Determining the AAC for
The Weyerhaeuser Edson FMA
Component#2: Landbase Allocations

Forest Management Agreement Area
FMA #9700035

November 24, 2004

1 Introduction

In support of the Detailed Forest Management Plan (DFMP) this document explains the process of using inventory data to summarize the Weyerhaeuser Edson Forest Management Agreement (FMA) landbase. This is the second component of a three part technical series (first component: *Stand Yield Protections*, third component: *Timber Supply Modeling*) used to estimate the sustainable annual allowable cut (AAC) for the Weyerhaeuser Edson FMA.

A Weyerhaeuser core value is to manage forestlands for the sustainable production of raw materials while protecting water quality, fish and wildlife habitat, soil productivity, and cultural, historical, aesthetic values. The landbase allocation process considered these values when delineating the operable landbase. The overall goal of this document is to provide data that can be used as input into the timber supply modeling process.

The area of the Edson FMA straddles nearly 510,000 ha of the Lower and Upper Foothills natural regions of Alberta (Figure 1). Four forest management units (FMUs) make up the area of the Edson FMA: E1, E2, W5, and W6.

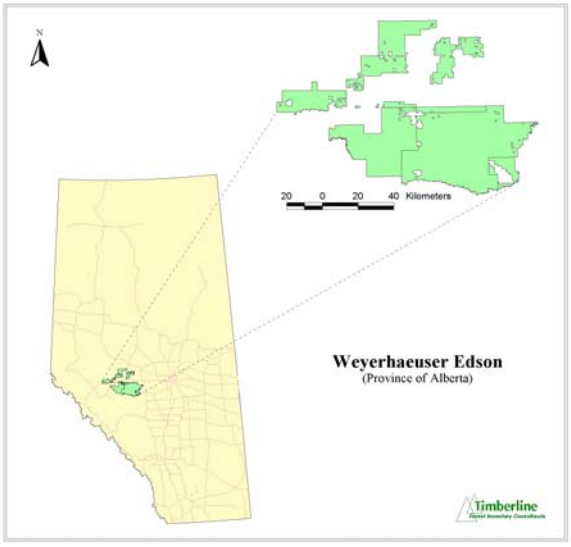

Figure 1-1Weyerhaeuser Edson: Forest Management Area

2 Data layers and methods

Various data sources were used to provide the final results for this report, which include:

- Alberta Vegetation Inventory (AVI)
- SiteLogix ecosite assignments
- Fourth order watershed boundaries
- ARIS silviculture records
- Boundaries of Weyerhaeuser's harvest design areas (HDAs)
- Grazing Dispositions
- Historic Resources (archeological potential)
- Provincial natural sub-region boundary
- ESIP zones
- Linear Dispositions and other polygonal dispositions
- Cutlines
- Private Land
- Parks
- Water course data
- Historical cutblocks
- Future planned cutblocks
- Historical Fire Boundaries
- Pioneer PNT area

The start date to be used for the TSA modeling is May 1, 2004, therefore the most current data that was available was used for all layers provided. To assist the auditing process when landbase data fields are referenced they will be referenced in ***BOLD ITALICS*** in the form ***[FILE:FIELD]*** (if no file is indicated then the start file ***FMA_2004*** is to be assumed).

2.1 AVI inventory background

Weyerhaeuser Company completed an AVI standard forest inventory (Version 2.0) that covered the entire Edson Forest Management Area (FMA).

The FMU W6 inventory was based on aerial photography which was taken in 1995 and was approved by the provincial government in 1996; whereas for E1, E2, and W5 the aerial photography was taken in 1998 and approved by the provincial government in 2004.

All fields from the approved AVI layer were included in the final netdown. The AVI field names used were consistent with the AVI standards manual (Alberta Environmental Protection 1991). The AVI layer is considered the key data in the netdown process as it enables various forest cover types to be identified, defined, and located.

2.2 Tools used

Two software types were used to process the netdown data. All spatial data was handled through ARCGIS 9.0, and all netdown and data processing was done using SAS 8.2. FoxPro 6.0 was also used intermittently for translating data between the two former software platforms. In addition FoxPro 6.0 assisted in querying and error checking data base files.

2.3 GIS processing

The process of overlaying all spatial GIS layers was completed by Silvacom Ltd. (see appendix 5.6 for technical details). All spatial data sources are described in this section.

2.4 Administrative designations

Administrative designations are legal boundaries that include:

Forest Management Agreement (FMA) [***FMA***] and the **Forest Management Unit** (FMU) boundaries [***FMU***] – Considerable effort was taken to ensure that Edson FMA and FMU boundaries were correctly portrayed. The FMA, and FMU boundaries used as an input layer were based on cross-referencing information provided from Silvacom with Alberta Provincial Government officials and Weyerhaeuser employees.

Weyerhaeuser Land Management Units (LMU**)** ***[LMU]*** and **Harvest Design Areas** (HDA) ***[Workarea]*** – LMUs and HDAs are areas internally defined by Weyerhaeuser to assist with operational activities. HDAs will be used during the TSA modeling to control locations of harvesting activities and LMUs are used during the landbase netdown to provide information for assigning the expected regeneration forest type on cutblocks (section 2.8.4).

2.5 Non-harvesting type dispositions

There are numerous non-industrial forestry management activities that occur within the Edson FMA. Therefore any dispositions within the FMA that do not allow for complete integration with forest harvesting activities were identified and removed from the harvestable landbase.

2.5.1 Landuse dispositions

Land use dispositions include activities such as roads, pipelines, and various types of easements (including: electrical, and vegetation control). Sometimes this information is captured in the AVI inventory process as either anthropogenic vegetated land or anthropogenic non-vegetated land. However, due to the continually changing nature and location of human activities across the landscape, separate spatial layers (Section 5.3) that specifically captured these disturbances were overlaid against the AVI layer to ensure increased accuracy.

Linear type disturbances were estimated by an average disturbance width applied (Table 2-1) as a buffer. To simplify processing, a single field ***[LU_LINE]*** was used that flagged polygons (using a 1 or 0) as being part of a linear disposition or not. If more detailed information on the specific types of linear dispositions is desired, then the input spatial layer file (lu_line.e00) will need to be referenced. All linear dispositions were included within the total FMA area (although technically that area is outside the FMA) but were removed from the FMA net harvestable landbase.

Table 2-1 Types of linear dispositions and total buffer width applied

Type of Disposition	Disposition Code	Total Disturbance Width* (m)
Disposition reservations	DRS	20
License of occupation	LOC	20
Pipeline installation lease	PIL	15
Rural electrification association easement	REA	10
Vegetation control easement	VCE	15
Easement	EZE	15
Miscellaneous lease	MLL	20
Pipeline agreement	PLA	20
Private land sale	PLS	15
Right-of-entry agreement	ROE	20
Forestry road	FRD	20
Mineral surface lease	MSL	20
Roadway	RDS	20
Registered roadway	RRD	20

* - Total Disturbance widths includes disturbance on both sides of the buffered line delineating the centre of the disturbance. Therefore, a pipeline agreement (PLA) has a 7.5m buffer applied and a total expected disturbance width of 15m.

Polygon type dispositions were also applied by simply overlaying their boundaries (tda.e00) onto the AVI layer. Unlike linear dispositions, polygonal landuse dispositions were individually identified in the netdown processed database ***[LANDUSE]*** (Table 2-2). More specifically the pioneer protective notation PNT ***[PNT]*** and Disposition Reservations ***[DRS]*** type dispositions were assigned individual fields to allow for tracking of each individual disposition number. The Pioneer PNT (PNT990220) ***[Pioneer]*** was individually flagged because (during the modeling process) harvest activities will be prohibited in that area for the first 10 years of the harvest sequence. All polygon dispositions (except for PNTs and GEOs) were removed from the FMA net harvestable landbase. GEOs are typically only in effect for 1 year therefore these areas were included in the net harvestable landbase. PNTs are included in the net landbase and will be dealt with on an operational basis.

Table 2-2 Polygon Type Dispositions

• DRS – Disposition reservation	• PLA – Pipeline agreement
• EZE – Easement	• PRI – Unknown Code
• GEO - Geophysical exploration	• REC – Recreation lease
• ISP - Industrial Sample Plot	• ROE – Right-of-entry agreement
• LOC – License of occupation	• SMC – Surface material licence
• MLL – Miscellaneous lease	• SME – Surface material exploration
• MLP – Miscellaneous permit	• SML – Surface material lease
• MSL – Mineral surface lease	• VCE - Vegetation Control Easements
• PIL – Pipeline installation lease	• WDL - Water Development lease
• PNT – Protective Notation	

2.5.2 Grazing dispositions

In the Edson FMA there is significant land area dedicated to grazing dispositions. Four types of grazing dispositions are located within the Edson FMA: grazing license (FGL), grazing lease (GRL), grazing permit (GRP), and grazing reserves (GRR). Each individual grazing disposition are individually identified on the landbase ***[GRAZING]***.

Each of the grazing dispositions types were handled differently:

- Grazing Reserves (GRR) – Not part of the FMA and were not included in the total FMA area (meaning the area to which the net down is completed upon).
- Grazing Leases (GRL) and Grazing Permits (GRP) – Not considered part of the FMA. However, lease/permit areas were included in the total FMA area because both the coniferous and deciduous volumes on grazing leases/permits are allocated for harvest through quota certificates (or deciduous timber allocations) and are chargeable against the FMA AAC.

  In instances where a GRL or GRP was issued after an FMA commenced (July 1, 1997), the FMA holder is entitled to compensation from the applicant.

- Forest Grazing Licenses (FGL) – Considered within the FMA if the licence was issued after July 1, 1997 (the date of commencement for the Forests Act – Forest Management Agreement (O.C. 257/97)). Licenses issued prior to July 1, 1997 were not considered part of the FMA. However, these areas were included in the total FMA area because both the coniferous and deciduous volumes were allocated for harvest through quota certificates (or deciduous timber allocations) and are chargeable against the FMA AAC. According to the data used in the landbase netdown, no licenses have been issued after July 1, 1997 (therefore all grazing licenses are not considered part of the FMA but are included in the total FMA area).

  The grazing disposition deciduous volumes (excluding grazing reserves and incidental deciduous volumes in W5F) are 100% allocated to Weyerhaeuser. Weyerhaeuser has agreed to wave the coniferous volume rights in the dispositions (other operators are allocated this volume by Alberta Sustainable Resource Development (SRD)) with the agreement that Weyerhaeuser will be able to make up this volume from within the FMA.

2.5.3 Provincial PSPs

All provincial PSPs ***[PSP]*** were considered within the FMA but were marked as a deletion category therefore they do not contribute volume to the FMA.

2.6 Prohibited Areas

Prohibited Areas are areas that are not included within the FMA which includes private land, provincial parks and natural areas.

2.6.1 Private land

All land area marked as under private title status ***[STATUS]*** was removed from the total FMA area.

2.6.2 Parks

Since the last DFMP three Special Places 2000 candidate sites (Obed Lake, Fickle Lake, and Sundance Valley) having area within the Weyerhaeuser Edson FMA boundary were given full provincial park status. These parks were marked out spatially on the GIS processed landbase ***[SP2000]***. They are considered outside the FMA and will not contribute any volume to the FMA AAC, however because they are within the boundary of the FMA their contributions to old-growth strategies will still be tracked.

Weyerhaeuser has agreed to buffer the Sundance Valley site 500m ***[SUN500M]*** on both sides of the valley. This buffer area is still considered part of the FMA and will contribute volume to the FMA AAC, however, this area will be maintained in the netdown landbase to provide operational planners with information required to make special considerations when operating these areas.

2.7 Ecological and cultural feature designations

The Edson FMA has several important ecological and cultural features within the FMA.

2.7.1 Natural subregions

The provincial coverage of natural subregions was used to assign areas within the FMA to either the Lower or Upper Foothills ***[NSN]***.

2.7.2 Watershed basins

Fourth order watershed basins were delineated ***[WTRSHED]*** on the landbase. This coverage does not impact the netdown however, during the TSA modeling it will be used to report on harvesting activities within each basin.

2.7.3 Ecosite

Site quality is an important factor when determining if a forest stand can produce a merchantable timber. Therefore, each AVI polygon was assigned to an ecosite ***[ECOSITE]*** using the data from an ecosite classification project developed for the Weyerhaeuser Edson FMA in July 2000 (called – SiteLogix, Geographic Dynamics Corporation, 2000). For the most part the project used the same ecosite assignment protocol as the *Field Guide to Ecosites of West-central Alberta (Beckingham et al. 1996)*. Sometimes SiteLogix would assign a complex ecosite call naming two ecosites (i.e. ***ECOSITE*****= '**LF-e/f'). In this situation, the stand was assigned to the first ecosite in the complex.

2.7.4 Integrated resource plans (IRP) and eastern slopes integrated plans (ESIP)

Some areas with the Edson FMA come under the jurisdiction of ESIP zones. ESIP and IRP zones were included within the landbase ***[ESIP*** and ***IRP_NAME]***. Normally "Prime Protection" ESIP areas are removed from the harvestable landbase, however, within the Edson FMA there were no areas assigned this designation. Therefore, these designations were of no concern in the TSA process however they were included to provide important information to operational planners.

2.7.5 Historic resources

The historic resources coverage predicts the archeological potential of a site ***[ARCH_POT]***. Resources are estimated from Low to High with areas marked "high" potential being the most likely locations to contain archeological historical findings. This coverage was not used in the netdown nor will it be referenced in the modeling stage. However, it was included so extra care could be taken during operations in areas of "high" potential.

2.8 Landscape disturbances

Natural and man-caused disturbances can impact the amount of timber available for harvest and the AAC. These disturbances were included the netdown process as separate coverages.

2.8.1 Forest fires

The forest fire coverage (fire_all.e00) estimates the historical boundary of fires that have occurred within the Edson FMA landbase since the 1930s. In the netdown database each decade of fire activity (starting at the 1930s) was assigned its own field ***[FIRE1930, FIRE1940, FIRE1950, FIRE1960, FIRE1970, FIRE1980, FIRE1990, FIRE2000]*** where each area burnt by individual fires of that decade are discernable.

Almost all fires since the 30s were either too small (in area) or occurred too long ago to be of concern (except for the Chip Lake fire of 1998). These fire areas were treated the same as non-burn areas. The Chip Lake fire ***[CL_FIRE]*** will be treated somewhat differently. The fire occurred in 1998 therefore the aerial photography captured the pre-harvest forest cover type. Netdown deletion rules will be applied to the Chip Lake fire area the same as non-burn areas. Therefore, in the netdown the Chip Lake fire is of no consequence. However, in the modeling step different regeneration lag rules will be applied depending upon if salvage logging has occurred. Salvage logging will be indicated by the cutblock layer, any post 1998 cutblocks within the Chip Lake fire boundary will be assumed to be from salvage activities ***[CL_SAL]***.

2.8.2 Linear disturbances (not captured as a linear disposition)

The Edson FMA is a working forest with a number of non-industrial forestry activities occurring. In an attempt to capture the harvesting of timber (and the resultant reduction in operable landbase) caused by these other activities Weyerhaeuser maintains a spatial coverage of linear disturbances across the FMA. These cutlines ***[CUTLINES]*** are often not captured as a linear disposition. Therefore, a total width of 8m was applied to these disturbances and the area was removed from the operable landbase.

2.8.3 On going update process

There are regular updates to Weyerhaeuser's GIS data for changes caused by cutblocks and landuse. These updates do not impact the data associated within this DFMP because the results

stated within this document represent a-point-in-time analysis. When the process to complete the next DFMP is engaged the captured landbase changes will be implemented into the next plan. Therefore, the update procedure is provided for information purposes only.

Cutblocks are typically updated once a year. (Blocks are flown with leaf on - anytime in summer June - Sept). The digitized updated cutblocks are added into the "master file" and placed within the cutblock layer and stored on Silvacom Online. As for landuse updates, all changes are added to the Silvacom Online Landuse layer almost three weeks after a survey plan is consented to.

2.8.4 Cutblocks

A number of data sources contributed to define cutblocks. Weyerhaeuser maintains a spatial cutblock coverage ***[CUTBLK]*** and the W6 quota holders also provided a spatial cutblock coverage ***[QUOT_BLK].*** Both coverages provided (when possible) an opening number (Weyerhaeuser = ***[CUT_NUM]*** : Quota = ***[QB_NUM]*)** that could be linked to an ARIS data set ***[File: ALLARIS:OPEN_NUM].*** In addition, the quota coverage also provided the operator name ***[QB_OP].***

Accurately assigning all current cutblocks to either the coniferous or deciduous landbase and to the proper broad cover group was a complex issue. Cutblock landbase designations were based either on the silviculture records (ARIS landbase designation) or the AVI forest cover type or sometimes the historical harvesting history (see *historical harvesting ratio* section below). Likewise, broad cover groups (BCG) were assigned either by ARIS or AVI or the results from a study of regenerated cutblocks that was conducted in 2000 (Table 2-5).

Cutblocks were identified by two data sources. Two GIS *spatial cutblock layers* (cutblks.e00 and quot_blks.e00) were the primary (and assumed most accurate) source of information. Each polygon was linked (when possible) to the representative ARIS record by ARIS opening number. The secondary source of cutblocks information was the AVI "CC" modifier.

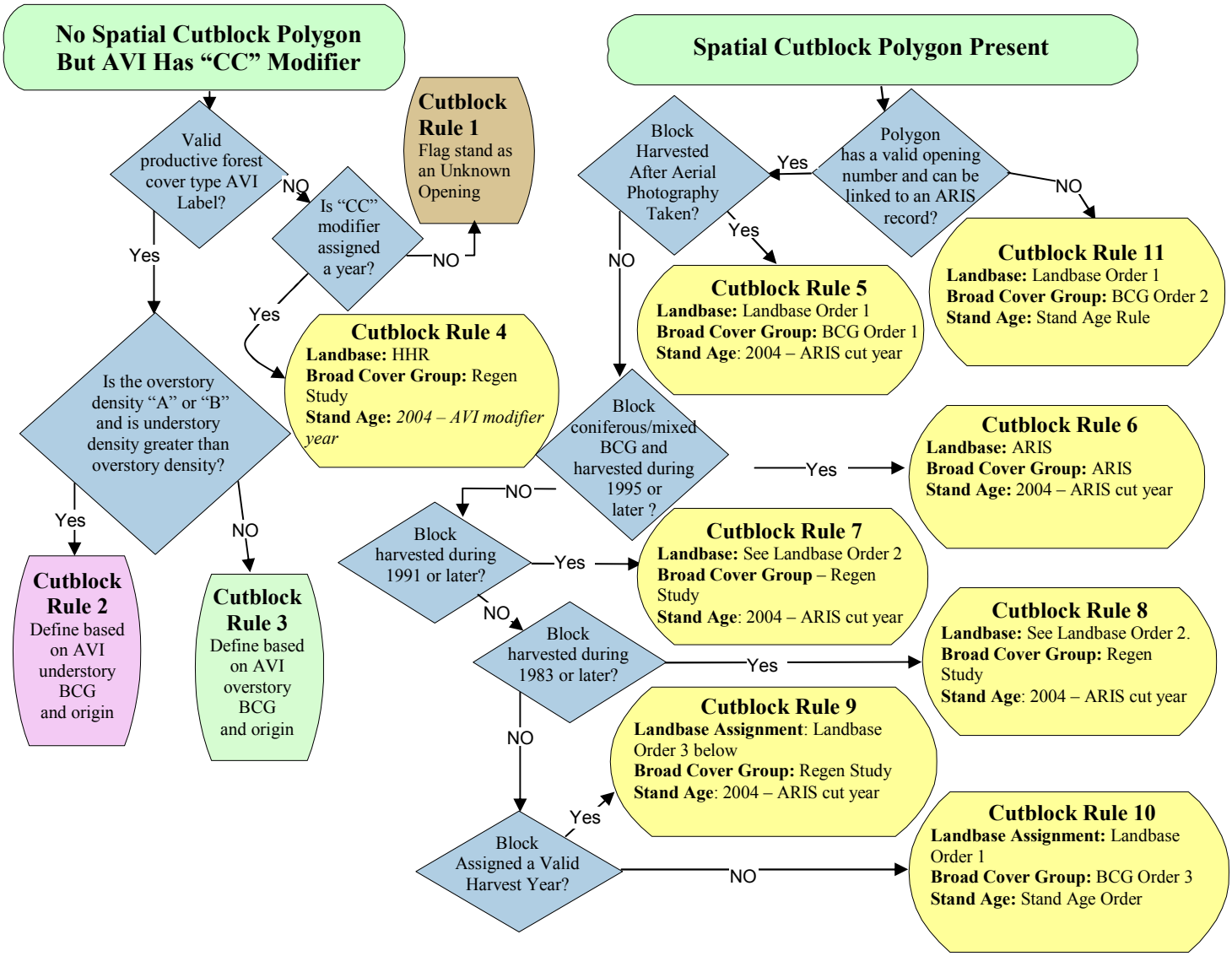

Figure 2-1 Flow diagram for assigning landbase, broad cover group, and stand age to cutblock polygons

BCG Assignment Orders (lists the hierarchy of data sources referenced)

1 – 1. ARIS 2. AVI SoPM 3. Coniferous Landbase: 70 coniferous/30 deciduous or Deciduous Landbase: 70% deciduous/ 30% coniferous.

2 – 1. AVI SoPM 2. Regen Study

3 – 1. ARIS 2. AVI SoPM 3. Regen Study

HHR – Historical Harvesting Ratio (See Section below)

Landbase Assignment Orders (lists the hierarchy of data sources referenced)

1 – 1. ARIS 2. AVI SoPM, 3. HHR

2 – 1. ARIS 2. HHR

3 – 1. ARIS 2. Assumed to be Coniferous.

Regen Study – Timberline Forest Inventory Consultants, 2000. *Analysis of regenerated cutblock data, Weyerhaeuser Canada* (See table 1).

Historical harvest ratio (HHR)

When information was lacking to assign a landbase designation to a cutblock, landbase was assigned based on the HHR of coniferous and deciduous dominated stands harvested in each LMU. The steps of this process are as follows:

1. Obtain all valid spatial cutblock polygons (separated by LMU) which have been assigned as either either a coniferous or deciduous cutblock.
2. Since all cutblocks prior to 1983 are assumed to be coniferous, only those cutblocks from harvested from 1983 to 2004 are included in the ratio.
3. Calculate the percentage of area belonging to coniferous cutblocks versus deciduous cutblocks.
4. Round the percentages to the nearest integer for both coniferous ***[HHR_CON]*** and deciduous ***[HHR_DEC]*** cutblock frequency.
5. Each AVI stand is assigned a number between 0 and 99 to function as the flag variable (or random number to compare to the coniferous integer).
6. If the flag variable was less than the coniferous integer, the cutblock was designated as coniferous and if not the cutblock was designated as deciduous.

Table 2-3. The historical harvesting ratio (HHR) by land management unit (LMU)*

LMU	Area Harvested from 1983 to 2004 (Hectares)			HHR	
	Deciduous	Coniferous	Total	%Deciduous	%Coniferous
Beaver Meadows	1,884	1,911	3,795	50%	50%
Carrot Creek	1,431	1,518	2,948	49%	51%
Cynthia	2,892	5,788	8,680	33%	67%
Edson	3,958	2,419	6,377	62%	38%
Moose Creek	2,082	3,712	5,793	36%	64%
Wolf Lake	875	6,169	7,044	12%	88%

* - SAS Code used to derived HHR is available to the Alberta Government Upon Request

Assigning landbase, broad cover group and crown closure to cutblocks

A total of 11 cutblock rules ***[HAR_RULE]*** were used in an attempt to best assign each cutblock to a representative landbase, broad cover group, and density (Figure 2-1). A fully stocked cutblock is assumed to be comparable to a "C" crown closure AVI call. Often blocks were assumed to regenerate to fully stocked however, each cut rule has a unique set of criteria for assigning crown closure.

Cutblock Rule 1 – Rule 1 cutblocks did not have a polygon present in the spatial cutblock coverage but did have an AVI "CC" modifier. The AVI stand call was neither a productive forest cover type nor had a valid "CC" modifier year. Therefore these blocks did not provide enough evidence to be assigned to the net landbase and were classified as an "unidentified opening" for tracking purposes only ***[UNI_OP]***.

Crown Closure - Considered to not be part of the net harvestable landbase therefore no crown closure value was assigned.

Cutblock Rule 2 – Rule 2 cutblocks did not have a polygon present in the spatial cutblock coverage but had an AVI "CC" modifier with a valid productive forest cover type. The overstory was not remnant ***[REMAN]*** (remnant overstory is defined as an "A" or "B" density overstory with an understory density greater than the overstory density); therefore the stand landbase, composition, and density were defined by the AVI overstory call and the stand age was assigned based on the overstory origin.

Crown Closure - Crown closure was always assigned by the AVI overstory.

Cutblock Rule 3 – Rule 3 cutblocks did not have a polygon present in the spatial cutblock coverage but had an AVI "CC" modifier with a valid productive forest cover type. The overstory was remnant (defined as an "A" or "B" density overstory with an understory density greater than the overstory density); therefore the stand landbase, composition, and density were defined by the AVI understory call and the stand age was assigned based on the understory origin.

Crown Closure - Crown closure was always assigned by the AVI understory.

Cutblock Rule 4 – Rule 4 cutblocks had neither a polygon present in the spatial cutblock coverage nor was assigned to a valid AVI productive forest cover type. However, an AVI "CC" modifier and modifier year was assigned. Thus, it was assumed that when a "CC" modifier year was assigned, the stand could be confidently defined as a cutblock. Due to no valid ARIS or AVI data being assigned, the landbase could only be assigned by the HHR and the Timberline regenerated cutblock study was used the assign the stand to a BCG.

Crown Closure - Due to there being no ARIS data or AVI forest cover group all cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Cutblock Rule 5 – Rule 5 cutblocks had a polygon present in the spatial cutblock coverage and were harvested after the aerial photography was taken (1995 for W6, 1998 for E1, E2, and W5). The landbase and BCG were primarily assigned by ARIS, however because the pre-harvest stands were captured by the photography, if no ARIS information was available the AVI stand calls were used with confidence. As a last resort landbase was assigned by the HHR and BCG to a 70/30 mixedwood either conifer dominated or deciduous dominated depending upon the landbase assignment. The rationale for the 70/30 BCG is because that is the middle value between 50/50 and 0/100. The regeneration study is not expected to provide a good estimate in post-95 cutblocks because of the change in regeneration standards.

Crown Closure - All cutblocks are assumed to be fully stocked and thus have a "C" crown closure (except on grazing dispositions see below).

Cutblock Rule 6 – Rule 6 cutblocks had a polygon present in the spatial cutblock coverage and were harvested after 1995 and were assigned by ARIS to either the coniferous landbase or a coniferous/mixedwood broad cover group. In 1995 the regeneration standards used on coniferous/mixedwood stands had changed to a stricter standard; therefore it was assumed that post-95 blocks would regenerate to fully stocked status. Both the landbase and the BCG were assigned by ARIS.

Crown Closure - All cutblocks are assumed to be fully stocked and thus have a "C" crown closure (except on grazing dispositions see below).

Cutblock Rule 7 – Rule 7 cutblocks had a polygon present in the spatial cutblock coverage and were harvested after 1991. In 1991 the system of assigning BCG in ARIS (previously SMRS) had changed. If possible the cutblock landbase was assigned by ARIS; otherwise HHR was used. BCG was assigned by the Timberline regenerated cutblock study was used. The rationale for this assignment is that quota blocks for this period do not require tending and will maintain current levels of hardwood stocking as exhibited in the Timberline report.

Crown Closure - If there is either a valid ARIS BCG or a valid AVI forest cover group the cutblock is assumed to be fully stocked ("C" crown closure - except on grazing dispositions see below). Otherwise the cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Cutblock Rule 8 – Rule 8 cutblocks had a polygon present in the spatial cutblock coverage and were harvested in 1983 or later. The year 1983 was when deciduous harvesting operations officially commenced. The landbase calls were assigned by ARIS, if there was no valid landbase assignment present, HHR was used. The BCG was based on the results from the Timberline regenerated cutblock study.

Crown Closure - If there is a valid AVI forest cover group the cutblock is assumed to be fully stocked ("C" crown closure - except on grazing dispositions see below). Otherwise the cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Cutblock Rule 9 – Rule 9 cutblocks had a polygon present in the spatial cutblock coverage and were harvested pre-1983. The landbase calls were assigned by ARIS, if there was no landbase assignment in ARIS, the block was assumed to be from the coniferous landbase. The BCG was based on the results from the Timberline regenerated cutblock study.

Crown Closure - If there is a valid AVI forest cover group the cutblock is assumed to be fully stocked ("C" crown closure - except on grazing dispositions see below). Otherwise the cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Cutblock Rule 10 – Rule 10 cutblocks had a polygon present in the spatial cutblock coverage that was not assigned a valid harvest year. The landbase calls were assigned by ARIS, if there was no landbase assignment in ARIS, AVI was used, and as a last resort the HHR was used. The BCG was assigned by ARIS, however if no ARIS BCG call was present, AVI was used, and as a last resort the regeneration study was used.

Crown Closure - If there was a valid ARIS BCG the cutblock is assumed to be fully stocked ("C" crown closure - except on grazing dispositions see below). Otherwise, crown closure calls were assigned by the AVI story of primary management (SoPM). If both these options are exhausted

then cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Cutblock Rule 11 – Rule 11 cutblocks had a polygon present in the spatial cutblock coverage but there was no valid ARIS opening number associated. Therefore, the landbase calls were assigned by AVI forest cover group, otherwise HHR was used. The BCG was assigned by the AVI forest cover group, otherwise as a last resort the regeneration study was used.

Crown Closure - Crown closure calls were assigned by the AVI story of primary management (SoPM). If there was no valid AVI forest cover group the cutblocks were assigned a *Low Density Modifier* and assumed to have a crown closure of "A".

Grazing Disposition Exception for Crown Closure – It has been suggested that cutblocks regenerating on grazing dispositions (within the Edson FMA) are less likely to be fully stocked (see Timberline Regeneration report in the appendix tables 6-14, 6-15, and 6-16 for supporting evidence). Therefore, as per the exceptions in the cutblock rules described above coniferous cutblocks located on grazing dispositions will be assigned to "B" crown closure 50% of the time and deciduous cutblocks located on grazing dispositions will be assigned to "B" crown closure 40% of the time.

Table 2-4 Harvest rules applied to the to the FMA by area

Harvest Rule	Landbase Assignment	Broad Cover Group Assignment	Area (ha)
R01	NA	NA	0
R02	AVI_O	AVI_O	230
R03	AVI_U	AVI_U	414
R04	NA	NA	0
R05	ARIS	ARIS	13,119
R05	AVI_O	AVI_O	1,940
R05	AVI_U	AVI_U	1,018
R05	HHRAT	70_30	31
R06	ARIS	ARIS	1,452
R07	ARIS	LMU_C	12,907
R08	ARIS	LMU_A	1,790
R08	ARIS	LMU_C	3,258
R09	ARIS	LMU_A	4,276
R09	ARIS	LMU_C	8,836
R09	CONIF	LMU_C	21
R11	AVI_O	AVI_O	3,689
R11	AVI_U	AVI_U	1,413

Harvest Rule	Landbase Assignment	Broad Cover Group Assignment	Area (ha)
R11	HHRAT	LMU_A	335

ARIS – ARIS record, **AVI_O** – AVI overstory, **AVI_U** – AVI understory, **CONIF** – assumed coniferous, **HHRAT** – historical harvesting ratio, **LMU_C** – Regeneration study assumed to be fully stocked ("C" crown closure), **LMU_A** – Regeneration study assumed to have low density ("A" crown closure), **70_30** – 70/30 Mixed stand (Landbase assignment determines the lead species type)

Table 2-5. Edson FMA historical cutblock regeneration study stocking percentage (from Timberline 2000 see Appendix) by LMU converted to AVI stand stocking percentage

a	b	c	d	e	f	g
			Median Stocking Percentage		Stocking Percentage Converted to AVI Stand Composition Percentage	
Landbase	LMU	N	Coniferous	Deciduous	Coniferous Composition	Deciduous Composition
Deciduous (based on table 3.2 in Timberline report see appendix)	BM	19	0%	85%	0%	100%
	CC	10	50%	90%	40%	60%
	CY	20	27%	93%	20%	80%
	EU	35	27%	93%	20%	80%
	MC	9	50%	100%	30%	70%
	WL	15	22%	100%	20%	80%
Coniferous (based on table 3.3 in Timberline report see appendix)	BM	11	69%	81%	50%	50%
	CC	4	87%	85%	50%	50%
	CY	27	87%	87%	50%	50%
	EU	25	87%	68%	60%	40%
	MC	23	92%	61%	60%	40%
	WL	12	84%	57%	60%	40%

a, b, c, d, e – obtained from Timberline 2000 Edson regenerated cutblock report.
f = d/(d+e) - rounded to the nearest 10% class
g = e/(d+e) – rounded to the nearest 10% class

Regenerating Stand Age Order

There were four possible methods used to assign cutblock age:

1. If the cutblock had a valid cut year: Cutblock age = 2004 – ARIS cut year
2. If the stand BCG was defined by the AVI SoPM then: Cutblock age= 2004 – AVI origin
3. Cutblock age=2004 – AVI "CC" modifier year
4. If overstory was not remnant then: Cutblock age= 2004-AVI Overstory Origin
5. If understory was not remnant then: Cutblock age= 2004-AVI Understory Origin
6. Cutblock age= 1

The above list is the order of precedence for assigning the ages so for example a regenerating stand is only assumed to be 1 year old if no ARIS cut year or AVI modifier year are available.

Horizontal stands cutblocks

There were some cases where a spatial cutblock polygon was located in an AVI horizontal stand. In the majority of cases this was due to slivers being formed when the cutblock coverage was intersected with the AVI coverage. However, for clean processing these cutblock areas cannot just be ignored. Therefore, just as with non-horizontal stands the entirety of each horizontal stand cutblock was assumed part of the cutblock. The assignment of regeneration landbase and stand composition to horizontal stands follows the same procedure as outlined in (Figure 2-1).

A note about ARIS AOP area versus net landbase area

The cutblocks are located on the landbase through GIS processing thus the area indicated by the spatial coverage must be used and not the ARIS AOP area. The main reason for this is that the landbase netdown is based on a spatial coverage and ARIS is not. Therefore, while the statistic may be of some interest, there is no reason to expect ARIS areas to match the overlaid spatial cutblock coverage.

2.8.5 Planned Blocks

The Edson FMA has approximately 10 years of future planned blocks. Both Weyerhaeuser and the W6 quota holders provided planned blocks which were included as a spatial coverage within the net landbase (Weyerhaeuser = ***[PLAN_BLK]*** : Quota=***[PLAN_QUOT]***). Weyerhaeuser planned block coverage had an operator assigned ***[PB_OP]*** and in a few instances had an opening number that could be linked to ARIS ***[PB_NUM].*** Quota holder blocks did not any opening numbers provide but did have an operator assigned ***[PQ_OP].*** During the TSA modeling component (component #3) planned blocks will be pre-blocked to be harvested in the first 10 years of harvest sequence. Please note as agreed to by Weyerhaeuser and Alberta SRD during the review of the November 24, 2004 draft submission additional planned blocks were included in the harvesting sequence (discussed in detail in section 5.5).

2.9 Operational Parameters

Issues dealing with forestry operations were also included in the netdown. This category discusses how steep/sensitive slopes, watercourse buffers, and non-merchantable stands were addressed during the netdown.

2.9.1 Steep/sensitive slopes and isolated stands

In the Edson FMA, Weyerhaeuser planning staff (N. Volk and P. Scott) reviewed the occurrence of steep (45%) slopes and found that they rarely occur. Therefore, this issue was not included within the landbase netdown but rather will be addressed during the operational planning stage. All merchantable stands within the FMA are accessible therefore no stands were deemed isolated.

2.9.2 Watercourse buffers

An objective during harvesting activities is to protect water quality and water channel integrity. One method that has been shown to assist in achieving this goal is to leave riparian buffers. Ideally, the required buffer widths should be assessed separately for each watercourse by considering a variety of factors including: the potential for erosion (including mass slumping), the need to filter sediments, and the importance as fish and wildlife habitat. However, for the Edson FMA this level of detail was not available. Therefore, for the purposes of this project the standard procedure of assigning an average buffer width based on the watercourse category assigned was used.

Some larger water-bodies are captured directly in AVI but the most accurate tallying of watercourses requires overlaying a separate layer that specifically captures waterways. While the names differ the categories used for watercourse classification are similar as those used in the *Alberta: timber harvest planning and operating ground rules* (1994). Within the Edson FMA some lakes have been identified as critical trumpeter swan habitat (by Weyerhaeuser and Provincial Government officials), in those situations a buffer width of 200m was employed.

Table 2-6. Summary of watercourse classification and buffer width applied

Watercourse Classification (as defined by Alberta Environmental Protection, 1994)	Description	Buffer Width* Applied (m)	Data File Field Name
Large Permanent	Major – Slope issues warranting larges buffers	100	***[STRM100]***
Large Permanent	Major	60	***[STRM60]***
Small Permanent	Perennial	30	***[STRM30]***
Intermittent	Intermittent	0	
Unknown	Indefinite, No designation	0	
Lakes	Greater than 4 ha	100	***[LAKE]***
	Critical trumpeter swan habitat	200	***[LAKE200]***

* - Buffer Widths are applied to both sides of each line representing a watercourse.

2.9.2.1 Adding 100m buffers *[STRM100]*

In the file ***FMA_2004,*** a buffer of 100m ***[STRM100]*** was applied to some river locations. The original intention was to ignore this data and use the 60m buffer rule to be consistent with the operating ground rules. However, upon consideration by Weyerhaeuser's operational foresters it was determined that in most cases due to deviations in the accuracy of the spatial steam data and the width of the stream bank it was advisable to use the 100m buffer length as a deletion when it was provided.

2.9.3 Subjective deletions and ecosite deletions

Subjective and ecosite deletions are used to identify non-merchantable stands (regardless of age the stand will never be harvested). Subjective deletions are typically based on forest cover type characteristics and ecosite deletions focus on the site type the stand is located on. In the Edson FMA black spruce and larch tree species are indicative of stands that are non-merchantable and/or sites where successfully regeneration may be difficult. The following subjective deletion rules were applied to the landbase:

1. Subjective Deletion 1 – Story of Primary Management has greater than and equal to 80% black spruce composition.
2. Subjective Deletion 2 – Story of Primary Management has greater than and equal to 10% larch composition.

3. Ecosite Deletion - Deciduous landbase stand on a “Poor” site.

Subjective/Ecosite deletions were not applied when a cutblock or planned block was present. The reason being if a stand has been harvested or planned it is obviously merchantable.

2.10 Defining the forested landscape

This section outlines the rules used to define the Weyerhaeuser Edson FMA landscape.

2.10.1 Landbase, broad cover group, story of primary management, and stand age assignment

Each stand within the FMA was assigned to a landbase category (Table 2-9). For this report the term *landbase* ***[STD_LAND]*** is defined by the volume type (coniferous or deciduous) that a stand is primarily managed for. Landbase is normally assigned based on the broad cover group (BCG) of the story of primary management (defined as the story which a stand is managed for either overstory ***[O_LAND]*** or understory. ***[U_LAND]***) (Table 2-10). However, sometimes (mostly for cutblocks) landbase can be defined either legally or by silvicultural intent of the operator. For the Edson FMA landbase is an important distinct because there are several operators with differing jurisdictions over coniferous and deciduous volumes.

BCG ***[STD_COV]*** is a description of stand composition which is usually assigned based on the story of primary management (SoPM). There are four BCG categories (C – Pure Coniferous, CD – Coniferous dominated mixedwood, DC – Deciduous dominated mixedwood, and D – Pure Deciduous). Based on the composition of coniferous species versus deciduous species (Table 2-8) the BCG of each stand overstory ***[OS_COV]*** and understory ***[US_COV]*** was assigned (when possible) (Table 2-8). The overall stand assignment was then designated by the SoPM.

The rules for determining SoPM ***[STORY]*** differ by FMU (Table 2-10). For E1, E2, and W5 the SoPM of all non-cutblock and non-horizontal polygons were designated on the overstory except when a polygon had a pure deciduous “A” crown closure overstory (***[OS_COV]*** = “DX” and ***[OS_CC]*** = “A”) with an understory having a valid forest cover group with a crown closure greater than “A”. Under these circumstances the stand BCG, and age were based on the

understory, but the **landbase was still defined by the overstory**. Therefore, a stand can be designated to one landbase category while having a BCG that belongs to another category. In W6 the rules are somewhat different. The SoPM of all non-cutblock and non-horizontal polygons were designated based on the overstory except when a polygon had a pure deciduous (***[OS_COV]*** = "DX") overstory with a coniferous/mixedwood understory (***[US_COV]*** = "CX", "CD", "DC") forest cover group and a "B", "C", or "D" crown closure (***[U_CC]***>"A"). Under these circumstances the **stand BCG, age, and landbase were based on the understory**.

Stand age ***[STD_AGE]*** for non-cutblock stands = 2004-origin of SoPM. In the timber supply analysis will use 5 year periods so each stand will be placed into a 5 year category (Stand age class =Rounded up to nearest integer(Stand age/5)).

Cutblock assignment rules (section 2.8.4) can overrule the designations for landbase, BCG, and stand age described above.

Table 2-7 Species groupings used in defining broad cover groups

Coniferous Species	Deciduous Species
Black spruce (SB)	Trembling aspen (AW)
Engelmann spruce (SE)	White birch (BW)
White spruce (SW)	Balsalm poplar (PB)
Lodgepole pine (PL)	Non-descript deciduous (DE)*
Jack pine (PJ)	
Pine – generic (P)	
Balsalm fir (FB)	
Alpine fir (FA)	
Douglas fir (FD)	
Larch (LT)	
Non-descript coniferous (CO)*	

* - Only used for cutblocks when no species was present but a landbase designation is assigned.

Table 2-8 Decision rules for broad cover group

Broad cover group	Definition
C	% coniferous ≥ 80
CD	% coniferous > % deciduous and % coniferous < 80
CD	% coniferous = % deciduous and

	leading species = coniferous species
DC	% deciduous = % coniferous and leading species = deciduous species
DC	% deciduous > % coniferous and % deciduous < 80
D	% Deciduous ≥ 80

Table 2-9 Landbase designation* rules by FMU

Landbase	Forest Management Unit			
	E1	**E2**	**W5**	**W6**
Coniferous	**CX**	**CX**	**CX** **CD** **DC**	**CX** **CD** **DC** **D** overstorys with **CX**, **CD**, or **DC** understorys having **B, C,** or **D** crown closure
Deciduous	**CD** **DC** **D**	**CD** **DC** **D**	**D**	**D** having either no understory or an **A** crown closure **C**, **CD**, or **DC** understory

* - Note: ARIS records can overrule these landbase designations

Table 2-10 Description rules for story of primary management in non-cutblock and non-horizontal polygons

Story of Primary Management	Forest Management Unit	
	E1 , E2, W5, and W6	**Additional Rule for W6 only**
Overstory (OS)	The landbase of all polygons are defined by the OS. The BCG, and age of all polygons are to be defined on the OS, except (see understory):	The landbase, BCG, and age of all polygons are defined by the OS, except (see understory):
Understory (US)	The BCG, and age of polygons are defined by the US when all the following are true: 1. OS is "A" density and pure deciduous (***O_CC***="A" and ***OS_COV*** = "DX") 2. US crown closure is greater than "A" (***U_CC***>"A")	The landbase, BCG, and age of polygons are defined by the US when all the following are true: 1. OS is pure deciduous (***OS_COV*** = ***"DX"***) 2. US has a valid forest C, CD, or DC, cover group (***US_COV***="CX" or "CD" or "DC") 3. US crown closure is greater than "A" (***U_CC***>"A")

Horizontal Stands

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

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

a. if the overstory proportion of the stand was 50% or greater, the overstory was defined as the SoPM ***[STORY]***.
b. if the understory proportion of the stand was greater than 50%, the understory was defined as the SoPM.

Stands that had only one valid forest cover group:

a. if the overstory was the only valid forest cover group then the SoPM was defined as the overstory.
b. if the understory was the only valid forest cover group then the SoPM was defined as the understory.

All horizontal stands were expected to be managed only for the area assigned to the SoPM (except for cutblocks). Therefore, a 10 ha horizontal stand that is managed on the overstory call that is assigned a horizontal percentage of 7 (which means 70%) would contribute 7 ha to the landbase area.

2.10.2 Ecosite Stratification

Site quality was a stratum variable used in projecting future yields.

Each polygon was assigned to a site quality category (good, medium, or poor) based on the SiteLogix ecosite call was assigned to a site quality category of good, medium or poor ***[ST_SITE]*** (Table 2-11- see component report #1 for a detailed description of this process).

Table 2-11. Summary of assumed site quality for coniferous and deciduous stands by ecosite call

Stand Type	NSR	Site quality	SiteLogix ecosite call
Coniferous	LF	Good	E, F
		Medium	C, D, I,
		Poor	A, B, G, H, J, K, L, M, N
	UF	Good	D, E, F
		Medium	C, H, J
		Poor	A, B, G, I, K, L, M, N
Deciduous	LF	Good	E, F, I
		Medium	-
		Poor*	A, B, C, D, G, H, J, K, L, M, N
	UF	Good	E, F
		Medium	-
		Poor	A, B, C, D, G, H, I, J, K, L, M, N

*All "poor" site deciduous landbase stands were deemed non-merchantable and removed from the net landbase.
- "X", "Y", "Z" ecosites are not forest ecosites. Therefore all polygons located on these ecosites will be deleted.

Traditionally TPR has been used for defining stands into the above categories. While there may be merit in using TPR it was viewed as a blunt method of determining ecosite. Therefore, for this report a process of using Ecosite along with subjective deletions replaced TPR.

2.10.3 Yield curve assignment

Yield curves were produced for the Edson FMA (see component report #1). Yield curves were assigned based on the stratification used to develop the yield relationships. In total 158 yield curves were applied to the landbase (108 for coniferous dominated stands + 50 for deciduous dominated stands).

Yield Curve Assignment ***[YIELDNUM]*** was based on BCG ***[STD_COV]***, site quality ***[ST_SITE]***, crown closure ***[STD_CC]*** and percentage coniferous composition ***[STDPER_CON]*** (see appendix 5.2 – for an exhaustive list).

2.10.4 Seral stages and over-mature forests within the FMA

Tracking the distribution and prevalence of over-mature forest types across the landbase is one of the strategies that will be employed (during the TSA modeling) in an attempt to ensure that ecological values are met (others include removing riparian zones from the harvestable landbase and delaying harvesting activities in some locations). A total of six seral stages were identified ***[SERAL]***.

For coniferous broad cover groups (***STD_COV='CX' or 'CD')***:

Early ***[SERAL=1]***	0 to 10 years
Immature ***[SERAL=2]***	11 to 40 years
Mature ***[SERAL=3]***	41 to 90 years
Late ***[SERAL=4]***	91 to 120 years
Very Late ***[SERAL=5]***	121 to 170 years
Over-mature ***[SERAL=6]***	170+ years

For deciduous broad cover groups (***STD_COV='DX' or 'DC')***:

Early ***[SERAL=1]***	0 to 10 years
Immature ***[SERAL=2]***	11 to 40 years
Mature ***[SERAL=3]***	41 to 70 years
Late ***[SERAL=4]***	71 to 110 years
Very Late ***[SERAL=5]***	111 to 170 years
Over-mature ***[SERAL=6]***	170+ years

For both coniferous and deciduous broad cover groups "over-mature" was defined as the area in the late, very late, and over-mature seral stages. For coniferous BCGs age 90 was selected as the dividing line between mature and over-mature stages because the coniferous rotation age will be 90 years for the future TSA model (based on coniferous max MAI). Likewise, the deciduous rotation age of 70 years (based on deciduous max MAI) was the basis for the over-mature stages.

The estimated area of over-mature forest on the harvestable across the landscape will be tracked in the TSA model. All over-mature forest will be classified to one of following six over-mature forest cover groups ***[OLDGROW]***:

1. Pure deciduous ***[OLDGROW='OLD_DX']***
2. Deciduous dominated mixedwood ***[OLDGROW='OLD_DC']***
3. Coniferous dominated mixedwood ***[OLDGROW='OLD_CD']***
4. Pure coniferous pine dominated – pine species composition greater than and equal to 80% ***[OLDGROW='OLD_PL']***
5. Pure coniferous white spruce dominated – white spruce composition greater than and equal to 80% ***[OLDGROW='OLD_SW']***
6. Pure coniferous white spruce/pine mix – the first two cover type species are white spruce and pine (or pine and white spruce) with neither species composition is individually greater than and equal to 80% ***[OLDGROW='OLD_PS']***

Please note all stands will be evaluated to an "OLDGROW" category type regardless of stand age. The reason being, this is not a static category rather it changes over the planning horizon. Therefore, the ***[OLDGROW]*** and ***[SERAL]*** fields will have to be queried together to total the "over-mature" area in any one ***[OLDGROW]*** categories.

2.10.5 The deletion hierarchy

A given polygon may have several deletion types assigned to it. Therefore, a deletion hierarchy was applied from harder to softer deletions (the "harder" a deletion the more confident one can be in removing it from the net landbase). This method allows for a quick understanding of how much forested land is ultimately deleted for a given purpose.

The following is a listing of the deletion hierarchy (and a description of how they were applied) from harder to softer deletions ***[DEL]***:

1. Anthropogenic non-vegetated land ***[DEL="AN"]***
   - applied to entire landscape (including cutblocks)
2. Natural non-vegetated land ***[DEL="NV"]***
   - applied to entire landscape (including cutblocks)
3. Anthropogenic vegetated land ***[DEL="AV"]***
   - not applied to polygons identified within the Weyerhaeuser or Quota holder coverage as cutblocks (***[CUTBLK=1 or QUOTA_BLK=1]***). It was assumed AVI was mistyped as a non-cutblock.
4. Non-forested vegetated land ***[DEL="NF"]***
   - not applied to polygons identified within the Weyerhaeuser or Quota holder coverage as cutblocks (***[CUTBLK=1 or QUOTA_BLK=1]***). It was assumed AVI was mistyped as a non-cutblock.
5. Parks***[DEL="SP"]***

- applied to entire landscape (including cutblocks)

6. Prime protection areas (as defined by ESIP) ***[DEL="PR"]***
   - applied to entire landscape (including cutblocks)
7. Government PSPs ***[DEL="PS"]***
   - applied to entire landscape (including cutblocks)
8. Disposition reservations ***[DEL="DR"]***
   - applied to entire landscape (including cutblocks)
9. Legal landbase disposition ***[DEL="LP"]***
   - applied to entire landscape (including cutblocks)
10. Linear dispositions ***[DEL="LU"]***
    - applied to entire landscape (including cutblocks)
11. Non-disposition Cutlines ***[DEL="CT"]***
    - not applied to ANY polygons identified as cutblocks (***[CUTIDENT=1])*** which ARIS indicates were harvested in 2000 and after (***[ARIS_yc>=2000]***). As of 2000 it has been Weyerhaeuser Company policy to regenerate cutline areas within cutblocks.
12. Stream and lake buffers ***[DEL="LK" or "LS" or "ST"]***
    - not applied to polygons identified within the Weyerhaeuser or Quota holder coverage as cutblocks (***[CUTBLK=1 or QUOTA_BLK=1])***. It was assumed that since harvesting and regeneration occurred in a given location in the past, the area would be available for harvest.
13. Unidentified Opening ***[DEL="UI"]***
    - applied only to potential cutblocks
14. Invalid ecosites ***[DEL="XX"](***occurs when ***[ECOLET='W', 'Y', or 'Z']***)
    - not applied to ANY polygons identified as cutblocks (***[CUTIDENT=1])***, the reason being if an area has been harvested, it is obviously on a harvestable ecosites type (it is assumed to be a "poor" site).
15. Non-merchantable deciduous ecosites ***[DEL="EC"]***
    - applied only to polygons assigned to the deciduous landbase with a deciduous dominated cover type which are located on a "poor site"
16. Larch composition is 10% or more of the SoPM ***[DEL="LR"]***
    - not applied to cutblocks or planned cutblocks.
17. Black spruce composition makes up 80% or more of the SoPM ***[DEL="SB"]***
    - not applied to cutblocks or planned cutblocks.
18. Deletions which do not fit into one of the above categories that were identified by operations foresters ***[DEL="OP"]***
    - not applied to cutblocks or planned cutblocks.

2.11 Summary of SAS output files

Upon completion of running the netdown SAS program there were several output files (Figure 2-2).

SAS final Output Files

- *FMA_finassign* – Final SAS output file that assigns all polygons to their netdown allocation and maintains all fields used during the netdown process (including all AVI fields).

Summary Tables

- *FMAcon_decsum* – Summary of landbase (coniferous or deciduous) area by FMU.
- *Marg_sum* – Summary of marginal stand area by FMU.
- *Yieldtab12* – Summary of landbase area assigned to each yield curve by FMU.
- *FMAbcg_sum* – Summary of broad cover group area by landbase designation and FMU.
- *Netdels* – Summary of deletion areas by FMU.
- *FMAhar_rule* – Area assigned to each of the harvest rules (Table 2-4) throughout the FMA.
- *Lbagedist* – Age class distribution by landbase and FMU.

Woodstock Input File (see Appendix 5.5 for more detail)

- *FMA_GIS* – This file takes the output *FMA_finassign* file and places it in a format that can be quickly incorporated into Woodstock.
- *WS_cc* – The proportion of the operable landbase by crown closure.
- *WS_site* - The proportion of the operable landbase by site class.
- *WS_oldgrow* – Summary of operable landbase by seral stage, with emphasis on older seral stages.

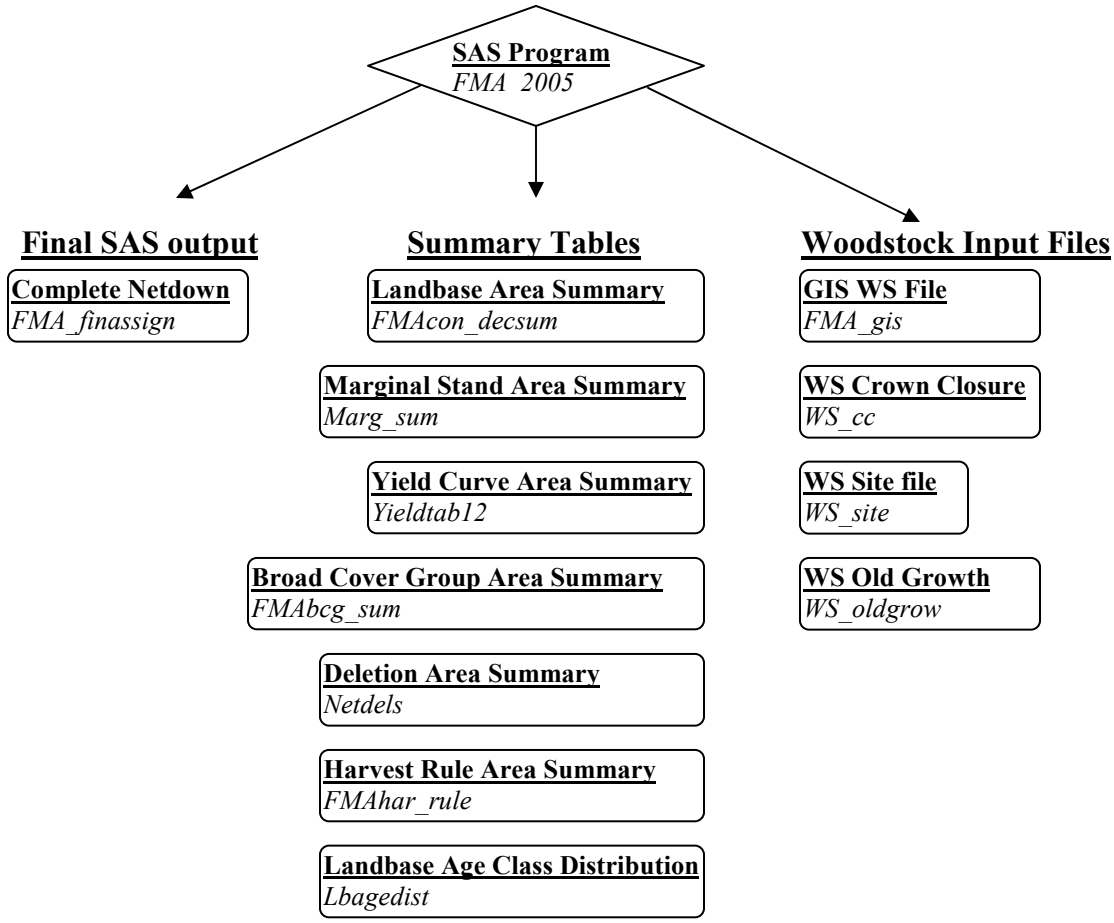

Figure 2-2 Summary of SAS netdown program output files

3 Final Results

Table 3-1 Final Proposed Netdown - deletion areas are based on the hierarchy (section 2.10.5) – each polygon is assigned to only one deletion type

Category			Forest Management Units Area (ha) FMU E1F	FMU E2F	FMU W5F	FMU W6F	FMA Total (ha)	FMA % Total
Non-Forested Area Reductions								
AN	Anthropogenic Non-Vegetated		1,540	2,627	709	2,490	**7,366**	**1.45%**
NV	Naturally Non-Vegetated		789	1,737	358	2,929	**5,813**	**1.14%**
AV	Anthropogenic Vegetated		1,313	1,092	1,102	3,472	**6,979**	**1.37%**
NF	Non-Forest Vegetated		1,853	3,635	3,491	12,027	**21,006**	**4.12%**
		Sub-Total	***5,495***	***9,091***	***5,660***	***20,918***	***41,164***	***8.08%***
Dispositions and Other Area Removals								
SP	Parks (Previous SP2000 nomination sites)		65	3,477	0	0	**3,542**	**0.70%**
PR	Prime Protection Area (Defined by ESIP)		0	0	0	0	**0**	**0.00%**
PS	Permanent Sample Plots		89	81	74	337	**581**	**0.11%**
DR	Disposition Reservation		95	293	10	335	**733**	**0.14%**
LP	Disposition Polygonal		361	650	491	1,072	**2,574**	**0.51%**
LU	Disposition Linear		1,477	1,935	1,726	5,250	**10,388**	**2.04%**
CT	Non-Disposition Cutlines		2,747	3,454	1,407	6,467	**14,075**	**2.76%**
		Sub-Total	***4,834***	***9,890***	***3,708***	***13,461***	***31,893***	***6.26%***
Water course buffers / Operational Removals								
ST	Stream buffers (30m, 60m, or 100m)		2,695	1,339	855	2,910	**7,799**	**1.53%**
LS	Critical Swan Habitat		0	345	0	32	**377**	**0.07%**
LK	Lake buffers		311	617	82	552	**1,562**	**0.31%**
OP	Operations Foresters Identifed Deletions		0	43	0	24	**67**	**0.01%**
		Sub-Total	***3,006***	***2,344***	***937***	***3,518***	***9,805***	***1.92%***
Subjective and Ecosite Deletions								
UI	Unidentified Opening		0	0	0	0	**0**	**0.00%**
XX	Invalid Ecosites (W,Y,Z)		0	2	15	0	**17**	**0.00%**
EC	Deciduous Poor Site Deletion		89	336	59	381	**865**	**0.17%**
LR	Larch Subjective Deletion		25,744	17,041	12,595	52,354	**107,734**	**21.15%**
SB	Black Spruce Subjective Deletion		13,643	7,352	3,609	12,729	**37,333**	**7.33%**
	Non-managed portions of horizontal stands		359	49	2	37	**447**	**0.09%**
		Sub-Total	***39,835***	***24,780***	***16,280***	***65,501***	***146,396***	***28.74%***
Total Deletion Area			**53,170**	**46,105**	**26,585**	**103,398**	**229,258**	***45.01%***
Timber Harvesting Landbase								
	Deciduous	Deciduous	6,394	30,832	16,578	37,026	**90,830**	**17.83%**
		Deciduous / Coniferous	5,239	8,577	598	1,915	**16,329**	**3.21%**
		Coniferous / Deciduous	5,131	6,554	111	0	**11,796**	**2.32%**
		Coniferous	299	340	63	0	**702**	**0.14%**
		Sub-Total	**17,063**	**46,303**	**17,350**	**38,941**	**119,657**	**23.49%**
	Coniferous	Coniferous	31,911	17,544	7,120	55,891	**112,466**	**22.08%**
		Coniferous / Deciduous	5,195	3,346	4,795	19,582	**32,918**	**6.46%**
		Deciduous / Coniferous	0	0	3,413	11,661	**15,074**	**2.96%**
		Deciduous	0	0	0	0	**0**	**0.00%**
		Sub-Total	***37,106***	***20,890***	***15,328***	***87,134***	***160,458***	***31.50%***
Total Harvestable Area			**54,169**	**67,193**	**32,678**	**126,075**	**280,115**	**54.99%**
Grand Total			**107,339**	**113,298**	**59,263**	**229,473**	**509,373**	**100.00%**

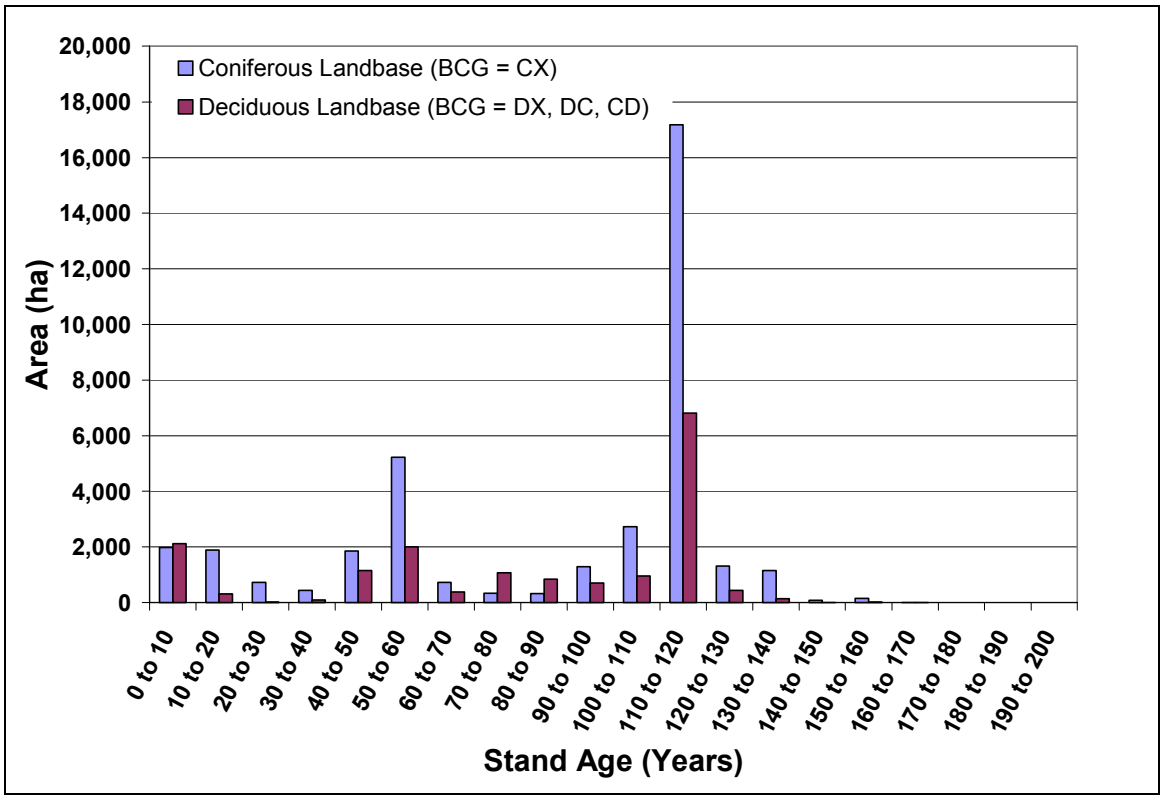

Figure 3-1 FMU E1F Age class distribution by operable coniferous and deciduous landbase

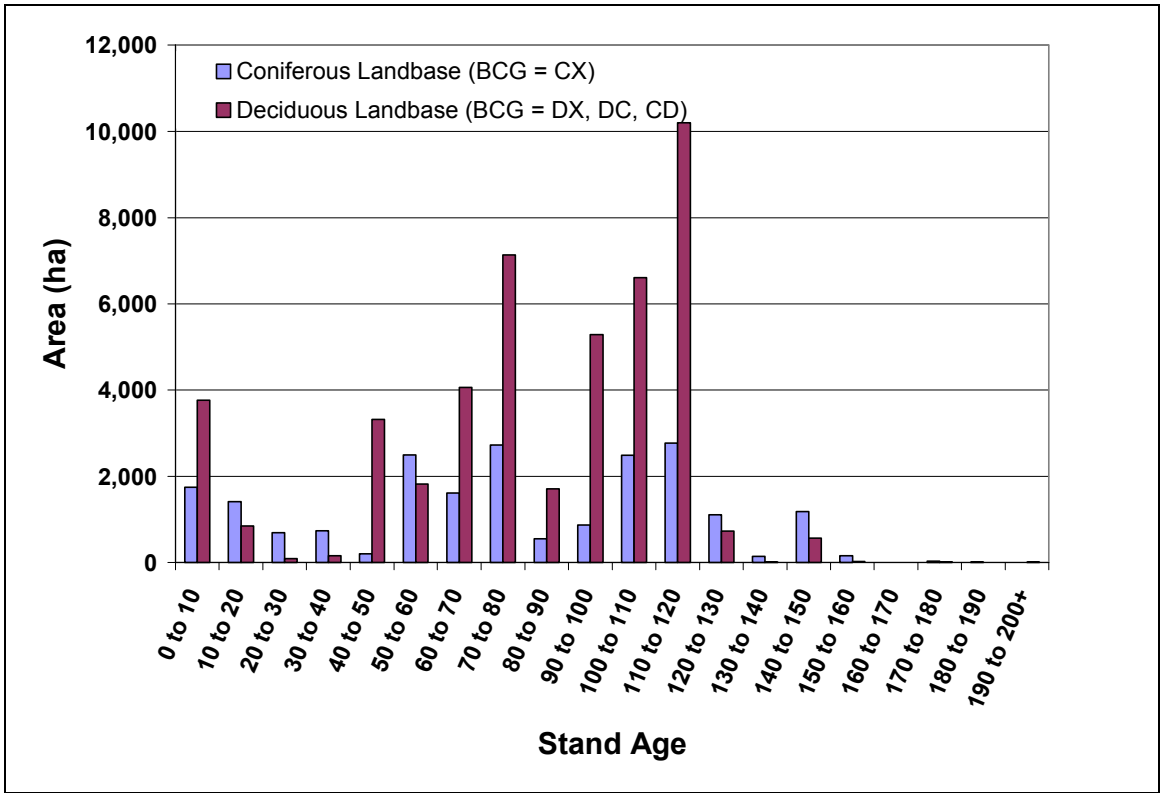

Figure 3-2 FMU E2F Age class distribution by operable coniferous and deciduous landbase

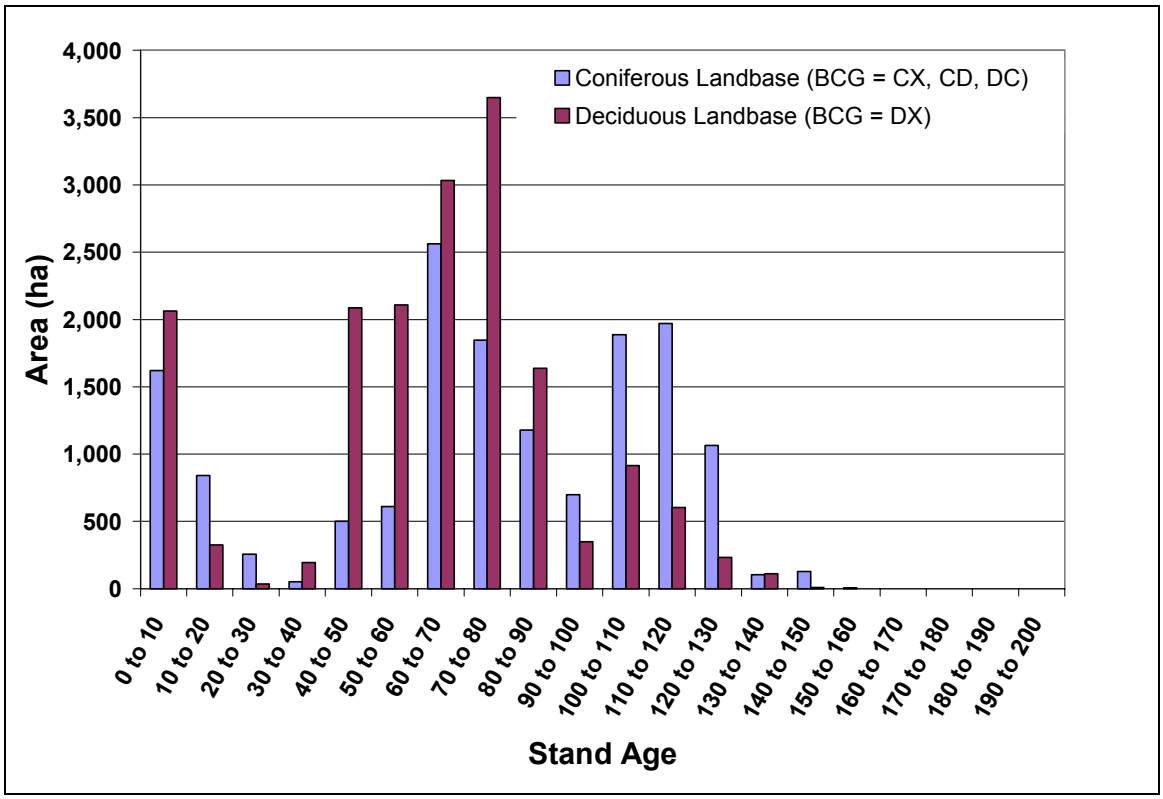

Figure 3-3 FMU W5F Age class distribution by operable coniferous and deciduous landbase

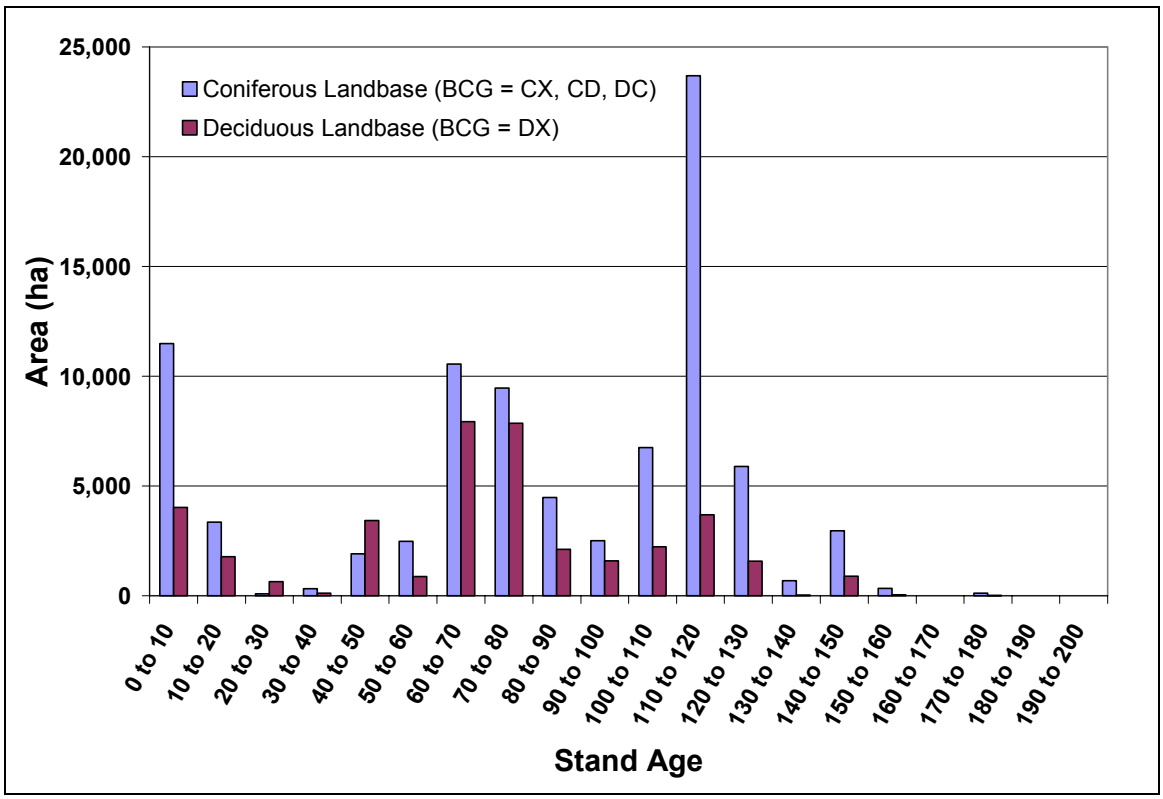

Figure 3-4 FMU W6F Age class distribution by operable coniferous and deciduous landbase

4 References

Alberta Environmental Protection, Resource Data Division, Data Acquisition Branch. 1991. Alberta Vegetation inventory standard manual (version 2.1).

5 Appendix

5.1 Data Library

Table 5-1 Data library (provided by Silvacom Ltd.) - (Field No. field relates directly to *FMA_2004* table only)

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
1.	AREA	Numeric	20	5	Area in Square Metres
2.	PERIMETER	Numeric	20	5	Perimeter of Polygon in Metres
3.	GIS_LINK	Numeric	20	0	Unique Spatial Identifier
4.	FMA	Character	10	0	FMA Identifier: EDSON; PERMIT; QUOTA.
5.	TOWNSHIP	Character	8		Township Range Meridian Label
6.	FMU	Character	8		Forest Management Unit Code: E1; E2; E3; E4; E5; E6; E7; EO1; R1; R13; R3; R4; RO1; W1; W10; W13; W2; W4; W5; W6; W8; WO1; WO2.
7.	LMU	Character	25		Landscape Management Unit Name: Beaver Meadows; Carrot Creek; Cynthia; Edson; Moose Creek; Permit; W13 (Quota); Wolf Lake.
8.	WORKAREA	Character	20		Harvest Design Areas: Big Rock; Bigoray; Brazeau Tower; Broken Arm; Broken Cabin; Chip Lake;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					Coyote Creek; Cricks Creek; Deer Hill; DTLW050008; DTLW050010; DTLW130001; DTLW130002; East Bank; Easyford; Erith; Eta Lake; Fickle Lake; Granada; Grand Trunk; Grande Prairie Trail; Hattonford; Jack Knife; Kathleen Lake DTP; Key Hole; Lobstick; Lodgepole; Lodgepole DV; Lost Elk Ridge; MacKay; McLeod Crossing; Medicine Lodge; Minnow Lake; Nine Mile; Nojack South; North Brazeau; North Dismal Creek; North Pembina; North Rat Creek; Obed Lake; Oldman Creek; Paddy Creek; Pembina; Pioneer; Poachers Creek; Rodney Creek; Sang Lake; Shiningbank East; Sinkhole Lake; South Dismal Creek; South Rat Creek; Sundance Creek; Surprise Lake; Svedberg; Swanson; Tom Hill; Tower; Trout Creek; Wolf Lake East; Wolf Lake West; Zeta Lake.
9.	LU_LINE	Numeric	2	0	Identifier for Area of Buffered Linear Dispositions
10.	LANDUSE	Character	3		Landuse Dispositions: EZE; GEO; ISP; LOC; MLL; MLP; MSL; PIL; PLA;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					PRI; REC; ROE; SMC; SME; SML; VCE; WDL.
11.	PNT	Character	10		New Area for PNT990220: PNT990220.
12.	PIONEER	Numeric	2	0	Identifier for Named Area for PNT990220
13.	DRS	Character	10		Disposition Reservation: DRS020047; DRS020049; DRS020050; DRS1370; DRS1371; DRS1372; DRS1373; DRS1374; DRS1375; DRS1376; DRS1379; DRS1380; DRS1381; DRS1382; DRS1383; DRS1384; DRS1385; DRS1386; DRS1387; DRS1388; DRS1479; DRS1548; DRS1549; DRS1550; DRS1552; DRS1553; DRS1554; DRS1555; DRS1556; DRS1557; DRS1558; DRS1559; DRS1577; DRS158; DRS230; DRS343; DRS508; DRS790121; DRS820068; DRS820076; DRS830127; DRS840029; DRS840067; DRS850062; DRS850093; DRS850099; DRS850103; DRS850117; DRS850218; DRS850219; DRS850224; DRS850257; DRS850259; DRS860057;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					DRS860058; DRS860059; DRS860072; DRS860135; DRS860140; DRS860141; DRS860142; DRS860143; DRS860214; DRS860217; DRS860276; DRS870001; DRS870008; DRS870009; DRS870010; DRS870016; DRS870069; DRS870134; DRS870150; DRS870159; DRS890102; DRS890108; DRS890110; DRS890111; DRS890112; DRS890113; DRS890142; DRS890144; DRS900107; DRS900108; DRS900110; DRS900114; DRS900115; DRS900119; DRS910036; DRS910059; DRS910061; DRS910070; DRS920004; DRS920005; DRS940045; DRS940077; DRS940099; DRS960; DRS970002; DRS980008; DRS980011.
14.	GRAZING	Character	10		Grazing Leases and Permits: FGL000002; FGL790012; FGL800017; FGL800019; FGL820003; FGL820022; FGL830005; FGL840001; FGL840023; FGL870014; FGL880012; FGL880015; FGL880024; FGL890003; FGL890012; FGL890020; FGL890025; FGL890027;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					FGL890030; FGL900001; FGL900007; FGL900025; FGL910013; FGL910015; FGL910016; FGL920014; FGL930025; FGL940004; FGL940013; FGL940021; FGL950006; FGL950008; FGL950016; FGL950018; FGL950022; FGL960001; FGL960007; FGL960014; FGL960016; FGL960019; FGL960021; FGL960023; FGL960024; GRL16097; GRL16454; GRL16540; GRL16585; GRL16827; GRL16927; GRL16972; GRL17013; GRL34501; GRL36280; GRL37186; GRL37225; GRL37469; GRL37478; GRL37678; GRL37827; GRL37990; GRL38204; GRL38299; GRL38504; GRL38603; GRL38718; GRL38748; GRL38777; GRL38819; GRL38838; GRL38955; GRL38967; GRL39265; GRL39275; GRL39279; GRL39359; GRL39414; GRL39454; GRL39567; GRL39579; GRL39756; GRL39799; GRL39884; GRL39887; GRL39901;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					GRL39951; GRL40008; GRL40030; GRL40034; GRL40135; GRL40248; GRL40252; GRL40372; GRL40396; GRL40534; GRL40556; GRL40586; GRL40602; GRL40640; GRL40779; GRL40829; GRL40835; GRL40852; GRL40926; GRL780188; GRL790524; GRL800691; GRL810453; GRL820372; GRL820434; GRL820512; GRL830091; GRL830277; GRL830324; GRL830436; GRL840026; GRL840120; GRL840528; GRL850351; GRL850430; GRL850440; GRL860021; GRL860328; GRL860481; GRL890044; GRL890120; GRL920022; GRL960009; GRL960073; GRL960077; GRL960102; GRL970004; GRL970035; GRL970062; GRP787879; GRP787904; GRP787909; GRP787921; GRP787929; GRP788018; GRP788237; GRP830043; GRP840064; GRP840066; GRP850079; GRP890012; GRP950003; GRP950004; GRP950005; GRP970002; GRR8890;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					GRR8922.
15.	STATUS	Character	16		Private Land: LEASE; TITLE.
16.	SP2000	Character	18		Special Places 2000 Areas: FICKLE LAKE; OBED LAKE; SUNDANCE.
17.	SUN500M	Numeric	2	0	Identifier for Buffered Sundance Area - 500 Metres
18.	ARCH_POT	Character	4		Archeological Potential of Areas within Historical Layer: High; Low; Mod; NA.
19.	CTP	Character	7		Coniferous Timber Permit Identifier: W060072; W060073; W060074; W060076.
20.	CUT_NUM	Character	11		Opening Number for Cutblocks
21.	CUTBLK	Numeric	2	0	Identifier for Cutblocks
22.	QB_OP	Character	10		Operator Name for Quota Holder Cutblocks: ANC – Alberta Newsprint; BR – Blue Ridge Lumber; MW – Millar Western.
23.	QB_NUM	Character	13		Opening Number for Quota Holder Blocks
24.	QUOT_BLK	Numeric	2	0	Identifier for Quota Holder Blocks
25.	PB_NUM	Character	11		Opening Number for Planned Blocks
26.	PB_OP	Character	10		Operator Name for Planned Cutblocks: ETP – Edson Timber Products; MTU – Miscellaneous Timber Users; WEYR – Weyerhaeuser.
27.	PLAN_BLK	Numeric	2	0	Identifier for Planned Blocks
28.	PQ_OP	Character	4		Operator for Planned Quota Blocks: ANC – Alberta Newsprint; BR - Blue Ridge; MW – Millar Western; WEY – Weyerhaeuser.
29.	PLAN_QUOT	Numeric	2	0	Identifier for Planned Quota Blocks
30.	STRM30	Numeric	2	0	Identifier for Stream Buffers - 30 metres
31.	STRM60	Numeric	2	0	Identifier for Stream Buffers - 60 metres
32.	STRM100	Numeric	2	0	Identifier for Stream Buffers - 100 metres
33.	LAKE	Numeric	2	0	Identifier for Lake Buffers - 100 metres
34.	SWAN200	Numeric	2	0	Identifier for Lakes Associated with Trumpeter Swan Habitat (Buffered 200m)
35.	WTRSHED	Character	50		Watersheds: Athabasca_Ord7; Bigoray_Ord4; Brazeau_Ord7; Carrot_Ord4; Dismal_Ord4; Edson_Ord4; Edson_Ord5; ElkR_Ord5; Embarras_Ord5; Erith_Ord6; Groat_Ord4; Groat_Ord5; Hanlan_Ord4; January_Ord4; Lambert_Ord4; Lobstick_Ord4; Lobstick_Ord5; McLeod_Ord7; Moose_Ord4;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					North Saskatchewan_Ord8; Obed_Ord4; Oldman_Ord4; Paddle_Ord4; Paddle_Ord5; Paddy_Ord4; Pembina_Ord5; Pembina_Ord6; Poison_Ord4; Prest_Ord4; RatE_Ord4; RatE_Ord5; Raven_Ord4; Sundance_Ord4; Swartz_Ord4; Unnamed_Ord4#01; Unnamed_Ord4#02; Unnamed_Ord4#03; Unnamed_Ord4#04; Unnamed_Ord4#05; Unnamed_Ord4#06; Unnamed_Ord4#07; Unnamed_Ord4#08; Unnamed_Ord4#09; Unnamed_Ord4#10; Unnamed_Ord4#11; Unnamed_Ord4#12; Unnamed_Ord4#13; Unnamed_Ord4#14; Unnamed_Ord4#15; Unnamed_Ord4#17; Unnamed_Ord4#18; Unnamed_Ord4#19; Unnamed_Ord4#22; Unnamed_Ord4#24; Unnamed_Ord4#25; Unnamed_Ord4#26; Unnamed_Ord4#27; Unnamed_Ord4#28; Unnamed_Ord4#29; Unnamed_Ord4#30; Unnamed_Ord4#31; Unnamed_Ord4#33; Unnamed_Ord4#34; Unnamed_Ord4#35; Unnamed_Ord4#36; Unnamed_Ord4#37; Unnamed_Ord4#38; Unnamed_Ord4#42; Unnamed_Ord4#43; Unnamed_Ord4#44; Unnamed_Ord5#01; Unnamed_Ord5#02; Unnamed_Ord5#03; Unnamed_Ord5#04; Unnamed_Ord6; WolfN_Ord4; WolfN_Ord5.
36.	CUTLINES	Numeric	2	0	Identifier for Cutline Buffers
37.	IRP_NAME	Character	26		Integrated Resource Plan Name: BRAZEAU- PEMBINA; COAL BRANCH; COLD CREEK; WHITECOURT- SWAN HILLS; YELLOWHEAD NORTH.
38.	IRP_STAT	Character	8		Integrated Resource Plan Status:

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					Approved; Proposed.
39.	IRP_TYPE	Character	12		Integrated Resource Plan Type: Regional; Sub-Regional.
40.	IRP_CODE	Character	3		Integrated Resource Plan Code: BRP; CBR; CCK; WSH; YLN.
41.	FIRE1930	Character	12		Fires for 1930's: REF-0033-36; REF-0137-40; REF-0139-40; REF-0140-40; REF-0142-40; REF-0143-40.
42.	FIRE1940	Character	12		Fires for 1940's: REF-0225-41; REF-0226-41; REF-0227-41; REF-0229-41; REF-0230-41; REF-0231-41; REF-0232-41; REF-0244-41; REF-0246-41; REF-0249-41; REF-0250-41; REF-0252-41; REF-0254-41; REF-0257-41; REF-0259-41; REF-0260-41; REF-0261-41; REF-0263-41; REF-0264-41; REF-0265-41; REF-0266-41; REF-0267-41; REF-0268-41; REF-0301-41; REF-0302-41; REF-0307-41; REF-0309-41; REF-0311-41; REF-0312-41; REF-0333-42; REF-0336-42; REF-0424-44; REF-0462-44; REF-0466-44; REF-0512-45; REF-0514-45; REF-0557-45; REF-0580-46; REF-0581-46; REF-0582-46; REF-0584-46; REF-0624-46; REF-0625-46; REF-0626-46; REF-0641-46; REF-0642-46; REF-0643-46;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					REF-0649-47; REF-0726-49; REF-0727-49; REF-0728-49; REF-0803-49; REF-0806-49; REF-0807-49; REF-0812-49; REF-0871-50.
43.	FIRE1950	Character	12		Fires for 1950's: 36-1-56; 5-1-56; 5-3-56; 5-5-59; 5-7-58; 5-9-58; 6-17-59; 6-2-56; 6-3-57; 6-5-56; 6-5-58; 6-6-56; 6-7-56; 6-8-56; 7-1-56; 7-2-56; 7-6-56; 9-3-56; 9-4-56; 9-4-57; 9-8-59; REF-0886-51; REF-0890-51; REF-0891-51; REF-0938-53; REF-0941-53.
44.	FIRE1960	Character	12		Fires for 1960's: DE4-010-61; DE4-034-61; DW1-009-68; DW2-010-68; DW2-011-68; DW2-013-68; DW2-017-68; DW2-018-68; DW2-020-68.
45.	FIRE1970	Character	12		Fires for 1970's
46.	FIRE1980	Character	12		Fires for 1980's: DE4-008-87; DW2-024-88.
47.	FIRE1990	Character	12		Fires for 1990's: N02-007-1998; N02-017-1998; N02-019-1998; N02-020-1998; N02-021-1998; N02-022-1998; N03-034-1998; P04-006-2000.
48.	FIRE2000	Character	12		Fires for 2000's: EWF-002-2003; EWF-007-2003; EWF-019-2001; EWF-029-2001; EWF-053-2003; EWF-070-2003;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					RWF-038-2001; RWF-049-2003; RWF-058-2001; WWF-012-2001.
49.	ESIP	Character	18		Eastern Slopes Integrated Plan: Agriculture; Critical Wildlife; Facility; General Recreation; Industrial; Multiple Use; No ESIP.
50.	NSN	Character	20		Natural Sub-Regions: Central Mixedwood; Dry Mixedwood; Lower Foothills; Upper Foothills.
51.	NRN	Character	16		Natural Regions: Boreal Forest; Foothills.
52.	PSP	Numeric	2	0	Identifier for Permanent Sample Plots
53.	FORSTKEY	Character	10		AVI Polygon ID Composed of PID, MER, TWP, RGE
54.	PID	Numeric	4	0	AVI Polygon ID Number by Township
55.	MER	Numeric	2	0	Meridian: 5.
56.	TWP	Numeric	3	0	Township: 47; 48; 49; 50; 51; 52; 53; 54; 55; 56; 57; 58; 59; 60.
57.	RGE	Numeric	2	0	Range: 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22.
59.					
59.	MOISTURE	Character	1		Moisture Regime Identified as Follows: A – Aquatic; D – Dry; M – Mesic; W – Wet.
60.	HEIGHT	Numeric	2	0	Height (m)
61.	SP1	Character	2		Species 1 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
62.	SP1PER	Numeric	2	0	Species 1 Percent
63.	SP2	Character	2		Species 2 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
64.	SP2PER	Numeric	2	0	Species 2 Percent
65.	SP3	Character	2		Species 3 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
66.	SP3PER	Numeric	2	0	Species 3 Percent
67.	SP4	Character	2		Species 4 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
68.	SP4PER	Numeric	2	0	Species 4 Percent
69.	SP5	Character	2		Species 5 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; SB – Black Spruce; SW – White Spruce.
70.	SP5PER	Numeric	2	0	Species 5 Percent
71.	STRUCTURE	Character	1		Stand Structure Identified as Follows: C – Complex; H – Horizontal; M – Multi-storey.
72.	HORPER	Numeric	2	0	Stand Structure Value
73.	ORIGIN	Numeric	4	0	Origin
74.	TPR	Character	1		Timber Productivity Rating Identified as Follows: G – Good; M – Medium;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					F – Fair; U – Unproductive.
75.	CC	Character	1		Crown Closure Identified as Follows: A – 6 – 30% Crown Closure; B – 31 – 50% Crown Closure; C – 51 – 70% Crown Closure; D – 71 – 100% Crown Closure.
76.	MODIFIER1	Character	2		Stand Modifier 1 Identified as Follows: AK – Animal kill; BU – Burn; CC – Clearcut; CL – Clearing; CW – Abandoned wellsite; DT – Discolored / dead tops; FL – Flooded; FT – Fire tower; IK – Insect kill; MT – Microwave tower; PI – Pipeline; RW – Railway; SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
77.	EXTENT1	Numeric	2	0	Extent of Modification 1
78.	YEAR1	Numeric	4	0	Year of Modification 1
79.	MODIFIER2	Character	2		Stand Modifier 2 Identified as Follows: BU – Burn; CC – Clearcut; CL – Clearing; GR – Grazing; IK – Insect kill; PI – Pipeline; PL – Planted; SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
80.	EXTENT2	Numeric	2	0	Extent of Modification 2
81.	YEAR2	Numeric	4	0	Year of Modification 2
82.	NONFORTYPE	Character	2		Naturally Non-Forested Vegetated Land Identified as Follows: BR – Bryophytes / mosses; HF – Herbaceous forbs; HG – Herbaceous grassland; SC – Closed shrubs; SO – Open shrubs.
83.	NONFORCL	Numeric	2	0	Non-Forested Natural Vegetated Land Shrub Closure
84.	NATNONVEG	Character	3		Naturally Non-Vegetated Land Identified as Follows: NMB – Recent burn; NMC – Cutbank; NMS – Sand; NWF – Flooded; NWL – Lake or pond; NWR – River.
85.	ANTHVEG	Character	3		Anthropogenic Vegetated Land Identified as Follows: CA – Annual crops; CIP – Pipeline; CIW – Geophysical activity (wellsite); CP – Cropland (perennial); CPR – Perennial crops (with SO or SC N.F.TYPE).

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
86.	ANTHNONVEG	Character	3		Anthropogenic Non-Vegetated Land Identified as Follows: AIE – Peat extractions; AIF – Farm; AIG – Gravel or borrow pit; AIH – Permanent right-of-way; AII – Industrial sites; AIW – Water reservoir; ASC – City, town, village; ASR – Ribbon development.
87.	INTERPRETE	Character	2		Interpreter's Initials
88.	REFSOURCE	Character	1		Reference Source Identified as Follows: A – Air call; F – Field plot; I – Interpreted TPR; P – PSP; S – Supplementary photography; V – Volume plot.
89.	REFYEAR	Numeric	4	0	Reference Year
90.	U_MOISTURE	Character	1		Moisture Regime Identified as Follows: A – Aquatic; D – Dry; M – Mesic; W – Wet.
91.	U_HEIGHT	Numeric	2	0	Height (m)
92.	U_SP1	Character	2		Species 1 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
93.	U_SP1PER	Numeric	2	0	Species 1 Percent
94.	U_SP2	Character	2		Species 2 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
95.	U_SP2PER	Numeric	2	0	Species 2 Percent
96.	U_SP3	Character	2		Species 3 Identified as Follows: A – Unspecified Deciduous; AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PJ – Jack Pine; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
97.	U_SP3PER	Numeric	2	0	Species 3 Percent
98.	U_SP4	Character	2		Species 4 Identified as Follows: AW – Trembling Aspen;

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
99.	U_SP4PER	Numeric	2	0	Species 4 Percent
100.	U_SP5	Character	2		Species 5 Identified as Follows: AW – Trembling Aspen; BW – White Birch; FB – Balsam Fir; LT – Larch; P – Pine; PB – Balsam Poplar; PL – Lodgepole Pine; SB – Black Spruce; SW – White Spruce.
101.	U_SP5PER	Numeric	2	0	Species 5 Percent
102.	U_STRUCTUR	Character	1		Stand Structure Identified as Follows: H – Horizontal; M – Multi-storey.
103.	U_HORPER	Numeric	2	0	Stand Structure Value
104.	U_ORIGIN	Numeric	4	0	Origin
105.	U_TPR	Character	1		Timber Productivity Rating Identified as Follows: G – Good; M – Medium; F – Fair; U – Unproductive.
106.	U_CC	Character	1		Crown Closure Identified as Follows: A – 6 – 30% Crown Closure; B – 31 – 50% Crown Closure; C – 51 – 70% Crown Closure; D – 71 – 100% Crown Closure.
107.	U_MOD1	Character	2		Stand Modifier 1 Identified as Follows: AK – Animal kill; BU – Burn; CC – Clearcut; CL – Clearing; CW – Abandoned wellsite; DT – Discolored / dead tops; FL – Flooded; MT – Microwave tower; RW – Railway; SC – Scarified; SN – Snags; ST – Scattered timber; TH – Thinned; TL – Transmission line; WF – Windfall.
108.	U_EXTENT1	Numeric	2	0	Extent of Modification 1
109.	U_YEAR1	Numeric	4	0	Year of Modification 1
110.	U_MOD2	Character	2		Stand Modifier 2 Identified as Follows: BU – Burn; CC – Clearcut; CL – Clearing; GR – Grazing; PL – Planted; SC – Scarified; SN – Snags; TH – Thinned.
111.	U_EXTENT2	Numeric	2	0	Extent of Modification 2
112.	U_YEAR2	Numeric	4	0	Year of Modification 2
113.	U_NONFORTY	Character	2		Non-Forested Natural Vegetated Land Type Identified as Follows:

Field No.	Field Name	Field Type	Field Width	No. of Decimals	Field Description
					BR – Bryophytes / mosses; HF – Herbaceous forbs; HG – Herbaceous grass; SC – Closed shrubs; SO – Open shrubs.
114.	U_NONFORCL	Numeric	2	0	Non-Forested Natural Vegetated Land Shrub Closure
115.	U_NATNONVE	Character	3		Naturally Non-Vegetated Land Identified as Follows: NMC – Cutbank; NMS – Sand; NWF – Flooded; NWL – Lake or pond; NWR – River.
116.	U_ANTHVEG	Character	3		Anthropogenic Vegetated Land Identified as Follows: CA – Annual crops; CIP – Pipeline; CIW – Geophysical activity (wellsite); CP – Cropland (perennial); CPR – Perennial crops (with SO or SC N.F.TYPE).
117.	U_ANTHNONV	Character	3		Anthropogenic Non-Vegetated Land Identified as Follows: AIF – Farm; AIG – Gravel or borrow pit; AIH – Permanent right-of-way; AII – Industrial sites; AIW – Water reservoir; ASR – Ribbon development.
118.	U_INTERPRE	Character	2		Interpreter's Initials
119.	U_REFSOURC	Character	1		Reference Source Identified as Follows: A – Air call; F – Field plot; I – Interpreted TPR.
120.	U_REFYEAR	Numeric	4	0	Reference Year
121.	ECOSITE	Character	8		Ecosite Code
122.	MISS_AVI	Numeric	2	0	Area Inside FMA Without AVI

Table 5-2. Data library - (for netdown defined fields – Alphabetical order by Field Name)

Field Name	Field Type	Field Width	No. of Decimals	Field Description
AGE5YR	Numeric	3	0	5 year period (in anticipation 5 year periods will be used during the TSA modeling)
AREAHA	Numeric	20	10	Area in hectares
ARIS_BCG	Character	3		ARIS record broad cover group designation CX – Pure Coniferous CD – Coniferous Dominated Mixedwood DC – Deciduous Dominated Mixedwood DX – Pure Deciduous
ARIS_LB	Character	3		ARIS record landbase designation CON – Coniferous DEC – Deciduous
ARIS_OP	Character	4		ARIS Operator ANC – Alberta Newsprint BR – Blue Ridge ETP MTU MW – Millar Western TP WEY/WEYR – Weyerhaeuser
ARIS_YC	Numeric	8	0	Year cut according to ARIS records

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				Year
AVI_STY	Character	1		Story of Primary Management (SoPM) based strictly on AVI O - Overstory U - Understory
AVI_YC	Numeric	7	0	Year cut accord to AVI "CC" modifier Year
BCGAGN	Character	5		Cutblock broad cover group assignment method 70/30 – Assumed 70/30 mixedwood coniferous or deciduous dominance depends on landbase assignment ARIS_ - ARIS records AVI_O – AVI overstory AVI_U – AVI understory LMU_A – Regeneration study (with an "A" crown closure) LMU_C – Regeneration study (with a "C" crown closure)
CL_FIRE	Character	1		Chip Lake Fire Identifier Y – Within 1998 Chip Lake Fire Boundaries BLANK – Not part of 1998 Chip Lake Fire
CL_SAL	Character	1		Chip Lake salvage block Y – Chip Lake salvage block N – Not a Chip Lake salvage block
CONTR_LB	Numeric	2	0	Landbase contributing to the harvestable land area 0 – not part of the harvestable landbase 1 – part of the harvestable landbase
CONYIELD	Numeric	4	0	Coniferous Yield Curve Number
CUTIDENT	Numeric	2	0	Cutblock Identifier (amalgamation of all cutblock identifier fields) 0 – Not a Cutblock 1 – Cutblock
DECYIELD	Numeric	4	0	Deciduous Yield Curve Number
DEL	Character	2		Polygon deletion assignment BLANK – not deleted (part of the harvestable landbase) AN – Anthropogenic non-vegetated land AV – Anthropogenic vegetated land CT – Non-disposition cutlines DR – Disposition Reservation EC – Deciduous ecosites deletion LP – Polygonal disposition LK – Riparian buffer - Lake LR - Larch subjective deletion LS – Riparian buffer – Trumpeter Swan critical habitat LU – Linear disposition NF – Non-forested vegetated land NV – Natural non-vegetated land PS – PSP PR - "Prime Protection" ESIP zones. SB – Black spruce subjective deletion SP – Park (Old Special Places 2000 nomination sites) ST – Riparian buffer - Stream UI – Unidentified opening XX – Non-valid ecosites
GRAZ_TYPE	Character	3		Grazing Disposition type FGL – Grazing License GRL – Grazing Lease GRP – Grazing Permit GRR – Grazing Reserve
HAR_AGE	Numeric	7	0	Cutblock age assignment Age in Years
HAR_CC	Character	1		Cutblock crown closure assignment based on harvesting rules A, B, C, D – As per AVI
HAR_LAND	Character	3		Cutblock landbase assignment based on harvesting rules CON – Coniferous DEC – Deciduous HHR – Historical harvesting ratio
HAR_RULE	Character	3		Cutblock Harvest Rule Assignment (see section 2.8.3) R01, R02, R03, R04, R05, R06, R07, R08, R09, R10, R11

Field Name	Field Type	Field Width	No. of Decimals	Field Description
HARPER_CON	Numeric	4	0	Composition of cutblock that are coniferous species as defined by harvesting rules 0 to 10
HARPER_DEC	Numeric	4	0	Composition of cutblock that are deciduous species as defined by harvesting rules 0 to 10
HHR_CON	Numeric	4	0	Percentage of Cutblocks assigned to the Coniferous landbase from 1983 to 2004
HHR_DEC	Numeric	4	0	Percentage of Cutblocks assigned to the Deciduous landbase from 1983 to 2004
HHR_LAND	Character	1		HHR identifier Y – Polygon landbase assigned by HHR BLANK - Polygon landbase not assigned by HHR
HHR_VAR	Numeric	4	0	HHR "random" variable assigned to each stand 0 to 99
LBAGN	Character	5		Cutblock landbase assignment method ARIS_ - ARIS records AVI_O – AVI overstory AVI_U – AVI understory CONIF – Assumed coniferous HHRAT – Historical harvesting ratio
LMU_CODE	Character	2	0	LMU Code BM – Beaver Meadows CC – Carrot Creek CY – Cynthia EU – Edson Unit MC – Moose Creek WL – Wolf Lake
MARG_OP	Numeric	1	0	Identifier of Potential Marginal Stands 1 – Potential marginal stand 0 – Not a marginal stand
NET_AREA	Numeric	20	10	Area (hectares) from stand assigned to the landbase
NSR	Character	2		Natural Subregion LF – Lower Foothills UF – Upper Foothills
O_LAND	Character	3		Overstory landbase assignment CON – Coniferous DEC – Deciduous
OLDGROW	Character	6		Potential Over-mature Category OLD_DX – stand potentially over-mature pure deciduous OLD_DC – stand potentially over-mature deciduous dominated mixedwood OLD_CD – stand potentially over-mature coniferous dominated mixedwood OLD_PL – stand potentially over-mature pine dominated pure coniferous OLD_SW – stand potentially over-mature spruce dominated pure coniferous OLD_PS - stand potentially over-mature pine/spruce mixed pure coniferous
OPEN_NUM	Character	11		Final ARIS opening number assigned to a cutblock
OPS_code	Character	8		Operational Stand Assignment Code
OPS_DEL	Character	1		Operational Deletion Y – Operational Deletion
OPS_LOCK	Character	6		Operational Lock _LOCK 4
OPS_SQ	Character	1		Operational Sequence Y – Operational Sequence
OPS_SQCP	Numeric	1	0	Period Sequenced 1 – Period 1
OS_AGE	Numeric	7	0	Overstory age Age in years
OS_COV	Character	2		Overstory Broad Cover Group CX – Pure Coniferous CD – Coniferous Dominated Mixedwood DC – Deciduous Dominated Mixedwood

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				DX – Pure Deciduous
PB_OPER2	Character	14		Operator for Planned Blocks as defined by Weyerhaeuser Operations Foresters: CCTL – Cold Creek Timber Limited MTU – Miscellaneous Timber Users
PER_CON	Numeric	4	0	Composition of overstory species that are coniferous as defined by AVI 0 to 10
PER_DEC	Numeric	4	0	Composition of overstory species that are deciduous as defined by AVI 0 to 10
PER_LARCH	Numeric	4	0	Composition of overstory that is larch as defined by AVI 0 to 10
PER_SB	Numeric	4	0	Composition of overstory that is black spruce as defined by AVI 0 to 10
PHOTOYEAR	Number	7	0	Year of Aerial Photography 1995 – W6 1998 – E1, E2, and W5
PLANNED	Numeric	2	0	Planned block identified 0 – polygon not planned for harvest 1 – polygon planned to be harvested within the first 15 years of the harvesting sequence
PLANNER	Character			Planned operator ANC – Alberta Newsprint BR – Blue Ridge ETP MTU MW – Millar Western TP UNK - Unknown WEY/WEYR – Weyerhaeuser
PRIME	Numeric	8	0	Identifier for “Prime Protection” ESIP zones. 0 - OUT 1 – IN
REMAN	Character	1		Cutblock Remnant Stand Identifier Y – Overstory remnant stand N – Overstory not a remnant stand
SEQ_NUM	Numeric	8		Sequential number assigned to each stand
SEQCHAR	Character	2		Sequential number assigned to each stand as a character
SERAL	Numeric	2	0	Seral Stage **If STD_COV=’CX’ or ‘CD’** 1 – Early (stand 0 to 10 years old) 2 – Immature (stand 11 to 40 years old) 3 – Mature (stand 40 to 90 years old) 4 – Late (stand 90 to 120 years old) 5 – Very Late (stand 120 to 170 years old) 6 – Over-mature (stand 170+ years old) **If STD_COV=’DX’ or ‘DC’** 1 – Early (stand 0 to 10 years old) 2 – Immature (stand 11 to 40 years old) 3 – Mature (stand 40 to 70 years old) 4 – Late (stand 70 to 110 years old) 5 – Very Late (stand 110 to 170 years old) 6 – Over-mature (stand 170+ years old)
ST_SITE	Character	3		Final stand site assignment LFG – Lower foothills Good LFM – Lower foothills Medium LFP – Lower foothills Poor UFG – Lower foothills Good UFM – Lower foothills Medium UFP – Lower foothills Poor XXX – Non-valid Ecosite assignment (Sitelogix W, Y, Z)
STANDKEY	Numeric	11	0	Unique Identifier for each AVI stand =mer*1,000,000,000+twp*1,000,000+rge*10,000+pid
STD_AGE	Numeric	7	0	Final stand age assignment

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				Age in Years
STD_CC	Character	1		Final stand crown closure assignment A, B, C, D – As per AVI
STD_COV	Character	2		Final Stand broad cover group assignment CX – Pure Coniferous CD – Coniferous Dominated Mixedwood DC – Deciduous Dominated Mixedwood DX – Pure Deciduous
STD_LAND	Character	3		Final stand landbase assignment CON – Coniferous DEC – Deciduous
STD_LARCH	Numeric	4	0	Composition of final stand designation that is larch as defined by AVI 0 to 10
STD_SB	Numeric	4	0	Composition of final stand designation that is black spruce as defined by AVI 0 to 10
STD_SP1	Character	2		First Species of the final stand designation (as per stand AVI codes) + CO – non-descript coniferous species and DE – non-descript deciduous species.
STD_SP1PER	Numeric	4	0	First Species of the final stand designation (as per stand AVI codes)
STD_SP2	Character	2		Second Species of the final stand designation (as per stand AVI codes)
STDPER_CON	Numeric	4	0	Final Stand composition that is contributed by coniferous species 0 to 10
STDPER_DEC	Numeric	4	0	Final Stand composition that is contributed by deciduous species 0 to 10
STORY	Character	1		Story of Primary Management (SoPM) A – Stand Managed on understory but defined to a landbase by the overstory C – Cutblock defined by the Cutblock rules (section 2.8.3) O – Overstory U – Understory (A traditional “switch” stand)
Theme1	Character	2		FMU E1 E2 W5 W6
Theme2	Character	2		Natural Subregion as defined by the provincial data sets. LF – Lower Foothills UF – Upper Foothills
Theme3	Character	8		Harvest design areas are a Weyerhaeuser operational/planning designation that divides FMUs into harvest compartments. BIGROK - Big Rock BIGORY - Bigoray BROCAB - Broken Cabin CHIPLK - Chip Lake COYOTE - Coyote Creek CRICKS - Cricks Creek DEERHL - Deer Hill EASTBK - East Bank EASYFD - Easyford ERITHX - Erith ETALAK - Eta Lake FICKLE - Fickle Lake GRANAD - Granada GRANDT - Grand Trunk GRANDE - Grande Prairie Trail HATTON - Hattonford KEYHOL - Key Hole LOBSTK - Lobstick LODGEP - Lodgepole

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				LOSTER - Lost Elk Ridge MACKAY - MacKay MCLEOD - McLeod Crossing MEDICI - Medicine Lodge NINEML - Nine Mile NMINNW – North Minnow NOJACK - Nojack South PEMBIN - North Pembina NRATCK - North Rat Creek OBEDLK - Obed Lake OLDMAN - Oldman Creek PADDYC - Paddy Creek PIONER - Pioneer RODNEY - Rodney Creek SANGLK - Sang Lake SHININ - Shiningbank East SINKHL - Sinkhole Lake SMINNW – South Minnow SRATCK - South Rat Creek SUNDAN - Sundance Creek SURPRI - Surprise Lake SVEDBG - Svedberg SWANSN - Swanson TOMHIL - Tom Hill TOWERX - Tower TROUTC - Trout Creek ZETALK - Zeta Lake
Theme4	Character	3		Grazing disposition GRZ – Grazing Allocated NOT – No Grazing
Theme5	Character	1		Site G – Good M – Medium P – Poor X – Not assigned
Theme6	Character	3		Landbase CON – Coniferous Landbase DEC – Deciduous Landbase
Theme7	Character	4		Yield Curve Assignment C1 to C111 – Coniferous dominated yield curve D1 to D50 – Deciduous dominated yield curve NONE – Not assigned to a yield curve (land that does not support forests)
Theme8	Character	1		Crown class A – “A” density crown closure B – “B” density crown closure C – “C” density crown closure D – “D” density crown closure N – Not crown closure designated
Theme9	Character	6		Old Growth Categories OLD_DX – Pure Deciduous OLD_DC – Deciduous dominated mixedwood OLD_CD – Coniferous dominated mixedwood OLD_PL – Pure Coniferous: Pine composition greater than and equal to 80% OLD_SW – Pure Coniferous: White Spruce composition greater than and equal to 80% OLD_PS – Pure Coniferous: White Spruce / Pine are the first two species with the composition of either species not greater than 79% OLD_CX – Pure Coniferous: All other pure coniferous stands that do not fit into any of the other old growth categories (OLD_PL, OLD_SW, or OLD_PS)
Theme10	Character	2		Deletion DL – Stand is a deletion and is not part of the harvestable landbase

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				NO – In the harvestable landbase
Theme11	Character	2		Chip Lake Fire NN – Not part of the Chip Lake Fire FN – Areas within the Chip Lake Fire Zone and not salvaged were assumed to be destroyed in the fire. FS – Areas within the Chip Lake Fire Zone and salvage harvested
Theme12	Character	4		Operator ANC – Alberta Newsprint Company BR – Blue Ridge Lumber CCTL – Cold Creek Timber Limited EDF – EDFOR ETP – Edson Timber Products MW – Millar Western WEY - Weyerhaeuser MTU – The MTU (Miscellaneous Timber User) designation was used in three of the FMUs (E2, W5, and W6). However, in each FMU a different user is being referred to.
Theme13	Character	4		Regeneration Tracker SR – Sufficiently restocked (typically indicates fire origin) RSR – Regenerating stand – sufficiently restocked PSR – Operationally planned and sufficiently restocked NSR - Not sufficiently restocked NOS – No stocking category
Theme14	Character	3		**Piece Size Strata** P1 – Piece Stratum 1: Coniferous dominated stands (C, or CD) – Good/Medium Sites – Lower/Upper Foothills – All crown closures (Understory managed stands not included) P2 – Piece Stratum 2: Deciduous dominated stands (D, or DC) – Good Sites – Lower/Upper Foothills – All crown closures (Understory managed stands not included) P3 – Piece Stratum 3: Poor Site (Both coniferous and deciduous dominated stands) – Lower/Upper Foothills – All crown closures (Understory managed stands not included) P4 – Piece Stratum 4: Understory managed stands (Switch stands) only – All Sites – Lower/Upper Foothills – All crown closures NA – Not assigned to a piece size stratum
U_LAND	Character	3		Understory landbase assignment CON – Coniferous DEC – Deciduous
UNI_OP	Numeric	2	0	Unidentified Opening Identifier 0 - Not an unidentified opening 1 – Unidentified opening
UPER_CON	Numeric	4	0	Composition of understory species that are coniferous as defined by AVI 0 to 10
UPER_DEC	Numeric	4	0	Composition of understory species that are deciduous as defined by AVI 0 to 10
UPER_LARCH	Numeric	4	0	Composition of understory that is larch as defined by AVI 0 to 10
UPER_SB	Numeric	4	0	Composition of understory that is black spruce as defined by AVI 0 to 10
US_AGE	Numeric	7	0	Understory age Age in years
US_COV	Character	2		Understory Broad Cover Group CX – Pure Coniferous CD – Coniferous Dominated Mixedwood DC – Deciduous Dominated Mixedwood DX – Pure Deciduous
Workab	Character	8		Work area (abbreviation) BIGROK - Big Rock BIGORY - Bigoray BROCAB - Broken Cabin

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				CHIPLK - Chip Lake COYOTE - Coyote Creek CRICKS - Cricks Creek DEERHL - Deer Hill EASTBK - East Bank EASYFD - Easyford ERITHX - Erith ETALAK - Eta Lake FICKLE - Fickle Lake GRANAD - Granada GRANDT - Grand Trunk GRANDE - Grande Prairie Trail HATTON - Hattonford KEYHOL - Key Hole LOBSTK - Lobstick LODGEP - Lodgepole LOSTER - Lost Elk Ridge MACKAY - MacKay MCLEOD - McLeod Crossing MEDICI - Medicine Lodge NINEML - Nine Mile NMINNW – North Minnow NOJACK - Nojack South PEMBIN - North Pembina NRATCK - North Rat Creek OBEDLK - Obed Lake OLDMAN - Oldman Creek PADDYC - Paddy Creek PIONER - Pioneer RODNEY - Rodney Creek SANGLK - Sang Lake SHININ - Shiningbank East SINKHL - Sinkhole Lake SMINNW – South Minnow SRATCK - South Rat Creek SUNDAN - Sundance Creek SURPRI - Surprise Lake SVEDBG - Svedberg SWANSN - Swanson TOMHIL - Tom Hill TOWERX - Tower TROUTC - Trout Creek ZETALK - Zeta Lake
WTR2	Character	12		Watershed Name Athabasca Bear Bigoray Cairn Carrot Carrot Tower Chevron Chip Coyote Cricks Cynthia Deer Hill East Pembina Edson Edson North Embarras Erith Fairless Fickle Graham Granada Groat

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				Half Moon Hanlan Hardluck Hinton Kathleen Ladd Lobstick Mason McLeod Miller Minnow Moose Obed Oldman Paddle Paddy Pembina Poison Rally Rat North Rat South Raven Sang Shiningbank Sinkhole Slide Sundance Swartz Tom Hill Trout West Eta Whitefish Zeta
WTRAB	Character	6		Watershed Abbreviation ATHA BEAR BIGO CAIR CARR CART CHEV CHIP COYO CRIC CYNT DEER EPEM EDSO EDSN EMBA ERIT FAIR FICK GRAH GRAN GROA HALF HANL HARD HINT KATH LADD LOBS MASO MCLE MILL MINN MOOS

Field Name	Field Type	Field Width	No. of Decimals	Field Description
				OBED OLDM PADD PADY PEMB POIS RALL RATN RATS RAVE SANG SHIN SINK SLID SUND SWAR TOMH TROU WEST WHIT ZETA
YIELDNUM	Character	4		Yield curve number assigned to stand (see yield curve document) Character#1: C – Coniferous Yield Curve D – Deciduous Yield Curve Character#2 to #4: Yield Curve Number (Example C 23 – Coniferous Yield Curve #23)
YIELDTYPE	Character	3		Yield Type CON – Coniferous DEC – Deciduous

5.2 Exhaustive list of Yield Curves

Yield Number *[YIELDNUM]*	Broad Cover Group *[STD_COV]*	Site *[ST_SITE]*	Crown Closure *[STD_CC]*	Coniferous Composition *[STDPER_CON]*	Operable Area *[NETAREA]*
Coniferous Dominated Yields					
C1	CD	LFG	A	5	**1,268**
C2	CD	LFG	A	6	**3,793**
C3	CD	LFG	A	7	**1,302**
C4	CX	LFG	A	8	**1,183**
C5	CX	LFG	A	9	**2,422**
C6	CX	LFG	A	10	**3,321**
C7	CD	LFG	B	5	**460**
C8	CD	LFG	B	6	**1,744**
C9	CD	LFG	B	7	**1,816**
C10	CX	LFG	B	8	**2,088**
C11	CX	LFG	B	9	**2,244**
C12	CX	LFG	B	10	**2,058**
C13	CD	LFG	C	5	**6,497**
C14	CD	LFG	C	6	**9,616**
C15	CD	LFG	C	7	**5,676**

Yield Number *[YIELDNUM]*	Broad Cover Group *[STD_COV]*	Site *[ST_SITE]*	Crown Closure *[STD_CC]*	Coniferous Composition *[STDPER_CON]*	Operable Area *[NETAREA]*
C16	CX	LFG	C	8	**5,141**
C17	CX	LFG	C	9	**8,786**
C18	CX	LFG	C	10	**2,130**
C19	CD	LFG	D	5	**126**
C20	CD	LFG	D	6	**377**
C21	CD	LFG	D	7	**804**
C22	CX	LFG	D	8	**1,143**
C23	CX	LFG	D	9	**2,462**
C24	CX	LFG	D	10	**703**
C25	CD	LFM	A	5	**24**
C26	CD	LFM	A	6	**243**
C27	CD	LFM	A	7	**347**
C28	CX	LFM	A	8	**492**
C29	CX	LFM	A	9	**1,234**
C30	CX	LFM	A	10	**2,162**
C31	CD	LFM	B	5	**8**
C32	CD	LFM	B	6	**219**
C33	CD	LFM	B	7	**809**
C34	CX	LFM	B	8	**803**
C35	CX	LFM	B	9	**2,323**
C36	CX	LFM	B	10	**4,338**
C37	CD	LFM	C	5	**99**
C38	CD	LFM	C	6	**1,462**
C39	CD	LFM	C	7	**1,290**
C40	CX	LFM	C	8	**2,164**
C41	CX	LFM	C	9	**9,984**
C42	CX	LFM	C	10	**16,938**
C43	CD	LFM	D	5	**0**
C44	CD	LFM	D	6	**46**
C45	CD	LFM	D	7	**126**
C46	CX	LFM	D	8	**168**
C47	CX	LFM	D	9	**2,181**
C48	CX	LFM	D	10	**6,121**
C49	CD	LFP	A, B, C, D	5	**156**
C50	CD	LFP	A, B, C, D	6	**656**
C51	CD	LFP	A, B, C, D	7	**604**
C52	CX	LFP	A, B, C, D	8	**589**
C53	CX	LFP	A, B, C, D	9	**3,301**
C54	CX	LFP	A, B, C, D	10	**6,250**
C55	CD	UFG	A	5	**12**
C56	CD	UFG	A	6	**242**

Yield Number *[YIELDNUM]*	Broad Cover Group *[STD_COV]*	Site *[ST_SITE]*	Crown Closure *[STD_CC]*	Coniferous Composition *[STDPER_CON]*	Operable Area *[NETAREA]*
C57	CD	UFG	A	7	**81**
C58	CX	UFG	A	8	**183**
C59	CX	UFG	A	9	**62**
C60	CX	UFG	A	10	**334**
C61	CD	UFG	B	5	**31**
C62	CD	UFG	B	6	**154**
C63	CD	UFG	B	7	**217**
C64	CX	UFG	B	8	**309**
C65	CX	UFG	B	9	**383**
C66	CX	UFG	B	10	**906**
C67	CD	UFG	C	5	**40**
C68	CD	UFG	C	6	**1,066**
C69	CD	UFG	C	7	**598**
C70	CX	UFG	C	8	**792**
C71	CX	UFG	C	9	**3,156**
C72	CX	UFG	C	10	**3,153**
C73	CD	UFG	D	5	**10**
C74	CD	UFG	D	6	**49**
C75	CD	UFG	D	7	**140**
C76	CX	UFG	D	8	**125**
C77	CX	UFG	D	9	**696**
C78	CX	UFG	D	10	**1,389**
C79	CD	UFM	A	5	**0**
C80	CD	UFM	A	6	**0**
C81	CD	UFM	A	7	**11**
C82	CX	UFM	A	8	**56**
C83	CX	UFM	A	9	**213**
C84	CX	UFM	A	10	**326**
C85	CD	UFM	B	5	**0**
C86	CD	UFM	B	6	**3**
C87	CD	UFM	B	7	**15**
C88	CX	UFM	B	8	**0**
C89	CX	UFM	B	9	**41**
C90	CX	UFM	B	10	**59**
C91	CD	UFM	C	5	**0**
C92	CD	UFM	C	6	**70**
C93	CD	UFM	C	7	**27**
C94	CX	UFM	C	8	**113**
C95	CX	UFM	C	9	**350**
C96	CX	UFM	C	10	**48**
C97	CD	UFM	D	5	**0**

Yield Number *[YIELDNUM]*	**Broad Cover Group** *[STD_COV]*	**Site** *[ST_SITE]*	**Crown Closure** *[STD_CC]*	**Coniferous Composition** *[STDPER_CON]*	**Operable Area** *[NETAREA]*
C98	CD	UFM	D	6	**0**
C99	CD	UFM	D	7	**3**
C100	CX	UFM	D	8	**1**
C101	CX	UFM	D	9	**11**
C102	CX	UFM	D	10	**71**
C103	CD	UFP	A, B, C, D	5	**0**
C104	CD	UFP	A, B, C, D	6	**8**
C105	CD	UFP	A, B, C, D	7	**8**
C106	CX	UFP	A, B, C, D	8	**0**
C107	CX	UFP	A, B, C, D	9	**97**
C108	CX	UFP	A, B, C, D	10	**35**
C109	Switch Stand (CD)	LFG/UFG	A, B, C, D	Understory Based 0 to10	**9,607**
C110	Switch Stand (CD)	LFM/UFM	A, B, C, D	Understory Based 0 to10	**196**
C111	Switch Stand (CD)	LFP/UFP	A, B, C, D	Understory Based 0 to10	**81**
Total Coniferous Dominated Stand Area					**157,881**
Deciduous Dominated Yields					
D1	DX	LFG	A	0	**1,568**
D2	DX	LFG	A	1	**446**
D3	DX	LFG	A	2	**1,365**
D4	DC	LFG	A	3	**2,150**
D5	DC	LFG	A	4	**1,700**
D6	DC	LFG	A	5	**402**
D7	DX	LFG	B	0	**6,233**
D8	DX	LFG	B	1	**4,709**
D9	DX	LFG	B	2	**2,696**
D10	DC	LFG	B	3	**2,903**
D11	DC	LFG	B	4	**1,852**
D12	DC	LFG	B	5	**883**
D13	DX	LFG	C	0	**21,316**
D14	DX	LFG	C	1	**19,835**
D15	DX	LFG	C	2	**16,522**
D16	DC	LFG	C	3	**9,053**
D17	DC	LFG	C	4	**6,513**
D18	DC	LFG	C	5	**1,978**
D19	DX	LFG	D	0	**7,095**
D20	DX	LFG	D	1	**4,362**
D21	DX	LFG	D	2	**1,423**
D22	DC	LFG	D	3	**718**

Yield Number *[YIELDNUM]*	Broad Cover Group *[STD_COV]*	Site *[ST_SITE]*	Crown Closure *[STD_CC]*	Coniferous Composition *[STDPER_CON]*	Operable Area *[NETAREA]*
D23	DC	LFG	D	4	**334**
D24	DC	LFG	D	5	**157**
D25	DX	UFG	A	0	**53**
D26	DX	UFG	A	1	**48**
D27	DX	UFG	A	2	**135**
D28	DC	UFG	A	3	**149**
D29	DC	UFG	A	4	**5**
D30	DC	UFG	A	5	**32**
D31	DX	UFG	B	0	**144**
D32	DX	UFG	B	1	**179**
D33	DX	UFG	B	2	**114**
D34	DC	UFG	B	3	**325**
D35	DC	UFG	B	4	**119**
D36	DC	UFG	B	5	**129**
D37	DX	UFG	C	0	**358**
D38	DX	UFG	C	1	**1,013**
D39	DX	UFG	C	2	**615**
D40	DC	UFG	C	3	**579**
D41	DC	UFG	C	4	**538**
D42	DC	UFG	C	5	**258**
D43	DX	UFG	D	0	**61**
D44	DX	UFG	D	1	**20**
D45	DX	UFG	D	2	**157**
D46	DC	UFG	D	3	**33**
D47	DC	UFG	D	4	**93**
D48	DC	UFG	D	5	**10**
D49	DX	LFP/UFP	A, B, C, D	0 to 2	**362**
D50	DC	LFP/UFP	A, B, C, D	3 to 5	**490**
Total Deciduous Dominated Stand Area					**122,233**

5.3 Individual input data layers

File name and description

avi.e00 – AVI
ctp.e00 – coniferous timber permit
cutblks.e00 – cutblocks data provided by Weyerhaeuser Company
cutlines.e00 – non-dispositions cutlines
drs.e00 – dispositions reservations
ecosites.e00– SiteLogix
esip.e00 – Eastern Slopes Policy zones
fire_all.e00 – fire history

fma.e00 – FMA
fmu.e00 – FMU
grazing.e00 – grazing dispositions
hda.e00 – harvest design areas (work areas)
historical.e00 – historical resources
index.e00 – township grid
irp_zones.e00 – Integrated Resource Plan zones
lmu.e00 – LMU
lu_line.e00 – linear dispositions
p_blk.e00 – Weyerhaeuser planned block
pioneer.e00 – Pioneer PNT
pq_blk.e00 – Quota holder planned blocks
private.e00 – private land
psp.e00 – PSPs
quot_blks.e00 – cutblocks data provide by Quota holders
sp2000.e00 – old sp2000 sites (now parks)
sub_regions.e00 – Provincial defined natural regions
sun_500m.e00 – 500m buffer around Sundance Valley park
tda.e00 – polygon and linear dispositions
water_buff.e00 – water course buffers
watershed.e00 – fourth order watersheds

5.4 Additions to the landbase netdown since the November 24, 2004 submission

On April 1, 2005 Weyerhaeuser received written notification from Sustainable Resource Development of an agreement-in-principle with the document that was submitted on November 24, 2005. This document replicates the process used in the previous submission. However, some coding has been added that enables for easier input of information into the modeling process (Woodstock/Stanley). There also have been some minor updates to the coding based on information that came apparent after the previous submission. Each of these additions/updates are discussed in detail below.

5.4.1 Corrections to coding of the subjective deletion criteria

Pure black spruce stands were to be identified as subjective deletions (inoperable sites) by the following AVI criteria used in section 2.9.3:

> *Subjective Deletion 1 – Story of Primary Management has greater than and equal to 80% black spruce composition.*

The original coding:

If STD_SP1=SB and sp1per>=8 and cutident<1 and plan_quot<1 and plan_blk<1 then del=SB

Was replaced with (see line 729 in the code):

If STD_SB>=8 and cutident<1 and plan_quot<1 and plan_blk<1 then del=SB

The original coding was very close to the intent of subjective deletion 1 however the evaluation of the stand black spruce stand composition should have been made on the story of primary management (see section 2.10) not on the overstory only. Therefore, the field that evaluates the amount of black spruce within the story of primary management *[STD_SB]* was used instead. Switching to the new code had the following minimal impact on the net operable landbase:

E1 = + 175 ha
E2 = + 94 ha
W5 = - 4 ha
W6 = + 1 ha

5.4.2 Changes based on using 100m stream buffers

In the GIS file ***FMA_2004,*** a buffer of 100m ***[STRM100]*** was applied to some river locations. The original intention was to ignore this data and use 60m buffers to be consistent with the operating ground rules. However, upon consideration by Weyerhaeusers operational foresters it was determined that in most cases (due to deviations in the accuracy of the spatial steam data and the width of the stream bank) it was operationally more realistic to use the 100m buffer length as a deletion when it was provided.

Therefore, the following code was added to the program:

```
if strm100=1 and cutblk<1 and quot_blk<1 THEN DEL=ST;
```

This had moderate impact upon the netdown with an additional 1,285ha being assigned as stream buffers within the FMA (E1= -700 ha, E2= - 270ha, W5= -75ha, W6= -240ha). However, the actual impact on the net landbase was significantly less because a large portion of this area had already been deleted for other reasons.

5.4.3 Changes to assigning first species to cutblocks

Assigning first species to a cutblock can be a difficult task because the AVI call sometimes accurately represents the post harvest block type and sometimes the call represents retention patches. Additionally, in some instances ARIS records were used in addition to AVI data as a descriptor of what is growing on cutblocks (Section 2.8.4).

For the November 24, 2004 submission it was assumed that the first species of the AVI overstory was representative of the first species of the cutblock *[STD_SP1=SP1]*. However, upon review it appears that this strategy (while being sufficient in a number of cases) resulted in some instances where retention patches were used to assign the first species of a cutblock. Therefore, it was possible for ARIS to indicate that a stand was regenerating as a pure coniferous stand *[STD_COV=CX]* but then assign the stand a deciduous first species from AVI. To fix this problem, the code that assigned first species for cutblocks by the first species of the overstory *[STD_SP1=SP1]* was removed. First species for cutblocks is now assigned based on the landbase call to either a generic "CO" for the coniferous landbase *[*`if std_sp1= and`

std_land=CON then std_sp1=CO;] or "DE" for the deciduous landbase *[if std_sp1= and std_land=DEC then std_sp1=DE;].*

This change has no impact on non-cutblock stands. The only further impact to the netdown caused by this change is that some 50% coniferous/50% deciduous mixedwoods stands were moved to a "CD" cover group from a "DC" cover group (and vice versa). This change doses not impact stand landbase assignment as that was independent of this process. For example a Coniferous landbase stand assigned the "DC" 50/50 yield curve "D24" is now a Coniferous landbase stand assigned the "CD" 50/50 yield curve "C19". To summarize by FMU:

- E1 – 0.2 ha from CD to DC
- E2 – 10.8 ha from CD to DC
- W5 – 721.2 ha from DC to CD
- W6 – 2,892.9 ha from DC to CD

There is little change in E1 and E2. However, for W5 and W6 there has been some moderately significant shift (total of 3,614 ha) from DC to CD cover groups from the previous run. The vast majority of this data 3,549 ha came from harvest rules 7, 8, and 9 (Section 2.8.4). Since all cutblocks prior to 1983 are assumed to be coniferous unless otherwise explicitly stated by ARIS it is credible to assume that there would be a bias towards coniferous dominated stands. However, for cutblocks harvested from 1983 to 1995 it is somewhat more difficult to understand how these areas should be assigned. Therefore, the HHRs (historical harvesting ratio) for stand records harvested between the years 1983 and 1995 (Table 5-3 and Table 5-4) were compared to the landbase netdown area from the net landbase.

Table 5-3. The HHR of coniferous versus deciduous broad cover groups by LMU (W5 and W6) for stands harvested from 1983 to 1995 (based on ARIS data)

Land Management Unit	Area (ha) Harvested	CX and CD stands	DX and DC stands
Beaver Meadows	2,205	1,222	983
Wolf Lake	1,351	639	712
Cynthia	4,213	2,811	1,402
Carrot Creek	1,575	691	884
Total	9,344	5,363 (57%)	3,981 (43%)

Table 5-4. The netdown file coniferous versus deciduous broad cover groups (W5 and W6 combined) for stands harvested from 1983 to 1995 (netdown area comparison)

Netdown Date	Area (ha) of CX and CD stands	Area (ha) of DX and DC stands
November 24, 2004	4,194 (40%)	6,368 (60%)
Current Report	6,742 (64%)	3,818 (36%)

The previous (November 24, 2004) netdown resulted in a significantly greater proportion of cutblock data being assigned to deciduous broad cover groups than were indicated by the HHR (43% versus 60% - see Table 5-3 and Table 5-4 respectively). The current report having a proportion split of 64% coniferous versus 36% deciduous is much closer to the HHR split of 57% coniferous versus 43% deciduous.

These results suggest the current report is closer to the HHR and therefore the area moved from DC to CD cover groups appears to be justified. The shift of 3,600 ha from a 50/50 DC yield

curve to a 50/50 CD yield curve ultimately causes a small impact on the AAC. This change causes no shift in landbase assignment as both CD and DC cover groups are part of the coniferous landbase in W5 and W6 (or in E1 and E2 part of the deciduous landbase). This also has no operational consequences because none of these blocks will be harvested within the lifespan of this DFMP therefore; this issue will be clarified in the future as subsequent data are provided.

5.4.4 Input from operational foresters

Since the November 24, 2004 netdown there have been several inputs by operation foresters (from Weyerhaeuser, other operators, and SRD). After observing the first draft sequence operations foresters noticed some problems with the sequence caused by a variety of issues including:

- recent changes to the status of planned blocks and cutblocks that had not been captured in the original landscape coverages
- poor harvest sequence
- poor access
- inoperable areas
- areas incorrectly assigned

Changes observed by operations personnel are tracked in the following fields:

- PB_OPER2 – Operations identified harvester of sequenced blocks in the Cynthia LMU in FMU – W6.
- OPS_CODE – All operational changes were provided a grouping code to make future identification easier.
- OPS_SEQ – Identified polygons to be sequenced for harvest
- OPS_SQCP – Identified the cut period that polygons are to be harvested
- OPS_LOCK – Identified polygons to be temporality locked from being sequenced
- OPS_DEL – Identified operational deletions

These issues were than added to the netdown process by a series of files that linked directly to the *FMA_finassign* file through the *GIS_LINK* field and the SAS program was re-run to reflect these changes.

5.4.4.1 Assigning Operators within the Cynthia LMU

After the November 24, 2004 netdown submission Weyerhaeuser operations foresters identified the scheduled harvester of a number of pre-planned blocks within the Cynthia LMU in W6F *[Cynthia_pb]*. This coverage was linked into the landbase assignment file *[FMA_finassign]* by the *[PB_Num]* field, which is the ARIS opening number for planned blocks. The imported field *[PB_Oper2]* was then used to update the *[Planner]* field, which defines the operators for sequenced planned blocks.

This change has no impact on the netdown and is used only within Woodstock as a reporting tool.

5.4.4.2 Operational Deletions

Three additional deletion areas were identified by operations foresters that had not been removed from the operable landbase in the November 24, 2005 submission. Two of these deletion areas were located in FMU W6. Firstly, an oxbow island was removed (Figure 5-1) because it was determined that the expense required to access this location (a total of 16 ha) is too great to justify over the foreseeable future (this can be reviewed during the next DFMP). Therefore, the entire island was removed from the operable landbase *[File=W6_bigo_del:OPS_CODE =W6_GR5]*.

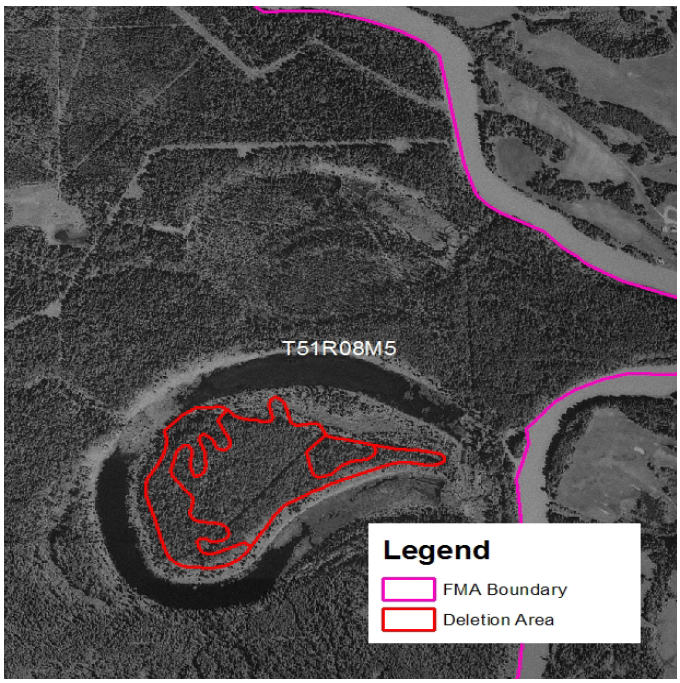

Figure 5-1 Bigory oxbow island - operational deletion

Secondly, a total of 8 ha located between a road and a pipeline were deemed to be inoperable (Township 48 Range 11 - Figure 5-3) *[File=W6_pipe_del:OPS_CODE=W6_GR6]*. This will be re-examined during the next DFMP process. Finally in E2, 43 ha were not correctly identified as private land (in Township 51 Range 8) and were removed from the operable landbase (Figure 5-3). All of these deletion polygons are identified by an "OP" placed in the *[DEL]* field *[File=E2_priv_del:OPS_CODE=E2_GR1]*.

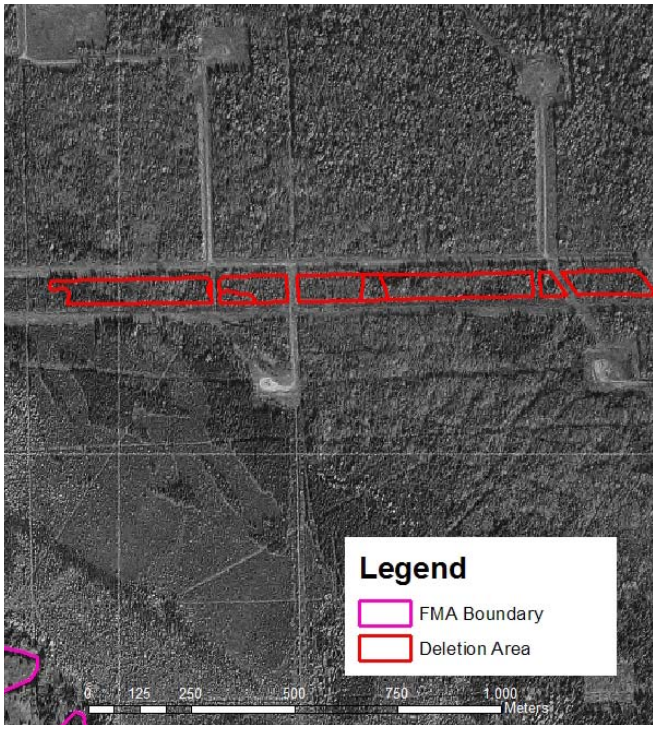

Figure 5-3. Pipeline and road - operational deletion

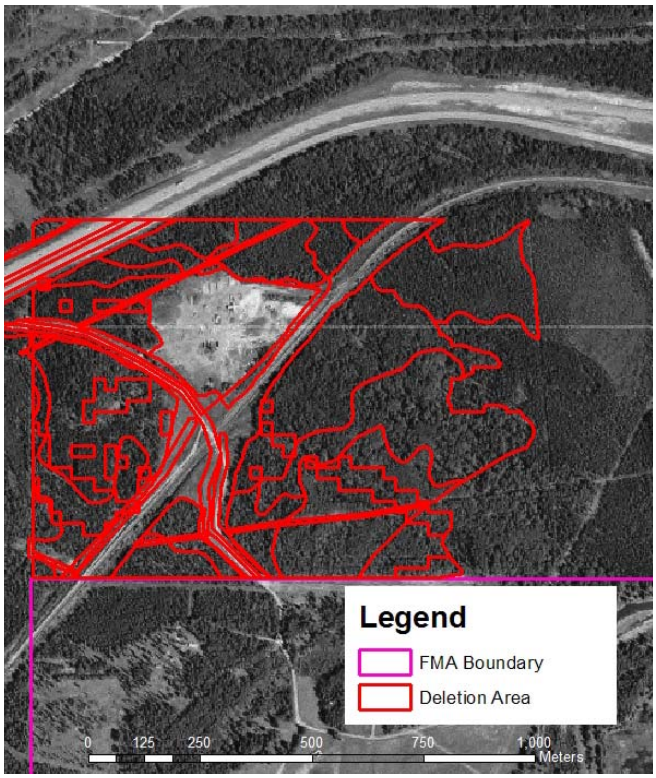

Figure 5-3. Private land - operational deletion

5.4.4.3 Operational Locking of Stands

Upon instruction from operational foresters a number of stands were locked for harvest due to a variety of reasons which included:

- improving the harvest sequence
- poor access
- prohibiting harvesting in areas to maintain contiguous areas of minimally impacted forest

A summary of lock *[input file:OPS_CODE]* designations by FMU are as follows:

E1
E1P3:E1P3
E1P5:E1P5
E1P9:E1P9
E1P10:E1P10

E2
E2_obed_lock:E2GR2
E2_moos_lock:E2GR4
E2_camp_lock:E2GR6

W5
None

W6
W6_nojs_lock:W6_GR1
W6_gas_np_lock:W6_GR2
W6_gas_sr_lock:W6_GR4
W6_GL1:W6_GL1
W6_GL2:W6_GL2
W6_GL3:W6_GL3
W6_GL4:W6_GL4
W6_GL5:W6_GL5
W6_GL6:W6_GL6

5.4.4.4 Operational Sequencing

Planning foresters selected stands to improve sequencing.

A summary of sequenced *[input file:OPS_CODE]* designations by FMU are as follows:

E1
E1_SVED_SEQ:E1_1SEQ
E1P1:E1P1
E1P2:E1P2
E1P4:E1P4
E1P7:E1P7
E1P8:E1P8

E2
E2_gp_seq:E2GR5
E2_miss_seq:E2GR6
E2P1:E2P1

W5
W5_er_seq:W5_GR1

W6
W6_anc_seq:W6_ANCS
W6_mw_seq:W6_GR3
W6_GS1:W6_GS1
W6_GS2:W6_GS2
W6_GS4:W6_GS4
W6_GS5:W6_GS5
W6_GS6:W6_GS6

5.4.5 Marginal Stands

The Edson FMA has a number of different timber operators with diverse standards. These operators have an agreement upon the definition of what constitutes a truly merchantable stand.

However, there is a relatively small range of forest types (hereafter called *marginal*) where some disparities between operators arose as to if marginal stands are viable for operations.

During the landbase allocation portion of the DFMP process, Weyerhaeuser in discussion with other Edson FMA timber harvesters developed a set of agreed upon "rules" to identify the merchantable landbase. These rules were used in the submitted November 24, 2004 as subjective deletions. The Edson FMA AACs were set based upon this "approved" netdown procedure along with the "approved" yield curves (volume from marginal stands not included).

In general subjective deletions identify stands located on wet sites. The two subjective deletion rules used were: 1) Stands with 10% or more Larch composition or; 2) Stands with 80% or more Black spruce composition.

To identify the *marginal* area all subjectively deleted stands with the most favorable AVI stand attributes were identified. During meetings and discussions with Edson FMA timber harvesters the following rules were agreed upon to indicate potential marginal stands (all the following must be true to qualify).

a. Area must have been assigned as a subjective deletion only and must not have greater than 20% larch composition (for example a 100% pure black spruce stand within a stream buffer cannot be considered marginal).
b. Stand must be greater than and equal to 14m tall
c. Stand must have greater than an "A" crown closure

Marginal stands are represented in the database when marg_op=1.

Table 5-5. Marginally productive stand areas by FMU

FMU	Area of stands with 10% or 20% larch that are defined as marginally productive (ha)	Area of stands with 80% or greater black spruce that are defined as marginally productive (ha)	Total marginally productive area (ha)
E1	748	2,047	2,795
E2	1,061	1,814	2,875
W5	400	354	754
W6	1,255	2,103	3,358

5.4.6 Assigning Piece Size Strata

Four strata were used to project piece size across the Edson FMA.

1. Coniferous dominated stands (C, or CD) – Good/Medium Sites – Lower/Upper Foothills – All crown closures (Understory managed stands (Switch) not included)
2. Deciduous dominated stands (D, or DC) – Good Sites – Lower/Upper Foothills – All crown closures (Understory managed stands (Switch) not included)
3. Poor Site (Both coniferous and deciduous dominated stands) – Lower/Upper Foothills – All crown closures (Understory managed stands (Switch) not included)
4. Understory managed stands – All Sites – Lower/Upper Foothills – All crown closures

Table 5-6 Area (ha) by Piece Strata Group

PStrata	Site	Stand Type	Area (ha)
1	Good/ Medium	Coniferous	136,292
2	Good	Deciduous	106,490
3	Poor	Coniferous / Deciduous	12,558
4	All	Understory Managed	27,775

To clarify the above understory management regime does not match exactly with the understory SoPM defined in (Section 2.10.1). The piece size strata are based upon a stand alone analysis as outlined in the Yield Projections Report.

5.4.7 Woodstock Input files

To ensure a realistic harvest sequence, two goals within the timber supply model (Woodstock) were to ensure harvesting across the profile of the operable landbase and to ensure that a minimum critical level of late seral stage stand area remains on the FMA over time.

5.4.7.1 Harvesting across the profile

To ensure sustainability, constraints were used in the Woodstock/Stanley timber supply analysis model to ensure that there are no significant biases toward any strata types. When no such controls were maintained, operational problems were caused because disproportionately high amounts of low density (CC=A) stand areas were being scheduled for harvested. The reason being the model was attempting to take maximum benefit from moving understocked stands to fully-stocked status.

To avoid this problem, crown closure and site class were identified as the two selection factors which most strongly influence the volume obtained from a stand. In the TSA each FMU is identified as a sustained yield unit and the area by crown closure class and site class were estimated for each unit. The goal was to identify a range of areas for each class that allowed for flexibility in the TSA model yet ensured that most harvest strata types are harvested in some proportional type to its distribution with in the operable landbase. Therefore, the goal harvest range for each site and crown closure class was to harvest between +50% or –50% of the proportional harvest area based on the rotation age (Table 5-7, Table 5-8). For easier implementation into the TSA model, the ranges were reported for each 5-year-period.

Table 5-7. Proportional 5-year operational harvest area target for the TSA model by Site Class

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)
FMU	**Landbase**	**Site**	**Operable Area (ha)**	**Rotation Age (Years)**	**5-year Proportional Harvest Area (Col.4)*5/(Col.5)**	**Lower 50% Harvest Area (Col.6)*0.50**	**Upper 50% Harvest Area (Col.6)*1.50**
E1	**CON**	**G**	16,530	80	1,033	517	1,550
		M	17,675	80	1,105	552	1,657
		P	2,901	80	181	91	272
	DEC	**G**	16,045	80	1,003	501	1,504
		M	850	80	53	27	80
		P	168	80	10	5	16
E2	**CON**	**G**	14,405	80	900	450	1,351
		M	5,464	80	341	171	512
		P	1,021	80	64	32	96
	DEC	**G**	44,687	80	2,793	1,396	4,189
		M	1,365	80	85	43	128
		P	251	80	16	8	24
W5	**CON**	**G**	9,778	100	489	244	733
		M	3,843	100	192	96	288
		P	1,708	100	85	43	128
	DEC	**G**	17,289	80	1,081	540	1,621
		P	61	80	4	2	6
W6	**CON**	**G**	54,742	80	3,421	1,711	5,132
		M	25,998	80	1,625	812	2,437
		P	6,394	80	400	200	599
	DEC	**G**	38,804	80	2,425	1,213	3,638
		P	136	80	9	4	13

Table 5-8. Proportional 5-year operational harvest area target for TSA model by Crown Closure Class

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)
FMU	**Landbase**	**AVI Crown Closure**	**Operable Area (ha)**	**Rotation Age (Years)**	**5-year Proportional Harvest Area (Col.4)*5/(Col.5)**	**Lower 50% Harvest Area (Col.6)*0.50**	**Upper 50% Harvest Area (Col.6)*1.50**
E1	**CON**	**A**	5,491	80	343	172	515
		B	6,157	80	385	192	577
		C	16,744	80	1,046	523	1,570
		D	8,715	80	545	272	817
	DEC	**A**	1,394	80	87	44	131
		B	3,074	80	192	96	288
		C	10,180	80	636	318	954
		D	2,414	80	151	75	226
E2	**CON**	**A**	3,808	80	238	119	357
		B	4,731	80	296	148	444
		C	9,378	80	586	293	879

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)
FMU	**Landbase**	**AVI Crown Closure**	**Operable Area (ha)**	**Rotation Age (Years)**	**5-year Proportional Harvest Area (Col.4)*5/(Col.5)**	**Lower 50% Harvest Area (Col.6)*0.50**	**Upper 50% Harvest Area (Col.6)*1.50**
		D	2,972	80	186	93	279
	DEC	**A**	3,010	80	188	94	282
		B	8,945	80	559	280	839
		C	29,094	80	1,818	909	2,728
		D	5,254	80	328	164	493
W5	**CON**	**A**	5,569	100	278	139	418
		B	2,003	100	100	50	150
		C	6,778	100	339	169	508
		D	978	100	49	24	73
	DEC	**A**	1,455	80	91	45	136
		B	2,986	80	187	93	280
		C	9,112	80	569	285	854
		D	3,798	80	237	119	356
W6	**CON**	**A**	12,724	80	795	398	1,193
		B	17,323	80	1,083	541	1,624
		C	53,073	80	3,317	1,659	4,976
		D	4,014	80	251	125	376
	DEC	**A**	1,190	80	74	37	112
		B	5,230	80	327	163	490
		C	28,513	80	1,782	891	2,673
		D	4,008	80	250	125	376

5.4.7.2 Maintaining a remanent of old seral stages

Ensuring a remnant level of old seral stages was deemed to be an important target for this management plan. Weyerhaeusers Senior Ecologist provided a list of critical minimum areas that must be maintained (Table 5-9) for six old growth broad cover groups (see Section 2.10.4). These areas were directly input into the TSA model of each FMU.

Table 5-9. Minimum old growth areas to be maintained within the TSA model by broad cover group

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)	(Col.9)	(Col.10)
FMU	**Natural Sub-region**	**Old Growth Broad Cover Group Category**	**Minimum Percentage of Gross Area that Must Be Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Very Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Over-mature Seral Stage**	**Gross Area (ha) Operable + Inoperable**	**Minimum Area that Must Be Late Seral Stage or Older (Col.7)*(Col.4)**	**Minimum Area that Must Be Very Late Seral Stage or Older (Col.7)*(Col.5)**	**Minimum Area that Must Be Over-mature Seral Stage or Older (Col.7)*(Col.6)**
E1	**LF**	**CD**	5.0%	1.0%	NA	11,179	559	112	0
		Other Pure CX	5.0%	1.0%	NA	47,952	2,398	480	0
		DC	5.0%	1.0%	NA	5,644	282	56	0
		DX	5.0%	1.0%	NA	7,015	351	70	0
		Pure CX Pine Leading	5.0%	1.0%	NA	22,109	1,105	221	0

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)	(Col.9)	(Col.10)
FMU	**Natural Sub-region**	**Old Growth Broad Cover Group Category**	**Minimum Percentage of Gross Area that Must Be Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Very Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Over-mature Seral Stage**	**Gross Area (ha) Operable + Inoperable**	**Minimum Area that Must Be Late Seral Stage or Older (Col.7)*(Col.4)**	**Minimum Area that Must Be Very Late Seral Stage or Older (Col.7)*(Col.5)**	**Minimum Area that Must Be Over-mature Seral Stage or Older (Col.7)*(Col.6)**
		Pure CX Pine/White Spuce Mix	5.0%	1.0%	NA	3,769	188	38	0
		Pure CX White Spruce Leading	10.0%	2.0%	NA	3,014	301	60	0
	UF	**CD**	5.0%	2.0%	NA	63	3	1	0
		Other Pure CX	10.0%	5.0%	2.5%	105	10	5	3
		DC	5.0%	2.0%	NA	55	3	1	0
		DX	5.0%	2.0%	NA	84	4	2	0
		Pure CX Pine Leading	2.0%	1.0%	0.5%	121	2	1	1
		Pure CX Pine/White Spuce Mix	10.0%	5.0%	2.5%	26	3	1	1
		Pure CX White Spruce Leading	15.0%	5.0%	2.5%	10	1	0	0
E2	**LF**	**CD**	5.0%	1.0%	NA	9,204	460	92	0
		Other Pure CX	5.0%	1.0%	NA	31,661	1,583	317	0
		DC	5.0%	1.0%	NA	7,734	387	77	0
		DX	5.0%	1.0%	NA	31,883	1,594	319	0
		Pure CX Pine Leading	5.0%	1.0%	NA	5,828	291	58	0
		Pure CX Pine/White Spuce Mix	5.0%	1.0%	NA	2,335	117	23	0
		Pure CX White Spruce Leading	10.0%	2.0%	NA	2,313	231	46	0
	UF	**CD**	5.0%	2.0%	NA	1,952	98	39	0
		Other Pure CX	10.0%	5.0%	2.5%	1,650	165	83	41
		DC	5.0%	2.0%	NA	2,062	103	41	0
		DX	5.0%	2.0%	NA	2,482	124	50	0
		Pure CX Pine Leading	2.0%	1.0%	0.5%	3,798	76	38	19
		Pure CX Pine/White Spuce Mix	10.0%	5.0%	2.5%	622	62	31	16
		Pure CX White Spruce Leading	15.0%	5.0%	2.5%	495	74	25	12
W5	**LF**	**CD**	5.0%	1.0%	NA	5,454	273	55	0
		Other Pure CX	5.0%	1.0%	NA	19,181	959	192	0
		DC	5.0%	1.0%	NA	4,391	220	44	0
		DX	5.0%	1.0%	NA	18,436	922	184	0

(Col.1)	(Col.2)	(Col.3)	(Col.4)	(Col.5)	(Col.6)	(Col.7)	(Col.8)	(Col.9)	(Col.10)
FMU	**Natural Sub-region**	**Old Growth Broad Cover Group Category**	**Minimum Percentage of Gross Area that Must Be Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Very Late Seral Stage or Older**	**Minimum Percentage of Gross Area that Must Be Over-mature Seral Stage**	**Gross Area (ha) Operable + Inoperable**	**Minimum Area that Must Be Late Seral Stage or Older (Col.7)*(Col.4)**	**Minimum Area that Must Be Very Late Seral Stage or Older (Col.7)*(Col.5)**	**Minimum Area that Must Be Over-mature Seral Stage or Older (Col.7)*(Col.6)**
		Pure CX Pine Leading	5.0%	1.0%	NA	3,761	188	38	0
		Pure CX Pine/White Spuce Mix	5.0%	1.0%	NA	707	35	7	0
		Pure CX White Spruce Leading	10.0%	2.0%	NA	1,672	167	33	0
W6	**LF**	**CD**	5.0%	1.0%	NA	20,398	1,020	204	0
		Other Pure CX	5.0%	1.0%	NA	76,207	3,810	762	0
		DC	5.0%	1.0%	NA	14,491	725	145	0
		DX	5.0%	1.0%	NA	40,141	2,007	401	0
		Pure CX Pine Leading	5.0%	1.0%	NA	24,684	1,234	247	0
		Pure CX Pine/White Spuce Mix	5.0%	1.0%	NA	4,333	217	43	0
		Pure CX White Spruce Leading	10.0%	2.0%	NA	12,595	1,259	252	0
	UF	**CD**	5.0%	2.0%	NA	985	49	20	0
		Other Pure CX	10.0%	5.0%	2.5%	9,085	908	454	227
		DC	5.0%	2.0%	NA	347	17	7	0
		DX	5.0%	2.0%	NA	625	31	13	0
		Pure CX Pine Leading	2.0%	1.0%	0.5%	4,327	87	43	22
		Pure CX Pine/White Spuce Mix	10.0%	5.0%	2.5%	117	12	6	3
		Pure CX White Spruce Leading	15.0%	5.0%	2.5%	206	31	10	5

5.4.7.3 Summary of change in net area from November 24, 2004 netdown compared to the current netdown

The netdown represented in this report has removed an additional 944 hectares from the operable landbase compared to the November 24, 2004 netdown (Table 5-10). This is a relatively small area which constitutes a change of only 0.3%. Most of the difference was caused by including the 100 m stream buffers (especially along the Pembina River).

Table 5-10 Change in area (ha) November 24, 2004 landbase netdown compared to the current netdown represented within this report

	E1	E2	W5	W6	FMA
Operable Deciduous Landbase	-232	-148	-58	-48	-486
Operable Coniferous Landbase	-258	-64	-21	-115	-458
Total Operable Landbase	-490	-212	-79	-163	-944

5.5 Preparing data for input into Woodstock/Stanley

After completion of the SAS netdown a number of additional steps were required to prepare data for input into Woodstock. These changes only impact the timing and sequencing of harvesting. In no way was a stand designation changed as to if it was in or out of the operable landbase or its assignment as being managed for coniferous or deciduous volume.

The SAS file created as the output link to Woodstock/Stanley was the *FMA_gis* table (Figure 2-2). Several steps were needed to ensure that all the data from operations foresters were captured prior to using the file as an input into the TSA model. A total of three steps were taken to integrate all the post planning input (Figure 5-4).

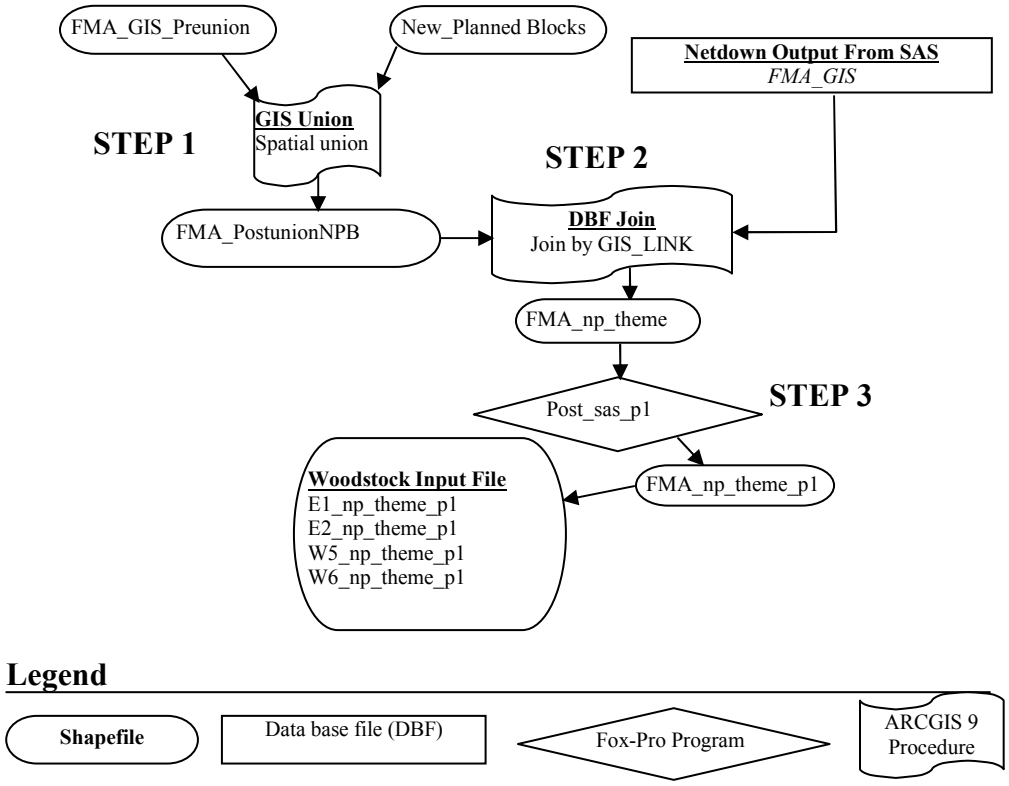

Figure 5-4 Procedure of going from SAS netdown output file to Woodstock/Stanley Input

Step 1 – Adding additional planned blocks

After the November 24, 2005 netdown, additional planned blocks were identified by Weyerhaeuser. This coverage was provided as a shapefile *[NewPlanned_Blocks]* from operations foresters. The boundaries for the new planned blocks represent an operable solution and often did not exactly follow the boundaries for the coverages presented in November 24, 2005. Initially the intent was to use the AVI boundaries as a proxy for the planned block boundaries. However, this resulted in some gross differences from the current planned blocks. Therefore, it was determined that the easiest solution to this issue was to use the *ARCGIS 9* "union" function.

The *FMA_GIS_Preunion* shapefile was "unioned" to the *NewPlanned Blocks* shapefile. In the context of the total dataset very few polygons (0.1%) were impacted by this procedure (*FMA_GIS_Preunion* has 2,120,869 polygons versus 2,122,281 polygons for *FMA_GIS_PostunionNPB*). Care was taken to ensure that all polygon areas were recalculated after this procedure and that the total area matched before and after the union.

Step 2 – Post_join shapefile is joined to SAS output file

The *FMA_PostunionNPB* shapefile was linked to the SAS Woodstock/Stanley output file *[FMA_GIS]* through the *GIS_LINK field.* The linking of the *[FMA_PostunionNPB]* shapefile to the *[FMA_GIS]* SAS output file (based on the *GIS_LINK* field) was a one-to-many join. While in some regards this appears unappealing, in reality this has no impact on data integrity as the netdown polygon call from *[FMA_GIS]* is the same for split polygons as before the "union". The polygon areas for *[FMA_GIS]* are then replaced with the new polygon areas within the *[FMA_Postunion]* shapefile. To ensure future one-to-one joining of polygons a new unique polygon identifier was made *[New_uni]*.

Step 3 – Run FoxPro program *Post_SAS_P1*

The dbf file from the resultant shapefile from step 2 *[FMA_np_theme]* was run through a Fox-pro program to correctly capture the new planned block data correctly. There were a number of data steps preformed including:

- **Identifying new cutblocks -** Ensuring that all recent cutblocks (called "new cuts" *[new_cut=Y]*) that could impact the harvest sequence due to green-up constraints were correctly assigned to a cut period. New cuts were defined as areas less than and equal to 20 years for pure coniferous stands and less than and equal to 15 years for pure deciduous stands and mixedwoods.
- **Fully integrate the new planned blocks -** Assigning the new planned blocks *[newplanned=1]* (from step 2 above) to a correct cut period and when possible to an operator.
- **Assign other planned blocks to operators** - Using general rules to assign cut blocks to operators. These rules include:
    - Assign all deciduous landbase blocks in either FMUs W6 or E1 to Weyerhaeuser unless otherwise designated.
    - Assign all coniferous landbase cutblocks within the Cynthia LMU in FMU W6 to Weyerhaeuser unless otherwise designated.
    - Assign all coniferous landbase cutblocks within the Wolf Lake LMU in FMU W6 to ANC unless otherwise designated.

- Assign all coniferous landbase cutblocks within the Carrot Creek LMU in FMU W6 to Blue Ridge Lumber unless otherwise designated.
- Assign all planned areas (coniferous and deciduous) within Lobstick HDA of W5 to the MTU.

- **Divide W6 Minnow HDA into South Minnow and North Minnow**
  - In W6 the intent was to have the major coniferous operators (ANC, Blue Ridge, and Weyerhaeuser) harvesting in different Land management units LMUs over the harvest sequence. This HDA was split as a potential fix to a problem of not quite enough forest area being present in the Carrot Creek LMU to fulfill Millar Western and Blue Ridges volume requirements.

After the program was run the output FMA file *[FMA_np_theme_p1]* was separated into four separate FMU coverages *[E1_np_theme_p1, E2_np_theme_p1, W5_np_theme_p1, W6_np_theme_p1]*. These coverages were used as the initial Woodstock/Stanley input data.

5.6 GIS Processing Document (data and documentation provided by Silvacom Ltd.)

Development of spatial composite landbase coverage for net landbase determination

All data sets were assembled into ArcInfo Coverage format from the source information and projected to UTM, Zone 11, NAD83 Datum if required. Only the required attributes (see table below) were maintained for each input layer (as identified by Weyerhaeuser). All input data sets listed below were overlaid together to produce a composite landbase coverage to be used in the net landbase determination. The software and operating system used to produce this overlay product was ESRI Workstation ArcInfo version 8.3 on UNIX. The input data sets were overlaid in the order listed in the table below. All spatial processing was done using a fuzzy tolerance of 0.001 and a dangle tolerance of 0. All of the separate input data sets and the final composite landbase coverage are currently stored at Silvacom and will be distributed as part of the deliverable for this project.
The following table summarizes the input coverages used in creating the initial gross landbase spatial GIS coverage.

Input Spatial Coverages

GIS Coverage	Source	Description	Database Fields	Dropped Fields	Unique Issues
FMA	Data provided by Weyerhaeuser	Forest Management Agreement Boundary	FMA	LOCATION_D	
Township	Data provided by Weyerhaeuser	Township Identifier	TOWNSHIP		
FMU	Data provided by Weyerhaeuser	Forest Management Unit Boundaries	FMU	NAME	
Landscape Management Units	Data provided by Weyerhaeuser	Landscape Management Unit Boundaries	LMU	COMPARTMENT, FMA	
Working Areas	Data provided	Harvest Design	WORKAREA	FMA	

GIS Coverage	Source	Description	Database Fields	Dropped Fields	Unique Issues
	by Weyerhaeuser	Areas			
Land Use Dispositions	LU_LINE, LU_POLY, TDA data sets stored at Silvacom	Land Use Dispositions Linear Dispositions Buffered using the Following Criteria (distances are total widths): EZE - 15m FRD - 20m GEO - 8m LOC - 20m MLL - 20m MLP - 10m MSL - 20m PIL - 15m PLA - 20m RDS - 20m REA - 10m ROE - 20m RRD - 20m SML - 15m VCE - 15m	LU_LINE, LANDUSE		Polygonal dispositions cannot overlap and therefore only one disposition type can be kept. Linear disposition type/number will not be included in the overlay, but a linear reference coverage will be provided.
PNT	Data loaded based on description provided by Weyerhaeuser	Pioneer Area	PNT, PIONEER		
Disposition Reservations	Derived from LSAS Database	DRS Boundaries	DRS		Identified on list by ASRD
Grazing Leases, Licenses and Permits	Data provided by Weyerhaeuser	Grazing Dispositions	GRAZING		
Private Land Inventory	Data provided by Weyerhaeuser	Private Land Identifier	STATUS	MER, RGE, TWP, SEC, QS, OWNER1_FN, OWNER1_LN, CITY1, PROVINCE1, PCODE1, OWNER2_FN, OWNER2_LN, ADDRESS2, CITY2, PROVINCE2, PCODE2, OWNER3_FN, OWNER3_LN, ADDRESS3, CITY3, PROVINCE3, PCODE3, OWNER4_FN, OWNER4_LN, ADDRESS4, CITY4, PROVINCE4, PCODE4, OWNER5_FN, OWNER5_LN, ADDRESS5, CITY5, PROVINCE5,	

GIS Coverage	Source	Description	Database Fields	Dropped Fields	Unique Issues
				PCODE5, STATUS, ID_NUMBER, STATUSDATE, OWNER6_FN, OWNER6_LN, ADDRESS6, CITY6, PROVINCE6, PCODE6, ADDRESS1	
Special Places 2000 Areas	Assembled from previous Net Landbase Project	SP2000 Areas	SP2000, SUN500M		Sundance area buffered 500m (from the boundary)
Historical Potential	Data provided by Weyerhaeuser	Archaeological Potential	ARCH_POT		
Coniferous Timber Permits	Assembled from previous Net Landbase Project	CTP Identifier	CTP		
Cutblocks	Data provided by Weyerhaeuser	Inventory and Post-Inventory Updates Reflecting Harvest Activities	CUT_NUM, CUTBLK	WORKAREA, BLOCK_NUM, SOURCE, FMA	
Quota Holder Cutblocks	Data provided by Weyerhaeuser	Harvest Activities from Quota Holders	QB_OP, QB_NUM, QUOT_BLK	HARVYEAR	
Planned Cutblocks	Data provided by Weyerhaeuser	Cutblocks Planned for Harvest	PB_NUM, PB_OP, PLAN_BLK	FIELD_NUM, OPEN_TYPE, DESIGN_YR, AOP_YR, OPERATOR, SEASON, PLAN_STAT, ARCHIVE, APPR_DATE, CONTINGEN SP,1 BCGP, REFOR_SYS, REFOR_USR, REFOR_APR, PRIM_DISP, FMU, COMPART, WORKAREA, SUBREGION, AREA_CODE, TRAPLINE, GRAZ_DISP, ARCH_POTEN, CAL_CONVOL, FLD_CONVOL, CAL_DECVOL, FLD_DECVOL, CAL_TOTVOL, CAL_SW_VOL, CAL_PL_VOL, CAL_SB_VOL, CAL_FB_VOL, FLD_FB_PER, SPF_PCE_SZ, CAL_LT_VOL, CAL_AW_VOL, CAL_PB_VOL, FLD_PB_PER, CAL_BW_VOL,	

GIS Coverage	Source	Description	Database Fields	Dropped Fields	Unique Issues
Quota Holder Planned Cutblocks	Data provided by Weyerhaeuser	Cutblocks Planned for Harvest	PQ_OP, PLAN_QUOT	PLAN_YEAR, PLAN_BCG	
Water Buffers	Data provided by GISmo Solutions	Water Features Buffered using the Following Criteria (distances are total widths): Lake buffers -- 100m Buffer Applied to All Lakes Greater than 4 ha in Area Trumpeter Swan Lake Buffers -- 200m Buffer River Buffers -- 100m Buffer Large Permanent Buffers -- 60m Buffer Small Permanent Buffers -- 30m Buffer	STRM30, STRM60, STRM100, LAKE, SWAN200		
Watersheds	Data provided by GISmo Solutions	4th Order Watershed Boundaries	WTRSHED	NEW_W_OR, NEW_W_NAM, NEW_STR, CLIENT_NAME, FMA_OVERLAP	
Cutline Buffers	Data provided by Weyerhaeuser	All Cutline Features Buffered 8 Metres (total width)	CUTLINES		
Integrated Resource Plan	Data provided by ASRD	IRP Identifiers	IRP_NAME, IRP_STAT, IRP_TYPE, IRP_CODE	IRP_, IRP_ID, LABEL	
Historical Fires	Data provided by ASRD	Historical Class E Fires	FIRE1930, FIRE1940, FIRE1950, FIRE1960, FIRE1970, FIRE1980, FIRE1990, FIRE2000	BURNCODE, YEAR, SOURCE	
Eastern Slopes Integrated Plan	Data provided by ASRD	ESIP boundaries	ESIP	ESIP_ZONES, ESIPZONE, DESCRIPTION	
Natural Regions and Sub-Regions	1:1,000,000 scale provincial data	Natural Region and Sub-Region Identifiers	NSN, NRN	EDC, EDN, EDTC, CR_, CD_, ADC, REL, G1, PM1, SE1, SL1, SLU1, S1, T1, DU1, DL1, V1, G2, PM2, SE2, SL2, SLU2, S2, T2, DU2, DL2, V2, G3, PM3, SE3, SL3, SLU3, S3, T3, DU3, DL3, V3, P, AG, MT_ BT_ FT_, WMF, WM, WS, WD, WB, WF, WO, MF1, MF2, MF3, MF4, MF5, MF6, MF7, MF8, MF9, BF1, BF2, BF3, BF4, BF5, BF6,	

GIS Coverage	Source	Description	Database Fields	Dropped Fields	Unique Issues
				BF7, BF8, BF9, LF1, LF2, LF3, LF4, LF5, LF6, LF7, LF8, LF9, LF10, LF11, LF12, LF13, LF14, LF15, LNO, LHA, DB1, DB2, DB3, HA, INFIL, COLOR, COLOR2	
Permanent Sample Plots	Data provided by ASRD	PSP points and polygons	PSP	STATUS, PLOT_NUM, TYPE, RESERVE, SIZE, PLOTS, CENTRE_GPS, FILENAME, LONGITUDE, LATITUDE, EASTING, NORTHING, ELEVATION, MERIDIAN, SIZE_M2, COMMENTS, PLOT_NUM, META2	PSPs represented by points were buffered to become a 300m by 300m square
Forest Inventory	Data assembled from existing Weyerhaeuser AVI and AVI re-inventory completed by Silvacom	Alberta Vegetation Inventory Version 2.1	AVI Overstorey and Understorey Attributes		
Ecosite Classification	Data provided by Weyerhaeuser	Ecosite Class	ECOSITE		Each AVI Polygon was Assigned an Ecosite Type Based on the Ecosite Type Which Comprises the Largest Area of the AVI Polygon

SLIVER STATISTICS

All slivers were retained in the final data set and throughout the processing. The distribution of slivers in the composite landbase coverage is summarized in the following table.

Sliver Size	Number of Records
<.01 ha	1,211,058
.01-.05 ha	565,090
.05 - .1 ha	186,880
.1 - .25 ha	175,690
.25 - .5 ha	98,423

QUALITY CONTROL

Quality control checks were performed on both the spatial data and the output databases. Area summaries were completed to ensure that the areas in the output data set matched the areas of the input data sets. Frequency summaries were performed to ensure that each field contained a valid code. Internal QC maps were produced to highlight any missing data and to verify the spatial location of the data.

5.7 Regeneration Study (data and documentation provided by Timberline Forest Inventory Consultants)

Analysis of regenerated cutblock data
Weyerhaeuser Canada (Edson)

Submitted by Timberline Forest Inventory Consultants
Suite 315, 10357 109 Street
Edmonton, Alberta T5J 1N3
August 3, 2000

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1. Introduction

Timberline Forest Inventory Consultants (TFIC) conducted an analysis of regenerated cutblock information on behalf of Weyerhaeuser (Edmonton and Edson). Data pertaining to stocking, height and density measurements were provided to TFIC by Weyerhaeuser, along with a detailed survey design and analysis framework[1]. The statistical analysis undertaken and presented in this document closely followed the analysis criteria and framework used for the *Analysis of Regenerated Cutblock data, Weyerhaeuser (Drayton Valley)* document completed in July 2000 by TFIC. Additional analyses were completed in this report regarding grazing disposition. Landbase classes were combined because of low sample sizes in types other than HH and SS (HH includes HH; SS includes SS and MS). Grazing disposition was added as a variable with landbase, therefore additional landbase classes were analyzed HH_YG (HH landbase with grazing), HH_NG (HH landbase without grazing), SS_YG (SS landbase with grazing) and SS_NG (SS landbase without grazing)

Data were checked for coding errors. There was one instance of a missing tree species and a incorrectly coded species "PW". There were 17 instances of crop trees that should probably have been assigned to advanced growth (i.e. having root collar diameter ages greater than 4 years older than the block "year cut" age). These instances were not corrected, as they would have had a minimal influence on statistical calculations based on 7111 observations, and the correction would have taken more time than was justifiable.

For stocking and density calculations, a series of box and whisker plots were produced along with a summary table showing median and sample size for groups defined in the survey design. In the boxplot graphics:

- The box is defined by the 25th and 75th percentile values (the interquartile range); 50 percent of observations lie within the box, and the line through the box is the median.
- Outliers (values more than 1.5 and less than 3 box-lengths from the 25th or 75th percentile) are designated by a circle (O). The lines extending above and below each box contain the range of smallest to largest values that are not considered outliers.
- Extreme values (values more than 3 box-lengths from the 25th or 75th percentile) are designated by a star (*).
- The "N" label and associated numbers along the X axis of the boxplots and in the tables refers to the number of blocks within each LMU.

For height-age relationships, a linear regression curve was fit to each of the groups and the line was forced through the origin; growth responses are probably more or less linear during the early stages of stand establishment. In support of management activities that are influenced by the results of this analysis, block age measurements are used for modelling rather than true tree age measurements. The reason for this is to permit modelling of overall tree responses at the block and land management unit level; crop tree age-height relationships are useful for modelling individual tree growth responses, but this is not a focal issue at this time. Approximately 425 height-age pairs do occur in the dataset, however, and could be used to develop basic statistical relationships for crop tree growth if desired.

[1] Regenerated Cutblock Assessment – Survey Design (Weyerhaeuser Canada Ltd., Edmonton, internal document).

Results are presented in the following order:

- Density (by species group and then by species and LMU): boxplots, tables including median, 25th and 75th percentile (limits of boxes in boxplots)
- Stocking (boxplots, tables including median, 25th and 75th percentiles).
- Height (graphs)

2. Density

Figure 5-5. Density: LB HH; by LMU and species group (conifer, decid. and total)

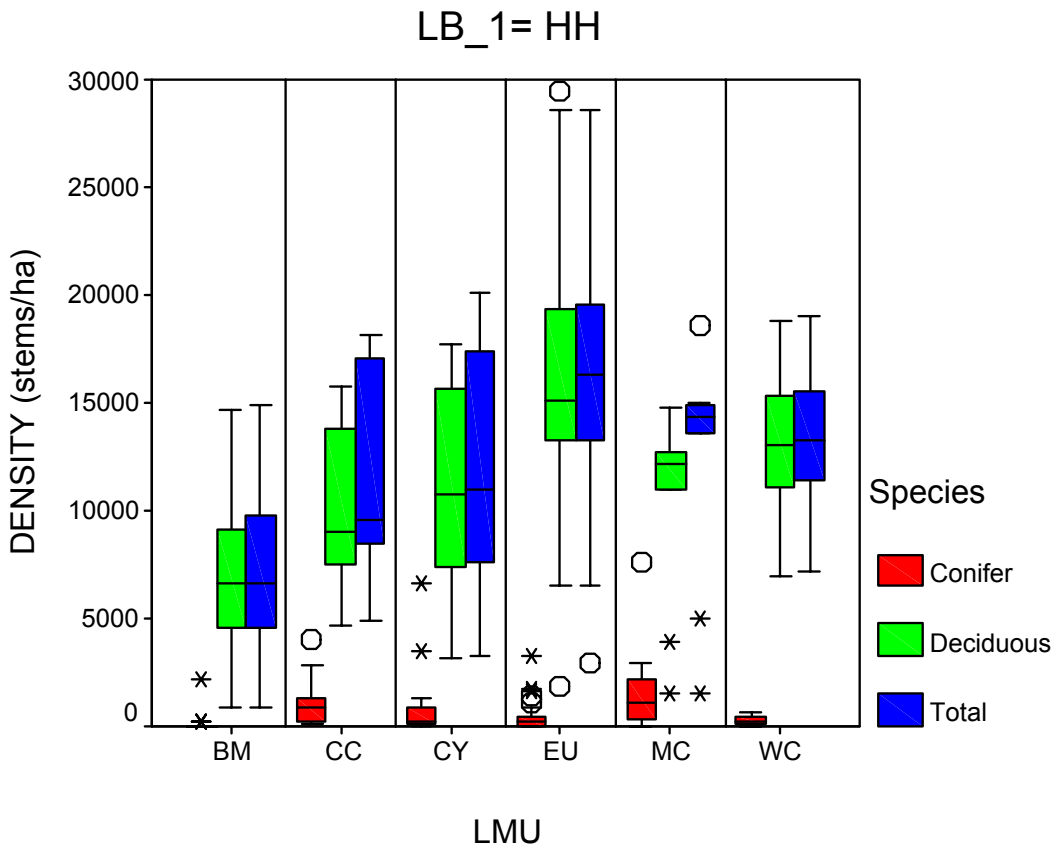

Table 5-11. Density: LB HH; by LMU and species group (conifer, decid. and total)

Summary: Median Stem Density (stems/ha) by LMU for LB Designation HH, MH, or SH; Deciduous, Coniferous, and Total

LB				Valid N	Median	Percentile 25	Percentile 75
HH	BM	Species	Conifer	N=19	0	0	30
			Deciduous	N=19	6892	4221	9725
			Total	N=19	6917	4225	10437
	CC	Species	Conifer	N=10	875	249	2258
			Deciduous	N=10	9083	7272	14767
			Total	N=10	9808	8076	17538
	CY	Species	Conifer	N=20	200	145	912
			Deciduous	N=20	11008	7413	15846
			Total	N=20	11133	7588	17525
	EU	Species	Conifer	N=35	217	37	496
			Deciduous	N=35	15192	13159	19592
			Total	N=35	16407	13159	19812
	MC	Species	Conifer	N=9	1283	237	2812
			Deciduous	N=9	12200	8303	13929
			Total	N=9	14425	10363	15016
	WC	Species	Conifer	N=15	217	59	446
			Deciduous	N=15	13059	11058	15358
			Total	N=15	13267	11171	15725

Figure 5-6. Density: LB SS; by LMU and species group (conifer, decid. and total)

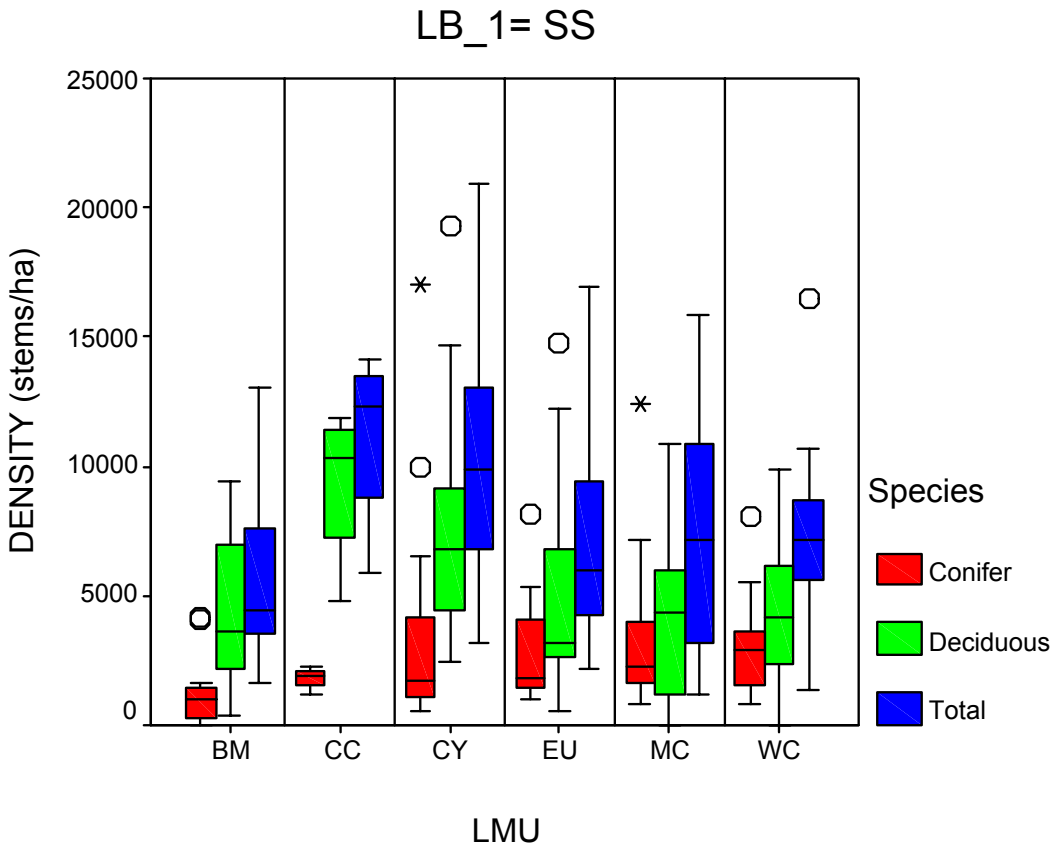

Table 5-12. Density: LB SS; by LMU and species group (conifer, decid. and total)

LB				Valid N	Median	Percentile 25	Percentile 75
SS	BM	Species	Conifer	N=11	939	171	2546
			Deciduous	N=11	3775	1891	9004
			Total	N=11	4633	3217	9391
	CC	Species	Conifer	N=4	1933	1333	.
			Deciduous	N=4	10650	6654	.
			Total	N=4	12583	8087	.
	CY	Species	Conifer	N=27	1733	1100	5058
			Deciduous	N=27	6976	4437	10046
			Total	N=27	9884	6474	13567
	EU	Species	Conifer	N=25	1875	1417	4129
			Deciduous	N=25	3233	2567	7233
			Total	N=25	6166	4225	9812
	MC	Species	Conifer	N=23	2399	1637	4179
			Deciduous	N=23	4438	1075	6567
			Total	N=23	7475	3041	11066
	WC	Species	Conifer	N=12	2950	1483	4041
			Deciduous	N=12	4242	2354	7092
			Total	N=12	7233	5521	9033

Figure 5-7. Density: LB SS; by LMU and species group (pine and spruce)

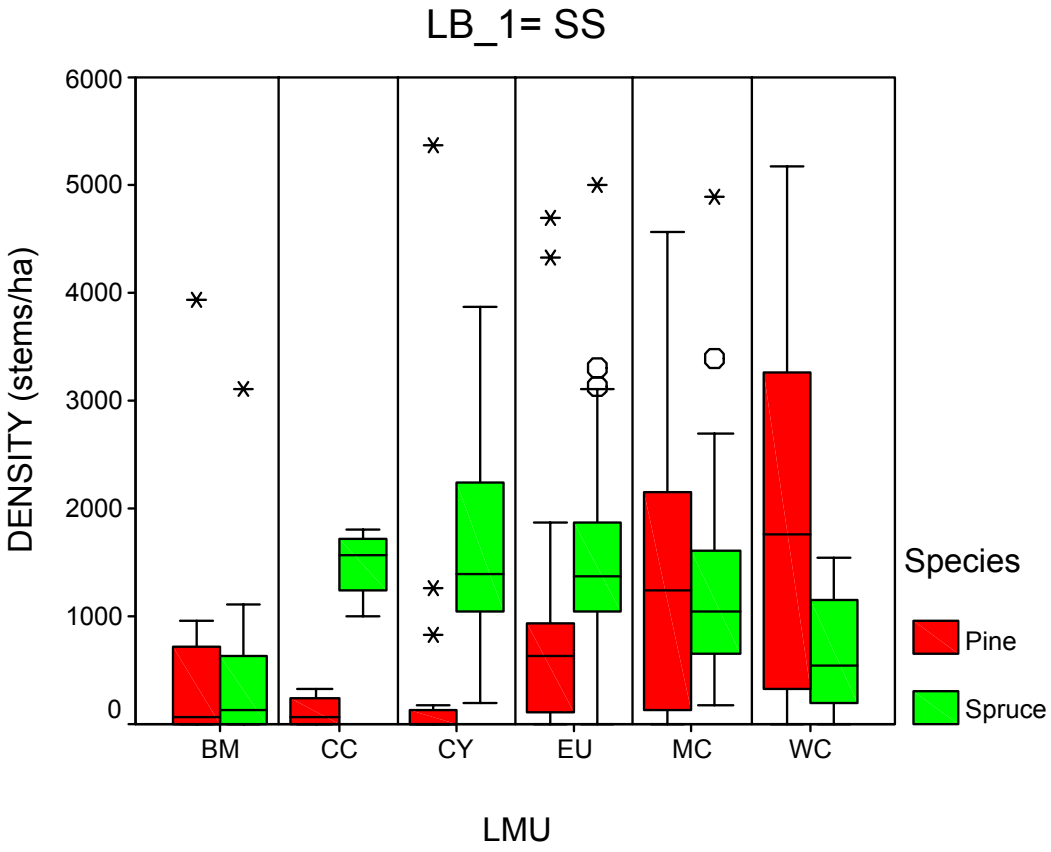

Table 5-13. Density: LB SS; by LMU and species group (pine and spruce)

Summary: Median Stem Density (stems/ha) by LMU for LB Designation SS, MS, or HS; Pine, Spruce (SB,SW)

LB				Valid N	Median	Percentile 25	Percentile 75
SS	BM	Species	Pine	N=11	92	0	925
			Spruce	N=11	208	0	808
	CC	Species	Pine	N=4	100	0	.
			Spruce	N=4	1600	1187	.
	CY	Species	Pine	N=27	0	0	142
			Spruce	N=27	1417	1037	2558
	EU	Species	Pine	N=25	658	61	1283
			Spruce	N=25	1375	780	2158
	MC	Species	Pine	N=23	1312	133	2529
			Spruce	N=23	1061	562	1737
	WC	Species	Pine	N=12	1883	283	3533
			Spruce	N=12	550	183	1404

Figure 5-8. Density: LB HH; by grazing and species group (conifer, decid. and total)

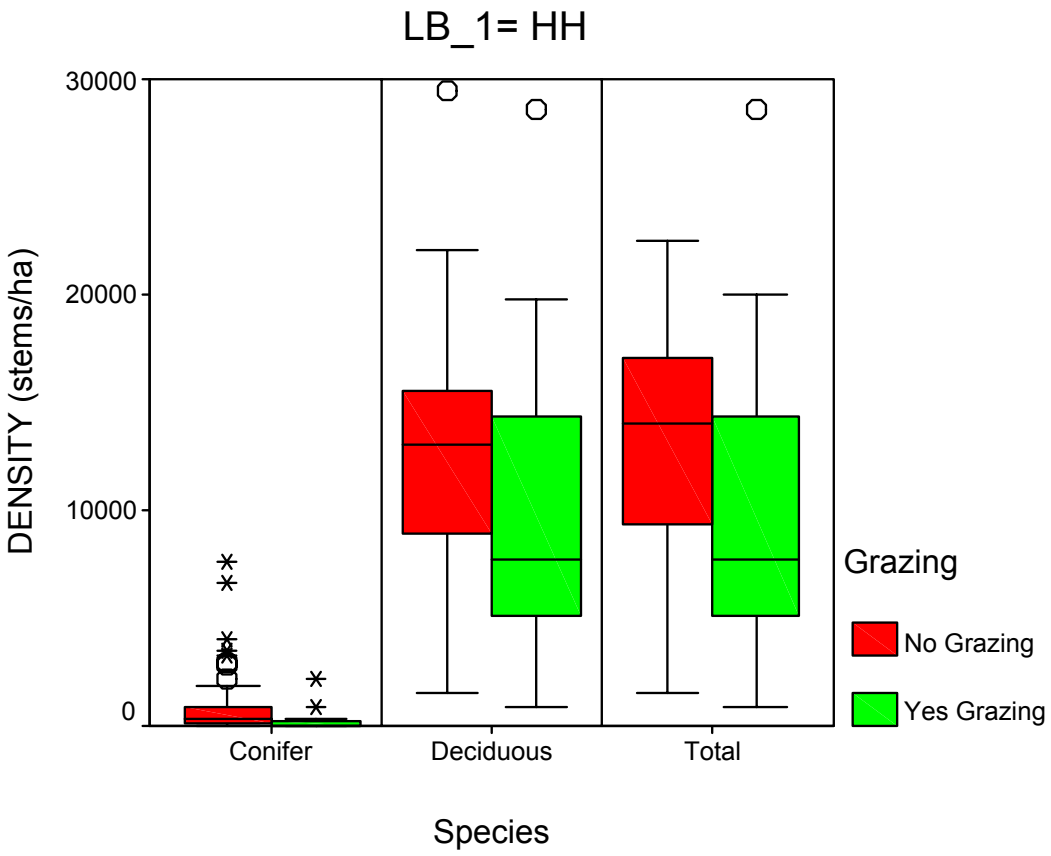

Table 5-14. Density: LB HH; by grazing, and species group (conifer, decid. and total)

Summary: Median Stem Density (stems/ha) by Grazing for LB Designation HH; Deciduous, Coniferous, and Total

LB					Valid N	Median	Percentile 25	Percentile 75
HH	Species	Conifer	Grazing	No Grazing	N=87	294	92	846
				Yes Grazing	N=21	0	0	186
		Deciduous	Grazing	No Grazing	N=87	13034	8937	15592
				Yes Grazing	N=21	7700	4704	14651
		Total	Grazing	No Grazing	N=87	14033	9270	17058
				Yes Grazing	N=21	7700	4725	14826

Figure 5-9. Density: LB SS; by grazing and species group (conifer, decid. and total)

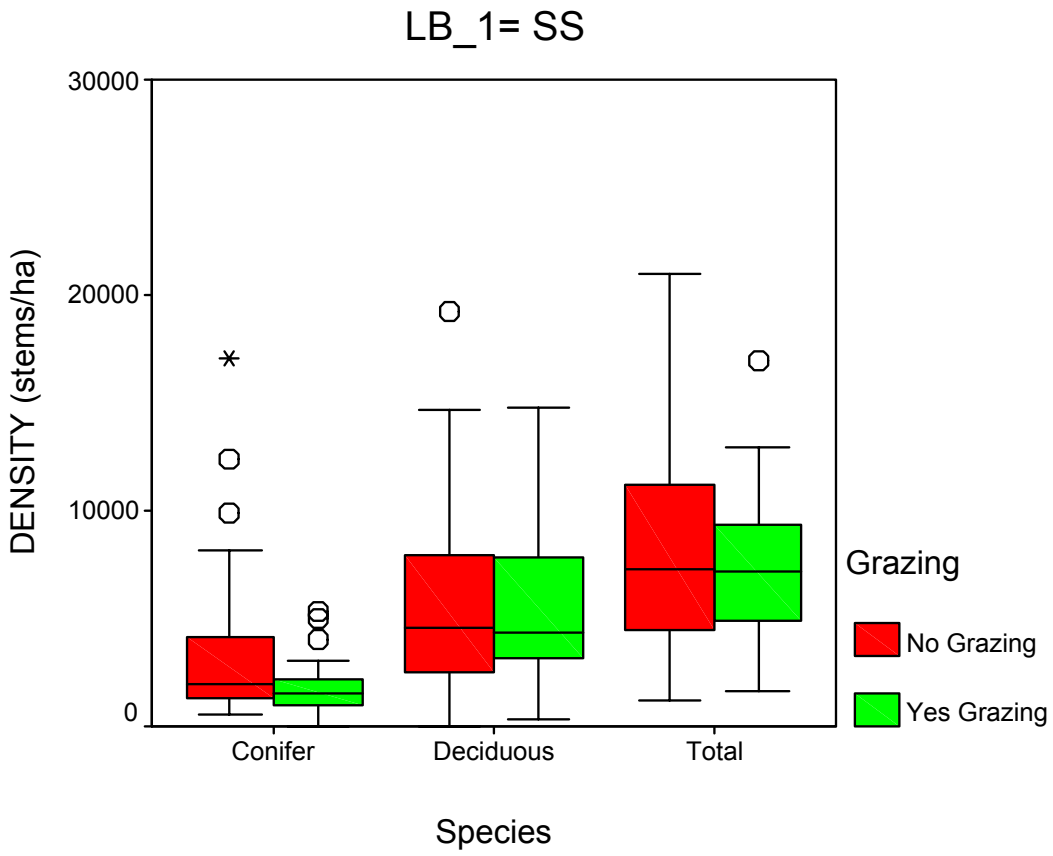

Table 5-15. Density: LB SS; by grazing and species group (conifer, decid. and total)

Summary: Median Stem Density (stems/ha) by Grazing for LB Designation SS; Deciduous, Coniferous, and Total

LB					Valid N	Median	Percentile 25	Percentile 75
SS	Species	Conifer	Grazing	No Grazing	N=81	1974	1283	4129
				Yes Grazing	N=21	1566	904	2200
		Deciduous	Grazing	No Grazing	N=81	4641	2521	7996
				Yes Grazing	N=21	4500	3042	9062
		Total	Grazing	No Grazing	N=81	7500	4424	11666
				Yes Grazing	N=21	7158	4703	9425

Figure 5-10. Density: LB SS; by grazing and species group (pine and spruce)

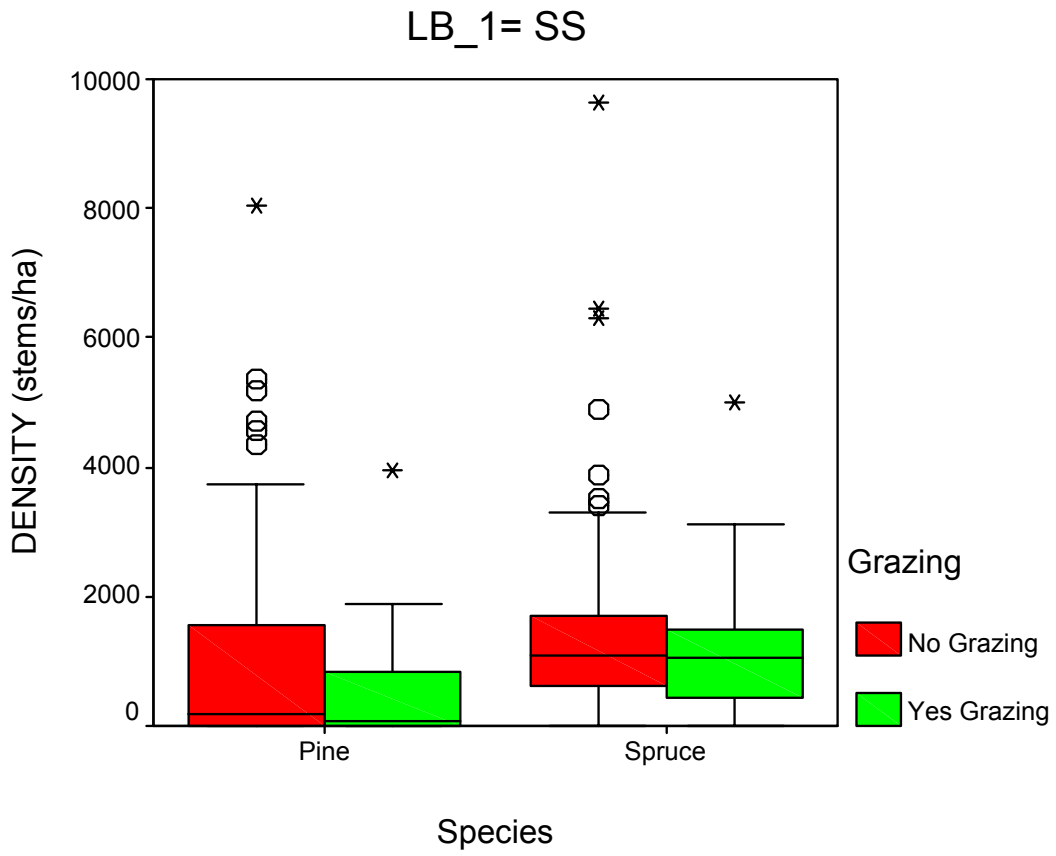

Table 5-16. Density: LB SS; by grazing and species group (pine and spruce)

Summary: Median Stem Density (stems/ha) by GRAZING for LB Designation SS; Pine and Spruce (SB,SW)

LB					Valid N	Median	Percentile 25	Percentile 75
SS	Species	Pine	Grazing	No Grazing	N=81	175	0	1586
				Yes Grazing	N=21	83	0	863
		Spruce	Grazing	No Grazing	N=81	1117	588	1787
				Yes Grazing	N=21	1075	320	1646

Figure 5-11. Density: LB HH; by date and species group (conifer, decid. and total)

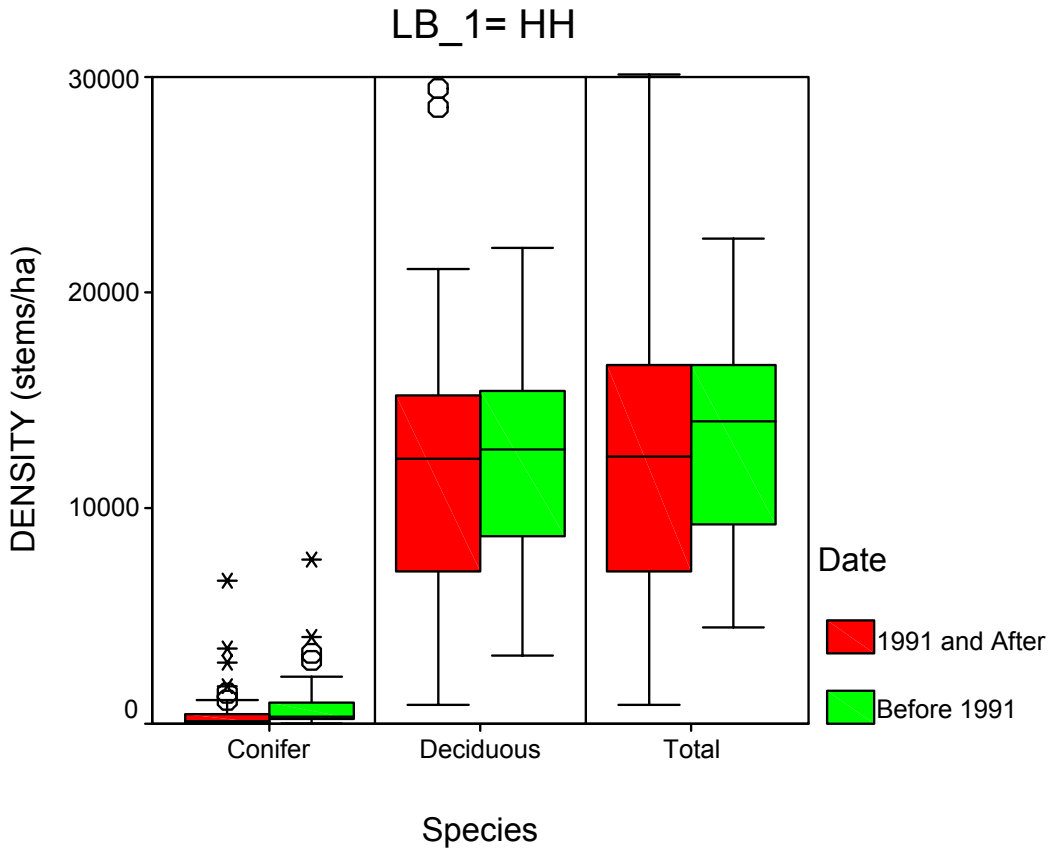

Table 5-17. Density: LB HH; by date and species group (conifer, decid. and total)

Summary: Median Stem Density (stems/ha) by Date for LB Designation HH; Deciduous, Coniferous, and Total

LB					Valid N	Median	Percentile 25	Percentile 75
HH	Species	Conifer	Date	1991 and After	N=63	105	0	446
				Before 1991	N=45	375	200	1088
		Deciduous	Date	1991 and After	N=63	12341	6730	15442
				Before 1991	N=45	12759	8687	15459
		Total	Date	1991 and After	N=63	12500	6759	16917
				Before 1991	N=45	14100	9196	16983

Figure 5-12. Density: LB SS; by date and species group (conifer, decid. and total)

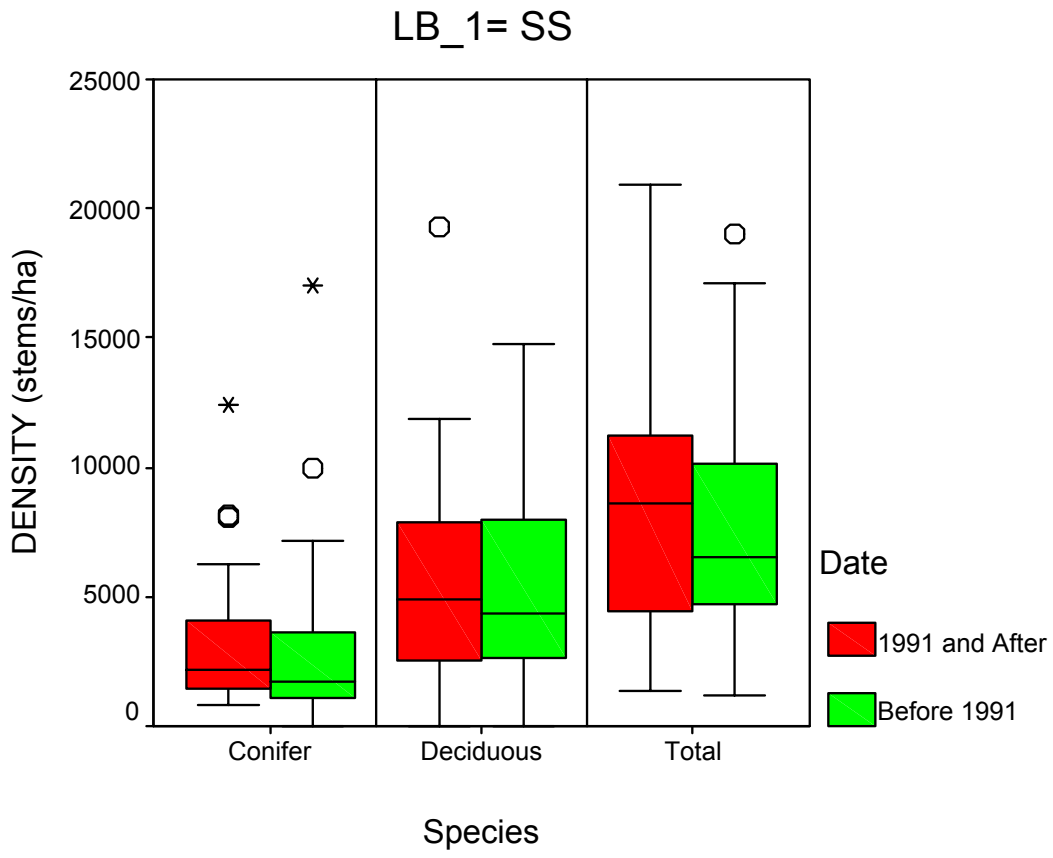

Table 5-18. Density: LB SS; by date and species group (conifer, decid. and total)

Summary: Median Stem Density (stems/ha) by Date for LB Designation SS; Deciduous, Coniferous, and Total

LB					Valid N	Median	Percentile 25	Percentile 75
SS	Species	Conifer	Date	1991 and After	N=50	2158	1450	4108
				Before 1991	N=52	1734	1094	3838
		Deciduous	Date	1991 and After	N=50	4950	2529	7971
				Before 1991	N=52	4358	2646	8096
		Total	Date	1991 and After	N=50	8675	4416	11533
				Before 1991	N=52	6667	4591	10375

Figure 5-13. Density: LB SS; by date and species group (pine and spruce)

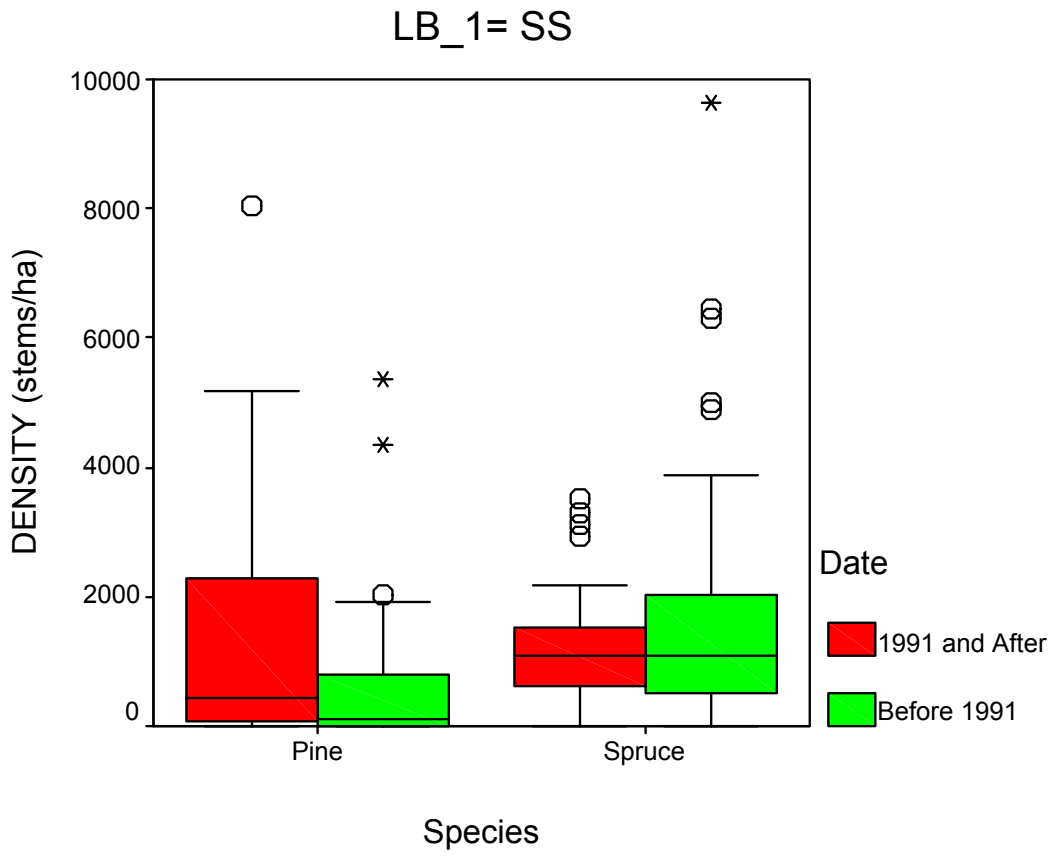

Table 5-19. Density: LB SS; by date and species group (pine and spruce)

Summary: Median Stem Density (stems/ha) by Date for LB Designation SS; Pine and Spruce (SB,SW)

LB					Valid N	Median	Percentile 25	Percentile 75
SS	Species	Pine	Date	1991 and After	N=50	459	67	2538
				Before 1991	N=52	117	0	836
		Spruce	Date	1991 and After	N=50	1117	596	1533
				Before 1991	N=52	1100	497	2217

3. Stocking

Figure 5-14. Stocking: LB HH; by LMU and species group (decid. “A”, decid. “B”)

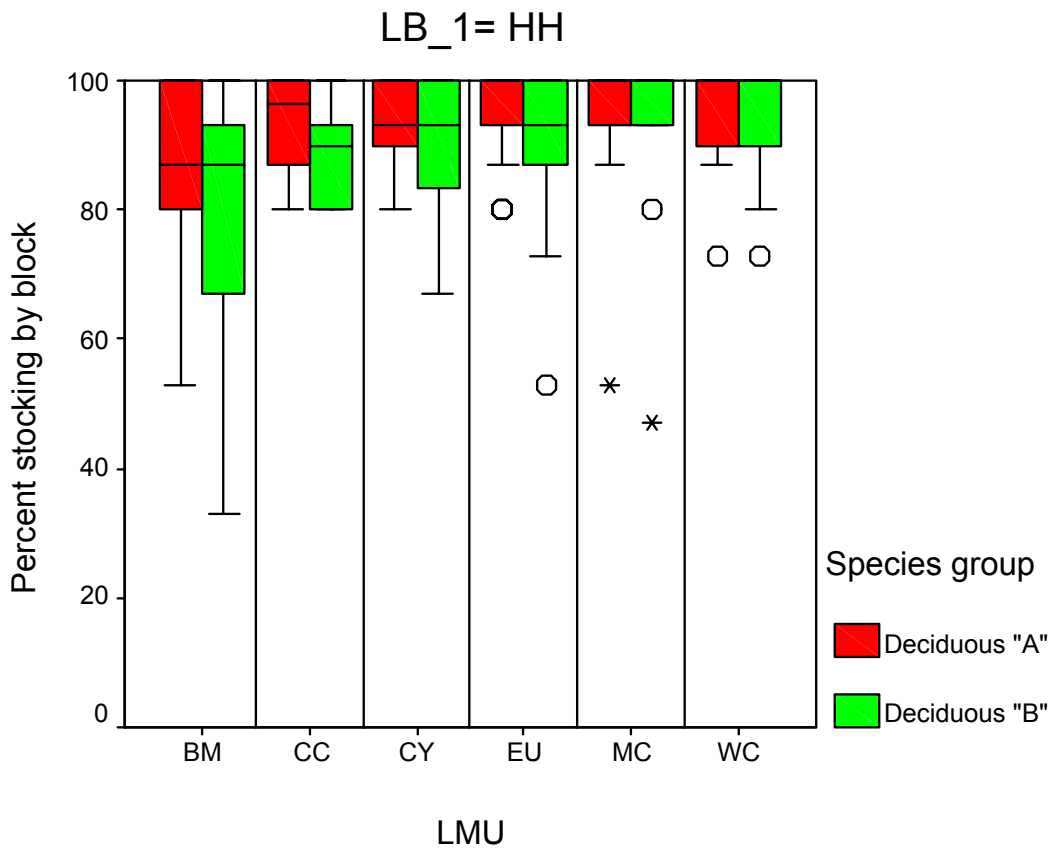

Table 5-20. Stocking: LB HH; by LMU and species group (decid. “A”, decid. “B”)

Summary: Stocking, LB class HH (Deciduous "A" and Deciduous "B")

				Percent stocking by block			
LB				Valid N	Median	Percentile 25	Percentile 75
HH	BM	Species group	Deciduous "A"	N=19	88.0	78.3	100.0
			Deciduous "B"	N=19	84.7	67.0	93.0
	CC	Species group	Deciduous "A"	N=10	88.0	87.0	100.0
			Deciduous "B"	N=10	90.0	80.0	93.0
	CY	Species group	Deciduous "A"	N=20	93.0	88.5	100.0
			Deciduous "B"	N=20	93.0	81.8	100.0
	EU	Species group	Deciduous "A"	N=35	98.8	91.5	100.0
			Deciduous "B"	N=35	93.0	87.0	100.0
	MC	Species group	Deciduous "A"	N=9	100.0	90.8	100.0
			Deciduous "B"	N=9	100.0	88.1	100.0
	WC	Species group	Deciduous "A"	N=15	100.0	87.8	100.0
			Deciduous "B"	N=15	100.0	87.8	100.0

Figure 5-15. Stocking: LB HH; by LMU and species group (conifer, decid "B", and total)

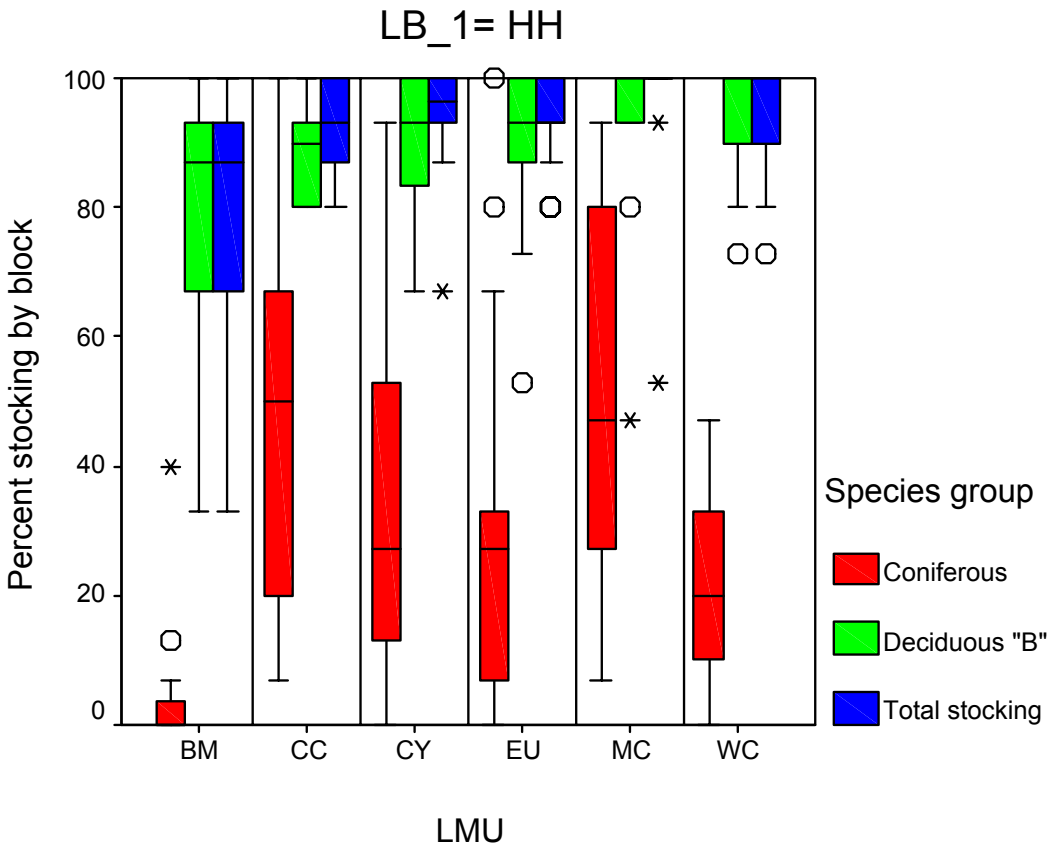

Table 5-21. Stocking: LB HH; by LMU and species group (conifer, decid. "B", and total)

Summary: Stocking, LB class HH (Deciduous "B", Conifer, and total (all eligible species))

LB				Percent stocking by block			
				Valid N	Median	Percentile 25	Percentile 75
HH	BM	Species group	Coniferous	N=19	.0	.0	6.4
			Deciduous "B"	N=19	84.7	67.0	93.0
			Total stocking	N=19	84.7	67.0	93.0
	CC	Species group	Coniferous	N=10	50.0	20.0	70.8
			Deciduous "B"	N=10	90.0	80.0	93.0
			Total stocking	N=10	93.0	87.0	100.0
	CY	Species group	Coniferous	N=20	27.0	13.0	54.7
			Deciduous "B"	N=20	93.0	81.8	100.0
			Total stocking	N=20	96.5	92.5	100.0
	EU	Species group	Coniferous	N=35	27.0	7.0	35.6
			Deciduous "B"	N=35	93.0	87.0	100.0
			Total stocking	N=35	93.0	91.5	100.0
	MC	Species group	Coniferous	N=9	50.3	18.8	86.1
			Deciduous "B"	N=9	100.0	88.1	100.0
			Total stocking	N=9	100.0	95.9	100.0
	WC	Species group	Coniferous	N=15	21.7	7.5	33.0
			Deciduous "B"	N=15	100.0	87.8	100.0
			Total stocking	N=15	100.0	87.8	100.0

Figure 5-16. Stocking: LB SS; by LMU and species group (conifer, decid. "B", and total)

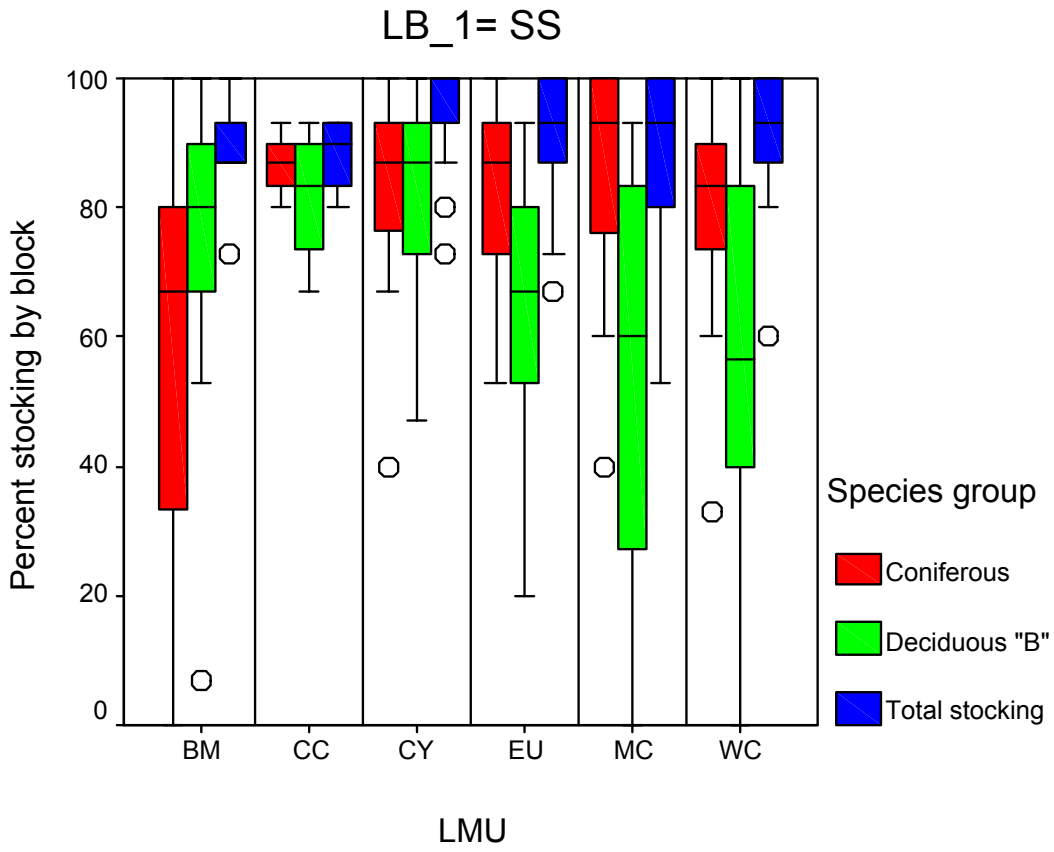

Table 5-22. Stocking: LB SS; by LMU and species group (conifer, decid. "B", and total)

Summary: Stocking, LB class SS (Deciduous "B", Conifer, and total (all eligible species))

LB				Percent stocking by block			
				Valid N	Median	Percentile 25	Percentile 75
SS	BM	Species group	Coniferous	N=11	69.2	13.6	82.6
			Deciduous "B"	N=11	81.2	63.5	92.5
			Total stocking	N=11	88.0	87.0	94.8
	CC	Species group	Coniferous	N=4	87.0	81.8	.
			Deciduous "B"	N=4	85.3	71.9	.
			Total stocking	N=4	90.0	82.6	.
	CY	Species group	Coniferous	N=27	87.0	73.6	94.8
			Deciduous "B"	N=27	87.0	73.0	93.0
			Total stocking	N=27	100.0	93.0	100.0
	EU	Species group	Coniferous	N=25	87.0	73.0	93.0
			Deciduous "B"	N=25	68.0	50.7	80.0
			Total stocking	N=25	93.0	87.0	100.0
	MC	Species group	Coniferous	N=23	92.0	73.8	100.0
			Deciduous "B"	N=23	61.2	27.0	86.4
			Total stocking	N=23	94.2	80.0	100.0
	WC	Species group	Coniferous	N=12	83.5	70.3	93.6
			Deciduous "B"	N=12	56.5	38.2	85.3
			Total stocking	N=12	93.0	86.4	100.0

Figure 5-17. Stocking: LB HH; by grazing and species group (decid. “A” and decid. “B”)

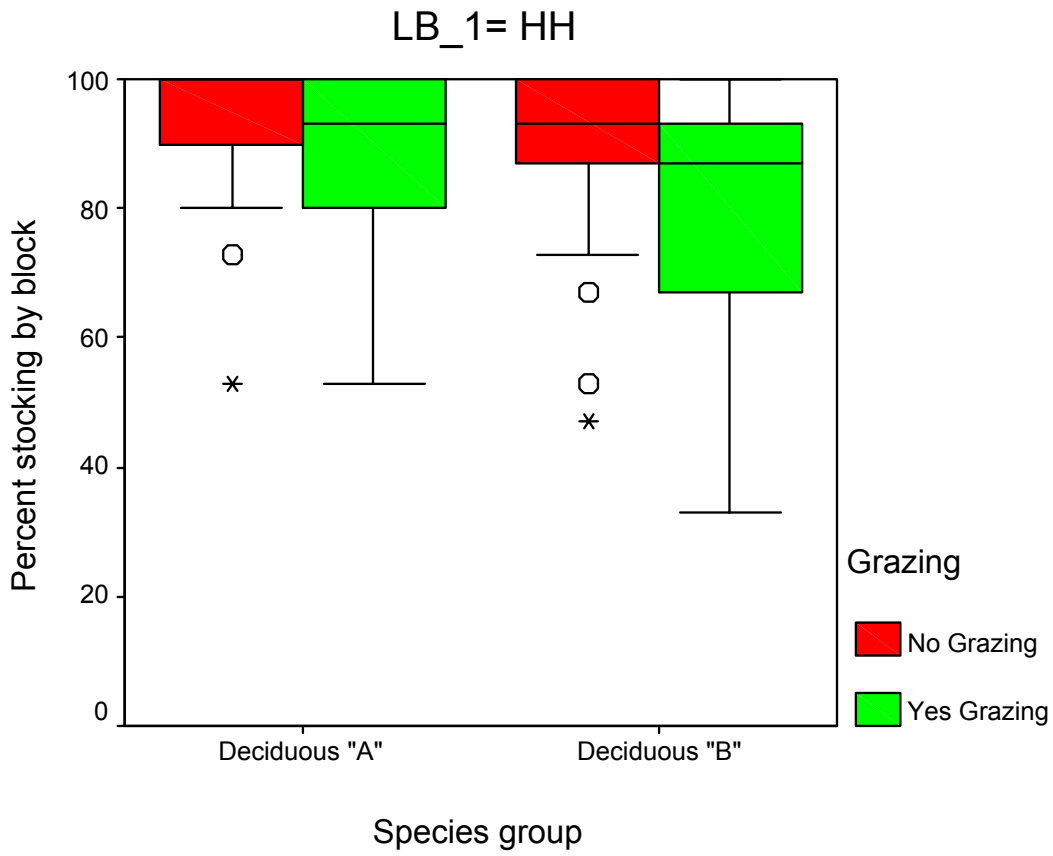

Table 5-23. Stocking: LB HH; by grazing and species group (decid. “A” and decid. “B”)

Summary: Stocking, LB class HH by Grazing (Deciduous "A" and Deciduous "B")

					Percent stocking by block			
LB					Valid N	Median	Percentile 25	Percentile 75
HH	Species group	Deciduous "A"	Grazing	No Grazing	N=87	100.0	87.5	100.0
				Yes Grazing	N=21	92.0	80.0	100.0
		Deciduous "B"	Grazing	No Grazing	N=87	93.0	87.0	100.0
				Yes Grazing	N=21	87.0	67.0	93.0

Figure 5-18. Stocking: LB HH; by grazing and species group (conifer, decid. "B" and total)

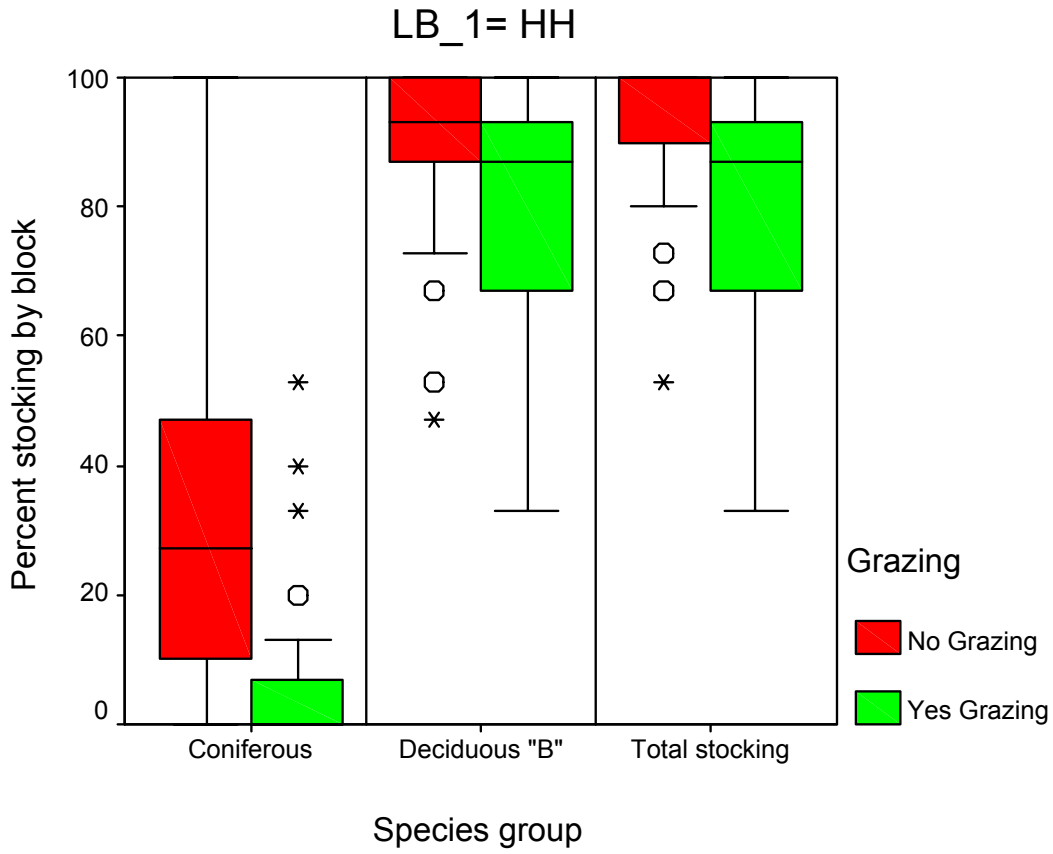

Table 5-24. Stocking LB HH; by grazing and species group (conifer, decid. "B" and total)

Summary: Stocking, LB class HH by Grazing (Deciduous "B", Conifer, and total (all eligible species))

LB					Percent stocking by block			
					Valid N	Median	Percentile 25	Percentile 75
HH	Species group	Coniferous	Grazing	No Grazing	N=87	27.0	7.5	47.0
				Yes Grazing	N=21	.0	.0	12.2
		Deciduous "B"	Grazing	No Grazing	N=87	93.0	87.0	100.0
				Yes Grazing	N=21	87.0	67.0	93.0
		Total stocking	Grazing	No Grazing	N=87	100.0	87.5	100.0
				Yes Grazing	N=21	87.0	67.0	93.0

Figure 5-19. Stocking: LB SS; by grazing and species group (conifer, decid. "B" and total)

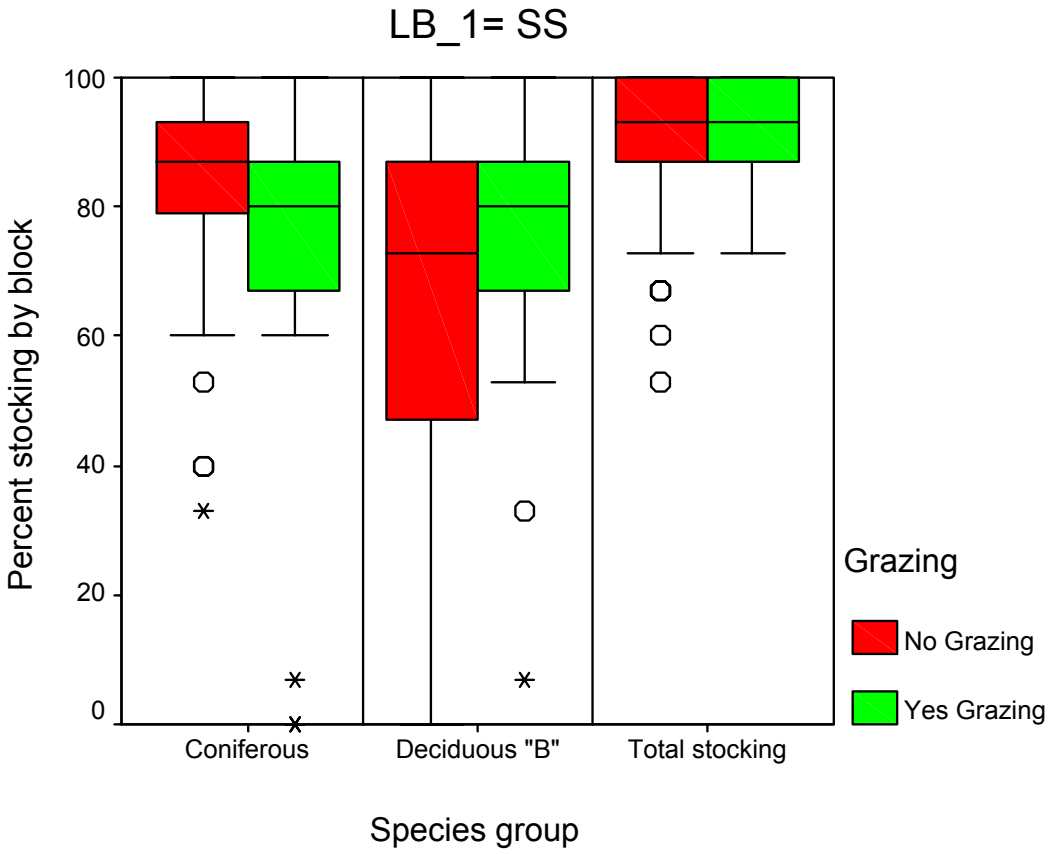

Table 5-25. Stocking: LB SS; by grazing and species group (conifer, decid. "B" and total)

Summary: Stocking, LB class SS by Grazing (Deciduous "B", Conifer, and total (all eligible species))

LB					Percent stocking by block			
					Valid N	Median	Percentile 25	Percentile 75
SS	Species group	Coniferous	Grazing	No Grazing	N=81	87.0	76.8	93.0
				Yes Grazing	N=21	80.0	67.0	90.5
		Deciduous "B"	Grazing	No Grazing	N=81	72.0	47.0	87.0
				Yes Grazing	N=21	80.0	67.0	90.5
		Total stocking	Grazing	No Grazing	N=81	93.0	87.0	100.0
				Yes Grazing	N=21	93.0	87.0	100.0

Figure 5-20. Stocking: LB HH; by date and species group (decid. "A" and decid. "B")

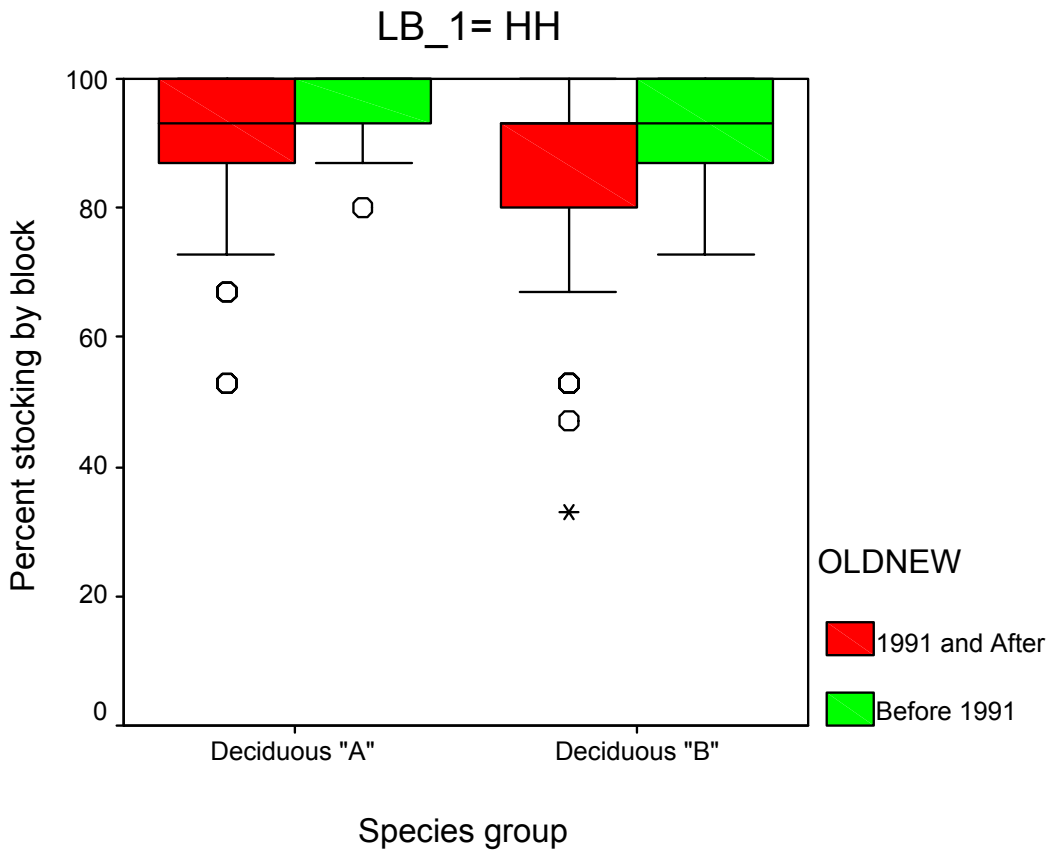

Table 5-26. Stocking: LB HH; by date and species group (decid. "A" and decid. "B")

Summary: Stocking, LB class HH by date (Deciduous "A" and Deciduous "B")

				Percent stocking by block			
LB				Valid N	Median	Percentile 25	Percentile 75
HH	Species group	Deciduous "A"	1991 and After	N=63	93.0	87.0	100.0
			Before 1991	N=45	100.0	93.0	100.0
		Deciduous "B"	1991 and After	N=63	93.0	80.0	94.8
			Before 1991	N=45	94.2	87.0	100.0

Figure 5-21. Stocking: LB HH; by date and species group (conifer, decid. "B" and total)

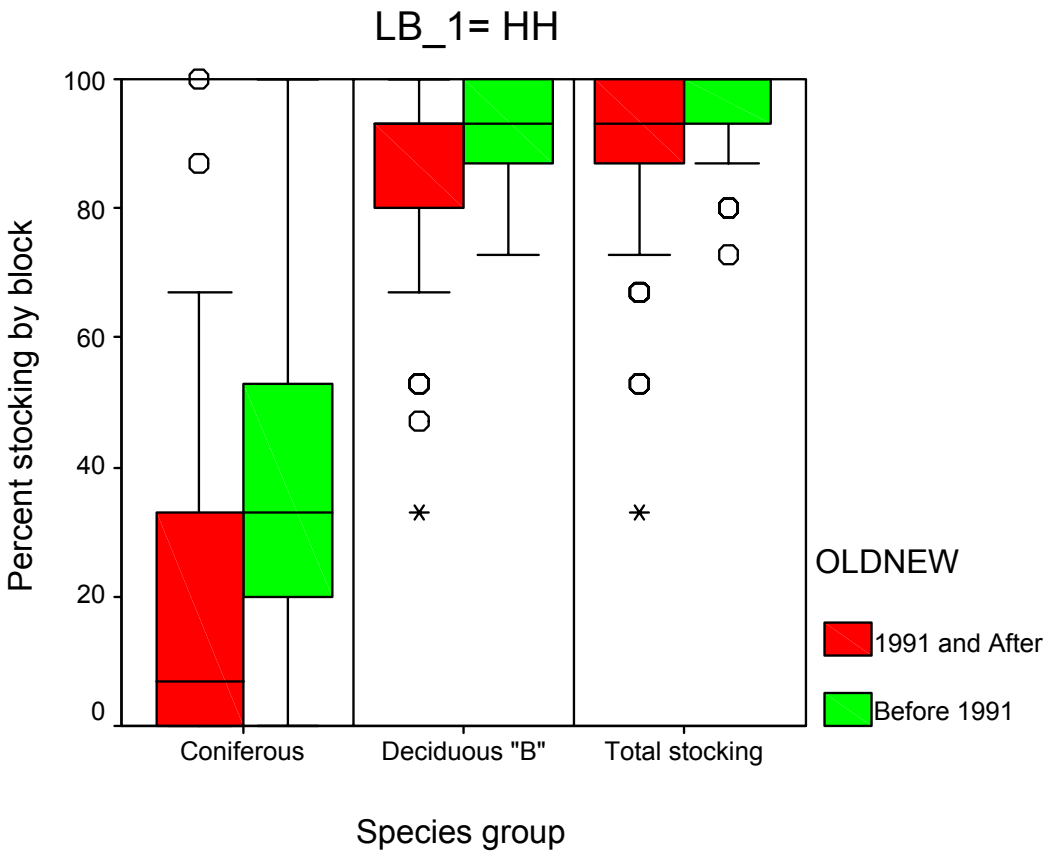

Table 5-27. Stocking: LB HH; by date and species group (conifer, decid. "B" and total)

Summary: Stocking, by Block Age and LB HH, Species groups Decid "B", Conifer, and Total (all eligible)

LB				Percent stocking by block			
				Valid N	Median	Percentile 25	Percentile 75
HH	Species group	Coniferous	1991 and After	N=63	8.0	.0	33.0
			Before 1991	N=45	33.0	15.9	57.1
		Deciduous "B"	1991 and After	N=63	93.0	80.0	94.8
			Before 1991	N=45	94.2	87.0	100.0
		Total stocking	1991 and After	N=63	93.0	87.0	100.0
			Before 1991	N=45	100.0	89.5	100.0

Figure 5-22. Stocking: LB SS; by date and species group (conifer, decid. "B" and total)

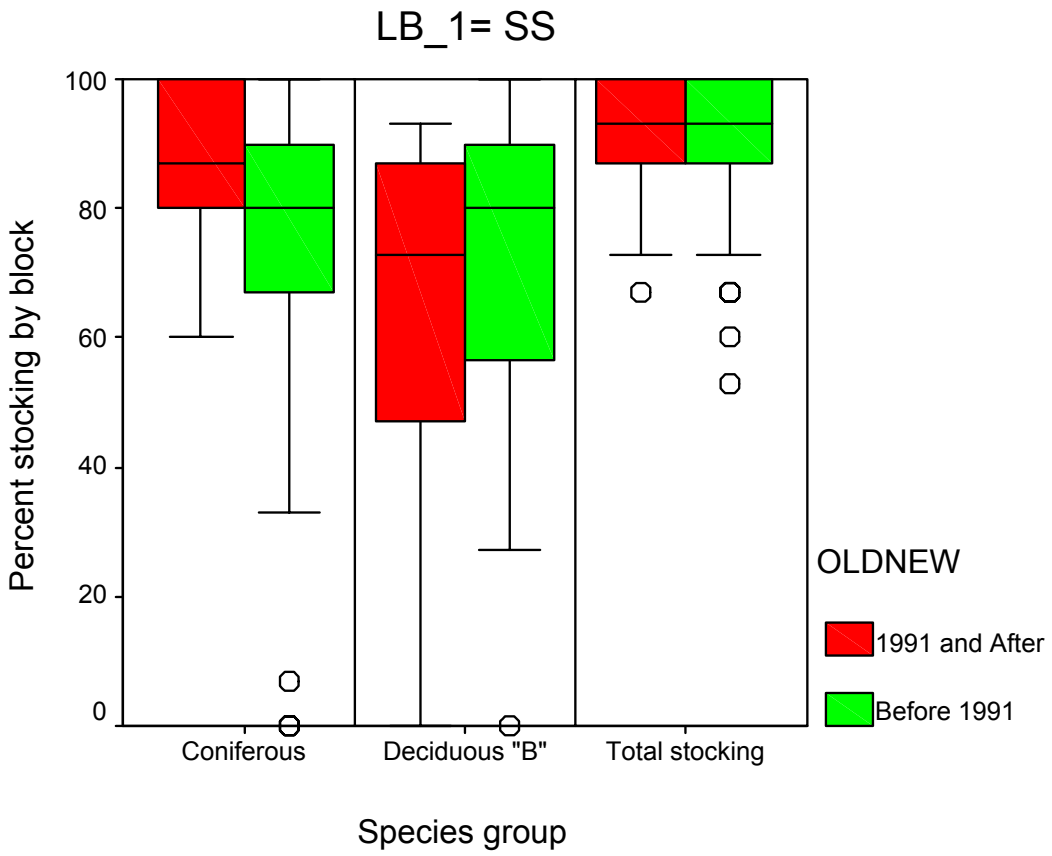

Table 5-28. Stocking: LB SS; by date and species group (conifer, decid. "B" and total)

Summary: Stocking, by Block Age and LB SS, Species groups Decid "B", Conifer, and Total (all eligible)

LB				Percent stocking by block			
				Valid N	Median	Percentile 25	Percentile 75
SS	Species group	Coniferous	1991 and After	N=50	87.0	80.0	100.0
			Before 1991	N=52	80.0	67.0	91.5
		Deciduous "B"	1991 and After	N=50	73.0	47.0	87.0
			Before 1991	N=52	80.0	54.7	91.5
		Total stocking	1991 and After	N=50	93.0	87.0	100.0
			Before 1991	N=52	93.0	87.0	100.0

4. Height

Figure 5-23. Height: All Blocks in all LB types

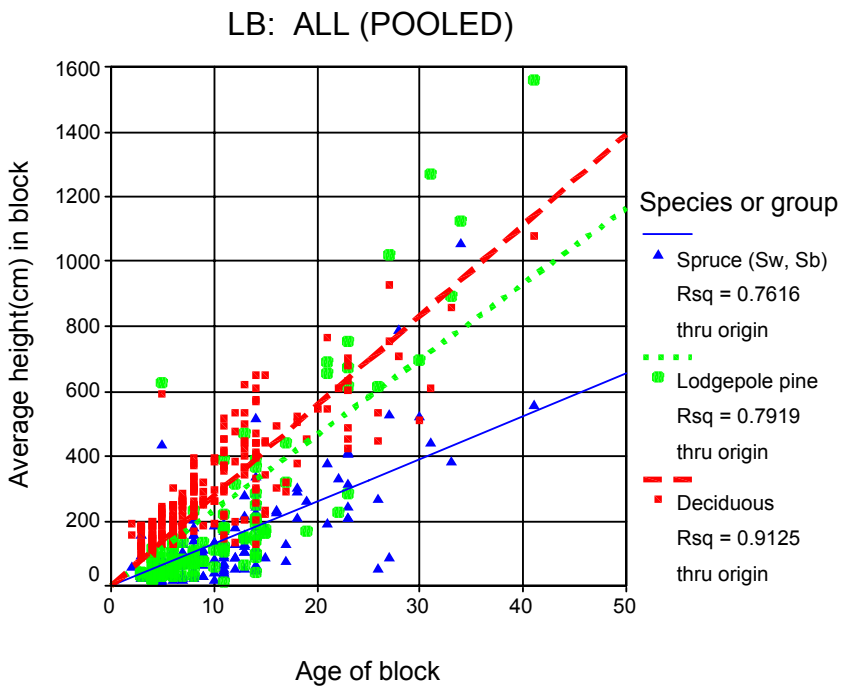

Figure 5-24. Height: All blocks combined, LB HH (spruce, pine decid.)

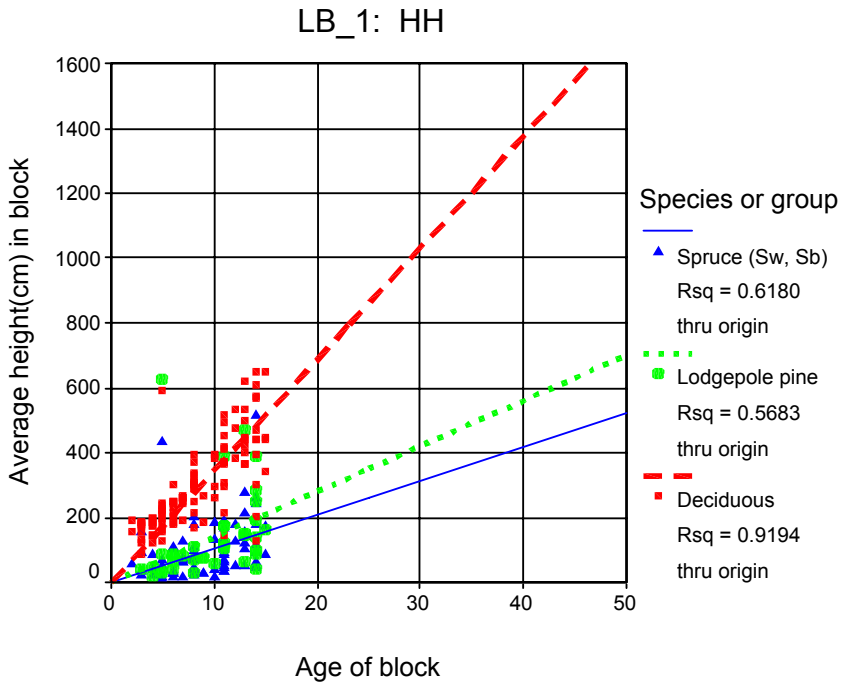

Figure 5-25. Height: All blocks combined, LB SS (spruce, pine decid.)

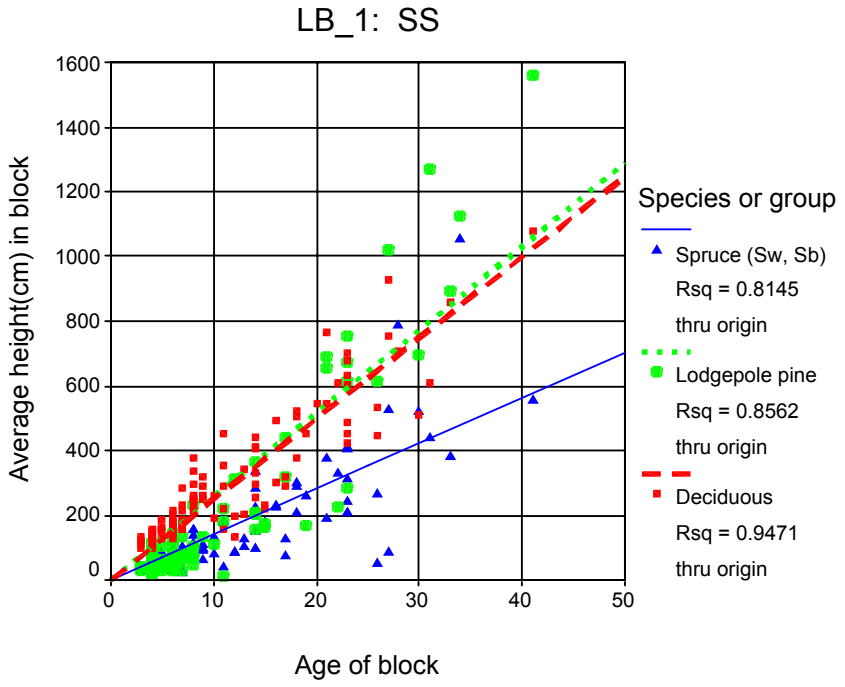

Figure 5-26. Height: LMU BS (spruce, pine decid.)

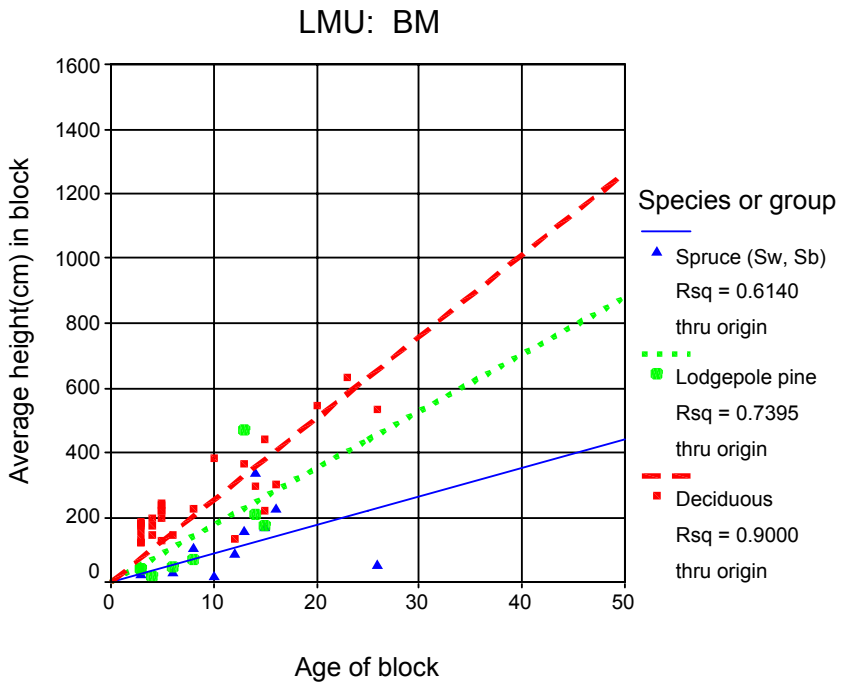

Figure 5-27. Height: LMU CC (spruce, pine decid.)

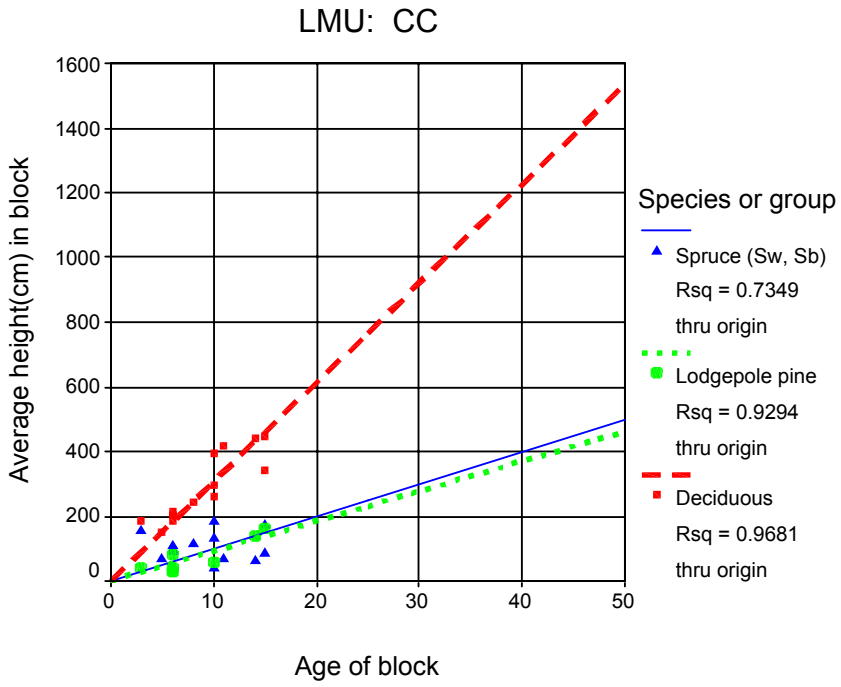

Figure 5-28. Height: LMU CY (spruce, pine decid.)

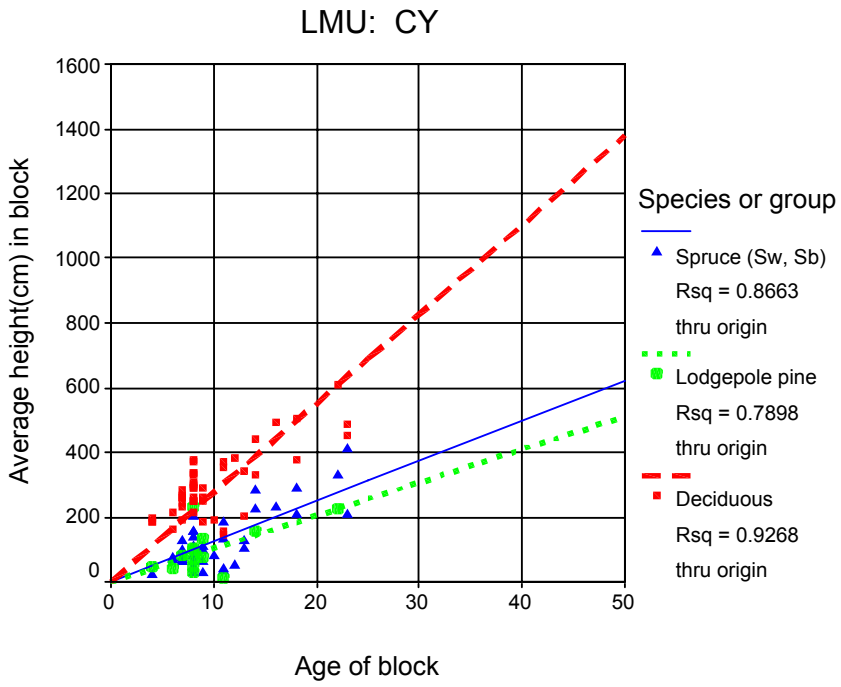

Figure 5-29. Height: LMU EU (spruce, pine decid.)

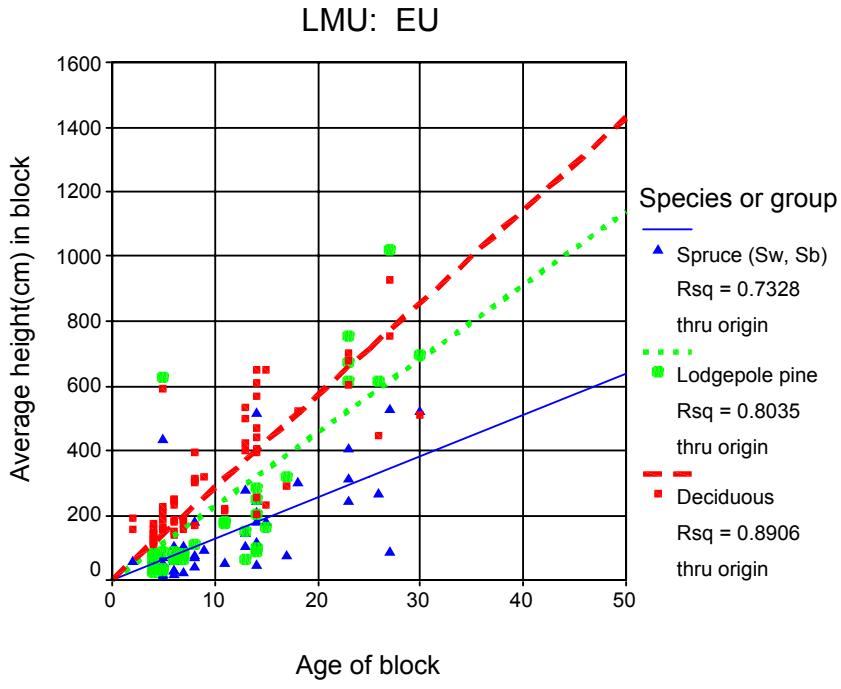

Figure 5-30. Height: LMU MC (spruce, pine decid.)

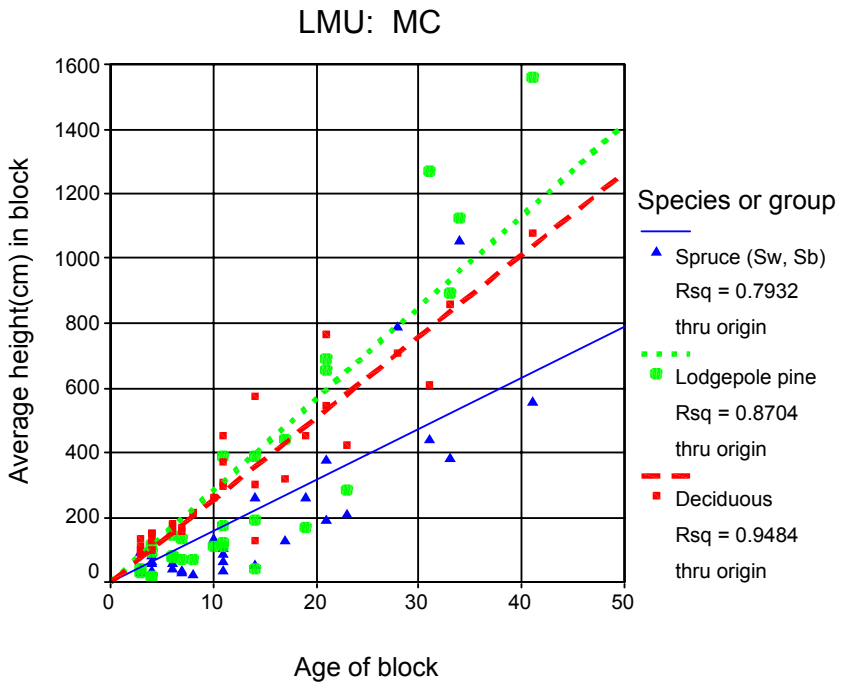

Figure 5-31. Height: LMU WC (spruce, pine decid.)

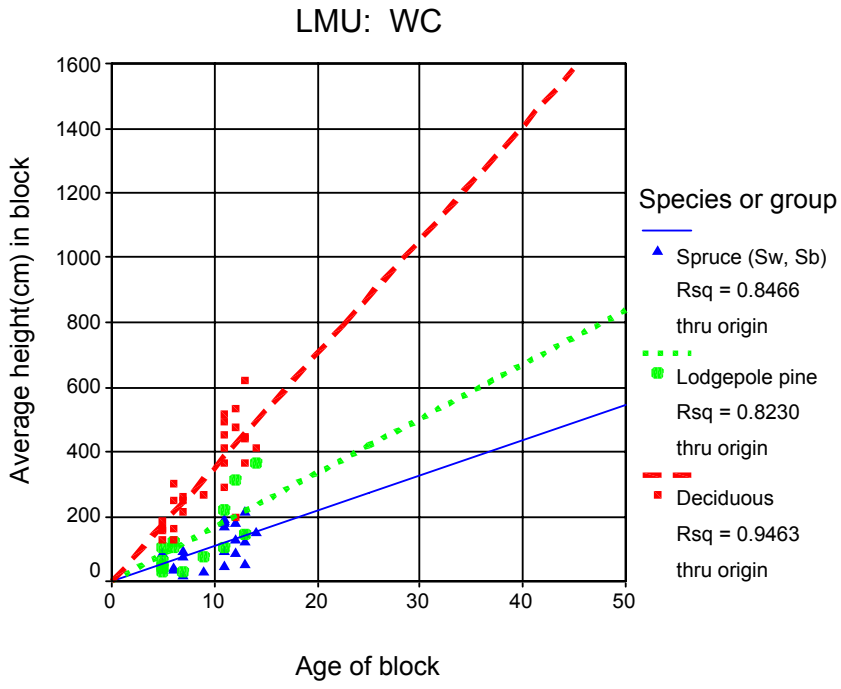

Figure 5-32. Height: LB HH grazed (spruce, pine decid.)

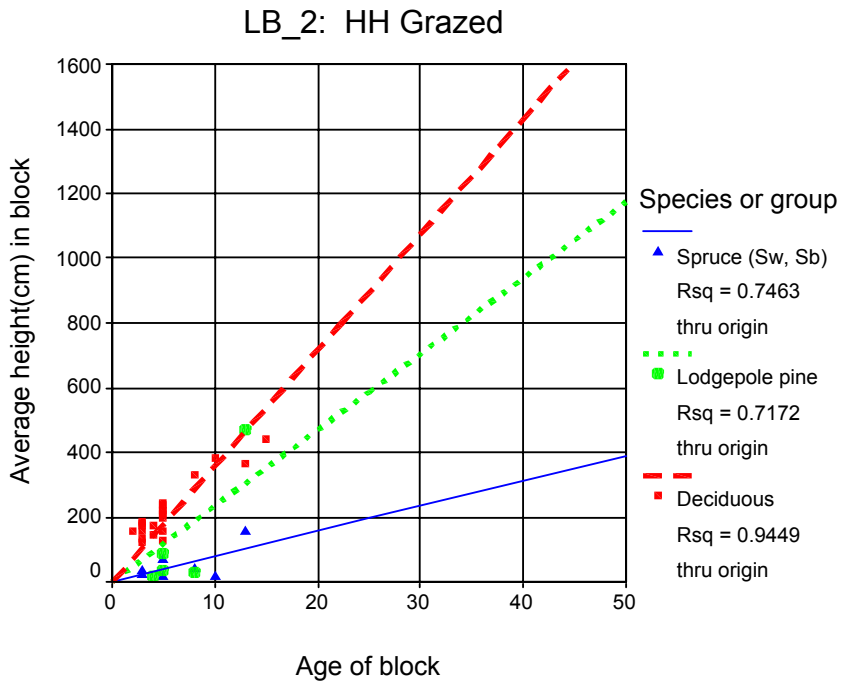

Figure 5-33. Height: LB HH not grazed (spruce, pine decid.)

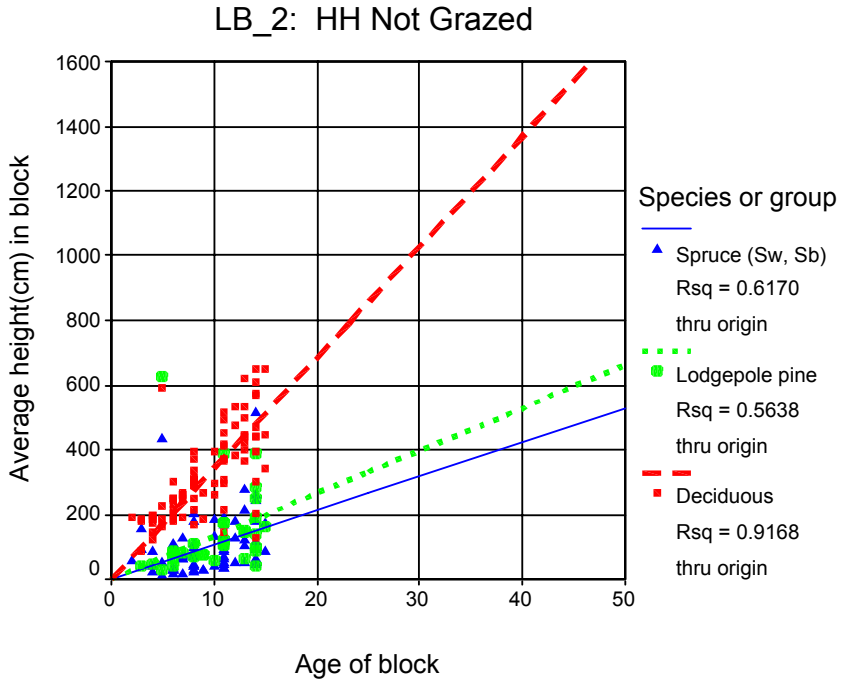

Figure 5-34. Height: LB SS grazed (spruce, pine decid.)

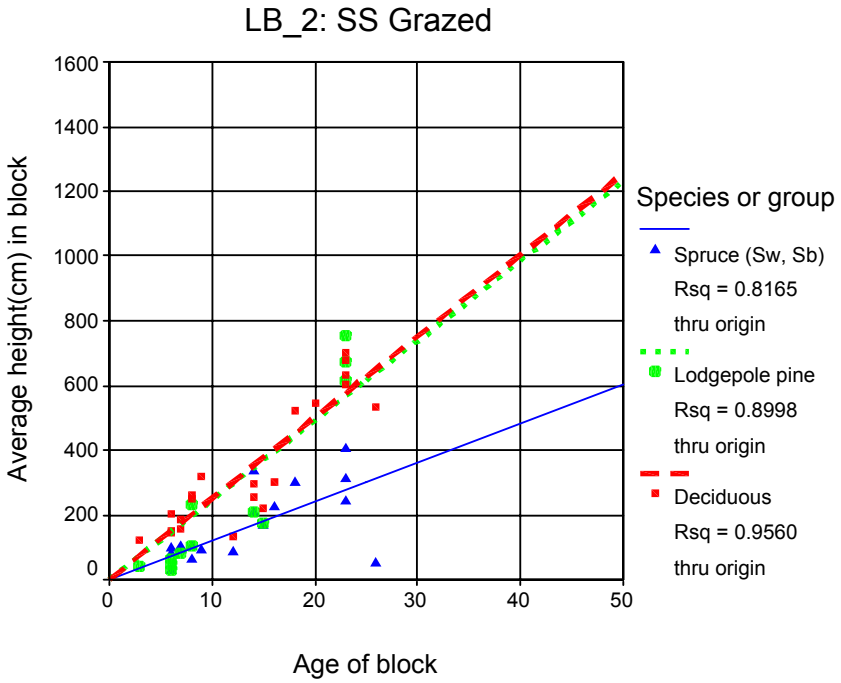

Figure 5-35. Height: LB SS not grazed (spruce, pine decid.)