Millar Western Forest Products Ltd.

Development of the Landbase

2007-2016 Detailed Forest Management Plan

August 17, 2007

Executive Summary

This document describes the process used to establish and classify the managed landbase and report the spatially classified landbase for the Millar Western Forest Products (MWFP) 2007-2016 Detailed Forest Management Plan. Separate documents in the DFMP discuss the yield curve development (Appendix VIII – Yield Curve Development) and the timber supply analysis (Chapter 5 – Forecasting).

This document describes the creation of the classified landbase which describes the condition of the forest as of May 1, 2004 and was created to meet the requirements of the Forest Management Planning Standard. The extent of the gross landbase was all lands within the outer boundaries of Forest Management Units (FMU) W11 and W13. This includes the full extent of lands under MWFP Forest Management Agreement (FMA) tenure, private land and additional crown lands within the FMUs. This report also describes the Timber Supply Analysis (TSA) landbase and the modelling landbase which were developed from the classified landbase to meet the needs of timber supply analysis. The final TSA and modelling landbases contain additional black spruce deletions identified during the review of the spatial harvest sequence for W13. These reflect the results of the preferred forest management scenario.

The landbase covers an area of 478,507 ha in the FMUs W11 (176,634 ha) and W13 (301,873 ha). On the base landbase, the managed landbase, the area available for harvest, covers 63% of the classified landbase, 299,784 ha with 87,369 ha in W11 and 212,416 ha in W13. On the final landbase, the managed landbase is reduced to 293,784 ha with 87,369 ha in W11 and 206,415 ha in W13.

Table 1 shows the classified landbase summarized on managed and unmanaged areas. The column SRD_DESC on the dataset reflects this classification and will duplicate these results when summarized by the areas fields (*F_AREAHA, AREA_H_DEL,* or *AREAHA_POL*) and the *FMU_NUM* field. Table 2 summarizes the areas for the final TSA and modelling landbases. The managed area is shown in the *F_AREAHA_MOD* field. The process used to generate this summary is discussed in Section 8.3.

Table 1. Area distribution on classified landbase.

Description	Landbase area(ha)	W11 176,634	W13 301,873	ALL 478,507	% Gross Landbase
Area outside FMA (including parks) or areas without AVI		11,557	14,490	26,048	
Linear dispositions,seismic and trails		4,821	16,952	21,772	
Non-linear landuse dispositions		1,590	3,432	5,021	
Recreation		0	26	26	
Nonforest, burnt or nonproductive		35,464	28,377	63,842	
Water buffers		2,626	6,095	8,721	
Larch and black spruce subjective deletions		32,781	19,430	52,211	
Isolated stands		14	511	526	
Horizontal stand deletion from managed landbase		412	145	557	
Total unmanaged landbase area		**89,265**	**89,458**	**178,723**	**37%**

Description	F_YC	W11	W13	ALL	% Landbase
Aspen	AW	53,186	57,846	111,032	
Birch	BW	130	1,105	1,235	
Aspen-pine mixedwood	AP	1,505	6,042	7,548	
Aspen-spruce mixedwood	AS	4,875	19,115	23,990	
Pine-aspen mixedwood	PA	1,555	10,354	11,909	
Spruce-aspen mixedwood	SA	5,066	17,700	22,766	
Pine	PL	11,588	66,641	78,229	
Black spruce	SB		16,806	16,806	
White spruce	SW	9,463	16,808	26,271	
Total managed area		**87,369**	**212,416**	**299,784**	**63%**

Table 2. Area distribution on Final landbase (additional Sb deletions in W13).

Final landbase Description		FMU Landbase area (ha)	W11 176,634	W13 301,873	ALL 478,507	% Gross Landbase
Area outside FMA (including parks)		**Stand area**	11,557	14,491	26,048	5%
Seismic or linear deletion assigned		**Stand area**	231	2,224	2,455	1%
Non-linear landuse dispositions		**Stand area**	1,663	3,684	5,346	1%
Recreation		**Stand area**	0	27	27	0%
Nonforest, burnt or nonproductive		**Stand area**	36,739	32,175	68,914	14%
Water buffers		**Stand area**	2,668	6,307	8,975	2%
Larch and black spruce subjective deletions		**Stand area**	33,605	21,564	55,169	12%
Isolated stands		**Stand area**	14	515	529	0%
Deletions from managed landbase						
Black spruce yield reduction from SHS		**Attribute area**	0	4,841	4,841	1%
Horizontal stand deletion		**Attribute area**	412	145	557	0%
Seismic area deletion		**Attribute area**	1,519	5,621	7,140	1%
Road area deletion from		**Attribute area**	537	2,274	2,811	1%
Linear feature area deletion		**Attribute area**	309	1,476	1,785	0%
Small poly area deletion		**Stand area**	12	114	126	0%
	Total unmanaged landbase area		**89,265**	**95,458**	**184,723**	**39%**
Description	**F_YC**	**FMU**	**W11**	**W13**	**ALL**	**% Gross Landbase**
Aspen	AW		53,186	57,846	111,032	23%
Birch	BW		130	1,105	1,235	0%
Aspen-pine mixedwood	AP		1,505	6,042	7,547	2%
Aspen-spruce mixedwood	AS		4,875	19,115	23,989	5%
Pine-aspen mixedwood	PA		1,555	10,354	11,909	3%
Spruce-aspen mixedwood	SA		5,066	17,700	22,766	5%
Pine	PL		11,588	66,640	78,229	16%
Black spruce	SB		0	10,805	10,805	2%
White spruce	SW		9,463	16,808	26,271	5%
	Total managed area		**87,369**	**206,415**	**293,784**	**61%**

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1. Introduction

The 2007–2016 Detailed Forest Management Plan (DFMP) for Millar Western Forest Products (MWFP) was developed with reference to the Alberta Forest Management Planning Standard (Alberta 2006). The DFMP describes the current status of the forest and the Values, Objectives, Indicators and Targets for the management of the forest. This document describes one component of the DFMP process, the landbase development.

This document describes the data and processes used to develop the datasets used in the landbase classification process and to generate the classified landbase to meet the requirements of the Forest Management Planning Standard and the TSA and modelling landbases used in the timber supply analysis (TSA). It also describes the process to develop and the attributes carried on the TSA and modelling landbases used in the forecasting stages of the TSA. Separate documents in the DFMP describe the yield projection (Appendix VIII) and the forecasting stages of the TSA (Chapter V).

This classified landbase describes the condition of the forest as of May 1, 2004. The extent of the gross landbase was all lands within the outer boundaries of Forest Management Units (FMU) W11 and W13. This includes the full extent of lands under MWFP Forest Management Agreement (FMA) tenure as well as private land and additional crown lands within the FMUs. The classified landbase is the base for both the TSA and modelling landbases.

The landbase classification defines the area available for forest management activities known as the managed landbase and the area excluded from forest management activities (deletions from the managed landbase) known as the unmanaged landbase. Other Impact Assessment Groups

developing strategies to address FireSmart, enhanced forest management, monitoring and biodiversity issues also used the classified or TSA landbases to support analyses.

The creation of the MWFP spatial landbase combined information from a wide variety of sources. This document meets the requirements of the spatially classified landbase outlined in Annex 1, item 3.0 of the Forest Management Planning Standard that states "describe the procedure and steps required to establish the net landbase and report the spatially classified landbase" (Alberta, 2006). This document also describes the TSA and modelling landbase created to meet the requirements of both the Forest Management Planning Standard (Alberta 2006) and TSA modelling. Figure 1 shows the landbase classification process.

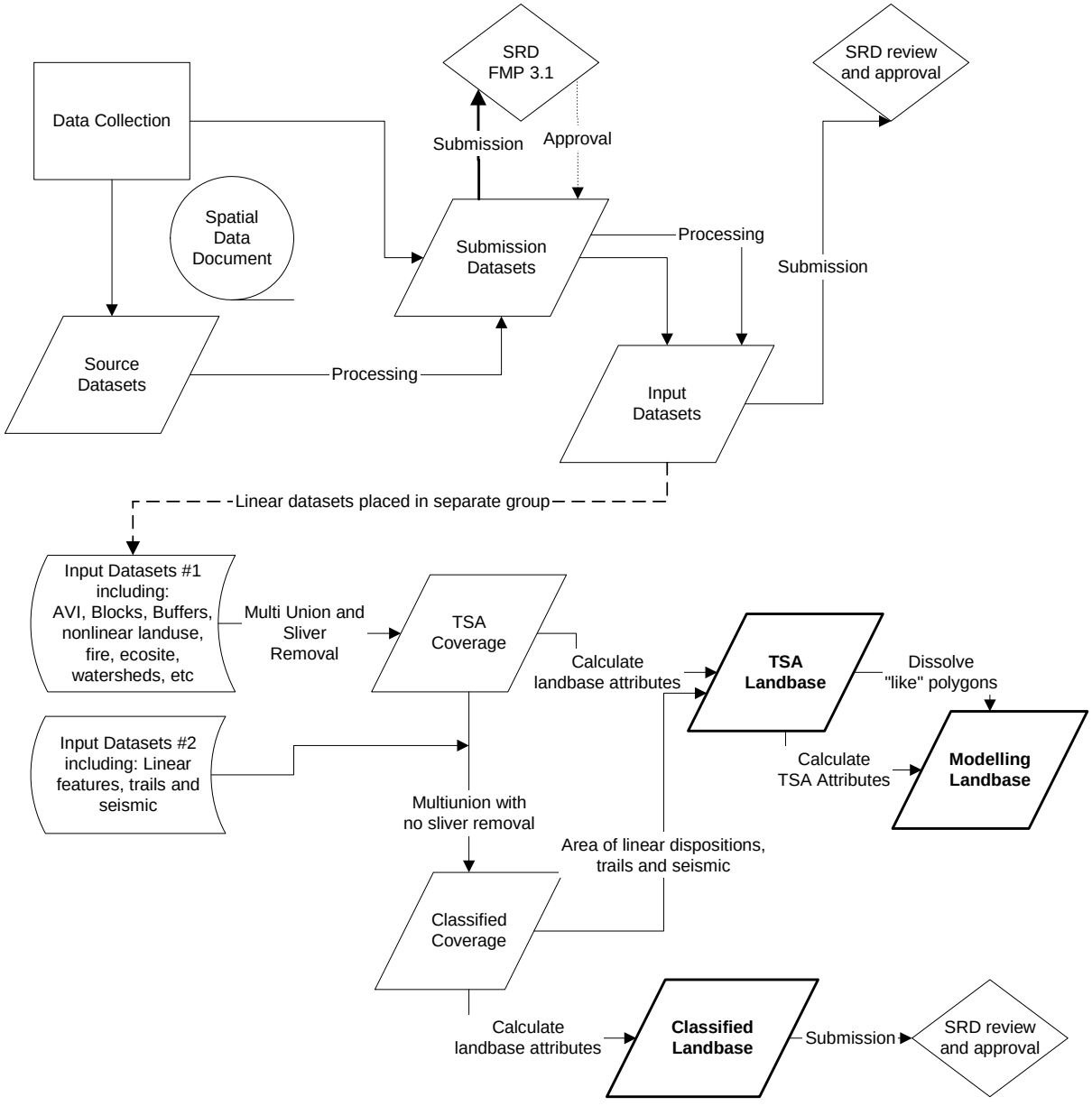

Figure 1. Landbase classification process.

Section 5.3 describes each landbase and the spatial processing required.

The classified landbase has the highest level of detail and number of polygons. It carries linework for seismic and linear features. The classified landbase carries the unique key for the TSA landbase as an attribute. This allows the seismic and linear feature area and attributes from the classified landbase to be shown on the TSA landbase without the spatial linework. This preserves the information for these features without adding the constraint of additional polygons to the TSA and modelling landbases. The TSA and modelling landbases directly link back to the classified landbase and were developed through specific documented spatial processing steps and attribute assignments.

The classified landbase covers an area of 478,507 ha in the FMUs W11 (176,634 ha) and W13 (301,873 ha). The managed landbase, the area available for harvest, covers 63% of the classified landbase, 300,341 ha with 87,781 ha in W11 and 212,560 ha in W13. The TSA and modelling landbases have the same extent and areas on the managed landbase.

1.1 Spatial Landbases

The landbase classification process must satisfy many requirements. The landbase classification defines the area available for forest management activities known as the managed landbase and the area excluded from forest management activities (deletions from the managed landbase) known as the unmanaged landbase. The Forestry Corp has generated 3 separate landbases that represent the same information in slightly different ways. Each landbase is designed to most efficiently meet a specific purpose and has the same extent, areas under deletions and species distribution. The extent of the gross landbase for all was lands within the outer boundaries of Forest Management Units (FMU) W11 and W13. This includes the full extent of lands under MWFP Forest Management Agreement (FMA) tenure as well as private land and additional crown lands within the FMUs. Descriptions of the spatial landbases follow:

1. Classified landbase. This landbase was developed to satisfy the requirements listed in the Forest Management Planning Standard (Alberta, 2006). The landbase includes linework for linear features (seismic, roads and utilities). The classified landbase is also used to calculate the areas and identify the locations of linear features on the landbase and to generate the attributes for the TSA landbase. This landbase carries the largest number of polygons.

2. TSA landbase. The landbase forms the start point for TSA modelling. The TSA landbase carries all information in the classified landbase but does not include spatial linework for linear features. The unique key for the TSA landbase is carried on the classified landbase.

3. Modelling landbase. This landbase was developed to make the spatial landbase more suited for both strategic and operation TSA modelling. The goal was to represent the necessary information with appropriate attributes but to simplify the assignments wherever possible. This landbase carries the fewest number of polygons. The landbase processing maintains a link to the TSA landbase through UKEY#_TSA.

Specific descriptions and documentation of the unique characteristics of each landbase are described in more detail in Sections 5 and 7.

1.2 Process Overview

Development of the classified landbase for a DFMP has six phases that continue through the development of the plan and may extend over multiple years. The main phases are:

- Identify and collect all available data to support the landbase classification process;
- Process data (spatial and attribute) to develop submission datasets;
- Prepare or combine datasets for input to spatial processing;
- Spatially process input datasets to generate spatial landbases;
- Process attributes of input datasets to characterize landbases and generated attributes required for modelling; and
- Identify area available for forest management activities.

Each landbase classification phase is summarized below and addressed in detail in the following sections of the document:

- Data Collection (Section 2). This first step identified any relevant spatial and attribute data that could be used to characterize the area. Data were collected in a variety of formats and from many different sources. Data were presented and discussed with the company and interested stakeholders to determine their accuracy and relevancy to the DFMP. These source datasets contain the information used to characterize the landbase. All spatial data used were processed or converted to an ArcInfo coverage format. Attribute data were stored as INFO, DBF or ORACLE table formats.
- Submission Datasets (Section 3). All datasets used in the landbase classification stage of the TSA must be submitted for approval by Alberta. Each dataset was described fully and the processing steps required to generate the data were outlined. The processing steps completed to include this information as part of the input datasets was also outlined.
- Input Coverages and Tables (Section 4). With some initial processing or grouping of submission datasets the datasets used in the spatial data processing were generated. The actual coverages, attributes and related tables used to classify the landbase and the specific fields used in the classification process are described in Section 4.
- Spatial Data Processing (Section 5). The spatial processing of input datasets used to generate the classified landbase coverage and further processing to generate the TSA and modelling landbases are described in Section 5.

- AVI Attribute Processing (Section 6). The processing and definition of AVI attributes to calculate composite stand attributes, generate species groupings, define landbase classifications and assign strata are described in Section 6.

- Generated Attribute Processing (Section 7). The processing and definition of landbase attributes to generate final landbase classification is described in Section 7. This includes attributes for the classified landbase and additional attributes required for timber supply modelling.

- Landbase Summaries (Section 8). The managed landbase and unmanaged landbase form the final classified landbase and are described in Section 8. This section also includes summaries of the TSA landbase and the modelling landbases.

Figure 2 outlines the process flow and tasks included in the landbase classification.

1.3 Effective Date

This classified landbase describes the condition of the forest as of the effective date of May 1, 2004. The Alberta Vegetation Inventory for the area was completed on 1994 photos with some updates for existing harvest areas to 1996. Spatial data for landuse, harvest and fire regeneration updated the condition of the forest defined in AVI to the effective date.

1.4 Terminology

In this document the following terms are used to classify the gross (full extent) landbase:

- Unmanaged: That portion of the gross landbase that is not available for forest management activities.

- Managed: That portion of the gross landbase that is available for forest management activities.

- Deletions: This identified all areas excluded from the managed area and assigned a code identifying the reason for deletion.

- Submission Datasets: Datasets submitted for Alberta approval.

- Input Datasets: Datasets used in multi-union processing to generate spatial landbases.

- Timber Supply Analysis (TSA): Calculations/computer models with built-in assumptions regarding forest growth patterns, used to determine the annual allowable cut. (Also calculates the Spatial Harvest Sequence and other non-timber values). The landbase classification was the first of four stages in the TSA.

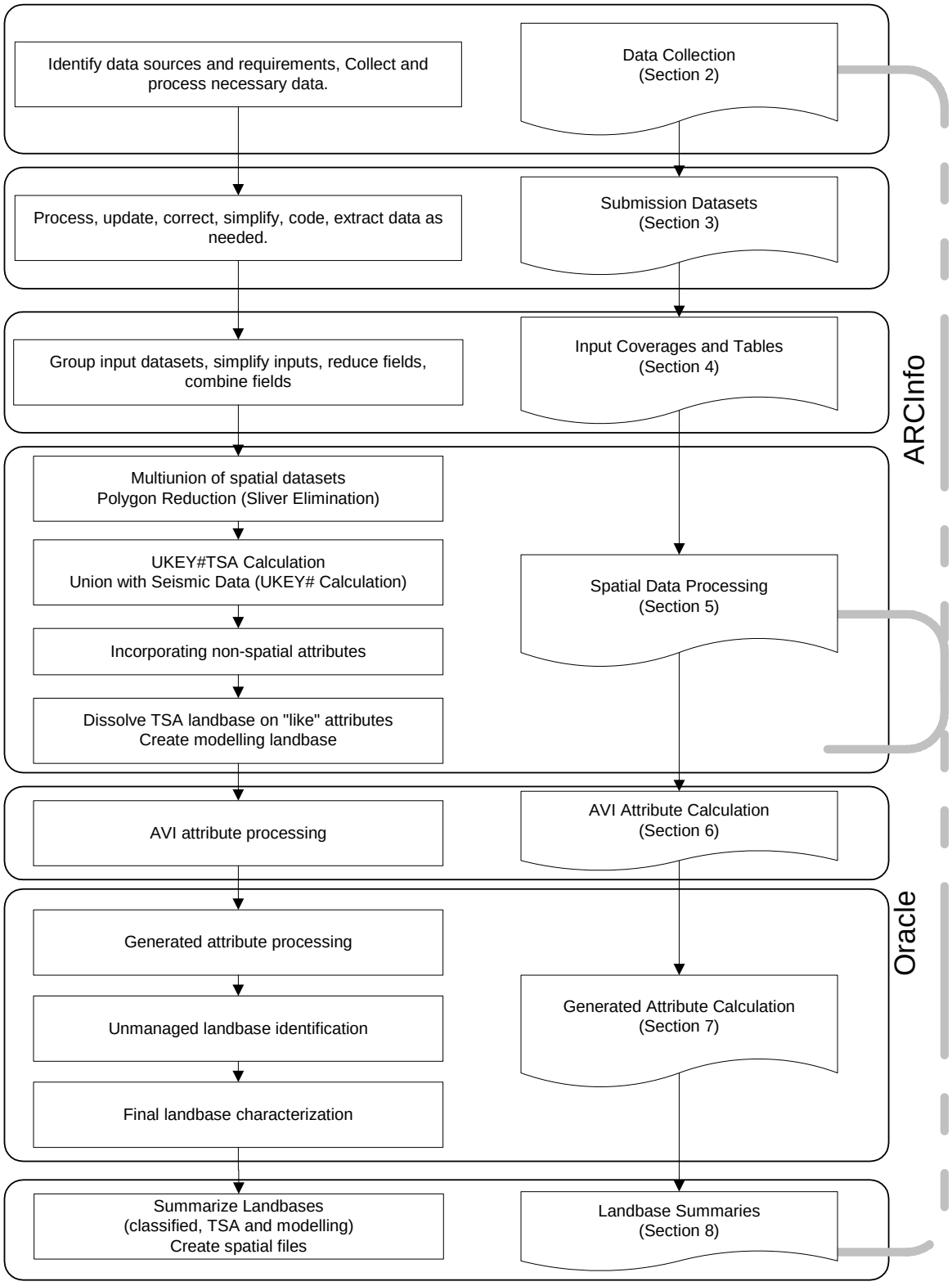

Figure 2. Classified landbase process flow.

- Classified Landbase: The spatial landbase (including linework representing seismic and linear dispositions) and attribute classification generated as the first stage of the TSA process.

- Timber Supply Landbase. The spatial landbase developed to support the TSA. Spatial linework for linear dispositions trails and seismic was not included in this landbase however the area and type of feature was carried in attribute fields.

- Modelling landbase. The spatial landbase developed from the TSA with some simplification of the linework within "like" groupings of attributes for blocks and survey areas to reduce the number of polygons in the model input shapefile. Attribute fields required for modelling are added to this landbase.

1.5 Document Protocols

The following document protocols are used in this landbase classification document:

- # sign when used with landbase name or ukey. This was a generic identifier for the spatial landbase iteration. The landbase classification process may have numerous iterations and a consecutive number was assigned to each multi-union of the input datasets. This ensured attribute and related spatial files could always be linked to the proper spatial landbase files. In the document the # sign was used to represent all or any of the iterations.

- All dataset names are presented in **lowercase** bold font in the text.

- All field names in the body text are presented in *UPPERCASE* italic font. Generally in tables and in title the italics are not used.

- All scripts (SQL and AML) are presented in *lowercase italic* font.

- Table 3 outlines the default table organization. Where possible tables follow this format.

Table 3. Default table layout.

Name	Description	Fields or Decision rules	As needed	As needed
Dataset name	Additional descriptive	Fields for classification	DATA[1]	
Field Name	information	Summary groupings		
Item Name		Decision rules		
Data group of interest				
Classification				

[1] Text to clarify or additional information may be contained in footnotes

- Figure 3 defines the shapes used in all flowcharts.

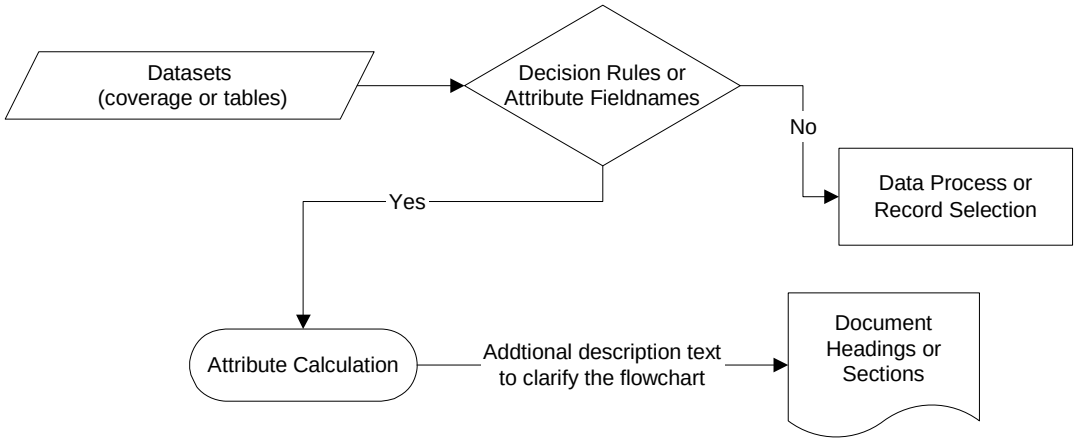

Figure 3. Shape definition for figures.

2. Data Collection

Data collection and preparation of source datasets involved seven main steps:

- Compile and process landuse, roads and operational information;
- Process forest cover (AVI) attribute data;
- Prepare existing and planned harvest cutblock coverage;
- Incorporate regeneration strata on existing cutblocks and fire survey areas;
- Compile and process base data, administrative and fire history information;
- Delineate any special management zones; and
- Incorporate additional information to support TSA modelling and reporting.

The classification of a landbase was developed with data from many sources. The DFMP process requires effort to compile an extensive group of data sources. These spatial and attribute data are included within the classified landbase to help address the values identified by the TSA Impact Assessment Group committee and other advisory groups involved in the DFMP development process. These were outlined with the Terms of Reference (MWFP 2005b) to meet the requirements listed in the Alberta Forest Management Planning Standard (Alberta 2006). Data for the following "Defined Forest Area Values" as listed in the Terms of Reference are included in the classified landbase:

- Base data from provincial data and MWFP spatial data;
- Alberta Vegetation Inventory (AVI) version 2.1 from provincial data;

- Administrative boundaries from provincial data and MWFP data;
- Disposition update as captured from provincial listings;
- Company roads (from MWFP and quota holders);
- Fire boundaries from provincial data;
- Special management areas (including Athabasca Flats) from company data;
- Cutblocks (from company and ARIS records);
- Volume sampling programs;
- Soils classification;
- Wetland inventory;
- Ecological land classification;
- Watersheds, and;
- Values datasets (administrative, aquatic, cultural, recreation, research, wildlife) (from MWFP and provincial data sources).

2.1 Data Sources

2.1.1 Provincial Data

Regional base data was the starting point for many datasets. Information for AVI, hydrology, roads, administrative boundaries, parks and natural areas, fire boundaries, wildlife zones, timber harvest licenses, and traplines were collected from Alberta government sources. Some data required additional processing or was used to augment company information into more comprehensive datasets. Specific source information and processing detail will be provided in Section 3.

2.1.2 MWFP Data

Millar Western maintains a repository of a wide range of spatial and attribute data. This includes provincial base data and additional datasets created by the company. Company generated data includes cutblocks, sample plot data, landuse dispositions, ecological land classification, soil, watersheds, administrative boundaries and survey results. MWFP has commissioned updates to hydrology, roads, landuse and administrative boundaries to improve existing base data and update the data to the effective date of May 1, 2004.

2.1.3 Additional Sources

MWFP received data from other users of their FMA area. Forestry companies with harvest rights within the area provided information on existing cutblocks, planned harvest areas, special management areas and roads. Researchers active in the area provided information on watersheds, soils and wildlife.

2.1.4 Generated Datasets

DFMP production requires some specific datasets that did not previously exist or did not exist in an appropriate format. Datasets were created to address the capture the following data and are described in more detail in Section 3:

- LSAS disposition update and boundary capture,
- Fire survey results from Virginia Hills and Roche Lake burn areas not salvage logged,
- Existing cutblock boundary update and attribute classification,
- Pre-91 cutblock survey and attribute classification,
- Soils classification,
- Wetland identification and classification,
- Ecological land classification for W11, and
- Watershed delineation and classification.

3. Submission Datasets

The data collection steps prepared a set of submission datasets and decision rules for classification. This section describes the datasets that contain all the spatial data used in the landbase classification process and attributes for landbase classification. It lists all datasets used including interim datasets created. It defines the information to be used to classify the landbase and lists the processing to generate the input datasets described separately in Section 4. It also identifies which datasets were used to determine the managed landbase and those datasets that provide additional information for TSA modelling. Datasets, descriptions and source are listed in Table 4 and in Table 5.

Table 4 identified submission datasets used in spatial processing. The spatial union group contained linework and attributes used to generate the input datasets and classify the landbase. The input datasets are described in Section 4. The processing and relationships amoung these submission datasets are outlined in Figure 4. Bold dataset names identify submission datasets which formed input datasets with no additional spatial processing.

Table 5 lists submission datasets used only for attribute assignment. The spatial overlay group lists the source for attribute information for the landbase. These spatial overlay datasets were separately combined with either the AVI or the TSA landbase coverage with a spatial overlay (generally using the IDENTITY process in ARCINFO). The output coverage from the overlay was summarized on either POLY_NUM or UKEY#_TSA (as appropriate) and polygon area. The results of the summary were further processed to identify the polygon with the maximum area for each POLY_NUM or UKEY#_TSA polygon. The attributes from the polygon having the maximum area were used to characterize the full AVI or TSA landbase polygons. These attributes were exported to an INFO table. These tables were joined to the classified landbase on POLY_NUM or UKEY#_TSA as needed.

Table 4. Spatial union submission datasets.

Dataset Name	Description	Data Type	Source
Administrative boundaries			
mw_fma2006mar	MWFP FMA boundary updated in March 2006	coverage	MWFP + AB
fmu_june04	W11 and W13 FMU boundaries from June 2004	coverage	MWFP + AB
parks_mw	Provincial parks, natural areas and historic sites	coverage	AB
graze_mw_11	Forest grazing license, grazing lease and permits	coverage	MWFP + AB
AVI			
avi21_fmu	combined AVI version 2.1 from FMUs W11 and W13	coverage	AB
net_strata_mw.dat	AVI attributes and generated species strata table	INFO table	AB
Landuse			
lu_drs_pnt	LSAS Landuse records	coverage	MWFP + AB
drs_pnt_psp	DRS and PNT boundaries from shapes and definition	coverage	MWFP + AB
drs_pnt_digt	DRS and PNT boundaries digitized from sketches	coverage	MWFP + AB
landuse	EZRA Landuse region coverage (LSAS Oct 2004)	coverage	MWFP + AB
lu_rank1_fmu	Landuse polygons, single highest ranking disposition	coverage	MWFP + AB
lu_nonlin11	Non-linear landuse polygons, single highest ranking disp.	coverage	MWFP + AB
lu_lin11	Linear landuse polygons, single highest ranking disposition	coverage	MWFP + AB
road_add	Additional road polygons from company sources	coverage	MWFP
huestis	Huestis Experimental Forest boundary- DRS 890155	coverage	AB
eagle_camp	Eagle Campground boundary - DRS 790004	coverage	AB
trails	Snowmobile trails and Klondike Historical Trail	coverage	MWFP
trails_fmu	trails buffers to 10m (snowmobile) and 8m (Klondike)	coverage	MWFP
Cutblocks			
dfmp_blks11	Existing and planned cutblock coverage	coverage	MWFP
Hydrology buffers			
wat_fmu	streams from MWFP base data	coverage	MWFP
wbdy_fmu	Lakes and rivers from MWFP base data	coverage	MWFP
swan_and_heron_lakes.shp	Lakes requiring additional waterfowl buffers	shapefile	MWFP
wat_buf	Streams buffered per ground rules	coverage	MWFP
wbdy_buf	Lakes and rivers buffered per ground rules	coverage	MWFP
Fire impacts			
fire_fmu	Wildfire boundaries since 1994 (and 1956 Windfall burn)	coverage	AB
fire_surv_all	Virginia Hills and Roche Lake fire regeneration polygons	coverage	MWFP
fire_surv_11	Fire regeneration polygons clipped to FMU	coverage	MWFP
Landbase characterization			
mgmt_area	Special management areas identified by operations staff	coverage	MWFP
opbuf_mw	MWFP special management areas	coverage	MWFP
opbuf_weymost	Weyerhaeuser and Mostowich areas digitized from maps	coverage	MWFP
ecosite_w13	W13 ecological land classification	coverage	MWFP
eco_w11_avi.dat	W11 ecological land classification	coverage	MWFP
license_mw	Provincial harvest license boundaries	coverage	AB
fwd_wshed	FORWARD watershed boundaries	coverage	MWFP
compt_mw	MWFP operation compartment boundaries	coverage	MWFP
Watersheds			
e_funcord1	Functional order 1 watersheds for east study area	coverage	MWFP
w_funcord1	Functional order 1 watersheds for west study area	coverage	MWFP
mw_funcord1	Combined functional order 1 watersheds	coverage	MWFP
Seismic			
seismic_fmu	Seismic lines from MWFP base data	coverage	MWFP
seismic_buf	Seismic buffered to 4 or 8m depending on year	coverage	MWFP

Note: **Bold datasets** form Input datasets without additional processing (Section 4.0).

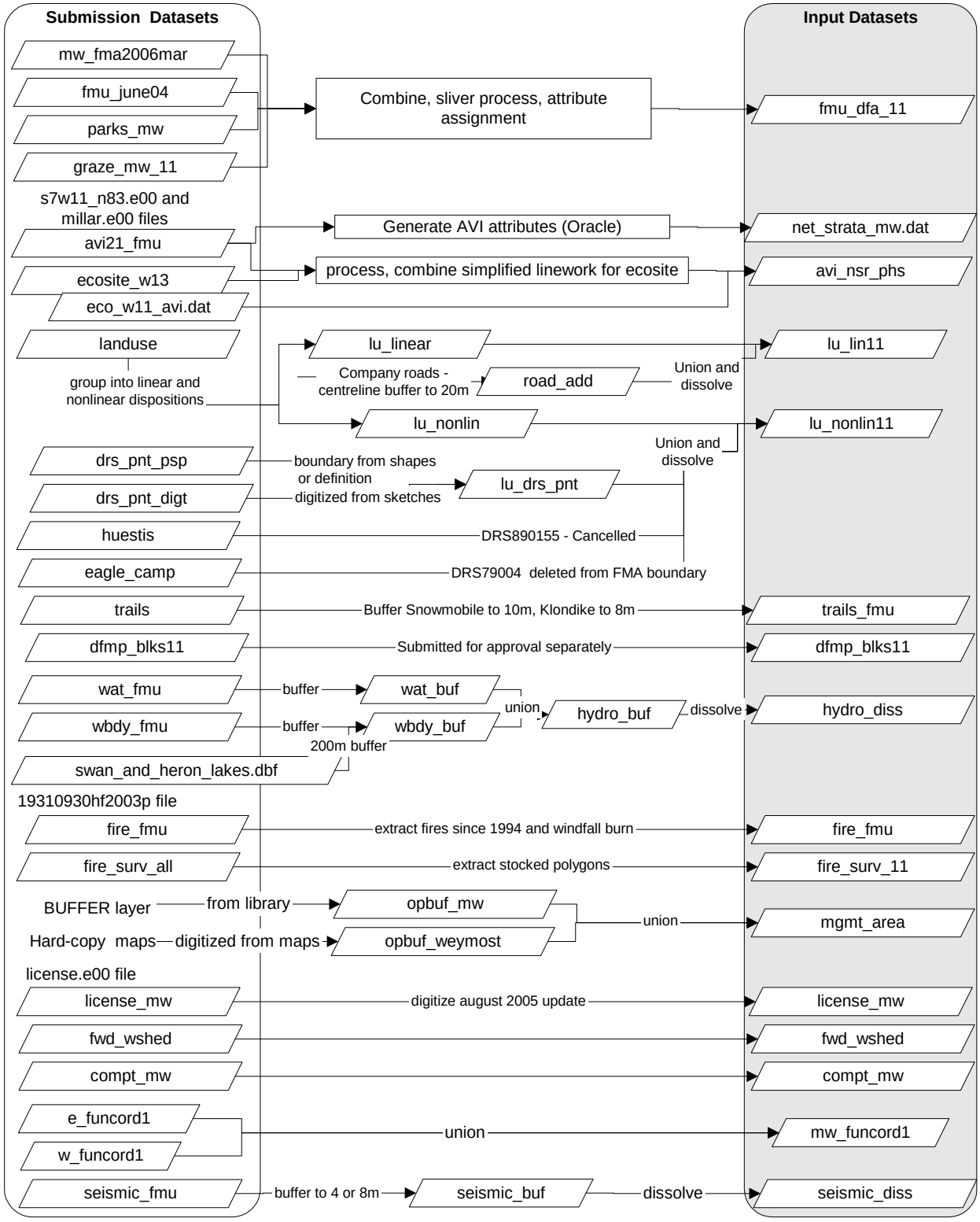

Figure 4. Dataset names and relationships used for classification (spatial union datasets).

Table 5. Spatial overlay submission datasets.

Dataset Name	Description	Data Type	Source
psp_mw	MWFP existing and proposed PSP locations	coverage	MWFP
psp_buffer	30m and 200m buffers on PSP points	coverage	MWFP
bma_ab	Bear management areas for Alberta	coverage	AB
caribou	Slave River Caribou wildlife zone	coverage	AB
aw_stands.dat	Survey results of A density aspen stands	INFO table	MWFP
trapl_fma	Provincial trapline boundaries	coverage	AB
dsoils_aug06	Combined soils data for MWFP area	coverage	MWFP
wetl_avi_lb12.dat	Wetland classification	INFO table	MWFP
paddle_r_zone	Paddle River Hydrologic Zones	coverage	AB

Figure 5 shows the spatial overlay datasets which are used for characterization only.

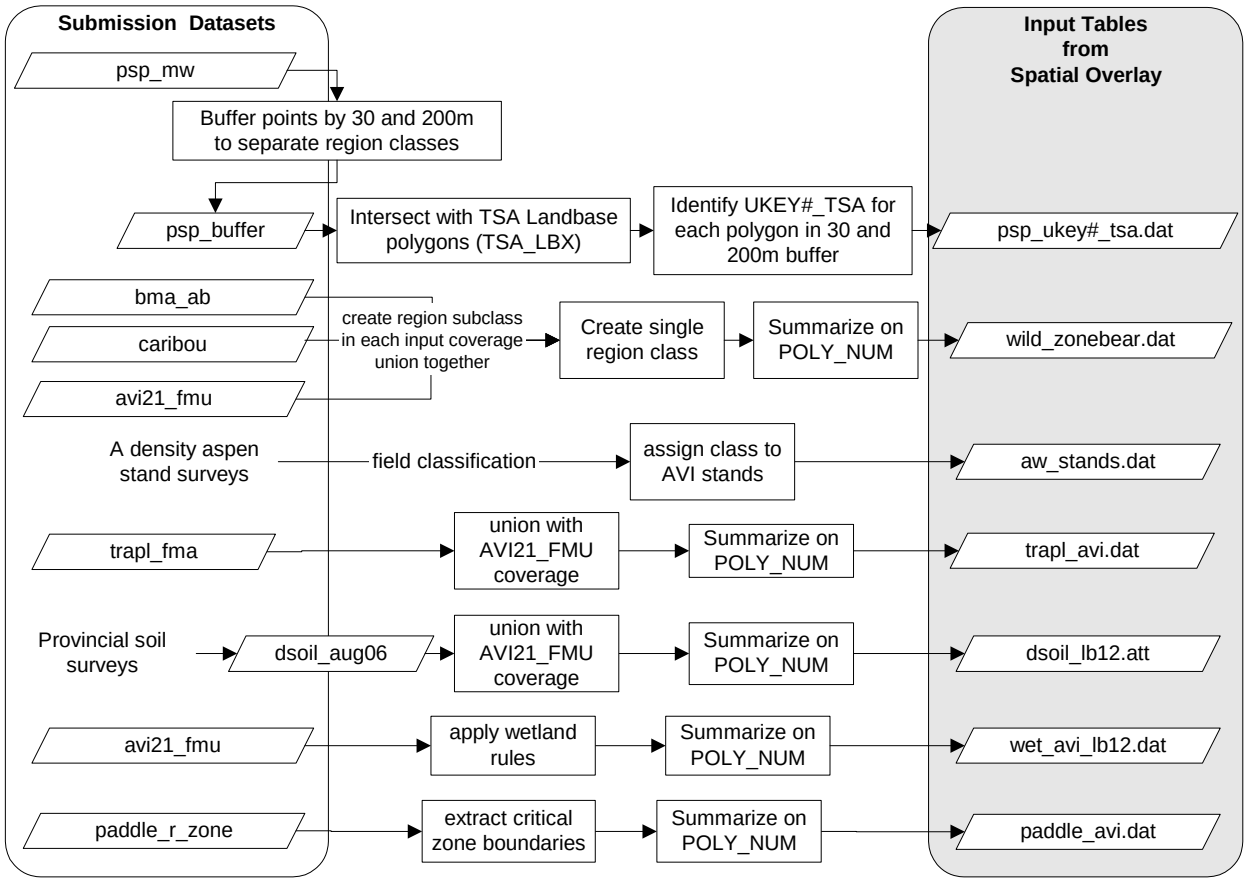

Figure 5. Dataset names and processing for characterization (spatial overlay datasets).

3.1 Administrative Boundaries

The classified landbase includes all areas within FMUs W11 and W13 and tracks the land classification for all of this area. Four spatial coverages form the linework for the **fmu_dfa_11** input dataset. The MWFP FMA was comprised of 5 spatially distinct management areas as shown in Figure 6 and stored in *LOCATION* field.

The W11 FMU was classified as the "Fort Assiniboine" management area within the FMA. The W13 FMU was divided into 4 management areas, "Virginia Hills" in the north, "MacLeod" in the central, then east to "Whitecourt" and finally "Blue Ridge". The classification for administrative boundaries also includes a landbase label. This was a general classification generated from labels applied by EZRA during the FMA boundary generation process. This includes designation of industrial plant sites, private lands, and parks.

The Defined Forest Area (DFA) includes all lands within the FMU with the exception of the Alexis Nakota Sioux First Nation Reserve (Alexis Reserve) and any private or non-classified lands. Thus all lands within the FMA, all grazing dispositions and any crown lands designated parks or natural areas within the FMUs are part of the DFA. Figure 6 shows this classification.

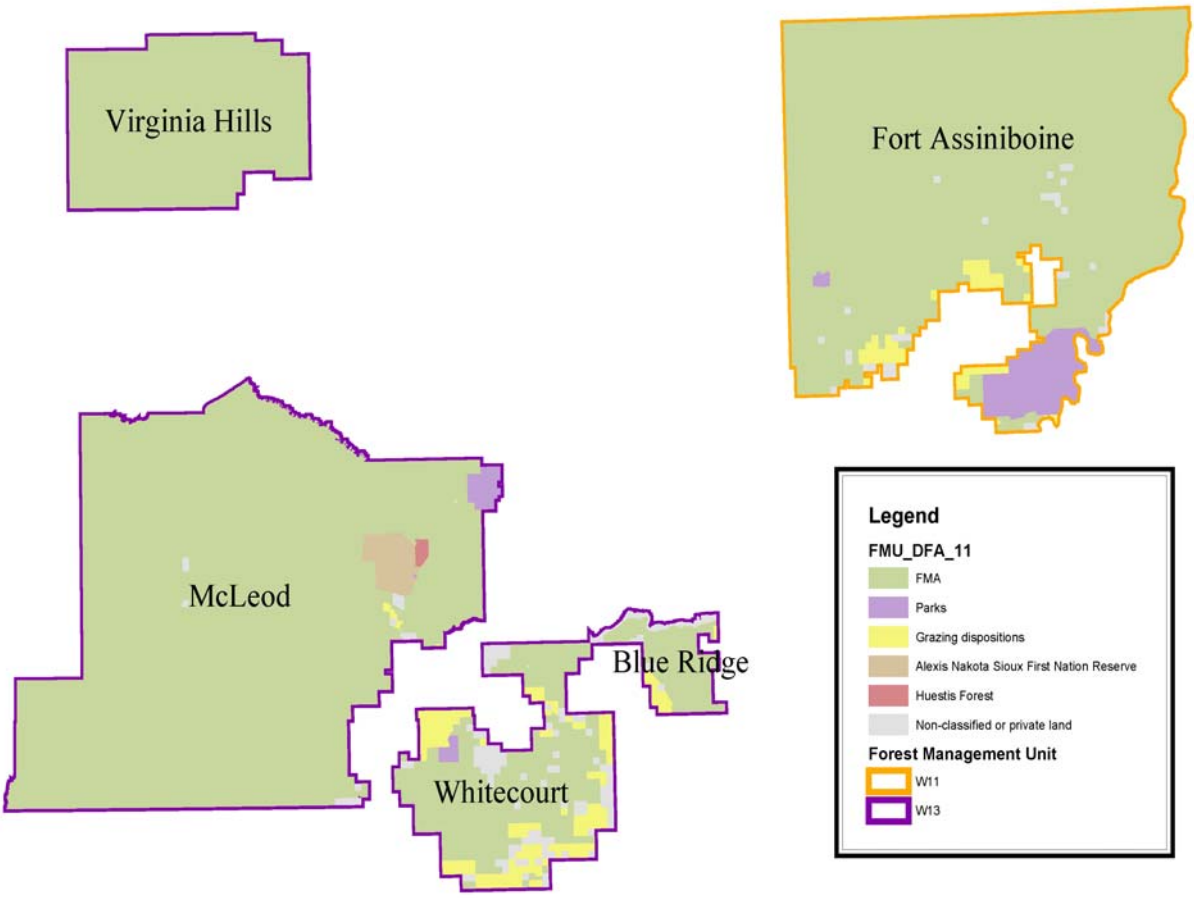

Figure 6. Administrative boundaries.

3.1.1 Forest Management Agreement Boundary

The FMA boundary used in the landbase classification was finalized in March 2006 from discussions between EZRA Consulting (on behalf of Millar Western) and Lowell Lyseng (Alberta Sustainable Resource Development). It has been submitted for approval to SRD and has been updated from the originally approved FMA boundary. This boundary has received the greatest scrutiny and was digitized at the largest scale. Where this boundary should coincide with other administrative boundaries the FMA boundary linework will be used (**mw_fma2006mar** coverage).

3.1.2 Forest Management Unit Boundary

Fmu_june04 was an approved boundary for the provincial forest management units that contain the Millar Western FMA. EZRA Consulting updated this coverage for boundaries coinciding with the FMA boundary in June 2004. EZRA describes this coverage as representing the FMU, the outmost boundary of lands under FMA tenure to MWFP. Private land boundaries recorded in the June 2004 listing from Alberta Land Status Automated System (LSAS) are excluded from this coverage.

3.1.3 Parks, Recreation and Natural Areas Coverage

Boundaries of crown lands identified as parks, recreation areas, natural areas or provincial historical areas were used to classify lands within the FMUs. The coverage, **parks_mw** was dated 2003 and, as part of a provincial dataset, downloaded from Alberta Government sources. Original source was in shapefile format.

3.1.4 Grazing Dispositions

Grazing leases (GRL), grazing permits (GRP) and forest grazing licenses (FGL) outline dispositions where both grazing and timber harvesting are permitted. All grazing dispositions listed in the LSAS within FMUs W11 and W13 are included. Legal boundaries were captured as part of the update, by EZRA Consulting, of landuse information completed in October 2004 (described in Section 3.3) and of the FMA boundary completed in March 2006 (described in Section 3.1.1). These grazing disposition boundaries were refined during the 2006 FMA boundary update completed by EZRA Consulting described in Section 3.1.1. **Graze_mw_11** contains all grazing dispositions.

3.2 Alberta Vegetation Inventory (AVI)

Approved AVI, interpreted to AVI 2.1 specifications was available for both W11 and W13 FMUs. The approval letter for FMU W13 and the audit approval results for FMU W11 are shown in Appendix I. AVI was available for the FMA area and most of the lands within the Defined Forest Area. AVI was not available for some grazing licenses and a small part of the Fort Assiniboine Sandhills Provincial Park in W11 and for the Carson Pegasus Provincial Park in W13. The processing of AVI attributes is discussed in Section 6.

3.2.1 Spatial Data

Source

AVI for FMUs W11 and W13 was provided in two files (**S7W11_n83.e00** and **millar.e00**) from Alberta Resource Data Division to Millar Western. The files were clipped to the FMU boundaries and combined into **avi21_fmu** coverage. Appendix I holds the approval letters.

Interpretation

Medium scale (1:15,000), leaf-on, black and white infrared aerial photography was acquired as the base for AVI photo-interpretation. In the Virginia Hills and McLeod management areas, 1996 cutblock update photography was used to update the AVI photography. The cutblock boundaries were delineated on the 1996 photography and transferred directly to the 1994 AVI photography prior to AVI delineation and interpretation. Small scale (1:60,000) black and white infrared photography was used for orthophoto development across the FMA area. The scale, date and use of the aerial photography used in the inventory process are listed in Table 6.

Table 6. AVI photography.

FMU	Management Areas	Inventory Task	Photo Details	
			Scale	Photo Date
W13	Virginia Hills and McLeod	AVI Interpretation	1:15,000	1994
		Cutblock Updates	1:15,000	1996
		Orthophoto Development	1:60,000	1995
W13	Whitecourt and Blue Ridge	AVI Interpretation	1:15,000	1994
		Orthophoto Development	1:60,000	1997
W11	Fort Assiniboine	AVI Interpretation	1:15,000	1994

In preparing the datasets some inconsistencies were found in the approved AVI Version 2.1 for FMU W13. Five fields (105 polygons, 274 ha) in the AVI 2.1 for W13 were found to have incorrect codes. In all but 1 case these were AVI 2.2 codes that are not present in the AVI 2.1 data catalogue. All errors related to non-forest polygons. The inconsistencies (and SRD approved resolutions) are outlined in Appendix II. It should be noted that the AVI was not changed however when combining all non-forest fields (*ANTH_VEG*, *ANTH_NON*, *NAT_NON*, *NFL*) into a single field the codes were updated. This process received approval through email (March 2, 2005 email from Stephen Wills, Forest Management Planning Forester, SRD to Jonathan Russell, Chief Forester, Millar Western) (See Appendix I).

3.2.2 Attribute Data

AVI Strata Assignment

Three strata were applied to all polygons within the AVI. These strata were the SRD Extended strata, MWFP species strata and BAP strata. The AVI attribute table was loaded to Oracle and all strata were calculated through SQL. Species groups, species distributions, broad cover groups, composite stand values and age for each layer and the defining layer was assigned. The table

net_strata_mw.dat holds all calculated values for the AVI attributes. This table joins to the AVI or spatial landbase coverage on *POLY_NUM.* All AVI attribute processing and strata assignment is described in Section 6.

3.3 Landuse Dispositions

MWFP has captured landuse updates for use in operations and the landbase description stage of their 2007-2016 Detailed Forest Management Plan. Complete land use information for activities was necessary to classify the landbase. The land use update involved considerable time and effort compiling, spatially capturing and loading disposition information over the last several years by company staff and both EZRA Consulting Ltd and The Forestry Corp. by request of Millar Western. All dispositions recorded in the Land Status Automated System (LSAS) in fall 2004 were captured. Areas within the Alexis Reserve boundary and on private lands were not updated. The coverages **lu_lin11** (all linear dispositions including pipelines, utility corridors and transportation related dispositions) and **lu_nonlin11** (all non-linear dispositions including government reservations, reclaimed lands and industrial, recreation and private leases and permits) have the landuse dispositions considered in the landbase classification. Figure 7 shows the dispositions. The landuse groups are defined in Table 7. The development of the landuse dataset was documented and the coverage submitted separately for approval (MWFP 2005a).

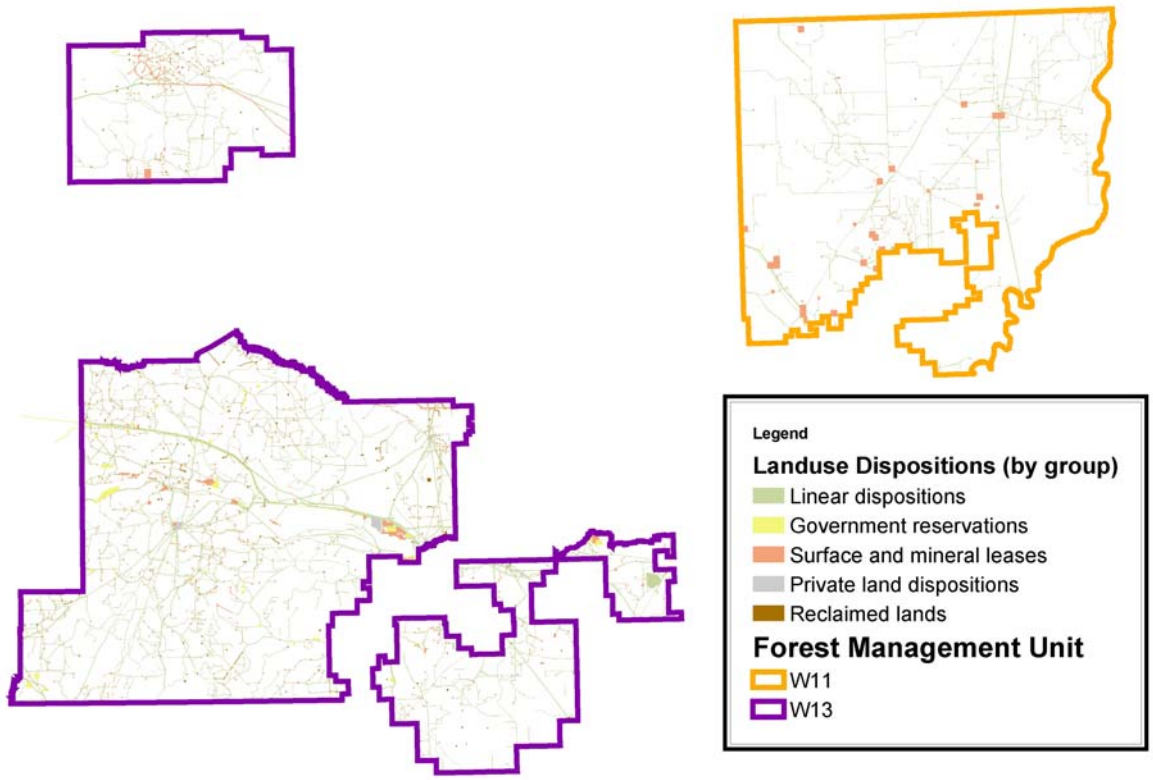

Figure 7. Landuse dispositions.

3.3.1 Boundary Capture

In October, 2004 EZRA Consulting completed an update of the landuse information for the FMU areas where MWFP was operating. This included the areas of FMUs W11 and W13. LSAS data used in this update was current from October 15, 2004. This met the DFMP requirement to incorporate land data current to the effective date of May 1, 2004. The landuse information captured by EZRA contains all types of information stored in the Alberta Government Reservation package and listed in the Land Status Automated System (LSAS). All boundaries were captured in an ArcInfo region coverage and classified by disposition type (**landuse** coverage).

Disposition reservations (DRS) and protective notations (PNT) disposition types are established only by government agencies. These dispositions are not generally stored in LSAS with actual planned or as-built boundaries. Instead the boundaries of the legal subdivision (¼ section or a portion of) that enclose the area under dispositions are recorded. To appropriately deal with these dispositions in the landbase description process it was necessary to capture the actual boundaries. On behalf of MWFP, a request was sent to SRD in February 2005 to obtain actual disposition locations for DRS and PNTs affecting the DFMP. In response, the boundaries for all existing and potential PSPs managed through SRD's Edmonton office were provided as either GPS boundaries or as a plot center location and dimension of the plot. From this information, actual boundaries for 37 PSPs under DRS and 4 PSPs under PNT were created and added to the coverage (**drs_pnt_psp**). In July 2005 the Forestry Corp. digitized boundaries for an additional 23 DRS and 23 PNT dispositions from photocopies of the maps stored in LSAS files as provided by SRD (**drs_pnt_digt** coverage). In February 2006 SRD agreed to amend reservations for 3 PNT dispositions; remove the "no surface disposition" restriction on PNT010312 and PNT960114 and cancel PNT940318 (email Brian Wallach, Woodlands Area SRD to Ray Hilts, Planning Supervisor, Millar Western, February 9, 2006). The landuse input coverages were updated to reflect this.

In addition to LSAS listings, MWFP and Weyerhaeuser provided road arc datasets of current forestry roads. All primary or secondary roads within the FMUs built by MWFP or Weyerhaeuser but not yet under LOC were added to this landuse dataset. Road centerlines were buffered to a width of 20m to generate a polygon representation of road area (**road_add** coverage). All input coverages were combined into a single regions coverage **lu_lb11_reg**.

3.3.2 Dataset Processing

More than one disposition can exist on a single area of land. Therefore the dispositions are stored in an ArcInfo regions coverage that allows overlapping polygons (**landuse**). In the landbase classification process it was desirable to have a single landuse designation for any area. MWFP identified a "landuse deletion hierarchy" which lists disposition types that identify areas that should be considered in planning and ranks these types by a type of priority. Grazing dispositions are dealt with separately because they impact harvest allocation and FMA boundary definitions. Table 7 lists the dispositions types considered deletions from the classified landbase, the assigned disposition group for each type and the hierarchy assignment category or order of assignment.

Table 7. Landuse deletion hierarchy.

DispositionType	Definition	Disposition Group	Hierarchy
LOC	License of Occupation	LINEAR	1
PRI	Private Land	PRIVATE	2
RR	Railroad	LINEAR	3
PLA	Pipeline Agreement	LINEAR	4
MSL	Mineral Surface Lease	LEASE/PERMIT	5
EZE	Easement	LINEAR	6
MLL	Miscellaneous Surface Lease	LEASE/PERMIT	7
SMC	Surface Material Lease	LEASE/PERMIT	8
VCE	Vegetation Control Easement	LINEAR	9
ROE	Right-of-Entry Agreement	LINEAR	10
SML	Surface Material Lease	LEASE/PERMIT	11
REA	Rural Electrification Association Easement	LINEAR	12
PIL	Pipeline Installation Lease	LINEAR	13
RDD	Road Related	LINEAR	14
FRD	Forestry Road	LINEAR	15
RDS	Roadway	LINEAR	16
RRD	County Roads	LINEAR	17
RD	Road	LINEAR	18
MLP	Miscellaneous Permit	LEASE/PERMIT	19
REC	Recreation Lease	LEASE/PERMIT	20
DRS	Disposition Reservation	GOVRES	21
PNT	Protective Notation	GOVRES	22
RCD	Reclamation Certified [1]	RECLAIMED	23

[1] RCD lands are not a deletion however these lands have no strata assignment and must be considered nonforest until further information is available. The boundary is included in this layer to ensure AVI is updated.

This hierarchy was used to generate a region subclass with all dispositions considered deletions and a single disposition type for any area (**lu_lb11_full** region subclass). From this subclass separate linear and non-linear classes were created. Disposition "groupings" were assigned to landuse data. Roads, utility corridors and transportation related dispositions were grouped into "linear"; Industrial leases and permits and recreational leases were grouped to "lease/permits"; Government dispositions were grouped to "govres"; and "private" and "reclaimed" lands formed separate groups.

The ArcInfo coverage was dissolved on disposition type to simplify the linework. All linear dispositions were then extracted to **lu_lin11** and the remaining dispositions formed **lu_nonlin11** coverage.

3.3.3 Other Linework Included

The Huestis Demonstration Forest was established under DRS890155. This disposition was cancelled on March 17, 2005 and this area was now part of the Millar Western FMA. The boundary was included in the classified landbase coverage to allow special management plans for this area (**huestis** coverage).

The Eagle River Campground was established under DRS790004. The most recent FMA boundary already excludes this area (**eagle_camp** coverage).

3.3.4 Trails

Historic or recreational trails in the FMUs need to be identified on the landbase. Linear locations for these features were buffered to estimate the actual width of the trails. Linework for the historic Klondike Trail in W11 was buffered to a total width of 8m and established snowmobile trails were buffered to a total width of 10m (**trails_fmu** coverage).

3.4 Cutblocks

The DFMP cutblock coverage includes both existing and planned cutblocks and both clearcut and thinning harvest areas. A separate table identified AVI polygons with an 'A' density overstory, clearcut modifier and year of harvest where 50% or greater of the polygons was harvested. Each type of cutblock is discussed in the following sections.

3.4.1 Existing cutblocks

Existing cutblocks were defined as all cutblocks that have an ARIS opening number and timber year of harvest (May 1 of timber year to April 30 of the following year) prior to 2004. The dataset of existing cutblocks and documentation of the process used to assign cutblock attributes was documented and submitted separately for approval (MWFP 2006). The cutblock classification process identified existing harvest areas, documented harvest dates, cutblock treatments and identified the regeneration stratum assigned to each cutblock.

There are multiple stakeholders with contributing information for the cutblocks in the Millar Western FMA. Spatial and attribute information was assembled from the following sources to create the cutblock coverage:

- Millar Western coniferous and deciduous cutblocks in W13;
- Millar Western deciduous cutblocks in W11;
- Mostowich Lumber coniferous quota cutblocks in W13;
- Weyerhaeuser deciduous quota cutblocks in W13;
- Spruceland Millworks coniferous quota cutblocks in W11;
- FRIAA cutblocks in both FMUs; and,
- Pre-1991 cutblocks in both FMUs.

Selective harvest, shelterwood and commercial and salvage thinning areas were identified by silviculture system and harvest location and considered together as "thinning" within Millar Western datasets. Figure 8 shows the cutblock dataset.

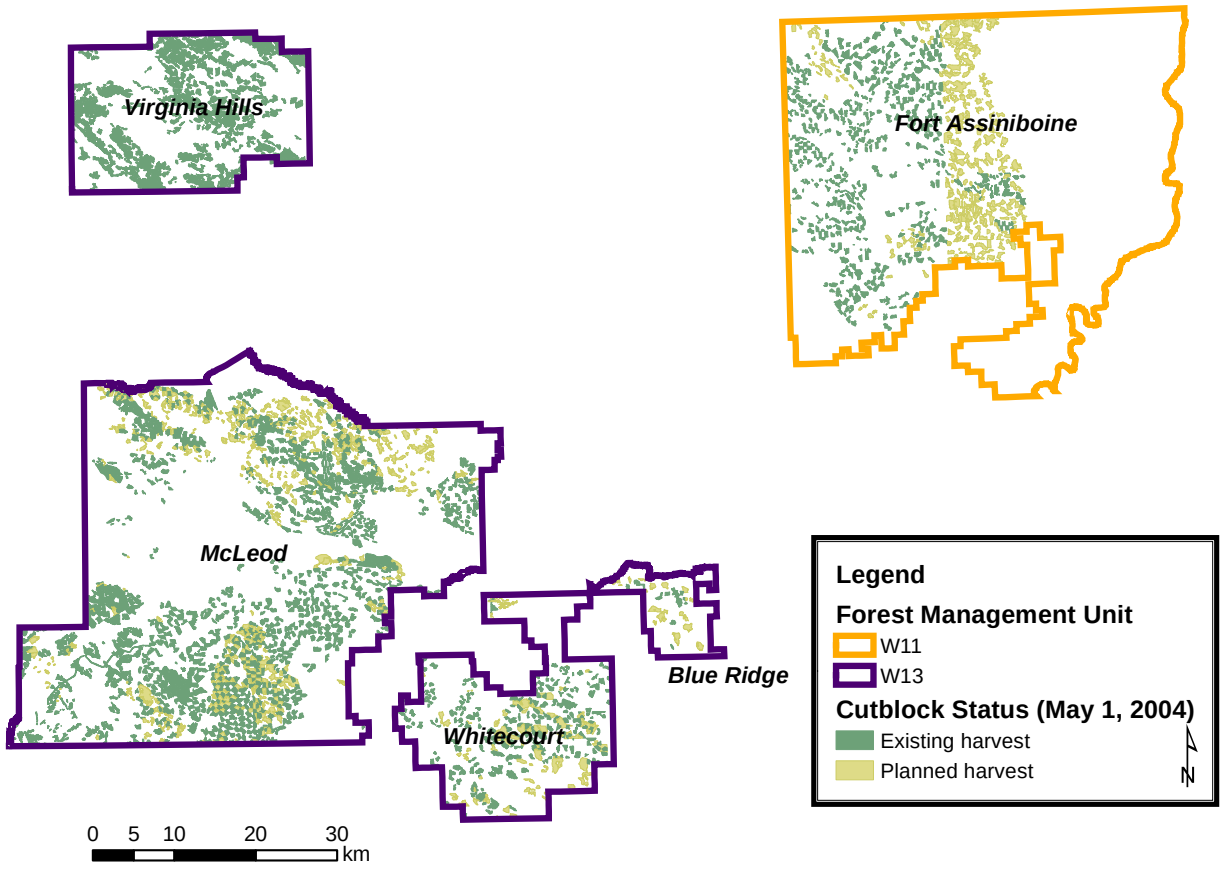

Figure 8. Existing and planned cutblocks.

The sources for attribute data were:

- Millar Western Geodatabase (received February 2006),
- Alberta Regeneration Information System (ARIS) information (received March 2005), and
- Strata and survey information from Mostowich Lumber, Weyerhaeuser and SRD.

3.4.2 Planned cutblocks

The boundaries of harvest and thinning activities scheduled after May 1, 2004 were provided by Millar Western, quota holders Weyerhaeuser, Mostowich Lumber and Spruceland and SRD Whitecourt staff. These were added to the existing cutblock coverage. (**dfmp_blks11** coverage) as "planned" activities.

3.4.3 Cutblock Classification

Attributes for each existing cutblock included in the DFMP cutblocks dataset must include the attributes in Table 8. Planned cutblocks include an opening number and an estimated year of harvest. For planned cutblocks strata was assigned based on AVI attributes as per the rules for natural stands.

Table 8. Cutblock dataset attributes.

Final Attribute	Description
OPENING_NUMBER	Unique cutblock opening number.
TIMBER_YEAR	Cutblock start year (May 1 to April 30).
BLK_RESP	Cutblock responsibility (harvest operator with reforestation responsibility).
HARV_LOC	Harvest location (special harvesting areas).
SILV_SYSTEM	Silviculture system.
BLK_TPR	Cutblock timber productivity rating.
BLK_DENSITY	Cutblock density.
BLK_ACT	Cutblock harvest action.
BLK_STATUS	Cutblock status.
BLK_STRATA	Cutblock BAP strata.

3.4.4 AVI 'CC' Modifier polygons

AVI identifies harvest activity in the modifier field (*MOD*1). The year of harvest (*MOD1_YR)* and extent of harvest (*MOD1_EXT*) are also indicated. Many polygons with a CC modifier show the residual stems as a mature forested overstory. In the TSA model this would indicate areas available for harvest instead of regenerating areas. Polygons with an 'A' density overstory, a modifier of 'CC' and an extent indicating 50% or more of the polygon was clearcut were assumed to represent regenerating stands. These stands are identified in AVI by *MOD1* = 'CC' and *MOD1_EXT* > 2 and a density of 'A'. The field *CC_YEAR* was added to hold the *MOD1_YR* if available or a default harvest year of 1991 if no year is listed in AVI. This dataset is described in Section 4.2.1.

3.5 Hydrology Buffers

Hydrology buffers are generated from the base hydrology for the area. These buffers define areas to be excluded from the managed landbase. The MWFP base hydrology layer was the Alberta government base hydrology layer, a 1:20,000 single line network spatial database from 1998. The hydrology within FMU W13 was updated to better reflect the 1994 photography used for the AVI. The process and results of the update process were submitted and received approval from the government in 2005. No updates were done to the hydrology in FMU W11.

Linear hydrology (water layer) and polygon hydrology (waterbdy layer) were extracted from the MWFP spatial library. Linear features (mainly streams) and polygon features (mainly rivers and lakes) are stored in separate coverages (**wat_fmu** arcs and **wbdy_fmu** polygons). Each feature has been characterized with an Alberta Feature Code (CLU Code). This indicates the type of

feature the linework represents. Three lakes within the MWFP FMA are important waterfowl lakes and require large buffer width for habitat protection. Erickson Lake was identified for Heron habitat and Baseline and Teepee Lake for Trumpeter Swan habitat. All three lakes required a buffer of 200m surrounding the lake. Figure 9 shows the hydrology buffers and waterfowl lakes.

3.5.1 Buffer Definition

The requirements for riparian buffers listed in the Planning Standard (Alberta 2005) outline rules for the creation of riparian buffers from the base linear (stream) and polygon (river and lake) features. Buffer distances were assigned to the DIST attribute on the coverage according to Alberta feature codes (CLU codes) as listed in Table 9. The buffer distance was applied to each side of the spatial feature. In addition three specific lakes were spatially identified for an additional waterfowl lake buffer. The buffer distance for these features was updated to 200m. These lakes are shown in **swan_and_heron_lakes** shapefile.

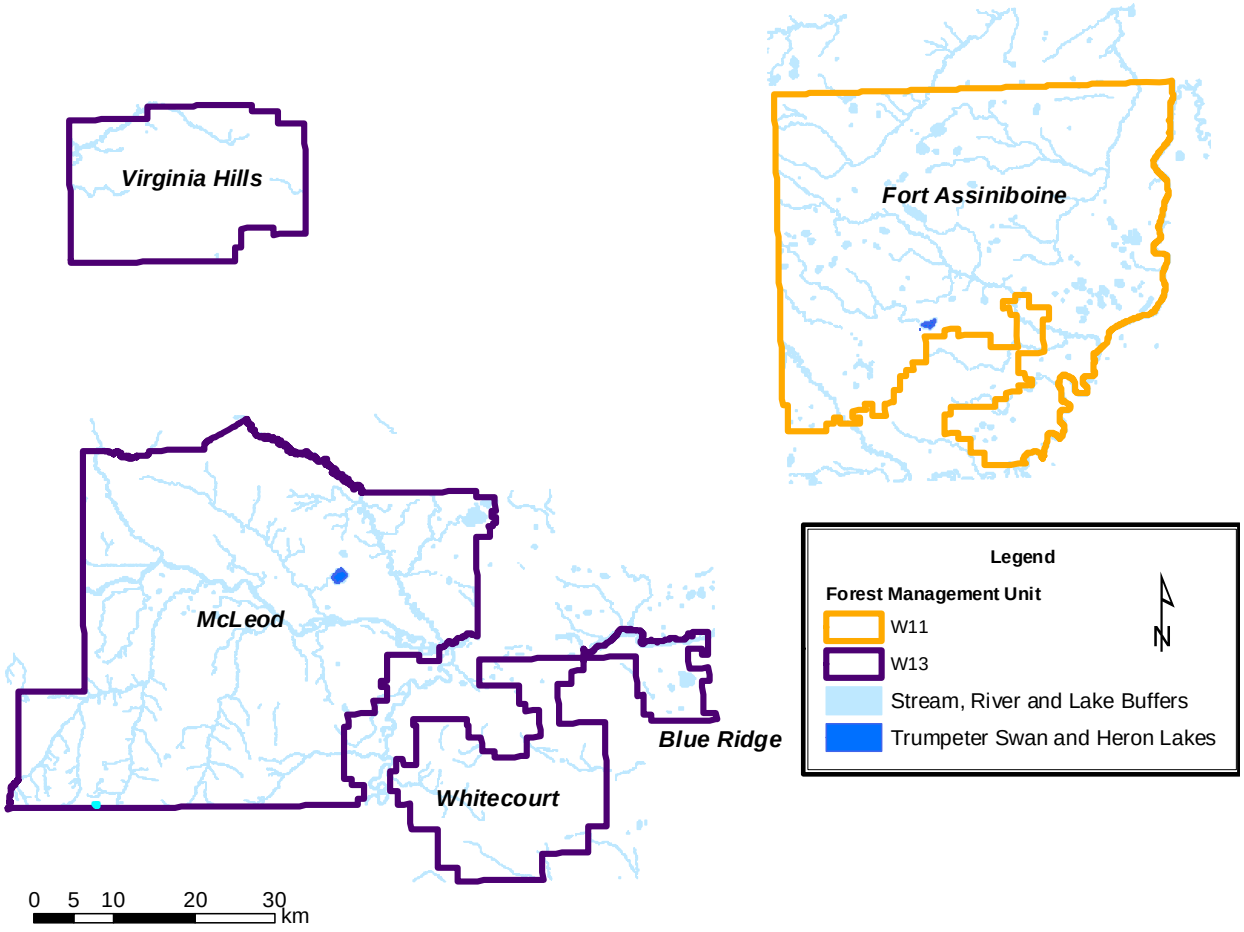

Figure 9. Hydrology buffers.

Table 9. Hydrology buffer widths.

Feature Code	Code Definition	Description	Distance [1]	Feature Source
GA61900 0 3	STR-PER	Permanent Streams	30	Water (linear) layer
GB49850 0 3	OXBOW-PER	Permanent Oxbows	30	Water (linear) layer
GA61850 0 3	RIV-MAJ-RB	Major Permanent River	60	Waterbdy (polygon) layer
GB37950 0 3	LAKE-PER	Permanent Lakes[2]	100	Waterbdy (polygon) layer

[1] Buffer distances applied to each side of linear features and to the outside of polygon features

[2] Three waterfowl lakes were spatially identified and a buffer of 200m applied to these features

The **wat_fmu** and **wbdy_fmu** coverages were both buffered in ArcInfo with the *regionbuffer* command using the *buffer_item, .001 fuzzy tolerance, round ends, full and non-contiguous* options. The resulting polygon coverages **wat_buf** (buffer of water features with inside buffer renamed to *IN_WAT*) and **wbdy_buf** (buffer of waterbdy features with inside buffer renamed to *IN_WBDY*) were combined to create the **hydro_buf** Input coverage. The attribute *IN_WATER* combines the codes from *IN_WAT* and *IN_WBDY* and identifies all areas inside hydrology buffers.

Table 9 shows the total buffer widths applied to each feature. The buffers were generated through ArcInfo which assigned codes of 100 to area inside the buffer (*IN_WATER*), 1 to non-buffered areas completely surrounded by buffered area, and null to areas outside the buffer. The attribute *IN_WATER* for area within buffers on the waterfowl lakes was coded to 200.

3.6 Fire Impacts

The impact of fire since the AVI was completed was identified on the classified landbase. The boundaries of recent fires were added to identify areas burned since the date of AVI (1994) to update of the landbase to the effective date. Surveyed polygons from fire regeneration surveys completed in the Virginia Hills and the Roche Lake fire boundaries were used to update the landbase classification for recently burned areas. In addition, the boundary of the Windfall Burn (1956) was included but only used for characterization of the landbase. Figure 10 shows recent burns and fire survey areas.

In 2006 the Chickadee Fire burned part of the DFMP landbase area. This fire occurred after the effective date of the landbase so the area is not considered a 'BURN' deletion and was not part of the submission datasets. The boundary of this fire was required for TSA modelling. The TSA polygons impacted by the burn were identified through spatial overlay on the TSA and modelling landbases. This attribute update is described in Section 7.4.3.

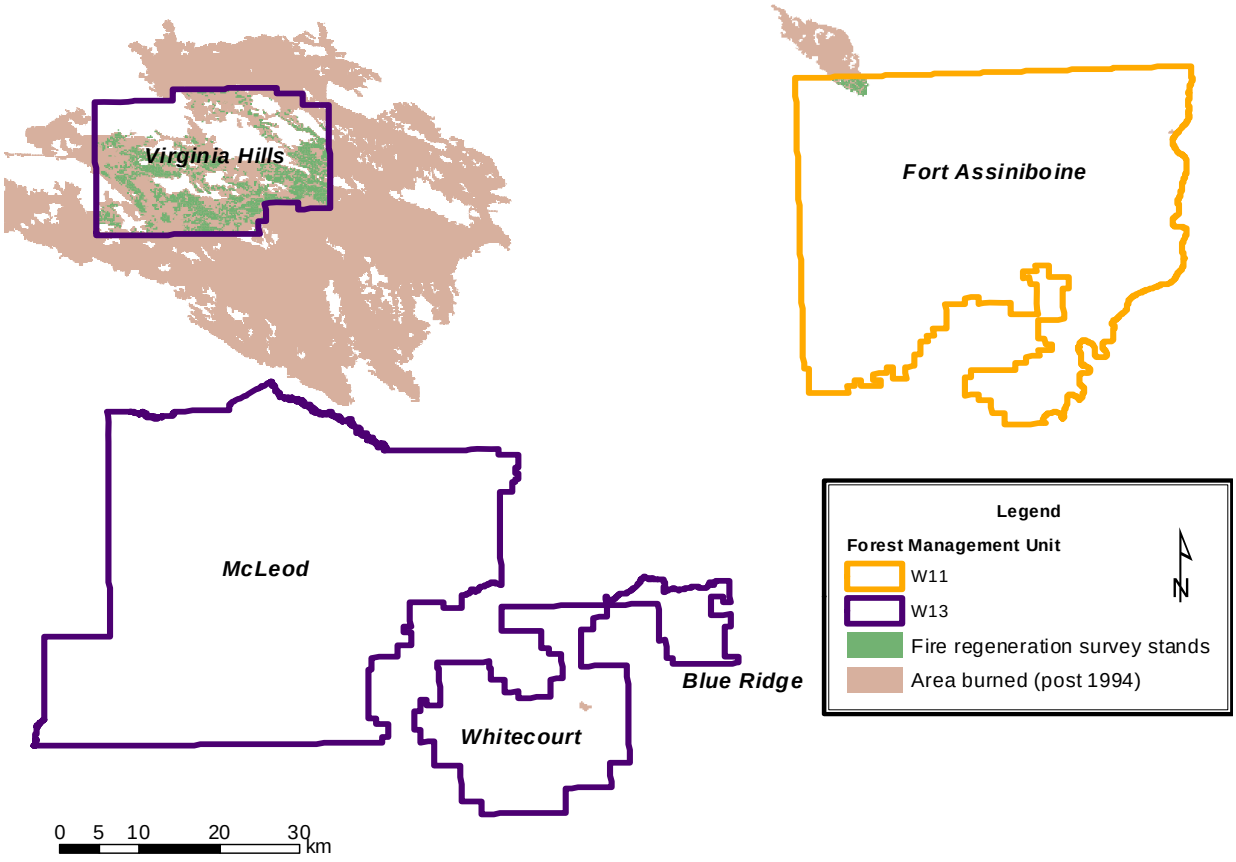

Figure 10. Fires since 1994 and fire regeneration survey areas.

3.6.1 Fire Boundaries

Any fires that impact the areas of FMUs W11 and W13 and have occurred since the date of AVI (1994) are included in the classified landbase. These boundaries were extracted from the provincial fire coverage updated to the end of the fire year 2003. The Alberta Government Historical Wildfire Coverage (**19310930hf2003p**) was used to select burnt polygons (only (*BURNCODE* = 'B')). These boundaries are used to exclude land from the managed landbase. [**fire_fmu** coverage].

3.6.2 Fire Regeneration Survey Boundaries

Fire regeneration surveys were completed on areas within the Virginia Hills and Roche Lake fire boundaries in 2004 and 2005 to identify areas with productive regenerating strata. The boundaries of potentially productive areas were delineated from post-fire photography and then field sampled for regeneration success. Stocking, broad cover group, leading conifer species and yield stratum attributes were developed from survey results. Polygons designated "stocked" (a minimum of 30% stocking was required) were extracted to a coverage (**fire_surv_mw**). This coverage was clipped to the boundaries of FMUs W11 and W13 (**fire_surv_11**) and used in landbase classification. The survey process and results are documented in *Virginia Hills and*

Roche Lake Fire Survey Results: *2007-2016 Detailed Forest Management Plan* (MWFP 2005c). The approval letters for the survey process and documentation are included in Appendix I.

3.7 Seismic

The area impacted by seismic was not part of the managed landbase. Linear features representing seismic were extracted from the transportation base features in MWFP spatial library. The *CLU* code JA 19300 was used to identify seismic features. The spatial coverages included linear features representing seismic in the provincial base transportation layer and seismic updates digitized in 2002 and again in 2004 by EZRA Consulting. The *START-DATE* attribute, where available, was used to assign *SEIS_YEAR*. Recent updates used the year of capture as the year of establishment. Lines with no known year of establishment were assigned a *SEIS_YEAR* = 100.

The width of the buffer applied to linear features representing seismic varies according to the year of establishment. The buffer was applied to generate a polygon that represents the actual width of the seismic feature on the ground. Lines established before 2000 were buffered to a total width of 8m and lines from 2000 onwards were buffered to a total width of 4m to represent updated practices. Lines where the year of establishment was not known were buffered to a total width of 8m.

The linear arcs representing seismic (**seismic_fmu**) were buffered by the *DIST* listed on the file. The buffer was established using *regionbuffer* with the *buffer_item* and *non-contiguous* option to create SEIS region. The items *SEIS_YEAR, DIST, TOT_DIST* were carried on the final polygon coverage created by a regionpoly action. The final coverage was called **seismic_diss**.

3.8 Landbase Characterization Information

The following information was used to characterize the gross landbase and was useful for TSA modelling. This information was not used to define the managed landbase but linework was added to delineate these areas.

3.8.1 Special Management Areas

The classified landbase carries additional information provided by operations staff for MWFP and Quota holders in the area that identifies areas that should be carefully evaluated when scheduling timber operations. These areas will be evaluated during the timber supply analysis process.

Operations staff from Millar Western and quota operators Weyerhaeuser and Mostowich Lumber outlined streams and areas identified during past harvest operations that should receive special management consideration in future planning. Staff planning harvest and access in past or current operations areas identified these special management areas. At MWFP additional operational buffers identify potential riparian areas, unproductive or inaccessible timber, sensitive slopes and special management areas (**opbuf_mw**). MWFP staff generates and stores digital polygons for the boundaries of these areas. Each polygon has an assigned classification

code (*SOURCE*) to classifying these management areas. MWFP will evaluate these areas and may identify land that should not be scheduled for harvest or should be reserved for the duration of the current DFMP. Quota operators provided maps identifying similar lands in their areas of operations (**opbuf_weymost**). These were digitized from paper maps, assigned a *SOURCE* classification of 2 and added to the **mgmt_area** coverage.

3.8.2 Natural Subregion and Ecosite Assignment

The ecological land classification was completed separately for FMUs W11 and W13. In FMU W11 a single classification was developed for each AVI polygon. In FMU W13 the AVI polygons were combined with additional linework to delineate ecological units. The process for each FMU is described separately.

FMU W13

In 1999 for the previous DFMP, Millar Western developed an ecosite map for their FMA (MWFP 2000). This map was created through a series of steps that began with the development of a generalized ecosite model for west-central Alberta. The model assigned ecosites to the landscape by performing a "best-fit" classification using spatial data including AVI, soil surveys and a digital elevation model (DEM). The DEM was raster or grid based which yielded a blocky edge for each classification area boundary, even where these boundaries essentially coincided with an AVI boundary. The combined spatial data had many “sliver” polygons created wherever linework in the data sources were similar. These very tiny polygons had no meaning and only reflected differences in the way data was stored. The high number of the polygons would impact the potential for timber supply modelling if they were carried to the final landbase.

For the 2007-2016 DFMP the FMU W13 ecosite coverage (GDC 1999) was updated to address 3 issues.

1. Areas of the FMA with no ecosite classification. These were generally small areas along township boundaries. These areas were classified based on surrounding classification, vegetation information and, if needed, photo interpretation.

2. Errors in the natural subregion (NSR) assignment. The *NSR* attribute was corrected or added to the coverage where required. In addition, the Boreal Mixedwood (BM) NSR was assigned to represent both the Central Mixedwood and Dry Mixedwood regions to provide consistency with the classification developed for FMU W11. *ECOPHASE* was updated to reflect these NSR adjustments.

3. DEM linework creating slivers in coverage. AVI polygon boundaries were used as a base and additional linework from the previous ecosite coverage was added only to delineate classifications that split or were completely contained within AVI boundaries. The steps involved were:
   - Split AVI polygons where required to reflect natural subregion boundary (**avi_nsr**).

   - Union **avi_nsr** with ecosite coverage to create **avi_nsr_eco**. Summarize, by area, for each distinct ECOPHASE (ecosite and phase) by AVI POLY_NUM.

- Identify the dominant ecophase, by area, for each **avi_nsr** polygon. Assign this attribute to the **avi_nsr_eco** coverage.

- Identify polygons where the assigned ECOPHASE does not equal the dominant ECOPHASE for the polygon. Extract any polygons greater than 1 hectare in size to a separate coverage and identify the existing **avi_nsr** polygons that contain these polygons. These additional polygons were added to the linework of **avi_nsr** to identify interior areas within AVI polygons that had a distinctive ecological classification.

- Union these 2 subsets and eliminate any sliver polygons less than 1 hectare. Reselect all remaining polygons where the ECOPHASE classification differs from the dominant.

This linework and classification was added to the **avi_nsr** coverage to create **avi_nsr_phs** (See Section 4.1.2).

FMU W11

In 2005 The Forestry Corp. developed an ecosite assignment for each AVI polygon in W11. This classification used information from DEM, Soils and AVI to calculate *ECOSITE*. The NSR, ecosite and phase attributes were assigned to the **avi_nsr_phs** coverage for each AVI polygon in FMU W11 (from **ecosite_w11.dat**). The process was documented in *W11 Ecosite Mapping* (MWFP 2005d).

3.8.3 Timber Harvesting Licenses

Timber harvesting license boundaries current to August 2005 are included. These boundaries were extracted from the **license** digital file (ArcInfo .e00 file current to February 2005) and from a hardcopy listing of changes to license CTLW110003 (confirmed in July 2005) provided by Whitecourt SRD staff (**license_mw** coverage).

3.8.4 FORWARD Watersheds

MWFP was an industry partner with the FORWARD watershed research program. Water research and monitoring is ongoing in several research watersheds within the FMA. The boundaries for the FORWARD research watersheds were included in the classified landbase to allow these areas to be identified and harvest controlled until research is complete (**fwd_wshed** coverage).

3.8.5 Watershed Boundaries

Watershed boundaries were included in the landbase for use in hydrologic modelling. Functional first order polygons were calculated separately for the west study area (mainly McLeod and Virginia Hills locations) and the east study area (mainly Fort Assiniboine, Whitecourt and Blue Ridge locations). The process was completed with the direction of FORWARD project leaders by GISmo Solutions Ltd.. Functional first order watersheds were created to have an average size of 5 km^2. In W13 this objective was met from the existing MWFP stream network and DEM. To

accomplish this in the flat relief of W11 additional DEM processing was required to increase the stream network density.

The watershed ID's assigned to the east study area (**e_funcord1** coverage *FUNCORD1* and *FUNCORD3* fields) were increased by 1000 to differentiate them from the IDs in the west study area (the **w_funcord1** coverage). The coverages were combined to create **mw_funcord1** which assigns the functional first order watersheds and the accompanying functional third order attributes. The coverage includes the boundaries for the research watersheds from the FORWARD watershed research program.

3.8.6 Compartments

MWFP has delineated compartments within FMUs W11 and W13. The boundaries are used in forest planning at both the DFMP and operational level. Each compartment was assigned a name and a unique 3-letter code (**compt_mw** coverage).

3.9 Classification Attributes added without Linework

Additional information to characterize the landbase was added through spatial overlay on the AVI or the TSA landbase coverages. No additional linework was included for this information. This allows additional information to be assigned to the classified landbase without creating additional polygons.

3.9.1 PSP Buffers

Millar Western's established and planned permanent sample plots (PSPs) are represented on the landbase in two ways. A circular buffer of 30m on the plot centre was assigned to encompass the actual plot boundary and a circular buffer of 200m on the plot centre was assigned to provide a buffer area around the plot.

No additional linework was added to the landbase to represent PSP buffers, however landbase polygons that intersect the buffers are flagged. The processing steps to generate and flag buffer areas included the following steps:

- Process the PSP point coverage using the region buffer command to create overlapping 30m and 200m buffers. Create a single region class (PSP_BUF) combining the two buffer regions.

- Intersect the PSP_BUF with the TSA landbase coverage to identify the polygons within the buffer area (**psp_buffer**). Generate a list of the TSA landbase polygons within PSP buffers using the *regionpolylist* command.

- Select all records listed as part of the 30m buffer (*KEY* = 'BUF30'). Summarize on the *PSP_BUFFER#* and maximum establishment year. Join this table back to the **psp_buffer** coverage and select all polygons where the establishment year = the maximum establishment year. Summarize the *UKEY#_TSA* and *PSP_PLOTNUM* for these records. This represents

all TSA landbase polygons overlapped by the 30m buffer and the plot number of the last PSP scheduled for establishment on this area. Assign additional fields from the original PSP point coverage (*PSP_BRKDN, PSP_TYPE, PSP_STATUS, PSP_YEAR* and join on *PSP_PLOTNUM*).

- Select all records listed as part of the 200m buffer (*KEY* = 'BUF200') from the *regionpolylist*. Repeat the steps listed above to identify all polygons overlapped by the 200m buffer and the PSP establishment date for each polygon. Add fields from the PSP point coverage as listed above.

- Assign PSP attributes to the landbase for all polygons within the 30m buffer and assign a value of 30 to the *PSPBUF* field. Select all polygons on the 200m buffer listing outside of the 30m buffer and assign *PSPBUF* to 200m. Reselect all polygons having *PSPBUF* = 200 where the area of the polygon inside the 200m buffer was less than ½ of the total polygon area. Set *PSPBUF* to -1 for these polygons.

This information was joined to the classified landbase through the *UKEY#_TSA* key (**psp_ukey#_tsa.dat** INFO table).

3.9.2 Wildlife Information

Bears

The Alberta Bear Management Area (BMA) boundary was identified by Alberta government sources as the current defined management unit for bear, specifically grizzly bear management in the province. Gord Stenhouse, Foothills Model Forest, provided this coverage (**bma_ab** coverage). The date for the coverage is listed as unknown.

Caribou

Slave River Caribou Zone was a special wildlife management zone in FMU W11. The boundary was extracted from the more extensive **wildlifezones** coverage in the MWFP VALUES database where WILD_ZONE = "Caribou". This information was originally provided through Alberta Government sources (**caribou** coverage).

Processing of Wildlife information

The **ab_bma** and **caribou** coverages were combined with the **avi21_fmu** coverage into a single coverage with 3 separate region classes. All three classes were combined into a single WILD_VAL region coverage. The WILD_VAL region attribute table was summarized by *POLY_NUM*, and *WILD_ZONE* (for caribou), then *POLY_NUM* by *AB_BMA* (for grizzly bear). Both tables were summarized by area. A table of AVI *POLY_NUM* and the dominant *AB_BMA* value and *WILD_ZONE* value was created (**wild_zonebear.dat** INFO table).

3.9.3 Aspen Stand Evaluation

Information from MWFP field surveys and photo evaluation of 'A' density aspen stands in W13 was summarized for individual AVI stands (*POLY_NUM*) (**aw_stands.dat** INFO table). The information in the *AW_STATUS* field was included only as additional information to characterize the landbase.

3.9.4 Trapline Boundaries

MWFP stores the provincial trapline boundaries in their VALUES database. Trapline attribute information from the provincial trappers database (current to February 2005) was also available however only the trapline identification was carried on the classified landbase for privacy reasons. Each AVI polygon was assigned the identification of the trapline boundary (from **trapl_fma**) that covers the dominant portion of the polygon. A table of *POLY_NUM* and *TRAPLINE-ID* was created (**trapl_avi.dat** INFO table).

3.9.5 Soils and Wetlands

Provincial soil survey maps were digitized to identify soils classifications for the MWFP FMA. Soil surveys for the Iosegun, Hinton-Edson, Chip Lake, and Whitecourt and Barrhead areas were combined to a single coverage and stored in the Millar Western spatial library. Some additional townships from the Fort Assiniboine soil survey were added to this coverage in September 2005 to extend the soils coverage in FMU W11. These polygons were classified to reflect information needs for the FORWARD watershed modelling (*SOIL_CLASS* field in **dsoil_aug06** coverage). All information was assigned to AVI polygons using the dominant soils classification (by area) for each polygon (**dsoil_lb12.att** INFO table).

FORWARD researchers identified wetlands by applying 5 "wetland rules" which combine AVI and surface characteristics. These identified black spruce-larch, shrub, black spruce under pine, grasslands and flooded areas from AVI attributes. The wetland rule was assigned to specific AVI polygons in the *WET_CLASS* field (**wetl_avi_lb12.dat** INFO table).

3.9.6 Paddle River Hydrologic Zones

The boundaries of hydrologic response zones established in "Watershed Management in the Paddle River Headwaters, AFS 1985 Update" (AFS 1986) are included on the classified landbase. The report outlines the land management guidelines for timber harvesting activities in the Paddle River headwaters. The Whitecourt location within the MWFP FMA contains portions of the Paddle River headwaters. The boundaries of the hydrologic response zones were delineated by legal subdivision boundaries as colour coded on Map 2 in the document and captured digitally by TFC staff. The critical and marginally critical zones (from **paddle_r_xone** coverage) are added as attributes to the classified landbase wherever AVI polygons intersect these zones. A table of *POLY_NUM* and *HYDRO_ZONE* was created (**paddle_avi.dat** INFO table).

4. Input Coverages and Tables

This section outlines the actual coverages, fields and related tables used to classify the landbase. The original data sources that were used to generate these coverages are described in detail in Section 3. Table 10 lists all the datasets, a brief description and the landbase attributes on each dataset.

4.1 Spatial Input Data (from Coverages)

A landbase classification was developed with spatial data from numerous sources. Often these source data have very slight differences in representation of boundaries. The scale of the photography or source used may indicate which boundary should be given priority. In these cases grouping of the submitted datasets prior to processing was the most efficient means to accomplish this. The Forestry Corp. has found it efficient to group some datasets into a single input dataset and address the creation of slivers along shared borders before using these input datasets in the multiunion process to create the final landbase. For each input dataset the spatial data source(s) and any processing required was described.

4.1.1 FMU_DFA_11

This coverage classifies the gross landbase. The outside boundary was the FMU boundary. The FMA boundary was delineated within this outer boundary. Boundaries for the Alexis Reserve, private lands, parks and natural areas and grazing reserves are added to this coverage and a classification for each area was assigned. The Alexis Reserve, private lands and any unclassified land (i.e. along the Athabasca River where FMA and FMU boundaries don't match) was excluded from the Defined Forest Area. All other area was classified as 'PARK' (parks and natural area), 'GRL' (grazing leases), 'GRP' (grazing permits), 'FGL' (forest grazing licenses) or 'FMA'. The fields *LB_LABEL, DFA, LOCATION, FMU_NUM* provide landbase information.

Table 10. Spatial input datasets.

Dataset Name	Description	Fields Used
Administrative boundaries		
fmu_dfa_11	Combined FMA, FMU, parks and grazing covers	*LB_LABEL, DFA, LOCATION, FMU_NUM*
AVI		
avi_nsr_phs	Combined AVI and ecological land classification	*POLY_NUM, NSR, ECOSITE, ECOPHASE*
Landuse		
lu_nonlin11	Non-linear landuse polygons dissolved on disposition type	*NLIN_DISP, NLIN_GRP, NLIN_ORD*
lu_lin11	Linear landuse polygons dissolved on disposition type	*LIN_DISP, LIN_GRP, LIN_ORD*
trails_fmu	Klondike and snowmobile trails (polygon representation)	*TRAIL_TYPE, WIDTH*
Cutblocks		
dfmp_blks11	Existing and planned cutblocks	*OPENING_NUM, TIMBER_YEAR, BLK_RESP, SILV_SYSTEM, BLK_TPR, BLK_DENSITY, BLK_STRATA, BLK_ACT, BLK_STATUS, HARV_LOC, UKEY_BLK*
Hydrology buffers		
hydro_diss	Combined stream, river and lake buffers	*IN_WATER*
Fire impacts		
fire_fmu	Wildfire boundaries since 1994 and Windfall burn	*BURNCODE, FIRE_YEAR*
fire_surv_11	Virginia Hills and Roche Lake fire regeneration polygons	*SAMPLE_NO, VHIL_BCG, VHIL_YC, VHIL_ORIGIN*
Landbase characterization		
mgmt_area	Special management areas identified by operations staff	*SOURCE*
license_mw	Provincial harvest license boundaries	*LICENSE_NUM, COMPANY*
fwd_wshed	FORWARD watershed boundaries	*FWD_WSHD, WSD_CLASS*
compt_mw	MWFP operation compartment boundaries	*COMP_CODE*
Watersheds		
mw_funcord1	Functional first order watersheds	*FUNCORD1, FUNCORD3, AVG_SLP*
Seismic		
seismic_diss	Buffered seismic polygons dissolved on year	*SEIS_YEAR*

4.1.2 AVI_NSR_PHS

This input coverage combines approved AVI for FMUs W11 and W13 with information to indicate natural subregion and ecosite. The AVI polygons form the basis for this coverage and the only additional linework splits some polygons to represent the natural subregion boundary in W13 and adds some ecosite polygons within AVI polygons in W13. This processing was described in Section 3.8.2

The input coverage carries attributes for AVI polygon number (*POLY_NUM*), natural subregion (*NSR*), the ecosite map unit (*ECOSITE*) and a comprehensive ecosite call (*ECOPHASE*) that combines natural subregion, and primary and secondary ecosite and phase classifications.

4.1.3 LU_NONLIN11

All non-linear dispositions that preclude land from timber harvesting are included in this coverage. The dataset was dissolved on disposition type to generate a simplified landuse input dataset. The *NLIN_DISP* field holds the landuse disposition type and the *NLIN_GRP* field grouped dispositions into "private", "lease/permits", "govres" and "reclaimed" groups. *NLIN_ORD* holds the hierarchy order for that disposition type as shown in Table 7.

4.1.4 LU_LIN11

All linear dispositions that preclude land from timber harvesting are included in this coverage. The dataset was dissolved on disposition type to generate a simplified landuse input dataset. The *LIN_DISP* field holds the landuse disposition type and the *LIN_GRP* field grouped dispositions into "lease/permits" and "linear" groups. *LIN_ORD* holds the hierarchy order for that disposition type as shown in Table 7.

4.1.5 TRAILS_FMU

Recreational snowmobile trails and the historic Klondike trail are represented on the classified landbase as areas not available for harvest. The linework representing the trail locations was buffered to a width of 10m for snowmobile trails and 8m for the Klondike trail to generate a polygon representation of these features on the landbase. *TRAIL_TYPE* and *WIDTH* hold this information.

4.1.6 DFMP_BLKS11

All identified cutblocks within the DFA with ARIS opening number designation, year of harvest and regeneration information are included in the classified landbase. This includes all existing cutblocks (harvested prior to 2004). The coverage also includes any planned cutblocks with the year of harvest identified. Fields *OPENING_NUM, TIMBER_YEAR, BLK_RESP, SILV_SYSTEM, BLK_TPR, BLK_DENSITY, BLK_STRATA, BLK_ACT, BLK_STATUS, HARV_LOC* and *UKEY_BLK* carry cutblock information. Cutblock fields are defined in Table 8.

4.1.7 HYDRO_DISS

Hydrologic buffers created from the base data formed the starting point for this coverage. Additional lake buffers for special waterfowl lakes were added to this coverage. All areas inside the hydrologic buffers were assigned a value of 100 (*IN_WATER*). Any waterfowl lake buffers (special 200m buffers) were assigned a value of 200. Area isolated by or completely surrounded by generated buffers has a code of 1. The input coverage was dissolved on *IN_WATER* to generate a simplified hydrologic buffer coverage. Hydrologic buffer codes are listed in Table 11.

Table 11. Hydrologic buffer codes.

Buffer Code	Description	Buffer source
1	Interior or Isolated stands	Interior polygons from hydrology buffering
100	Generated Watercourse Buffer	Buffered hydrology base features
200	Waterfowl Lake Buffers	Identified important waterfowl lakes

4.1.8 FIRE_FMU

Fires since 1994 (AVI photo date) are added into the coverage where the *BURNCODE* was 'B'. In addition the boundary for the 1956 Windfall Burn fire was added to identify stands resulting from this burn. *BURNCODE* and *FIRE_YEAR* fields hold fire information.

4.1.9 FIRE_SURV_11

Polygons in this coverage are added to indicate additional productive areas within recently burned areas. The areas surveyed were located within the Virginia Hills and Roche Lake fire boundaries and were burned in 1998. This information was used to override a fire deletion and to assign a productive stratum, tpr, density and age to this portion of the classified landbase. The fields *SAMPLE_NO, VHIL_BCG, VHIL_YC,* and *VHIL_ORIGIN* hold the fire survey information.

4.1.10 SEISMIC_DISS

All seismic information from a single coverage was dissolved on the basis of the estimated year of seismic establishment or information capture. This simplified dissolved coverage was used in a final processing step to generate the classified landbase and to provide information on seismic area for the TSA landbase. The field *SEIS_YEAR* holds seismic information.

4.1.11 Additional Coverages Used to Characterize Landbase

Mgmt_area

Special management areas identified by MWFP and Quota staff are outlined in this coverage. The field *SOURCE* indicates the type of management area.

License_mw

Current timber harvest licenses in FMUs W11 and W13 are included in the classified landbase to assist in harvest planning and allocation. The field *LICENSE_NUM* holds the license value, the field *COMPANY* holds the company assigned harvest rights.

Fwd_wshed

The 13 research watersheds included in the FORWARD watershed research program are identified in the classified landbase to allow for special harvest planning. The name [*FWD_WSHD*] and designation [*WSD_CLASS*] of each watershed was included.

Compt_mw

The boundaries of Millar Western compartments and each unique code are carried on the classified landbase (*COMP_CODE*). Compartments cover all areas of Millar Western operations within the FMUs.

4.1.12 MW_FUNCORD1

Watershed boundaries for functional first order streams are represented on the landbase for potential hydrologic modelling. The field *FUNCORD1* identifies the watershed and the field *FUNCORD3* shows the larger third order basin it falls inside. The field *AVG_SLP* field shows the average watershed slope.

4.2 Tabular Input Data (from INFO Tables)

Tabular input data listed in Table 12 was joined to the spatial input data on AVI *POLY_NUM* or the TSA landbase unique key (*UKEY12_TSA*).

Table 12. Tabular input datasets.

Dataset Name	Description	Fields Used
AVI		
net_strata_mw.dat	Generated attibutes from AVI including strata	AVI and generated attributes
ukey12_mod1_cc.dat	CC Modifier of 50% or more on managed landbase	*CC_YEAR*
Landbase characterization		
dsoil_lb12.att	Soils information (on UKEY12_TSA)	*SOIL_CLASS*
wetl_avi_lb12.dat	Wetland areas (on POLY_NUM)	*WET_CLASS*
lb12_add_attr.dat	Table combining all spatial overlay data	Combination of all the following:
wild_zonebear.dat	Bear management and caribou areas (on POLY_NUM)	*AB_BMA, WILD_ZONE*
paddle_avi.dat	Paddle River hydrologic zones (on POLY_NUM)	*HYDRO_ZONE*
trapl_avi.dat	Provincial trapline boundaries (on POLY_NUM)	*TRAPLINE_ID*
aw_stands.dat	Aspen stand survey results (on POLY_NUM)	*AW_STATUS*
psp_lb12_plot.dat	MW buffered PSP (polygon selected on UKEY12_TSA)	*PSP_PLOTNUM, PSP_BRKDN, PSP_TYPE, PSP_STATUS, PSP_YEAR, PSP_BUF*

4.2.1 AVI (net_strata_mw.dat, ukey2_mod1_cc.dat)

Net_strata_mw.dat contains AVI attributes and calculated strata attributes and was joined to the classified landbase on the POLY_NUM field. Section 6 describes these data. The fields *LEAD_DEC*, *ULEAD_DEC*, *CLEAD_DEC*, *LEAD_CON*, *ULEAD_CON*, *CLEAD_CON*, *SOFTPCT*, *HARDPCT*, *USOFTPCT*, *UHARDPCT*, *SP_COMP*, *USP_COMP*, *CSP_COMP* and *AVI_STORY* from this file are carried on the classified landbase file.

Ukey12_mod1_cc.dat identifies polygons in the managed landbase with an 'A' density overstory where 50% or more of the polygon was clearcut. These stands are identified in AVI by *MOD1* = 'CC' and *MOD1_EXT* > 2 and a density of 'A'. The field *CC_YEAR* was added to

hold the *MOD1_YR* if available or a default harvest year of 1991 if no year is listed in AVI. This information was used to ensure these polygons were modeled as regenerating stands as indicated by the modifier information. Only the portions of the AVI polygon on the managed landbase (*F_DEL* = 'NONE') were listed in the table. The table **ukey12_mod1_cc.dat** joins to the landbase on *UKEY12_TSA*.

4.2.2 Soils (dsoil_lb12.att)

The dominant soils classification (*SOIL*_CLASS) from the **dsoil_aug06** coverage was assigned to each polygon in the landbase. The table **dsoil_lb12.dat** joins with the spatial landbase on *UKEY12_TSA* (Section 3.9.5).

4.2.3 Wetlands (wetl_avi_lb12.dat)

The wetland classification (*WET*_CLASS) for each AVI polygon is contained in **wetl_avi_lb12.att**. The table joins with the spatial landbase on *POLY_NUM* (Section 3.9.5).

4.2.4 Landbase attribute table (lb12_add_attr.dat)

The following files are joined to the **lb12_add_attr.dat** table on *POLY_NUM*.

Wildlife data. The Slave River Caribou management zone was identified in the field *WILD_ZONE* while the Alberta Bear Management zones are identified in the *AB_BMA* field (**wild_zonebear.dat**).

Paddle River Hydrologic Zones. The field *HYDRO_ZONE* identifies the critical and marginally critical zones (**paddle_avi.dat**).

Trapline data. The field *TRAPLINE-ID* holds the trapline identifier (**trapl_avi.dat**).

Aspen stand data. The field *AW_STATUS* characterizes aspen stands surveyed (**aw_stands.dat**).

The following files are joined to the **lb12_add_attr.dat** table on *UKEY12_TSA*.

PSP buffers. PSP information was carried in the fields *PSP_PLOTNUM*, *PSP_BRKDN*, *PSP_TYPE*, *PSP_STATUS*, *PSP_YEAR* and *PSPBUF* (**psp_ukey12_tsa.dat**). PSP information was summarized from the TSA landbase (Section 3.9.1) and was joined on the UKEY#_TSA.

5. Spatial Data Processing

5.1 Overview

This section outlines the spatial processing required to combine the input datasets into a single spatial landbase file. Standard processing involved six main steps:

- Multiunion to combine all input datasets (with the exception of linear landuse and seismic);
- Attribute processing to generate a preliminary identification of deletion areas;
- Polygon reduction to eliminate sliver polygons;
- Addition of linear landuse and seismic linework to generate the classified landbase;
- Summarize areas of linear features for TSA landbase, and;
- Simplify linework and add attributes for modelling landbase.

The landbase after spatial union contained some polygons that exceeded the desired maximum polygon size for TSA modelling. An additional processing step was added to split these large polygons.

Figure 11 shows the processing steps and interim coverages.

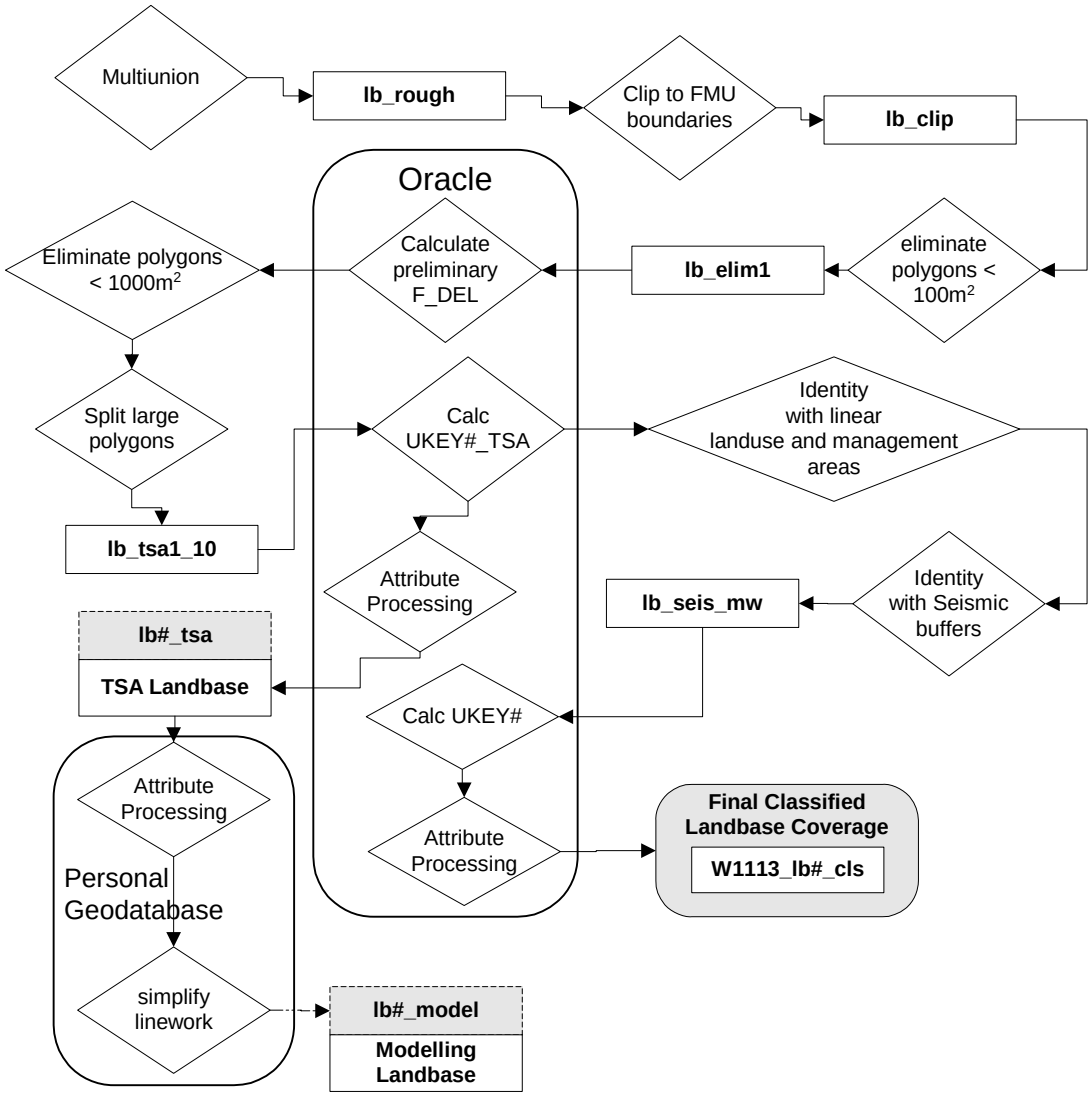

Figure 11. Spatial data processing.

5.2 Processing

5.2.1 Multiunion

A list of the input coverages was stored in an oracle table (**net_table#**) accessed through ArcInfo. This table tracks the input coverages, date of processing and final output dataset for each run.

Table 13 lists the input coverages to the multi-union process for the spatial landbase. The Rank field identifies the order of union and the interim coverages are listed in Union Cover field.

Table 13. Landbase netdown table.

Input Coverage Name	Cover type	Rank	Union Cover
fire_fmu	poly	1	
fwd_wshed	poly	2	zu_1_2
firesurv_11	poly	3	zu_2_3
license_mw	poly	4	zu_3_4
hydro_diss	poly	5	zu_4_5
compt_mw	poly	6	zu_5_6
avi_nsr_phs	poly	7	zu_6_7
fmu_dfa_11	poly	8	zu_7_8
lu_nonlin11	poly	9	zu_8_9
mw_funcord1	poly	10	zu_9_10
dfmp_blks11	poly	11	zu_10_11
Polygon reduction process and UKEY#_TSA calculated			
TSA Landbase spatial files created at this point.			
mgmt_area	poly	12	zc_21_22
lu_lin11	poly	13	zc_22_23
trails_fmu	poly	14	zc_23_24
seismic_diss	poly	15	zc_24_25

Using ArcInfo processing and the *multiunion_gdb.aml* all input datasets are unioned into a single coverage. The AML references the oracle table to identify the coverages to union, the names to assign to the interim datasets and the order of processing. The multi-union output coverage name (**lb_rough**) was specified as an argument when running the aml. The **lb_rough** coverage was clipped with the FMU boundary (**fmu_june04**) to form the **lb_clip** coverage. More than half of the polygons (65%) are < 100m^2 in size. Table 14 shows the changes in polygon numbers through the spatial processing steps outlined in Figure 11.

Table 14. Coverage polygon numbers through spatial data processing.

Coverage name	Description	# of polygons
lb_rough	Coverage resulting from multiunion	479,399
lb_clip	Multiunion coverage clipped to FMU boundary	474,849
lb_elim1	Polygons < .01 ha eliminated	166,104
lb_tsa_1_10	Polygons < .1 ha eliminated under certain conditions	132,229
lb_tsa_1_10	Large polygons split where required (TSA landbase)	132,275
W1113_lb12_cls	Seismic linework added (classified landbase)	542,490

5.2.2 Polygon Reduction

Sliver polygons (< 100 m^2) generally result from slight differences in boundaries amoung input datasets and do not provide useful information to the landbase classification. Large numbers of polygons in the modelled datasets increases complexity. It also slows the mapping, querying and viewing of the landbase. To reduce the number of polygons in the landbase, especially the TSA landbase measures to address sliver polygons were completed before seismic linework was added.

As shown in Figure 11 the landbase was processed to reduce sliver polygons in 3 steps:

1. All polygons less than 0.01ha were eliminated.

2. A preliminary assignment of deletion types was calculated and assigned to the landbase.

3. A second eliminate was done for slivers < 0.1ha but only for polygons where the deletion code would not change if the sliver was eliminated.

More detail on the steps and the impacts of this processing follow.

Eliminate slivers < 0.01 ha

All polygons less than 0.01ha were eliminated. This step used the *eliminate* command in ArcInfo with the *nokeepedge* and *border* options. This allowed slivers on the boundary to be eliminated and merged eliminated polygons into the adjacent polygon that shared the longest border with the sliver. The processing eliminated 308,745 sliver polygons and created **lb_elim1** coverage.

The coverage **lb_clip** is the result of the multiunion process clipped to the FMU boundary. It represents the full extent of the DFMP landbase including all slivers. The coverage **lb_elim1** is the coverage after the first eliminate is completed. A comparison of the input and output coverages used the AVI overstory yield curve strata assignment as an attribute to summarize areas in both coverages. Table 15 shows the relative change in areas by strata and illustrates that the direct elimination of slivers less than 0.01 hectares had no meaningful impact on the landbase attributes.

Table 15. Sliver reduction comparison by AVI strata.

	Area (lb_clip)	Area(lb_elim1)	Difference (ha)	Difference (%)
STRATA_YC	**ha**	**ha**	**(lb_elim1**	**- lb_clip)**
AP	8,768.7485	8,768.3582	-0.3904	-0.0001%
AS	22,373.0713	22,373.2813	0.2100	0.0000%
AW	154,111.7790	154,111.5266	-0.2524	-0.0001%
BW	1,109.3213	1,109.3933	0.0720	0.0000%
LT	32,731.1916	32,731.0745	-0.1171	0.0000%
PA	11,046.2690	11,046.1816	-0.0874	0.0000%
PL	79,520.5515	79,520.5538	0.0022	0.0000%
SA	18,452.6744	18,452.8743	0.1998	0.0000%
SB	66,797.8393	66,797.3689	-0.4705	-0.0001%
SW	34,068.4603	34,068.7094	0.2491	0.0001%
Not assigned	46,258.4267	46,259.2408	0.8142	0.0002%
Total	475,238.3329	475,238.5625	0.2296	0.0000%

Assign preliminary deletion types

The **lb_elim1.pat** attribute file was loaded into oracle for processing. A preliminary assignment of deletion types was calculated. The *elim_calc_lb_elim1.sql* script assigned deletions similar to those described in Section 7.3.2 although they were only a temporary assignment and were not considered past the second elimination step. The F_DELELIM field calculated in ORACLE was added to the **lb_elim1** coverage.

Eliminate slivers < 0.1 ha where deletions do not change

A second eliminate with the same parameters as the first was done for slivers < 0.1ha but only for polygons where the deletion code or cutblock boundary would not change if the sliver was eliminated. This was accomplished by hardcoding (calculating cover–id to -1) for any arcs that form the boundary between deletion types. If the deletion code on both sides of the boundary was the same then that arc was available for elimination if the polygon size was < 1000 m^2. The *findarc_elim1.aml* ran this process. The processing eliminated 33,875 sliver polygons and created **lb_tsa1_10** (with some large polygons).

Table 16 shows the area comparison after the second eliminate was completed. The deletion code item (*F_DELELIM*) was carried through the sliver removal process and the areas before and after the eliminate process were summarized on this item. These deletion types and areas are presented only to compare the coverages before and after sliver removal and do not represent the final assignments to the landbase. The sliver removal did not change the managed landbase area (*F_DELELIM* = 'NONE').

Table 16. Sliver reduction comparison by preliminary deletion codes.

	Area (lb_elim1)	Area(lb_tsa1_10)	Difference (ha)	Difference (%)
F_DELELIM	**ha**	**ha**	**(lb_tsa1_10 - lb_elim1)**	
FIRE	10,517.4488	10,517.4488	0.0000	0.0000%
GOVRES	1,174.7690	1,174.7690	0.0000	0.0000%
HYDROBUF	8,985.3634	8,985.3634	0.0000	0.0000%
ISL	297.6475	297.6475	0.0000	0.0000%
ISO	313.9132	313.9132	0.0000	0.0000%
LEASE	4,246.8920	4,246.8920	0.0000	0.0000%
LT	17,254.4465	17,254.4465	0.0000	0.0000%
NF	33,673.7421	33,673.7421	0.0000	0.0000%
PARK	10,334.5083	10,334.5083	0.0000	0.0000%
REC	27.3354	27.3354	0.0000	0.0000%
SB	20,602.0559	20,602.0559	0.0000	0.0000%
SB_ADENS	333.2628	333.2628	0.0000	0.0000%
SB_SBLT	5,113.5977	5,113.5977	0.0000	0.0000%
SB_STRUC	9,970.4290	9,970.4290	0.0000	0.0000%
TPR	27,262.5801	27,262.5801	0.0000	0.0000%
XAVI	721.8834	721.8834	0.0000	0.0000%
XDFA	14,418.4727	14,418.4727	0.0000	0.0000%
NONE	313,258.7848	313,258.7848	0.0000	0.0000%

A second comparison summarizes the AVI overstory species strata in the coverages before and after the second elimination. This summary includes both the managed and unmanaged landbases and is shown in Table 17. As the sliver removal did not allow changes in deletion assignments the slight differences in species strata distribution occur within deletion categories or within the managed landbase. Specifically the larch and black spruce differences mostly result from sliver deletions within the managed landbase along cutblock boundaries.

Table 17. Sliver reduction comparison by AVI overstory species strata.

	Area (lb_elim1)	Area(lb_tsa1_10)	Difference (ha)	Difference (%)
STRATA_YC	**ha**	**ha**	**(lb_tsa1_10 - lb_elim1)**	
AP	8,768.3582	8,769.1099	0.7517	0.0002%
AS	22,373.2813	22,374.6237	1.3424	0.0003%
AW	154,111.5266	154,115.7245	4.1979	0.0010%
BW	1,109.3933	1,109.5693	0.1760	0.0000%
LT	32,731.0745	32,719.7678	-11.3067	-0.0026%
PA	11,046.1816	11,048.9329	2.7513	0.0006%
PL	79,520.5538	79,553.3572	32.8034	0.0076%
SA	18,452.8743	18,461.7369	8.8627	0.0021%
SB	66,797.3689	66,760.7835	-36.5854	-0.0085%
SW	34,068.7094	34,083.7305	15.0211	0.0035%
Non-forested	46,259.2408	46,241.1332	-18.1076	-0.0042%

5.2.3 Large Polygon Splitting

The landbase file created after the elimination had a few AVI polygons that exceed the maximum polygon size appropriate for modelling or permitted for harvest in an area. In FMU W11 no polygons were split. Weyerhaeuser had identified a maximum cutblock size of 80ha for areas within the Whitecourt and Blue Ridge locations (FMU W13) where it has deciduous harvest rights. Polygons in these locations on the managed TSA landbase that exceeded 100 ha in size were split with existing seismic lines where available. 12 polygons were split.

The results from earlier runs of the TSA model have been field checked by MWFP staff. During this checking staff identified some polygons where operational cutblocks would be planned which included only part of the identified polygon. The company provided linework, captured from maps, which was used to split these polygons. Overall, splitting large polygons in the TSA landbase (**lb_tsa1_10** coverage) added 46 polygons. This spatial coverage forms the TSA landbase.

5.2.4 Calculate Unique ID for TSA Landbase

The spatial TSA landbase unique key (*UKEY#_TSA*) was calculated. This key was formed from the AVI *POLY_NUM* combined with a sequence number that identifies each polygon within the original AVI polygon boundary uniquely (starting at 1 for each poly_num). This was calculated as [*POLY_NUM* * 10000 + sequence number] using an Oracle procedure. This key was carried on the classified landbase to link the TSA landbase to the classified landbase file.

5.2.5 Add Linear Linework

The final step in spatial data processing to create classified landbase was to add the management areas, linear landuse and seismic linework to the TSA landbase. The coverage attributes needed for landbase classification (extracted using *pullitems_lb12.aml)* were loaded into Oracle for attribute calculations (See Section 7). Additional tabular items from the **net_strata_mw** table and attributes assigned without linework are stored in related Oracle tables.

5.2.6 Calculate Unique ID for Classified Landbase

A second unique key (*UKEY#*) was calculated for the classified landbase. This key was calculated equal to the numeric value of the ARCINFO internal # identifier. The *UKEY#* was generated for each iteration of the landbase multi-union process. The iteration number was listed (in place of the # sign) to ensure information was linked to the proper spatial file. *UKEY#_TSA* was calculated separately for the TSA landbase before seismic, linear landuse and management area linework was added.

5.3 Landbase Description

5.3.1 TSA Landbase

The spatial linework generated for the TSA landbase was used as input to create both the classified and the modelling landbase. The spatial coverage for the TSA landbase has the same inputs as the classified landbase. The only difference was that no linework for linear landuse or seismic was included in the file. Linear landuse, trails and seismic information was carried as attributes on the TSA landbase. This simplifies the linework of the TSA landbase but maintains the area impact of these features by polygon and reduces the total area available for harvest. All polygons in the classified landbase with seismic lines, with trails, or with linear landuse dispositions intersecting them are flagged. The area of any polygons where the classified landbase deletion was ‘SEIS’, ‘TRAIL’, ‘ROAD’ or ‘LINE’ was carried on the TSA landbase and used to reduce the polygon area and exclude this area from the managed landbase area. The coverage **lb_tsa1_10** has the spatial linework for the TSA landbase and carries the unique key UKEY#_TSA.

The forecasting stage of the TSA and review of the Spatial Harvest Sequence provided additional information used to refine the landbase classification (i.e. subjective deletions and planned blocks). The development of the TSA models determined the final operability through the modelling process. This is discussed in the DFMP Chapter 5. Other Impact Assessment Groups developing strategies to address FireSmart, enhanced forest management, monitoring and biodiversity issues use this landbase to support analyses.

5.3.2 Classified Landbase

The addition of management area, linear landuse, trails and seismic linework to the TSA landbase to create the classified landbase increased the total number by over 410,000 polygons.

Although many of these polygons would be considered slivers a final eliminate was not done in order to maintain the integrity of the seismic polygon boundaries. Also the number of polygons was less of a factor in the classified landbase as this landbase was not used for TSA modelling. The managed landbase area was the same on both the TSA and classified landbases. The classified landbase carries the unique key from the TSA landbase (UKEY#_TSA) to link to TSA results.

5.3.3 Modelling Landbase

The Forest Management Planning Standard (Alberta, 2006) requires companies to create a strategic model that is also capable of being an operational model. To make a strategic model operational, it is necessary to make the model create block shapes that companies are able to feasibly harvest. During the numerous iterations of the MWFP landbase process a number of changes to the TSA landbase to make it suitable for the TSA modelling were identified. The overall goal of the steps taken was to add the necessary fields for the TSA and to make the landbase as suitable as possible operational and strategic planning. The attribute assignments are described in Section 7.5 and only the spatial landbase processing to dissolve boundaries and simplify linework is described here.

The modelling landbase, used for the TSA modelling, was developed from the TSA landbase (Section 5.3.1). The additional processing steps to make the landbase as suitable as possible for operational and strategic planning were:

- Dissolve boundaries between “like” polygons to improve efficiency of processing
- Include TSA age to reflect the start date of the TSA;
- Identify and drop sliver polygons from the managed landbase;
- Add fields required by TSA models, and;
- Simplify ecosite assignment.

The spatial dissolve step is described in the following section. The attribute processing is described in Section 7.5.

5.3.4 Spatial processing to create Modelling Landbase

This processing includes an aggregation process of “like” polygons and a dissolve of linework within these aggregates to simplify the modelling landbase and create larger polygons more suited to forest harvest sequencing. This processing reduced the polygon count from 132,275 in the TSA landbase by 12,533 polygons to 119,742 polygons on the modelling landbase.

The first step is to assign dissolve groups and then aggregate polygons into subgroups within the identified dissolve groups. Table 18 defines the dissolve groups and the selection criteria used to assign them. Records within each dissolve group were selected as subgroups based on common

group fields attributes. Members within these subgroups were assigned new UKEY_LNK values based on the criteria in Figure 12 which illustrates the processing of all polygons within the TSA landbase. The TSA landbase is then dissolved on the *UKEY_LNK* attribute to generate the modelling landbase.

Table 18. Dissolve groupings for modelling landase.

DISS_GRP	Description	Selection Criteria	Order
2	Planned blocks managed landbase	*BLK_STATUS* = 'PLANNED' and *F_DEL* = 'NONE'	1
3	Planned blocks non-managed landbase	*BLK_STATUS* = 'PLANNED' and *F_DEL* <> 'NONE'	2
	Planned block group fields to generate subgroups	*LB_LABEL, DFA, HARV_LOC, ECOSITE, NSR, SOIL_CLASS, FUNCORD1, FWD_WSHD, F_BAP, F_TPR, F_DEN, F_ORIGIN, BLK_GRP, BLK_STATUS, TIMBER_YEAR, OPENING_NUMBER ACTION, TSA_AGE, SUB_COMP*	
4	Existing cutblocks managed landbase	*F_STORY* = 4 and *F_DEL* = 'NONE'	3
5	Existing cutblocks non-managed landbase	*F_STORY* = 4 and *F_DEL* <> 'NONE'	4
	Existing block group fields to generate subgroups	*LB_LABEL, DFA, HARV_LOC, ECOSITE, NSR, SOIL_CLASS, FWD_WSHED, FUNCORD1, OPENING_NUMBER, TIMBER_YEAR, SUB_COMP*	
6	VHIL survey areas managed landbase	*F_STORY* = 8 and *F_DEL* = 'NONE'	5
7	VHIL survey areas non-managed landbase	*F_STORY* = 8 and *F_DEL* <> 'NONE'	6
	Virginia Hills survey group fields to generate subgroups	*LB_LABEL, DFA, HARV_LOC, ECOSITE, NSR, SOIL_CLASS, FWD_WSHED, FUNCORD1, SAMPLE_NO, TIMBER_YEAR, SUB_COMP*	
NULL	Not part of a dissolve group		7

The processing to create the modelling landbase was done within a personal geodatabase (PGDB). As outlined in Section 7.5 some attributes were adjusted. The landbase was then exported from the PGDB to shapefile format for input into the Patchworks TSA model.

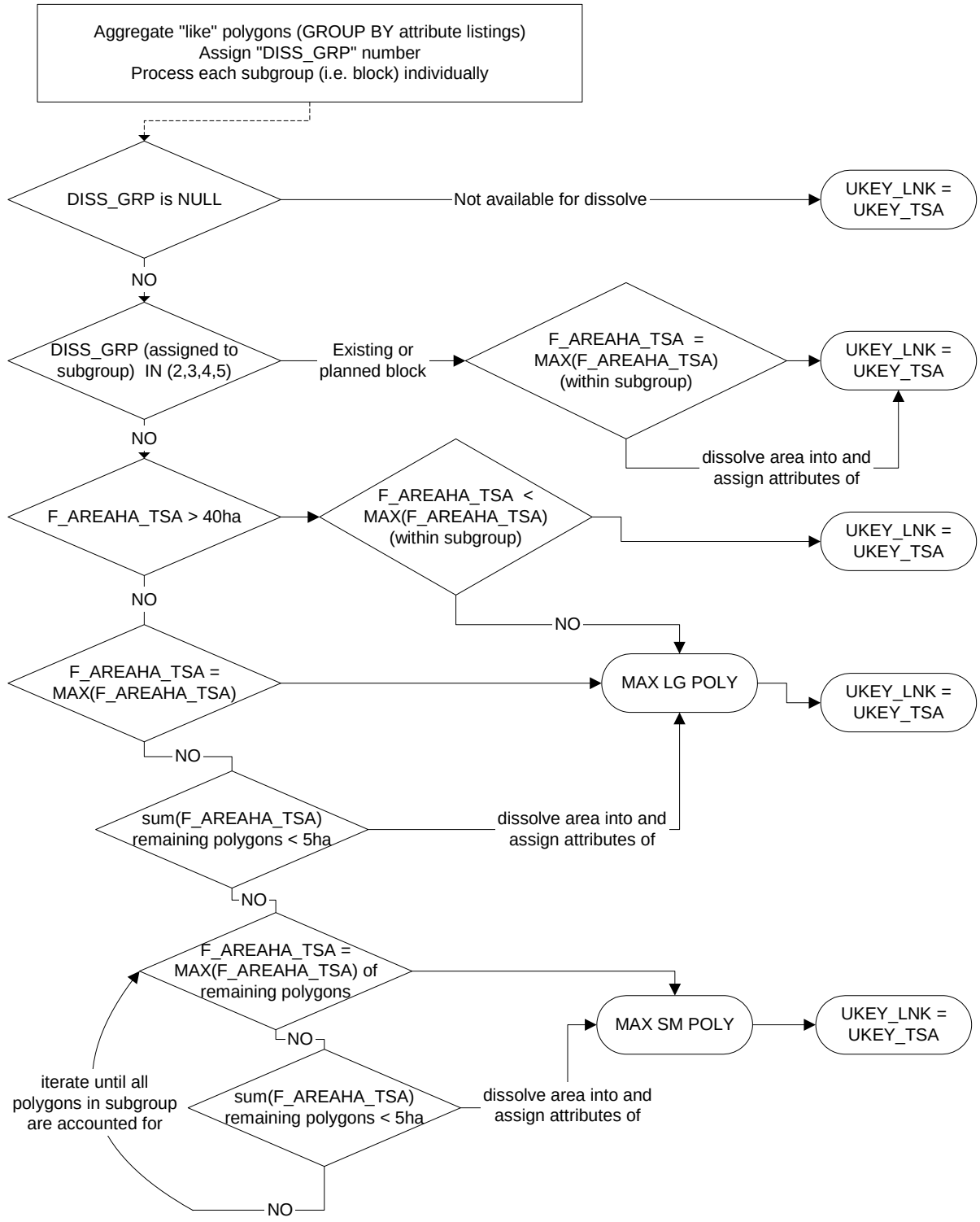

Figure 12. Dissolve criteria (assigning UKEY_LNK) for modelling landbase.

6. AVI Attribute Processing

AVI attributes provide the base classification for the landbase. The AVI attribute table was loaded to Oracle and all strata were calculated through SQL. Three strata were applied to all polygons within the AVI. *Net_strata_os_us_cs.sql* calculated species groups, species distributions, broad cover groups, composite stand values and age for each layer. The final stratification includes landbase updates from a variety of sources and is outlined in Section 7.

The calculated attributes generated from AVI attributes are carried in the **net_strata_mw.dat** table. This table carries the AVI attribute data and all the generated attributes listed in this section. This includes species, species percent, species order, strata decision rules, age, broad cover group, and strata assignments for the overstory, understory and composite layer. Layer 1 (overstory) attributes receive basic field names. Layer 2 (understory) attributes have a 'U' prefix on the basic field name. Layer 9 (composite) attributes have a 'C' prefix with the basic field name (e.g. age, uage, cage).

The species groupings and distribution are listed in Section 6.1. The defining layer and processing of different stand structure types are outlined in Section 6.2. Composite layer attributes are described in section 6.3. The stratification process and decision rules for each stratification type are documented in section 6.4.

6.1 Species Groupings and Distribution

6.1.1 Species percents (PL_PCT, SW_PCT, FB_PCT, FD_PCT, SB_PCT, PB_PCT, AW_PCT, BW_PCT, LT_PCT)

Individual species from AVI species codes were combined into species groups (Table 19). The species percents from AVI where AVI species codes matched the species group were summed to generate the species distribution. Percent values were the same as AVI classes (sp1_per to sp5_per) where classes 1 to 10 represented values 1 to 100 where each class represents 10

percent. Species percent fields for the understory have a 'U' prefix on the fields listed above.

Table 19. Species groups

Species Type	Species Group	Description	AVI Species codes
Deciduous	AW	Aspen	A, Aw
	BW	Birch	Bw
	PB	Poplar	Pb
Conifer	FB	True fir	Fb, Fa
	FD	Douglas-fir	Fd
	LT	Larch	Lt, La, Lw
	PL	Pine	P, Pl, Pj, Pa, Pf
	SB	Black spruce	Sb
	SW	White spruce	Sw, Se

For example the aspen percent would be calculated as follows:

$$AW\_PCT = \sum \begin{pmatrix} (\text{SP1\_PCT where SP1 IN ('A','AW')}), (\text{SP2\_PCT where SP2 in ('A','AW')}), \\ (\text{SP3\_PCT where SP3 IN ('A','AW')}), (\text{SP4\_PCT where SP4 IN ('A','AW')}), \\ (\text{SP5\_PCT where SP5 IN ('A','AW')}) \end{pmatrix}$$

6.1.2 Species Order (PL_ORD, SW_ORD, FB_ORD, FD_ORD, SB_ORD, PB_ORD, AW_ORD, BW_ORD, LT_ORD)

The stratification rules in the following section consider the order of species as one of the decision criteria. To simplify coding the appropriate species order value was updated for each of the species in *SP1* to *SP5* fields. When a species was not present it was assigned an order value of 9. Species order fields for the understory have a 'U' prefix on the fields listed above.

For example a stand with species and percents 1 to 3 of "SW5PL3AW2 " would have PL_ORD = 2, SW_ORD = 1, AW_ORD = 3, FB_ORD = 9, SB_ORD = 9, PB_ORD = 9 and all other species assigned an order of 9.

6.1.3 Species Type Percent (HARDPCT, SOFTPCT)

Deciduous species types (See Table 19) were summed to generate the deciduous (*HARDPCT*) and coniferous (*SOFTPCT*) species percents. Species type fields for the understory have a 'U' prefix on the fields listed above.

6.1.4 Stand Age (AGE, UAGE)

Stand age was calculated from the year of stand origin to the effective date as 2004 – *ORIGIN* for the overstory (layer 1). In the understory, *UAGE* was calculated as 2004 – *UORIGIN* where *UORIGIN* was greater than 0. Non-forested and stands with no origin are assigned a value of 0.

6.1.5 Leading Species by Species Type (LEAD_CON, LEAD_DEC)

The first listed deciduous species was stored as *LEAD_DEC* and can be identified as the minimum species order amoung *AW_PCT*, *BW_PCT* and *PB_PCT*. Where *HARDPCT* was 0, 'NO' was listed as the leading deciduous species. The first listed conifer species was stored as *LEAD_CON* and calculated as the minimum order amoung conifer species. Where *SOFTPCT* was 0 'NO' was listed as the leading conifer species. Leading species fields for the understory have a 'U' prefix on the fields listed above.

6.1.6 Broad Cover Group (C_CODE, UC_CODE)

The species group and the species distribution (as calculated from the AVI species percent classes) were used to calculate the broad cover group for a forested layer (Table 20). Species group and distribution in the understory generated *UC_CODE*.

Table 20. Broad cover group assignment using hardwood and softwood species percents

C_CODE	Description	Selection Criteria
'D'	Deciduous	*HARD_PCT* >= 8
'DC'	Deciduous-leading	*(HARD_PCT* < *8* and *HARD_PCT* > 5) or
	mixedwood	(*HARD_PCT* = 5 and *SP1* = ('AW', 'BW', 'PB'))
'CD'	Coniferous-leading	*(SOFT_PCT* < *8* and SOFT_*PCT* > 5) or
	mixedwood	*(SOFT_PCT = 5 and SP1 <> ('AW', 'BW', 'PB'))*
'C'	Coniferous	*SOFT_PCT* >= 8
NULL	Non-forested	*SOFT_PCT* = 0 and *HARD_PCT* = 0

6.2 Defining Layer for AVI (AVI_STORY)

6.2.1 AVI Defining Layer

A single defining layer was identified for each AVI stand. This was the layer that best characterized the stand. *AVI_STORY* can be layer 1 (overstory or dominant layer from a horizontal stand), layer 2 (understory or dominant layer from horizontal stand) or layer 9 (a composite list from layers 1 and 2 combined).

AVI stand structure type (*STRUC*) was used to identify the defining layer for AVI stands. Multi-story stands with a forested understory (*USP1* is not NULL) also use *DENSITY* and *HEIGHT*. Figure 13 documents the decision rules for this process. Table 21 shows the assignment of defining layer to AVI stands based on structure and stand description. As shown a multistory stand with a non-forested understory is assigned by layer 1, *AVI_STORY* = 1.

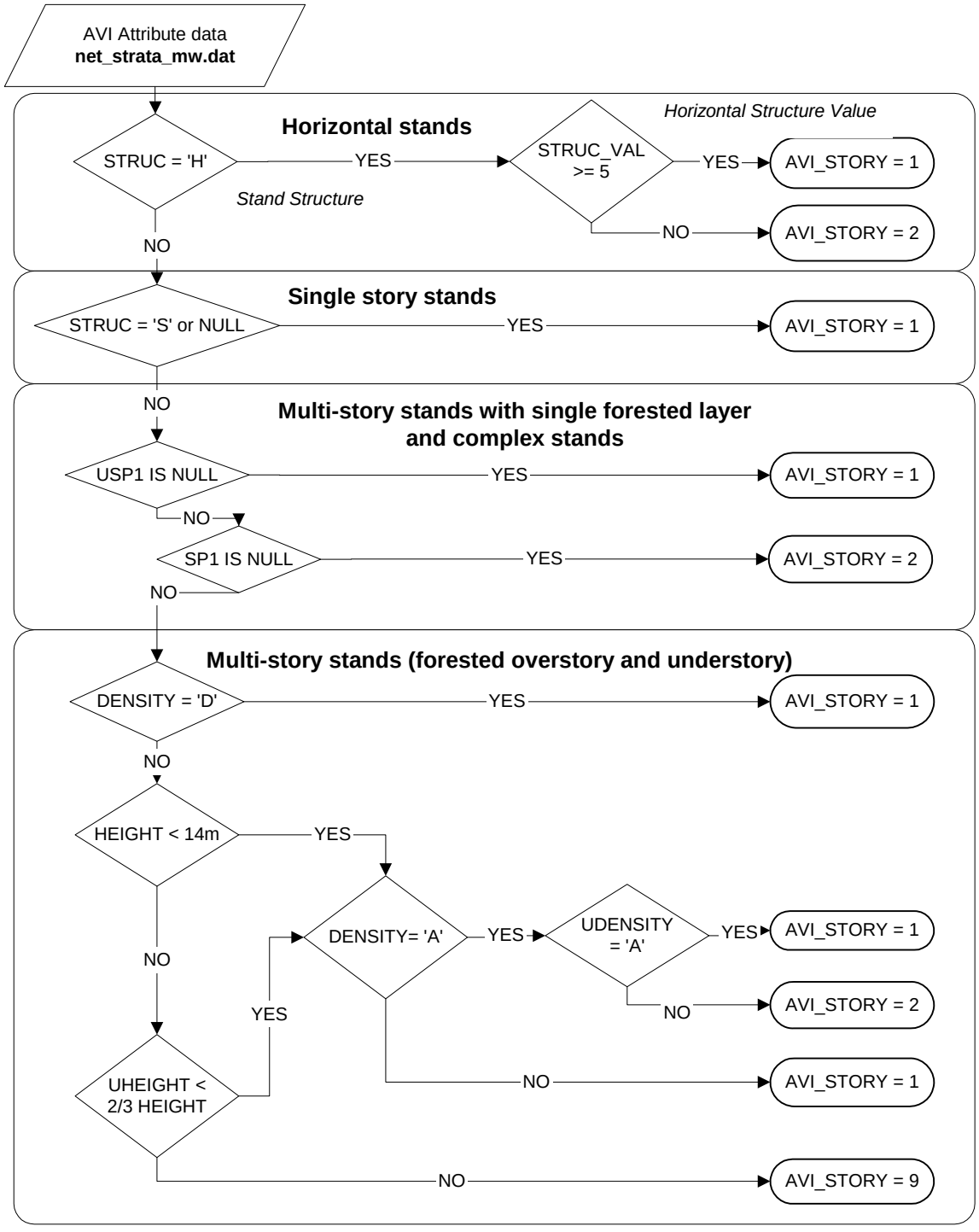

Figure 13. Defining AVI_STORY

Table 21. AVI_STORY definition

AVI_STORY	Definition	STRUC	Stand Description
1	Layer 1	H	Layer 1 dominant (STRUC_VAL >= USTRUC_VAL)
2	Layer 2	H	Layer 2 dominant (USTRUC_VAL > STRUC_VAL)
1	Layer 1	S	Single Story stand
1	Layer 1	C	Complex stand
9	Composite layer	M	Multi-story - overstory and understory composite[1]
1	Layer 1	M	Multi-story - non-forested understory
1	Layer 1	M	Multi-story - overstory dominant[2]
2	Layer 2	M	Multi-story - understory dominant[3]

[1]Composite stands have layer 1 height > 14m and layer 2 height > 2/3 layer 1 height

[2] Non-composite stands with overstory density of B, C or D or A density understory

[3] Non-composite stands with A density overstory and understory density of B, C or D

6.2.2 Horizontal Stands

Horizontal stands occur when polygons have two or more significant and observable strata or homogeneous units occurring within the same polygon and at least one was too small to stratify individually. Stand composition is outlined for two units with a structure value indicating the proportion of stand area assigned to that unit. The layer with the highest structure value was used to classify the stand. Where the structure values are the same the composition for layer 1 was used. The non-dominant unit was not considered on the classified landbase. The area for the stand was updated to reflect only the area of the dominant portion by adjusting the polygon area by the structure value percent. The area of the non-dominant portion of the stand was the horizontal stand deletion area in (*AREA_H_DEL*) as described in Section 7.1.4.

6.2.3 Multi-story Stands with Forested Understory

Stands with a forested understory were evaluated to determine the appropriate layer to use for classification. Multi-storied stands with an overstory density of D were classified using layer 1. Multi-storied stands with an overstory density of A, a productive understory, understory density higher than A and an understory strata that was not black spruce were classified by layer 2 or with a composite stand if it met the requirements. Multi-storied stands with two forested layers close in height received a stratification based on a composite of values in both the overstory and understory. Figure 13 outlines the process to determine which information was used to assign strata.

6.2.4 Composite Layers

A composite layer was created for all multi-storied stands with two forested layers that met the following criteria:

- The height of the understory was greater than or equal to 2/3 of the height of the overstory;
- The overstory height was greater than 14m, and

- The overstory density was A, B or C.

A composite layer receives an AVI_STORY value of 9. A set of composite layer attributes was generated by combining both layer's attributes for crown closure class, height class, species composition, stand origin and timber productivity rating.

6.3 Composite Layer Attributes

Attributes for multistoried stands as defined in Section 6.2.4 were calculated from a combination of attributes in layer 1 and layer 2. Table 22 illustrates the calculations based on list of AVI attributes. Decision rules for each attribute are listed in the following section. Composite attribute fieldnames mirror AVI fieldnames with a prefix of "c".

Table 22. Sample calculation for composite layer

AVI_STORY	Description	AVI Attribute String (Density, height, species distribution, origin, tpr)
AVI Attributes		
Layer 1	Overstory	C20$Pl_5Sw_3Fb_1Pb_1$ 1890-G
Layer 2	Understory	B15Sb_7Fb_3 1930-M
Composite Layer Attributes		
Layer 9	Composite	C 18 Pl3Sb2.8Sw1.8Fb1.8Pb0.6 1890-G

It should be noted that composite heights were rounded to the nearest metre (Section 6.3.3). Composite species percents were not rounded, however only one decimal place was show in the example (Section 6.3.6).

6.3.1 Density (CDENSITY)

The composite crown closure class (*CDENSITY*) was based on the combination of the overstory (*DENSITY*) and understory (*UDENSITY*) crown closure classes according to Table 23. The interior cells identify the *CDENSITY* assignment based on the *DENSITY* and *UDENSITY* values.

Table 23. Assignment of composite crown closure (CDENSITY)

CDENSITY	Description	Selection Criteria	Order
'A'	A crown closure class	*DENSITY* = 'A' and *UDENSITY* = 'A'	1
'B'	B crown closure class	(*DENSITY* = 'A' and *UDENSITY* = 'B') or (*DENSITY* = 'B' and *UDENSITY* = 'A')	2
'D'	D crown closure class	*DENSITY* = 'D' or *UDENSITY* = 'D' or (*DENSITY* = 'C and *UDENSITY* = 'C')	3
'C'	C crown closure class		4

6.3.2 Crown Closure Values (COMP_CC, UCOMP_CC)

The numeric midpoint of the crown closure class listed in Table 24 was assigned to each layer and used to develop weighted averages for the height and species composition.

Table 24. Midpoint values of crown closure classes

COMP_CC	Description	Selection Criteria
'18'	A crown closure class	*DENSITY* = 'A'
'40'	B crown closure class	*DENSITY* = 'B'
'60'	C crown closure class	*DENSITY* = 'C'
'85'	D crown closure class	*DENSITY* = 'D'

6.3.3 Height Calculation (CHEIGHT)

A weighted height value was calculated for the stand using the midpoint of the layer crown closure class for weighting of height for layer 1 and layer 2. The composite height was rounded to the nearest metre. The COMP_CC value and UCOMP_CC values were used to weight the *HEIGHT* and *UHEIGHT* values.

$$CHEIGHT = ROUND\left(\frac{(HEIGHT * COMP\_CC)}{(COMP\_CC + UCOMP\_CC)} + \frac{(UHEIGHT * UCOMP\_CC)}{(COMP\_CC + UCOMP\_CC)}\right)$$

6.3.4 Origin (CORIGIN)

The origin of the oldest layer was used as the origin of the composite layer.

$$CORIGIN = MAX(ORIGIN, UORIGIN)$$

6.3.5 Timber Productivity Rating (CTPR)

TPR was originally assigned to each layer based on the height and age of the leading species (species 1). The TPR for the composite layer reflected the most productive TPR for the stand. The decision rules are outlined in Table 25.

Table 25. Composite TPR (CTPR).

CTPR	Description	Selection Criteria
'G'	Good	*TPR* = 'G'
M'	Medium	*TPR* = 'M' and *UTPR* <> 'G'
'F'	Fair	*TPR* = 'F' and UTPR <> ('M','G')
'U'	Unproductive	*TPR* = 'U' and UTPR <> ('F','M','G')
X'	Unknown	*TPR* IS NULL and UTPR IS NULL
UTPR	Assign understory TPR	

6.3.6 Species Composition (CSP1, CSP1_PER to CSP6, CSP6_PER)

The species composition for each layer was weighted using the midpoint of the layer crown closure class and summed to provide the overall percentages for each species. The species were then ranked in order of descending dominance from species 1 to species 6. If two species have the same percent, the one that occurs first in the original species order was considered to have a higher percent. Species that occur in layer 1 are considered to have higher percents than species in layer 2. Species percents were not rounded.

6.3.7 Composite Species Groupings and Distribution (All "C" Species Percents, Orders, Types, CAGE, CC_CODE).

Composite values for species percents, species orders, softwood and hardwood percents, age, leading species and broad cover group were assigned with the same process outlined in Section 6.1. Fields for the composite layer have a 'C' prefix on the fields listed.

6.4 Stratification

Stratification assigns a single stratum code to classify each layer. Polygon strata were the strata for the defining layer. The strata reflect species distribution. Initially the stratification for yield projections (SRD extended strata, Alberta (2005)) was assigned to all forested areas covered by AVI. These strata were then grouped to Biodiversity Assessment Project (BAP) strata and MWFP species (YC) strata.

6.4.1 Strata Decision Rules (DRULE, CRULE)

To simplify the code developed to assign strata, decision rules to group species and indicate species order were assigned. These strata decision rules group the broad cover group assignment, and leading species (or species group) into a single "rule". The deciduous decision rule (*DRULE*) identifies the first listed (lead) deciduous species in the layer or shows no deciduous species in the layer (i.e. AW_LEAD or NO_D). The conifer decision rule (*CRULE*) identifies both the first listed conifer species or species group in the layer (i.e. 'SW_LEAD', 'SBLT_LEAD') and also whether the layer is a mixedwood cover group (i.e. 'PL_LEAD_MW'). Rules for the understory have a prefix of 'U'. Rules for the composite layer have a prefix of 'C'. The rules are only used in the data processing for assigning SRD extended strata. Table 26 lists the assignment rules.

Table 26. SRD deciduous (DRULE) and coniferous (CRULE) strata decision rules.

DRULE	Description	Selection Criteria
'AW_LEAD'	Aspen leading deciduous	*HARDPCT* > 0 and *AW_ORD* < *BW_ORD* and *AW_ORD* < *PB_ORD*
'BW_LEAD'	Birch leading deciduous	*HARDPCT* > 0 and *BW_ORD* < *AW_ORD* and *BW_ORD* < *PB_ORD*
'PB_LEAD'	Poplar leading deciduous	*HARDPCT* > 0 and *PB_ORD* < *AW_ORD* and *PB_ORD* < *BW_ORD*
'NO_D'	No deciduous present	*HARDPCT* = 0

CRULE	Description	Selection Criteria
'FBFD_LEAD_MW'	True fir or Douglas-fir leading conifer in mixedwood	*C_CODE* = ('DC', 'CD') and (((*FB_PCT* + *FD_PCT*) > *PL_PCT* and (*FB_PCT* + *FD_PCT*) > (*SB_PCT* + *LT_PCT*) and (*FB_PCT* + *FD_PCT*) > *SW_PCT*) or (*LEAD_CON* = ('FB','FD') and (*FB_PCT* + *FD_PCT*) >= *PL_PCT* and (*FB_PCT* + *FD_PCT*) >= (*SB_PCT* + *LT_PCT*) and (*FB_PCT* + *FD_PCT*) >=
'PL_LEAD_MW'	Pine leading conifer in mixedwood	*C_CODE* = ('DC', 'CD') and ((*PL_PCT* > (*FB_PCT* + *FD_PCT*) and *PL_PCT* > (*SB_PCT* + *LT_PCT*) and *PL_PCT* > *SW_PCT*) or (LEAD_CON = 'PL' and *PL_PCT* >= (*FB_PCT* + *FD_PCT*) and *PL_PCT* >= (*SB_PCT* + *LT_PCT*) and *PL_PCT* >= *SW_PCT*))
'SBLT_LEAD_MW'	Black spruce or larch leading conifer in mixedwood	*C_CODE* = ('DC', 'CD') and (((*SB_PCT* + *LT_PCT*) > (*FB_PCT* + *FD_PCT*) and (*SB_PCT* + *LT_PCT*) > *PL_PCT* and (*SB_PCT* + *LT_PCT*) > *SW_PCT*) or (*LEAD_CON* = ('SB', 'LT') and (*SB_PCT* + *LT_PCT*) >= (*FB_PCT* + *FD_PCT*) and (*SB_PCT* + *LT_PCT*) >= *PL_PCT* and (*SB_PCT* + *LT_PCT*)
'SW_LEAD_MW'	White spruce leading conifer in mixedwood	*C_CODE* = ('DC', 'CD') and ((*SW_PCT* > (*FB_PCT*+*FD_PCT*) and *SW_PCT* > *PL_PCT* and *SW_PCT* > (*SB_PCT* + *LT_PCT*)) or (*LEAD_CON* = 'SW' and *SW_PCT* >= (*FB_PCT*+*FD_PCT*) and *SW_PCT* >= *PL_PCT* and *SW_PCT* >= (*SB_PCT* + *LT_PCT*)))
'FB_LEAD'	True fir leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*FB_PCT* > *FD_PCT* and *FB_PCT* > *LT_PCT* and *FB_PCT* > *PL_PCT* and *FB_PCT* > *SB_PCT* and *FB_PCT* > *SW_PCT*) or (*LEAD_CON* = 'FB' and *FB_PCT* >= *FD_PCT* and *FB_PCT* >= *LT_PCT* and *FB_PCT* >= *PL_PCT* and *FB_PCT* >= *SB_PCT* and *FB_PCT* >= *SW_PCT*))
'FD_LEAD'	Douglas-fir leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*FD_PCT* > *FB_PCT* and *FD_PCT* > *LT_PCT* and *FD_PCT* > *PL_PCT* and *FD_PCT* > *SB_PCT* and *FD_PCT* > *SW_PCT*) or (*LEAD_CON* = 'FD' and *FD_PCT* >= *FB_PCT* and *FD_PCT* >= *LT_PCT* and *FD_PCT* >= *PL_PCT* and *FD_PCT* >= *SB_PCT* and *FD_PCT* >= *SW_PCT*))
'LT_LEAD'	Larch leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*LT_PCT* > *FB_PCT* and *LT_PCT* > *FD_PCT* and *LT_PCT* > *PL_PCT* and *LT_PCT* > *SB_PCT* and *LT_PCT* > *SW_PCT*) or (*LEAD_CON* = 'LT' and *LT_PCT* >= *FB_PCT* and *LT_PCT* >= *FD_PCT* and *LT_PCT* >= *PL_PCT* and *LT_PCT* >= *SB_PCT* and *LT_PCT* >= *SW_PCT*))
'PL_LEAD'	Pine leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*PL_PCT* > *FB_PCT* and *PL_PCT* > *FD_PCT* and *PL_PCT* > *LT_PCT* and *PL_PCT* > *SB_PCT* and *PL_PCT* > *SW_PCT*) or (*LEAD_CON* = 'PL' and *PL_PCT* >= *FB_PCT* and *PL_PCT* >= *FD_PCT* and *PL_PCT* >= *LT_PCT* and *PL_PCT* >= *SB_PCT* and *PL_PCT* >= *SW_PCT*))
'SB_LEAD'	Black spruce leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*SB_PCT* > *FB_PCT* and *SB_PCT* > *FD_PCT* and *SB_PCT* > *LT_PCT* and *SB_PCT* > *PL_PCT* and *SB_PCT* > *SW_PCT*) or (*LEAD_CON* = 'SB' and *SB_PCT* >= *FB_PCT* and *SB_PCT* >= *FD_PCT* and *SB_PCT* >= *LT_PCT* and *SB_PCT* >= PL_*PCT* and *SB_PCT* >= *SW_PCT*))
'SW_LEAD'	White spruce leading conifer in pure stand	*C_CODE* = ('C', 'D') and ((*SW_PCT* > *FB_PCT* and *SW_PCT* > *FD_PCT* and *SW_PCT* > *LT_PCT* and *SW_PCT* > *PL_PCT* and *SW_PCT* > *SB_PCT*) or (*LEAD_CON* = 'SW' and *SW_PCT* >= *FB_PCT* and *SW_PCT* >= *FD_PCT* and *SW_PCT* >= *LT_PCT* and *SW_PCT* >= PL_*PCT* and *SW_PCT* >= *SB_PCT*))
'NO_C'	No coniferous present	*SOFTPCT* = 0

6.4.2 Forested Stratification (STRATA_SRD, STRATA_BAP, STRATA_YC)

Each AVI polygon has up to three levels of vegetation strata assigned to it. The SRD Extended Strata was the most detailed and was generated for each forested layer in the AVI coverage. There are 44 potential SRD strata for forested layers. The BAP strata grouped the SRD strata into 17 treed strata. The species strata grouped the treed BAP strata into 10 species strata (YC). Table 27 outlines the relationships between the strata and broad cover group.

Table 27. Forested stratification

Broad Cover Group	Species Stratum (YC)	BAP Stratum (BAP)	SRD Extended Stratum (SRD)
D	AW	AW	D1, D2, D3
		PB	D4
	BW	BW	D5
DC	AP	AW_PL	DC2,DC10
	AS	AW_SWSB	DC1, DC3, DC4, DC9, DC11, DC12
		PB_CON	DC5, DC6, DC7, DC8
CD	PA	PL_DEC	CD4, CD5,CD6
	SA	SWSB_DEC	CD1,CD2,CD3,CD7, CD8, CD9,CD10,CD11,CD12
C	PL	PL	C4, C5, C6, C7, C8
	SB	SB	C9, C10, C11
	SW	SW	C1, C2, C3, C13, C14, C15, C16, C17
	LT	LT	C12

6.4.3 SRD Extended Strata (STRATA_SRD)

SRD extended strata were assigned to all forested overstory, understory and composite layers for each AVI stand using the decision rules provided in Table 28. These rules define the SRD extended strata as documented in the Interpretive Bulletin – Yield Projection Guidelines for Alberta in the Alberta Forest Management Planning Standard (Alberta 2005). SRD staff has reviewed this table and agreed with the updates of the table located in Version 3 of the planning manual (D. Aitkin, pers comm., 2005). SRD extended strata for the understory have a prefix of 'U'. SRD extended strata for the composite layer have a prefix of 'C'. Non-forested stands are assigned *STRATA_SRD* code of 'XX0'.

Table 28. SRD extended strata by broad cover group.

STRATA_SRD	Description	Selection Criteria
'D1'	Pure aspen	*C_CODE* = 'D' and *AW_PCT* >= 9
'D2'	Aspen leading with poplar	*C_CODE* = 'D' and *DRULE* = 'AW_LEAD' and *AW_PCT* < 9 and *PB_PCT* > 1
'D3'	Aspen leading without poplar	*C_CODE* = 'D' and *DRULE* = 'AW_LEAD' and *AW_PCT* < 9 and *PB_PCT* <= 1
'D4'	Poplar leading	*C_CODE* = 'D' and *DRULE* = 'PB_LEAD'
'D5'	Birch leading	*C_CODE* = 'D' and *DRULE* = 'BW_LEAD'
'DC1'	Aspen/white spruce	*C_CODE* = 'DC' and *DRULE* = 'AW_LEAD' and *CRULE* = 'SW_LEAD_MW'
'DC2'	Aspen/pine	*C_CODE* = 'DC' and *DRULE* = 'AW_LEAD' and *CRULE* = 'PL_LEAD_MW'
'DC3'	Aspen/black spruce	*C_CODE* = 'DC' and *DRULE* = 'AW_LEAD' and *CRULE* = 'SBLT_LEAD_MW'
'DC4'	Aspen/fir	*C_CODE* = 'DC' and *DRULE* = 'AW_LEAD' and *CRULE* = 'FBFD_LEAD_MW'
'DC5'	Poplar/white spruce	*C_CODE* = 'DC' and *DRULE* = 'PB_LEAD' and *CRULE* = 'SW_LEAD_MW'
'DC6'	Poplar/pine	*C_CODE* = 'DC' and *DRULE* = 'PB_LEAD' and *CRULE* = 'PL_LEAD_MW'
'DC7'	Poplar/black spruce	*C_CODE* = 'DC' and *DRULE* = 'PB_LEAD' and *CRULE* = 'SBLT_LEAD_MW'
'DC8'	Poplar/fir	*C_CODE* = 'DC' and *DRULE* = 'PB_LEAD' and *CRULE* = 'FBFD_LEAD_MW'
'DC9'	Birch/white spruce	*C_CODE* = 'DC' and *DRULE* = 'BW_LEAD' and *CRULE* = 'SW_LEAD_MW'
'DC10'	Birch/pine	*C_CODE* = 'DC' and *DRULE* = 'BW_LEAD' and *CRULE* = 'PL_LEAD_MW'
'DC11'	Birch/black spruce	*C_CODE* = 'DC' and *DRULE* = 'BW_LEAD' and *CRULE* = 'SBLT_LEAD_MW'
'DC12'	Birch/fir	*C_CODE* = 'DC' and *DRULE* = 'BW_LEAD' and *CRULE* = 'FBFD_LEAD_MW'
'CD1'	White spruce/aspen	*C_CODE* = 'CD' and *CRULE* = 'SW_LEAD_MW' and *DRULE* = 'AW_LEAD'
'CD2'	White spruce/poplar	*C_CODE* = 'CD' and *CRULE* = 'SW_LEAD_MW' and *DRULE* = 'PB_LEAD'
'CD3'	White spruce/birch	*C_CODE* = 'CD' and *CRULE* = 'SW_LEAD_MW' and *DRULE* = 'BW_LEAD'
'CD4'	Pine/aspen	*C_CODE* = 'CD' and *CRULE* = 'PL_LEAD_MW' and *DRULE* = 'AW_LEAD'
'CD5'	Pine/poplar	*C_CODE* = 'CD' and *CRULE* = 'PL_LEAD_MW' and *DRULE* = 'PB_LEAD'
'CD6'	Pine/birch	*C_CODE* = 'CD' and *CRULE* = 'PL_LEAD_MW' and *DRULE* = 'BW_LEAD'
'CD7'	Black spruce/aspen	*C_CODE* = 'CD' and *CRULE* = 'SBLT_LEAD_MW' and *DRULE* = 'AW_LEAD'
'CD8'	Black spruce/poplar	*C_CODE* = 'CD' and *CRULE* = 'SBLT_LEAD_MW' and *DRULE* = 'PB_LEAD'
'CD9'	Black spruce/birch	*C_CODE* = 'CD' and *CRULE* = 'SBLT_LEAD_MW' and *DRULE* = 'BW_LEAD'
'CD10'	Fir/aspen	*C_CODE* = 'CD' and *CRULE* = 'FBFD_LEAD_MW' and *DRULE* = 'AW_LEAD'
'CD11'	Fir/poplar	*C_CODE* = 'CD' and *CRULE* = 'FBFD_LEAD_MW' and *DRULE* = 'PB_LEAD'
'CD12'	Fir/birch	*C_CODE* = 'CD' and *CRULE* = 'FBFD_LEAD_MW' and *DRULE* = 'BW_LEAD'
'C1'	Pure white spruce	*C_CODE* = 'C' and *SW_PCT* >= 9
'C2'	White spruce leading with pine	*C_CODE* = 'C' and *CRULE* = 'SW_LEAD' and *SW_PCT* < 9 and *PL_PCT* > 1
'C3'	White spruce leading without pine	*C_CODE* = 'C' and *CRULE* = 'SW_LEAD' and *SW_PCT* < 9 and *PL_PCT* <= 1
'C4'	Pure pine	*C_CODE* = 'C' and *PL_PCT* >= 9
'C5'	Pine leading with white spruce	*C_CODE* = 'C' and *CRULE* = 'PL_LEAD' and *PL_PCT* < 9 and *SW_PCT* > 1 and *SW_ORD* < *FB_ORD* and *SW_ORD* < *SB_ORD*
'C6'	Pine leading with black spruce	*C_CODE* = 'C' and *CRULE* = 'PL_LEAD' and *PL_PCT* < 9 and *SB_PCT* > 1 and *SB_ORD* < *FB_ORD* and *SB_ORD* < *SW_ORD*
'C7'	Pine leading with fir	*C_CODE* = 'C' and *CRULE* = 'PL_LEAD' and *PL_PCT* < 9 and *FB_PCT* > 1 and *FB_ORD* < *SB_ORD* and *FB_ORD* < *SW_ORD*
'C8'	Pine leading without spruce and fir	*C_CODE* = 'C' and *CRULE* = 'PL_LEAD' and *PL_PCT* < 9 and *FB_PCT* <= 1 and *SB_PCT* <=1 and *SW_PCT* <= 1
'C9'	Pure black spruce	*C_CODE* = 'C' and *SB_PCT* >= 9
'C10'	Black spruce leading with pine	*C_CODE* = 'C' and *CRULE* = 'SB_LEAD' and *SB_PCT* < 9 and *PL_PCT* > 1
'C11'	Black spruce leading without pine	*C_CODE* = 'C' and *CRULE* = 'SB_LEAD' and *SB_PCT* < 9 and *PL_PCT* <= 1
'C12'	Larch leading	*C_CODE* = 'C' and *CRULE* = 'LT_LEAD'
'C13'	Pure Douglas-fir	*C_CODE* = 'C' and *FD_PCT* >= 9
'C14'	Douglas-fir leading	*C_CODE* = 'C' and *CRULE* = 'FD_LEAD' and *FD_PCT* < 9
'C15'	Pure balsam fir	*C_CODE* = 'C' and *FB_PCT* >= 9
'C16'	Balsam fir leading with pine	*C_CODE* = 'C' and *CRULE* = 'FB_LEAD' and *FB_PCT* < 9 and *PL_PCT* > 1
'C17'	Balsam fir leading without pine	*C_CODE* = 'C' and *CRULE* = 'FB_LEAD' and *FB_PCT* < 9 and *PL_PCT* <= 1
'XX0'	Non-forested	*C_CODE* = NULL

6.4.4 BAP Strata (STRATA_BAP)

The BAP strata are assigned to all overstory, understory and composite layers (if stands meet the criteria) for each AVI stand. Forested strata are defined in Table 27 and were formed by grouping assigned SRD strata for the layer and calculated using *assign_bap_yc_strata_avi.sql.* These same rules for modelling strata are applied to forested lands that are not classified by AVI. This includes harvested areas and fire regeneration survey areas. BAP strata values for cutblocks and for fire survey polygons are carried on the input datasets in the *BLK_STRATA* field or generated from the *VHIL_YC* field. The process is described in 7.3.5

Non-forested strata are defined in Table 29 and calculated from the AVI non-forested fields. They are also assigned to lands updated by seismic activity (Table 31) or certain landuse dispositions.

6.4.5 Non-Forest Classification (NONFOREST, UNONFOREST)

The AVI fields for naturally non-forested areas (*NFL, NFL_PER, NAT_NON*) and anthropogenic non-forested (*ANTH_VEG, ANTH_NON)* are combined to a single field *NONFOREST* in the order listed. These fields in the understory are assigned to *UNONFOREST*.

Table 29 outlines the BAP strata for AVI non-forested codes.

Table 29. Non-forest stratification

BAP Stratum	Description	AVI Non-forest Codes
64	Anthropogenic non-vegetated - water related	AIW
	Naturally non-vegetated - water related	NWF,NWI,NWL,NWR
103	Anthropogenic non-vegetated -industrial development	AIG,AIH,AII,AIU
	Anthropogenic non-vegetated -settlements	AS,AIF,ASR
	Anthropogenic vegetated - industrial development	CIP,CIU,CIW
	Naturally non-vegetated - bare mineral soil	NMM
105	Naturally non-vegetated - mineral	NMC,NMG,NMR,NMS
106	Non-forest vegetated - bryophyte and mosses	BR
107	Naturally non-vegetated -recent burn	NMB
203	Open shrub	SO
204	Closed shrub	SC
206	Herbaceous grassland	HG
207	Herbaceous forbs	HF
1111	Anthropogenic vegetated - agriculture	CA,CP

6.4.6 AVI Species Composition (SP_COMP)

The full AVI species composition was not carried on the TSA landbase. The species composition was a concatenated string of the density, height, species composition, origin and TPR for each layer from the AVI attributes.

6.4.7 Landbase Code (LB_CODE)

The landbase code was assigned from the broad cover group values from the AVI defining layer. Deciduous cover groups are assigned a landbase code of ‘D’ and mixedwood and conifer cover groups are assigned to ‘C’.

7. Generated Attribute Processing

All calculations to generate the final attributes for the classified landbase take place in ORACLE and are done using Structured Query Language (SQL). The fields of interest from the polygon attribute table of the classified landbase coverage are loaded into Oracle. The AVI2.1 attributes were stored in a related table in the database as was the table of attributes calculated from AVI attributes. Some attributes were adjusted or added to create the TSA landbase and then modelling landbase. This processing is described in sections 7.4 and 7.5.

7.1 Generated Attributes from Landbase Attributes

7.1.1 Black Spruce and Larch (SB_LT_PCT, USB_LT_PCT, CSB_LT_PCT)

Black spruce and larch stands were evaluated for subjective deletions. Individual species percents are not carried as landbase attributes however the sum of black spruce or larch species percents was used to assign subjective deletions. This field was calculated as the black spruce species percent plus the larch species percent for layer 1 (*SB_LT_PCT*) or the black spruce species percent plus larch percent for layer 2 (*USB_LT_PCT*) or the black spruce species percent plus the larch percent for layer 9 (*CSB_LT_PCT*) based on the defining layer.

$$SB\_LT\_PCT = SB\_PCT + LT\_PCT$$

For example a pure conifer stand (*SOFTPCT* = 9) classified using the overstory (*F_STORY* = 1) with 40% black spruce (*SB_PCT* = 4) and 10% larch species (*LT_PCT* = 1) would be assigned a *SB_LT_PCT* of 5.

7.1.2 Disposition Type (DISP_TYPE)

The *DISP_TYPE* field holds the disposition types listed in the *NLIN_DISP* and *LIN_DISP* fields in a single attribute field. As each input field is unique the fields were used to populate *DISP_TYPE* whenever *NLIN_DISP* or *LIN_DISP* was not NULL.

7.1.3 Seismic (WITH_SEIS, STRATA_SEIS)

Seismic information for the landbase covers the years pre-1991 to 2004. As outlined in Section 3.6.2 the width of seismic lines has changed over time. The regeneration impact of seismic within existing cutblocks has also changed (see Table 35). Table 30 shows rules used to identify seismic areas. *WITH_SEIS was* set to 100 for all areas within seismic (*SEIS_YEAR* > 0) except for the following conditions:

- Seismic area within cutblocks harvested in or after the timber year of 1991 but before the end of the timber year 2000 was assumed to have been regenerated to the cutblock strata and was not classified as a seismic deletion;

- Seismic area within cutblocks after 2000 where the timber year of harvest was after the assigned year of seismic was considered to have been regenerated and was not classified as a seismic deletion; and

- Seismic area in cutblocks harvested on or after 2000 with a seismic year of establishment after the timber year was assumed to have converted any regenerating strata to grass or shrub and was therefore classified as a seismic deletion.

Table 30. With_SEIS assignment

WITH_SEIS	Description	Selection criteria
100	Seismic area outside cutblocks	*SEIS_YEAR* > 0 and BLK_STATUS <> 'COMPLETE'
100	Seismic through block before 1991	*SEIS_YEAR > 0 and TIMBER_YEAR< 1991* and *BLK_STATUS* = 'COMPLETE'
100	Seismic after harvest date after 2000	*BLK_STATUS = 'COMPLETE' and TIMBER_YEAR >= 2000* and *SEIS_YEAR > TIMBER_YEAR*
0	Regenerating seismic area	*BLK_STATUS = 'COMPLETE' and TIMBER_YEAR >= 2000* and *SEIS_YEAR <= TIMBER_YEAR*
0	Area without seismic	

The field *STRATA_SEIS* holds the strata for areas within seismic. The strata were assigned based on BAP strata for the defining layer. Where the defining layer had forested BAP strata the BAP strata of 204 (Closed Shrub) were assigned and where the defining layer has non-forested BAP strata those existing strata were assigned to *STRATA_SEIS*. Table 31 outlines the strata assignment.

Table 31. BAP strata assignment for seismic areas

STRATA_SEIS	Description	Source for Classification	Original BAP Strata for underlying polygon
204	Seismic through forested areas	AVI, Blocks	AW, PB, BW, AW_PL, AW_SWSB, PB_CON, PL_DEC, SWSB_DEC, PL, SB, SW, LT
Use existing BAP strata	Seismic through non-forest areas	BAP strata	103, 105, 106, 107, 1111, 203, 204, 206, 207, 64

As shown in Table 31 a seismic line crossing a pine stand would be assigned a *STRATA_SEIS* of 204.

7.1.4 Area fields (AREA_HORIZ, AREA_H_DEL, AREAHA_POL)

The area for polygons classified by AVI attributes, with a horizontal stand structure within the Defined Forest Area must be updated to delete the unmanaged portion of the stand from the polygon area values. The area of the portion of the stand used to characterize the stand was the layer listed in *AVI_STORY* and was calculated as the *AREA* (polygon area in m^2) times *STRUC_VAL*/10 (percentage of the stand assigned to that layer). *AREA_HORIZ* holds this area as hectares. *AREA_H_ DEL* was the remaining stand area that was deleted from the classified landbase (also in hectares). Structure for regenerating stands (cutblocks and fire survey regeneration) was not reflected in the AVI attributes. These stands are all considered to be single story stands. The ArcInfo calculated area was converted to hectares (*AREA* / 10000) and stored in the *AREAHA_POL* field. This was referenced as the polygon area or the spatial area of the polygon. Table 32 outlines area calculations. To simplify reporting, horizontal stand areas were updated only on the managed landbase as indicated by *F_DEL* = 'NONE' (See Section 7.3.2).

Table 32. Horizontal and stand area calculations.

Area field	Description	Selection criteria	Calculation
AREAHA_HORIZ	Area of horizontal stands defined by layer 1 attributes	*STRUC* = *'H'* and *F_DEL* = 'NONE' and AVI_STORY = 1	*AREA* /10000 * *STRUC_VAL/10*
	Area of horizontal stands defined by layer 2 attributes	*STRUC* = *'H'* and *F_DEL* = 'NONE' and AVI_STORY = 2	*AREA* /10000 * U*STRUC_VAL/10*
AREA_H_DEL	Area deleted from horizontal stands defined by layer 1	STRUC = 'H' and *F_DEL* = 'NONE' and AVI_STORY = 1	*AREA* /10000 * USTRUC_VAL/10
	Area deleted from horizontal stands defined by layer 2	STRUC = 'H' and *F_DEL* = 'NONE' and AVI_STORY = 2	*AREA* /10000 * STRUC_VAL/10
AREAHA_POL	Spatial area (ha) from ARCInfo	ALL	*AREA* /10000

For example, a horizontal stand (STRUC = 'H') with and *AREA* of 20,000 m² and a *STRUC_VAL* of 6 would be assigned AREAHA_POL = 2, AREA_HORIZ = 1.2 and AREA_H_DEL = 0.8.

7.1.5 Cutblock group (BLK_GRP)

This field groups the cutblock information into five groups. DFMP cutblocks are indicated by any polygon with *TIMBER_YEAR* > 0. The silviculture systems for commercial thinning, salvage thinning, shelterwood, selection, release cut and group selection were all classed as thinning. DFMP cutblocks from thinning before 2004 were assigned to 'EXIST_TH' and the rest to 'PLAN_TH'. All other DFMP cutblocks were assigned to 'EXIST' where *TIMBER_YEAR* < 2004 and 'PLANNED' if *TIMBER_YEAR* > 2003. Polygons characterized by AVI on the managed landbase which had an 'A' density overstory but carried the clearcut modifier and an extent greater than 2 were identified separately as regenerating stands. These stands characterized by AVI where *CC_YEAR* is > 0 were assigned the code 'MOD1'. The code of 'FIRE_REG' was assigned to all areas with the fire survey polygons, where SAMPLE_NO is not blank. Table 33 outlines the cutblock group assignment.

Table 33. Cutblock group assignment.

BLK_GRP	Description	Selection criteria	Order
'PLAN_TH'	Planned Thinning	SILV_SYSTEM in ('TC','TS','SH','SL','RC',SG') and TIMBER_YEAR > 2003	1
'EXIST_TH'	Existing Thinning	SILV_SYSTEM in ('TC','TS','SH','SL','RC',SG') and TIMBER_YEAR< 2004	2
'EXIST'	Existing cutblocks	BLK_STATUS = 'COMPLETE'	3
'FIRE_REG'	Fire survey polygons	SAMPLE_NO is not NULL	4
'MOD1'	AVI clearcut blocks	CC_YEAR > 0	5

7.2 Attributes to Classify Deletions

Information from input datasets used to classify the landbase and identify the managed and unmanaged polygons was assigned to a list of deletion codes. A polygon may have more than one deletion code assigned. In each field the polygons without the listed deletion code remain NULL.

7.2.1 Landuse Deletion (D_LAND)

This deletion was developed from the *DISP_TYPE* codes. *D_LAND* codes grouped landuse dispositions types (*DISP_TYPE*) that identify unmanaged areas as outlined in Table 34. As shown in Table 34 a road created under an 'LOC' disposition was assigned a *D_LAND* of 'ROAD'. Reclamation certified areas (*DISP_TYPE* = 'RCD') do not receive a *D_LAND* code.

Table 34. Landuse disposition deletion codes

D_LAND	Description	Disposition Codes [1]
ROAD	Road Related Features	FRD, LOC, RD, RDD, RDS, RRD
GOVRES	Government Reservations	DRS, PNT
LINE	Utility corridors	EZE, PIL, PLA, REA, ROE, RR, VCE
LEASE	Miscellaneous and Surface Leases	MLL, MLP, MSL, SML, SMC
XDFA	Private lands since FMA boundary delineation	PRI
REC	Recreation Leases	REC

[1] Disposition codes are from the DISP_TYPE field and are defined in the 'Landuse deletion heirarchy' table

7.2.2 Inventory Deletion (D_INV)

This deletion identified the AVI inventory status of polygons within the FMU. Areas without AVI (*POLY_NUM* = 0) are classified as 'XAVI' in the *D_INV* field.

7.2.3 Access Deletion (D_ACCESS)

This deletion identified deletion areas that may have potential for access. It includes the dispositions for roads and utilities ('ROAD' and 'LINE' from Table 34) and trails delineated in the *TRAIL_TYPE* field ('SNOW' and 'KLONDIKE').

7.2.4 Seismic Deletion (D_SEIS)

This deletion indicated lands covered by seismic. Any areas classified as *WITH_SEIS* = 100 are seismic deletions and receive the code 'SEIS'. Some areas of seismic within cutblocks are not considered deletions. Table 35 outlines the decision rules for seismic. A seismic line established in 2003 which crosses an existing block harvested in 2001 would be assigned *D_SEIS* = 'SEIS' as a deletion code.

Table 35. Seismic deletion codes

D_SEIS	Description	TIMBER_YEAR	SEIS_YEAR
SEIS	Seismic area outside blocks	NULL (Not a block)	SEIS_YEAR > 0
SEIS	Seismic through Pre-91 blocks	< 1991 (Pre-91 blocks)	SEIS_YEAR > 0
NULL	Assume seismic regenerated	>= 1991 and < 2000	SEIS_YEAR > 0
NULL	Assume seismic regenerated	>= 2000	SEIS_YEAR <= TIMBER_YEAR
SEIS	Assume seismic not regenerated	>= 2000	SEIS_YEAR > TIMBER_YEAR

7.2.5 Non-forest Deletion (D_NONFOR)

This deletion indicated lands without forest cover. The information may come from AVI or from updated land cover information (e.g. landuse or seismic). Table 29 outlines and defines the non-forest strata based on AVI attributes. Non-forested landuse updates are assigned a strata code of '103' except for RCD dispositions which are assigned '206' (See Table 37 and Table 41). Table 31 assigned the strata to areas under seismic on the landbase. D_NONFOR contains BAP strata for non-forested areas. Strata codes are 64, 103, 105, 106, 107 203, 204, 206, 207, or 1111.

7.2.6 Burn Deletion (D_BURN)

This deletion identified additional stands burnt since the AVI inventory was completed (*FIRE_YEAR* > 1993) with two exceptions. Areas with fire boundaries that are a cutblock (TIMBER_YEAR > 0) or in fire survey areas (SAMPLE_NO is not blank) are not a burn deletion. Areas burnt and not salvage logged or successfully surveyed for regeneration are assigned the deletion code 'FIRE'.

7.2.7 TPR Deletion (D_TPR)

This deletion identified all stands characterized as unproductive in AVI. For multi-story stands in AVI this indicated that no portion of the stand was calculated as having a productive (good, medium or fair) TPR. It should be noted that TPR was adjusted for areas within cutblocks in 4 cases. In FMU W13 existing cutblocks with a TPR of 'U' were reassigned to a TPR of 'F'. Also all cutblocks (*TIMBER_YEAR* > 0) with TPR of 'F' or 'U' and a BAP strata of 'SB' in the defining layer per AVI_STORY were reassigned to 'M'. In FMU W11 any cutblock with an assigned TPR of 'U' was reassigned to 'F'. Clearcut areas identified in AVI (BLK_GRP = 'MOD1') with a TPR of 'U' were assigned to 'F'.

The deletion does not reclassify TPR for lands updated through landuse information. D_TPR was assigned to 'TPR' for all polygons (excluding the reassigned TPR described above for cutblocks) where the TPR of the defining layer was 'U'.

7.2.8 Riparian Buffer Deletion (D_BUF)

This deletion identifies areas within riparian buffers defined in the operating ground rules or with extended riparian buffers on waterfowl lakes. D_BUF assigns codes to the values in *IN_WATER*. *IN_WATER* = 100 identifies lands assigned the ground rule buffers and was assigned the 'GRBUF' code. *IN_WATER* = 200 identifies lakes important for waterfowl and was assigned the 'BIRDBUF' code.

7.2.9 Subjective Deletion (D_SUBJ)

This deletion identifies forested stands that are not considered productive based on the AVI stand composition. Millar Western has identified stands with larch strata and some black spruce strata stands as subjective deletions. Table 36 lists the decision rules for subjective deletion codes.

Table 36. Subjective deletion codes.

D_SUBJ	Description	Selection criteria[1]	Order
LT	Larch stands	F_BAP = 'LT'	1
SB	Black spruce strata in W11	FMU_NUM = 'W11' and F_BAP = 'SB'	2
SB_STRUC	Complex or horizontal structure black spruce	FMU_NUM = 'W13' and BLK_STATUS <> 'PLANNED' and F_BAP = 'SB' and STRUC in ('C','H') and F_STORY in (1,2,9)	3
SB_ADENS	A density black spruce stands	FMU_NUM = 'W13' and BLK_STATUS <> 'PLANNED' and F_BAP = 'SB' and F_DEN = 'A' and F_STORY in (1,2,9)	4
SB_SBLT	Marginal black spruce stands	F_TPR = 'F' and F_STORY = 1 and SB_LT_PCT > 7	5
SB_SBLT	Marginal black spruce stands	F_TPR = 'F' and F_STORY = 2 and USB_LT_PCT > 7	6
SB_SBLT	Marginal black spruce stands	F_TPR = 'F' and F_STORY = 9 and CSB_LT_PCT > 7	7

[1]The F_STORY (final defining layer), *F_BAP* and *F_TPR* reflect the final assignment as defined in Section 7.3.

For stands characterized by AVI (*F_STORY* = 1, 2 or 9) the subjective deletion codes are:

- All larch strata (*F_BAP* = 'LT') are assigned 'LT';

- All W11 black spruce strata (*FMU_NUM* = 'W11' and *F_BAP* = 'SB') are assigned 'SB'
- W13 black spruce strata (*FMU_NUM* = 'W13' and *F_BAP* = 'SB') and
    - All 'A' density stands (*F_DEN* = 'A') are assigned 'SB_ADENS',
    - Complex or horizontal stands (*STRUC* = 'C' or 'H') are assigned 'SB_STRUC', and
    - Stand with more than 70% black spruce or larch in the defining layer (*SB_LT_PCT* > 7 and *AVI_STORY* = 1 or *USB_LT_PCT* > 7 and *AVI_STORY* = 2 or *CSB_LT_PCT* > 7 and *AVI_STORY* = 9) and classed as fair TPR are assigned 'SB_SBLT'.

7.2.10 Defined Forest Area Deletion (D_DFA)

This deletion identified specific areas outside the Defined Forest Area from information in *LB_LABEL*. The Alexis Reserve is assigned 'ALEXIS'; the Eagle River campground is assigned 'CAMP'; the Whitecourt dump is assigned 'DUMP'; ANC and Mobil sites are assigned 'IND_SITE'; and private and not classified areas are assigned to 'XDFA'. All coded areas were outside the DFA.

7.2.11 Recreation Area Deletions (D_REC)

This deletion identified recreation areas on the classified landbase. The Eagle River Campground (LB_LABEL = 'Eagle River Campground') was assigned 'CAMP' and parks and natural areas (DFA = 'PARKS') were assigned 'PARKS'.

7.2.12 Isolated Stand Deletion (D_ISO)

This identifies isolated and inaccessible stands. Isolated stands are completely surrounded by water buffers and were identified during the riparian buffer creation process with IN_WATER code of 1. These were assigned to 'ISO'. Stands on islands in the Athabasca River with the comp_code = 'ISL' were assigned to 'ISL' unless they were planned for harvest (BLK_GRP = 'PLANNED').

7.3 Final characterization for classified landbase

The fields identified by 'F_' indicate the final classification for a polygon and reflect all updates to the inventory. They show the classification based on a single source of information.

7.3.1 Final Defining Layer (F_STORY)

F_STORY identified the source of information used to characterize a polygon. As outlined in Section 6.1, each AVI stand had strata calculated for the overstory (layer 1), the understory (layer 2) and if required the composite layer (layer 9). For each stand a single layer was identified as the defining layer, the layer used to characterize the AVI stand. This value was

stored in AVI_STORY. AVI_STORY was assigned to F_STORY for all polygons that will be characterized by AVI.

The classified landbase also includes areas that have been updated from the AVI attributes. Polygons which fall within an existing cutblock are assigned F_STORY = 4. Cutblock attributes generally override AVI attributes with a few specific exceptions that are documented with each attribute. Fire regeneration survey polygons which identify productive strata are assigned F_STORY = 8. Linear features (roads and utility corridors) and surface leases established since AVI are assigned F_STORY = 3. Seismic polygons carry the *F_STORY* of the underlying stand. Table 37 outlines the assignment of F_STORY. This identifies the defining layer to use to assign attributes for stands characterized by AVI or from updated information.

Table 37. F_STORY assignment.

F_STORY	Stand Description	Selection criteria	Order
4	Existing harvest blocks	*BLK_GRP* = 'EXIST'	1
8	Regenerating area within recent burns	*BLK_GRP* = 'FIRE_REG'	2
3	Non-forested landuse disposition	*DISP_TYPE* NOT ('DRS','PNT'','PRI','REC') or NUL	3
AVI_STORY	Areas assigned by AVI attributes	*AVI_STORY* > 0	4
1	No inventory or other vegetation information		

The *F_STORY* value was assigned in the following order:

- All existing blocks (*BLK_GRP* = 'EXIST') were assigned *F_STORY* = 4,
- All fire survey areas (*BLK_GRP* = 'FIRE_REG') were assigned *F_STORY* = 8,
- All landuse dispositions with the exceptions of *DISP_TYPE* of 'DRS', 'PNT', 'REC' and 'PRI' were assigned *F_STORY* = 3,
- All areas with AVI (*AVI_STORY* > 0) were assigned *F_STORY* = *AVI_STORY* (values of 1, 2 or 9), and
- All remaining areas were assigned the default *F_STORY* = 1.

7.3.2 Final Stand Deletion Code (F_DEL)

A hierarchy of assignment was used to identify the final deletion code for the polygon as indicated in the F_DEL attribute. Each polygon in the unmanaged landbase was assigned a single deletion code. This code was derived from the information contained in the fields classifying deletions (the D_ fields). The hierarchy of assignment is listed in Table 38. Those stands with no assigned deletions are given the *F_DEL* = 'NONE' code and are considered the managed landbase. Table 38 lists and describes the deletion codes in order of assignment. Figure 14 outlines the deletion decision rules.

Table 38. F_DEL deletion order and codes.

F_DEL Code	Description	Field	Selection criteria	Order
'XDFA'	Outside DFA	D_DFA	*D_DFA* <> NULL	1
'PARK'	Parks	D_REC	*D_REC* <> 'PARK'	2
'XAVI'	Area without AVI	D_INV	*D_INV* <> 'XAVI'	3
ROAD	Roads	D_LAND	ROAD	4
LINE	Linear Features and Utility Corridors	D_LAND	LINE	5
LEASE	Mineral and Surface Leases	D_LAND	LEASE	6
SEIS	Seismic	D_SEIS	SEIS	7
GOVRES	Government Disposition Reservations and Protective Notations	D_LAND	GOVRES	8
XDFA	Recent private land dispositions in LSAS	D_LAND	XDFA	9
REC	Recreation Leases	D_LAND	REC	10
TRAIL	Recreation and Historical Trails	D_ACCESS	SNOW or KLONDIKE	11
REC	Eagle River campground	D_REC	CAMP	12
NF	Nonforest Areas	D_NONFOR	NOT NULL	13
FIRE	Areas burned since AVI and not in cutblocks or fire survey areas	D_BURN	NOT NULL	14
TPR	Unproductive TPR	D_TPR	U	15
HYDROBUF	Ground rule water and waterfowl lake buffers	D_BUF	NOT NULL	16
LT	Larch stands	D_SUBJ	LT	17
SB	Black spruce stands in W11	D_SUBJ	SB	18
SB_STRUC	Complex or horizontal black spruce stands	D_SUBJ	SB_STRUC	19
SB_ADENS	A density black spruce stands	D_SUBJ	SB_ADENS	20
SB_SBLT	Sb or Sb/Lt stands with < 30% other species	D_SUBJ	SB_SBLT	21
ISL	Stands on islands in Athabasca River	D_ISO	ISL	22
ISO	Stands isolated by water buffers	D_ISO	ISO	23
NONE	Remaining polygons (managed landbase)			

For example, areas within a riparian buffer (*D_BUF* = 'GRBUF') that are part of a government disposition (*D_LAND* = 'GOVRES') would be assigned *F_DEL* = 'GOVRES'.

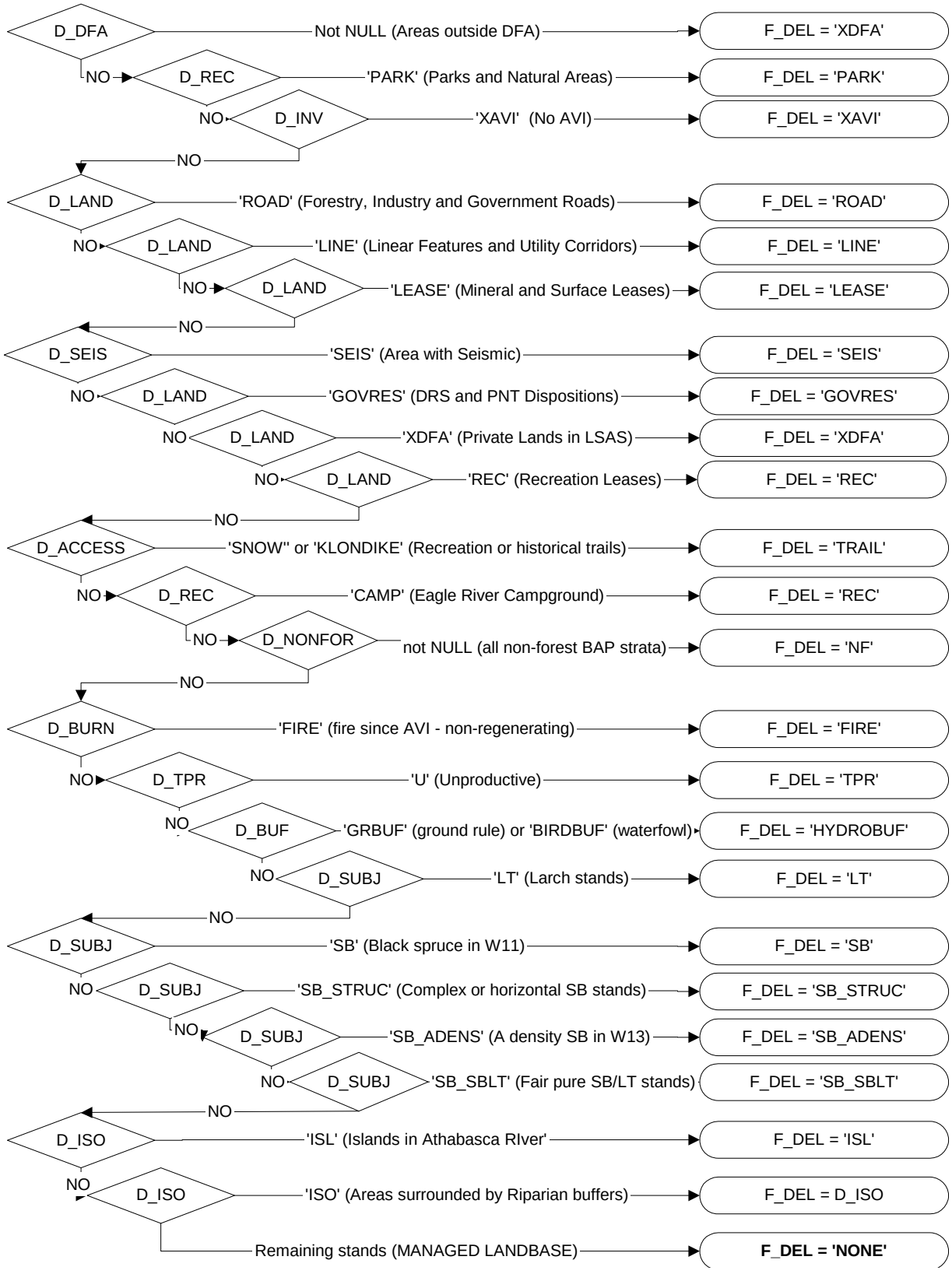

Figure 14. F_DEL assignment process.

7.3.3 Final SRD extended strata (F_SRD)

This indicated the SRD extended strata (*F_SRD*) calculated from AVI attributes and described in Section 6.4.2. Stands not classified by AVI (F_STORY in (3,4,8)) were converted from the assigned BAP strata to the first listed SRD strata in Table 15 (Forest stratification). Non-forested stands were assigned strata = 'XX0'. Areas without AVI (*D_INV* = 'XAVI') were assigned to 'X'. Table 39 lists the fields used to calculate final strata classifications as they vary by *AVI_STORY*. Fields used to populate F_SRD classification

Table 39. F_SRD assignment for stands characterized by AVI.

F_SRD	Description	AVI_STORY
STRATA_SRD	Classified from Layer 1	1
USTRATA_SRD	Classified from Layer 2	2
CSTRATA_SRD	Classified from Layer 9	9
'X'	No AVI available	

Table 40 shows the strata relationship between *F_BAP* and *F_SRD* for stands not classified by AVI.

Table 40. F_BAP to F_SRD and F_YC conversion

BAP Stratum F_BAP	Species Stratum F_YC	SRD Extended Stratum (SRD)
AW	AW	D1
PB		D4
BW	BW	D5
AW_PL	AP	DC2
AW_SWSB	AS	DC1
PB_CON		DC5
PL_DEC	PA	CD4
SWSB_DEC	SA	CD1
PL	PL	C4
SB	SB	C9
SW	SW	C1
LT	LT	C12

7.3.4 Final species strata (F_YC)

The species strata (*F_YC*) are based on groupings of the final BAP strata (F_BAP). Species strata are only assigned to forested stands. *F_YC* is assigned according to the data groups outlined in Table 27. It reflects the updates to *F_BAP* for thinned cutblocks in the Athabasca Flats area (see Table 41). Polygons without *F_YC* are assigned 'X'. Table 40 shows the strata relationship between *F_BAP* and *F_YC* for stands not classified by AVI.

7.3.5 Final BAP strata (F_BAP)

This indicated the BAP strata assigned to each polygon based on the *F_STORY* attribute as outlined in Table 41 and *BLK_GRP* attributes. Stands with *F_STORY* assignment of 1, 2 or 9 are based on AVI calculations. Existing clearcut cutblocks (*F_STORY* = 4) are assigned the *BLK_STRATA*. Linear features (*F_STORY* = 3) are assigned BAP strata of '103' except for the *DISP_TYPE* of 'RCD' which is assigned '206'. Thinned cutblocks are assigned BAP strata of the AVI defining layer with the exception of cutblocks in the Athabasca Flats harvest location. The strata for thinned stands in Athabasca Flats were updated to reflect the results of the harvest action. Thinned stands in Athabasca Flats with pine as leading coniferous species in AVI layer 1 were assigned 'PL_DEC' and all other Athabasca Flats blocks were assigned 'SWSB_DEC'. The species strata (*VHIL_YC*) assigned to fire survey polygons (*F_STORY* = 8) are converted to BAP strata using the assumption of 'AW' as the deciduous species in mixedwoods. Table 40 shows this assignment in reverse. AVI clearcut stands (*BLK_GRP* = 'MOD1') were assigned the BAP strata of 'AW_SWSB' to reflect an assigned managed (regenerating) strata.

Table 41. Fields used to populate F_BAP classification.

F_BAP	Description	Selection Criteria	Order
'X'	Area without AVI	*POLY_NUM = 0* or *POLY_NUM* is *NULL*	1
'PL_DEC'	Thinned blocks in Athabasca Flats with pine leading conifer	*HARV_LOC = 'ATHABASCA FLATS'* and BLK_GRP in ('EXIST_TH', 'PLAN_TH') and LEAD_CON = 'PL'	2
'SWSB_DEC'	Remaining thinned blocks in Athabasca Flats	*HARV_LOC = 'ATHABASCA FLATS'* and BLK_GRP in ('EXIST_TH', 'PLAN_TH')	3
BLK_STRATA	Existing clearcut blocks	*F_STORY* = 4	4
'SWSB_DEC'	Fire Survey areas ('SA' strata)	*F_STORY* = 8 and *VHIL_YC = 'SA'*	5
'PL_DEC'	Fire Survey areas ('PA' strata)	*F_STORY* = 8 and *VHIL_YC = 'PA'*	6
'AW_PL'	Fire Survey areas ('AP' strata)	*F_STORY* = 8 and *VHIL_YC = 'AP'*	7
AW_SWSB'	Fire Survey areas ('AW_SWSB' strata)	*F_STORY* = 8 and *VHIL_YC = 'AS'*	8
VHIL_YC	Remaining fire survey areas	*F_STORY* = 8 and *VHIL_YC* in ('AW','BW','PL','SB','SW')	9
'206'	Linear features disposition 'RCD'	*F_STORY* = 3 and *DISP_TYPE = 'RCD'*	10
'103'	Remaining linear features	*F_STORY* = 3 and *DISP_TYPE <> 'RCD'* and *DISP_TYPE* is not *NULL*	11
'AW_SWSB'	AVI CC 'A' density polygons	*BLK_GRP* = 'MOD1'	12
STRATA_BAP	Classified by AVI overstory	*F_STORY = 1*	13
USTRATA_BAP	Classified by AVI understory	*F_STORY = 2*	14
CSTRATA_BAP	Classified by AVI composite layer	*F_STORY = 9*	15
'X'	Remaining stands		

7.3.6 Leading species (F_LEAD_SP)

A single leading species was identified for each polygon. In coniferous and coniferous-leading mixedwood broad cover groups this was the leading conifer species of the defining layer. In deciduous and deciduous-leading mixedwoods it was the leading deciduous species.

In cutblocks and fire surveyed stands *F_LEAD_SP* was generated from the assigned *F_BAP* strata as shown in Table 42. For example *F_LEAD_SP* was 'AW' where *F*_BAP was ('AW','AW_PL','AW_SWSB'). In areas characterized by AVI, the species from the appropriate field (*LEAD_CON*, *ULEAD_CON*, *CLEAD_CON* or *LEAD_DEC*, *ULEAD_DEC*, *CLEAD_DEC*) of the layer's cover group (*C_CODE*, *UC_CODE*, *CC_CODE*) as indicated by

AVI_STORY were assigned. The field *F_STORY* (Section 7.3.1) indicates the source of information used to assign classifications. This differentiates cutblocks, AVI and fire surveys as sources for attribute assignments.

Table 42. Leading species assignment (F_LEAD_SP).

F_LEAD_SP	Description	Selection Criteria
X'	Nonforest areas	F_BAP in ('X','64','103','105','106','107','203','204','206','207','111
'AW'	Aspen leading managed strata	F_STORY in (4,8) and F_BAP in ('AW','AW_PL','AW_SWSB')
'PL'	Pine leading managed strata	F_STORY in (4,8) and F_BAP in ('PL_DEC','PL')
'SW'	Spruce leading managed strata	F_STORY in (4,8) and F_BAP in SWSB_DEC','SW')
F_BAP	Managed strata	F_STORY in (4,8) and F_BAP in ('BW','LT','PB','SB')
'AW'	AVI CC modifier stands	BLK_GRP = 'MOD1'
LEAD_DEC	Leading deciduous overstory	*F_STORY* = 1 and *C_CODE* in ('D','DC')
LEAD_CON	Leading coniferous understory	*F_STORY* = 1 and *C_CODE* in ('C','CD')
ULEAD_DEC	Leading deciduous understory	*F_STORY* = 2 and U*C_CODE* in ('D','DC')
ULEAD_CON	Leading coniferous understory	*F_STORY* = 2 and U*C_CODE* in ('C','CD')
CLEAD_DEC	Leading deciduous composite	*F_STORY* = 9 and C*C_CODE* in ('D','DC')
CLEAD_CON	Leading coniferous composite	*F_STORY* = 1 and *C_CODE* in ('C','CD')
'X'		

7.3.7 F_WET

This indicated the wetland classification for a polygon. Stands with an assignment in the *WET_CLASS* field were given the code ‘WET’. All other stands were assigned to ‘X’.

7.3.8 Final Stand density (F_DEN)

This indicated the final density (*F_DEN*) assigned to the polygon. Table 43 shows the fields used to assign density. The source of the information was dependent upon F_STORY assignment. Existing cutblocks (*F_STORY* = 4) and fire survey polygons (*F_STORY* = 8) are assigned ‘C’ density. Existing thinned cutblocks (BLK_GRP = ‘*EXIST_TH*’) are assigned to ‘B’ density. Non-thinned stands (F_STORY = 1, 2 or 9) are assigned the density from the appropriate layer. Areas without assigned density are given the value ‘X’.

Table 43. Fields used to populate final density (F_DEN) classification.

F_DEN	Description	Selection criteria	Order
'C'	Existing blocks	*F_STORY* = 4	1
'C'	Fire Survey areas	*F_STORY* = 8	2
'B'	Existing thinned blocks	*BLK_GRP* = 'EXIST_TH'	3
DENSITY	Area with density assigned by AVI overstory	*F_STORY* = 1 and *DENSITY* is not NULL	4
UDENSITY	Area with density assigned by AVI understory	*F_STORY* = 2 and *UDENSITY* is not NULL	5
CDENSITY	Area with density assigned by composite values	*F_STORY* = 9 and *CDENSITY* is not NULL	6
'X'	No density assigned		

7.3.9 Final Age (F_AGE)

This indicated the assigned age (F_AGE) for the polygon. Table 44 shows the fields used to assign age. The source of the information was dependent upon F_STORY assignment but all calculations used a base year of 2004, the year of the effective date. Existing cutblocks (*F_STORY* = 4) were assigned an age reflecting the years since harvest. Fire survey polygons (*F_STORY* = 8) were assigned an age reflecting years since burn. Existing thinned cutblocks (*BLK_GRP* = 'EXIST_TH') are assigned the age of the AVI overstory (layer 1). AVI CC modifier polygons (*BLK_GRP* = 'MOD1') were assigned an age reflecting years since assigned clearcut year (2004 – *CC_YEAR*). Non-thinned stands (*F_STORY* = 1, 2) are assigned the age calculated from the appropriate layer reflecting years since origin. Composite stands (*F_STORY* = 9) are assigned the maximum age for layers 1 and 2. Non-forest polygons had an age of 0 but were assigned an *F_AGE* of 1 due to modelling requirements for non-zero values. Polygons where age cannot be calculated were assigned a value of –99.

Table 44. Fields used to populate final age (F_AGE) classification.

F_AGE	Description	Selection criteria	Order
1	Nonforest areas	F_BAP in ('X','64','103','105','106','107','203','204','206','207','1111')	1
2004 - TIMBER_YEAR	Existing clearcut blocks	F_STORY = 4	2
2004 - FIRE_YEAR	Fire survey areas	F_STORY = 8	3
2004 - CC_YEAR	AVI CC Modifier polygons	BLK_GRP = 'MOD1'	4
UAGE	Classified by AVI understory	F_STORY = 2 and UAGE > 0	5
CAGE	AVI Composite stands	F_STORY = 9 and CAGE > 0	6
AGE	Areas with overstory age	AGE > 0	7
-99	No age assigned	8	

[1] The base year is 2004, the year of the effective date (May 1, 2004) of the landbase.

7.3.10 Final Timber Productivity (F_TPR)

Table 45 shows the fields used to assign a final timber productivity rating (*F_TPR*). The source of the information was dependent upon *F_STORY* assignment. Stands with *F_STORY* assignment of 1, 2 or 9 are based on AVI assignments of TPR for the layer. Existing cutblocks (*F_STORY* = 4) were assigned to *BLK_TPR* if available or *TPR* if not. Fire survey polygons (*F_STORY* = 8) were assigned to TPR of the pre-existing stand (AVI). Existing thinned areas (*BLK_GRP* = 'EXIST_TH') were assigned to TPR of the pre-thinned stand (AVI). Cutblocks and fire survey areas were assumed to be productive so any value of 'U' or NULL was reassigned to 'F'. In addition any existing cutblocks in W13 with a BAP strata of 'SB' were reassigned to at least a medium ('M') TPR. Stands classified by AVI were assigned the timber productivity calculated for AVI. For multi-story stands with a forested understory TPR from the most productive layer was assigned. For example, stands assigned to F_STORY = 2 were assigned to UTPR unless the TPR value was more productive.

Table 45. Fields used to populate final TPR (F_TPR) classification.

F_TPR	Description	Selection Criteria	Order
'X'	Nonforest areas	*F_BAP* in ('X','64','103','105','106','107', *'203','204','206','207','1111')*	1
'M'	Cutblocks in W13, SB strata and TPR < 'M'	*FMU_NUM* = 'W13' and *F_BAP* = 'SB' and *BLK_TPR in ('F','U')*	2
'F'	Cutblocks with unproductive TPR	*F_STORY* = 4 and *BLK_TPR* = 'U'	3
BLK_TPR	All remaining existing cutblocks	*F_STORY* = 4	4
'F'	Fire survey areas with unproductive TPR	*F_STORY* = 8 and *VHIL_TPR* = 'U'	5
VHIL_TPR	All remaining fire survey areas	*F_STORY = 8*	6
'F'	AVI CC stands with unproductive TPR	*BLK_GRP* = 'MOD1' and *TPR* = 'U'	7
TPR	All remaining AVI CC modifier areas	*BLK_GRP* = 'MOD1'	8
	Areas classified with AVI understory (layer 2)		
UTPR	Horizontal stands classified on layer 2	*F_STORY* = 2 and U*STRUC* = 'H'	9
TPR	TPR more productive than UTPR	*F_STORY* = 2 and TPR = 'G'	10
		F_STORY = 2 and TPR = 'M' and UTPR <> 'G'	11
		F_STORY = 2 and TPR = 'F' and UTPR <> ('M','G')	12
		F_STORY = 2 and TPR = 'U' and UTPR <> ('F','M','G')	13
UTPR	Remaining stands classified on Layer 2	*F_STORY* = 2	14
CTPR	Areas classified by composite values	*F_STORY* = 9 and *CTPR* is not NULL	15
TPR	Remaining area with assigned TPR	*TPR* is not NULL	16
X'	Area with no TPR		

7.3.11 Final Stand Origin (F_ORIGIN)

Origin is the disturbance that established the stand. The field *F_ORIGIN* indicates the origin code assigned to the polygon. Table 46 shows the criteria used to assign *F_ORIGIN* and the order of assignment.

Table 46. F_ORIGIN criteria in order of assignment.

F_ORIGIN	Description	Selection Criteria	Order
'X'	Nonforest areas	*F_BAP* in ('X','64','103','105','106','107', '203','204','206','207','1111')	1
'THIN'	Thinned areas	*BLK_GRP* = 'EXIST_TH'	2
'MGD'	Existing cutblocks	*F_STORY* = 4	3
'VHIL'	Fire survey areas	*F_STORY* = 8	3
'RECBURN'	Recently burned areas	*BURNCODE* = 'B' and *FIRE_YEAR* > 1994	4
'WIND'	Windfall burn pine	*BURNCODE* = 'B' and *FIRE_YEAR* = 1956 and ORIGIN = 1956 and *AVI_STORY = 1 and STRATA_BAP = 'PL' and USTRATA_BAP IS NULL*	5
'MGD'	AVI CC modifier areas	*BLK_GRP* = 'MOD1'	6
'NAT'	All remaining areas		

7.3.12 Final Stand Height (F_HGT)

This indicated the height of the stand. Height was based on the defining layer from AVI (or *HEIGHT* if understory height was 0) with some exceptions. Regenerating cutblocks after AVI (timber year between 1994 and 2003) and regenerating areas of the Virginia Hills and Roche Lake fires identified as the fire survey areas (*F_STORY* = 8) were assigned a height of 0. Any non-forest areas (including linear landuse updates) were assigned an height of 0. Where no

height can be assigned a value of –99 was assigned to fill the entries. Table 47 shows the criteria used to assign *F_HGT* and the order of assignment.

Table 47. F_HGT assignment.

F_HGT	Description	Selection Criteria	Order
0	Nonforest areas	*F_BAP* in ('X','64','103','105','106','107', '203','204','206','207','1111	1
0	Linear features	*F_STORY* = 3	2
0	Fire survey areas	*F_STORY* = 8	3
0	Regenerating (post 1993) cutblocks	*F_STORY* = 4 and *TIMBER_YEAR* > = 1994	4
0	Recently burned areas	*BURNCODE* = 'B' and *FIRE_YEAR* >= 1994 and *F_STORY* <> 4	5
UHEIGHT	Forested understory	*F_STORY* = 2 and UHEIGHT > 0	6
CHEIGHT	Composite stands	*F_STORY* = 9 and CHEIGHT > 0	7
HEIGHT	Forested stands	HEIGHT > 0	8
-99	No height value		

7.3.13 Final Stand Area (F_AREAHA)

This indicated the final stand area assigned to the classified landbase polygon. This is equivalent to the area of the polygon in hectares unless the polygon is a horizontal stand. For horizontal stands (*STRUC* = 'H') the area of the dominant portion of the stand (as defined in Section 7.1.4) is assigned (*AREA_HORIZ*).

Table 48. Final stand area assignment (F_AREAHA).

F_AREAHA	Description	Selection criteria
AREAHA_HORIZ	Final area (ha) of horizontal stands	*AREAHA_HORIZ* > 0
AREAHA_POL	Final area (ha) of remaining stands	

7.4 Additional fields or updates for TSA Landbase

7.4.1 Unique key (UKEY#_TSA, C_UKEY#_TSA)

The unique key for the TSA landbase is described 5.2.4. The *C_UKEY_TSA#* field shows this value in a character format for use in the TSA models.

7.4.2 Subcompartments (SUB_COMP)

SUB_COMP identified more operationally controllable units from portions of MWFP compartments (*COMP_CODE*). This was a manual process completed to break compartments into subcompartments. The breaks were selected based on major features or age class differences associated with compartments.

7.4.3 Chickadee Fire boundary

In 2006 the Chickadee Fire burned part of the DFMP landbase area. This fire occurred after the effective date of the landbase so the area is not considered a 'BURN' deletion; however the boundaries were required for TSA modelling. The TSA polygons impacted by the burn were identified through spatial overlay updating the *FIRE_YEAR* field to 2006 and *BURNCODE* field to 'B' for these polygons. This update allowed the model to identify these areas.

7.4.4 Seismic and trails on TSA Landbase (AREAHA_0M, AREAHA_4M, WIDTH_4M, AREAHA_8M, WIDTH_8M, WITH_SEIS, STRATA_SEIS, WITH_TR, AREAHA_TR, AREAHA_SEIS)

The seismic information from the classified landbase (Section 7.1.3) was carried on the TSA landbase. The Oracle SQL script *seismic_create_sum_table12_with_trail.sql* groups classified landbase polygons by *UKEY_TSA#* and summarizes the area under seismic, by type of line for each TSA landbase polygon. This information is carried in the fields AREAHA_0M (stand area without seismic), AREAHA_4M (stand area crossed by 4 metre wide seismic lines), AREAHA_8M (stand area crossed by 8 metre wide seismic lines). The WIDTH_4M and WIDTH_8M fields identify the occurrence of each group of seismic lines (WIDTH_4M is set to 4 if 4 metre wide seismic lines cross that particular TSA landbase polygon). The WITH_SEIS field is set to 100 for all TSA polygons which contain classified landbase polygons where *F_DEL* = 'SEIS' . The *STRATA_SEIS* field identified the BAP strata assigned to the seismic area and was calculated on the F_BAP strata assigned to the TSA landbase polygon using the assignment rules listed in Table 31.

The field *WITH_TR* was set to 100 for all TSA polygons which contain classified landbase polygons where *F_DEL* = 'TRAIL' indicating the Klondike or snowmobile trails cross these polygons. The *AREAHA_TR* field shows the area assigned to 'TRAIL' deletion code.

The AREAHA_SEIS was calculated as the sum of area under seismic and trails within each TSA polygons (AREAHA_4M + AREAHA_8M + AREAHA_TR).

7.4.5 Linear features on TSA Landbase (WITH_LIN, AREA_ROAD, AREA_LINE, AREA_XLIN)

The field *WITH_LIN* was set to 100 for all TSA polygons which contain classified landbase polygons where *F_DEL* = 'ROAD' or 'LINE'. The area for each group of features is carried in the *AREA_ROAD* and *AREA_LINE* fields. The field *AREA_XLIN* identifies the TSA polygon area which was not part of a road or linear disposition. It was calculated as the sum of area of classified landbase polygons with the TSA polygon boundary where F_DEL is not assigned to 'ROAD' or 'LINE'.

7.4.6 Horizontal area calculations on TSA Landbase (AREAHA_HORIZ, AREA_H_DEL)

Horizontal stand area was calculated only for the managed area of the landbase. On the TSA landbase the horizontal area was calculated after the area covered by roads, linear dispositions, seismic and trails has been removed from the polygon area. The remaining stand area was then adjusted by the structure percents listed in AVI to assign the *AREA_HORIZ* and *AREA_H_DEL* as listed in Table 32.

7.4.7 D_LAND and D_SEIS adjustments

An additional code was added to the *D_LAND* calculations to account for the area of TSA polygons where the full polygon area was accounted for in the *AREA_ROAD*, *AREA_LIN* and *AREAHA_SEIS* fields. These TSA landbase polygons had no available managed area and were assigned the *D_LAND* code of 'LINEAR'.

The *D_SEIS* field on the TSA landbase was set to 'SEIS' where *AREAHA_0M* = 0 indicating the full polygon was assigned to 'SEISMIC' or 'TRAIL' deletions.

7.4.8 Sliver polygon adjustment (D_AREA, AREAFLIP)

The sliver removal process on the TSA landbase removed many but not all sliver polygons. Patchworks, the TSA modelling software, does not easily process polygons less than 0.001 ha due to its method for tracking changes through time. These small polygons are also not useful at the strategic or operational level being an artefact of the multiunion process rather than representing actual landbase differences. On the modelling landbase it was decided to delete all polygons less than 0.01ha (10m X 10m) from the managed landbase.

New attribute fields *AREAFLIP* and *D_AREA* were added to identify these polygons. Small polygons on the landbase where F_AREAHA_TSA was less than 0.01 ha were assigned a value of 'Y' to the *AREAFLIP* field and a code of 'SMLPOLY' value in the *D_AREA* field. These polygons represent a final stand area of 2.534 ha of the final stand area on the gross landbase and 0.553ha on the managed landbase. Any of these small polygons on the managed landbase (*F_DEL* = 'NONE') were assigned the deletion of 'SMLPOLY'. The F_AREAHA_TSA was then recalculated to equal AREAHA_POL to account for all polygon area on the managed and unmanaged landbase. This process removed all modelling polygon areas to be less than 0.01 ha in size.

7.4.9 F_DEL Adjustments

F_DEL was recalculated to reflect the updates to *D_SEIS, D_LAND* and *D_AREA*. Areas were calculated on the basis of deletion assignments. *F_DEL* was assigned based on a heirarchy so each polygon was assigned to only one grouping. This was reflected in the *WITH_SEIS, WITH_TR* and *WITH_LIN* fields.

7.4.10 F_AREAHA_TSA Calculations

This area identified the final stand area assigned to the TSA landbase polygon. This was equivalent to the area of the polygon in hectares unless the polygon was a horizontal stand or was crossed by roads, linear dispositions, trails or seismic. For horizontal stands on the managed landbase the area of the dominant portion of the stand was assigned (*AREAHA_HORIZ*) (Section 7.4.6). For non-horizontal stands, the seismic area was removed from the area without linear features to provide the final stand area. This is calculated as:

F_AREAHA_TSA = AREA_XLIN – AREAHA_SEIS.

7.5 Modelling Fields

7.5.1 Black Spruce Deletion (D_SB_SUBJ)

During the development of the Spatial Harvest Sequence (SHS) MWFP identified the need for additional black spruce subjective deletions for the landbase. In the evaluation of the SHS for FMU W13, specific black spruce stands identified as part of the harvest sequence were reassigned to a black spruce subjective deletion.

These stands were identified as a deletion from the managed landbase with the deletion code of 'SB_SHS' in the *D_SB_SUBJ* deletion field. In addition a proportional reduction to available stand area for black spruce stands outside of the SHS was calculated. This is described in Section: 7.5.3.

7.5.2 Additional deletions for modelling (F_DEL_MOD)

The modelling landbase included a few additional deletions. To track these on the modelling and TSA landbases and separate the attribute assignment of the base landbase and the final landbase, the field *F_DEL_MOD* was added. The final modelling landbase included an adjustment for small polygons. Polygons in the TSA landbase assigned a deletion code of 'NONE' (managed landbase) with less than 0.01ha in managed area (*F_AREAHA_TSA* < 0.01ha) were removed from the managed landbase and assigned the deletion code of 'SMLPOLY'. The number of polygons reassigned was 230 with a spatial polygon area of 126 ha. However these 230 polygons represented a total of only 0.58 hectares on the managed landbase. The majority portion of each of these polygons was classified as a road, linear feature or seismic line.

Black spruce stands classified as subjective deletions during the evaluation of the spatial harvest sequence are identified by the code 'SB_SHS' in the *D_SB_SUBJ* deletion field and carry the same code in the *F_DEL_MOD* field. Table 49 shows the *F_DEL_MOD* assignment.

Table 49. F_DEL_MOD assignment rules.

F_DEL_MOD	Description	Selection Criteria	Order
'SMLPOLY'	Managed landbase polygons < 0.01 ha	*F_DEL* = 'NONE' and *F_AREAHA_TSA* < 0.01	1
'SB_SHS'	Black spruce deletion identified in SHS	*D_SB_SUBJ* = 'SB_SHS'	2
F_DEL	Remaining polygons		3

7.5.3 Final stand area after modelling (F_AREAHA_MOD).

The ratio of the area of black spruce stands dropped from the SHS and the total area of black spruce stands in the SHS was used to proportionally reduce the W13 black spruce available harvest volumes. This was done by a proportional area reduction for black spruce stands outside the SHS by .3548. On the modelling landbase the *F_AREAHA_TSA* (managed stand area) was adjusted for black spruce stands outside the SHS. Stand area for the remaining black spruce stands within the SHS were not adjusted nor were non black spruce stands. The updated areas are carried in the *F_AREAHA_MOD* field. Attribute calculation is shown in Table 50.

Table 50. F_AREAHA_MOD assignment rules.

F_AREAHA_MOD	Description	Selection criteria
F_AREAHA_TSA	Stands in Spatial harvest sequence (SHS)	*PROP_DELTA* > 0
F_AREAHA_TSA * 0.6432	Black spruce stands outside SHS	*F_YC* = 'SB' and *PROP_DELTA* = 0
F_AREAHA_TSA	Final area (ha) of remaining stands	

7.5.4 Adjust the effective date TSA modelling

The effective date of the landbase was the year 2004 for the Millar Western 2007-2016 DFMP. The effective date of the TSA was 2007. The TSA process has continued over a number of years and the boundaries and location for blocks harvested or planned for harvest between 2004 and 2007 has changed. This time period between the effective date on the landbase and the start date of the TSA needed to be modeled. The time period prior to the start of the TSA was set to 5 years to match the length of periods in the TSA. This consistent length standardized the reporting periods. Therefore the start date of the Modelling landbase was set to 2002 which allowed a single period before the start of the TSA. Landbase attributes calculated using effective date were updated on the modelling landbase to reflect a base year of 2002. Existing blocks for the years 2002 and 2003 were considered planned harvest in the TSA models.

7.5.5 Modelling Action (ACTION)

The *ACTION* field in the landbase was meant to allow the TSA model to determine what action should occur to each stand. Each action code corresponded to a different action or silvicultural system in the TSA model. Actions included thinning, deciduous harvest and clearcutting. The specific rules used to assign each polygon to an action can be seen in Table 51.

Table 51. TSA model ACTION assignment.

ACTION	Description	Selection criteria	Order
6	Athabasca Flats planned areas for thinning	*HARV_LOC* = 'Athabasca Flats'	1
6	Commercial thinning planned	*BLK_ACT* = 'CT'	2
5	Stand conversion	*BLK_ACT* = 'CP'	3
2	Deciduous harvest planned	*F_BAP* IN ('AW, 'PB', 'BW')	4
4	Remaining polygons (clearcutting action)		5

7.5.6 Planned Block designation in model (PREBLOCK)

The *PREBLOCK* field identified areas that were planned for future harvest actions before the start of modelling. In the TSA model three different sets of planned blocks were designated. The first set of planned blocks identified areas harvested in 2002 and 2003, prior to the effective date of the landbase (2004). These areas were shown as planned blocks as the start date of the TSA was before the start date of the DFMP. The second set of planned blocks identified blocks harvested or planned to be harvested in the timber years between 2004 and 2006. The last set identified blocks planned for harvest after 2007. The PREBLOCK assignment rules are listed in Table 52.

Table 52. PREBLOCK assignment rules.

PREBLOCK	Description	Selection criteria	Order
A	2002 - 2003 harvest blocks	*F_DE* L = 'NONE' and (*TIMBER_YEAR* = 2002 or 2003)	1
P	2004 - 2006 planned blocks	*F_DEL* = 'NONE' and (*TIMBER_YEAR* = 2004 or 2005 or 2006)	2
Y	2007 + planned blocks	*F_DEL* = 'NONE' and *TIMBER_YEAR* > 2006	3
NULL	Not a planned block		4

7.5.7 Cutting Period (CUT_PERIOD)

The CUT_PERIOD field code grouped planned harvest into 5 year periods beginning in 2002 for use in TSA modelling. In W11 all the deciduous and deciduous mixedwood blocks were assigned a cut period of 3. This assignment was required as the level of scheduled deciduous harvest volume in 'W11' was too large to achieve the coniferous harvest level in the 2007-2011 cutting period. By shifting the deciduous blocks it was possible to schedule enough volume in both periods. Table 53 shows the *CUT_PERIOD* assignment rules.

Table 53. CUTPERIOD assignment rules.

CUT_PERIOD	Description	Selection Criteria	Order
3	Deciduous planned blocks in W11	*PREBLOCK* IS NOT NULL and *FMU_NUM* = 'W11' and *F_BAP* IN ('AW','PB','BW','AW_PL','AW_SWSB','PB_CON')	1
CEIL(*TIMBER_YEAR* - 2001) / 5)	Remaining planned blocks	*PREBLOCK* IS NOT NULL	2
NULL	Not a planned block		3

7.5.8 TSA model theme assignments (THEME1 to THEME13)

Theme fields are used for input to the TSA model. These fields are calculated directly from attributes on the landbase or represent groupings of landbase attributes fields.

Theme1

THEME1 differentiates between the FMU W11 and W13 and identifies sub areas within each FMUs. *THEME1* assignment rules are shown in Table 54.

Table 54. THEME1 assignment rules.

THEME1	Description	Selection Criteria	Order
'W11_EAST'	W11 East	*LOCATION* = 'Fort Assiniboine' and COMP_CODE IN ('WLK', 'FLC', 'TIM', 'MUD', 'AKU', 'LEL', or 'KLO')	1
'W11_WEST'	W11 West	*LOCATION* = 'Fort Assiniboine'	2
'W13_VHIL'	W13 Virginia Hills Area	*LOCATION* = 'Virginia Hills'	3
'W13_MCLD_N'	W13 McLeod North	*LOCATION* = 'McLeod' and *COMP_CODE* IN ('TCK','SAK','BLK','PCK','CHC','AHL','ALR','CRC','CRL')	4
'W13_MCLD_S'	W13 Mcleod South	*LOCATION* = 'McLeod'	5
'W13_MCLD_S'	W13 Mcleod South FGL	*LOCATION* = 'FGL'	6
'W13_BLRG'	W13 Blue Ridge	*LOCATION* = 'Blue Ridge'	7
'W13_WCRT'	W13 Whitecourt	*LOCATION* = 'Whitecourt'	8

THEME2

THEME2 identified the different land use areas within the classified landbase. Some of the areas were used to control harvesting in specific areas while others were used to schedule special treatments in some areas. Table 55 shows the assignment rules used to assign THEME2.

Table 55. THEME2 assignment rules.

THEME2	Description	Selection Criteria	Order
'FMA_ATHF'	Athabasca Flats	*HARV_LOC* = 'Athabasca Flats'	1
'FMA_HUES'	Huestis demonstration forest	*LB_LABEL* = 'Huestis Forest'	2
DFA	Grazing Permit	*DFA* = 'GRP'	3
DFA	Grazing Lease	*DFA* = 'GRL'	4
'FMA_FGL'	Forest grazing license inside FMA	*LOCATION* = 'FGL'	
DFA	Forest grazing license outside FMA	*DFA* = 'FGL'	6
'FMA_REST'	Other FMA areas	*DFA* = 'FMA'	7
'NON_DFA'	Outside DFA		8

THEME3

THEME3 reflected the final BAP strata for the polygon. The 'SB' stratum was split based on the moisture regime assigned in AVI to reflect biological differences in the type as shown in Table 56.

Table 56. THEME3 assignment rules.

THEME3	Description	Selection Criteria	Order
'SB_LOW'	BAP Lowland SB	*F_BAP* = 'SB' and *MOIST_REG* = 'w'	1
'SB_UP'	BAP Upland SB	*F_BAP* = 'SB'	2
F_BAP	Rest		3

THEME4

THEME4 showed the assigned TPR of the stand in a numeric translation as outlined in Table 57.

Table 57. THEME4 assignment rules

THEME4 Code	Description	Selection Criteria	Order
'1'	Good timber productivity sites	*F_TPR* = 'G'	1
'2'	Medium timber productivity sites	*F_TPR* = 'M'	2
'3'	Fair timber productivity sites	*F_TPR* = 'F'	3
TPR	Unproductive	*F_TPR* = 'U'	4
'X'	Unclassified (all remaining)		5

THEME5

THEME5 grouped the final density (F_DEN) into 2 classes as shown in Table 58.

Table 58. THEME5 assignment rules.

THEME5	Description	Selection Criteria	Order
'AB'	A or B density	*F_DEN* IN('A' , 'B')	1
'CD'	C or D density	*F_DEN* IN *(*'C' , 'D')	2
'X'	all remaining		3

THEME6

THEME6 identified the stand origin process. Existing blocks from 2002 and 2003 were considered natural stands due to the roll back from the effective date to the start date of TSA modelling. Table 59 shows the assignment rules.

Table 59. THEME6 assignment rules.

THEME6	Description	Selection Criteria	Order
'NAT'	Existing thinning	*BLK_GRP* = 'EXIST_TH'	1
'EXT'	Regenerating Deciduous	*(BLK_STATUS* = 'COMPLETE' or *BLK_GRP* = 'MOD1') and *ACTION* = 2	2
'LOWINT'	Regenerating Coniferous	*(BLK_STATUS* = 'COMPLETE' or *BLK_GRP* = 'MOD1') and *ACTION* = 4	3
F_ORIGIN	Recent Burns	*F_ORIGIN* = 'RECBURN'	4
F_ORIGIN	Virginia Hills Areas	*F_ORIGIN* = 'VHIL'	5
'NAT'	Remaining stands		6

THEME7

THEME7 identified thinned stands for yield curve assignment as shown in Table 60.

Table 60. THEME7 assignment rules.

THEME7	Description	Selection Criteria	Order
'COMMTHN_ST'	Salvage Thinned	*BLK_GRP = 'EXIST_TH' and SILV_SYSTEM = 'TS'*	1
'COMMTHN_CT'	Commercial Thinned	*BLK_GRP = 'EXIST_TH'*	2
'NORET'	Remaining stands		3

THEME8

THEME8 described operability within planned 2002 to 2006 blocks. This allowed the planned blocks to be forced in Woodstock with flexibility that was initially needed, but removed towards the end of the TSA process; once planned blocks were decided.

Table 61. THEME8 assignment rules.

THEME8	Description	Selection Criteria	Order
'NONOP'	Not Operable	*F_DEL* <> 'NONE'	1
'A2'	2002-2003 deciduous harvest	*TIMBER_YEAR* IN (2002,2003) and *PREBLOCK* IS NOT NULL and *ACTION = 2*	2
'A5'	2002 -2003 crop plans	*TIMBER_YEAR* IN (2002,2003) and *PREBLOCK* IS NOT NULL and *ACTION = 5*	3
'A6'	2002-2003 commercial thinning	*TIMBER_YEAR* IN (2002,2003) and *PREBLOCK* IS NOT NULL	4
'A4'	2002-2003 non-deciduousharvest	*TIMBER_YEAR* IN (2002,2003) and *PREBLOCK* IS NOT NULL and *ACTION = 6*	5
'P2'	2004-2006 deciduous harvest	*TIMBER_YEAR* IN (2004,2005,2006) and *PREBLOCK* IS NOT NULL and *ACTION = 2*	6
'P5'	2004-2006 crop plans	*TIMBER_YEAR* IN (2004,2005,2006) and *PREBLOCK* IS NOT NULL and *ACTION = 5*	7
'P6'	2004 through 2006 commercial thinning	*TIMBER_YEAR* IN (2004,2005,2006) and *PREBLOCK* IS NOT NULL and *ACTION = 6*	8
'P4'	2004-2006 non-deciduous harvest	*TIMBER_YEAR* IN (2004,2005,2006) and *PREBLOCK* IS NOT NULL	9
'ELIG'	Other operable srea		10

THEME9

THEME9 identified AVI cutblocks, identified with *BLK_GRP* = ‘MOD1’ on the landbase.

THEME10 and THEME11

Spare themes not needed in the final model.

THEME12

THEME12 was required to track the different water indicators on the landbase. It represented a rollup of the slope measure of watersheds on the landbase. Table 62 shows the assignment rules.

Table 62. THEME12 assignment rules.

THEME12	Description	Selection criteria	Order
'0_2'	0-2% slopes	AVG_SLP <= 2.5	1
'3_4'	3-4% slopes	AVG_SLP <= 4.5	2
'5_6'	5-6% slopes	AVG_SLP <= 6.5	3
'7_8'	7-8% slopes	AVG_SLP <= 8.5	4
'9_14'	9+% slopes	AVG_SLP > 9.5	5
'0_2'	Unclassified		6

THEME13

THEME13 combined the soil classification and wetland class. This theme was required to track the wetland modifiers and assignment rules are shown in Table 63.

Table 63. THEME13 assignment rules.

THEME13	Description	Selection Criteria	Order
'WETLAND'	Wetland	*F_WET* = 'WET'	1
'CRSMIN'	Coarse Mineral	*SOIL_CLASS* = 'Coarse Mineral'	2
'FINMIN'	Fine Mineral	*SOIL_CLASS* = 'Fine Mineral'	3
'FARM'	Farm Land	*SOIL_CLASS* = 'Farm Land'	4
'MEDMIN'	Medium Mineral	*SOIL_CLASS* = 'Medium Mineral'	5
'RIPAR'	Riparian	*SOIL_CLASS* = 'Riparian'	6
'X'	Remaining stands		7

7.5.9 Patchworks Compartment (PW_COMPART)

Patchworks compartments were used to allow or disallow the Patchworks model to schedule harvest in certain areas during certain periods of times. *PW_COMPART* had two parts. The base assignment identified the Chickadee fire boundary or planned blocks then assigned the sub-compartment (if available) or the operational compartment code. This is shown in Table 64.

Table 64. Initial Patchworks compartment assignment.

PW_COMPART (base assignment)	Description	Selection Criteria	Order
'CHICK_FIRE'	Chickadee Fire deferal area	*FIRE_YEAR* = 2006	1
'PLN_BLK'	Planned blocks	*PREBLOCK* IS NOT NULL	2
SUB_COMP	Sub compartments where available	*SUB_COMP* IS NOT NULL	3
COMP_CODE	Remaining stands		4

The second step was to assign a suffix to PW_COMPART to reflect the additional information outlined in Table 65.

Table 65. Available Patchworks compartment modifiers

Add Suffix for PW_COMPART	Description	Selection Criteria	Order
'_BURN'	Burned watershed (Forward)	*WSD_CLASS* = 'BURN'	1
'_REF'	Reference watershed (Forward)	*WSD_CLASS* = 'REFERENCE'	2
'_NOHAR'	No more harvest watershed (Forward)	*WSD_CLASS* = 'NO MORE HARVEST'	3
'_WIND'	Windfall Burn	*F_ORIGIN* = 'WIND'	4
'_C#_XFMA'	Coniferous leading areas outside of the FMA	*DFA* <> 'FMA' and *FMU_NUM* = 'W13' and *F_BAP* IN ('LT','PL','PL_DEC','SB','SW','SWSB_DEC')	5
'_D#_XFMA'	Deciduous leading areas outside of the FMA	*DFA* <> 'FMA' and *FMU_NUM* = 'W11' and F_BAP IN ('AW','BW','PB','AW_PL','AW_SWSB','PB_CON")	6
'_ATHF'	Athabasca Flats area	*THEME2* = 'FMA_ATHF'	7
'_HUES'	Huestis demonstration forest	*THEME2* = 'FMA_HUES'	8
'_THIN'	Previously thinned areas	*BLK_GRP* = 'EXIST_TH'	9
PW_COMPART	Remaining stands		10

7.5.10 Stand Age for TSA model (TSA_AGE)

F_AGE was reduced by 2 years on the modelling landbase to reflect the change in effective date to TSA start date. Stands harvested in 2002 and 2003 were updated from existing to planned harvest and the stand age of the defining layer was assigned to the landbase.

TSA_AGE for the TSA Landbase was assigned based on F_AGE from the classified landbase. It was the adjusted on the modelling landbase to reflect the change to TSA start date.

There was a maximum value set on ages in the TSA models, and it was possible that managed stands were older than the maximum allowed age. The TSA_AGE and TSA_PER fields for stands which exceeded the maximum lifespan or were within 5 years of the reaching the maximum lifespan were reset to 5 years younger than the maximum age (lifespan) as listed in Table 66.

Table 66. Adjustment of TSA_AGE for maximum ages allowed in the TSA models.

TSA_AGE	THEME3	Description	Lifespan	Selection Criteria	Order
145	AW	Aspen stands	150	THEME3 = 'AW' and F_AGE > 145	1
145	PB	Poplar stands	150	THEME3 = 'PB' and F_AGE > 145	2
105	BW	Birch stands	110	THEME3 = 'BW' and F_AGE > 105	3
155	AW_PL	Aspen-Pine mixedwood	160	THEME3 = 'AW_PL' and F_AGE > 155	4
175	AW_SWSB	Aspen-Spruce mixedwood	180	THEME3 = 'AW_SWSB' and F_AGE > 175	5
175	PB_CON	Poplar-Conifer mixedwood	180	THEME3 = 'PB_CON' and F_AGE > 175	6
195	PL_DEC	Pine - deciduous mixedwood	200	THEME3 = 'PL_DEC' and F_AGE > 195	7
175	SWSB_DEC	Spruce - decidous mixedwood	180	THEME3 = 'SWSB_DEC' and F_AGE > 175	8
205	LT	Larch stands	210	THEME3 = 'LT' and F_AGE > 205	9
215	PL	Pine stands	220	THEME3 = 'PL' and F_AGE > 220	10
175	SB_UP	Black spruce upland stands	180	THEME3 = 'SB_UP' and F_AGE > 175	11
245	SB_LOW	Black spruce lowland stands	250	THEME3 = 'SB_LOW' and F_AGE > 245	12
205	SW	White spruce stands	250	THEME3 = 'SW' and F_AGE > 205	13
TSA_AGE	ALL STANDS	All remaining			14

Field checking of stands planned for harvest identified stands appropriate for harvest where age was less than the minimum harvest age allowed by the TSA model. TSA_AGE for these stands was increased to the minimum age to accurately represent their operability in the TSA model. The minimum harvest ages by FMU can be seen in Table 67.

Table 67. Minimum harvest ages of natural stands by FMU.

	FMU W11			FMU W13		
	F_TPR			F_TPR		
F_YC	G	M	F	G	M	F
AW	61	61	61	76	81	86
PB	61	61	61	76	81	86
BW	61	61	61	76	81	86
AP	81	81	81	61	66	71
AS	81	81	81	81	86	91
PA	81	81	81	61	66	71
SA	81	81	81	81	86	91
PL	81	81	81	61	76	76
SB	101	101	101	86	91	-
SW	81	81	81	81	86	91

7.5.11 TSA Age represented in 5 year periods (TSA_PER)

TSA_PER was calculated by dividing the TSA_AGE by 5 and then rounding up.

7.5.12 Volume fields (CONVOL and DECVOL)

The standing merchantable 2007 coniferous and deciduous volumes were shown in these fields

7.5.13 Patchworks results fields (PROP_TREAT and PROP_DELTA)

The Patchworks PFMS schedule for years 2007 – 2026 was attached to the landbase in these fields. The PROP_DELTA field showed the year of harvest and the PROP_TREAT field showed whether the stand was scheduled for clearcutting or thinning.

7.5.14 Harvest Volume fields (CONHARVOL and DECHARVOL)

The coniferous and deciduous volume harvested from each polygon, associated with the PROP_TREAT and PROP_DELTA actions were shown in these fields

7.5.15 Simplify Ecosite assignment (EDASITE)

Ecosite was an attribute carried on the TSA landbase (Section 3.8.2) and consisted of a group of probable ecosites for each polygon. This was more complex than required in the model where a single ecosite call for each polygon was desired. This simplification of ecosite was stored in the field *EDASITE* and calculated separately for FMU W11 and W13.

In W11 the ecosites were listed by probability of occurrence, so the first ecosite call was extracted. Table 68 shows the assignment rules for W11.

Table 68. W11 EDASITE assignment

EDASITE	Description	Selection Criteria
e	assign all forested areas to a real ecosite	*F_BAP* IS NOT NULL and *ECOSITE* IN (NULL, 'z')
e	assign all terrestrial, undeveloped areas to an ecosite	*D_INV* IS NULL and *ECOSITE* IN (NULL,'x', 'v')
w	ensure non-terrestrial areas have non-vegetated ecosite	*F_BAP* = '64' and *ECOSITE* IN (NULL, 'x')
z	ensure exposed areas have non-soil ecosite	*F_BAP* = '107' and *ECOSITE* IS NULL
y	ensure developed areas have non-vegetated ecosite	*F_BAP* = '103' and *ECOSITE* IS NULL
d	assign all terrestrial, undeveloped areas to an ecosite	*ECOSITE* = 'x'
ECOSITE	Assign first letter listed for ecosite	

In W13 the ecosite possibilities were listed in terms of alphabetic order. This made it more difficult to assign an individual ecosite, or edasite to the polygons. Table 69 shows the assignment rules used to assign the edasite to W13. The ecosite call assigned was selected to reflect the call that best fit the silvicultural impact assessment group treatments under assessment.

Table 69. W13 EDASITE assignment

EDASITE	Description	Selection Criteria
e	assign all forested areas to a real ecosite	*F_BAP* IS NOT NULL and *ECOSITE* IN (NULL, 'z')
e	assign all terrestrial, undeveloped areas to an ecosite	*D_INV* IS NULL and *ECOSITE* IN (NULL,'x', 'v')
w	ensure non-terrestrial areas have non-vegetated ecosite	*F_BAP* = '64' and *ECOSITE* IN (NULL, 'x')
z	ensure exposed areas have non-soil ecosite	*F_BAP* = '107' and *ECOSITE* IS NULL
y	ensure developed areas have non-vegetated ecosite	*F_BAP* = '103' and *ECOSITE* IS NULL
c*		*NSR* = 'BM' and *F_BAP* = 'PL' and *ECOSITE* = 'c/d'
e		*NSR* = 'BM' and *F_BAP* IN ('SW','SWSB_DEC') and *ECOSITE* = 'd/e'
e		*NSR* = 'BM' and *F_BAP* = 'SW' and *ECOSITE* = 'd/f'
f		*NSR* = 'BM' and *F_BAP* = 'PL' and *ECOSITE* = 'e/f'
d		*NSR* = 'BM' and *ECOSITE* = 'b/d'
d		*NSR* = 'BM' and *ECOSITE* = 'c/d'
f		*NSR* = 'BM' and *ECOSITE* = 'd/f'
h		*NSR* = 'BM' and *ECOSITE* = 'd/h'
I		*NSR* = 'BM' and *ECOSITE* = 'g/i'
j		*NSR* = 'BM' and *ECOSITE* = 'i/j'
k		*NSR* = 'BM' and *ECOSITE* = 'j/k'
ECOSITE	Assign first letter listed for ecosite	*NSR* = 'BM'
c*		*NSR* = 'LF' and *F_BAP* = 'PL' and *ECOSITE* = 'c/e'
d*		*NSR* = 'LF' and *F_BAP* IN('PL','SB','AW_PL') and *ECOSITE* = 'd/e'
d*		*NSR* = 'LF' and *F_BAP* = 'SB' and *ECOSITE* = 'd/h'
f		*NSR* = 'LF' and *F_BAP* IN('PL','SWSB_DEC','AW_PL') and *ECOSITE* = 'e/f'
f*		*NSR* = 'LF' and *F_BAP* NOT IN('PL','SWSB_DEC','AW_PL') and *ECOSITE* = 'e/f'
e		*NSR* = 'LF' and *F_BAP* = 'SWSB_DEC' and *ECOSITE* = 'e/i'
e		*NSR* = 'LF' and *F_BAP* IN('SW','SWSB_DEC') and *ECOSITE* = 'e/j'
j*		*NSR* = 'LF' and *F_BAP* = 'SB' and *ECOSITE* = 'e/j'
i		*NSR* = 'LF' and *F_BAP* = 'AW' and *ECOSITE* = 'f/i'
f*		*NSR* = 'LF' and *F_BAP* IN('AW_SWSB','PB_CON','SWSB_DEC','SW') and *ECOSITE* = 'f/i'
i		*NSR* = 'LF' and *ECOSITE* = 'e/i'
j		*NSR* = 'LF' and *ECOSITE* = 'e/j'
j		*NSR* = 'LF' and *ECOSITE* = 'f/j'
i		*NSR* = 'LF' and *ECOSITE* = 'h/i'
k		*NSR* = 'LF' and *ECOSITE* = 'h/k'
l		*NSR* = 'LF' and *ECOSITE* = 'k/l'
m		*NSR* = 'LF' and *ECOSITE* = 'l/m'
ECOSITE	Assign first letter listed for ecosite	*NSR* = 'LF'
d*		*NSR* = 'UF' and *F_BAP* IN('PL','SW','SB') and *ECOSITE* = 'd/e'
f*		*NSR* = 'UF' and *F_BAP* IN('AW_SWSB','PB_CON','SWSB_DEC','PL','SW') and *ECOSITE* = 'e/f'
i*		*NSR* = 'UF' and *F_BAP* = 'PL' and *ECOSITE* = 'e/i'
j*		*NSR* = 'UF' and *F_BAP* IN('SWSB_DEC','SW') and *ECOSITE* = 'e/j'
h		*NSR* = 'UF' and *F_BAP* = 'PL' and *ECOSITE* = 'h'
ECOSITE	Assign first letter listed for ecosite	*NSR* = 'UF'

8. Landbase Summaries

Summaries for the classified landbase, the TSA landbase and the modelling landbase are presented in this section. The final version of the modelling landbase included additional black spruce deletions identified as part of the review of the spatial harvest sequence. An updated summary of the final landbase with additional black spruce deletions is included. These values correspond to the information outlined in the preferred forest management strategy.

8.1 Classified Landbase

8.1.1 Classification by AREA

The classified landbase consists of 542,490 polygons with a total area of 478,507 ha. Table 70 shows the distribution between FMUs W11 and W13.

Table 70. Classified landbase area summary.

FMU_NUM	AREA (ha) (from areaha_pol)	Polygons (count)
W13	301,873	421,568
W11	176,634	120,922
Full Landbase	478,507	542,490

Table 71 summarizes the classified landbase by disposition groups. Table 72 summarizes the managed landbase by species strata. The area of each grouping within W11 and W13 and the total area and percent of total area are also shown. More detailed summaries and figures are included in the Sections 8.1.2 and 8.1.3.

Table 71. Unmanaged classified landbase area summary.

Description	FMU	W11	W13	ALL	% Gross Area
	Gross Landbase (ha)	**176,634**	**301,873**	**478,507**	
Area outside FMA (including parks)	**Stand area**	**11,557**	**14,490**	**26,048**	
or areas without AVI	Running sum of deleted	11,557	14,490	26,048	5%
	Landbase area remaining	165,077	287,383	452,460	95%
Linear dispositions and seismic	**Stand area**	**4,807**	**16,886**	**21,693**	
	Running sum of deleted	16,364	31,377	47,741	10%
	Landbase area remaining	160,270	270,497	430,766	90%
Non-linear landuse dispositions	**Stand area**	**1,590**	**3,432**	**5,021**	
	Running sum of deleted	17,954	34,808	52,762	11%
	Landbase area remaining	158,680	267,065	425,745	89%
Recreation and trails	**Stand area**	**13**	**91**	**105**	
	Running sum of deleted	17,967	34,900	52,867	11%
	Landbase area remaining	158,667	266,974	425,640	89%
Nonforest, burnt or nonproductive	**Stand area**	**35,464**	**28,377**	**63,842**	
	Running sum of deleted	53,432	63,277	116,709	24%
	Landbase area remaining	123,202	238,596	361,798	76%
Water buffers	**Stand area**	**2,626**	**6,095**	**8,721**	
	Running sum of deleted	56,058	69,372	125,430	26%
	Landbase area remaining	120,576	232,501	353,077	74%
Larch and black spruce	**Stand area**	**32,781**	**19,430**	**52,211**	
subjective deletions	Running sum of deleted	88,839	88,802	177,641	37%
	Landbase area remaining	87,795	213,072	300,867	63%
Isolated stands	**Stand area**	**14**	**511**	**526**	
	Running sum of deleted	88,853	89,313	178,166	37%
	Landbase area remaining	87,781	212,560	300,341	63%
Horizontal stand deletion	**Stand area**	**412**	**145**	**557**	
from managed landbase	Total area under deletion	89,265	89,458	178,723	37%
	Landbase area remaining	87,369	212,416	299,784	63%
	Total unmanaged landbase area	**89,265**	**89,458**	**178,723**	**37%**

Table 72. Managed classified landbase file.

Description	F_YC	Gross Landbase Area (ha)	176,634 W11	%FMU	301,873 W13	%FMU	478,507 ALL	% Gross Area
Aspen	AW		53,186	30.1%	57,846	19.2%	111,032	23.2%
Birch	BW		130	0.1%	1,105	0.4%	1,235	0.3%
Aspen-pine mixedwood	AP		1,505	0.9%	6,042	2.0%	7,548	1.6%
Aspen-spruce mixedwood	AS		4,875	2.8%	19,115	6.3%	23,990	5.0%
Pine-aspen mixedwood	PA		1,555	0.9%	10,354	3.4%	11,909	2.5%
Spruce-aspen mixedwood	SA		5,066	2.9%	17,700	5.9%	22,766	4.8%
Pine	PL		11,588	6.6%	66,641	22.1%	78,229	16.3%
Black spruce	SB			0.0%	16,806	5.6%	16,806	3.5%
White spruce	SW		9,463	5.4%	16,808	5.6%	26,271	5.5%
Total managed area			**87,369**	**49.5%**	**212,416**	**70.4%**	**299,784**	**62.6%**
Unmanaged area			89,265	50.5%	89,458	29.6%	178,723	37.4%

8.1.2 Unmanaged Landbase

Table 74 presents the area summary of the classified landbase by final deletion type. These numbers can be duplicated with a summary on the area field (*AREAHA_POL*) and reported by the FMU (*FMU_NUM*) and deletion code (*F_DEL*) as outlined in Table 73. The horizontal stand deletion areas is the sum of *AREA_H_DEL* where *F_DEL* = 'NONE'. On the unmanaged landbase the stand area is represented by the *AREAHA_POL* value.

Table 73. Unmanaged landbase summary items.

Landbase Field	Description	Action
FMU_NUM	FMU	Group by
F_DEL	Deletion type	Group by
AREAHA_POL	Total polygon area	Sum

Table 74. Unmanaged classified landbase summary by deletion type.

Description	F_DEL	W11	W13	Total	% Gross Area
		hectares			
Private, industrial and non-classified lands	XDFA	2,130.6	12,287.3	14,417.9	3.0%
Parks and natural areas	PARK	8,705.7	2,202.1	10,907.8	2.3%
Area without AVI	XAVI	720.8	1.1	721.9	0.2%
Roads	ROAD	1,039.5	4,990.7	6,030.3	1.3%
Linear Features and Utility Corridors	LINE	1,002.6	4,697.3	5,700.0	1.2%
Mineral and Surface Leases	LEASE	1,562.5	2,312.0	3,874.5	0.8%
Seismic	SEIS	2,765.0	7,198.0	9,963.0	2.1%
Government Disposition Reservations	GOVRES	27.1	1,119.7	1,146.9	0.2%
Trails	TRAIL	13.5	65.7	79.1	0.0%
Recreation	REC	0.0	25.7	25.7	0.0%
Nonforest Areas	NF	19,341.0	8,298.3	27,639.3	5.8%
Areas burned since AVI	FIRE	275.4	9,919.3	10,194.7	2.1%
Unproductive TPR	TPR	15,848.0	10,159.6	26,007.6	5.4%
Water buffers per Ground Rules	HYDROBUF	2,581.6	5,983.3	8,564.9	1.8%
Waterfowl lake buffers	HYDROBUF	44.3	111.8	156.2	0.0%
Larch stands	LT	12,529.4	4,427.6	16,957.0	3.5%
Black spruce stands in W11	SB	20,251.7	0.0	20,251.7	4.2%
Complex or horizontal black spruce stands	SB_STRUC	0.0	9,532.7	9,532.7	2.0%
A density black spruce stands	SB_ADENS	0.0	335.2	335.2	0.1%
Sb or Sb/Lt > 70% of stand species percent	SB_SBLT	0.0	5,134.3	5,134.3	1.1%
Stands on islands in Athabasca River	ISL	0.0	295.7	295.7	0.1%
Stands isolated by water buffers	ISO	14.4	215.5	229.9	0.0%
Horizontal stand deletion in managed landbase[1]		412.0	144.6	556.6	0.1%
Total		89,265.2	89,457.5	178,722.8	37.4%

[1] Calculated as SUM(*AREA_H_DEL*) where *F_DEL* = 'NONE'

Figure 15 shows the unmanaged classified landbase by deletion classification.

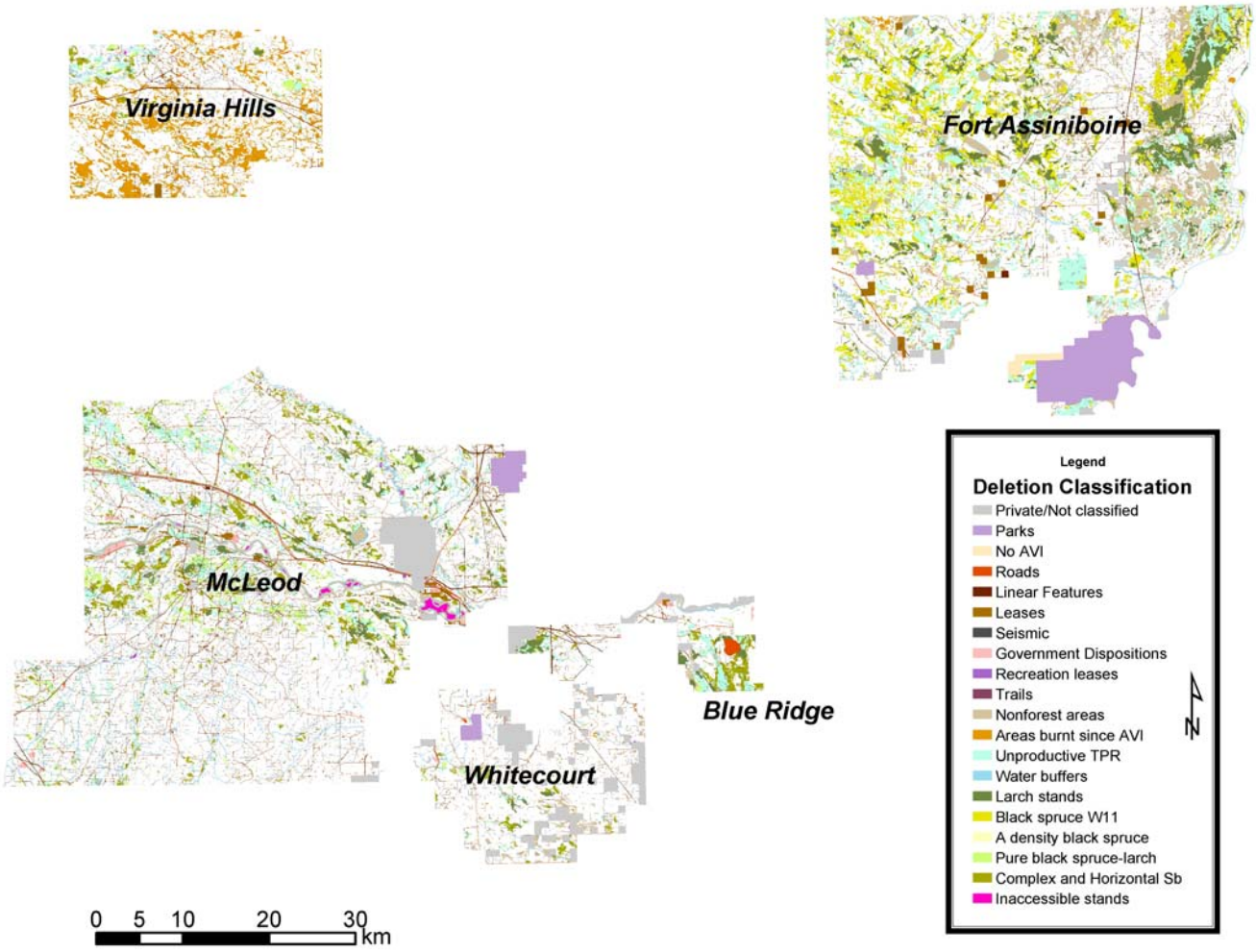

Figure 15. Unmanaged landbase.

8.1.3 Managed Landbase

The following table summarized the managed landbase by the assigned species strata (F_YC) with additional detail regarding stand origin (*F_ORIGIN*). Table 76 shows the areas and strata by managed stands, fire surveyed regenerating stands (in the Virginia Hills and Roche Lake burns), thinned stands and natural stands for the conifer and the deciduous landbase.

Table 75. Managed landbase summary items.

Landbase Field	Description	Action	
FMU_NUM	FMU	Group by	
F_ORIGIN	Stand origin type	Group by	
F_YC	Stand area	Group by	
AREA_H_DEL	Horizontal stand deletion	Sum	Part of unmanaged landbase
F_AREAHA	Final stand area	Sum	

Table 76. Managed area summary by species strata (F_YC).

Description	F_YC	W11	W13	Total	% Gross Area
		hectares			
Managed deciduous stands	AW	3,492.1	5,446.6	8,938.7	1.9%
	BW		79.7	79.7	0.0%
Fire surveyed deciduous stands	AW	303.3	448.1	751.4	0.2%
	BW	6.5	52.6	59.1	0.0%
Thinned deciduous stands	AW		2.1	2.1	0.0%
	BW		1.0	1.0	0.0%
Natural deciduous stands	AW	49,390.4	51,949.2	101,339.6	21.2%
	BW	123.9	971.6	1,095.5	0.2%
Managed coniferous stands	AP	251.3	526.9	778.2	0.2%
	AS	791.9	1,298.3	2,090.2	0.4%
	PA	363.3	2,646.6	3,009.9	0.6%
	PL	1,162.4	20,801.7	21,964.0	4.6%
	SA	1,230.7	6,773.7	8,004.4	1.7%
	SB		179.0	179.0	0.0%
	SW	1,484.4	4,876.4	6,360.8	1.3%
Fire surveyed coniferous stands	AP	45.0	537.3	582.3	0.1%
	AS		30.3	30.3	0.0%
	PA	15.4	1,864.7	1,880.1	0.4%
	PL	22.5	6,004.3	6,026.8	1.3%
	SA		100.4	100.4	0.0%
	SB		436.3	436.3	0.1%
Thinned coniferous stands	AP		16.9	16.9	0.0%
	AS		3.6	3.6	0.0%
	PA		106.1	106.1	0.0%
	PL		1,132.3	1,132.3	0.2%
	SA		506.1	506.1	0.1%
	SB		68.9	68.9	0.0%
	SW		2.5	2.5	0.0%
Natural coniferous stands	AP	1,209.0	4,961.2	6,170.2	1.3%
	AS	4,082.7	17,782.8	21,865.4	4.6%
	PA	1,176.3	5,736.8	6,913.1	1.4%
	PL	10,403.5	38,702.4	49,105.9	10.3%
	SA	3,835.8	10,319.4	14,155.2	3.0%
	SB		16,121.3	16,121.3	3.4%
	SW	7,978.5	11,928.8	19,907.2	4.2%
		87,368.7	212,415.7	299,784.4	62.6%
Total		87,368.7	212,415.7	299,784.4	62.6%

Figure 16 shows the managed landbase by broad cover group. Figure 17 shows the area distribution by species strata in each FMU.

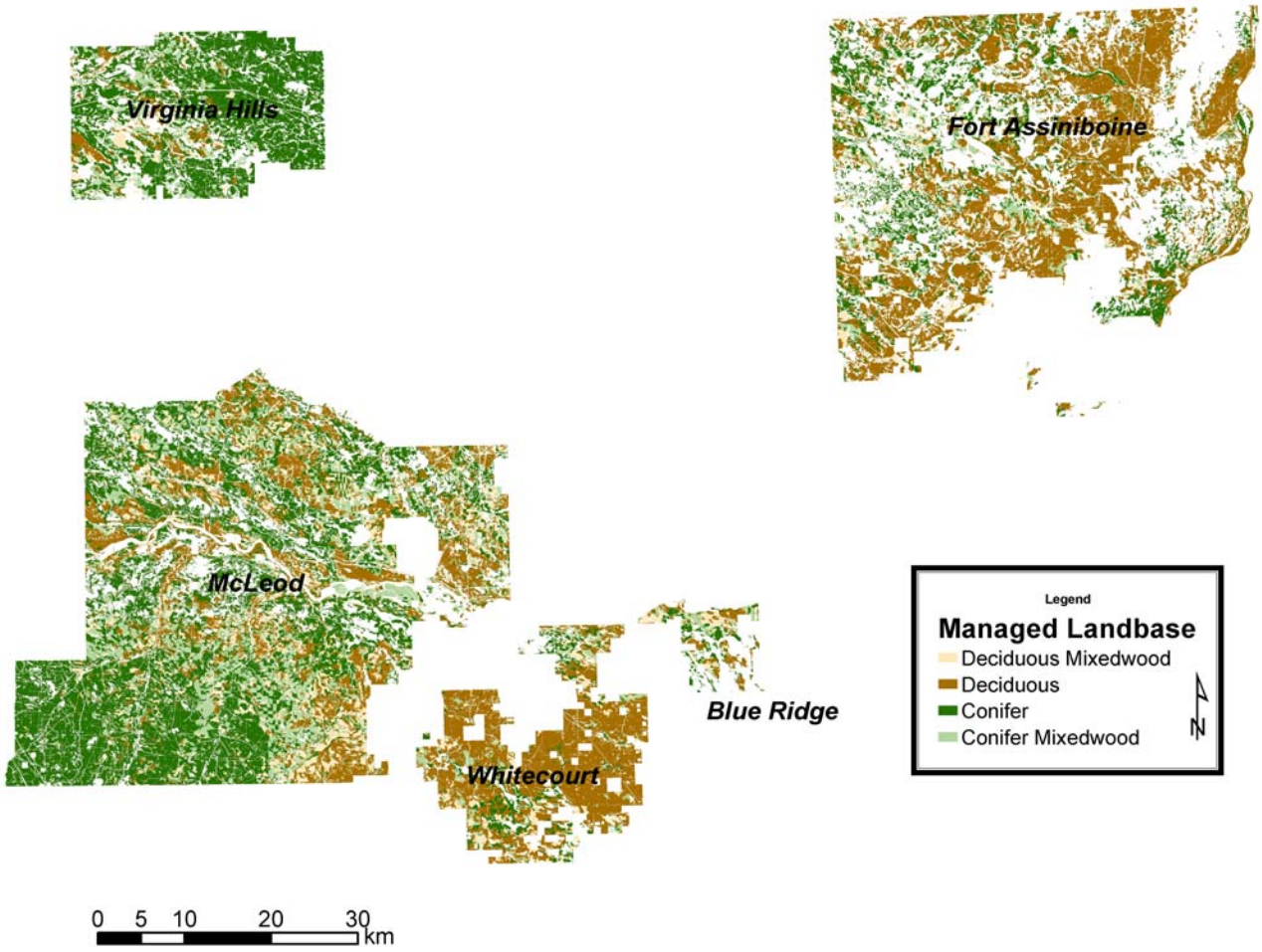

Figure 16. Managed landbase.

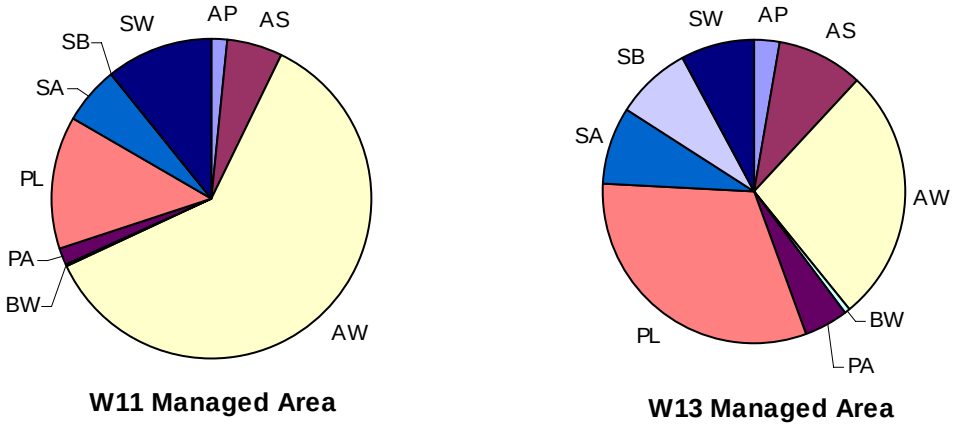

Figure 17. Managed area by FMU and species strata.

8.2 Base Landbases (without additional Sb deletions)

The Base TSA and modelling landbases correspond directly to the classified landbase. The Base TSA landbase was used to generate the classified landbase. The Base modelling landbase was developed from the TSA landbase and used as input to the Patchworks model. The final versions of these landbase (Section 8.3) differ only in a reduction to the managed landbase for an additional black spruce deletion.

8.2.1 Base TSA Landbase

The TSA landbase consisted of 132,275 polygons. As described in Section 5.3 the TSA landbase has the same inputs and attributes as the classified landbase. The only difference was that linear features were represented by area in attributes without linework. The areas of seismic, trails, roads and linear dispositions are included in the polygon areas of deletion types for the unmanaged landbase polygons. The area of these linear features on the managed landbase is shown in the final entries of the unmanaged landbase summary in Table 77.

Table 77. Base TSA unmanaged landbase summary.

TSA landbase	FMU	W11	W13	ALL	% Gross
Description	**Gross Landbase (ha)**	**176,634**	**301,873**	**478,507**	**Area**
Area outside FMA (including parks)	**Stand area**	**11,557**	**14,491**	**26,048**	5%
or areas without AVI		7%	5%		
Seismic or linear deletion assigned	**Stand area**	**231**	**2,223**	**2,454**	1%
		0%	1%		
Non-linear landuse dispositions	**Stand area**	**1,663**	**3,684**	**5,346**	1%
		1%	1%		
Recreation	**Stand area**	**0**	**27**	**27**	0%
		0%	0%		
Nonforest, burnt or nonproductive	**Stand area**	**36,739**	**32,175**	**68,914**	14%
		21%	11%		
Water buffers	**Stand area**	**2,668**	**6,307**	**8,975**	2%
		2%	2%		
Larch and black spruce	**Stand area**	**33,605**	**20,351**	**53,956**	11%
subjective deletions		19%	7%		
Isolated stands	**Stand area**	**14**	**515**	**529**	0%
		0%	0%		
Horizontal stand deletion	**Attribute area**	**412**	**145**	**557**	0%
from managed landbase		0%	0%		
Seismic area deletion	**Attribute area**	**1,523**	**5,665**	**7,188**	2%
from managed landbase		1%	2%		
Road area deletion from	**Attribute area**	**539**	**2,354**	**2,894**	1%
managed landbase		0%	1%		
Linear feature area deletion	**Attribute area**	**314**	**1,520**	**1,834**	0%
from managed landbase		0%	1%		
Total unmanaged landbase area		**89,265**	**89,458**	**178,723**	**37%**

Table 78 shows the TSA managed landbase summarized by species strata assignment (*F_YC*).

Table 78. Base TSA managed landbase summary.

Description	F_YC	Gross Landbase Area (ha)	176,634 W11	%FMU	301,873 W13	%FMU	478,507 ALL	% Gross Area
Aspen	AW		53,186	30%	57,846	19%	111,032	23%
Birch	BW		130	0%	1,105	0%	1,235	0%
Aspen-pine mixedwood	AP		1,505	1%	6,042	2%	7,548	2%
Aspen-spruce mixedwood	AS		4,875	3%	19,115	6%	23,990	5%
Pine-aspen mixedwood	PA		1,555	1%	10,354	3%	11,909	2%
Spruce-aspen mixedwood	SA		5,066	3%	17,700	6%	22,766	5%
Pine	PL		11,588	7%	66,641	22%	78,229	16%
Black spruce	SB			0%	16,806	6%	16,806	4%
White spruce	SW		9,463	5%	16,808	6%	26,271	5%
	Total managed area		**87,369**	49%	**212,416**	70%	**299,784**	63%

8.2.2 Base Modelling Landbase.

The modelling landbase consists of 119,742 polygons. This linework has simplified some linework for "like" polygons (Section 5.3.4). Sliver polygons were also removed from the managed landbase into the 'SMLPOLY' deletion type (Section 7.4.8). Table 79 shows the unmanaged modelling landbase summary.

Table 79. Base unmanaged modelling landbase summary.

Modelling landbase Description	FMU	W11	W13	ALL	% Gross Area
	Gross Landbase (ha)	**176,634**	**301,873**	**478,507**	
Area outside FMA (including parks)	**Stand area**	**11,557**	**14,491**	**26,048**	5%
or areas without AVI		7%	5%		
Seismic or linear deletion assigned	**Stand area**	**231**	**2,226**	**2,457**	1%
		0%	1%		
Non-linear landuse dispositions	**Stand area**	**1,661**	**3,678**	**5,339**	1%
		1%	1%		
Recreation	**Stand area**	**0**	**27**	**27**	0%
		0%	0%		
Nonforest, burnt or nonproductive	**Stand area**	**36,739**	**32,176**	**68,915**	14%
		21%	11%		
Water buffers	**Stand area**	**2,669**	**6,311**	**8,980**	2%
		2%	2%		
Larch and black spruce	**Stand area**	**33,605**	**20,351**	**53,956**	11%
subjective deletions		19%	7%		
Isolated stands	**Stand area**	**14**	**515**	**529**	0%
		0%	0%		
Horizontal stand deletion	**Attribute area**	**412**	**145**	**557**	0%
from managed landbase		0%	0%		
Seismic area deletion	**Attribute area**	**1,519**	**5,664**	**7,183**	2%
from managed landbase		1%	2%		
Road area deletion from	**Attribute area**	**537**	**2,279**	**2,816**	1%
managed landbase		0%	1%		
Linear feature area deletion	**Attribute area**	**309**	**1,482**	**1,792**	0%
from managed landbase		0%	0%		
Small poly area deletion	**Stand area**	**12**	**114**	**126**	0%
from managed landbase		0%	0%		
Total unmanaged landbase area		**89,265**	**89,458**	**178,724**	**37%**

Table 80 shows the managed modelling landbase summarized by species strata assignment (F_YC).

Table 80. Base modelling managed landbase summary.

Modelling landbase Description	F_YC	Gross Landbase Area (ha)	176,634 W11	301,873 W13	478,507 ALL	% Gross Area
Aspen	AW		53,186	57,846	111,032	23%
Birch	BW		130	1,105	1,235	0%
Aspen-pine mixedwood	AP		1,505	6,042	7,548	2%
Aspen-spruce mixedwood	AS		4,875	19,115	23,990	5%
Pine-aspen mixedwood	PA		1,555	10,354	11,909	2%
Spruce-aspen mixedwood	SA		5,066	17,700	22,766	5%
Pine	PL		11,588	66,640	78,229	16%
Black spruce	SB			16,806	16,806	4%
White spruce	SW		9,463	16,808	26,271	5%
	Total managed area		**87,369**	**212,415**	**299,784**	63%

8.3 Final Landbase (includes additional Sb deletions)

During the development of the Spatial Harvest Sequence (SHS) MWFP identified the need for additional black spruce subjective deletions for the landbase. The black spruce adjustment process is described more fully in the forecasting chapter of the DFMP (Chapter 5). Section 7.5 describes the additional attributes on the final landbase to account for the additional black spruce subjective deletions. The additional black spruce deletions on the final landbase were accounted for in 2 steps:

- Specific black spruce stands identified as part of the harvest sequence were reassigned to a black spruce subjective deletion code, (*F_DEL_MOD* = 'SB_SHS').

- The ratio of the area of black spruce stands dropped from the SHS and the total area of black spruce stands in the SHS was used to proportionally reduce the W13 black spruce available harvest volumes. This was done by a proportional area reduction for black spruce stands outside the SHS by .3548. The updated areas are carried in the *F_AREAHA_MOD* field.

The final landbase summaries include additional stand area deletions for black spruce identified as part of the review of the spatial harvest sequence. These stands have a spatial area of 1,213 ha. The managed stand area in these polygons was 1,159 ha. Table 81 also shows the additional attribute area reduction for black spruce areas on the managed landbase. This attribute area reduction was 4,481 ha, a proportional area reduction applied to the black spruces stands outside the SHS.

The Final TSA landbase contains both the base deletion types (F_DEL) and the final deletion assignments (F_DEL_MOD). It also shows both the base F_AREAHA_TSA and the final F_AREAHA_MOD. A summary of the managed and unmanaged portions of the final TSA landbase will give the same results as shown in Table 81 and Table 82.

8.3.1 Final Modelling Landbase with additional Sb deletions

Table 81. Final unmanaged modelling landbase summary.

Modelling landbase Description	FMU Gross Landbase (ha)	W11 176,634	W13 301,873	ALL 478,507	% Gross Area
Area outside FMA (including parks)	**Stand area**	**11,557**	**14,491**	**26,048**	5%
or areas without AVI		7%	5%		
Seismic or linear deletion assigned	**Stand area**	**231**	**2,224**	**2,455**	1%
		0%	1%		
Non-linear landuse dispositions	**Stand area**	**1,663**	**3,684**	**5,346**	1%
		1%	1%		
Recreation	**Stand area**	**0**	**27**	**27**	0%
		0%	0%		
Nonforest, burnt or nonproductive	**Stand area**	**36,739**	**32,175**	**68,914**	14%
		21%	11%		
Water buffers	**Stand area**	**2,668**	**6,307**	**8,975**	2%
		2%	2%		
Larch and black spruce	**Stand area**	**33,605**	**21,564**	**55,169**	12%
subjective deletions		19%	7%		
Isolated stands	**Stand area**	**14**	**515**	**529**	0%
		0%	0%		
Black spruce yield reduction from SHS	**Attribute area**	**0**	**4,841**	**4,841**	1%
expressed as mgd area reduction		0%	2%		
Horizontal stand deletion	**Attribute area**	**412**	**145**	**557**	0%
from managed landbase		0%	0%		
Seismic area deletion	**Attribute area**	**1,519**	**5,621**	**7,140**	1%
from managed landbase		1%	2%		
Road area deletion from	**Attribute area**	**537**	**2,274**	**2,811**	1%
managed landbase		0%	1%		
Linear feature area deletion	**Attribute area**	**309**	**1,476**	**1,785**	0%
from managed landbase		0%	0%		
Small poly area deletion	**Stand area**	**12**	**114**	**126**	0%
from managed landbase		0%	0%		
Total unmanaged landbase area		**89,265**	**95,458**	**184,723**	**39%**

Table 82 shows the updated areas for the managed portion of the final modelling landbase..

Table 82. Final managed modelling landbase summary.

Modelling landbase Description	F_YC	Gross Landbase Area (ha)	176,634 W11	301,873 W13	478,507 ALL	% Gross Area
Aspen	AW		53,186	57,846	111,032	23%
Birch	BW		130	1,105	1,235	0%
Aspen-pine mixedwood	AP		1,505	6,042	7,547	2%
Aspen-spruce mixedwood	AS		4,875	19,115	23,989	5%
Pine-aspen mixedwood	PA		1,555	10,354	11,909	2%
Spruce-aspen mixedwood	SA		5,066	17,700	22,766	5%
Pine	PL		11,588	66,640	78,229	16%
Black spruce	SB			10,805	10,805	2%
White spruce	SW		9,463	16,808	26,271	5%
Total managed area			**87,369**	**206,415**	**293,784**	61%

The following tables show a side by side comparison of the base modelling landbase and the final modelling landbase.(Table 83 and Table 84). This illustrates the distribution of the additional black spruce subjective deletion area on the landbase. Table 83 summarized the managed stand area. This is not the total area of the polygons which have managed stand area. A portion of the area of the managed landbase polygon may be assigned to represent roads, linear features, seismic lines, unmanaged portions of horizontal stands or black spruce proportional area reductions. The area difference between the managed stand area and the full polygon area for polygons with managed stand area is grouped by attribute type (horizontal stand area, seismic area, road area, linear feature area or black spruce area) and shown in Table 84 as an "attribute area" item.

Table 83. Final managed modelling landbase compared to base landbase.

	Base Modelling Landbase Areas		Final Modelling Landbase with SB deletions		
F_YC	**Stand (ha)**	**Polygon (ha)**	**Stand (ha)**	**Polygon (ha)**	**Sb deletion (ha)**
AW	111,032	115,528	111,032	115,528	
BW	1,235	1,312	1,235	1,312	
AP	7,547	7,920	7,547	7,920	
AS	23,989	25,053	23,989	25,053	
PA	11,909	12,449	11,909	12,449	
PL	22,766	23,725	22,766	23,725	
SA	78,229	81,480	78,229	81,480	
SB	16,805	17,569	10,805	16,355	6,000
SW	26,271	27,095	26,271	27,095	
Total	**299,784**	312,131	**293,784**	310,917	6,000

The managed area (shown as "stand (ha) in Table 83)

Table 84. Final unmanaged modelling landbase compared to base landbase.

Description		Base Modelling Landbase	Final Modelling Landbase
Area outside FMA (including parks)	**Polygon area**	**26,048**	**26,048**
or areas without AVI		5%	5%
Seismic or linear deletion assigned	**Polygon area**	**2,455**	**2,455**
		1%	1%
Non-linear landuse dispositions	**Polygon area**	**5,346**	**5,346**
		1%	1%
Recreation	**Polygon area**	**27**	**27**
		0%	0%
Nonforest, burnt or nonproductive	**Polygon area**	**68,914**	**68,914**
		14%	14%
Water buffers	**Polygon area**	**8,975**	**8,975**
		2%	2%
Larch and black spruce	**Polygon area**	**53,956**	**55,169**
subjective deletions		11%	12%
Isolated stands	**Polygon area**	**529**	**529**
		0%	0%
Small poly area deletion	**Polygon area**	**126**	**126**
from managed landbase		0%	0%
Horizontal stand deletion	**Attribute area**	**557**	**557**
from managed landbase		0%	0%
Seismic area deletion	**Attribute area**	**7,183**	**7,140**
from managed landbase		2%	1%
Road area deletion from	**Attribute area**	**2,816**	**2,811**
managed landbase		1%	1%
Linear feature area deletion	**Attribute area**	**1,792**	**1,785**
from managed landbase		0%	0%
Black spruce yield reduction from SHS	**Attribute area**	**0**	**4,841**
expressed as mgd area reduction		0%	1%
	Total unmanaged landbase area	**178,724**	**184,723**
	Percent of landbase	37%	39%

9. References

Alberta Forest Service. 1986. Watershed Management in the Paddle River Headwaters, AFS 1985 Update. ENR Technical Report Number T/104.

Alberta Sustainable Resource Development. 2005. Alberta Forest Management Planning Standard, Version 3, June 2005. Public Lands and Forests Division, Forest Management Branch.

Geographic Dynamics Corp., 1999. Overview of Mapping Methods and Data Dictionary for Millar Western Industries Ltd.'s FMA Area Ecosite Map. GDC ref: 1998014.

Millar Western Forest Products Ltd. 2000. W13 Ecosite Mapping: 1997-2007 Detailed Forest Management Plan.

Millar Western Forest Products Ltd. 2005a. Submission of Landuse datasets used in Landbase Description Stages of Timber Supply Analysis. 2007-2016 Detailed Forest Management Plan.

Millar Western Forest Products Ltd. 2005b. Terms of Reference: 2007-2016 Detailed Forest Management Plan, June 28, 2005.

Millar Western Forest Products Ltd. 2005c. Virginia Hills and Roche Lake Fire Survey Results: 2007-2016 Detailed Forest Management Plan.

Millar Western Forest Products Ltd. 2005d. W11 Ecosite Mapping: 2007-2016 Detailed Forest Management Plan.

Millar Western Forest Products Ltd. 2006. Cutblock Classification 2007-2016 Detailed Forest Management Plan.

Millar Western Forest Products Ltd. 2007a. Yield Curve Development: 2007-2016 Detailed Forest Management Plan. Appendix VIII.

Millar Western Forest Products Ltd. 2007b. Forecasting: 2007-2016 Detailed Forest Management Plan. Chapter 5.

Appendix I Approval documents

[Fwd: Fw: AVI Errors]
2 of 3 4/19/2006 8:44 AM
03/02/2005 09:53 <JRussell@millarwestern.com>
AM cc
"'Jonathan Russell (Millar
Western)'"
<jrussell@millarwestern.com>, Daryl
Price <Daryl.Price@gov.ab.ca>
Subject
RE: AVI Errors
We have reviewed the errors and find the changes acceptable. We will also
try to have the AVI in our possession corrected through RIMB
Stephen Wills
Forest Management Planning Forester
Public Lands and Forest Division, SRD
Ph. (780) 422 - 5430
Cell (780) 722 - 8566
Fax (780) 427 - 0084
-----Original Message-----
From: JRussell@millarwestern.com [mailto:JRussell@millarwestern.com]
Sent: Tuesday, March 01, 2005 3:26 PM
To: stephen.wills@gov.ab.ca
Subject: AVI Errors
Enclosed please find a ZIP file pertaining to the AVI errors Millar Western
found when developing rule sets for the landbase netdown. A hard copy of
the letter and error description has been mailed to your attention. Please
note that the file extension needs to be changed from "now" to "zip".
(See attached file: AVI errors.now)
Cheers
Jonathan Russell RPF
Chief Forester
Millar Western Forest Products
Phone 780-486-8227
Cell 780-974-0916
Fax 780-486-8284
e-mail jrussell@millarwestern.com
web site www.millarwestern.com

Alberta
ENVIRONMENT

Land and Forest Service

Mailing Address:
Petroleum Plaza, South Tower
9915 - 108 Street
Edmonton, Alberta
Canada T5K 2G8

Office Location:
Forest Management Division
Great West Life Building
9920 - 108 Street
Edmonton, Alberta
Canada T5K 2M4

Floor 5th
Telephone 780/ 422-4590
Fax 780/ 422-0085
File No.

March 3, 2000

Mr. Jonathan Russell
Engineering and Planning Forester
Millar Western Forest Products Ltd.
5004 - 52 Street
Whitecourt, Alberta
T7S 1N2

Dear Jonathan:

LFS staff recently completed an audit of the AVI data covering the Millar Western Forest Products FMA area. This audit indicated that most of the data submitted was of acceptable quality according to the audit procedure. A report prepared by Resource Data Division staff is attached which provides a more detailed description of the audit results.

The audit was done on four randomly selected townships. The work on two of the four was of poorer quality. Your Company is strongly encouraged to review its AVI data based on the results of this audit and to prioritize those townships with marginal air photo vegetation interpretation for correction or re-inventory.

Sincerely,

D. (Doug) A. Sklar
Director
Forest Management Division

cc: M. Toomey
Resource Data Division

M. Rayner
Resource Data Division

M. Poscente
Northern East Slopes Region

Attachment

Printed on Recycled Paper

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Public Lands and Forests Division
Forest Management Branch

7th Floor 9920 - 108 Street
Edmonton, Alberta
Canada T5K 2M4

Telephone (780) 427-8474
Fax (780) 427-0085

Ref: 06301 – F01 – 07

RECEIVED

July 19, 2004

Mr. Jonathan Russell
Chief Forester
Millar Western Forest Products Ltd.
5004 – 52 Street
Whitecourt, Alberta
T7S 1N2

Dear Mr. Russell:

Re: FMA AND FMU BOUNDARY FOR W13

Forest Management Branch has reviewed Mr. Ray Hiltz's letter to Dan Wilkinson and attached information of June 24, 2004 to Dan Wilkinson, concerning the boundary of FMU W13.

I am pleased to advise that we are in agreement with the boundaries depicted for the FMU and FMA, which incorporate the relevant grazing disposition and private land holdings in the area.

Sincerely,

D. (Doug) A. Sklar
Executive Director
Forest Management Branch

cc: Dan Wilkinson, Executive Director, Forest Business and Policy Branch
Robert W. Stokes, Senior Manager, Forest Planning Section

Stephen Wills <Stephen.Wills@gov.ab.ca>
11/27/2003 09:32 AM

To: "'Jonathan Russell (Millar Western)'" <jrussell@millarwestern.com>
cc:
Subject: FW: Interpretation audit status for W11

Jonathan

> Attached is a summary of the audit results for the W11 AVI. This contract
> was completed through the department, so all areas would have been checked
> and no formal report would have been created.
>
>
> <<w11.doc>>
>
>
Stephen Wills
Forest Management Planning Forester
Forest Planning Section
Forest Management Branch
Public Lands and Forests Division
Stephen.Wills@gov.ab.ca
Cell (780) 722 - 8566
Ph. (780) 422 - 5430
Fax (780) 427 - 0084
>
>
This communication is intended for the use of the recipient to which it is addressed, and may contain confidential, personal and or privileged information. Please contact us immediately if you are not the intended recipient of this communication, and do not copy, distribute, or take action relying on it. Any communication received in error, or subsequent reply, should be deleted or destroyed.

w11.doc

STATUS SUMMARY

W11 AUDIT

Forest management unit "W11" was contracted out in 1996-97 to Simons Reid Collins (Forest Resource Consultants) for vegetation interpretation. The contract area included the inventory interpretation of 15.81 townships according to the specifications set out in the "Alberta Vegetation Inventory Standards Manual – Contract Version 2.1"

Two interpreters, Derek Fisher and John Barbeau interpreted W11 between September and December of 1996. They used photography flown in September of 1994.

The photo interpretation accuracy level is based on quality control measures (tolerance limits) placed on the inventory cover typing. The categories for assessing interpretation include crown closure (overstorey and understorey), species composition, height, origin, non-forest land, anthropogenic vegetated land, modifiers, moisture regime, stand structure and percentage, TPR, natural non-vegetated, anthropogenic non-vegetated, polygon size, legibility and mislabeled polygons. (See Appendix 1 for internal audit procedures.)

An interpretation submission is accepted if the interpretation audit accuracy is $\geq$80%. The submitted increment cores are checked for correct age count. Field tally sheets are checked for completeness to ensure plot data agrees with interpretation.

The government interpretation audit of "W11" resulted in an average accuracy of **92.4%.** The orthophoto transfer, coding, and database portions of the audit shared similar accuracies.

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Forestry Division
Forest Management Branch

8th Floor 9920 - 108 Street
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Canada T5K 2M4

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

May 29, 2006

Ref: 06301 - F02 - 04
06301 - 010

Mr. Jonathan Russell
Millar Western Forest Products Ltd.
16640 – 111 Avenue
Edmonton, Alberta
T5M 2S5

Dear Mr. Russell:

RE: AGREEMENT-IN-PRINCIPLE - *PRE-91 HARVEST BLOCK SURVEYS: 2007-2016 DETAILED FOREST MANAGEMENT PLAN* AND *VIRGINIA HILLS AND ROCHE LAKE FIRE SURVEY RESULTS: 2007-2016 DETAILED FOREST MANAGEMENT PLAN*

The department has reviewed the documents entitled "*Pre-91 Harvest Block Surveys: 2007-2016 Detailed Forest Management Plan*" and "*Virginia Hills and Roche Lake Fire Survey Results: 2007-2016 Detailed Forest Management Plan*". These reports were dated December 15, 2005, and the subsequent data was submitted in March 2006.

The department agrees-in-principle with the information provided. Final approval will be granted with approval of the forest plan.

Yours truly,

Robert W. Stokes, RPF
Senior Manager
Forest Planning Section

cc: George Robertson, Manager, Woodlands Area
Daryl Price, Senior Manager, Resource Analysis Section

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October 26, 2005

Ref: 06301 - 10

Mr. Jonathan Russell, RPF
Chief Forester
Millar Western Forest Industries
16640 – 111 Avenue
Edmonton, Alberta
T5M 2S5

Dear Mr. Russell:

The department has reviewed four documents submitted for its approval.

The following are approved:

1. *Terms of Reference, 2007 –2016 Detailed Forest Management Plan*, dated June 28, 2006, the new timelines are acceptable;
2. "*In-Block Road Sampling Design*", dated June 30, 2005;
3. "*Virginia Hills Fire Survey Results: Compilation Methodology*" dated June 30, 2005; and
4. "*Windfall Burn Sampling Protocols*" dated January 2005.

Please work with SRD staff to ensure the data used is appropriate for its intended application.

Yours truly,

Robert W. Stokes, RPF
Senior Manager
Forest Planning Section

cc: Daryl Price, Senior Manager, Resource Analysis Section
George Robertson, Manager, Woodlands Area

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

Reference: 06301 – 10

July 19, 2004

Mr. Jonathan Russell
Millar Western Forest Products Ltd.
16640-111 Ave.
Edmonton, AB
T5M 2S5

RE: APPROVAL VIRGINIA HILLS FIRE SAMPLING

Dear Mr. Russell:

The Department has reviewed the document "Virginia Hills Fire Aerial Survey Proposal" dated June 28, 2004 and it is approved. The following points apply:

1. I have been advised that there were unresolved issues related to the allocation of polygons to strata. Although we have not agreed with your strata allocation rules, we are confident, however, that we can reach an equitable agreement on these rules after the data is collected and available for analysis.

2. The acceptance of this protocol does not imply any linkage to Stratum Specific Reforestation Standards (Model 2) or the standards contained in the current version of the Regeneration Survey Manual, and the types of data or analysis which will be acceptable for such standards. This protocol is a specific operational procedure to collect timely information to provide a basic summary of likely outcomes following this wildfire.

We look forward to future discussions with your company when this plot data is available. If you wish to discuss operational issues which may arise during field sampling please contact Ken Greenway (780) 422-0417 or Grant Klappstein (780) 422-5278.

Sincerely,

Daryl Price, RPF
Senior Manager
Resource Analysis Section

cc: Robert Stokes, Senior Manager, Forest Planning Section, FMB
Grant Klappstein, Forester, Resource Analysis Section, FMB
Ken Greenway, Silviculture Specialist, Harvesting and Renewal Section, FMB

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Fax (780) 427-0084

Reference: 06301-R01-01
06301-R01-04
06301-001

September 23, 2004

Mr. Jonathan Russell, R.P.F.
Chief Forester
Millar Western Forest Products Ltd.
Bag Service 2200
Edmonton, AB
T5J 4W2

Dear Jonathan:

We have reviewed the document titled, "Virginia Hills Survey Sampling Manual" dated August 31, 2004, received by us September 1, 2004, and revised September 23, 2004.

The methodology described appears to be consistent with the discussion our staff had with you and your staff and your consultant held May 20, 2004, and meets our expectations. Methods for post-hoc analysis including the treatment of portions of polygons classified as ST based on photo interpretation but found to be NS based on a ground survey must be discussed with our staff prior to implementation. If during the course of field sampling or data compilation you wish to discuss this project further with our staff please contact Grant Klappstein (780) 422-5278 or Dave Morgan (780) 422-5295.

We look forward to further discussions with your Company after the field data has been collected and are ready for analysis.

Sincerely,

Daryl Price, RPF
Senior Manager
Resource Analysis Section

Cc: Katrina Froese, The Forestry Corp
Grant Klappstein, Forest Management Branch
Ken Greenway, Forest Management Branch
Stephen Wills, Forest Management Branch

Appendix II AVI2.1 code errors in AVI for W13

1. Understory Species 1 was not a valid tree species. (5 stands).

([*USP*1] = "Al") Alder was not valid tree species code in AVI2.1. All 4 stands with this coding have a forested overstory and are identified as multistory stands. This will be processed as a closed shrub understory. (Identified as [*NFL*] = 'SC')

([*USP*1] = "Bp") Bog Birch was not a valid tree species code in AVI2.1. This stand will also be processed as a closed shrub understory. (Identified as [*NFL*] = 'SC')

2. Anthropogenic Non-Vegetated polygons have incorrect codes (2 stands).

([*ANTH_NON*] = "AIU") Unknown Industrial Sites are not allowed in AVI2.1 These polygons will be treated as an industrial wellsite. (Identified as [*ANTH_NON*] = 'AII')

([*ANTH_NON*] = "AIW") Flooded gravel pit or water reservoir was only identified in AVI2.2. These polygons will be dealt with as a gravel pit. (Identified as [*ANTH_NON*] = 'AIG')

3. Anthropogenic Vegetated polygons have incorrect codes (5 stands).

([*ANTH_VEG*] = "CIU") Unknown Clearings are not allowed in AVI2.1. These areas will be treated as a vegetated wellsites. (Identified as [*ANTH_VEG*] = 'CIW'

4. Natural Non-Vegetated polygons have incorrect codes (92 stands).

([*NAT_NON*] = "NMG") Gravel Bars with Water features are not identified in AVI2.1 These 90 polygons will be identified as sand areas. (Identified as [*NAT_NON*] = 'NMS')

([*NAT_NON*] = "NMM") Bare Mineral Soil was not identified within AVI2.1 codes. These areas will receive the code for cutbank. (Identified as [*NAT_NON*] = 'NMC')

5. Natural Vegetated Lands have incorrect (redundant) code (1 stand).

([*NFL*] = "AS") This was not a valid code for NFL. The ANTH_NON field shows this polygon as "ASC" – City or Ribbon Development. The additional code for NFL will be ignored. (Identified as [*NFL*] = '')

Appendix III Classified Landbase Dataset Description

The Millar Western classified landbase file is named **w1113_lb12_cls**.

Dataset Information **w1113_lb12_cls (COVER), w1113_lb12_cls.shp (SHAPEFILE)**

Description: Classified landbase for MWFP 2007-2016 DFMP

Data Source: Generated by The Forestry Corp.

Date Generated: 1/15/2007

Data Format: ArcInfo Coverage / Shapefile

Software Used: ESRI ArcInfo

Projection: UTM 11

Datum: GRS80

Units: metres

Data Precision: Double

Tolerance: .001

Extent: All lands within outer boundaries of FMU W11 and FMU W13

Appendix IV Classified Landbase Data Dictionary

Dataset Name: W1113_LB12_CLS
Description: Classified Landbase for MWFP LB12

Column Name	*Order*	*Type*	*Width*	*Decimal*	*Description*	
					Value	***Definition***
UKEY12_SEIS	1	FloatingPt	22	0	Unique key for LB12 Classified landbase	
UKEY12_TSA	2	FloatingPt	22	0	Unique key for LB12 TSA landbase	
LB_LABEL	3	Character	40	0	Landbase label	
DFA	4	Character	16	0	Defined forest area designation	
					FGL	Forest grazing license
					FMA	Forest Management Agreement area
					GRL	Grazing lease
					GRP	Grazing permit
					NO	Outside Defined Forest Area
					PARK	Parks/natural areas
LOCATION	5	Character	16	0	Management area	
					.	Blue Ridge
						FGL
						Fort Assiniboine
						McLeod
						Virginia Hills
						Whitecourt
FMU_NUM	6	Character	4	0	Forest Management Unit	
					.	W11
						W13
TRM	70	Integer	0	0	Township-range-meridian values	
NSR	71	Character	12	0	Natural subregion	
					BM	Boreal Mixedwood
					LF	Lower Foothills
					UF	Upper Foothills
ECOPHASE	72	Character	18	0	Ecosite and phase coding	
					BM-(v)	BM-unclassified meadow
					BM-(w)	BM-water
					BM-(y)	BM-anthropogenic lands
					BM-(z)	BM-natural mineral substrate
					BM-a1	BM-lichen Pj
					BM-a1/b1	BM-lichen Pj//blueberry Pj-Aw
					BM-a1/b4	BM-lichen Pj//blueberry Sw-Pj
					BM-a1/c1	BM-lichen Pj//Labrador tea-mesic Pj-Sb
					BM-a1/g1	BM-lichen Pj//Labrador tea-subhygric Sb-Pj
					BM-b1	BM-blueberry Pj-Aw
					BM-b1/b3	BM-blueberry Pj-Aw//blueberry Aw-Sw
					BM-b1/b4	BM-blueberry Pj-Aw//blueberry Sw-Pj
					BM-b1/c1	BM-blueberry Pj-Aw//labrador tea-mesic Pj-Sb
					BM-b1/d1	BM-blueberry Pj-Aw//low-bush cranberry Aw
					BM-b1/d2	BM-blueberry Pj-Aw//low-bush cranberry Aw-Sw
					BM-b2	BM-blueberry Aw(Bw)
					BM-b2/d1	BM-blueberry Aw(Bw)//low-bush cranberry Aw
					BM-b3	BM-blueberry Aw-Sw
					BM-b3/d1	BM-blueberry Aw-Sw//low-bush cranberry Aw
					BM-b3/d2	BM-blueberry Aw-Sw//low-bush cranberry Aw-Sw
					BM-b3/f3	BM-blueberry Aw-Sw//horsetail Sw

BM-b4	BM-blueberry Sw-Pj
BM-b4/a1	BM-blueberry Sw-Pj//lichen Pj
BM-b4/b1	BM-blueberry Sw-Pj//blueberry Pj-Aw
BM-b4/b3	BM-blueberry Sw-Pj//blueberry Aw-Sw
BM-b4/c1	BM-blueberry Sw-Pj//Labrador tea-mesic Pj-Sb
BM-b4/d3	BM-blueberry Sw-Pj//low-bush cranberry Sw
BM-b4/g1	BM-blueberry Sw-Pj//Labrador tea-subhygric Sb-Pj
BM-b4/h1	BM-blueberry Sw-Pj//Labrador tea/horsetail Sw-Sb
BM-c1	BM-Labrador tea-mesic Pj-Sb
BM-c1/a1	BM-Labrador tea-mesic Pj-Sb//lichen Pj
BM-c1/b4	BM-Labrador tea-mesic Pj-Sb//blueberry Sw-Pj
BM-c1/d3	BM-Labrador tea-mesic Pj-Sb//low-bush cranberry Sw
BM-c1/g1	BM-Labrador tea-mesic Pj-Sb//Labrador tea-subhygric Sb-Pj
BM-c1/h1	BM-Labrador tea-mesic Pj-Sb//Labrador tea/horsetail Sw-Sb
BM-c1/i1	BM-Labrador tea-mesic Pj-Sb//treed bog
BM-c1/j1	BM-Labrador tea-mesic Pj-Sb//treed poor fen
BM-c1/k1	BM-Labrador tea-mesic Pj-Sb//treed rich fen
BM-d?	BM-low-bush cranberry (clearcut)
BM-d1	BM-low-bush cranberry Aw
BM-d1/b1	BM-low-bush cranberry Aw//blueberry Pj-Aw
BM-d1/b2	BM-low-bush cranberry Aw//blueberry Aw(Bw)
BM-d1/b3	BM-low-bush cranberry Aw//blueberry Aw-Sw
BM-d1/d2	BM-low-bush cranberry Aw//low-bush cranberry Aw-Sw
BM-d1/d3	BM-low-bush cranberry Aw//low-bush cranberry Sw
BM-d1/e1	BM-low-bush cranberry Aw//dogwood Pb-Aw
BM-d1/e2	BM-low-bush cranberry Aw//dogwood Pb-Sw
BM-d1/f1	BM-low-bush cranberry Aw//horsetail Pb-Aw
BM-d1/f2	BM-low-bush cranberry Aw//horsetail Pb-Sw
BM-d2	BM-low-bush cranberry Aw-Sw
BM-d2/b1	BM-low-bush cranberry Aw-Sw//blueberry Pj-Aw
BM-d2/b3	BM-low-bush cranberry Aw-Sw//blueberry Aw-Sw
BM-d2/b4	BM-low-bush cranberry Aw-Sw//blueberry Sw-Pj
BM-d2/d1	BM-low-bush cranberry Aw-Sw//low-bush cranberry Aw
BM-d2/d3	BM-low-bush cranberry Aw-Sw//low-bush cranberry Sw
BM-d2/e1	BM-low-bush cranberry Aw-Sw//dogwood Pb-Aw
BM-d2/e2	BM-low-bush cranberry Aw-Sw//dogwood Pb-Sw
BM-d2/f1	BM-low-bush cranberry Aw-Sw//horsetail Pb-Aw
BM-d2/f2	BM-low-bush cranberry Aw-Sw//horsetail Pb-Sw
BM-d2/h1	BM-low-bush cranberry Aw-Sw//Labrador tea/horsetail Sw-Sb
BM-d2/i1	BM-low-bush cranberry Aw-Sw//treed bog
BM-d2/j1	BM-low-bush cranberry Aw-Sw//treed poor fen
BM-d3	BM-low-bush cranberry Sw
BM-d3/b4	BM-low-bush cranberry Sw//blueberry Sw-Pj
BM-d3/d1	BM-low-bush cranberry Sw//low-bush cranberry Aw

BM-d3/d2	BM-low-bush cranberry Sw//low-bush cranberry Aw-Sw
BM-d3/e3	BM-low-bush cranberry Sw//dogwood Sw
BM-d3/f3	BM-low-bush cranberry Sw//horsetail Sw
BM-d3/h1	BM-low-bush cranberry Sw//Labrador tea/horsetail Sw-Sb
BM-e?	BM-dogwood (clearcut)
BM-e1	BM-dogwood Pb-Aw
BM-e1/d1	BM-dogwood Pb-Aw//low-bush cranberry Aw
BM-e1/d2	BM-dogwood Pb-Aw//low-bush cranberry Aw-Sw
BM-e1/f1	BM-dogwood Pb-Aw//horsetail Pb-Aw
BM-e2	BM-dogwood Pb-Sw
BM-e2/b1	BM-dogwood Pb-Sw//blueberry Pj-Aw
BM-e2/d1	BM-dogwood Pb-Sw//low-bush cranberry Aw
BM-e2/d2	BM-dogwood Pb-Sw//low-bush cranberry Aw-Sw
BM-e2/e1	BM-dogwood Pb-Sw//dogwood Pb-Aw
BM-e2/e3	BM-dogwood Pb-Sw//dogwood Sw
BM-e2/f1	BM-dogwood Pb-Sw//horsetail Pb-Aw
BM-e2/f2	BM-dogwood Pb-Sw//horsetail Pb-Sw
BM-e2/f3	BM-dogwood Pb-Sw//horsetail Sw
BM-e3	BM-dogwood Sw
BM-e3/d3	BM-dogwood Sw//low-bush cranberry Sw
BM-e3/e2	BM-dogwood Sw//dogwood Pb-Sw
BM-e3/f3	BM-dogwood Sw//horsetail Sw
BM-f1	BM-horsetail Pb-Aw
BM-f1/d1	BM-horsetail Pb-Aw//low-bush cranberry Aw
BM-f1/d2	BM-horsetail Pb-Aw//low-bush cranberry Aw-Sw
BM-f1/e1	BM-horsetail Pb-Aw//dogwood Pb-Aw
BM-f1/f2	BM-horsetail Pb-Aw//horsetail Pb-Sw
BM-f1/f3	BM-horsetail Pb-Aw//horsetail Sw
BM-f2	BM-horsetail Pb-Sw
BM-f2/d2	BM-horsetail Pb-Sw//low-bush cranberry Aw-Sw
BM-f2/e1	BM-horsetail Pb-Sw//dogwood Pb-Aw
BM-f2/e2	BM-horsetail Pb-Sw//dogwood Pb-Sw
BM-f2/f1	BM-horsetail Pb-Sw//horsetail Pb-Aw
BM-f2/f3	BM-horsetail Pb-Sw//horsetail Sw
BM-f3	BM-horsetail Sw
BM-f3/d2	BM-horsetail Sw//low-bush cranberry Aw-Sw
BM-f3/d3	BM-horsetail Sw//low-bush cranberry Sw
BM-f3/e2	BM-horsetail Sw//dogwood Pb-Sw
BM-f3/e3	BM-horsetail Sw//dogwood Sw
BM-f3/f1	BM-horsetail Sw//horsetail Pb-Aw
BM-f3/f2	BM-horsetail Sw//horsetail Pb-Sw
BM-g1	BM-Labrador tea-subhygric Sb-Pj
BM-g1/a1	BM-Labrador tea-subhygric Sb-Pj//lichen Pj
BM-g1/b4	BM-Labrador tea-subhygric Sb-Pj//blueberry Sw-Pj
BM-g1/c1	BM-Labrador tea-subhygric Sb-Pj//Labrador tea-mesic Pj-Sb
BM-g1/h1	BM-Labrador tea-subhygric Sb-Pj//Labrador tea/horsetail Sw-Sb
BM-g1/i1	BM-Labrador tea-subhygric Sb-Pj//treed bog
BM-h1	BM-Labrador tea/horsetail Sw-Sb
BM-h1/c1	BM-Labrador tea/horsetail Sw-Sb//Labrador tea-mesic Pj-Sb
BM-h1/d2	BM-Labrador tea/horsetail Sw-Sb//low-bush cranberry Aw-Sw
BM-h1/d3	BM-Labrador tea/horsetail Sw-Sb//low-bush cranberry Sw
BM-h1/i1	BM-Labrador tea/horsetail Sw-Sb//treed bog

BM-h1/j1	BM-Labrador tea/horsetail Sw-Sb//treed poor fen
BM-i1	BM-treed poor fen
BM-i1/c1	BM-treed bog//Labrador tea-mesic Pj-Sb
BM-i1/d2	BM-treed bog//low-bush cranberry Aw-Sw
BM-i1/e2	BM-treed bog//dogwood Pb-Sw
BM-i1/g1	BM-treed bog//Labrador tea-subhydgric Sb-Pj
BM-i1/h1	BM-treed bog//Labrador tea/horsetail Sw-Sb
BM-i1/j1	BM-treed bog//treed poor fen
BM-i2	BM-shrubby bog
BM-i2/j2	BM-shrubby bog//shrubby poor fen
BM-i2/k2	BM-shrubby bog//shrubby rich fen
BM-i2/k3	BM-shrubby bog//graminoid rich fen
BM-i2/l1	BM-shrubby bog//marsh
BM-j1	BM-treed poor fen
BM-j1/b4	BM-treed poor fen//blueberry Sw-Pj
BM-j1/c1	BM-treed poor fen//Labrador tea-mesic Pj-Sb
BM-j1/d2	BM-treed poor fen//low-bush cranberry Aw-Sw
BM-j1/h1	BM-treed poor fen//Labrador tea/horsetail Sw-Sb
BM-j1/i1	BM-treed poor fen//treed bog
BM-j1/k1	BM-treed poor fen//treed rich fen
BM-j2	BM-shrubby poor fen
BM-j2/i2	BM-shrubby poor fen//shrubby bog
BM-j2/k2	BM-shrubby poor fen//shrubby rich fen
BM-j2/k3	BM-shrubby poor fen//graminoid rich fen
BM-j2/l1	BM-shrubby poor fen//marsh
BM-k1	BM-treed rich fen
BM-k1/h1	BM-treed rich fen//Labrador tea/horsetail Sw-Sb
BM-k1/j1	BM-treed rich fen//treed poor fen
BM-k2/i2	BM-shrubby rich fen//shrubby bog
BM-k2/j2	BM-shrubby rich fen//shrubby poor fen
BM-k2/k3	BM-shrubby rich fen//graminoid rich fen
BM-k2/l1	BM-shrubby rich fen//marsh
BM-k3/i2	BM-graminoid rich fen//shrubby bog
BM-k3/j2	BM-graminoid rich fen//shrubby poor fen
BM-k3/k2	BM-graminoid rich fen//shrubby rich fen
BM-k3/l1	BM-graminoid rich fen//marsh
BM-l1	BM-marsh
BM-l1/i2	BM-marsh//shrubby bog
BM-l1/j2	BM-marsh//shrubby poor fen
BM-l1/k2	BM-marsh//shrubby rich fen
BM-l1/k3	BM-marsh//graminoid rich fen
BM-xx	BM-Unclassified
CM-d1	Not In Domain
CM-d1/e1	
LF-(w)	LF-water
LF-(y)	LF-anthropogenic lands
LF-(z)	LF-natural mineral substrate
LF-a1	LF-shrubby grassland
LF-b1	LF-bearberry/lichen Pl
LF-c1	LF-hairy wild rye Pl
LF-c1/e1	LF-hairy wild rye Pl//low-bush cranberry Pl
LF-c2	LF-hairy wild rye Aw
LF-c2/e2	LF-hairy wild rye Aw//low-bush cranberry
LF-c2/f2	LF-hairy wild rye Aw//bracted honeysuckle Aw-Pb
LF-c3	LF-hairy wild rye Aw-Sw-Pl
LF-c3/e3	LF-hairy wild rye Aw-Sw-Pl//low-bush cranberry Aw-Sw-Pl
LF-d1	LF-Labrador tea-mesic Pl-Sb
LF-d1/e1	LF-Labrador tea-mesic Pl-Sb//low-bush cranberry Pl
LF-d1/e3	LF-Labrador tea-mesic Pl-Sb//low-bush cranberry Aw-Sw-Pl
LF-d1/h1	LF-Labrador tea-mesic Pl-Sb//Labrador tea-

	subhygric Sb-Pl
LF-e?	LF-low-bush cranberry (clearcut)
LF-e?/f?	LF-low-bush cranberry//bracted honeysuckle (clearcut)
LF-e1	LF-low-bush cranberry Pl
LF-e1/c1	LF-low-bush cranberry Pl//hairy wild rye Pl
LF-e1/c3	LF-low-bush cranberry Pl//hairy wild rye Aw-Sw-Pl
LF-e1/d1	LF-low-bush cranberry Pl//Labrador tea-mesic Pl-Sb
LF-e1/e3	LF-low-bush cranberry Pl//low-bush cranberry Aw-Sw-Pl
LF-e1/e4	LF-low-bush cranberry Pl//low-bush cranberry Sw
LF-e1/f1	LF-low-bush cranberry Pl//bracted honeysuckle Pl
LF-e1/h1	LF-low-bush cranberry Pl//Labrador tea-subhygric Sb-Pl
LF-e1/j1	LF-low-bush cranberry Pl//Labrador tea/horsetail Sb-Sw
LF-e2	LF-low-bush cranberry Aw
LF-e2/c2	LF-low-bush cranberry Aw//hairy wild rye Aw
LF-e2/e3	LF-low-bush cranberry Aw//low-bush cranberry Aw-Sw-Pl
LF-e2/e4	LF-low-bush cranberry Aw//low-bush cranberry Sw
LF-e2/f2	LF-low-bush cranberry Aw//bracted honeysuckle Aw-Pb
LF-e2/i1	LF-low-bush cranberry Aw//horsetail Pb-Aw
LF-e3	LF-low-bush cranberry Aw-Sw-Pl
LF-e3/c2	LF-low-bush cranberry Aw//hairy wild rye Aw
LF-e3/d1	LF-low-bush cranberry Aw//Labrador tea-mesic Pl-Sb
LF-e3/e1	LF-low-bush cranberry Aw//low-bush cranberry Pl
LF-e3/e2	LF-low-bush cranberry Aw//low-bush cranberry Aw
LF-e3/e4	LF-low-bush cranberry Aw//low-bush cranberry Sw
LF-e3/f2	LF-low-bush cranberry Aw-Sw-Pl//bracted honeysuckle Aw-Pb
LF-e3/f3	LF-low-bush cranberry Aw-Sw-Pl//bracted honeysuckle Aw-Sw-Pl
LF-e3/h1	LF-low-bush cranberry Aw-Sw-Pl//Labrador tea-subhygric Sb-Pl
LF-e3/i2	LF-low-bush cranberry Aw-Sw-Pl//horsetail Pb-Sw
LF-e3/i3	LF-low-bush cranberry Aw-Sw-Pl//horsetail Sw
LF-e3/j1	LF-low-bush cranberry Aw-Sw-Pl//Labrador tea/horsetail Sb-Sw
LF-e4	LF-low-bush cranberry Sw
LF-e4/e2	LF-low-bush cranberry Sw//low-bush cranberry Aw
LF-e4/e3	LF-low-bush cranberry Sw//low-bush cranberry Aw-Sw-Pl
LF-e4/f4	LF-low-bush cranberry Sw//bracted honeysuckle Sw
LF-e4/i3	LF-low-bush cranberry Sw//horsetail Sw
LF-e4/j1	LF-low-bush cranberry Sw//Labrador tea/horsetail Sb-Sw
LF-f?	LF-bracted honeysuckle (clearcut)
LF-f1	LF-bracted honeysuckle Pl
LF-f1/e1	LF-bracted honeysuckle Pl//low-bush cranberry Pl
LF-f2	LF-bracted honeysuckle Aw-Pb
LF-f2/c2	LF-bracted honeysuckle Aw-Pb//hairy wild

	rye Aw
LF-f2/e2	LF-bracted honeysuckle Aw-Pb//low-bush cranberry Aw
LF-f2/e3	LF-bracted honeysuckle Aw-Pb//low-bush cranberry Aw-Sw-Pl
LF-f2/i1	LF-bracted honeysuckle Aw-Pb//horsetail Pb-Aw
LF-f3	LF-bracted honeysuckle Aw-Sw-Pl
LF-f3/e3	LF-bracted honeysuckle Aw-Sw-Pl//low-bush cranberry Aw-Sw-Pl
LF-f3/i2	LF-bracted honeysuckle Aw-Sw-Pl//horsetail Pb-Sw
LF-f4	LF-bracted honeysuckle Sw
LF-f4/e4	LF-bracted honeysuckle Sw//low-bush cranberry Sw
LF-f4/i3	LF-bracted honeysuckle Sw//horsetail Sw
LF-g1	LF-shrubby meadow
LF-g1/g2	LF-shrubby meadow//forb meadow
LF-g2	LF-forb meadow
LF-g2/g1	LF-forb meadow//shrubby meadow
LF-h1	LF-Labrador tea-subhygric Sb-Pl
LF-h1/d1	LF-Labrador tea-subhygric Sb-Pl//Labrador tea-mesic Pl-Sb
LF-h1/e3	LF-Labrador tea-subhygric Sb-Pl//low-bush cranberry Aw-Sw-Pl
LF-h1/j1	LF-Labrador tea-subhygric Sb-Pl//Labrador tea/horsetail Sb-Sw
LF-h1/k1	LF-Labrador tea-subhygric Sb-Pl//treed bog
LF-i1	LF-horsetail Pb-Aw
LF-i2	LF-horsetail Pb-Sw
LF-i2/e3	LF-horsetail Pb-Sw//low-bush cranberry Aw-Sw-Pl
LF-i3	LF-horsetail Sw
LF-i3/c4	LF-horsetail Sw//hairy wild rye Sw
LF-i3/e4	LF-horsetail Sw//low-bush cranberry Sw
LF-i3/f4	LF-horsetail Sw//bracted honeysuckle Sw
LF-j1	LF-Labrador tea/horsetail Sb-Sw
LF-j1/e3	LF-Labrador tea/horsetail Sb-Sw//low-bush cranberry Aw-Sw-Pl
LF-j1/h1	LF-Labrador tea/horsetail Sb-Sw//Labrador tea-subhygric Sb-Pl
LF-j1/i3	LF-Labrador tea/horsetail Sb-Sw//horsetail Sw
LF-j1/k1	LF-Labrador tea/horsetail Sb-Sw//treed bog
LF-j1/l1	LF-Labrador tea/horsetail Sb-Sw//treed poor fen
LF-k1	LF-treed bog
LF-k1/h1	LF-treed bog//Labrador tea-subhygric Sb-Pl
LF-k1/j1	LF-treed bog//Labrador tea/horsetail Sb-Sw
LF-k1/l1	LF-treed bog//treed poor fen
LF-k2/l2	LF-shrubby bog//shrubby poor fen
LF-k2/m2	LF-shrubby bog//shrubby rich fen
LF-k2/m3	LF-shrubby bog//graminoid rich fen
LF-k2/n1	LF-shrubby bog//marsh
LF-l1	LF-treed poor fen
LF-l1/j1	LF-treed poor fen//Labrador tea/horsetail Sb-Sw
LF-l1/k1	LF-treed poor fen//treed bog
LF-l1/m1	LF-treed poor fen//treed rich fen
LF-l2	LF-shrubby poor fen
LF-l2/k2	LF-shrubby poor fen//shrubby bog
LF-m1	LF-treed rich fen
LF-m1/l1	LF-treed rich fen//treed poor fen
LF-m2/k2	LF-shrubby rich fen//shrubby bog
LF-m2/m3	LF-shrubby rich fen//graminoid rich fen
LF-m2/n1	LF-shrubby rich fen/marsh
LF-m3/k2	LF-gramminoid rich fen//shrubby bog
LF-m3/m2	LF-shrubby rich fen//shrubby rich fen
LF-m3/n1	LF-shrubby rich fen//marsh
LF-n1	LF-marsh

					LF-n1/k2 LF-marsh//shrubby bog LF-n1/m2 LF-marsh//shrubby rich fen LF-n1/m3 LF-marsh//graminoid rich fen LF-xx LF-Unclassified UF-(w) UF-water UF-(y) UF-anthropogenic lands UF-(z) UF-natural mineral substrate UF-c1 UF-hairy wild rye Pl UF-c2 UF-hairy wild rye Aw UF-c3 UF-hairy wild rye Aw-Sw-Pl UF-d?/e? UF-Labrador tea-mesic//tall bilberry/arnica (clearcut) UF-d1 UF-Labrador tea-mesic Pl-Sb UF-d1/e1 UF-Labrador tea-mesic Pl-Sb//tall bilberry/arnica Pl UF-d1/h1 UF-Labrador tea-mesic Pl-Sb//Labrador tea-subhygric Sb-Pl UF-e? UF-tall bilberry/arnica (clearcut) UF-e?/f? UF-tall bilberry/arnica//bracted honeysuckle (clearcut) UF-e1 UF-tall bilberry/arnica Pl UF-e1/f1 UF-tall bilberry/arnica Pl//bracted honeysuckle Pl UF-e2 UF-tall bilberry/arnica Aw-Sw-Pl UF-e2/f2 UF-tall bilberry/arnica Aw-Sw-Pl//bracted honeysuckle Pb UF-e2/f3 UF-tall bilberry/arnica Aw-Sw-Pl//bracted honeysuckle Pb-Sw-Pl UF-e2/i1 UF-tall bilberry/arnica Aw-Sw-Pl//Labrador tea/horsetail Sb-Sw UF-e2/j1 UF-tall bilberry/arnica Aw-Sw-Pl//horsetail Sw UF-e3 UF-tall bilberry/arnica Sw UF-e3/f4 UF-tall bilberry/arnica Sw//bracted honeysuckle Sw UF-e3/i1 UF-tall bilberry/arnica Sw//Labrador tea/horsetail Sb-Sw UF-e3/j1 UF-tall bilberry/arnica Sw//horsetail Sw UF-e4 UF-tall bilberry/arnica Fa UF-e4/f5 UF-tall bilberry/arnica Fa//bracted honeysuckle Fa UF-f1 UF-bracted honeysuckle Pl UF-f2 UF-bracted honeysuckle Pb UF-f2/j1 UF-bracted honeysuckle Pb//horsetail Sw UF-f3 UF-bracted honeysuckle Pb-Sw-Pl UF-f3/j1 UF-bracted honeysuckle Pb-Sw-Pl//horsetail Sw UF-f4 UF-bracted honeysuckle Sw UF-f4/j1 UF-bracted honeysuckle Sw//horsetail Sw UF-g1 UF-shrubby meadow UF-g2 UF-forb meadow UF-h1 UF-Labrador tea-subhygric Sb-Pl UF-h1/i1 UF-Labrador tea-subhygric Sb-Pl//Labrador tea/horsetail Sb-Sw UF-h1/k1 UF-Labrador tea-subhygric Sb-Pl//treed bog UF-i1 UF-Labrador tea/horsetail Sb-Sw UF-j1 UF-horsetail Sw UF-k1/l1 UF-treed bog//treed poor fen UF-l1 UF-treed poor fen UF-l1/m1 UF-treed poor fen//treed rich fen UF-l2 UF-shrubby poor fen UF-l3 UF-graminoid poor fen UF-m3 UF-graminoid rich fen
ECOSITE	73	Character	8	0	Ecosite codes - definitions vary by NSR
NLIN_DISP	74	Character	3	0	Non-linear disposition type DRS Disposition reservation MLL Miscellaneous lease MLP Miscellaneous permit MSL Mineral Surface lease

					PNT Protective notation
					PRI Private land
					RCD Reclamation certified
					REC Recreation lease
					SMC Surface material license
					SML Surface material lease
NLIN_GRP	75	Character	16	0	Nonlinear landuse disposition group
					GOVRES DRS and PNT dispositions
					LEASE/PERM DRS, MLL, MLP, MSL, PIL, PNT, REC, SMC,
					IT SML dispositions
					PRIVATE Private lands - PRI disposition
					RECLAIMED Dispositions with reclamation certificate - RCD disposition
NLIN_ORD	76	Integer	3	0	Non-linear disposition heirarchy order
LIN_DISP	77	Character	3	0	Linear landuse disposition code
					EZE Easement
					FRD Forestry road
					LOC License of occupation
					PIL Pipeline installation lease
					PLA Pipeline agreement
					RD Road
					RDD Road related
					RDS Roadway
					REA Rural electrification association
					ROE Right-of-entry agreement
					RR Railroad
					RRD Road related
					VCE Vegetation control easement
LIN_GRP	78	Character	16	0	Linear landuse disposition group
					LEASE/PERM DRS, MLL, MLP, MSL, PIL, PNT, REC, SMC,
					IT SML dispositions
					LINEAR EZE, FRD, LOC, PLA, RD, RDD, RDS, REA, ROE, RR, RRD, VCE dispositions
LIN_ORD	79	Integer	3	0	Linear disposition heirarchy order
TRAIL_TYPE	80	Character	30	0	Recreational or historical trails
WIDTH	81	FloatingPt	3	1	Width of trails (for buffering)
OPENING_NUMBER	82	Character	11	0	ARIS cutblock opening number
TIMBER_YEAR	83	Integer	5	0	Block origin year
BLK_RESP	84	Character	8	0	Agency responsible for cutblocks
					F4 FRIAA - 1994 to 1999
					F5 FRIAA Post 2000
					FLEM Robert Fleming blocks
					MOST Mostowich Lumber Ltd.
					OK OK Lumber
					SPML Spruceland Millworks Inc.
					SRD Sustainable Resource Development
					WEST Millar Western Forest Products
					WEYR Weyerhaeuser Canada Ltd.
SILV_SYSTEM	85	Character	25	0	Silviculture system
					CC Clearcut
					RC Release Cut
					SG Group Selection
					SH Shelterwood
					SL Selection
					ST Sanitation Cut
					SW Wildfire Salvage
					TC Commercial Thinning
					TS Salvage Thinning
					X No system specified
BLK_TPR	86	Character	2	0	Cutblock productivity assignment
					F Fair
					G Good
					M Medium
					U Unproductive
BLK_DENSITY	87	Character	3	0	Block density assignment
					B Crown closure 31-50%
					CD Crown closure > 50%
BLK_STRATA	88	Character	8	0	Cutblock BAP strata

					AW Aspen AW_PL Aspen - lodgepole pine AW_SWSB Aspen - spruce mixedwood BW White birch LT Larch PB Balsam poplar PL Lodgepole pine PL_DEC Pine - deciduous mixedwood SB Black spruce SW White spruce SWSB_DEC Spruce - deciduous mixedwood XATH Athabasca Flats blocks XPLN Planned blocks XTHN Thinned blocks
BLK_ACT	89	Character	7	0	Company assigned harvest action CP Crop plan CT Commercial thinning X No block action
BLK_STATUS	90	Character	15	0	Cutblock harvest status COMPLETE Harvested prior to 2004 timber year (begins May 1, 2004) PLANNED Harvested or planned after 2003 timber year (ends April 30, 2004)
HARV_LOC	91	Character	20	0	Special harvesting areas ATHABASC A FLATS Athabasca Flats logging area X Not assigned
UKEY_BLK	92	Integer	0	0	Unique key for block polygons
IN_WATER	93	Integer	5	0	Hydrology buffer assignment 0 not in watercourse buffers 1 Interior, isolated stands - surrounded by buffers 100 Generated watercourse buffers (ground rules) 200 Waterfowl lake buffer
BURNCODE	94	Character	6	0	Wildfire burn designation B Burned areas
FIRE_YEAR	95	Integer	0	0	Year of wildfire
SAMPLE_NO	96	Character	16	0	Fire survey plot number
VHIL_BCG	97	Character	10	0	VHIL plot broad cover group C Conifer CD Conifer/deciduous mixedwood D Deciduous DC Deciduous/conifer mixedwood
VHIL_YC	98	Character	10	0	VHIL plot assigned yield strata AP Aspen leading pine mixedwood AS Aspen leading spruce mixedwood AW Aspen BW White birch PA Pine leading aspen mixedwood PL Lodgepole pine SA Spruce leading aspen mixedwood SB Black spruce
VHIL_TPR	99	Character	3	0	VHIL timber productivity code F Fair G Good M Medium U Unproductive
VHIL_ORIGIN	100	Integer	0	0	VHIL plot stand origin year
SOURCE	101	Character	128	0	Type of operational management areas
LICENSE_NUM	102	Character	20	0	Timber license or permit number
COMPANY	103	Character	30	0	Company assigned harvest rights . Community Timber Program Fort Assiniboine Lumber Millar Western - non-FMA Mostowich OK Lumber Spruceland Weyerhaeuser

FWD_WSHD	104	Character	16	0	FORWARD watershed
					. Cassidy
					Chickadee
					Goose Tributary
					Kashka
					Millions
					Mosquito
					Pierre
					Sak A
					Sak B
					Thistle
					Toby
					Two Creek
					Willow
WSD_CLASS	105	Character	20	0	FORWARD watershed classification
COMP_CODE	106	Character	6	0	Operating compartment code
					AHL Athabasca Hills
					AKU Akuinu
					ALR Alexis Reserve
					ATH Athabasca
					BCK Bessie Creek
					BLK Baseline Lake
					CHC Chickadee Creek
					CLE Clearwater
					COU Coutts
					CRC Carson Creek
					CRL Carson Lake
					DOR Doris
					ELK Erickson Lake
					FLC Foley Creek
					FLK Foley Lake
					GLK Goodwin Lake
					GOO Goose
					GRC Groat Creek
					HCK Hardluck Creek
					HEV Headless Valley
					ISL Island
					KAY Kaybob
					KLO Klondike
					LEL Long End Lake
					LLK Leech Lake
					MEE Meekwap
					MUD Mud Creek
					NFR North Freeman
					NOG North Goose
					OCE Ocelot
					PCK Pass Creek
					PRV Paddle River
					RLK Roche Lake
					ROB Robison
					SAH Sand Hills
					SAK Sakwatamau
					SFR South Freeman
					TCK Two Creeks
					TIM Timeu Creek
					TOH Tom Hill
					WEG West Goose
					WHM Whitecourt Mountain
					WIN Windfall
					WLK Windfall Lake
					WWF West Windfall
FUNCORD1	107	Integer	0	0	Functional order 1 watersheds
FUNCORD3	108	Integer	0	0	Functional order 3 watersheds
AVG_SLP	109	FloatingPt	4	3	Average slope class for watershed
SEIS_YEAR	110	Integer	5	0	Year of seismic
CC_YEAR	111	Integer	0	0	AVI clearcut polygons year of harvest
SOIL_CLASS	112	Character	16	0	Soil Class
					. Coarse Mineral
					Farm Land
					Fine Mineral

						Medium Mineral
						NOTREE
						Riparian
						TREED
WET_CLASS	113	Character	16	0	Wetland classification	
					NOTREE	Open wetlands
					TREED	Treed wetlands
AB_BMA	114	Character	10	0	Alberta bear management unit	
					2B	Bear management zone 2B
					3A	Bear management zone 3A
WILD_ZONE	115	Character	16	0	Special wildlife zone	
					Caribou	Slave Lake caribou range
HYDRO_ZONE	116	Character	2	0	Paddle River hydrologic designation	
					C	Critical
					MC	Marginally critical
TRAPLINE_ID	117	Integer	0	0	Trapline number	
AW_STATUS	118	Character	22	0	Aspen stand survey classification	
					.	Borrow Pit
						CC
						Gravel pit
						Highway
						Meadow
						Merch Decid/Conif
						Non-merch
						Non-merch willow/alder
						Non-operable
						Non-operable ROW
						Powerline ROW
						Wellsite
PSP_PLOTNUM	119	Character	16	0	MWFP PSP plot number	
PSP_BRKDN	120	Character	20	0	PSP grouping	
					DELETION_D RS	PSP in DRS area
					FMA	PSP inside FMA
					GRAZING_F MA	PSP in grazing license
					GRAZING_F MU	PSP in grazing lease
					NONPROD_B W/AS	PSP in non-productive deciduous
					NONPROD_G RASS	PSP in grasslands
					NONPROD_LT	PSP in larch stands
					NONPROD_SB	PSP in black spruce stands
					NONPROD_S HRUB	PSP in shub area
PSP_TYPE	121	Character	16	0	PSP type	
					EFM	PSP for enhanced forest management
					NON-PRODUCTIVE	PSP to characterize nonproductive forest
					PLANTATION	PSP on plantation areas
					STANDARD	Standard PSP
PSP_STATUS	122	Character	16	0	MWFP PSP status	
					ACTIVE	Not In Domain
					PROPOSED	
PSP_YEAR	123	Integer	0	0	PSP establishment year	
PSPBUF	124	Integer	5	0	Circular buffer on PSP centres	
					0	Outside PSP buffer
					-1	Less than 50% of polygon in 200m buffer
					200	> 50% within 200m PSP plot centre buffer
					30	Within 30m PSP buffer
PL_PCT	125	Integer	2	0	Lodgepole pine order in species assignment	
SW_PCT	126	Integer	2	0	White spruce percent in species distribution	
FB_PCT	127	Integer	2	0	Balsam fir percent in species distribution	
FD_PCT	128	Integer	2	0	Douglas fir percent in species distribution	
SB_PCT	129	Integer	2	0	Black spruce percent in species distribution	
PB_PCT	130	Integer	2	0	Balsam poplar percent in species distribution	
AW_PCT	131	Integer	2	0	Aspen percent in species distribution	
BW_PCT	132	Integer	2	0	White birch percent in species distribution	

LT_PCT	133	Integer	2	0	Larch percent in species distribution
PL_ORD	134	Integer	2	0	Lodgepole pine order in species assignment
SW_ORD	135	Integer	2	0	White spruce order in species assignment
FB_ORD	136	Integer	2	0	Balsam fir order in species assignment
FD_ORD	137	Integer	2	0	Douglas fir order in species assignment
SB_ORD	138	Integer	2	0	Black spruce order in species assignment
PB_ORD	139	Integer	2	0	Balsam poplar order in species assigment
AW_ORD	140	Integer	2	0	Aspen order in species assignment
BW_ORD	141	Integer	2	0	White birch order in species assignment
LT_ORD	142	Integer	2	0	Larch order in species assignment
UPL_PCT	143	Integer	2	0	Lodgepole pine percent in species distribution
USW_PCT	144	Integer	2	0	White spruce percent in species distribution
UFB_PCT	145	Integer	2	0	Balsam fir percent in species distribution
UFD_PCT	146	Integer	2	0	Douglas fir percent in species distribution
USB_PCT	147	Integer	2	0	Black spruce percent in species distribution
UPB_PCT	148	Integer	2	0	Balsam poplar percent in species distribution
UAW_PCT	149	Integer	2	0	Aspen percent in species distribution
UBW_PCT	150	Integer	2	0	White birch percent in species distribution
ULT_PCT	151	Integer	2	0	Larch percent in species distribution
UPL_ORD	152	Integer	2	0	Lodgepole pine order in species assignment
USW_ORD	153	Integer	2	0	White spruce order in species assignment
UFB_ORD	154	Integer	2	0	Balsam fir order in species assignment
UFD_ORD	155	Integer	2	0	Douglas fir order in species assignment
USB_ORD	156	Integer	2	0	Black spruce order in species assignment
UPB_ORD	157	Integer	2	0	Balsam poplar order in species assignment
UAW_ORD	158	Integer	2	0	Aspen order in species assignment
UBW_ORD	159	Integer	2	0	White birch order in species assignment
ULT_ORD	160	Integer	2	0	Larch order in species assignment
SOFTPCT	161	Integer	2	0	Coniferous species percent (overstory)
HARDPCT	162	Integer	2	0	Deciduous species percent (overstory)
USOFTPCT	163	Integer	2	0	Coniferous species percent (understory)
UHARDPCT	164	Integer	2	0	Deciduous species percent (understory)
AGE	165	Integer	5	0	Stand age (2004 base year)
UAGE	166	Integer	5	0	Understory age (2004 base year)
LEAD_DEC	167	Character	2	0	Leading deciduous species
					AW Trembling aspen
					BW White birch
					NO No appropriate species present
					PB Balsam poplar
ULEAD_DEC	168	Character	2	0	Leading deciduous species (understory)
					AW Trembling aspen
					BW White birch
					NO No appropriate species present
					PB Balsam poplar
CLEAD_DEC	169	Character	2	0	Leading deciduous species (compostie layer)
					AW Trembling aspen
					BW White birch
					NO No appropriate species present
					PB Balsam poplar
					X No tree species present
LEAD_CON	170	Character	2	0	Leading conifer species
					FB Balsam fir
					LT Tamarack
					NO No appropriate species present
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
ULEAD_CON	171	Character	2	0	Leading conifer species (understory)
					FB Balsam fir
					LT Tamarack
					NO No appropriate species present
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
CLEAD_CON	172	Character	2	0	Leading conifer species (composite layer)
					FB Balsam fir
					LT Tamarack
					NO No appropriate species present
					PL Lodgepole pine
					SB Black spruce

					SW White spruce
					X No tree species present
C_CODE	173	Character	4	0	Broad cover group (overstory)
					C Conifer
					CD Conifer/deciduous mixedwood
					D Deciduous
					DC Deciduous/conifer mixedwood
UC_CODE	174	Character	4	0	Broad cover group (understory)
					C Conifer
					CD Conifer/deciduous mixedwood
					D Deciduous
					DC Deciduous/conifer mixedwood
CC_CODE	175	Character	4	0	Broad cover group (composite layer)
					C Conifer
					CD Conifer/deciduous mixedwood
					D Deciduous
					DC Deciduous/conifer mixedwood
AVI_STORY	176	Integer	2	0	AVI layer used for strata assignment
					1 AVI overstory
					2 AVI understory
					9 Composite layer
COMP_CC	177	Integer	2	0	Numeric midpoint of stand density class
UCOMP_CC	178	Integer	2	0	Numeric midpoint of stand density class
CDENSITY	179	Character	2	0	Stand density (composite layer)
					A Crown closure 6-30%
					B Crown closure 31-50%
					C Crown closure 51-70%
					D Crown Closure 71-100%
CHEIGHT	180	FloatingPt	5	2	Stand height (composite layer)
CORIGIN	181	Integer	5	0	Stand origin (composite layer)
CAGE	182	Integer	5	0	Stand age (composite layer)
CTPR	183	Character	2	0	Timber productivity rating (composite layer)
					F Fair
					G Good
					M Medium
CSP1	184	Character	2	0	Composite layer species 1
					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No tree species present
CSP1_PER	185	FloatingPt	15	4	Composite layer species 1 percent
CSP2	186	Character	2	0	Composite layer species 2
					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No tree species present
CSP2_PER	187	FloatingPt	15	4	Composite layer species 2 percent
CSP3	188	Character	2	0	Composite layer species 3
					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No tree species present
CSP3_PER	189	FloatingPt	15	4	Composite layer species 3 percent
CSP4	190	Character	2	0	Composite layer species 4

					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No tree species present
CSP4_PER	191	FloatingPt	15	4	Composite layer species 4 percent
CSP5	192	Character	2	0	Composite layer species 5
					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No tree species present
CSP5_PER	193	FloatingPt	15	4	Composite layer species 5 percent
CSP6	194	Character	2	0	Composite layer species 6
					PB Balsam poplar
					X No tree species present
CSP6_PER	195	FloatingPt	15	4	Composite layer species 6 percent
CPL_PCT	196	FloatingPt	10	4	Lodgepole pine percent (composite layer)
CSW_PCT	197	FloatingPt	10	4	White spruce percent (composite layer)
CFB_PCT	198	FloatingPt	10	4	Balsam fir percent (composite layer)
CFD_PCT	199	FloatingPt	10	4	Douglas fir percent (composite layer)
CSB_PCT	200	FloatingPt	10	4	Black spruce percent (composite layer)
CPB_PCT	201	FloatingPt	10	4	Balsam poplar percent (composite layer)
CAW_PCT	202	FloatingPt	10	4	Aspen percent (composite layer)
CBW_PCT	203	FloatingPt	10	4	White birch percent (composite layer)
CLT_PCT	204	FloatingPt	10	4	Larch percent (composite layer)
CPL_ORD	205	Integer	2	0	Lodgepole pine species order (composite layer)
CSW_ORD	206	Integer	2	0	White spruce species order (composite layer)
CFB_ORD	207	Integer	2	0	Balsam fir species order (composite layer)
CFD_ORD	208	Integer	2	0	Douglas fir species order (composite layer)
CSB_ORD	209	Integer	2	0	Black spruce species order (composite layer)
CPB_ORD	210	Integer	2	0	Balsam poplar species order (composite layer)
CAW_ORD	211	Integer	2	0	Aspen species order (composite layer)
CBW_ORD	212	Integer	2	0	White birch species order (composite layer)
CLT_ORD	213	Integer	2	0	Larch species order (composite layer)
DRULE	214	Character	15	0	Deciduous strata decision rule (overstory)
					AW_LEAD Aspen leading deciduous
					BW_LEAD Birch leading deciduous
					NO_D No deciduous species
					PB_LEAD Poplar leading deciduous
UDRULE	215	Character	15	0	Deciduous strata decision rule
					AW_LEAD Aspen leading deciduous
					BW_LEAD Birch leading deciduous
					NO_D No deciduous species
					PB_LEAD Poplar leading deciduous
C_DRULE	216	Character	15	0	Deciduous strata decision rule (composite layer)
					AW_LEAD Aspen leading deciduous
					BW_LEAD Birch leading deciduous
					NO_D No deciduous species
					PB_LEAD Poplar leading deciduous
CRULE	217	Character	15	0	Conifer strata decision rule (overstory)
					FB_LEAD Fir leading coniferous
					FBFD_LEAD_MW Fir leading mixedwood
					LT_LEAD Larch leading coniferous
					NO_C No coniferous species
					PL_LEAD Pine leading coniferous
					PL_LEAD_MW Pine leading mixedwood
					SB_LEAD Black spruce leading coniferous
					SBLT_LEAD_MW Black spruce larch leading mixedwood

					SW_LEAD White spruce leading coniferous SW_LEAD_MW White spruce leading mixedwood
UCRULE	218	Character	15	0	Conifer strata decision rule (understory) FB_LEAD Fir leading coniferous FBFD_LEAD_MW Fir leading mixedwood LT_LEAD Larch leading coniferous NO_C No coniferous species PL_LEAD Pine leading coniferous PL_LEAD_MW Pine leading mixedwood SB_LEAD Black spruce leading coniferous SBLT_LEAD_MW Black spruce larch leading mixedwood SW_LEAD White spruce leading coniferous SW_LEAD_MW White spruce leading mixedwood
C_CRULE	219	Character	15	0	Conifer strata decision rule (composite layer) FB_LEAD Fir leading coniferous FBFD_LEAD_MW Fir leading mixedwood LT_LEAD Larch leading coniferous NO_C No coniferous species PL_LEAD Pine leading coniferous PL_LEAD_MW Pine leading mixedwood SB_LEAD Black spruce leading coniferous SBLT_LEAD_MW Black spruce larch leading mixedwood SW_LEAD White spruce leading coniferous SW_LEAD_MW White spruce leading mixedwood
STRATA_SRD	220	Character	5	0	Stand SRD extended strata assignment C1 Pure white spruce C10 Black spruce leading with pine C11 Black spruce leading without pine C12 Larch leading C15 Pure balsam fir C16 Balsam fir leading with pine C17 Balsam fir leading without pine C2 White spruce leading with pine C3 White spruce leading without pine C4 Pure pine C5 Pine leading with white spruce C6 Pine leading with black spruce C7 Pine leading with fir C8 Pine leading without spruce and fir C9 Pure black spruce CD1 White spruce/aspen CD10 Fir/aspen CD12 Fir/birch CD2 White spruce/poplar CD3 White spruce/birch CD4 Pine/aspen CD5 Pine/poplar CD6 Pine/birch CD7 Black spruce/aspen CD8 Black spruce/poplar CD9 Black spruce/birch D1 Pure aspen D2 Aspen leading with poplar D3 Aspen leading without poplar D4 Poplar leading D5 Birch leading DC1 Aspen/white spruce DC10 Birch/pine DC11 Birch/black spruce DC12 Birch/fir DC2 Aspen/pine DC3 Aspen/black spruce DC4 Aspen/fir

					DC5	Poplar/white spruce
					DC6	Poplar/pine
					DC7	Poplar/black spruce
					DC9	Birch/white spruce
					XX0	Non forest
USTRATA_SRD	221	Character	5	0	Stand SRD extended strata assignment	
					C1	Pure white spruce
					C10	Black spruce leading with pine
					C11	Black spruce leading without pine
					C12	Larch leading
					C15	Pure balsam fir
					C16	Balsam fir leading with pine
					C17	Balsam fir leading without pine
					C2	White spruce leading with pine
					C3	White spruce leading without pine
					C4	Pure pine
					C5	Pine leading with white spruce
					C6	Pine leading with black spruce
					C7	Pine leading with fir
					C8	Pine leading without spruce and fir
					C9	Pure black spruce
					CD1	White spruce/aspen
					CD10	Fir/aspen
					CD2	White spruce/poplar
					CD3	White spruce/birch
					CD4	Pine/aspen
					CD6	Pine/birch
					CD7	Black spruce/aspen
					CD8	Black spruce/poplar
					CD9	Black spruce/birch
					D1	Pure aspen
					D2	Aspen leading with poplar
					D3	Aspen leading without poplar
					D4	Poplar leading
					D5	Birch leading
					DC1	Aspen/white spruce
					DC10	Birch/pine
					DC11	Birch/black spruce
					DC12	Birch/fir
					DC2	Aspen/pine
					DC3	Aspen/black spruce
					DC4	Aspen/fir
					DC5	Poplar/white spruce
					DC7	Poplar/black spruce
					DC9	Birch/white spruce
					XX0	Non forest
CSTRATA_SRD	222	Character	5	0	Composite layer yield strata assignment	
					C1	Pure white spruce
					C10	Black spruce leading with pine
					C11	Black spruce leading without pine
					C12	Larch leading
					C17	Balsam fir leading without pine
					C2	White spruce leading with pine
					C3	White spruce leading without pine
					C4	Pure pine
					C5	Pine leading with white spruce
					C6	Pine leading with black spruce
					C7	Pine leading with fir
					C8	Pine leading without spruce and fir
					C9	Pure black spruce
					CD1	White spruce/aspen
					CD10	Fir/aspen
					CD2	White spruce/poplar
					CD3	White spruce/birch
					CD4	Pine/aspen
					CD6	Pine/birch
					CD7	Black spruce/aspen
					CD8	Black spruce/poplar
					D1	Pure aspen
					D2	Aspen leading with poplar

					D3 Aspen leading without poplar D4 Poplar leading D5 Birch leading DC1 Aspen/white spruce DC10 Birch/pine DC11 Birch/black spruce DC2 Aspen/pine DC3 Aspen/black spruce DC4 Aspen/fir DC5 Poplar/white spruce DC7 Poplar/black spruce DC9 Birch/white spruce XX0 Non forest
STRATA_YC	223	Character	5	0	Stand yield strata assignment AP Aspen leading pine mixedwood AS Aspen leading spruce mixedwood AW Aspen BW White birch LT Larch PA Pine leading aspen mixedwood PL Lodgepole pine SA Spruce leading aspen mixedwood SB Black spruce SW White spruce
USTRATA_YC	224	Character	5	0	Stand yield strata assignment AP Aspen leading pine mixedwood AS Aspen leading spruce mixedwood AW Aspen BW White birch LT Larch PA Pine leading aspen mixedwood PL Lodgepole pine SA Spruce leading aspen mixedwood SB Black spruce SW White spruce
CSTRATA_YC	225	Character	5	0	Composite layer yield strata assignment AP Aspen leading pine mixedwood AS Aspen leading spruce mixedwood AW Aspen BW White birch LT Larch PA Pine leading aspen mixedwood PL Lodgepole pine SA Spruce leading aspen mixedwood SB Black spruce SW White spruce
STRATA_BAP	226	Character	8	0	Stand BAP strata assignment 103 Anthropogenic non-vegetated (industrial) - terrestrial 105 Naturally non-vegetated - mineral - gravel, sand 106 Bryophyte 107 Bare ground, burned non-vegetated areas 1111 Anthropogenic vegetated - agriculture 203 Shrub open 204 Shrub closed 206 Herbaceous grassland 207 Herbaceous forbs 64 Water and wetlands AW Aspen AW_PL Aspen - lodgepole pine AW_SWSB Aspen - spruce mixedwood BW White birch LT Larch PB Balsam poplar PB_CON Poplar - conifer mixedwood PL Lodgepole pine PL_DEC Pine - deciduous mixedwood SB Black spruce

					SW White spruce
					SWSB_DEC Spruce - deciduous mixedwood
USTRATA_BAP	227	Character	8	0	Stand BAP strata assignment
					103 Anthropogenic non-vegetated (industrial) - terrestrial
					105 Naturally non-vegetated - mineral - gravel, sand
					106 Bryophyte
					1111 Anthropogenic vegetated - agriculture
					203 Shrub open
					204 Shrub closed
					206 Herbaceous grassland
					207 Herbaceous forbs
					64 Water and wetlands
					AW Aspen
					AW_PL Aspen - lodgepole pine
					AW_SWSB Aspen - spruce mixedwood
					BW White birch
					LT Larch
					PB Balsam poplar
					PB_CON Poplar - conifer mixedwood
					PL Lodgepole pine
					PL_DEC Pine - deciduous mixedwood
					SB Black spruce
					SW White spruce
					SWSB_DEC Spruce - deciduous mixedwood
CSTRATA_BAP	228	Character	8	0	Composite layer BAP strata assignment
					AW Aspen
					AW_PL Aspen - lodgepole pine
					AW_SWSB Aspen - spruce mixedwood
					BW White birch
					LT Larch
					PB Balsam poplar
					PB_CON Poplar - conifer mixedwood
					PL Lodgepole pine
					PL_DEC Pine - deciduous mixedwood
					SB Black spruce
					SW White spruce
					SWSB_DEC Spruce - deciduous mixedwood
NONFOREST	229	Character	4	0	Nonforest code assignment
					AIF farmsteads
					AIG gravel pits
					AIH permanent right of way, roads, highways, railways
					AII industrial plant sites
					ASC Not In Domain
					ASR ribbon development
					BR bryophyte mosses and liverworts
					CA cropland annual
					CIP pipelines, transmission lines, grass airstrips
					CIW well sites, geophysical
					CP cropland perennial
					HF herbaceous forbs
					HG herbaceous grasslands
					NMB burn recent
					NMC cutbank - watercourse related
					NMR rock barren - bedrock, talus
					NMS sand - dunes, beaches
					NWF flooded, beaver ponds
					NWI ice/snow - permanent
					NWL lakes, ponds
					NWR rivers
					SC shrub closed
					SO shrub open
UNONFOREST	230	Character	4	0	Nonforest AVI code
					AIF farmsteads
					AIG gravel pits
					AIH permanent right of way, roads, highways, railways
					AII industrial plant sites

					ASR ribbon development
					BR bryophyte mosses and liverworts
					CIP pipelines, transmission lines, grass airstrips
					CIW well sites, geophysical
					CP cropland perennial
					HF herbaceous forbs
					HG herbaceous grasslands
					NMC cutbank - watercourse related
					NMS sand - dunes, beaches
					NWF flooded, beaver ponds
					NWL lakes, ponds
					NWR rivers
					SC shrub closed
					SO shrub open
SP_COMP	231	Character	30	0	AVI overstory string of attributes
USP_COMP	232	Character	30	0	AVI understory string of attributes
CSP_COMP	233	Character	80	0	AVI composite layer string of attributes
LB_CODE	234	Character	5	0	Conifer or deciduous landbase code
					C Coniferous landbase
					D Deciduous landbase
SB_LT_PCT	235	Integer	0	0	Overstory black spruce and larch species percent
USB_LT_PCT	236	Integer	0	0	Understory black spruce and larch species percent
CSB_LT_PCT	237	Integer	0	0	Composite layer black spruce and larch species percent
DISP_TYPE	238	Character	4	0	Landuse disposition type
					DRS Disposition reservation
					EZE Easement
					FRD Forestry road
					LOC License of occupation
					MLL Miscellaneous lease
					MLP Miscellaneous permit
					MSL Mineral Surface lease
					PIL Pipeline installation lease
					PLA Pipeline agreement
					PNT Protective notation
					PRI Private land
					RCD Reclamation certified
					RD Road
					RDD Road related
					RDS Roadway
					REA Rural electrification association
					REC Recreation lease
					ROE Right-of-entry agreement
					RR Railroad
					RRD Road related
					SMC Surface material license
					SML Surface material lease
					VCE Vegetation control easement
WITH_SEIS	239	Integer	4	0	Polygons with seismic area
					0 Outside seismic area
					100 Polygon area intersected by seismic
STRATA_SEIS	240	Character	8	0	Strata assignment to seismic areas
					103 Anthropogenic non-vegetated (industrial) - terrestrial
					105 Naturally non-vegetated - mineral - gravel, sand
					106 Bryophyte
					107 Bare ground, burned non-vegetated areas
					1111 Anthropogenic vegetated - agriculture
					203 Shrub open
					204 Shrub closed
					206 Herbaceous grassland
					207 Herbaceous forbs
					64 Water and wetlands
AREA_HORIZ	241	FloatingPt	12	6	Area for horizontal stands
AREA_H_DEL	242	FloatingPt	12	6	Area lost to horizontal stands (ha)
AREAHA_POL	243	FloatingPt	12	6	Polygon area(ha)
BLK_GRP	244	Character	10	0	Cutblock grouping
					EXIST Existing cutblocks
					EXIST_TH Existing thinning

					FIRE_REG Fire regeneration survey MOD1 AVI MOD1 = CC polygons PLAN Planned harvest PLAN_TH Planned thinning
D_LAND	245	Character	8	0	Deletion for landuse GOVRES Government assigned dispositions LEASE Surface and mineral leases LINE Utility corridors and linear features REC Dispositions for recreation areas ROAD Roads XDFA Private and non-classified lands under disposition
D_INV	246	Character	8	0	Deletion for lack of inventory XAVI Areas without AVI
D_ACCESS	247	Character	8	0	Deletion for access KLONDIKE Historical Klondike trail LINE Utility corridors and linear features ROAD Roads SNOW Snowmobile trails
D_SEIS	248	Character	4	0	Deletion for seismic SEIS Seismic area
D_NONFOR	249	Character	8	0	Deletion for nonforest lands 103 Anthropogenic non-vegetated (industrial) - terrestrial 105 Naturally non-vegetated - mineral - gravel, sand 106 Bryophyte 107 Bare ground, burned non-vegetated areas 1111 Anthropogenic vegetated - agriculture 203 Shrub open 204 Shrub closed 206 Herbaceous grassland 207 Herbaceous forbs 64 Water and wetlands X No strata assigned
D_BURN	250	Character	8	0	Deletion for areas burnt since AVI B Areas burned since 1994
D_TPR	251	Character	4	0	Deletion for unproductive areas U Unproductive
D_BUF	252	Character	8	0	Deletion for hydrologic buffers BIRDBUF Waterfowl lake buffer (200m) GRBUF Ground rule buffers
D_SUBJ	253	Character	16	0	Subjective deletions LT Larch stands SB Black spruce stands in W11 SB_ADENS A density Sb stands in W13 SB_SBLT SB or SB/LT stands with < 30% other species SB_STRUC SB stands with complex or horizontal structures
D_DFA	254	Character	8	0	Deletion for areas outside DFA ALEXIS Alexis Reserve land CAMP Campgrounds DUMP Whitecourt dump IND_SITE Industrial sites within FMU boundary PRIVATE Private lands XDFA Private and non-classified lands outside DFA
D_REC	255	Character	8	0	Deletion for recreation areas CAMP Campgrounds PARK Parks and Natural areas
D_ISO	256	Character	8	0	Deletion for isolated/inaccessible stands ISL Islands in Athabasca River ISO Stands surrounded by riparian buffers
F_STORY	257	Integer	4	0	Inventory source used for stand classification 1 AVI overstory 2 AVI understory 3 Linear features established since AVI 4 Existing cutblock 8 Fire regeneration survey

					9 Composite layer
F_DEL	258	Character	12	0	Final stand deletion classification
					FIRE Areas burned since 1994
					GOVRES Government assigned dispositions (DRS and PNT)
					HYDROBUF Riparian and waterfowl buffers
					ISL Islands in Athabasca River
					ISO Isolated stands
					LEASE Government assigned dispositions
					LINE Linear features / utility corridors
					LT Larch stands
					NF Nonforest areas
					NONE Managed area - no deletions
					PARK Parks and natural areas
					REC Recreation areas
					ROAD Roads
					SB Black spruce in W11
					SB_ADENS Black spruce A density stands in W13
					SB_SBLT Black spruce/larch stands with < 30% other species - W13
					SB_STRUC Black spruce complex and horizontal stands - W13
					SEIS Areas covered by seismic lines
					TPR Unproductive timber productivity rating
					TRAIL Klondike and snowmobile trails
					XAVI Area without AVI
					XDFA Private lands and non-classified areas
F_SRD	259	Character	8	0	Final stand SRD existended strata assignment
					C1 Pure white spruce
					C10 Black spruce leading with pine
					C11 Black spruce leading without pine
					C12 Larch leading
					C15 Pure balsam fir
					C16 Balsam fir leading with pine
					C17 Balsam fir leading without pine
					C2 White spruce leading with pine
					C3 White spruce leading without pine
					C4 Pure pine
					C5 Pine leading with white spruce
					C6 Pine leading with black spruce
					C7 Pine leading with fir
					C8 Pine leading without spruce and fir
					C9 Pure black spruce
					CD1 White spruce/aspen
					CD10 Fir/aspen
					CD12 Fir/birch
					CD2 White spruce/poplar
					CD3 White spruce/birch
					CD4 Pine/aspen
					CD5 Pine/poplar
					CD6 Pine/birch
					CD7 Black spruce/aspen
					CD8 Black spruce/poplar
					CD9 Black spruce/birch
					D1 Pure aspen
					D2 Aspen leading with poplar
					D3 Aspen leading without poplar
					D4 Poplar leading
					D5 Birch leading
					DC1 Aspen/white spruce
					DC10 Birch/pine
					DC11 Birch/black spruce
					DC12 Birch/fir
					DC2 Aspen/pine
					DC3 Aspen/black spruce
					DC4 Aspen/fir
					DC5 Poplar/white spruce
					DC6 Poplar/pine
					DC7 Poplar/black spruce

					DC9 Birch/white spruce
					X No strata assigned
F_YC	260	Character	8	0	Final stand yield strata assignment
					AP Aspen leading pine mixedwood
					AS Aspen leading spruce mixedwood
					AW Aspen
					BW White birch
					LT Larch
					PA Pine leading aspen mixedwood
					PL Lodgepole pine
					SA Spruce leading aspen mixedwood
					SB Black spruce
					SW White spruce
					X No strata assigned
F_BAP	261	Character	8	0	Final stand BAP strata assignment
					103 Anthropogenic non-vegetated (industrial) - terrestrial
					105 Naturally non-vegetated - mineral - gravel, sand
					106 Bryophyte
					107 Bare ground, burned non-vegetated areas
					1111 Anthropogenic vegetated - agriculture
					203 Shrub open
					204 Shrub closed
					206 Herbaceous grassland
					207 Herbaceous forbs
					64 Water and wetlands
					AW Aspen
					AW_PL Aspen - lodgepole pine
					AW_SWSB Aspen - spruce mixedwood
					BW White birch
					LT Larch
					PB Balsam poplar
					PB_CON Poplar - conifer mixedwood
					PL Lodgepole pine
					PL_DEC Pine - deciduous mixedwood
					SB Black spruce
					SW White spruce
					SWSB_DEC Spruce - deciduous mixedwood
					X No strata assigned
F_LEAD_SP	262	Character	8	0	Leading species
					AW Trembling aspen
					BW White birch
					FB Balsam fir
					LT Tamarack
					NO No appropriate species present
					PB Balsam poplar
					PL Lodgepole pine
					SB Black spruce
					SW White spruce
					X No species found
F_WET	263	Character	8	0	Final wetland classification
					WET Areas classes as wetlands (per AVI)
					X Non-wetland areas
F_DEN	264	Character	8	0	Final stand density assignment
					A Crown closure 6-30%
					B Crown closure 31-50%
					C Crown closure 51-70%
					D Crown Closure 71-100%
					X No crown closure
F_AGE	265	Integer	4	0	Final stand age assignment
F_TPR	266	Character	8	0	Final stand timber productivity assignment
					F Fair
					G Good
					M Medium
					U Unproductive
					X No TPR
F_ORIGIN	267	Character	8	0	Final stand origin assignment
					MGD Managed stands
					NAT Natural stands

					RECBURN Recently burned stands (post 1994) THIN Thinned stands VHIL Fire survey pine regeneration stands WIND Windfall burn X Non forest
F_HGT	268	Integer	5	0	Final stand height assignment
F_AREAHA	269	FloatingPt	12	6	Final stand area (ha) assignment
F_DEL_GROUP	270	Character	30	0	Grouping of deletion codes
F_DEL_ORD	271	Integer	0	0	Order of display for deletion types
YC_ORD	272	Integer	0	0	Order of display for species strata
SRD_DESC2	273	Character	55	0	Summary description

Appendix V TSA Landbase Dataset Description

The Millar Western TSA landbase file is the base landbase with additional attributes to shows the modelling deletions and areas adjustments is named: **mw_lb12tsamod** (coverage) and **mw_lb12tsamod.shp** (shapefile).

Dataset Information **mw_lb12tsamod (COVER), mw_lb12tsamod(SHAPEFILE)**

Description: TSA landbase for MWFP 2007-2016 DFMP With adjustments for additional black spruce deletions.

Data Source: Generated by The Forestry Corp.

Date Generated: 7/07/2007

Data Format: ArcInfo Coverage / Shapefile

Software Used: ESRI ArcInfo

Projection: UTM 11

Datum: GRS80

Units: metres

Data Precision: Double

Tolerance: .001

Extent: All lands within outer boundaries of FMU W11 and FMU W13

Appendix VI TSA Landbase Data Dictionary

Dataset Name: MW_LB12TSAMOD

Description: TSA Landbase (with final deletions and areas) MW_LB12TSAMOD

Column Name	*Order*	*Type*	*Width*	*Decimal*	*Description*	
					Value	***Definition***
UKEY12_TSA	1	Integer	0	0	Unique key TSA Landbase	
C_UKEY12_TSA	2	Character	30	0	Character unique key	
POLY_NUM	3	Integer	0	0	AVI 2.1 polygon number	
LB_LABEL	4	Character	40	0	Landbase label	
					.	Alexis Reserve
						ANC Site
						Blue Ridge
						Carson Pegasus Provincial Park
						Centre of Alberta
						Eagle River Campground
						FGL
						Fort Assiniboine
						Ft Assiniboine Sandhills Provincial Park
						GRL
						GRP
						Huestis Forest
						McLeod
						Mobil Site
						Not classified
						Private Land
						Virginia Hills
						Whitecourt
						Whitecourt Dump
						Whitecourt Mountain Natural Area
DFA	5	Character	16	0	Defined forest area designation	
					FGL	Forest grazing license
					FMA	Forest Management Agreement area
					GRL	Grazing lease
					GRP	Grazing permit
					NO	Outside Defined Forest Area
					PARK	Parks/natural areas
LOCATION	6	Character	16	0	Management area	
					.	Blue Ridge
						FGL
						Fort Assiniboine
						McLeod
						Virginia Hills
						Whitecourt
FMU_NUM	7	Character	4	0	Forest Management Unit	
					.	W11
						W13
BURNCODE	8	Character	6	0	Wildfire burn designation	
					B	Burned areas
FIRE_YEAR	9	Integer	4	0	Year of wildfire	
FWD_WSHD	10	Character	16	0	FORWARD watershed name	
					.	Cassidy
						Chickadee
						Goose Tributary
						Kashka
						Millions
						Mosquito
						Pierre

Column Name	Order	Type	Width	Decimal	Description	
					Value	**Definition**
					.	Sak A
						Sak B
						Thistle
						Toby
						Two Creek
						Willow
WSD_CLASS	11	Character	20	0	FORWARD watershed classification	
					.	BURN
						NO MORE HARVEST
						REFERENCE
SAMPLE_NO	12	Integer	0	0	Fire survey plot number	
VHIL_BCG	13	Character	9	0	VHIL plot broad cover group	
					C	Conifer
					CD	Conifer/deciduous mixedwood
					D	Deciduous
					DC	Deciduous/conifer mixedwood
VHIL_YC	14	Character	9	0	VHIL plot assigned species strata	
					AP	Aspen leading pine mixedwood
					AS	Aspen leading spruce mixedwood
					AW	Aspen
					BW	White birch
					PA	Pine leading aspen mixedwood
					PL	Lodgepole pine
					SA	Spruce leading aspen mixedwood
					SB	Black spruce
VHIL_TPR	15	Character	3	0	VHIL timber productivity rating	
					F	Fair
					G	Good
					M	Medium
					U	Unproductive
VHIL_ORIGIN	16	Integer	0	0	VHIL plot stand origin year	
NLIN_DISP	17	Character	3	0	Non-linear disposition type	
					DRS	Disposition reservation
					MLL	Miscellaneous lease
					MLP	Miscellaneous permit
					MSL	Mineral Surface lease
					PNT	Protective notation
					PRI	Private land
					RCD	Reclamation certified
					REC	Recreation lease
					SMC	Surface material license
					SML	Surface material lease
IN_WATER	18	Integer	5	0	Hydrology buffer assignment	
					0	not in watercourse buffers
					1	Interior, isolated stands - surrounded by buffers
					100	Generated watercourse buffers (ground rules)
					200	Waterfowl lake buffer
COMP_CODE	19	Character	6	0	Operating compartment code	
					AHL	Athabasca Hills
					AKU	Akuinu
					ALR	Alexis Reserve
					ATH	Athabasca
					BCK	Bessie Creek
					BLK	Baseline Lake
					CHC	Chickadee Creek
					CLE	Clearwater
					COU	Coutts
					CRC	Carson Creek
					CRL	Carson Lake
					DOR	Doris
					ELK	Erickson Lake
					FLC	Foley Creek
					FLK	Foley Lake
					GLK	Goodwin Lake

Column Name	Order	Type	Width	Decimal	Description
					Value / **Definition**
					GOO / Goose
					GRC / Groat Creek
					HCK / Hardluck Creek
					HEV / Headless Valley
					ISL / Island
					KAY / Kaybob
					KLO / Klondike
					LEL / Long End Lake
					LLK / Leech Lake
					MEE / Meekwap
					MUD / Mud Creek
					NFR / North Freeman
					NOG / North Goose
					OCE / Ocelot
					PCK / Pass Creek
					PRV / Paddle River
					RLK / Roche Lake
					ROB / Robison
					SAH / Sand Hills
					SAK / Sakwatamau
					SFR / South Freeman
					TCK / Two Creeks
					TIM / Timeu Creek
					TOH / Tom Hill
					WEG / West Goose
					WHM / Whitecourt Mountain
					WIN / Windfall
					WLK / Windfall Lake
					WWF / West Windfall
LICENSE_NUM	20	Character	20	0	Timber license or permit number
					. / CTLW030063
					CTLW110001
					CTLW110002
					CTLW110003
					CTLW110004
					CTLW110005
					CTLW130003
					CTLW13L001
					CTPW13L002
					CTPW13L004
					CTPW13L005
					CTPW13L006
					CTPW13L008
					CTPW13L021
					CTPW13L022
					CTPW13L023
					CTPW13L025
					CTPW13L026
					CTPW13L027
					DTLW050010
					. / DTLW130001
					DTLW130002
OPENING_NUMBER	21	Character	11	0	ARIS cutblock opening number
TIMBER_YEAR	22	Integer	5	0	Block origin year
BLK_RESP	23	Character	8	0	Agency responsible for cutblocks
					F4 / FRIAA - 1994 to 1999
					F5 / FRIAA Post 2000
					FLEM / Robert Fleming blocks
					MOST / Mostowich Lumber Ltd.
					OK / OK Lumber
					SPML / Spruceland Millworks Inc.
					SRD / Sustainable Resource Development
					WEST / Millar Western Forest Products
					WEYR / Weyerhaeuser Canada Ltd.

Column Name	Order	Type	Width	Decimal	Description	
					Value	Definition
SILV_SYSTEM	24	Character	25	0	Silviculture system	
					CC	Clearcut
					RC	Release Cut
					SG	Group Selection
					SH	Shelterwood
					SL	Selection
					ST	Sanitation Cut
					SW	Wildfire Salvage
					TC	Commercial Thinning
					TS	Salvage Thinning
					X	No system specified
BLK_TPR	25	Character	2	0	Cutblock productivity assignment	
					F	Fair
					G	Good
					M	Medium
					U	Unproductive
BLK_DENSITY	26	Character	3	0	Block density assignment	
					B	Crown closure 31-50%
					CD	Crown closure > 50%
BLK_STRATA	27	Character	5	0	Cutblock BAP strata	
					AW	Aspen
					AW_PL	Aspen - lodgepole pine
					AW_SWSB	Aspen - spruce mixedwood
					BW	White birch
					LT	Larch
					PB	Balsam poplar
					PL	Lodgepole pine
					PL_DEC	Pine - deciduous mixedwood
					SB	Black spruce
					SW	White spruce
					SWSB_DEC	Spruce - deciduous mixedwood
					XATH	Athabasca Flats blocks
					XPLN	Planned blocks
					XTHN	Thinned blocks
BLK_ACT	28	Character	15	0	Company assigned harvest action	
					CP	Crop plan
					CT	Commercial thinning
					X	No block action
BLK_STATUS	29	Character	15	0	Cutblock harvest status	
					COMPLETE	Harvested prior to 2004 timber year (begins May 1, 2004)
					PLANNED	Harvested or planned after 2003 timber year (ends April 30, 2004)
HARV_LOC	30	Character	20	0	Special harvesting areas	
					ATHABASC	Athabasca Flats logging area
					X	Not assigned
UKEY_BLK	31	Integer	0	0	Unique key for block polygons	
NSR	32	Character	12	0	Natural subregion	
					BM	Boreal Mixedwood
					LF	Lower Foothills
					UF	Upper Foothills
ECOPHASE	33	Character	18	0	Ecosite and phase coding	
ECOSITE	34	Character	8	0	Ecosite codes - definitions vary by NSR	
WILD_ZONE	35	Character	16	0	Special wildlife zone	
					.	Caribou
AB_BMA	36	Character	10	0	Alberta bear management unit	
					2B	Bear management zone 2B
					3A	Bear management zone 3A
HYDRO_ZONE	37	Character	2	0	Paddle River hydrologic designation	
					C	Critical
					MC	Marginally critical
TRAPLINE_ID	38	Integer	0	0	Provincial trapline number	

Column Name	Order	Type	Width	Decimal	Description	
					Value	Definition
AW_STATUS	39	Character	22	0	Aspen stand survey classification	
					.	Borrow Pit
						CC
						Gravel pit
						Highway
						Meadow
						Merch Decid/Conif
						Non-merch
						Non-merch willow/alder
						Non-operable
						Non-operable ROW
						Powerline ROW
						Wellsite
PSP_PLOTNUM	40	Character	16	0	MWFP PSP plot number	
PSP_BRKDN	41	Character	20	0	PSP grouping	
					DELETION_	PSP in DRS area
					FMA	PSP inside FMA
					GRAZING_F	PSP in grazing license
					GRAZING_F	PSP in grazing lease
					NONPROD_	PSP in non-productive deciduous
					NONPROD_	PSP in grasslands
					NONPROD_	PSP in larch stands
					NONPROD_	PSP in black spruce stands
					NONPROD_	PSP in shub area
PSP_TYPE	42	Character	16	0	PSP type	
					EFM	PSP for enhanced forest management
					NON-	PSP to characterize nonproductive forest
					PLANTATI	PSP on plantation areas
					STANDARD	Standard PSP
PSP_STATUS	43	Character	16	0	MWFP PSP status	
					.	ACTIVE
						PROPOSED
PSP_YEAR	44	Integer	0	0	PSP establishment year	
PSPBUF	45	Integer	5	0	Circular buffer on PSP centres	
					0	Outside PSP buffer
					-1	Less than 50% of polygon in 200m buffer
					200	> 50% within 200m PSP plot centre buffer
					30	Within 30m PSP buffer
SOIL_CLASS	46	Character	60	0	Soil Class	
					.	Coarse Mineral
						Farm Land
						Fine Mineral
						Medium Mineral
						NOTREE
						Riparian
						TREED
WET_CLASS	47	Character	16	0	Wetland classification	
					.	NOTREE
						TREED
FUNCORD1	48	Integer	10	0	Functional order 1 watersheds	
FUNCORD3	49	Integer	10	0	Functional order 3 watersheds	
AVG_SLP	50	FloatingPt	4	3	Average area slope for order 1 watersheds	
SUB_COMP	51	Character	8	0	Subcompartment for Modelling	
AUGSHS10	52	Integer	5	0	August 2005 spatial harvest sequence	
					0	Outside August 2005 spatial harvest sequence
					100	Part of August 2005 spatial harvest sequence
HARV_ADJ	53	Character	4	0	Patchworks harvest plan evaluation	
					BLUE	Add to block
					D	Delete from managed landbase
					F	Defer for future harvest
					M	MTU block
					P	Part of an existing block
SOFTPCT	54	Integer	2	0	Coniferous species percent (overstory)	
HARDPCT	55	Integer	2	0	Deciduous species percent (overstory)	

Column Name	Order	Type	Width	Decimal	Description	
					Value	Definition
SB_LT_PCT	56	Integer	0	0	Combined black spruce and larch species % (overstorey)	
USOFTPCT	57	Integer	2	0	Coniferous species percent (understory)	
UHARDPCT	58	Integer	2	0	Deciduous species percent (understory)	
USB_LT_PCT	59	Integer	0	0	Combined blackspruce and larch species % (understorey)	
CSB_LT_PCT	60	Integer	0	0	Combined black spruce and larch species % (composite)	
SP_COMP	61	Character	30	0	AVI overstory string of attributes	
USP_COMP	62	Character	30	0	AVI understory string of attributes	
CSP_COMP	63	Character	80	0	AVI composite layer string of attributes	
AGE	64	Integer	5	0	Overstory age (in 2004)	
CAGE	65	Integer	5	0	Composite age (in 2004)	
UAGE	66	Integer	5	0	Understory age (in 2004)	
MOIST_REG	67	Character	1	0	AVI moisture classification	
					a	Aquatic (hydric)
					d	Dry (xeric)
					m	Mesic
					w	Wet (hydric)
AVI_STORY	68	Integer	2	0	AVI layer used for strata assignment	
					1	AVI overstory
					2	AVI understory
					9	Composite layer
WITH_SEIS	69	Integer	4	0	Polygons with seismic area	
					0	Outside seismic area
					100	Polygon area intersected by seismic
STRATA_SEIS	70	Character	8	0	Strata assigned to seismic areas	
					103	Anthropogenic non-vegetated (industrial) - terrestrial
					105	Naturally non-vegetated - mineral - gravel, sand
					106	Bryophyte
					107	Bare ground, burned non-vegetated areas
					1111	Anthropogenic vegetated - agriculture
					203	Shrub open
					204	Shrub closed
					206	Herbaceous grassland
					207	Herbaceous forbs
					64	Water and wetlands
BLK_GRP	71	Character	10	0	Block grouping	
					EXIST	Existing cutblocks
					EXIST_TH	Existing thinning
					FIRE_REG	Fire regeneration survey
					PLAN	Planned harvest
					PLAN_TH	Planned thinning
EDASITE	71	Character	7	0	Edasite	
TSA_AGE	71	Integer	4	0	TSA modelling age in years	
AREAHA_0M	72	Integer	0	0	Area outside seismic(ha) in polygons intersected by	
AREAHA_4M	73	Integer	0	0	Area with 4m wide seismic(ha) in polygons intersected by	
WIDTH_4M	74	Integer	0	0	Seismic line width	
AREAHA_8M	75	Integer	0	0	Area with 8m wide seismic(ha) in polygons intersected by	
WIDTH_8M	76	Integer	0	0	Seismic line width	
WITH_LIN	77	Integer	4	0	Polygons with linear dispositions	
AREA_ROAD	78	FloatingPt	12	6	Area (ha) under road dispositions in polygon	
AREA_LINE	79	FloatingPt	12	6	Area (ha) under linear features or utility corridors in polygon	
AREA_XLIN	80	FloatingPt	12	6	Area (ha) of polygon not under road or line dispositions in	
AREAHA_SEIS	81	FloatingPt	12	6	Area of polygon lost to seismic	
AREA_HORIZ	82	FloatingPt	12	6	Area of classified portion of horizontal stands (ha)	
AREA_H_DEL	83	FloatingPt	12	6	Area of unclassified portion of horizontal stands (ha)	
AREAHA_POL	84	FloatingPt	12	6	Polygon area (ha)	
F_LEAD_SP	85	Character	8	0	Leading species	
					AW	Trembling aspen
					BW	White birch
					FB	Balsam fir
					LT	Tamarack
					NO	No appropriate species present
					PB	Balsam poplar
					PL	Lodgepole pine
					SB	Black spruce
					SW	White spruce

Column Name	Order	Type	Width	Decimal	Description
					Value **Definition**
					X No species found
D_TPR	86	Character	4	0	Deletion for unproductive areas
					U Unproductive
D_LAND	87	Character	8	0	Deletion for Landuse
					GOVRES Government assigned dispositions
					LEASE Surface and mineral leases
					LINEAR Road and Line features without linework
					REC Dispositions for recreation areas XDFA Private and non-classified lands under disposition
D_ACCESS	88	Character	8	0	Deletion for access
D_INV	89	Character	8	0	Deletion for lack of inventory
					XAVI Areas without AVI
D_DFA	90	Character	8	0	Deletion for areas outside DFA
					ALEXIS Alexis Reserve land
					CAMP Campgrounds
					DUMP Whitecourt dump
					IND_SITE Industrial sites within FMU boundary
					PRIVATE Private lands
					XDFA Private and non-classified lands outside DFA
D_REC	91	Character	8	0	Deletion for recreation areas
					CAMP Campgrounds
					PARK Parks and Natural areas
D_BUF	92	Character	8	0	Deletion for hydrologic buffers
					BIRDBUF Waterfowl lake buffer (200m)
					GRBUF Ground rule buffers
D_ISO	93	Character	8	0	Deletion for isolated/inaccessible stands
					ISL Islands in Athabasca River
					ISO Stands surrounded by riparian buffers
D_SUBJ	94	Character	16	0	Subjective deletions
					LT Larch stands
					SB Black spruce stands in W11
					SB_ADENS A density Sb stands in W13
					SB_SBLT SB or SB/LT stands with < 30% other species
					SB_STRUC SB stands with complex or horizontal structures
D_BURN	95	Character	8	0	Deletion for areas burnt since AVI
					B Areas burned since 1994
D_NONFOR	96	Character	8	0	Deletion for nonforest lands
					103 Anthropogenic non-vegetated (industrial) - terrestrial
					105 Naturally non-vegetated - mineral - gravel, sand
					106 Bryophyte
					107 Bare ground, burned non-vegetated areas
					1111 Anthropogenic vegetated - agriculture
					203 Shrub open
					204 Shrub closed
					206 Herbaceous grassland
					207 Herbaceous forbs
					64 Water and wetlands
					X No strata assigned
D_SEIS	97	Character	4	0	Deletion for seismic
					SEIS Seismic area
F_WET	98	Character	8	0	Final wetland class
					WET Areas classes as wetlands (per AVI)
					X Non-wetland areas
F_STORY	99	Integer	2	0	Inventory source used for stand classification
					1 AVI overstory
					2 AVI understory
					3 Linear features established since AVI
					4 Existing cutblock
					8 Fire regeneration survey

Column Name	Order	Type	Width	Decimal	Description	
					Value	Definition
					9	Composite layer
F_DEL	100	Character	12	0	Final stand deletion classification	
					FIRE	Areas burned since 1994
					GOVRES	Government assigned dispositions (DRS and PNT)
					HYDROBUF	Riparian and waterfowl buffers
					ISL	Islands in Athabasca River
					ISO	Isolated stands
					LEASE	Government assigned dispositions
					LINEAR	Linear features without linework
					LT	Larch stands
					NF	Nonforest areas
					NONE	Managed area - no deletions
					PARK	Parks and natural areas
					REC	Recreation areas
					SB	Black spruce in W11
					SB_ADENS	Black spruce A density stands in W13
					SB_SBLT	Black spruce/larch stands with < 30% other species - W13
					SB_STRUC	Black spruce complex and horizontal stands - W13
					SEIS	Areas covered by seismic lines
					TPR	Unproductive timber productivity rating
					XAVI	Area without AVI
					XDFA	Private lands and non-classified areas
F_SRD	101	Character	8	0	Final stand SRD extended strata assignment	
					C1	Pure white spruce
					C10	Black spruce leading with pine
					C11	Black spruce leading without pine
					C12	Larch leading
					C15	Pure balsam fir
					C16	Balsam fir leading with pine
					C17	Balsam fir leading without pine
					C2	White spruce leading with pine
					C3	White spruce leading without pine
					C4	Pure pine
					C5	Pine leading with white spruce
					C6	Pine leading with black spruce
					C7	Pine leading with fir
					C8	Pine leading without spruce and fir
					C9	Pure black spruce
					CD1	White spruce/aspen
					CD10	Fir/aspen
					CD12	Fir/birch
					CD2	White spruce/poplar
					CD3	White spruce/birch
					CD4	Pine/aspen
					CD5	Pine/poplar
					CD6	Pine/birch
					CD7	Black spruce/aspen
					CD8	Black spruce/poplar
					CD9	Black spruce/birch
					D1	Pure aspen
					D2	Aspen leading with poplar
					D3	Aspen leading without poplar
					D4	Poplar leading
					D5	Birch leading
					DC1	Aspen/white spruce
					DC10	Birch/pine
					DC11	Birch/black spruce
					DC12	Birch/fir
					DC2	Aspen/pine
					DC3	Aspen/black spruce
					DC4	Aspen/fir
					DC5	Poplar/white spruce
					DC6	Poplar/pine

Column Name	Order	Type	Width	Decimal	Description	
					Value	**Definition**
					DC7	Poplar/black spruce
					DC9	Birch/white spruce
					X	No strata assigned
F_YC	102	Character	8	0	Final stand species strata assignment	
					AP	Aspen leading pine mixedwood
					AS	Aspen leading spruce mixedwood
					AW	Aspen
					BW	White birch
					f_bap	Not In Domain
					LT	Larch
					PA	Pine leading aspen mixedwood
					PL	Lodgepole pine
					SA	Spruce leading aspen mixedwood
					SB	Black spruce
					SW	White spruce
					X	No strata assigned
F_BAP	103	Character	8	0	Final stand BAP strata assignment	
					103	Anthropogenic non-vegetated (industrial) - terrestrial
					105	Naturally non-vegetated - mineral - gravel, sand
					106	Bryophyte
					107	Bare ground, burned non-vegetated areas
					1111	Anthropogenic vegetated - agriculture
					203	Shrub open
					204	Shrub closed
					206	Herbaceous grassland
					207	Herbaceous forbs
					64	Water and wetlands
					AW	Aspen
					AW_PL	Aspen - lodgepole pine
					AW_SWSB	Aspen - spruce mixedwood
					BW	White birch
					LT	Larch
					PB	Balsam poplar
					PB_CON	Poplar - conifer mixedwood
					PL	Lodgepole pine
					PL_DEC	Pine - deciduous mixedwood
					SB	Black spruce
					SW	White spruce
					SWSB_DEC	Spruce - deciduous mixedwood
					X	No strata assigned
F_DEN	104	Character	8	0	Final stand density assignment	
					A	Crown closure 6-30%
					B	Crown closure 31-50%
					C	Crown closure 51-70%
					D	Crown Closure 71-100%
					X	No crown closure
F_AGE	105	Integer	4	0	Final stand age assignment	
F_TPR	106	Character	8	0	Final stand timber productivity assignment	
					F	Fair
					G	Good
					M	Medium
					U	Unproductive
					X	No TPR

Column Name	Order	Type	Width	Decimal	Description	
					Value	Definition
F_ORIGIN	107	Character	8	0	Final stand origin assignment	
					CROP	Crop plans
					MGD	Managed stands
					NAT	Natural stands
					RECBURN	Recently burned stands (post 1994)
					THIN	Thinned stands
					VHIL	Fire survey pine regeneration stands
					WIND	Windfall burn
					X	Non forest
F_HGT	108	Integer	5	0	Final stand height assignment	
F_AREAHA_TSA	109	FloatingPt	12	6	Final stand area (ha) assigned for TSA modelling	
F_DEL_MOD	100	Character	12	0	Final stand deletion classification	
					FIRE	Areas burned since 1994
					GOVRES	Government assigned dispositions (DRS and PNT)
					HYDROBUF	Riparian and waterfowl buffers
					ISL	Islands in Athabasca River
					ISO	Isolated stands
					LEASE	Government assigned dispositions
					LINEAR	Linear features without linework
					LT	Larch stands
					NF	Nonforest areas
					NONE	Managed area - no deletions
					PARK	Parks and natural areas
					REC	Recreation areas
					SB	Black spruce in W11
					SB_ADENS	Black spruce A density stands in W13
					SB_SBLT	Black spruce/larch stands with < 30% other species - W13
					SB_SHS	Black spruce subjective deletions identified from SHS stands - W13
					SB_STRUC	Black spruce complex and horizontal stands - W13
					SEIS	Areas covered by seismic lines
					SMLPOLY	Polygons < 0.01 ha on managed landbase
					TPR	Unproductive timber productivity rating
					XAVI	Area without AVI
					XDFA	Private lands and non-classified areas
F_AREAHA_MOD	109	FloatingPt	12	6	Final stand area (ha) including W13 SB deletion adjustments	

Appendix VII Modelling Landbase Dataset Description

The Millar Western modelling landbase file with black spruce deletions is named **mwfp_lb12_pw9** (coverage) and **mwfp_lb12_pw9.shp** (shapefile).

Dataset Information **mwfp_lb12_pw9 (COVER), mwfp_lb12_pw9(SHAPEFILE)**

Description: Modelling landbase for MWFP 2007-2016 DFMP With adjustments for additional black spruce deletions.

Data Source: Generated by The Forestry Corp.

Date Generated: 1/05/2007

Data Format: ArcInfo Coverage / Shapefile

Software Used: ESRI ArcInfo

Projection: UTM 11

Datum: GRS80

Units: metres

Data Precision: Double

Tolerance: .001

Extent: All lands within outer boundaries of FMU W11 and FMU W13

Appendix VIII Modelling Landbase Data Dictionary

Dataset Name: MWFP_LB12_PW9

Description: Modelling landbase with additional Sb deletions

Column Name	*Order*	*Type*	*Width*	*Decimal*	*Description*	
					Value	***Definition***
UKEY12_TSA	1	Integer	0	0	Numeric unique key TSA landbase	
C_UKEY12_TSA	2	Character	30	0	Character unique key TSA landbase	
AREAFLIP	3	Character	3	0	Polygon where AREAHA_POL <= 0.01	
					.	Y
F_AREAHA_MOD	4	FloatingPt	12	4	Final stand area on modelling landbase	
D_AREA	5	Character	7	0	Polygon where AREAHA_POL <= 0.01	
					.	SMLPOLY
D_SB_SUBJ	6	Character	7	0	Stands for additional SB subjective deletion	
EDASITE	7	Character	3	0	Edasite	
THEME1	8	Character	10	0	FMU / Management Area	
					W11_EAST	W11 EAST
					W11_WEST	W11 WEST
					W13_BLRG	W13 BlueRidge
					W13_MCLD_N	W13 McLeod North
					W13_MCLD_S	W13 McLeod South
					W13_VHIL	W13 Virginia Hills
					W13_WCRT	W13 Whitecourt
THEME2	9	Character	8	0	Disposition	
					FGL	Forest Grazing Leases (outside FMA)
					FMA_ATHF	Athabasca Flats(within FMA)
					FMA_FGL	Forest Grazing Leases (within FMA)
					FMA_HUES	Huestis demonstration forest (within FMA)
					FMA_REST	FMA Area
					GRL	Grazing leases
					GRP	Grazing permits
					NON_DFA	Non-DFA areas
THEME3	10	Character	8	0	BAP Strata	
					103	Anthropogenic non-vegetated (industrial) - terrestrial
					105	Naturally non-vegetated - mineral - gravel, sand
					106	Bryophyte
					107	Bare ground, burned non-vegetated areas
					1111	Anthropogenic vegetated - agriculture
					203	Shrub open
					204	Shrub closed
					206	Herbaceous grassland
					207	Herbaceous forbs
					64	Water and wetlands
					AW	Aspen
					AW_PL	Aspen - lodgepole pine
					AW_SWSB	Aspen - spruce mixedwood
					BW	White birch
					LT	Larch
					PB	Balsam poplar
					PB_CON	Poplar - conifer mixedwood
					PL	Lodgepole pine
					PL_DEC	Pine - deciduous mixedwood
					SB_LOW	Black spruce - lowland
					SB_UP	Black spruce - upland
					SW	White spruce
					SWSB_DEC	Spruce - deciduous mixedwood
					X	No strata assigned

THEME4	11	Character	1	0	Site Class
					1 Good
					2 Medium
					3 Fair
					U Unproductive
					X No TPR
THEME5	12	Character	2	0	Density class
					AB Crown closure 51-100%
					CD Crown closure 6-50%
					X No crown closure
THEME6	13	Character	9	0	Yield Curve
					EXT Harvested stands on a Natural stand curve
					LOWINT Harvested stands on a Regenerated stand curve
					NAT Natural stands
					RECBURN Recent burn (nonop)
					VHIL Virginia Hills Burn (surveyed areas)
THEME7	14	Character	10	0	Stand treatment modifier
					COMMTHN_CT Salvage thinned
					COMMTHN_ST Commercially thinned
					NORET Natural stands or managed stand with no retention
THEME8	15	Character	8	0	Eligibility of stands for harvest
					A2 Stand treated by CC_NRET_NOVEGC between 2002 and 2003
					A4 Stand treated by CC_NRET_VEGC between 2002 and 2003
					A5 Stand treated by CC_NRET_CROPPLAN between 2002 and 2003
					A6 Stand treated by THIN between 2002 and 2003
					ELIG Stand eligible for treatment
					NONOP Stand never eligible for treatment
					P2 Stand with a planned treatment of CC_NRET_NOVEGC between 2004 and 2006
					P4 Stand with a planned treatment of CC_NRET_VEGC between 2004 and 2006
					P5 Stand with a planned treatment of CC_NRET_CROPPLAN between 2004 and 2006
					P6 Stand with a planned treatment of THIN between 2004 and 2006
THEME9	16	Character	2	0	Natural Subregion
					1 1
					X Unknown
THEME10	17	Character	3	0	Edasite
THEME11	18	Integer	0	0	Functional order 1 watersheds
THEME12	19	Character	8	0	Slope Percent Class
					. 0_2
					3_4
					5_6
					7_8
THEME13	20	Character	16	0	Soil Class
					CRSMIN Coarse Mineral
					FARM Farmland
					FINMIN Fine Mineral
					MEDMIN Medium to Fine Mediuim
					RIPAR Riparian
					WETLAND Wetland
					X Other
PREBLOCK	21	Character	2	0	Planned block status
CUT_PERIOD	22	Integer	4	0	Period which planned blocks are scheduled
ACTION	23	Integer	2	0	Action that would occur if block was a planned block
					2 CC_LRET_NOVEGC_CDDEN
					4 CC_LRET_VEGC_CDDEN
					5 CC_LRET_CROPPLAN_CDDEN
					6 THIN
TSA_AGE	24	Integer	4	0	TSA Modeling age in years
TSA_PER	25	Integer	4	0	TSA modeling age in 5-year periods
PW_COMPART	26	Character	34	0	Areas grouped for limiting access control to areas

CONVOL	27	FloatingPt	6	2	Coniferous volume (m3) in the polygon at the beginning of
DECVOL	28	FloatingPt	6	2	Dediduous volume (m3) in the polygon at the beginning of
PROP_TREAT	29	Character	24	0	Treatment proposed to occur based on the model
					X No Scheduled Treatment
PROP_DELTA	30	Integer	3	0	Year from the start of the model in which the proposed
CONHARVOL	31	FloatingPt	6	2	Coniferous volume harvested (m3) from the polygon from
DECHARVOL	32	FloatingPt	6	2	Deciduous volume harvested (m3) from the polygon from

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