Appendix XVII Product Objectives Rationale

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This appendix expands and clarifies the product strategy described in MP 8.

At the outset of preparing a timber supply analysis, we determined that constituent managed stand yield curves must be based on our central management objective: *to maximise the present and future yield of the TFL, while ensuring that our silviculture regimes mesh with future processing and marketing needs.* Before deriving managed stand yield tables for each site series we considered two questions:

- What can we grow?
- What should we grow?

The answer to the first question is relatively simple. At the stand level, using the biogeoclimatic system, historical evidence and stand simulation models, we can predict with reasonable accuracy which species combinations will best perform on each site series. At the landscape level we can utilise our terrestrial ecosystem inventory to extrapolate an estimate of species and grade distribution across the landbase.

The second question is clearly more difficult. Any attempt to predict future requirements involves considerable uncertainty. At the same time assumptions must be made on which to base management strategies. The fact that TFL holders are required to revisit management plans every five years allows adjustments to assumptions as required. This process reduces the risk of foreclosing future options.

Projection of Future Products

To assist in answering the second question, we solicited input from key production, manufacturing and sales people throughout the company. These individuals were asked to give their views on the following issues:

- Forecasted changes in our current mix of forest products (dimension lumber, appearance grades, timbers, panel products and pulp and paper). Will any of these products increase or decrease in importance?
- Dimension lumber products and estimates of how these might be impacted by alternative technologies. Which construction products currently produced as conventional lumber are likely to be replaced by engineered products?
- Specific log characteristics that are most desired for milling, engineering and subsequent marketing, (wood density, piece size, taper, rings per inch etc).
- Forecast of preference(s) for particular species and ranking as to suitability for future products and markets. Species preferences and log characteristics provided essential information for stand level modelling inputs.

As expected, this survey did not provide many specific recommendations. While responses were general in nature, a number of clear trends emerged:

- No major shifts are expected in the current product mix, except that large dimension lumber will likely be replaced with engineered products.
- While world demand for pulp and paper will increase especially in developing countries, it was recommended that we not rely on a major proportion of our timber supply to be used in the pulp sector. We will not be able to compete with increasing pulp and paper production coming on line in developing countries in tropical and subtropical areas. Producers in these areas are forecast to utilise

fast growing fibre plantations and significantly lower labour costs to gain competitive advantage over traditional suppliers.

- Produce high-quality appearance grade timber where possible. This will either be used as clear lumber or as a source of veneer to be used in conjunction with engineered products. Opinions were divided on species, particularly Fdc due to projected oversupply. Concentrate management efforts on unique species where possible, (Cw, Yc, Pw and Ss). Managing for diversity in the portfolio of species will likely be most prudent to minimise risk. Variety in site characteristics across the landbase will ensure a good range in species diversity.
- Stands should be managed to produce logs of high quality, uniform characteristics with the ability to be manufactured into a number of end products, similar to strategies applied to radiata pine in New Zealand. Yc would be a good bet for a multitude of uses due to its uniform wood quality.
- Strong points were raised on future coastal logging costs and risk of concentration on pulpwood production. The B.C. coast may be a low-cost timber producer in the future as we return to harvesting valley bottoms and gentler slopes, allowing for less labour intensive methods, reduced road building costs and shortened transportation systems. Also, silviculture investments tend to be allocated to areas with lower slopes and flats, as these are generally our most productive sites.

Using the results of this survey, we developed product attributes for four, broad product categories or grades (Table 1). future managed stands

Table 1 lists the product attributes for future managed stands developed from this survey. Four product categories or grades were established to develop and describe the product strategy.

Table 1 Product attributes for future managed stands

Product Grade	Product Attributes				
	Butt Diameter Range (cm)	**Max Knot Size (cm)**	**Max Taper (cm/ 3m)**	**Minimum Length (m)**	**General Description**
Premium	60 +	5.0	2.5	5.0	Large, clean sawlogs –dominant component of stands. Small knots and minimum taper.
Standard	40 – 59	10.0	2.5	5.0	Logs too small or too rough to meet Premium. Other possible sorts include Cw poles and house/cabin logs.
Gang	25 – 39	10.0	2.5	5.0	Smaller, pole-sized material suitable for peeling or sawing.
Utility	0 – 24			3.0	Small material or rough large pieces unsuitable for sawlogs.

Product Strategy

The fundamental component of our product strategy is the link between stand-level objectives and our forest estate model. Stand projection data used in the timber supply analysis was derived by grouping each BEC subzone and site series within TFL 37 into analysis units (Appendix V). The resultant yield tables provided additional stand and stock tables to explore our product strategy.

Tables 2 through 5 describe the product targets established for each BEC subzone and site series within TFL 37. These product targets consider our silviculture strategies (Appendix XV), as well as the corresponding stand projection data used in the timber supply analysis. Our objective was to specify minimum harvest ages required to produce the desired attributes. The following approach was used:

- Select species that maximise yields while giving due consideration to unique species (Cw, Yc, and Pw) where possible and ecologically suitable.
- Set minimum volume per hectare limits that provide a reasonable expectation of economical harvesting operations.
- Set piece size targets. Table 1 provides a description of proposed second growth log grades. Butt diameters are used as TIPSY presents only DBH in output.
- Set minimum piece size targets for each site series (Tables 2 to 5). Dimensions chosen allow for a wide variety of potential products without the need to delay rotations beyond MAI culmination on the majority of our sites.

Table 2 MHmm1 Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Gang	30	67	398	130	Hw/Hm (30) Ba (44) Yc (26)
01p	Gang	30	67	398	130	Hw/Hm (28) Ba (42) Yc (30)
03	Gang	30	67	398	130	Hw/Hm (24) Ba (44) Yc (32)
05	Gang	30	67	386	110	Hw/Hm (22) Ba (38) Yc (40)
07	Gang	35	75	350	125	Hw/Hm (24) Ba (30) Yc (46)

Table 3 CWHvm2 Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard	45	33	750	70	Hw (60) Ba (21) Yc (19)
01s	Gang	35	67	640	85	Hw (65) Ba (8) Yc (21) Cw (6)
01p	Gang	35	67	663	95	Hw (63) Ba (8) Yc (21) Cw (8)
03	Gang	35	75	767	95	Fdc (20) Cw (41) Hw (38) Ba (1)
04	Standard	45	33	668	75	Hw (74) Yc (26)
05	Gang	35	75	767	95	Ba (56) Yc (30) Hw (14)
06	Gang	35	75	745	95	Ba (22) Yc (39) Hw (39)
06s	Gang	30	75	455	125	Hw (46) Ba (12) Yc (38) Cw (4)
06p	Gang	30	75	455	125	Hw (45) Ba (12) Yc (39) Cw (4)
07	Gang	35	75	751	85	Ba (52) Yc (30) Hw (18)
09	Standard	45	50	617	100	Cw (38) Yc (44) Hw (18)
11	Gang	35	75	414	130	Cw (42) Yc (48) Hw (10)

Table 4 CWHvm1 Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard/Premium	45	50	816	60	Fdc(71) Hw(19) Cw (10)
01s	Gang	30	67	372	130	Hw (81) Cw (18) Ba (1)
01p	Standard	45	33	715	70	Hw (82) Cw (18)
03	Standard	45	33	692	55	Fdc(66) Hw(19) Cw (15)
04	Standard	45	50	708	80	Fdc(66) Hw(19) Cw (15)
05	Standard/Premium	45	67	959	55	Hw (56) Cw (15) Ba (29)
06	Standard	45	50	877	65	Hw (56) Cw (22) Ba (22)
06s	Standard	45	50	350	120	Hw (69) Cw (16) Ba (15)
06p	Gang	35	67	707	90	Hw (69) Cw (22) Ba (9)
07	Standard/Premium	45	50	906	80	Hw (38) Cw (40) Ba (22)
09	Standard/Premium	45	50	890	70	Hw (35) Cw (39) Ba (26)
12	Gang	35	75	418	130	Cw (40) Yc (40) Hw (19) Ba (1)
14	Standard	45	67	653	80	Cw (86) Hw (13) Ba (1)

Table 5 CWHxm Product Strategy

Site Series No.	Product Targets					
	Product Grade	Minimum DBH (cm)	Percent of Total Volume	Minimum Total Volume (m^3/ha)	Minimum Harvest Age	Expected Species Mix at Rotation (Percent by Volume)
01	Standard/Premium	45	67	949	65	Fdc (64) Cw (11) Hw (25)
01p	Standard	45	33	640	65	Fdc (62) Cw (15) Hw (23)
03	Standard	45	50	756	70	Fdc (81) Cw (14) Hw (5)
05	Premium/Standard	45	67	884	50	Fdc (70) Cw (22) Hw (8)
06	Standard	45	33	780	70	Hw (70) Cw (30)
06p	Gang	35	75	813	100	Fdc (2) Cw (30) Hw (68)
07	Premium/Standard	45	67	876	55	Fdc (67) Cw (27) Hw (6)
08	Premium/Standard	45	67	961	50	Fdc (69) Cw (26) Hw (5)
12	Gang	35	67	762	75	Cw (81) Hw (19)

Each site series has a proposed product, minimum DBH, percent of total volume and minimum total volume requirements. All criteria must be met before the stand is harvested in the forest estate model. For example, for the CWHxm 01 site series, two thirds of the stand must be at least 45cm and net volume must be 949 m^3/hectare before the stand will be cut. Based on our species and site quality assumptions for this site series, this will occur at age 65.

The timber supply analysis – product-based scenario describes the harvest flow derived from incorporating the revised minimum harvest ages (Appendix VI).

Results

To get a picture of species and grade distributions across the landbase, estimates of expected volumes at product rotation and net operable area were extrapolated into the long term. This provides the species and grade distribution illustrated in Figure 1.

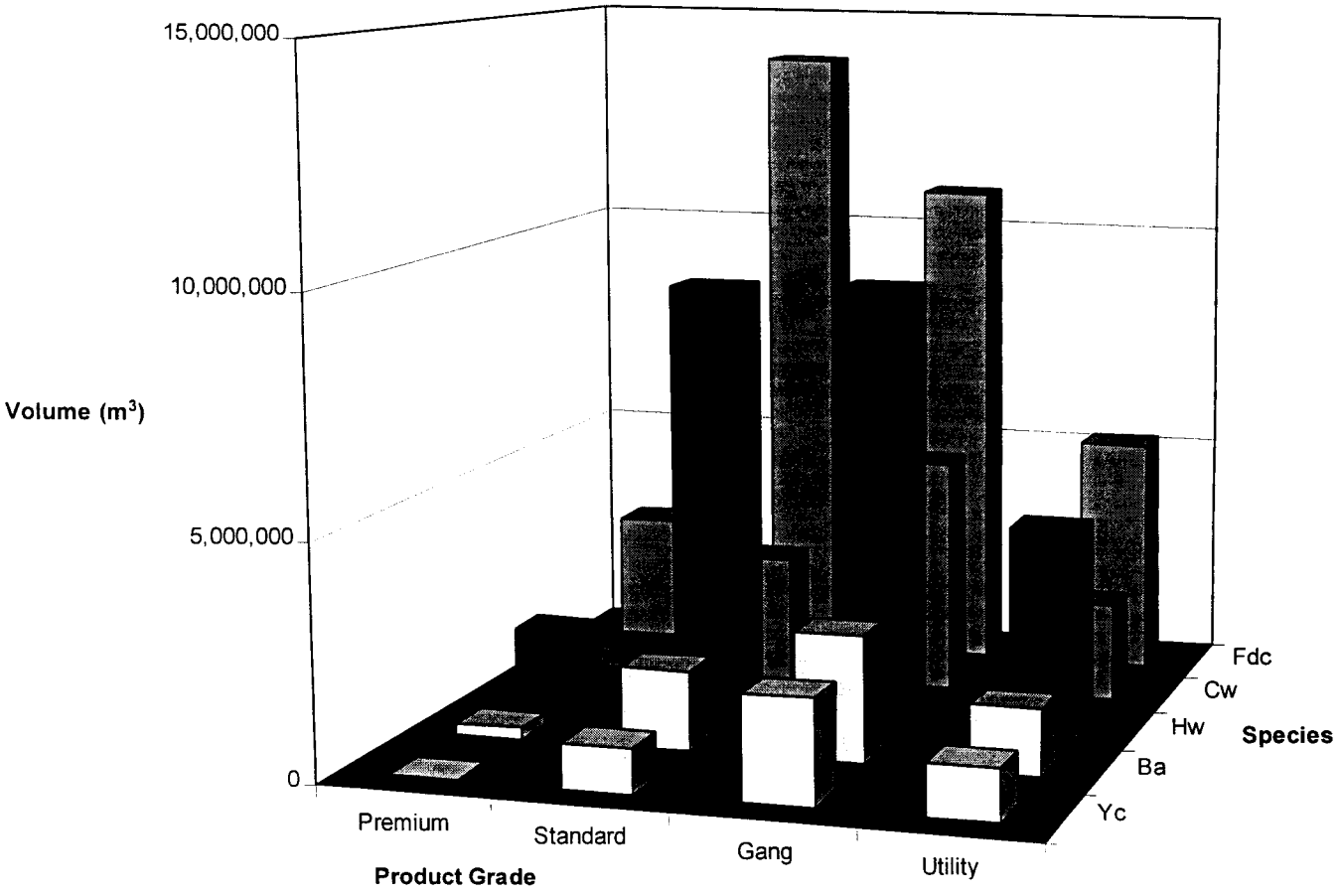

Figure 1 Expected managed stand volumes by species and product

Figures 2 and 3 further clarify the picture by expressing expected percent species distribution and percent log grade distribution across the landbase.

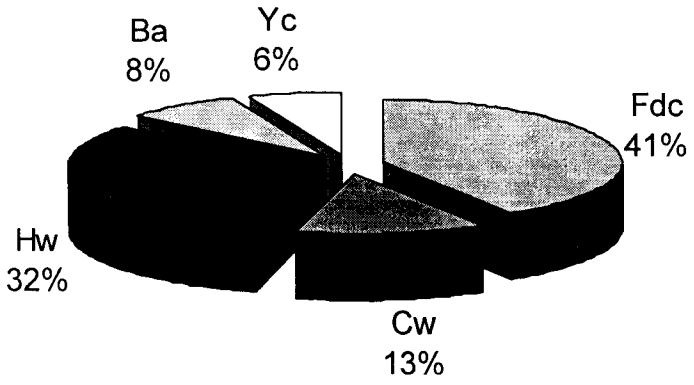

Figure 2 ***Projected Species Distribution***

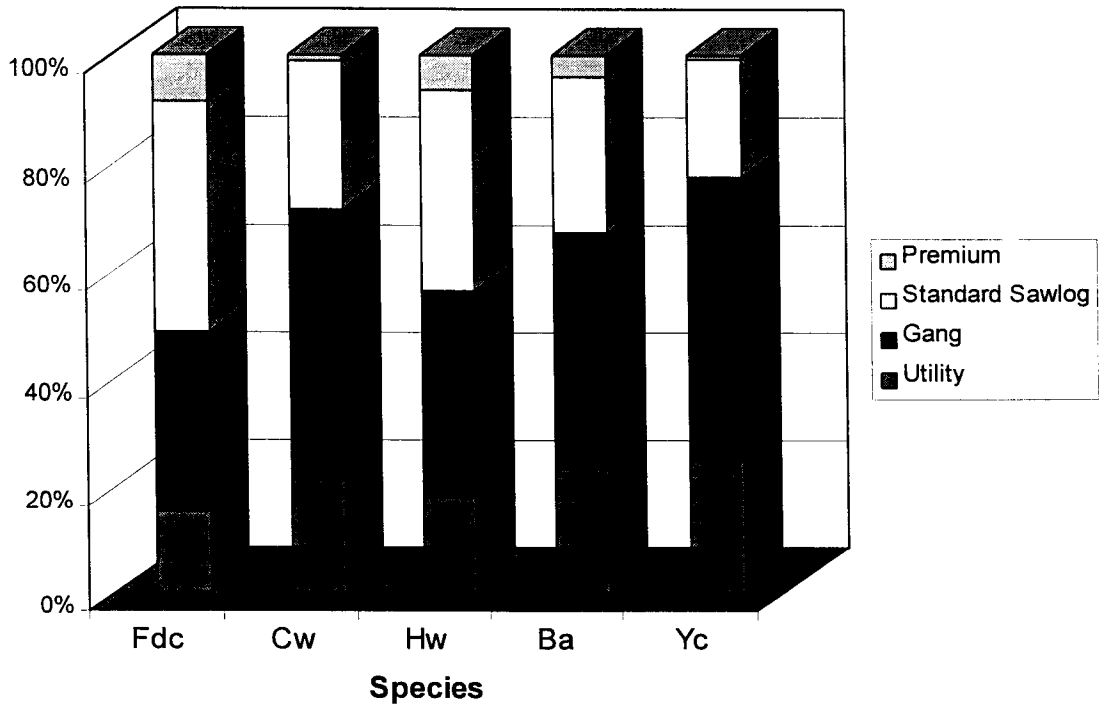

Figure 3 ***Projected product grade breakdown by species***

For comparison, a similar illustration of current species and grade profile was completed over a five year period (1993 – 1997). Figure 4 shows current species distribution and Figure 5 illustrates current grade distribution. Note that grade breakdown in Figure 5 is based on current industrial log grade specifications.

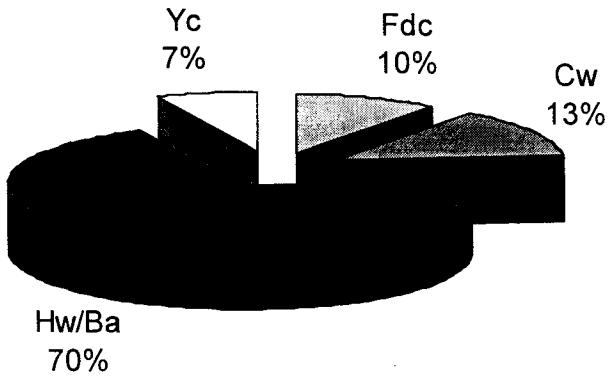

Figure 4 – Current species distribution

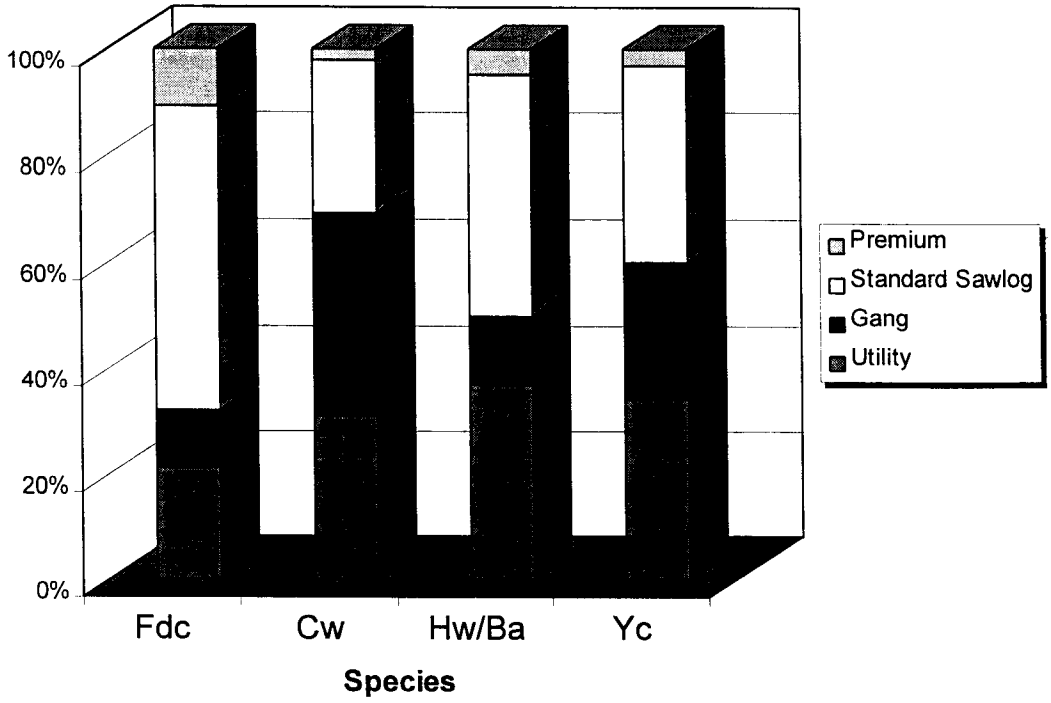

Figure 5 Current product grade distribution

This comparison of future and current species and product grade distributions indicates three major points:

- Future managed stands will bring about a shift in species dominance from hemlock and balsam to Douglas-fir. Yellow cedar and western redcedar proportions will not change significantly, although management activities will focus on promoting these species where appropriate.
- While overall piece sizes are smaller, the overall log quality distribution improves as the proportion of utility grade in future managed stands is lower. This is due to the nature of thrifty managed stands to be relatively low in disease and physical defects.
- Projected managed stands will result in a well diversified portfolio of species and grades allowing maximum flexibility in future wood products manufacturing.

This product strategy provides a foundation for the silviculture regimes outlined in the silviculture standards and procedures in Appendix XV. Minimum harvest ages determined based on product piece size and minimum volume objectives are available at a stand level for operational planning and linked at a forest level for strategic planning. Accordingly, our silviculture strategies for future managed stands target species selection and stocking levels by site series according to both ecological suitability and future product objectives.