

Estimating AAC Potential from Marginal Stands on the Weyerhaeuser Edson FMA #9700035

Introduction

Weyerhaeuser has completed a DFMP that proposes an annual allowable cut level for each of the four FMU's comprising Edson's FMA. Complicating this process, the Edson FMA has a number of timber operators with diverse operation standards. These operators agree upon the definition of what constitutes a truly merchantable stand. However, there is a relatively small range of forest types (hereafter called *marginal*) where there was some disagreement as to merchantability and inclusion into the productive landbase. Some operators considered these marginal stands as viable for operations while others did not.

The DFMP proposes to address this problem through the approach discussed below. This method is based on previous discussions with officials from Alberta Sustainable Resource Development.

Methods

A summary of the steps are as follows:

1. **Identify net landbase (ignoring marginal stands)** - During the landbase allocation portion of the DFMP process Weyerhaeuser in discussion with other Edson FMA timber harvesters developed a set of agreed upon "rules" to identify the merchantable landbase. These rules were used in the submitted November 24, 2004 Landbase Allocation document. Alberta SRD gave an agreement-in-principle to this document in February of 2005. Therefore, the Edson FMA AAC's will be based upon this "approved" netdown procedure along with the "approved" submitted February 4, 2005 yield curves. At this stage marginal stands were ignored.
2. **Identify marginal stands** - In the November 24, 2004 Landbase Allocation document subjective deletion rules were to identify stands located on undesirable (often too wet) harvest sites. Two subjective deletion rules were used: 1) Stands with 10% or more Larch composition or; 2) Stands with 80% or more Black spruce composition. Therefore, all stands that met either of the above criteria were removed from the net landbase. However, some Edson FMA timber harvesters expressed a concern that the subjective deletion rules were too coarse and removed some merchantable stands. To identify the most likely operationally viable area, the previously subjectively deleted stands with the most favorable AVI stand attributes were identified and assigned to marginally operable status. During meetings and discussions with Edson FMA timber harvesters the following rules were agreed upon to indicate potential marginal stands (all the following must be true to qualify).

- a. Stand must have been identified as a subjective deletion in the November 24, 2004 Landbase Allocation document and have no more than 20% larch composition and or 80 percent or greater black spruce composition.
- b. Stand must be greater than and equal to 14m tall
- c. Stand must have greater than an "A" crown closure

The following query was used: MARG_OP=1 AND HEIGHT>=14 AND STD_CC>'A' AND INLIST(DEL,'LR','SB','UI','XX','EC') AND (STD_LARCH<=2 OR STD_SB>7), where INLIST is a function that returns all matching database fields.

3. **Estimate volume from marginal stands** – In the February 4, 2005 yield curve submission, plots located within marginal areas were removed and did not contribute to the final yield curve projections. Therefore, plot volumes sampled on marginal area needed to be compiled. The compilation process was the same as that used in the February 4, 2005 yield curve submission. Five SAS programs were used:
 - a. 01mergetsp_marginal
 - b. 02si_marginal
 - c. 03htdbh_marginal
 - d. 04volume_marginal
 - e. 05marginal_standvol

A conservative rotation age of 140 years was assumed for marginal stands. Thus, only compiled volumes for plots within marginal stands 120 to 160 years old were used to calculate a mean volume m^3/ha . Mean annual increment (MAI) was then calculated by dividing by 140 years.

4. **Estimate marginal stand AAC** - The maximum possible AAC from marginal stands was calculated by multiplying MAI by marginal stand area for each FMU.
5. **Locate marginal stands on Stanley sequence map** - After the proposed Stanley harvest sequences have been derived (marginal stands not included) the marginal stands will be identified on a map to provide visual representation of where the opportunities exist for harvesting marginal stand in association with sequenced stands.
6. **Allocation** – The marginal stands would be accessed by the operator proportional to the conifer allocation as described in the DFMP. As an example, a quota holder having 10% of the conifer AAC in a FMU would be able to access up to 10% of the volumes indicated in Table 1 below in any quadrant.

Analysis and Results

Estimating Marginal Stand Yields

Number of plots located in subjective deletion stands (February 4, 2005 yield curve report) = **332 plots**

Number of plots located in subjective deletion stands + no more than 20% larch composition or 80% or greater black spruce composition = **287 plots**

Number of plots located in subjective deletion stands + no more than 20% larch composition or 80% or greater black spruce composition + stand height \geq 14m + crown closure \geq “B” density = **100 plots**

Number of plots located in subjective deletion stands + no more than 20% larch composition or 80% or greater black spruce composition + stand height \geq 14m + crown closure \geq “B” density + stand age between 120 and 160 years old = **46 plots**

Mean volumes for 46 plots on marginal stands 140 to 160 years old

Total Volume = $125 \text{ m}^3/\text{ha}$

Coniferous Volume = $123 \text{ m}^3/\text{ha}$

Deciduous Volume = $2 \text{ m}^3/\text{ha}$

Coniferous MAI = $123 \text{ m}^3/\text{ha} / 140 \text{ yrs} = 0.87 \text{ m}^3/\text{ha/yr}$

Deciduous MAI = $2 \text{ m}^3/\text{ha} / 140 \text{ yrs} = 0.01 \text{ m}^3/\text{ha/yr}$

Table 1. Estimated annual gross* marginal stand volumes for FMUs E1, E2, W5, and W6 in FMA#9700035.

FMU	Marginal Stand Area (ha)	Coniferous MAI	Coniferous Volume (m^3/yr)	Deciduous MAI	Deciduous Volume (m^3/yr)
E1	2,331	0.87	2,028	0.01	23
E2	2,564	0.87	2,231	0.01	26
W5	730	0.87	635	0.01	7
W6	3,178	0.87	2,765	0.01	32
FMA	8,803		7,659		88

*does not take into account cull, retention, or spatial reduction percentage.

Marginal stands were summarized into a shapefile ‘WED_MARGINAL’.