

Current Resource Inventories

This Appendix describes the current status of the different resource inventories in TFL 44.

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1.0 FOREST (TIMBER) INVENTORY

The first forest inventory was completed in 1956. Since then it has been maintained and improved by new cruises of both mature and the immature forest. The base for the MP #4 analysis is an inventory updated to December 31, 1995, for changes in landbase and ownership, fire and reforestation. In addition, the spatial data has been updated to the end of 2000 for logging.

The basic building block of the inventory is the "stand." Each stand is identified by the following variables:

- A measure of site productivity: expressed by 3-meter site index classes.
- Age of immature by year established.
- Up to three species: in descending order of basal area.
- A measure of stocking:
- Volume class in mature and in older second growth cruised during the last 20 years;
- Basal area in cruised second-growth stands; and
- Number of stems per hectare and distribution in younger stands.

These measures of inventory permit highly specific aggregation of similar stands for yield projection and analysis.

1.1 Mature Inventory

Since the original cruise in 1956 the inventory has been continuously upgraded and updated as follows:

- In 1958 a more intensive cruise was made of Douglas-fir forests.
- In 1963 more new cruising was completed and all volumes were recompiled.
- In 1966 mature volumes were recompiled, as required by MoF, to close utilization standards (15 cm top diameter for trees 22.5 cm and larger).
- In 1972 mature volumes were recompiled using new MB decay factors.
- Between 1973 and 1977 the TFL was re-inventoried.
- In 1987 and 2000, operational cruising was combined with the inventory to improve the less-intensive original inventory on these areas.

- On both occasions in the remaining area (not included in the operational cruise), average lines were recalculated to reflect the samples remaining.
- The volume recompilation in 2000 used MB's 1973 loss factors and Kozak's Taper Equation Version 4.1.
- In addition, the inventory has been updated to reflect areas and volumes logged.

Forty-two percent of the mature timber volume is now estimated from operational cruising, a more intensive cruise than the earlier inventories.

Most of the remaining 1970s' inventory has been subject to inventory audits during the last six years. Separate check cruises were conducted for Blocks 1, 2, 3 and 4 of the TFL. The results show no significant difference between the check volumes and the inventory volumes for any of these Blocks. Hence, no changes have been made to the inventory volumes in the base option. Refer to the summary in Table 1.1

Table 1.1 Results of Inventory Audits in TFL 44

TFL 44 Block	Average volume (m ³ /ha)		No. of Sample Points	T	Critical t Value
	Inventory	Audit			
1	732.9	758.5	69	0.5065	1.9955
2	962.5	960.3	98	-0.0427	1.9847
3	662.8	611.7	92	0.8744	1.9731
4	541.9	622.5	75	1.4793	1.9761

1.2 Inventory of the New Forest

During the 1970s' forest inventories, all the immature forest was cruised and mapped. Each stand was described according to age, species, site index class and stocking.

The new forest inventory is updated in a two-stage process. First the stand information for new, planted and natural stands is added into the inventory. Any changes found by assessment of survival and free-growing status are also made.

Second, as the new stands reach "pole size", generally between 20 and 40 years, they are re-inventoried; site index is measured based on the growth of the new crop, and volume and basal area are obtained as measures of stocking. Since 1977 cruise data has been entered into the inventory database for 19,000 ha of second-growth that have been re-inventoried.

1.3 Not Satisfactory Restocked (NSR) Inventory

Areas logged or otherwise rendered unstocked, e.g., fire kill, are recorded in the inventory annually. For planning and control purposes, all NSR areas are

categorized and summarized to show areas prescribed for site preparation, planting or natural regeneration, and the target date for achievement.

NSR areas are re-classified as second-growth when they meet or exceed inventory requirements.

1.4 Growth and Yield

Weyerhaeuser has a long history of establishing and measuring permanent sample plots to evaluate long-term growth trends. Seven-hundred-and-two plots have been established in TFL 44. The earliest plots were established in 1950, and many have been measured since the 1960s and 1970s.

Forty percent of the plots are in Douglas-fir stands, and substantial numbers are also in western hemlock, red cedar and balsam. Approximately 65% of the plots are in natural stands or controls. Another 10% are in mature stands [generally greater than 200 years of age], and most of the remainder are located in thinning and fertilization treatments. The current emphasis is on establishing plots to measure the impacts of variable retention on forest growth.

The core set of plots for re-measurement is reviewed periodically to ensure that funds are spent effectively in gathering further applicable growth and yield data.

2.0 OPERABILITY

Operability mapping was completed in 1993. This included classifying the productive forest for physical operability and broad logging method (conventional and non-conventional). Refer to Table 2.1 for a summary.

The physical operability classes applied to productive forest land are as follows:

- Physically Inoperable—Timber on productive land that is so steep and/or rocky that it cannot be safely felled or yarded, or a significant proportion of the volume could not be recovered.
- Physically Operable —Timber on productive land that can be safely felled and yarded and can be recovered. The operable area is further classed as:
 - Conventional: Timber on productive, physically operable land that is loggable by conventional methods; i.e., grapple, high-lead, hoe-chuck, skidder, etc., or
 - Non-conventional: Timber on productive, physically operable land that is loggable only by non-conventional means. These include helicopter, balloon or long-line cable systems.

Table 2.1 TFL 44 Productive Forest Area by Physical Operability and Logging Method (ha)

	TFL 44 (ha)
Conventional	229,651
Non-conventional	29,085
Physically inoperable	9,449
Total Productive Forest	268,185

The mature forest (> 125 years) has also been classified for economic operability.

The economic operability classification is applied to mature forest areas that are productive and physically operable. It is a separate layer of map information from the physical operability classification.

Economic operability changes with changing markets, technologies and regulations. A classification based on detailed fieldwork is likely out-of-date by the time the information is plotted on maps. A more efficient approach for strategic analysis is to classify for economic operability according to forest inventory attributes.

The inventory attributes (refer to Table 2.2) include species and percentage of low grades for cedar and cypress stands, significant determinants of timber value. They also include volume per hectare and harvest method which have a significant effect on harvesting costs.

Economic classes include economic, marginal and uneconomic. Areas classified as uneconomic are removed from the net timber harvesting land base for the base option in the MP #4 Timber Supply Analysis.

Table 2.2 Inventory and Logging Method Criteria for Classification of Economic Operability. Volumes are m³/ha⁽¹⁾

Stand Type	Harvest Method			
	Conventional		Non-conventional	
	Uneconomic	Marginal	Uneconomic	Marginal
Fir, Fir-hem Fir-cedar	<278	278-389	<444	444-556
Hemlock Hem-balsam	<333	333-444	<500	500-611
Hem-bal-cyp				
<=40% X,Y,Z	<333	333-444	<444	444-556
>40% X,Y,Z	<444	444-556	<556	556-667
Cedar				
<=40% X,Y,Z	<278	278-389	<389	389-500
>40% X,Y,Z	<389	389-500	<556	556-667

⁽¹⁾ Breakage and Waste 2 are included; volumes are as shown on Weyerhaeuser Forest Cover Maps

3.0 TERRAIN

Most of TFL 44 has been mapped for terrain stability; however, mapping in different areas has occurred at various times throughout the last 25 years at various levels of detail and to different standards. Much of the terrain stability mapping on crown land in TFL 44 is presently being updated to current standards. This FRBC/Forest Investment Account-funded project will be complete in 2003.

Avalanche run-out zones were mapped in the 1980s and early 1990s and are stored as a separate layer of spatial information. Run-out zones, generally at the toe of avalanche runs, are managed to protect surrounding areas from avalanches.

4.0 RECREATION AND VISUAL LANDSCAPE

The recreation inventory was completed in 1995 to 1991 MoF standards. The MoF have recently completed a "rollover" of the TFL 44 recreation inventory data to MoF 1998 standards. This conversion was not completed until after data preparation for the MP #4 analysis. Hence, the inventory attributes of recreation-feature significance and management class refer to descriptors in the 1991 standards.

MoF District and Regional recreation specialists and Weyerhaeuser staff agreed that the global application of a 50% net-down to all C1A recreation polygons (feature significance of C and management class of 1A) would often be too high and inappropriate. A review of all C1A polygons was undertaken and netdowns applied specifically to each polygon. These revised netdowns contribute to the area netdowns and the timber harvesting landbase. The main reasons for reducing the netdowns for specific C1A polygons included:

- Many polygons along streams and shorelines are excessively wide;
- Some were rated C1A because of visual values and subsequently covered off by visual landscape inventories; and
- Many relatively large polygons identify areas where activities such as trail use, wildlife viewing and driving or camping may occur, but these activities apply to small specific areas within the polygon.

Table 4.1 Netdowns for recreation inventory polygons

Recreation Feature Significance	Recreation Management Class	Netdown %
A, B	0	100
A, B	1	50
C	1A	Varies – 0, 10, 25 or 50.

The visual landscape inventory was updated in 2000 to 1997 MoF standards. Visual Quality Objectives have not yet been declared known by the District Manager. Consequently, Recommended Visual Quality Classes identified in the inventory are used in strategic analysis.

The South Island Forest District Manager has made Scenic Areas known throughout TFL 44. Two scenic area zones are defined. Zone 1 includes the more visually sensitive areas such as the area around Port Alberni, the Alberni Canal, the Port Alberni-to-Ucluelet Highway and the Nahmint Watershed. Zone 2 identifies somewhat lower priority visual landscape areas such as the Great Central Lake and the highway from Port Alberni to Bamfield.

5.0 WILDLIFE

Ungulate (deer and elk) winter ranges were defined in TFL 44 in the 1980s and early 1990s. They have been reviewed and refined over the years and were grandparented in 1998.

Marbled Murrelet areas have been identified in TFL 44. Joint reviews by company staff and MoWLAP specialists have resulted in some changes during MP #3. The most significant change was the addition of approximately 1,140 hectares in three new Marbled Murrelet areas in the Corrigan Landscape Unit.

A Wildlife Habitat Area (WHA) was established and made known on May 14, 2001. The WHA provides protection around Queen Charlotte Goshawk nests on McLaughlin Ridge in Alberni East.

6.0 RIPARIAN

Stream classification ("S Class") is based on that prepared for and submitted with Forest Development Plans. This inventory is updated as operational inventories are completed for planned cutblocks. Stream reaches that are currently not inventoried are classified according to local knowledge (for example of stream gradients) and by relating to inventoried stream reaches. The number of mapped smaller streams has increased with the change in the map base to Datum NAD 83 and the application of enhanced TRIM map data.

The presence of fish and community watersheds are recognized in classifying the smaller streams as specified in the Riparian Guidebook. Riparian buffers and netdowns in the Nahmint Watershed correspond to those defined in the Nahmint LRUP.

7.0 CULTURAL HERITAGE RESOURCES

Traditional Use Studies, Archaeological Impact Assessments and Archaeological Inventory Studies are landscape level inventories that have been completed for various portions of TFL 44. These are detailed in Appendix III.

Approximately 8,000 ha of proposed cutblocks in TFL 44 have been intensively surveyed for Culturally Modified Trees (CMTs). This stand level information has been entered into Weyerhaeuser's GIS database.

8.0 TERRESTRIAL ECOSYSTEM MAPPING (TEM)

The program to map ecosystems (site series) for all Weyerhaeuser BC Coastal tenures commenced in 1995. It is expected that TEM mapping for nearly all of TFL 44 will be complete in 2002.

Funding was provided by Forest Renewal BC. Mapping is at a 1:20,000 scale on the TRIM (NAD 83) base. The provincial Resource Inventory Committee (RIC) mapping and database standards are followed.