

**APPENDIX I - STATEMENT OF MANAGEMENT OBJECTIVES,
OPTIONS AND PROCEDURES**

TREE FARM LICENCE 14
STATEMENT OF MANAGEMENT OBJECTIVES
OPTIONS AND PROCEDURES
for use in preparation of
MANAGEMENT PLAN #8

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Key Map

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1.0 INTRODUCTION

Tree Farm Licence 14, the Spillimacheen Forest, lies in the Purcell Mountains and falls within the Engelmann Spruce Subalpine Fir, Montane Spruce, Interior Cedar Hemlock, and Interior Douglas Fir zones of the biogeoclimatic ecosystem classification (BEC) system. It encompasses the watersheds of the Spillimacheen River, Bobbie Burns Creek and Vowell Creek drainages as well as the benches directly west of the Columbia River near Parson, B.C.

The TFL is held by Crestbrook Forest Industries (CFI) Ltd. of Cranbrook, B.C. TFL 14 is about 151,000 ha in size and supports an annual allowable cut of 164,000 m³.

The primary importance of TFL 14 to Crestbrook is its capability to produce timber values within an integrated resource management (IRM) framework. Wildlife, visual quality, water values and recreational activities are ranked high in importance in certain parts of the TFL. Identifying, ranking and incorporating these resources into harvesting plans is the challenge of integrated resource management.

Crestbrook Forest Industries is preparing Management Plan #8 for TFL 14. This plan, for submission to the Chief Forester of British Columbia, will provide the general goals, objectives and operating procedures to be followed on TFL 14. After approval by the Chief Forester the Management Plan will take effect on December 1, 2000 and be in force for five years.

The planning process for management of a Tree Farm Licence involves several steps designed to ensure that all resource uses are given appropriate consideration. The process culminates in the Management Plan, which describes the strategic objectives for the TFL and provides the data and analysis necessary to identify appropriate harvest levels.

As a preliminary step in management planning, Crestbrook has prepared this Statement of Management Objectives, Options and Procedures (SMOOP). The SMOOP is designed to initiate the planning process by clearly stating management objectives and clarifying the issues to be considered. The SMOOP is an outline of Crestbrook's intentions towards the preparation of Management Plan #8.

2.0 MANAGEMENT PLAN #7 COMMITMENTS

In management of the resources on the TFL 14 area, Crestbrook has identified various commitments. These have been summarised below in three categories. The first category (Section 2.1) is associated with those commitments outlined in the Tree Farm Licence document. Secondly, (Section 2.2) are the commitments identified in the current Management Plan #7. Section 2.3 lists directions given by the Chief Forester of B.C. in approval of the Management Plan No. 7 and determination of the annual allowable cut (AAC). Crestbrook has achieved, and will continue to achieve, a high level of performance on these commitments.

2.1 Tree Farm Licence Document Commitments

The following commitments are associated with acceptance of the Licence:

- **Operate timber processing facilities as per Section 16.00 of the Tree Farm Licence.** CFI has operated sawmill facilities capable of processing the volume from TFL 14.
- **Meet the requirements of Section 9.00 of the Licence which deals with cut control.** CFI has met annual requirements and will be within the five year 10% requirement.
- **Meet the requirements of TFL Section 15.00 the 'Contractors Clause'.** Contracts are in place and have been in compliance throughout the term of MP #7.
- **Meet the requirements of Section 22.11 of the TFL 'Undersized material'.** Undersized material has been exchanged with Brisco Wood Preservers. The continuation of this program is dependent on the market for fence posts as it affects affordability of the undersized material.

2.2 Management Plan #7 Commitments

The commitments listed in this section were identified in MP #7. This plan was approved in November 1996 and over half of the term remains for implementation of these commitments.

2.2.1 Planning

- **Maintain an updated timber inventory and undertake a reinventory of the TFL extension area.** This commitment has been addressed through the inventory enhancement project described immediately below as well as incrementally by forest cover updates.
- **Undertake an inventory enhancement project referred to as *Improving Volume Estimates on TFL 14* including reassessment of volume prediction for existing stands.** This project is ongoing.

- **Complete terrain sensitivity mapping.** Will be complete by March 1999.
- **Obtain Forest Renewal BC funding to complete stream inventory and fisheries data and to undertake wildlife habitat inventories.** Stream inventory and fisheries data has been gathered and will be further updated over the next two years, pending funding. Operational fish inventory will continue as part of regular operational planning and as per FPC requirements. Wildlife habitat inventories have been undertaken for winter range. Analysis of TEM will provide additional habitat inventory information. Further, an analysis of avalanche habitats on the Licence area has been undertaken. To date the avalanche and TEM field work is complete and the respective reports and maps will be available the first quarter of 1999.
- **Complete Resource Management Plans for all planning cells or Draft Landscape Units.** Resource management plans are completed for the entire TFL and can be grouped to match LUP draft landscape units. Pending resources, these plans will be updated for use in the 20-year planning portion of MP No. 8.
- **Submit an updated forest development plan and five-year silviculture plan every year.** Forest Development Plans have been submitted yearly with the most recent Plan receiving two-year approval (1998-2002). Five-Year Silviculture Plans were submitted when they were required.
- **Secure three years harvest volume in approved cutting permits at the equivalent AAC level.** Two and a half years of harvest volume is currently approved equivalent to the current AAC.
- **Implement a public review and consultation strategy.** A grass roots public review strategy has been implemented to meet current public demand. Previous lack of attention and involvement by the public in more elaborate public reviews resulted in localized involvement associated with forest development plans and local issues as they arose.

2.2.2 Harvesting

- **Log 750,000 m³ between 1997-2001 in compliance with the cut control and contractor clause regulations.** Crestbrook will meet cut control, including the undercut, within contractor clause regulations.
- **Conduct operations in accordance with cutting permit obligations and site disturbance standards.** Operations are in compliance.
- **Meet and exceed minimum utilisation standards.** Operations are in compliance.

- **Pursue utilisation of volumes from pre-commercial thinning.** Pre-commercial thinning options and products have been reviewed. Layout was initiated but curtailed as changes in utilisation resulted in the same products being available incidental to regular harvesting operations. Demand for these products is low at this time.
- Maintain the main road network in a safe operating condition and deactivate roads as prescribed. Roads have been maintained and deactivated according to plans and prescriptions.

2.2.3 Silviculture

- **Carry out basic silviculture in a cost effective manner on all harvested areas.** Obligation met.
- **Use genetically improved planting stock as it comes available.** Obligation met.
- **Reforest all logged areas in accordance with prescribed stocking standards and free growing periods.** Obligation met.
- **Obtain Forest Renewal BC funding for incremental silviculture projects.** Crestbrook has undertaken five projects during the term of MP No. 7. In 1997 \$205,000 was spent on prescriptions, juvenile spacing, and pruning.
- **Develop a stand tending strategy.** An initial Intensive Silviculture Plan was developed. The majority of the Plan has been initiated.

2.2.4 Forest Health

- **Monitor insect and disease activity at both the forest and stand level and continue proactive control of mountain pine beetle infestation.** Insect and disease activities have been monitored on an ongoing basis by a team involving Crestbrook, the University of Calgary, the MoF, Forestry Canada and a variety of planning, silviculture and harvesting contractors. An annual Forest Health Plan is prepared and submitted to the MoF in conjunction with the FDP. Research into forest health agents and effective management thereof, is carried out and reported on by both the University of Calgary and Forestry Canada.
- **On a proactive basis, salvage-harvest diseased and insect damaged timber.** An aggressive and proactive program involving harvesting, single load extraction, single tree burning, and baiting is ongoing as the seasons permit. Over the last 18 months the primary concern has been the Mountain Pine Beetle.

2.2.5 Fire Protection

- **Keep an updated fire protection pre-organization plan.** This plan has been updated and approved annually.
- **Maintain a high standard of fire preparedness.** A high standard of fire preparedness has been maintained through employee training, monitoring of forest conditions, implementation of fire standby as required, assessment of hazards and abatement as required, and the maintenance of an up-to-date and complete equipment complement.
- **Conduct all activities in compliance with forest fire suppression regulations.** In compliance.

2.2.6 Range

- **Co-operate with range permittees and the Ministry of Forests in the range program and protect range improvements.** Range improvements have been protected or enhanced by various forest activities. There has been good co-operation between Crestbrook and the range permittees.

2.2.7 Recreation

- **Plan for increased recreational usage.** Increased recreational usage has been planned for by working with various publics, user groups, and commercial licensees and through access management planning.
- **Maintain and upgrade existing recreation sites.** Increased recreational usage has been accommodated by the construction of docks, site and trail maintenance, road maintenance to recreation sites, provision for a variety of recreational experiences from motorized to primitive back country experiences and through cut block design to complement heli-ski activities.
- **Recognize visual sensitivity in harvest design.** Visual sensitivity is an input to harvest design.

2.2.8 Heritage resources

- **Report discovery of archaeological sites to the provincial government.** Annual plans are evaluated by an Archaeologist. From this overview Preliminary Field Reviews (PFR) and Archaeological Impact Assessments (AIA) are carried out as recommended. Study results are reported to the provincial government. In addition, various personnel working on the TFL have had training in the identification of probable archaeological sites that they may encounter.

2.3 Chief Foresters Requirements

In his approval of Management Plan #7 and in the associated AAC Rationale report, the Chief forester specified certain conditions and directed Crestbrook to continue or

undertake certain projects. These commitments are listed below and status for each is reported:

- **Complete an ongoing review of the various components of the inventory and to include the results in the next timber supply analysis.** This refers to Crestbrook's inventory project entitled "Improving Volume Estimates on TFL 14". The project is ongoing and will be complete for input to the upcoming timber supply analysis. The Ministry of Forests Resources Inventory and Research Branches have reviewed and approved methods to be used.
- **Complete a reassessment of the inventory volumes for existing stands and use revised inventory estimates in the upcoming 20-Year Plan for consistency with strategic planning.** This is addressed in the above-mentioned project. To address MoF inventory audit findings of significant underestimate of existing volumes, an unbiased sampling of 179 forested stands aged 40 years and older was undertaken. Results, including an inventory adjustment process, will be available for the upcoming timber supply analysis. Revised current volume estimates will be used consistently in the timber supply analysis and the 20-Year Plan.
- **Evaluate the alternative analytical approaches to assessing growth and yield and timber supply implications of uneven-aged management.** Growth and yield in complex or partially harvested stands is being addressed in several ways. As a part of the above-mentioned project, inventory sampling includes collection of data designed to improve the ability to model stands using Prognosis^{BC}. This model is capable of modelling partial cutting. The *Improving Volume Estimates* project will also provide improved stand descriptions for partially harvested stands. Prediction of existing volume in partially harvested stands is the topic of an ongoing comparison of data resulting from enhanced multi-layer silviculture surveys, pre-harvest factor cruising, and possibly post harvest cruise data.
- **Clarify the appropriate site index estimates throughout the inventory.** A Terrestrial Ecosystem Mapping (TEM) project will provide a biogeoclimatic ecosystem classification (BEC) of the TFL to the site series level. This site series inventory will be used to assign site index based on provincial default values modified with local data. The TEM project is collecting site index/BEC data pairs where applicable. As input to timber supply, a hierarchical approach to site index assignment will be used. For each stand the site index estimate judged most appropriate will be applied. This could include: indicated site index based on age/height data; growth intercept based site index; and/or SIBEC values.
- **Clarify the timber supply implications of landscape-level biodiversity, and old growth retention and forest ecosystem networks in the next timber supply analysis.** Draft landscape units have been defined. These draft units, and emphasis levels if brought forward from the Landscape Unit Planning (LUP) process, will be used in implementation of the biodiversity guidelines (as

interpreted at the time) in the upcoming timber supply analysis. If the LUP process has not been completed, the landscape biodiversity requirements will be simulated using an average value based on a 10/45/45 weighting of high, moderate and low emphasis constraints.

- **Monitor any forest health considerations of current and planned partial cutting particularly in the Columbia Bench VQO zone and to consider this issue in the next management plan and timber supply analysis.** The Mountain Pine Beetle population has been increasing to epidemic levels in the southern area of the TFL. Only initial monitoring of root rot has been undertaken.
- **Initiate a monitoring program to refine the future operable land base assumptions for inclusion in the next timber supply analysis.** The current definitions of physical and economic operability are being reviewed with regard to harvest planning and biological limits to regeneration. An appropriate course of action will be incorporated into the yield analysis.
- **Review estimates of regeneration delay.** The actual regeneration delay achieved on the TFL over the past five years will be estimated based on silviculture records. These values will be compared to the Invermere TSA to ensure reasonableness. The Nelson Forest Region AAC mitigation study entitled *Regeneration Delay Validation and Effect on Allowable Cut in the Nelson Forest Region* will also be used for reference.
- **Evaluate, and update if required, soils ESAs on the TFL extension.** Soils ESAs are being evaluated against level D terrain hazard across the TFL. Crestbrook, in consultation with the Invermere Forest District, will determine the appropriate interpretation of this data for the upcoming timber supply analysis.

3.0 MANAGEMENT OBJECTIVES

The primary goal of Crestbrook is to maintain a long-term, economically viable forest products operation while practicing sound integrated resource management. In setting this goal Crestbrook recognizes its commitments to forest stewardship, the environment, and to meeting various government policies and objectives. In order to reach this objective, Crestbrook is committed to operating its facilities in a cost effective and profitable manner. This will allow Crestbrook to provide stable employment for our employees and contractors with resultant socio-economic benefits to the local communities and the Province of British Columbia. Where possible, Crestbrook will pursue a course of continued growth within the industry.

As signatories to the Principles of Sustainable Forestry (Forest Practices Committee document of the Forest Alliance of B.C.), Crestbrook is committed to the sustainability of the environmental, economic and social values of TFL 14 while maintaining an economically competitive enterprise. This commitment requires forest management standards in compliance with the Forest Practices Code including protection of biological diversity at the stand and landscape levels.

This section lists specific management objectives proposed for TFL 14 to provide a clear vision of the planning and management requirements for MP #8. These objectives are a continuation and refinement of those adopted in previous management plans.

3.1 Forest Land Stewardship

- To promote balanced resource management which ensures that there is a sufficient area of productive forest land available to provide a sustainable timber supply, while incorporating the requirements of wildlife, fisheries, water production, grazing, viewscapes, cultural, recreational and unique ecological values.

3.2 Management of the Timber Resource

- To harvest the currently approved annual allowable cut (AAC) as set by Chief Forester. The AAC is currently 164,000 metres per year;
- To adhere to the Forest Practices Code for all activities conducted on TFL 14;
- To harvest the forest profile over the short and long term in an environmentally sound and economically viable manner;
- To harvest to standard and accepted utilisation levels;
- To harvest the annual allowable cut (AAC) according to the conditions of the management plan, approved cutting permits and government regulations;
- Use appropriate harvesting systems including helicopter, cable and ground skidding; and
- Use appropriate silviculture systems including seed trees, shelterwood intermediate cuts, selection harvests, clear cuts, and patch clearcuts.

3.3 Protection and Conservation of Non-timber Values and Resources

3.3.1 Visual Quality

- Implement 'partial retention' to 'modification' visual quality objectives on the

Columbia Bench west of the Columbia River as influenced by forest health.

3.3.2 *Biological Diversity*

- Maintain opportunities for acceptable levels of landscape level biological diversity. Considered are the concepts included in the Biodiversity Guidebook and new information directly related to the TFL. Utilized are Draft Landscape Units. Emphasis levels will be utilized when they are brought forward from the Landscape Unit Planning (LUP) process.

3.3.3 *Soil Conservation*

- To minimize the forest land base occupied by permanent access structures required to provide access to operating areas;
- Carry-out terrain hazard assessments to determine risks related to road construction; and
- To minimize temporary access structures using economically viable harvesting systems.

3.3.4 *Water Resources*

- Plan harvest operations to maintain water quality for licenced water users.

3.3.5 *Recreation*

- To continue the integration of public and commercial use of the licence area for the full spectrum of recreational activities; and
- Continue to co-operate with the Ministry of Forests in the maintenance of existing recreation sites.

3.3.6 *Culture*

- Work with local aboriginal groups to identify activities and integrate these uses into specific harvesting plans; and
- Use archaeological overview assessments being conducted by the Ministry of Forests to determine the requirements for additional detailed assessments on specific sites.

3.3.7 *Range*

- To work with the Ministry of Forests in maintaining a range program capable of sustaining the present carrying capacity of animal-unit months (595 AUMs); and
- Ensure that forest planning priorities are co-ordinated in the current range program, and that timber development input is included in the Range Use Plans prepared by the Ministry of Forests.

3.3.8 *Fisheries*

- To use harvesting and silviculture practices that maintain the integrity of streamside networks as they pertain to water quality, fish habitat and wildlife habitat.

3.3.9 *Wildlife*

- To maintain a variety of wildlife habitats capable of supporting existing wildlife species;

- To manage forest ecosystems in a fashion that provides for wildlife habitat requirements with the production of timber; and
- Use natural disturbance regimes and ongoing forest habitat inventories in forest planning to achieve these objectives.

3.4 Public Consultation and Involvement

- To provide the public with an opportunity to review management plans, development plans and silviculture prescriptions;
- Include other resource users such as range tenure holders, other licenced resource users, trappers and guide outfitters, as well as aboriginal peoples, in the consultation process in order to consider their needs. This will be achieved by notifying and meeting with effected parties through the management planning and development planning processes;
- To promote increased public awareness and knowledge of forest management activities through field trips, school tours and open houses; and
- Ensure that all issues of public importance are addressed and that the importance of all resources is clearly understood.

3.5 Fire Protection

- To protect the forest resources from damage and losses caused by wildfires by maintaining an effective, efficient fire prevention and control organization. This will be accomplished using an annual Fire Preparedness Plan. Crestbrook will implement programs with the MoF to ensure prompt control action; and
- Use prescribed fire as a tool for fuel management and fire hazard abatement.

3.6 Forest Health

- To promote forest health by the identification and timely harvesting or appropriate treatment of threatened or damaged stands, and by employing integrated pest management strategies based on MoF information to reduce insect, disease and animal damage; and
- Co-ordinate efforts with MoF to ensure efficient delivery of programs.

3.7 Silviculture

- Use appropriate silviculture systems including seed trees, shelterwood intermediate cuts, selection harvests, clear cuts, and patch clearcuts to address non-timber resource requirements while ensuring prompt regeneration;
- To regenerate all harvested or denuded operable forest lands promptly to maintain the productive fibre growing capacity of the land base; and
- To capitalize on intensive silvicultural activities for the purposes of managing stand structure, and providing fibre supply opportunities such as pulplogs.

3.8 Roads

- To construct, maintain, and deactivate roads following applicable guidelines and standards as required to facilitate economic timber extraction, while minimizing withdrawals from the timber harvesting land base;
- Deactivation planning will consider other resource user requirements, silviculture obligations, fire protection and forest health needs.

3.9 Other Issues

- Pursue options that will allow the productive forest land along the proposed BC Hydro R/W to contribute to the operable forest. Currently, BC Hydro has a *Notation of Interest* filled with BC Lands for the future possibility of a transmission line from the Mica Dam to Cranbrook. Portions of this right-of-way were removed from the TFL land base in 1982 (Instrument 11) and logged. Removal of the land base was somewhat premature and while the *Notation of Interest* can still be respected the lands should contribute in the same manner as within the Invermere TSA.
- Continue to pursue implementation of an access management plan by the Ministries of Forests and Environment

4.0 INVENTORIES

Resource inventories available for this Management Plan will include:

- Updated and upgraded forest cover inventory;
- Digital terrain model;
- Terrain classification;
- Revised operability line;
- Environmentally sensitive areas;
- Recreation and landscape;
- Terrestrial ecosystem mapping;
- Biogeoclimatic ecosystem classification to the site series;
- Wildlife habitat suitability and capability interpreted from biogeoclimatic ecosystem classification;
- Draft landscape unit definitions;
- Roads classification;
- A fish inventory; and
- Forest Practices Code riparian classification.

Inventories will be merged in a geographic information system environment and prepared for input to timber supply analysis.

4.1 Forest Cover Inventory

A reinventory of the original TFL area was undertaken in the period 1984 through 1986. It was completed to MoF standards of the day and has been compiled in digital format. MoF inventory data for the TFL extension area was added to the database in 1990. All maps have been converted to the TRIM map base (NAD 83). The inventory will be updated for depletion and disturbance to December 1998.

An MoF inventory audit of TFL 14 identified a significant underestimate of volume in existing stands. In order to provide sufficient data to support correction of the inventory, an unbiased inventory sampling project (179 polygons within TFL 14) is underway. This project will provide statistically sound inventory adjustments or enhancements as well as reliability estimates associated with the inventory volume estimates.

4.2 Digital terrain model

Slope, elevation and aspect data is available based on standard TRIM I digital terrain models.

4.3 Terrain classification

Level D terrain stability classification for the entire TFL is nearing completion. Interpretations of this data will be investigated to replace or augment soils ESAs in the determination of harvest contribution.

4.4 Revised operability line

Current definitions of physical and economic operability will be reviewed. An appropriate course of action will be incorporated into the yield analysis and the Twenty Year Plan.

4.5 Environmentally sensitive areas

Environmentally Sensitive Areas (ESAs) exist as polygon attributes in the forest cover inventory. These were defined in 1984. Areas were classified as:

- Actual or potentially sensitive or unstable soils;
- Areas providing protection to man-made or natural resources from avalanches;
- Questionable forest regeneration success; and
- Recreation values.

Overlap between soils ESAs and terrain hazard mapping is being investigated.

4.6 Recreation and Landscape

Recreation and Landscape (viewscape) inventories for the entire TFL are complete to the standards in place for the previous Management Plan. Crestbrook has provided the Recreation Resources inventory to the MoF for update to the recently revised format.

Visual quality objectives defined for the Columbia Bench areas defined in co-operation with the Regional Planning Officer in 1993/1994 will be used to identify management zones in which visual management is emphasized.

4.7 Biogeoclimatic ecosystem classification to the site series

A Terrestrial Ecosystem Mapping project will provide site series level biogeoclimatic ecosystem classification to the site series by the first quarter of 1999.

4.8 Wildlife habitat suitability and capability

Interpretations of wildlife habitat, suitability and capability will be based on the site series level ecosystem mapping, habitat use studies and avalanche path assessments. This is to be complete by the first quarter of 1999.

4.9 Draft Landscape Units

Digital line work defining draft landscape units as derived from the LUP program is available.

4.10 Roads classification

All current, main and secondary roads, as well as the majority of trails, are classified based on MoF standard categories of main road, secondary road, and trail. In addition to this, roads are classified according to width reflecting the area lost to long-term production of trees. The classification is used to buffer roads using the GIS to make appropriate land base reductions.

4.11 Fish Inventory

Completed in 1994, this pre-code inventory was one input to the Forest Practices Code Riparian Classification discussed below.

4.12 Forest Practices Code Riparian Classification

In order to model riparian reserves as required by the Forest Practices Code, streams and wetlands are classified using the FPC system. A Terrestrial Ecosystem Mapping project to be completed in early 1999 will provide additional information on riparian areas.

4.13 Range

A Range Inventory and Range Plan will be requested from the Invermere Forest District.

5.0 MANAGEMENT ISSUES AND OPPORTUNITIES

Crestbrook will consider the following management issues and opportunities in preparation of Management Plan #8. The list is drawn from management experience on TFL 14, previous planning documents, and from consultation with the public and resource agencies.

5.1 Economic Operability

Issue/Opportunity:

An operability survey of TFL 14 was completed in 1984. Planning activities during the term of MP No. 6 questioned the economic viability of harvesting in certain areas that had been classified as operable. An economic operability line, which increased the area defined as inoperable, was defined in 1992. The Timber Supply Analysis for MP No. 7 applied both as a base case, but a sensitivity analysis used only the original operability line. The results of these two analyses were significantly different and enough uncertainty remained that the Chief Forester of B.C. directed Crestbrook to establish a monitoring program to refine the operable land base assumptions.

Action:

Crestbrook will finalize an operability line based on the previously identified lines, field inspections of questionable areas, and recent performance and development planning.

5.2 Standing Timber Volumes

Issue/Opportunity:

A Ministry of Forests Inventory Audit determined that standing timber volumes were significantly underestimated on TFL 14 using the existing forest cover inventory and the empirical yield model VDYP. The sample size used for the audit was insufficient to build an inventory adjustment strategy however, and the base case of the Timber Supply Analysis for MP #7 did not address this issue. Sensitivity analysis did indicate a large impact on timber supply due to the underestimation.

Action:

For the upcoming Timber Supply Analysis Crestbrook will have completed an expansion of the inventory audit which will provide a defensible inventory adjustment strategy to improve estimation of standing timber volumes.

5.3 Site Index Estimation

Issue/Opportunity:

Although site productivity is a key input to forest management planning, it is widely accepted that measurement of productivity is problematic for a large proportion of the forest land in B.C. Site index may not necessarily reflect true productivity because mature and overmature stands may have had height growth adversely affected at some point in their development. A negative bias to site index in older stands is likely but not currently demonstrated on TFL 14. The Timber Supply Analysis for MP #7 identified

significant long and short-term benefits with the application of improved site index estimates.

Action:

Land-based biophysically derived classification systems are recognized as offering significant improvements over the current inventory-based systems for some stand conditions. In preparation for the Timber Supply Analysis for MP #8 Crestbrook is currently developing a biogeoclimatic ecosystem inventory upon which to assign estimates of site index by species and site series.

5.4 Managed stand yields and local operational adjustment factors

Issue/Opportunity:

Given the paucity of data available either locally or provincially, Crestbrook will not be able to localize managed stand yield predictions in the short term. Ministry of Forests' generalized operational adjustment factors (OAFs) for TIPSY managed stand yields may not be representative for TFL 14.

Action:

Crestbrook will consider establishment of permanent sample plots in co-operation with the Ministry of Forests and local growth and yield co-operatives. Crestbrook will investigate localization of OAFs.

5.5 Volume estimation in complex stands

Issue/Opportunity:

The use of partial harvest systems is increasing on TFL 14. Prediction of future harvest on the resulting stands is uncertain.

Action:

Crestbrook is currently augmenting the forest inventory to provide improved stand level modeling using Prognosis^{BC}. This model provides improved ability to project stands from their current state as well as simulate intervention. For the timber supply analysis, a mutual agreement will be reached between Crestbrook and the Ministry of Forests for a volume estimation technique.

5.6 Stand decline and breakup

Issue/Opportunity:

A significant proportion of the standing mature inventory on TFL 14 is past its biological maturity. Uncertainty regarding the effect of biodiversity guidelines may further reduce the productivity of the working forest.

Action:

Crestbrook will, within existing guidelines, focus its harvesting efforts on declining overmature stands. Normally, priorities of harvesting are i) infested, ii) susceptible, iii) overmature stands, and iv) timber profile. However, harvesting constraints imposed by biodiversity, water management, green-up, wildlife management, etc. may redirect the priority. Where appropriate, selection harvesting will be proposed in older stands, required for biodiversity, to salvage impending mortality.

5.7 Natural disturbance and harvest distribution patterns

Issue/Opportunity:

The forest stand history of TFL 14 includes significant natural fire disturbance which today provide large areas of contiguous even-aged stands. Forest management planning to date has been constrained by block size limits. This practice has the potential to increase the kilometers of road required and to reduce the biodiversity that is created by these large natural disturbances.

Action:

During the 20-year planning process, and the Forest Development Plan processes in future years, consideration will be given to amalgamating cut blocks with the goal of reducing the kilometers of road construction required. This will address biodiversity concerns by ensuring larger reserve areas with increased interior habitat. A proposal will be made to the District Manager which will be reviewed through the normal planning and public consultation process.

5.8 Riparian management areas

Issue/Opportunity:

Riparian Management Area impacts require further investigation to determine their impact on the available timber supply.

Action:

The impact of riparian management areas on timber supply will be assessed during the Total Resource Planning process as part of the 20-Year Plan requirement of the Management Plan #8 process. For timber supply analysis, riparian management areas will be explicitly identified in the geographic information data sets.

5.9 Forest Health

Issue/Opportunity:

The large component of overmature forests in TFL 14 represent a large risk of insect epidemics. Mountain Pine Beetle and especially Balsam Bark Beetle are prominent forest health threats.

Action:

Immediate road construction and harvesting action have contributed to recovering potential losses and avoiding catastrophic outbreak. Crestbrook will continue to maintain an aggressive insect control program, including forest health surveys, beetle-proofing of stands, maintaining road access availability for control measures, and where appropriate, a pheromone baiting program.

5.10 Non-recoverable Losses

Issue/Opportunity:

Although they have a large impact on allowable harvest, little information exists to determine reliable estimates of non-recoverable losses (NRLs). Also, the division between endemic (accommodated in yield curves) and epidemic (NRLs) infestations is not clear.

Action:

Crestbrook will work with the Invermere Forest District to improve estimates of non-recoverable losses.

5.11 Recreation (North Spillimacheen)

Issue/Opportunity:

The Kootenay/Boundary Land Use Plan recognized the Upper Spillimacheen as a special Management Zone. Recreational objectives are to maintain opportunities for semi primitive non motorized use, and semi primitive motorized recreational opportunities.

Action:

In accordance with the Implementation Strategy, Crestbrook will consider these objectives in the management planning.

6.0 TIMBER SUPPLY ANALYSIS

Timber supply is the quantity of timber available for harvest over time. It is dynamic, not only because trees naturally grow and die, but also because conditions that affect tree growth, and the social and economic environment that effect the availability of trees for harvest, change with time.

Timber supply analysis is the process of assessing and predicting the current and future supply from a management unit. An analysis evaluates how management, including allowance for management of non-timber resources, affects the supply of harvestable timber over the long term. The timber supply analysis provides the technical basis for the provincial Chief Forester to determine an annual allowable cut for TFL 14.

However, due to uncertainty surrounding both the information used in analysis and future forest management objectives, these projections are not viewed as static or prescriptive. They remain relevant only as long as the supporting information is relevant. In recognition of this, TFL licensees are required to re-evaluate timber supply for each successive Management Plan (every five years).

Timber supply is influenced by many biological and management factors. Land use, past management patterns, timber inventories, growth and yield assumptions, management intensities, formulation of the analysis problem and the modeling process all influence the harvest levels found to be achievable.

Analysis of options will be undertaken using the Timberline Forest Inventory Consultants forest level model CASH (Critical Analysis of Schedules for Harvesting), a proprietary spatial forest estate simulation model. CASH is capable of explicitly simulating integrated resource management by regulating forest cover.

6.1 Proposed Analysis Options

Each analysis Option is discussed below.

6.2 Current Management Option

The current management or “base case” option will include:

- Management activity as defined by operations over the last five years;
- Implementation of the Forest Practices Code (FPC) as it is currently being interpreted, including riparian management and stand and landscape biodiversity guidelines;
- Up-to-date forest cover inventory;
- VDYP natural stand yields, TIPSY managed stand yields and Prognosis^{BC} for complex stands;
- Current utilisation standards;
- Visual quality objectives;
- Wildlife management;
- Recreation management objectives
- Basic Silviculture; and

- Consideration of problem forest types and forest health (consistent with current management).

A sensitivity analysis will be done for this option that will address any issues or assumptions which have significant uncertainties associated with them.

7.0 PUBLIC REVIEW

The opportunity to review the draft documents was taken by a relatively small but concerned group, who either meet with staff in our Parson office or reviewed the documents in the Golden Library.

Appendix I is a collation of their comments and our responses. Upon review of comments we have incorporated some changes to the draft as follows:

1)The addition of section 5.11 to consider the recreational objectives in the Upper Spillimacheen drainage.

2)Recreational objectives were added to the list of items to be considered in the “base case” current management option (Section 6.2).

**APPENDIX 1 PUBLIC REVIEW OF DRAFT STATEMENT OF
MANAGEMENT OBJECTIVES OPTIONS AND PROCEDURES**