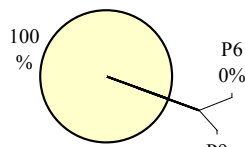
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	0
P9 Area (ha):	0

Stratum as a % of the active landbase:

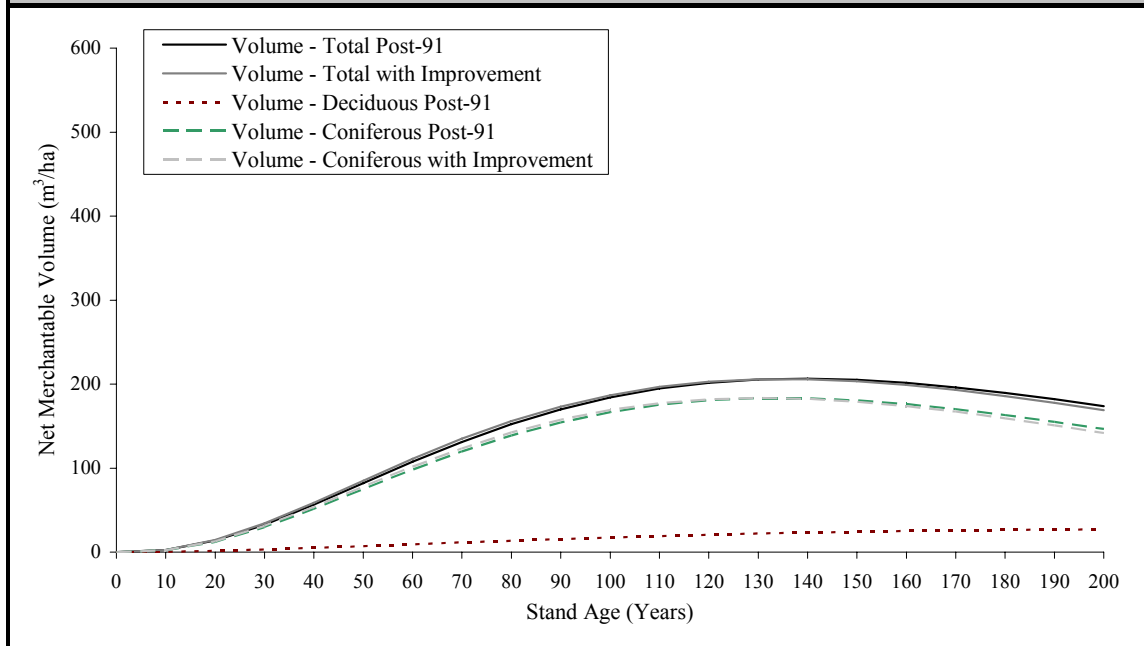


¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.6	2.2	3.8	0.160	0.215	0.376
20	9.7	11.1	20.7	0.484	0.553	1.037
30	24.4	24.3	48.6	0.812	0.809	1.620
40	44.3	38.8	83.1	1.108	0.970	2.078
50	68.0	52.6	120.6	1.360	1.053	2.413
60	94.0	64.4	158.4	1.566	1.074	2.640
70	120.8	73.5	194.4	1.726	1.051	2.777
80	147.6	79.8	227.4	1.844	0.998	2.842
90	173.2	83.4	256.6	1.925	0.926	2.851
100	197.2	84.5	281.7	1.972	0.845	2.817
110	219.0	83.7	302.6	1.991	0.760	2.751
120	238.3	81.2	319.4	1.986	0.676	2.662
130	254.9	77.4	332.3	1.960	0.596	2.556
140	268.7	72.8	341.5	1.919	0.520	2.439
150	279.7	67.7	347.4	1.865	0.451	2.316
160	288.1	62.2	350.3	1.800	0.389	2.189
170	293.8	56.7	350.6	1.728	0.334	2.062
180	297.2	51.3	348.5	1.651	0.285	1.936
190	298.4	46.0	344.4	1.571	0.242	1.813
200	297.6	41.0	338.6	1.488	0.205	1.693



FMU P6 / PL-BCD-P6 / Tree Improvement Yield Curve With Cull

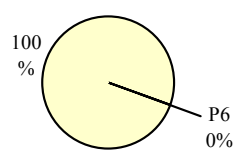


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	2% @ 90 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

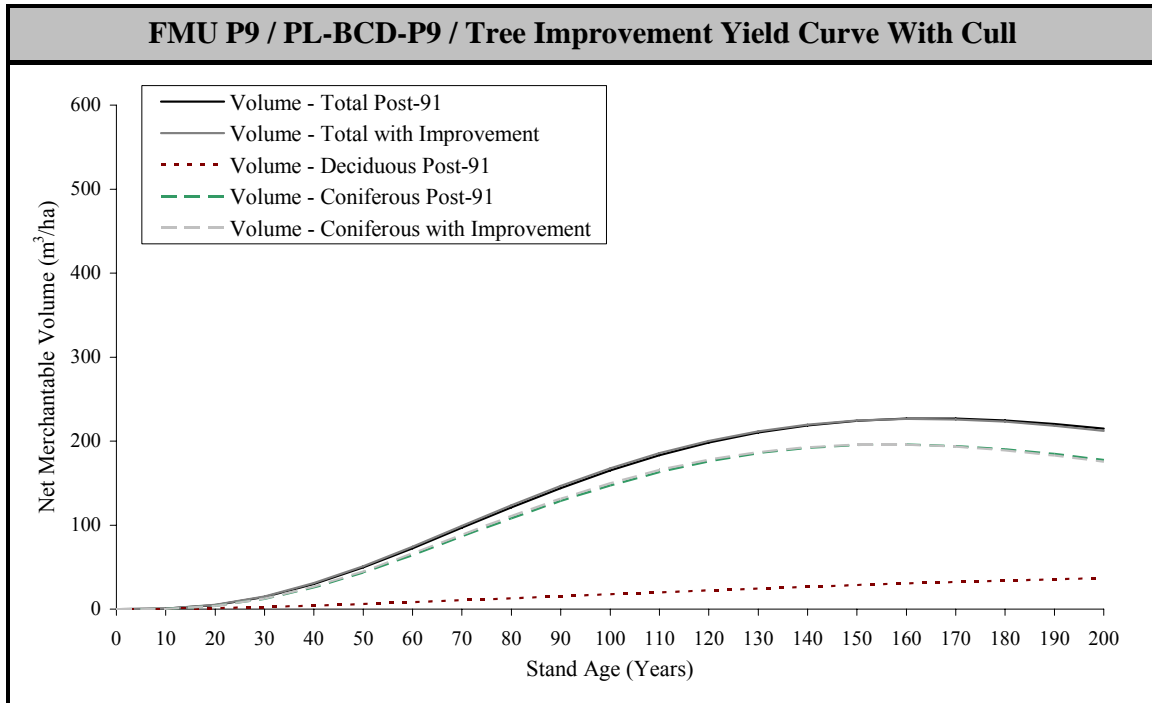
Stratum Summary:	
Stratum Area (ha) :	0

Stratum as a % of the active landbase, FMU P6:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.3	0.4	2.6	0.227	0.036	0.263
20	13.1	1.5	14.6	0.654	0.074	0.729
30	31.2	3.1	34.3	1.040	0.104	1.144
40	53.7	5.0	58.8	1.344	0.126	1.470
50	78.0	7.1	85.1	1.560	0.143	1.702
60	101.8	9.3	111.1	1.696	0.155	1.851
70	123.6	11.5	135.0	1.765	0.164	1.929
80	142.4	13.6	156.0	1.780	0.170	1.950
90	157.7	15.6	173.3	1.753	0.173	1.926
100	169.4	17.5	186.9	1.694	0.175	1.869
110	177.4	19.2	196.6	1.613	0.175	1.787
120	182.0	20.8	202.8	1.517	0.173	1.690
130	183.6	22.1	205.7	1.412	0.170	1.583
140	182.5	23.4	205.8	1.304	0.167	1.470
150	179.1	24.4	203.5	1.194	0.163	1.357
160	173.9	25.2	199.1	1.087	0.158	1.245
170	167.2	25.9	193.2	0.984	0.153	1.136
180	159.4	26.5	185.9	0.886	0.147	1.033
190	150.9	26.9	177.8	0.794	0.141	0.936
200	141.8	27.1	168.9	0.709	0.136	0.845

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

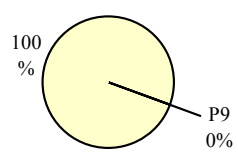


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	2% @ 90 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	0

Stratum as a % of the active landbase, FMU P9:

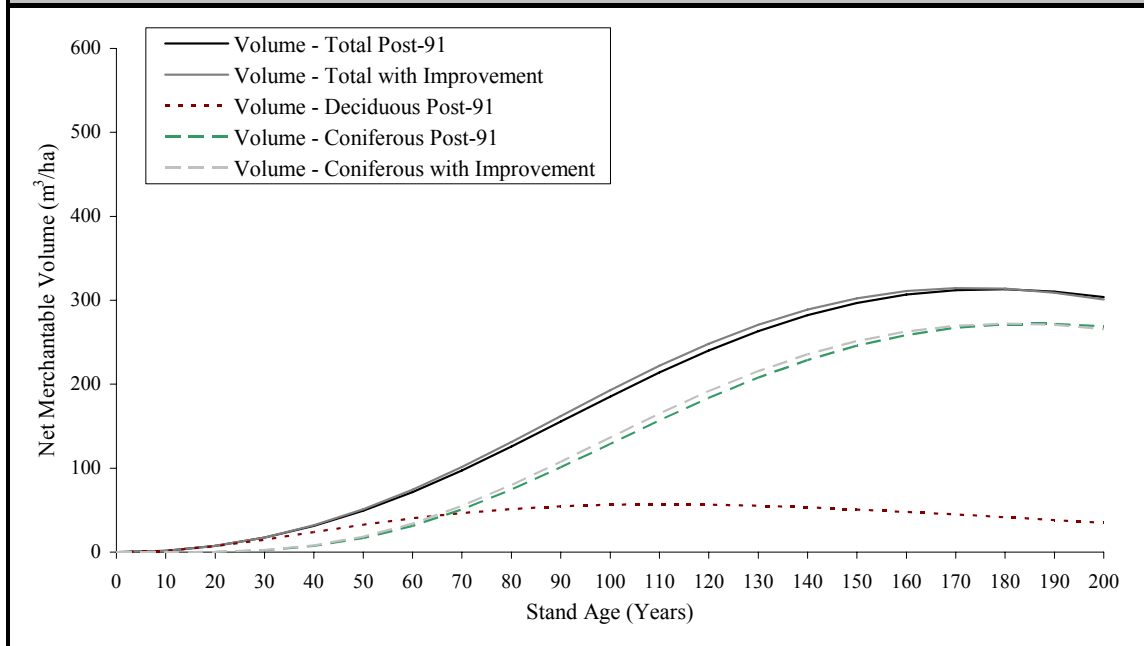


Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.4	0.3	0.6	0.039	0.026	0.065
20	3.9	1.1	5.1	0.196	0.057	0.253
30	12.6	2.5	15.1	0.421	0.083	0.505
40	26.7	4.2	30.9	0.667	0.105	0.771
50	45.0	6.1	51.2	0.900	0.123	1.023
60	66.2	8.3	74.5	1.103	0.138	1.241
70	88.6	10.5	99.1	1.265	0.151	1.416
80	110.8	12.9	123.6	1.384	0.161	1.546
90	131.5	15.3	146.8	1.462	0.170	1.631
100	150.0	17.7	167.7	1.500	0.177	1.677
110	165.7	20.0	185.7	1.506	0.182	1.688
120	178.1	22.3	200.4	1.484	0.186	1.670
130	187.2	24.5	211.7	1.440	0.189	1.628
140	193.0	26.6	219.7	1.379	0.190	1.569
150	195.8	28.7	224.5	1.306	0.191	1.497
160	195.9	30.6	226.5	1.224	0.191	1.415
170	193.5	32.4	225.9	1.138	0.191	1.329
180	189.0	34.1	223.1	1.050	0.189	1.240
190	182.9	35.6	218.5	0.963	0.187	1.150
200	175.4	37.0	212.4	0.877	0.185	1.062

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.



FMU P6 / SW-CD-P6 / Tree Improvement Yield Curve With Cull

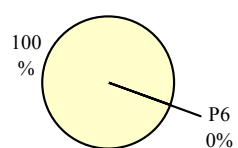


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	5% @ 110 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	0

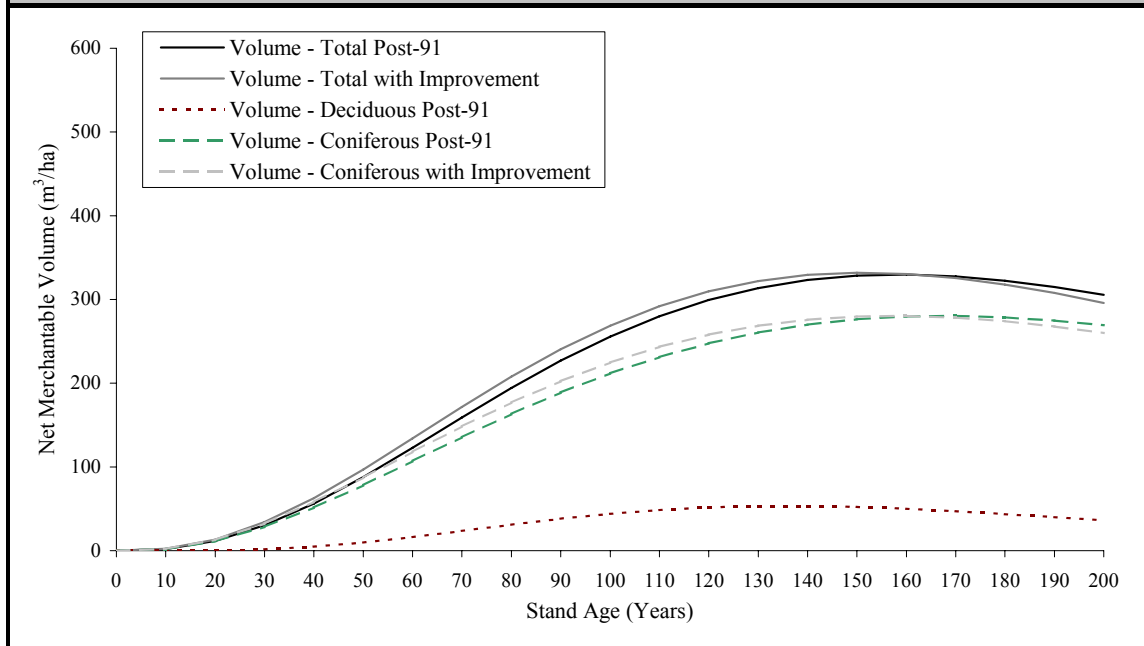
Stratum as a % of the active landbase, FMU P6:



Stand Age	Predicted Net Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	1.5	1.5	0.001	0.146	0.147
20	0.4	7.0	7.4	0.022	0.350	0.372
30	2.6	15.0	17.6	0.086	0.501	0.587
40	8.1	23.9	32.1	0.204	0.598	0.802
50	18.5	32.6	51.0	0.369	0.651	1.021
60	34.1	40.3	74.4	0.568	0.671	1.239
70	54.8	46.6	101.4	0.783	0.665	1.449
80	79.7	51.4	131.1	0.997	0.642	1.639
90	107.4	54.7	162.1	1.194	0.607	1.801
100	136.4	56.5	192.9	1.364	0.565	1.929
110	164.9	57.1	222.1	1.499	0.520	2.019
120	191.7	56.7	248.4	1.598	0.472	2.070
130	215.6	55.4	271.0	1.659	0.426	2.084
140	235.8	53.3	289.1	1.684	0.381	2.065
150	251.6	50.8	302.4	1.677	0.339	2.016
160	262.9	47.9	310.8	1.643	0.299	1.943
170	269.7	44.8	314.5	1.587	0.264	1.850
180	272.2	41.6	313.8	1.512	0.231	1.743
190	270.8	38.3	309.0	1.425	0.202	1.627
200	265.8	35.1	300.9	1.329	0.175	1.504

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.
² Maximum MAI highlighted in blue.

FMU P9 / SW-CD-P9 / Tree Improvement Yield Curve With Cull

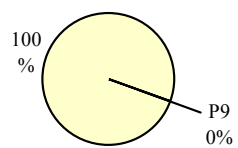


Modification Parameters:	
Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Deciduous Decline:	0%
Improvement:	5% @ 110 y
Regen Lag - Coniferous :	2 y
Regen Lag - Deciduous:	N/A

Utilization Standards:	
Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:	
Stratum Area (ha) :	0

Stratum as a % of the active landbase, FMU P9:



Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0	0.0	0.000	0.000	0.000
10	2.2	0.012	2.2	0.216	0.001	0.217
20	13.1	0.332	13.4	0.653	0.017	0.669
30	32.5	1.703	34.2	1.082	0.057	1.139
40	58.0	4.762	62.8	1.451	0.119	1.570
50	87.3	9.669	97.0	1.746	0.193	1.940
60	118.0	16.11	134.1	1.967	0.268	2.235
70	148.3	23.46	171.7	2.118	0.335	2.453
80	176.8	30.99	207.8	2.210	0.387	2.597
90	202.5	38.01	240.5	2.250	0.422	2.672
100	224.8	44.01	268.8	2.248	0.440	2.688
110	243.3	48.64	291.9	2.212	0.442	2.654
120	257.9	51.72	309.7	2.149	0.431	2.580
130	268.7	53.26	322.0	2.067	0.410	2.477
140	275.9	53.37	329.3	1.971	0.381	2.352
150	279.7	52.24	331.9	1.864	0.348	2.213
160	280.4	50.1	330.5	1.752	0.313	2.065
170	278.4	47.19	325.6	1.637	0.278	1.915
180	274.0	43.76	317.8	1.522	0.243	1.766
190	267.7	40	307.7	1.409	0.211	1.620
200	259.8	36.12	295.9	1.299	0.181	1.479

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

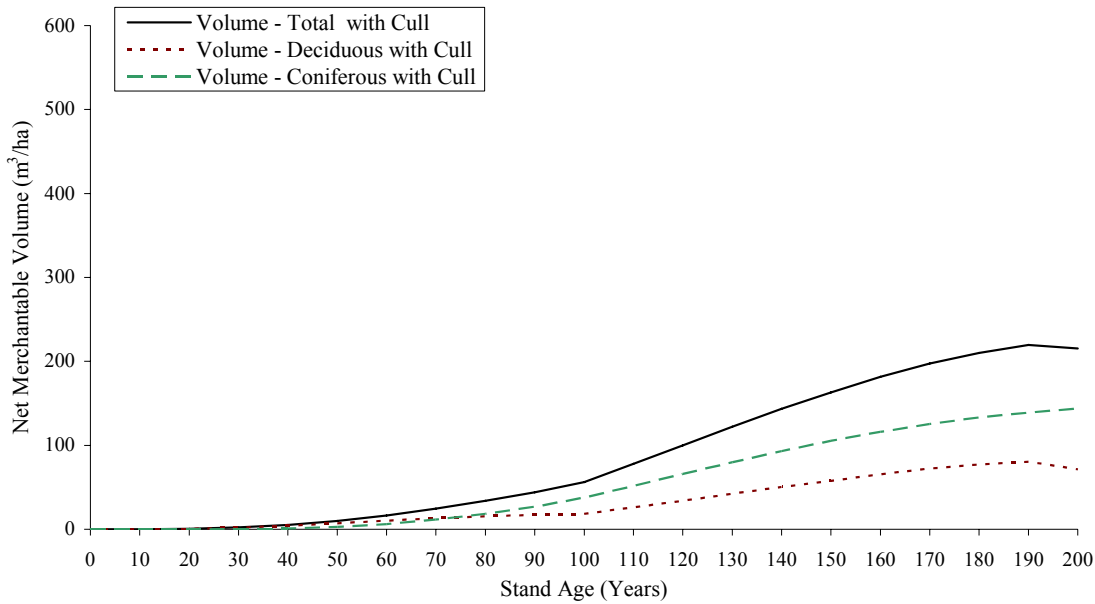
² Maximum MAI highlighted in blue.



Appendix XIII Yield Curves: Understory Protection



FMU P6 & P9 / DU-A-COMB / Understory Protection Yield Curve With Cull



Modification Parameters:

Cull - Coniferous:	4.6%
Cull - Deciduous:	9%
Dec. Decline:	Variable
See Yield Curve Document	
Improvement:	0%
Regen Lag - Coniferous:	2 y
Regen Lag - Deciduous:	N/A

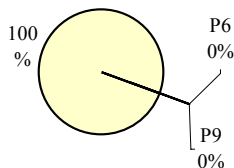
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

P6 Area (ha):	250
P9 Area (ha):	0

Stratum as a % of the active landbase:



Stand Age	Predicted Net Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.0	0.0	0.0	0.000	0.004	0.004
20	0.0	0.5	0.6	0.001	0.027	0.029
30	0.2	2.0	2.2	0.008	0.066	0.073
40	1.0	4.3	5.3	0.025	0.107	0.133
50	2.9	7.2	10.1	0.058	0.144	0.201
60	6.3	10.3	16.5	0.105	0.171	0.276
70	11.5	13.1	24.6	0.164	0.187	0.351
80	18.4	15.5	33.9	0.230	0.194	0.424
90	26.9	17.2	44.1	0.298	0.191	0.490
100	37.7	18.4	56.1	0.377	0.184	0.561
110	51.6	26.3	77.9	0.469	0.239	0.709
120	65.9	34.0	99.9	0.549	0.284	0.833
130	80.0	42.4	122.3	0.615	0.326	0.941
140	93.2	50.4	143.7	0.666	0.360	1.026
150	105.4	57.7	163.1	0.703	0.385	1.087
160	116.1	65.6	181.7	0.726	0.410	1.136
170	125.4	72.3	197.7	0.738	0.425	1.163
180	133.1	77.2	210.3	0.739	0.429	1.168
190	139.1	80.4	219.6	0.732	0.423	1.156
200	143.7	71.5	215.2	0.718	0.357	1.076

¹ Net volume is calculated at the utilization standards specified on this page and includes cull.

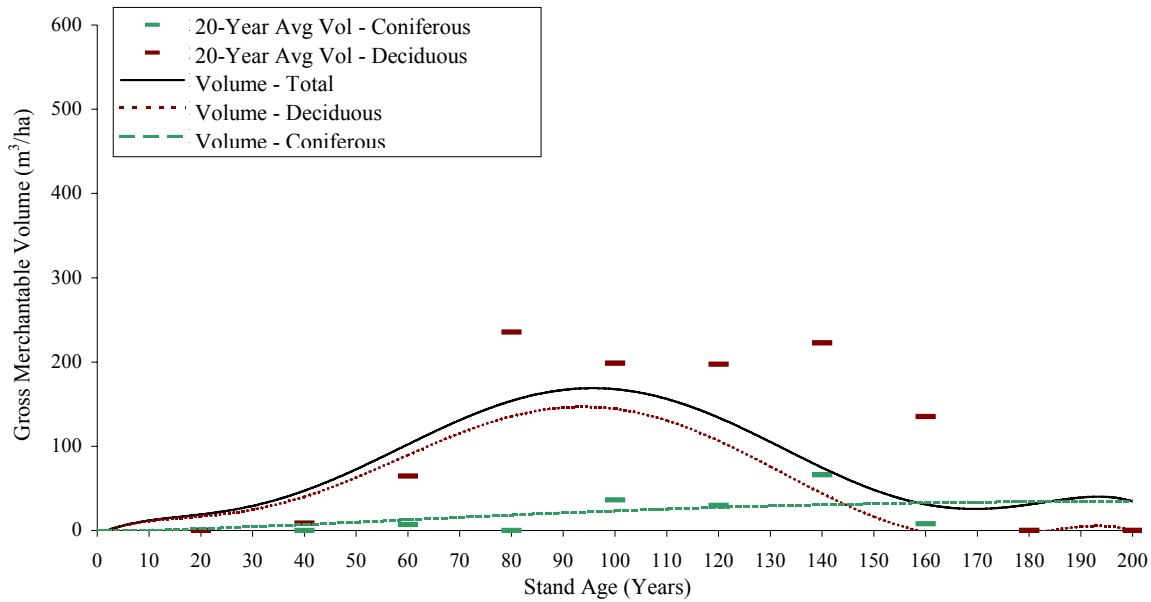
² Maximum MAI highlighted in blue.



Appendix XIV Yield Curves: Composite



FMU P6 & P9 / COMPOSITE / D Broad Cover Group



Stand Age	Predicted Gross Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.7	3.0	3.6	0.066	0.298	0.364
20	2.3	13.0	15.2	0.114	0.648	0.762
30	4.5	28.6	33.1	0.150	0.953	1.103
40	7.1	47.7	54.8	0.177	1.192	1.369
50	9.9	68.3	78.2	0.198	1.366	1.564
60	12.8	88.8	101.6	0.213	1.480	1.693
70	15.6	108.0	123.7	0.223	1.543	1.767
80	18.4	125.2	143.5	0.229	1.565	1.794
90	20.9	139.7	160.7	0.233	1.553	1.785
100	23.3	151.5	174.8	0.233	1.515	1.748
110	25.5	142.7	168.2	0.232	1.297	1.529
120	27.5	111.5	139.0	0.229	0.929	1.158
130	29.2	76.5	105.7	0.224	0.589	0.813
140	30.6	39.4	70.1	0.219	0.282	0.501
150	31.9	1.9	33.7	0.212	0.012	0.225
160	32.9	0.0	32.9	0.205	0.000	0.205
170	33.7	0.0	33.7	0.198	0.000	0.198
180	34.3	0.0	34.3	0.190	0.000	0.190
190	34.7	0.0	34.7	0.182	0.000	0.182
200	34.9	0.0	34.9	0.174	0.000	0.174

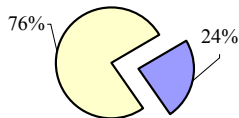
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	69,683
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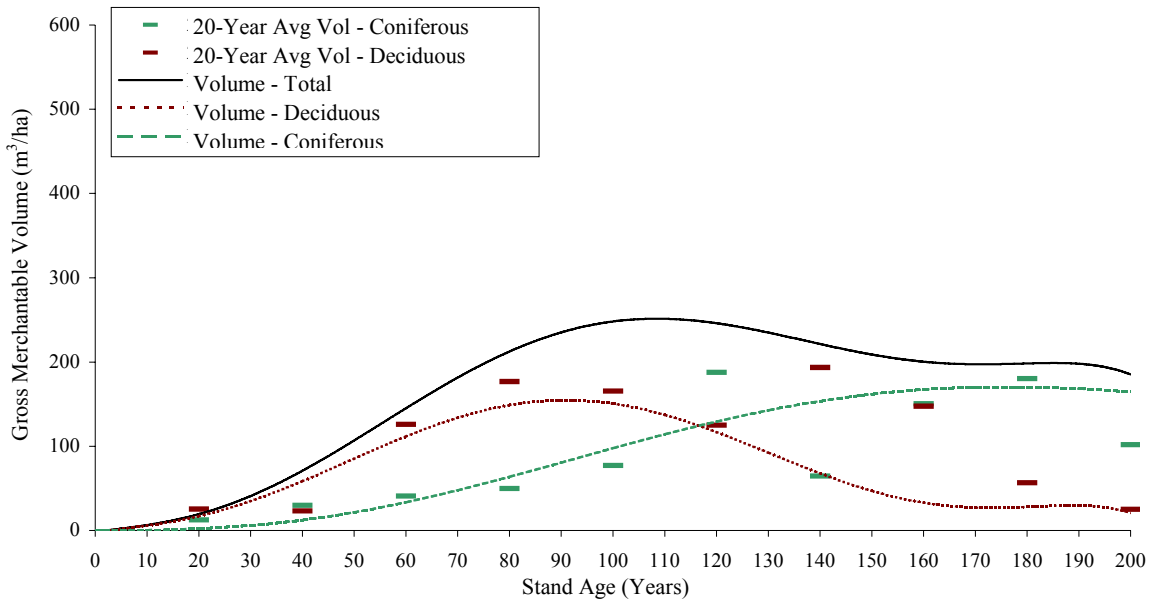
Composite as a % of the total active landbase:



¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / COMPOSITE / DC Broad Cover Group



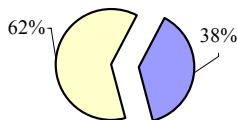
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	112,186
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Composite as a % of the total active landbase:



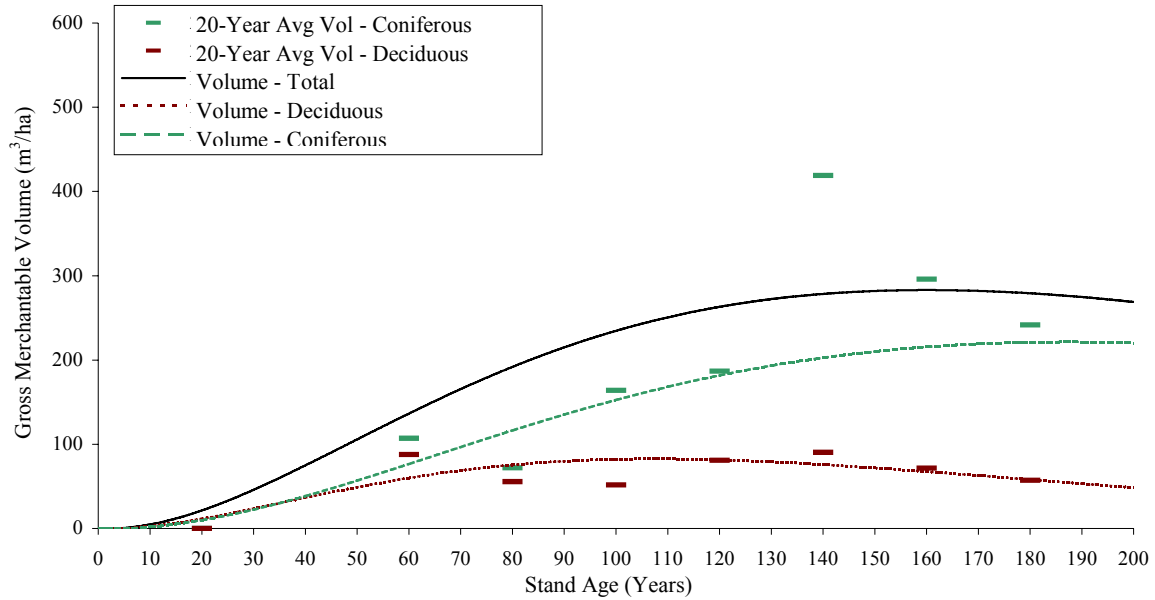
Stand Age	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.4	3.2	3.7	0.043	0.325	0.368
20	2.3	15.7	17.9	0.115	0.783	0.897
30	6.2	36.2	42.4	0.207	1.206	1.412
40	12.6	61.3	73.9	0.315	1.533	1.848
50	21.7	87.3	109.0	0.434	1.746	2.180
60	33.5	111.0	144.5	0.558	1.851	2.408
70	47.6	130.4	178.0	0.680	1.863	2.543
80	63.5	144.4	207.9	0.794	1.804	2.598
90	80.5	152.6	233.1	0.894	1.696	2.590
100	97.7	155.5	253.2	0.977	1.555	2.532
110	114.2	143.3	257.5	1.038	1.302	2.341
120	129.4	117.2	246.6	1.078	0.977	2.055
130	142.7	90.4	233.0	1.097	0.695	1.792
140	153.5	64.6	218.1	1.096	0.462	1.558
150	161.7	41.4	203.1	1.078	0.276	1.354
160	167.2	36.3	203.5	1.045	0.227	1.272
170	170.0	32.3	202.3	1.000	0.190	1.190
180	170.3	28.6	198.9	0.946	0.159	1.105
190	168.4	25.2	193.6	0.886	0.133	1.019
200	164.5	22.2	186.7	0.823	0.111	0.933

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / COMPOSITE / CD Broad Cover Group



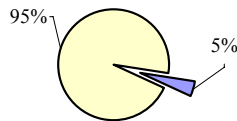
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	13,490
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Composite as a % of the total active landbase:

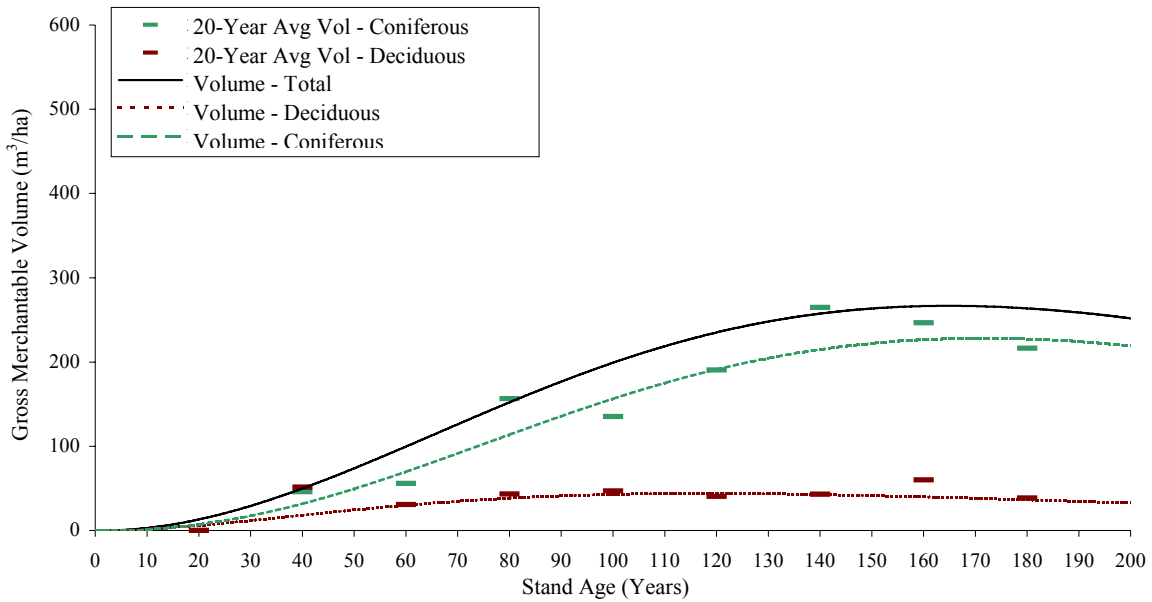


Stand Age	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	2.2	2.9	5.2	0.222	0.294	0.517
20	9.8	11.5	21.3	0.491	0.577	1.067
30	22.2	23.5	45.7	0.741	0.782	1.523
40	38.3	36.5	74.8	0.957	0.912	1.870
50	56.8	49.0	105.8	1.135	0.980	2.116
60	76.6	60.0	136.5	1.276	1.000	2.276
70	96.7	68.9	165.6	1.382	0.984	2.366
80	116.5	75.5	191.9	1.456	0.943	2.399
90	135.2	79.8	215.0	1.502	0.887	2.389
100	152.5	82.1	234.6	1.525	0.821	2.346
110	168.0	82.5	250.5	1.528	0.750	2.278
120	181.6	81.4	263.0	1.514	0.678	2.192
130	193.2	79.1	272.3	1.486	0.608	2.094
140	202.7	75.8	278.5	1.448	0.542	1.989
150	210.1	71.9	282.0	1.401	0.479	1.880
160	215.6	67.5	283.1	1.347	0.422	1.769
170	219.2	62.8	282.0	1.289	0.370	1.659
180	221.1	58.0	279.1	1.228	0.322	1.551
190	221.4	53.2	274.7	1.165	0.280	1.446
200	220.4	48.6	268.9	1.102	0.243	1.345

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / COMPOSITE / C Broad Cover Group



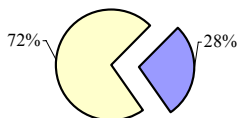
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	81,721
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Composite as a % of the total active landbase:



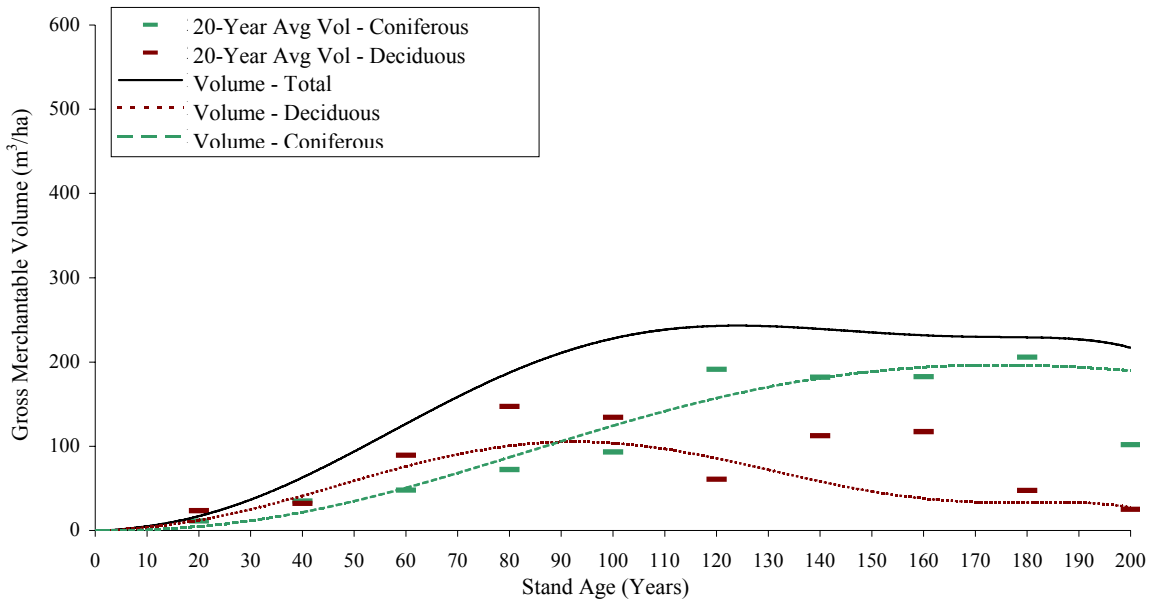
Stand Age	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.5	1.6	3.1	0.147	0.161	0.308
20	7.1	5.9	13.1	0.357	0.297	0.654
30	17.3	11.8	29.1	0.577	0.393	0.971
40	31.7	18.2	49.8	0.791	0.454	1.246
50	49.4	24.4	73.8	0.988	0.487	1.475
60	69.7	29.9	99.6	1.161	0.499	1.660
70	91.5	34.6	126.1	1.307	0.495	1.802
80	113.8	38.3	152.1	1.423	0.479	1.902
90	135.7	41.0	176.7	1.508	0.456	1.964
100	156.3	42.8	199.1	1.563	0.428	1.991
110	174.9	43.7	218.7	1.590	0.397	1.988
120	191.1	43.9	235.0	1.593	0.366	1.959
130	204.5	43.5	248.0	1.573	0.335	1.907
140	214.8	42.6	257.4	1.534	0.304	1.839
150	222.2	41.4	263.5	1.481	0.276	1.757
160	226.5	39.8	266.4	1.416	0.249	1.665
170	228.2	38.2	266.3	1.342	0.224	1.567
180	227.3	36.4	263.6	1.263	0.202	1.465
190	224.2	34.5	258.7	1.180	0.182	1.361
200	219.1	32.7	251.8	1.096	0.164	1.259

¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.



FMU P6 & P9 / COMPOSITE / Coniferous Landdbase (C/CD/DC Broad Cover Group)



Stand Age	Predicted Gross Merchantable Volume ¹ (m³/ha)			Mean Annual Increment (m³/ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	1.0	2.6	3.5	0.096	0.258	0.354
20	4.7	11.6	16.3	0.235	0.578	0.813
30	11.6	25.7	37.4	0.387	0.858	1.246
40	21.8	42.7	64.5	0.544	1.068	1.612
50	34.9	60.0	94.9	0.698	1.200	1.898
60	50.5	75.8	126.3	0.842	1.263	2.105
70	68.1	88.7	156.8	0.973	1.267	2.239
80	86.8	98.1	184.9	1.085	1.226	2.311
90	105.8	103.9	209.7	1.176	1.155	2.330
100	124.3	106.3	230.7	1.243	1.063	2.307
110	141.6	100.1	241.7	1.288	0.910	2.198
120	157.1	86.0	243.1	1.309	0.717	2.026
130	170.3	71.2	241.5	1.310	0.547	1.857
140	180.9	56.7	237.5	1.292	0.405	1.697
150	188.7	43.4	232.0	1.258	0.289	1.547
160	193.7	39.7	233.4	1.211	0.248	1.459
170	196.1	36.6	232.7	1.154	0.215	1.369
180	196.1	33.6	229.6	1.089	0.186	1.276
190	193.8	30.7	224.5	1.020	0.162	1.182
200	189.7	28.0	217.7	0.948	0.140	1.088

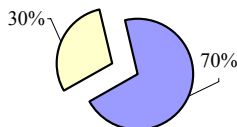
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	207,398
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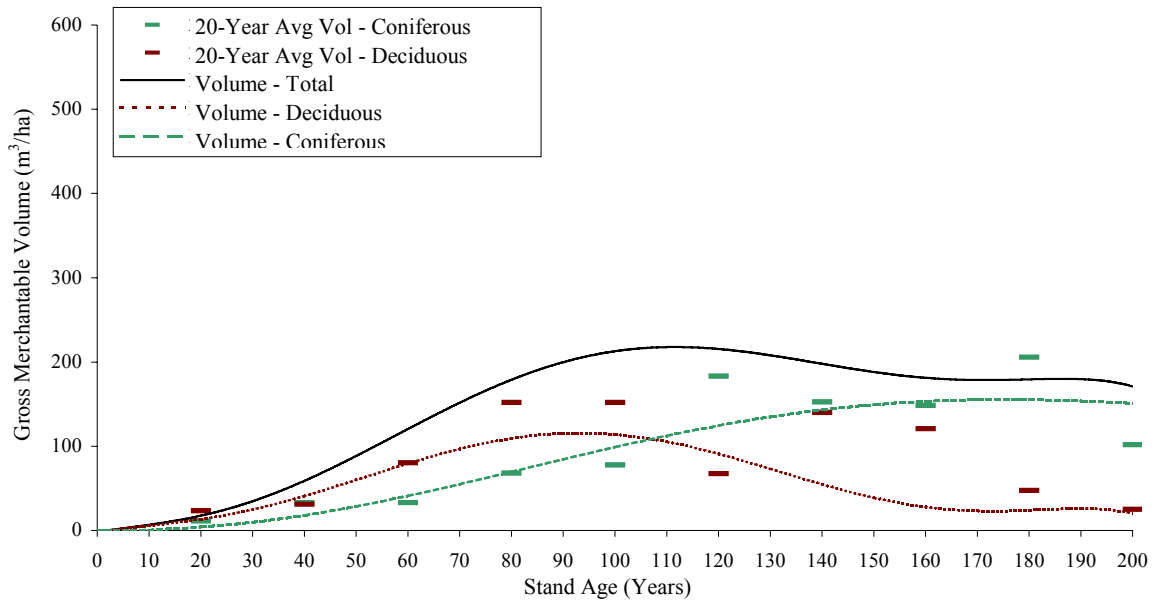
Composite as a % of the total active landbase:



¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

² Maximum MAI highlighted in blue.

FMU P6 & P9 / COMPOSITE / Total Landbase (C/CD/DC/D Broad Cover Group)



Stand Age	Predicted Gross Merchantable Volume ¹ (m ³ /ha)			Mean Annual Increment (m ³ /ha/year) ²		
	Conifer	Deciduous	Total	Conifer	Deciduous	Total
0	0.0	0.0	0.0	0.000	0.000	0.000
10	0.9	2.7	3.6	0.089	0.268	0.357
20	4.1	11.9	16.0	0.204	0.596	0.800
30	9.8	26.5	36.3	0.328	0.882	1.210
40	18.1	44.0	62.0	0.452	1.099	1.551
50	28.6	62.1	90.7	0.572	1.242	1.814
60	41.0	79.0	120.1	0.684	1.317	2.001
70	54.9	93.5	148.4	0.784	1.336	2.120
80	69.6	104.9	174.5	0.870	1.311	2.181
90	84.5	112.9	197.4	0.938	1.255	2.193
100	98.9	117.7	216.6	0.989	1.177	2.166
110	112.4	110.8	223.2	1.022	1.007	2.029
120	124.5	92.4	216.9	1.038	0.770	1.808
130	134.8	72.5	207.3	1.037	0.558	1.595
140	143.1	52.4	195.4	1.022	0.374	1.396
150	149.2	32.9	182.2	0.995	0.220	1.214
160	153.3	29.7	183.0	0.958	0.186	1.144
170	155.3	27.4	182.6	0.913	0.161	1.074
180	155.4	25.1	180.5	0.863	0.140	1.003
190	153.8	23.0	176.8	0.809	0.121	0.930
200	150.7	21.0	171.7	0.754	0.105	0.859

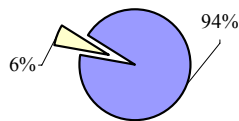
Utilization Standards:

Con. Top Diameter (cm):	11.0
Dec. Top Diameter (cm):	10.0
Stump Diameter (cm):	15.0
Stump Height-All (cm):	30.0
Minimum Log Length (m):	2.60

Stratum Summary:

Composite Area (ha):	277,081
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Composite as a % of the total active landbase:

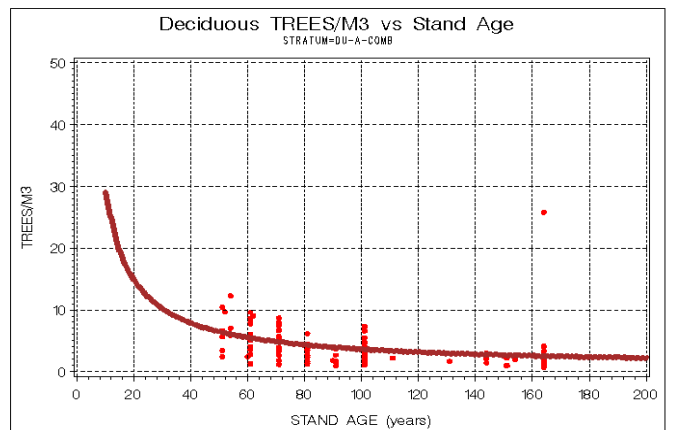
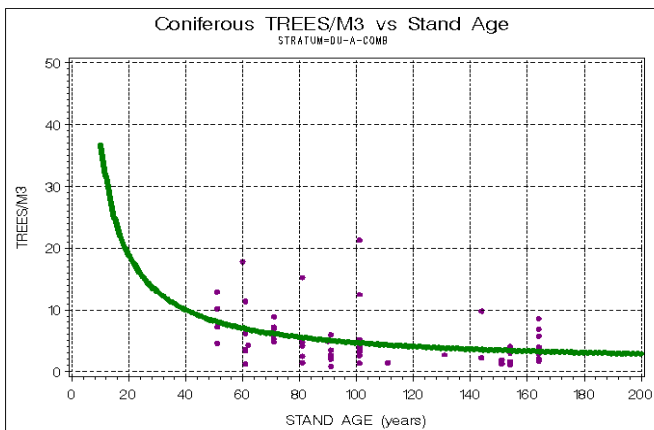
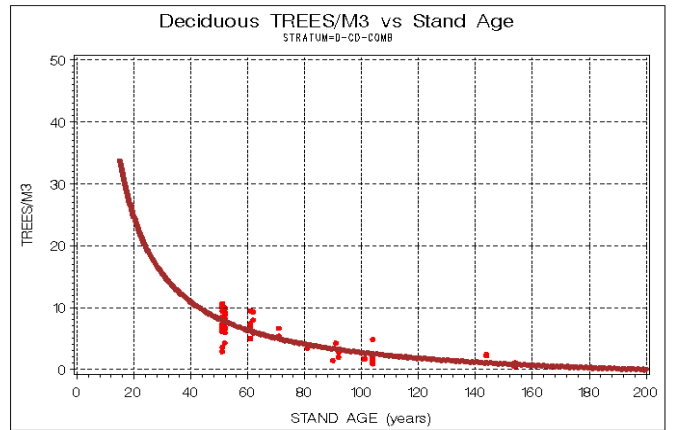
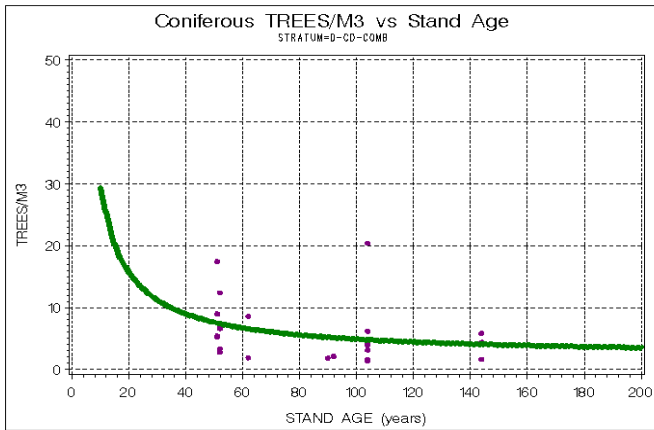
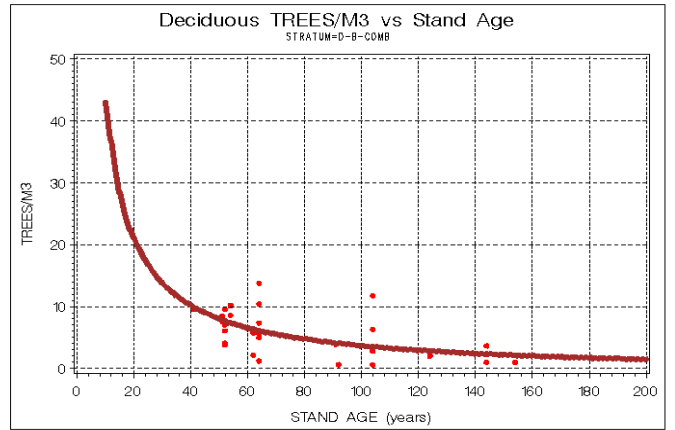
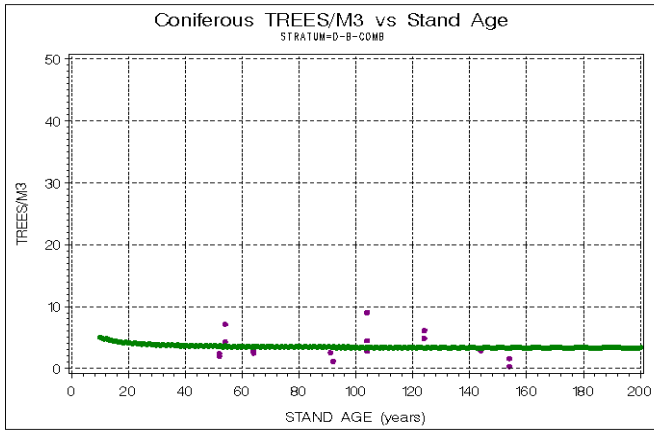


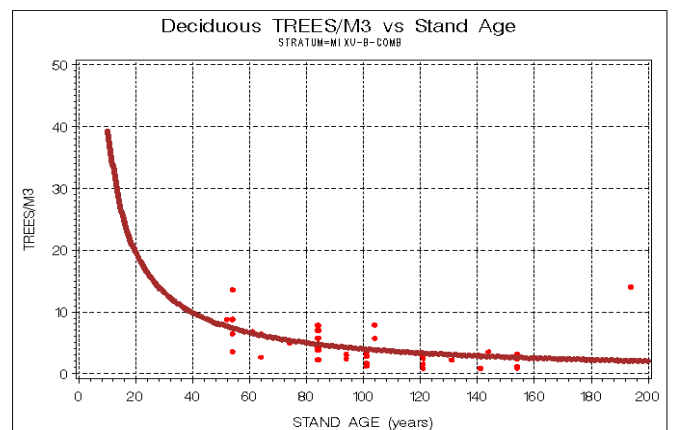
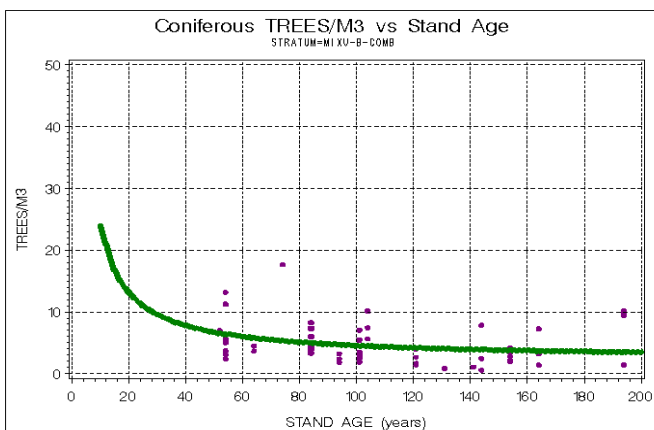
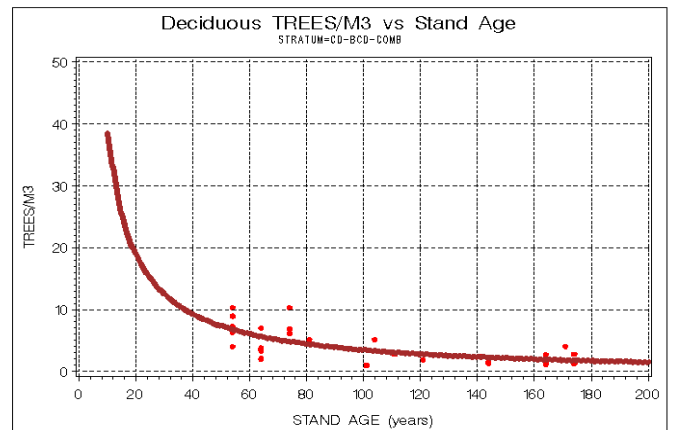
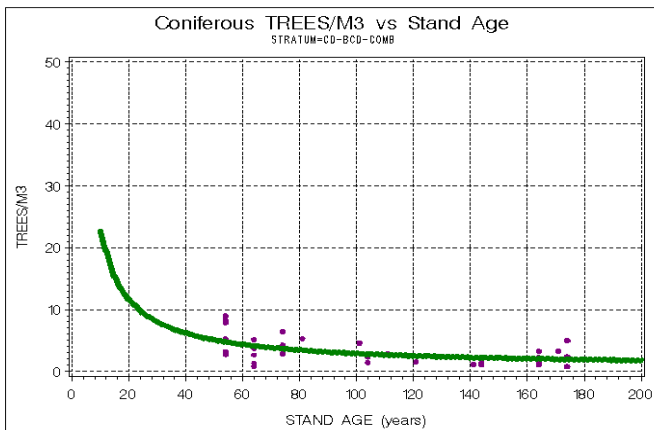
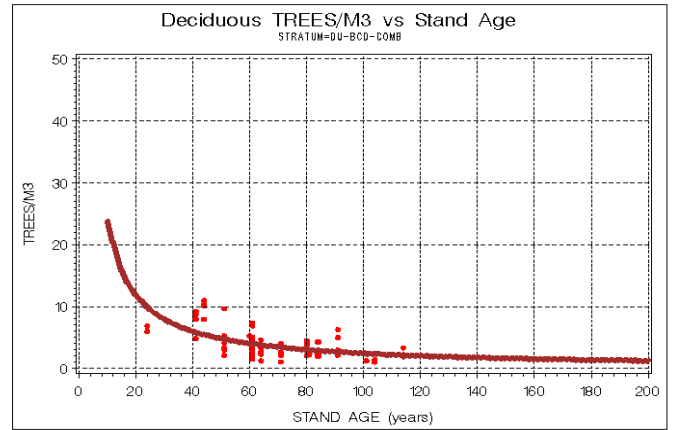
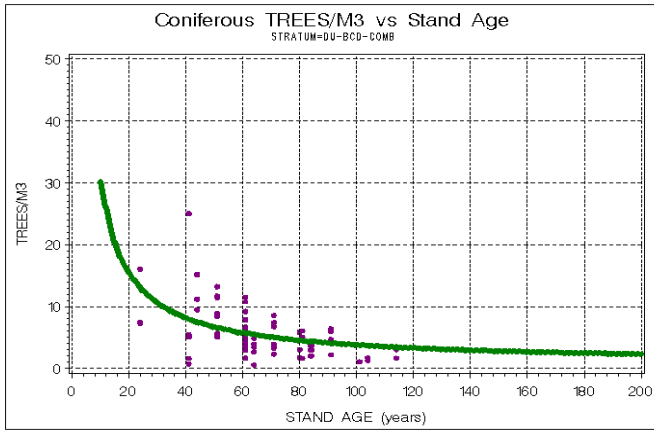
¹ Gross volume is calculated at the utilization standards specified on this page with no deductions for cull.

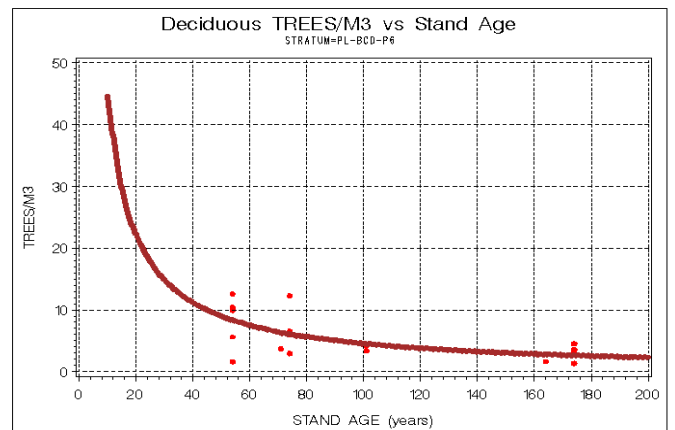
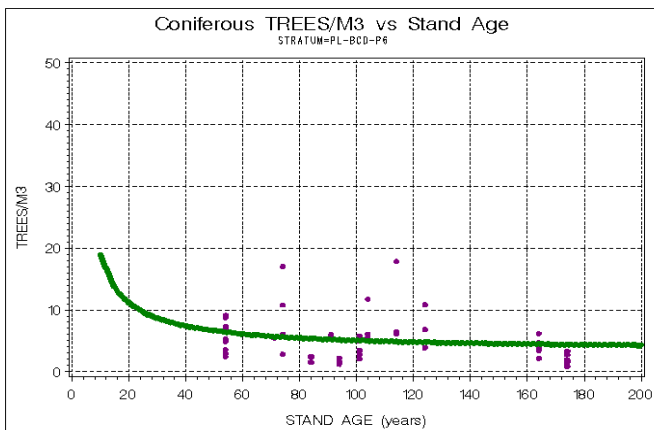
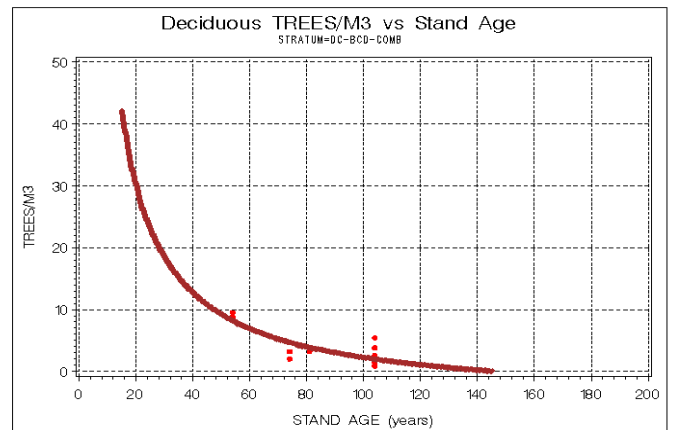
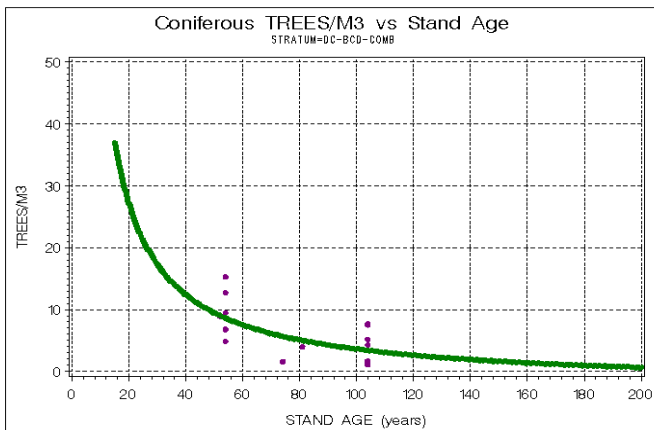
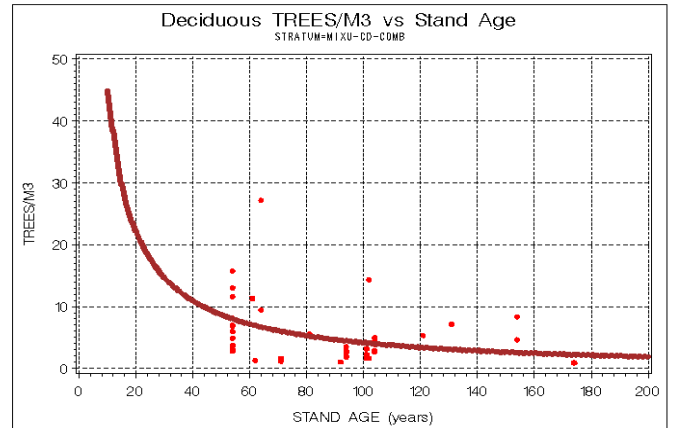
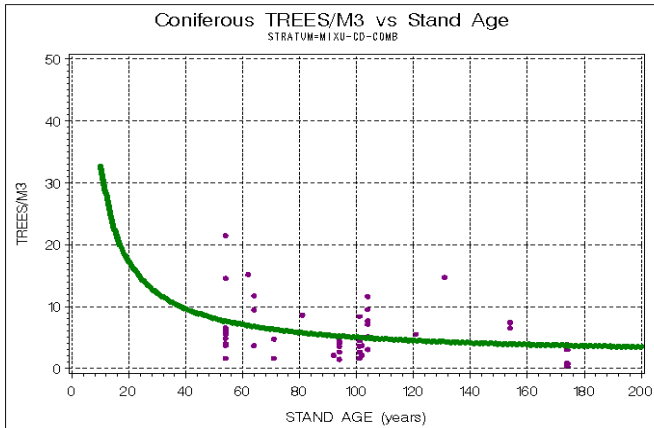
² Maximum MAI highlighted in blue.

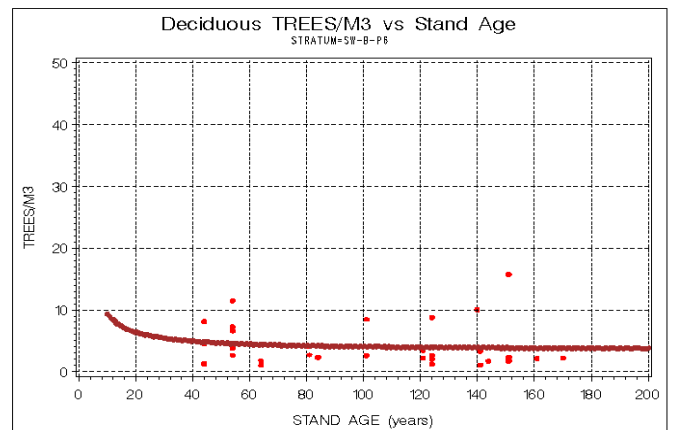
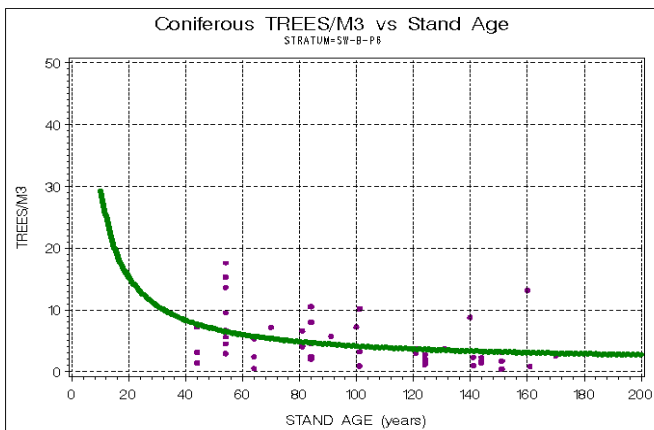
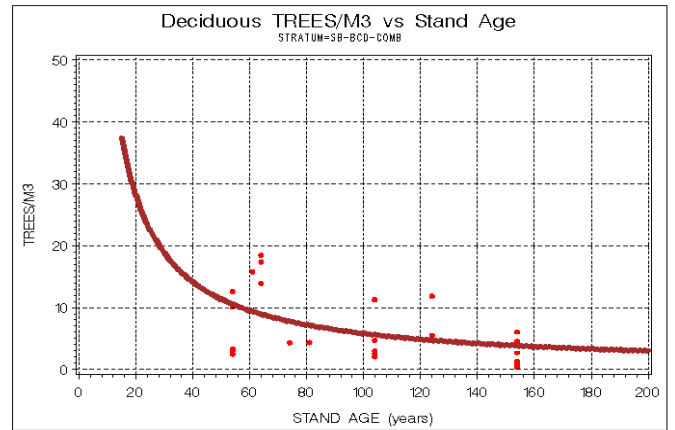
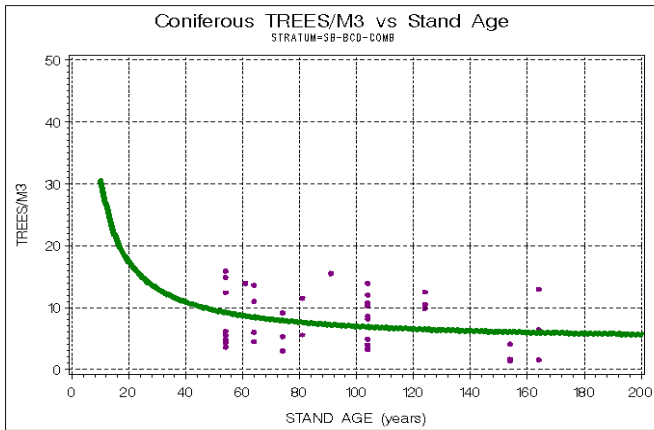
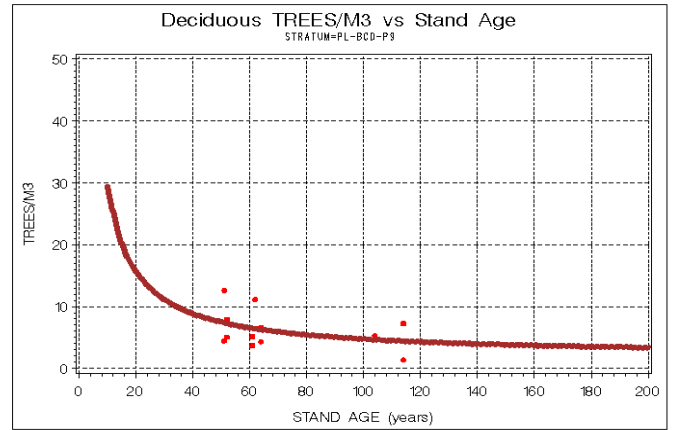
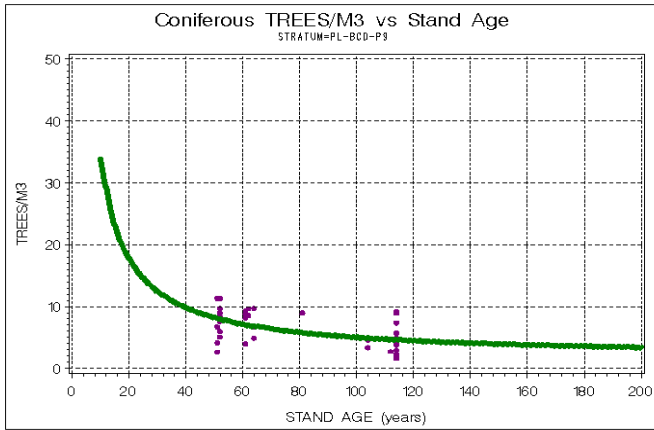


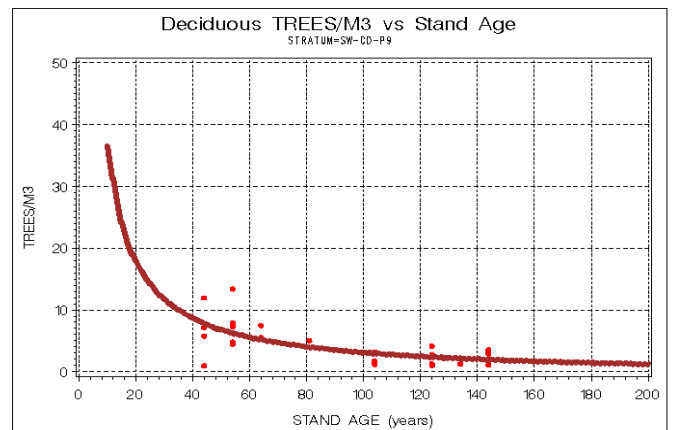
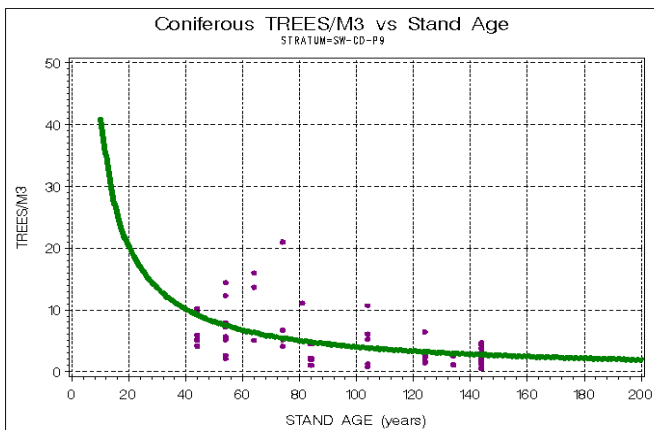
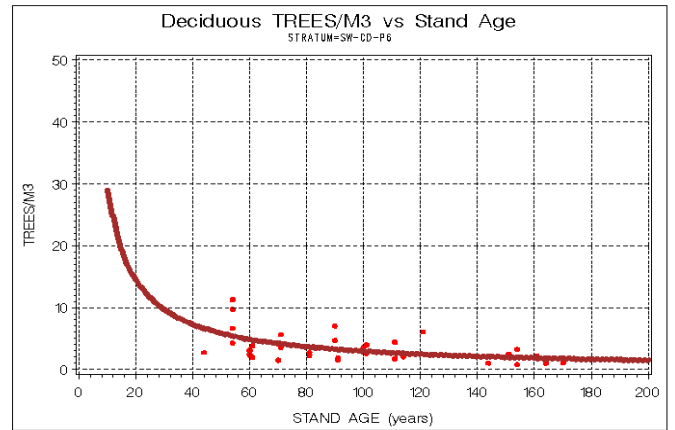
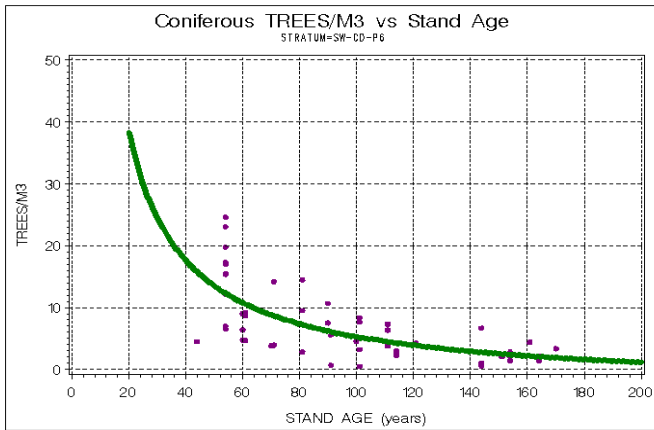
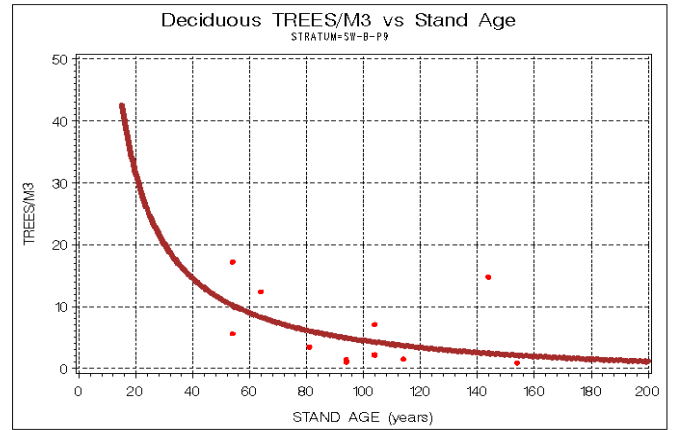
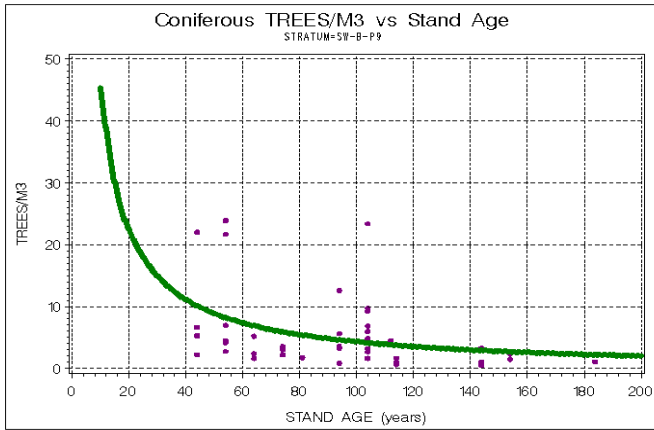
Appendix XV Yield Curves: Piece Size



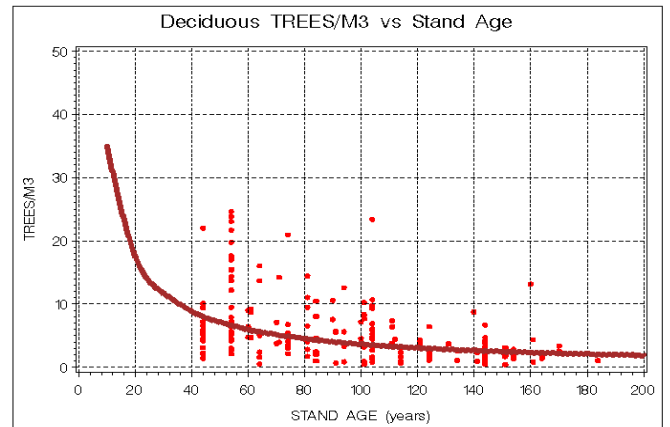
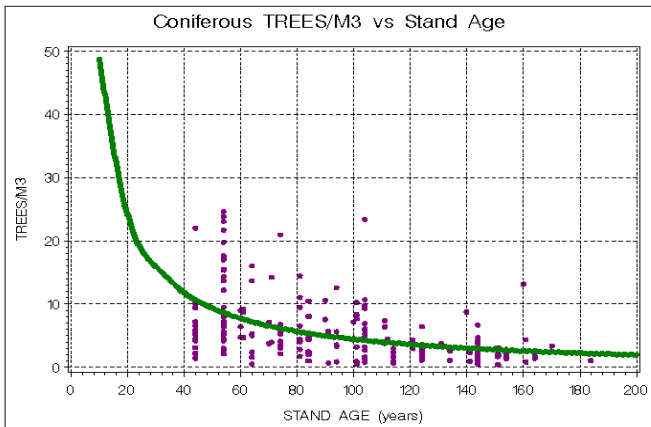








The following curve is an average of the four SW pieces size curves: SW-B-P6, SW-B-P9, SW-CD-P6 and SW-CD-P9.





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