

RIVERSIDE FOREST PRODUCTS LIMITED
TREE FARM LICENCE NO. 49
PROPOSED MANAGEMENT PLAN NO. 3
JANUARY 1, 1999 – DECEMBER 31, 2003

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FOREWORD

Management Plan No. 3 for Tree Farm Licence No. 49 outlines the management strategies that Riverside Forest Products Limited (Riverside) will pursue during the period January 1, 1999 through December 31, 2003. We accept the duties that we are charged with, to ensure that the activities performed under this Management Plan will further long-term forest management objectives for this licence area.

The operations and practices performed under this Management Plan require both corporate and operational commitments. Accordingly, it is imperative that our corporate and operational personnel concur with the intent of the management strategies expressed in this Management Plan for Tree Farm Licence No. 49 (TFL 49).

As representatives of Riverside, we will conduct our operations and practices on TFL 49 in accordance with the commitments provided within this Management Plan.

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1.0 INTRODUCTION

Tree Farm Licence No. 49 (TFL 49) referred to as the “Okanagan Tree Farm Licence” and located West of Okanagan Lake, is held in the name of Riverside Forest Products Limited. The primary importance of TFL 49 to Riverside is its capability to produce timber values within an integrated resource management (IRM) framework. Wildlife, cattle grazing, 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.

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 and operating procedures for the TFL and provides the data and analysis necessary to identify appropriate harvest levels.

After approval by the Chief Forester the Management Plan will take effect on January 1, 1999 and be in force for five years.

1.1 CHANGES WITH THIS PLAN

Although Management Plan No. 3 represents only an incremental change from Management Plan No. 2 there are several significant areas of change. Management Plans now exist in the context of the Forest Practices Code. Objectives and strategies are updated, especially in the areas of public involvement, culture, integrated resources management, and specifically landscape biodiversity. The plan includes a comprehensive consultation process (Review Strategy).

Supporting the allowable annual cut (AAC) proposed in the plan is a much updated timber supply analysis. Growth and yield modeling is significantly improved over methods used in support of MP No. 2 including key changes in the areas of site index and yield estimation techniques. A new Vegetation Inventory provides a strong base for the analysis. Updated ancillary resource inventories permitted accurate representations of the impact of integrated resources constraints on timber supply.

The map portfolio provides inventory overviews at a scale both more manageable and more suitable to strategic analysis.

1.2 ECONOMIC IMPACTS

Riverside is an integrated, publicly traded forest products company. Operations include eleven manufacturing facilities at six separate locations: a studmill and plywood plant at Armstrong; a studmill and plywood plant at Kelowna; a remanufacturing facility at Winfield; a studmill and veneer plant at Lumby; a dimension lumber sawmill, a stud mill and a fingerjointing plant at Williams Lake; as well as a railway tie treatment plant at Ashcroft.



Riverside's mill and woodlands employment base is relatively stable at approximately 2,000 employees with only slight variations due to seasonal demands. An additional 1,000 people working for independent contractors are employed in these operations.

Timber harvested from TFL 49 accounts for approximately 23% of the Armstrong and Kelowna mill demands. The employment base for TFL 49 includes the communities of Westwold, Falkland, Monte Lake, Armstrong, Vernon, Kelowna, Westbank, and the surrounding rural areas. Independent contractors carry out all timber harvesting on TFL 49.

The Southern operations of the TFL, located in the Penticton Forest District of the Ministry of Forests (MoF), comprise all areas South of Shorts Creek. The Northern operations, largely within the MoF Vernon Forest District, comprise the remainder of the TFL area.

This Plan and the associated Timber Supply Analysis indicate that no decrease in harvest level is required.

1.3 OTHER IMPACTS OF THE PLAN

The Timber Supply Analysis, through the integration of resource inventories and the use of forest cover constraints, models the production of various timber and non-timber resources through an extended modeling period. By explicitly constraining harvest we ensure that IRM objectives as expressed in the constraint regimes are met. The analysis exercise ensures that Riverside's primary goal (to maintain a long-term, economically viable forest products operation while practicing sound integrated resource management) is met.

1.4 LOCATION AND MANUFACTURING FACILITIES

TFL 49 (approximately 144,000 ha) consists of three blocks (see Key Map). The TFL was designated as a result of an amalgamation in 1984 of Tree Farm Licences No. 9 (Block A), No. 16 (Block B), and No. 32 (Block C). Management on this area-based licence has been conducted for over 45 years. Block A is situated West of Okanagan Lake to the height of land between the Okanagan and Nicola drainages, and north of Lambly Creek, to the Naswhito Creek drainage. Block B adjoins the North West portion of Block A, runs West of Bouleau Lake, bounded on the South by the Salmon River drainage, to Salmon Lake, North to Monte Lake and West to the Monte Hills and Weyman Creek drainage. Block C is separate from the rest of the TFL. It is located north of Falkland and east of Pillar Lake towards the Salmon River.

Riverside's two main manufacturing facilities supplied by TFL 49 are located on the East side of Okanagan Lake at Armstrong and Kelowna. Logs that are not suitable for plywood manufacture, or do not fit our sawmill configuration, are generally sold or traded to other local manufacturers.



2.0 MANAGEMENT OBJECTIVES

The primary goal of Riverside is to maintain a long-term, economically viable forest products operation while practicing sound integrated resource management. In order to reach this objective, we are committed to pursue a course of continued growth within the industry and to provide stable employment for our employees and contractors and socio-economic benefits for the residents of the local communities and for the Province of British Columbia. In setting this goal Riverside recognizes its commitments to forest stewardship, and to meeting various government policies and objectives. This section lists specific management objectives proposed for TFL 49 to provide direction for planning and management.

2.1 EMPLOYMENT AND ECONOMIC OPPORTUNITY

Riverside remains committed to providing a stable employment base for our local communities. It is in the social and economic best interest of Riverside to have available to it a stable and well-trained and educated work force.

Recognizing international economic pressures, it is expected that during the next 15 years primary manufacturing employment will decrease due to:

- Increased automation within the manufacturing process;
- Increased emphasis on Integrated Resource Management in Provincial policy and regulations; and
- The continued removal of land from the working forest.

Riverside will endeavour to maintain current employment levels, based on the allowable annual cut as proposed in this plan.

Riverside has requested a continuation of the current allowable cut of 380,000 cubic metres per year. Assuming this cut level is granted for the term of Management Plan No. 3, little change in employment levels and economic opportunity is anticipated. The estimated current levels of employment (1997) attributable to TFL 49 management activities (harvesting, silviculture, and manufacturing) as well as AAC, payroll and stumpage payments are shown in the following table.



TFL 49 Employment and Economic Activity Estimates

Allowable Annual Cut (Inclusive of SBFEP Portion) (m ³)	380,000
Riverside Full Time Employees	261
Riverside Contract Full Time Employees	76
SBFEP Employment *	33
Total Payroll Inclusive of SBFEP* (\$)	22,200,000
Annual Stumpage Payments Inclusive of SBFEP* (\$)	11,400,000

*Estimate prorated on the basis of Riverside employment, payroll and stumpage payments.

In addition, many TFL 49 specific projects are initiated over time. For instance, the recently completed TFL 49 Inventory created an estimated ten person years of employment. The preparation of the Timber Supply Analysis and Management Plan contributed 1.5 person years, and the TFL 49 boundary location project has provided 5 person years of employment.

2.2 PUBLIC INVOLVEMENT

The Ministry of Forests has accepted a Management Planning Review Strategy for TFL 49. In this document Riverside has outlined its commitment to public and governmental consultation. It is our goal to ensure that all issues of public importance are addressed and that the importance of all resources is clearly understood.

In order to practice integrated forest management, input is actively encouraged from the public, resource users, and government agencies. This information adds to our resource inventories and assists in ranking the importance of resources throughout the TFL. Riverside encourages public involvement as detailed in the Review Strategy. This includes all stages of Management Plan preparation including agency and public review of the previous Management Plan, the Statement of Management Objectives and Procedures (SMOOP), and the Draft Management Plan. Opportunities are provided for public viewing of all Silvicultural Prescriptions (SP) and all documents are available for viewing throughout the year during normal business hours. Public and agency input can be made at any time for consideration in management planning. All comments from the public and other resource users are incorporated or addressed where practical. The public comments, and Riverside's response, are also referred to the local Ministry of Forests' District Managers.

2.3 CULTURE

It is the desire of Riverside to respect aboriginal interests and to develop effective communication strategies in planning for resource use activities which concern their aboriginal rights.

Archaeological assessments are conducted by a professional archaeologist in consultation with the affected Indian Bands. Planning will continue to follow district directions on overview inventory implementation. Riverside has established protocols for archeological assessments with the Okanagan, Spallumcheen, Upper Nicola and Neskonlith, Adams Lake, and Little Shuswap Indian Bands. This protocol, resulting in review and assessment work being carried out on entire cutting permits, rather than on individual cut blocks, has been well received by the bands involved.



2.4 LAND USE AND INTEGRATED RESOURCE MANAGEMENT

As signatories to the *Principles of Sustainable Forestry* (Forest Practices Committee document of the Forest Alliance of B.C.), Riverside is committed to the sustainability of the environmental, economic and social values of TFL 49 while maintaining an economically competitive enterprise. This commitment requires forest management standards in compliance with the Forest Practices Code, including protection of natural biological diversity at the stand and landscape levels.

TFL 49 falls within the bounds of the Okanagan-Shuswap Land and Resource Management Plan (the LRMP) which is currently being prepared. Operations on TFL 49 will be consistent with the on-going strategies of the LRMP as approved by the Cabinet for the Province of B.C.

Riverside supports the concept of integrated resource management. We perceive integrated resource use as one or more users using the same unit of land concurrently or over time. Riverside co-operates with government resource agencies and the public on the identification, inventory and management of non-timber resources such as fish, wildlife, water, range, and recreation. Harvest planning incorporates the predetermined objectives for the land unit, and where other resource values are determined to be significant the plans are modified to accommodate these values. As concerns are identified in our Forest Development Plan update process, they will be considered for incorporation into the plan. When significant archaeological sites are identified and recognized by the Province of British Columbia, measures will be taken to protect their special significance.

Through the Forest Development Plan, Riverside will solicit the concerns of all major resource users. Users include trappers, guide outfitters, range tenure holders, and other recognized resource users.

2.5 TIMBER MANAGEMENT OBJECTIVES

The short and long-term availability of timber on TFL 49 has been examined in the Timber Supply Analysis Report. The analysis evaluates how current management, including allowance for management of non-timber resources, affects the supply of harvestable timber over a 250-year period. It also quantifies the sensitivity of the results to uncertainty associated with modeling inputs. The timber supply analysis provides the technical basis for the Chief Forester of British Columbia to determine an AAC for TFL 49 for the term of this plan.

Riverside proposes to maintain the currently approved AAC of 380,000 cubic metres per year, not including unrecoverable losses. This goal is inclusive of the small business allocation of 36,905 cubic metres per year (9.7%). For the purposes of timber supply analysis, the objective is to maintain the harvest at or above the long run sustainable yield level. Short-term harvests may be above a basic sustainable level without compromising future harvests.

Logging methods will be based on site-specific requirements and may include conventional logging, roadside logging, cable yarding, helicopter logging or other systems. In even-aged management the harvest system will generally be the clearcut system with selective harvesting in suitable uneven-aged stands.



The Forest Practices Code will guide activities conducted on TFL 49. Where applicable, the Okanagan TSA Integrated Resource Management Timber Harvesting Guidelines and other guidebooks and any updates or amendments to those will be used as a guide in forest management activities.

Riverside will also evaluate the feasibility of additional intensive forest management activities to mitigate future reductions in harvest. An Incremental Silviculture Plan can be found in Appendix II. Basic silviculture will be carried out in a cost-effective manner on all harvested areas.

Losses and damage will be minimized through rapid detection and suppression of fires and through early detection of abnormal insect and disease activity. Priority will be given to the harvest of merchantable and accessible damaged timber.

The long-term objective of Riverside is to produce logs of suitable species and quality for the profitable manufacture of lumber and plywood.

2.6 SILVICULTURE

Basic silviculture will be carried out in a cost-effective manner on all harvested areas. Forest Renewal BC will fund treatments on areas denuded prior to October 1, 1987. Where funds are available and appropriate incentives are in place, incremental silviculture will be practiced. An Incremental Silviculture Plan can be found in Appendix II.

Riverside will continue to emphasize the use of genetically improved planting stock, as it becomes available from ongoing tree improvement programs, for all lands within this land base.

Harvesting activities will be conducted in accordance with site-specific activities approved in the Silviculture Prescription. Subject to approval of plans, including the 20-Year plan and future Forest Development Plans, we anticipate the following distribution of silviculture systems:

Silviculture System	Approximate % of Harvest Area
Clearcut *	88 %
Selective	12 %
Total	100 %

Note: * Clearcut blocks include blocks with reserves within the block and blocks with wildlife trees within the block as well as seed tree systems. Clearcut blocks may be harvested by ground, cable or helicopter systems.

2.7 PROTECTION

2.7.1 Fire Prevention

Our management objective is to minimize the loss of forest cover resulting from fire. Rapid detection and suppression of fires will minimize losses and damage.

2.7.2 Forest Health

Insect and disease management objectives are to keep timber losses to a minimum.



2.8 ROADS

Most of the main road network is in place on TFL 49 (See Appendix VIII - Map 8). Secondary and spur road construction will facilitate development of new cutting permits. It is Riverside's objective to construct, maintain, and deactivate roads following applicable guidelines and standards as required for timber extraction, silviculture and protection.

2.9 SOIL CONSERVATION

It is the objective of Riverside to minimize the forest land base occupied by permanent structures required to provide access to operating areas. Levels of soil disturbance will be in compliance with the appropriate guidelines. Rehabilitation measures will be included in each silviculture prescription.

2.10 RANGE RESOURCES

The current grazing level of 10,000 animal unit months (AUMs) will be maintained for the period of MP No. 3 unless revised. Range inventory and objectives are developed by the Ministry. Increases above this level will not be supported by Riverside unless it is shown that the proposed level is sustainable and that the level of management is such that basic silviculture obligations are not compromised.

2.11 BIOLOGICAL DIVERSITY

Following the concepts included in the *Biodiversity Guidebook*, Riverside's objective is to maintain acceptable levels of landscape level biological diversity. Stand level biodiversity is also a priority for Riverside. As is noted in the Guidebook, however, not all elements of biodiversity can or should be maintained on every hectare. The Timber Supply Analysis implemented landscape unit boundaries provided by the MoF. Biodiversity emphasis levels were not available.

2.11.1 Landscape Level

Landscape units are expected to be defined by the Okanagan Shuswap LRMP process. Specific biodiversity objectives will become known at the time of completion of the LRMP. Until that time, guidance from the Okanagan Timber Harvesting Guidelines and consultation with the MoF and the B.C. Ministry of Environment, Lands and Parks (MoELP) will address this issue when evaluating cut block size, shape and distribution (spatial and temporal). The silviculture systems will be planned within the total chance concept. This should provide sound planning framework for addressing this issue.

2.11.2 Stand Level

Stand level biodiversity attributes are, and will be, addressed within the individual cut block SP through the application of logging methods, utilization standards, site preparation, fuel management, and reforestation methods. Where feasible, and in consideration of the previously



noted cut block issues, important structural attributes such as wildlife trees, coarse woody debris (CWD), tree species diversity and understory vegetation diversity will be addressed.

2.11.3 Coarse Woody Debris

Within the requirements of normal utilization standards, the licensee will attempt to maintain current levels of coarse woody debris on each cut block, providing post treatment objectives, forest health and fire hazard are not compromised.

2.12 WATER RESOURCES

Forest management activities will be conducted to minimize the impact on the water resources.

Total chance engineering will be used to minimize road construction activities. Referral of Forest Development Plans will be continued for the benefit of water resource management by the Ministry of Environment, Lands and Parks, and in consultation with water users.

Concerns about the quality, quantity and timing of water produced from watersheds in TFL 49, if they arise, will be addressed through meetings with the MoF, MoELP, Department of Fisheries and Oceans (DFO), Irrigation Districts, and local water users.

Watershed assessments are currently completed or planned for most major watersheds used for irrigation and potable water containment from TFL 49. These watersheds typically contain forest cover resulting from fire history. Water containment is mostly into a series of storage dams. The table below lists completed watershed assessments. Community Watersheds are displayed in Appendix VIII - Map 9.



Completed Watershed Assessments (Level one IWAP)

Watershed/Sub-basin	Year Completed	Area (ha)
Naswhito Creek	1994	8,050
Whiteman Creek	1994	22,250
Shorts Creek	1994	17,700
Lambly Creek	In review	27,000
Salmon River WRP:		
Weyman sub-basin	1998	9,657
Twig sub-basin	1998	3,928
Salmon sub-basin	1998	28,225
Nash sub-basin	1998	3,738
Cain sub-basin	1998	4,667
Ingram sub-basin	1998	1,106
Bolean sub-basin	1998	7,749
Silver sub-basin	1998	110
Total Area		134,180

2.13 RECREATION USE AND VISUAL RESOURCES

Recreation use is important within the TFL. Unless directed by the Ministry of Forests, an open access policy will be maintained with minimum restrictions to the public. Riverside will work with the MoF to maintain the availability of recreational opportunities at current levels. Where public use warrants, the establishment of additional facilities will be considered jointly with the MoF. Forest management activities will be conducted to allow for maintaining the current level of satisfactory user days.

A recreation and visual resource inventory for TFL 49 has been completed (see Appendix VIII - Maps 3,4a) and approved for use in the Timber Supply Analysis.

Map 4b in Appendix VIII is an updated visual resource inventory to be used in operational planning. Using this information, Riverside incorporates visual landscape values into forest management planning according to approved government guidelines. Digital terrain mapping techniques are used to simulate harvesting within visually sensitive areas or corridors and to ensure visual quality objectives are met.

2.14 FISH AND WILDLIFE RESOURCES

Close liaison will be maintained with the Ministry of Environment, Lands and Parks (Fish and Wildlife) and the Department of Fisheries and Oceans.



Areas having high fisheries or wildlife values will be identified and operations will be planned accordingly. Required fish stream assessment work will be conducted prior to road and harvesting activities.

3.0 TIMBER MANAGEMENT STRATEGIES

3.1 PLANNING

To meet our management objectives it is important to understand the planning process and its relationship to our operations. The Management Plan outlines broad goals and objectives and states commitments towards forest management practices on the TFL during the five-year period. The Forest Development Plan indicates the location of harvesting. The Silviculture Prescription outlines in detail how integrated resource management concerns are addressed, the sequence of activities and generally how an area is to be reforested to reach a free growing state.

Our practices are in accordance with the Forest Practices Code and the Okanagan Timber Supply Area Integrated Resource Guidelines for Timber Harvesting, where appropriate, unless identified in a specific plan. As new guidelines, policies and processes evolve, they will be incorporated into the planning process.

Riverside needs to monitor the impact of the Small Business Forest Enterprise Program (SBFEP) activities to ensure that the SBFEP Forest Development Plans and SPs incorporate the intent of this Management Plan. We expect that all proposed SBFEP SPs within TFL 49 will be referred to Riverside for comment, prior to approval by the District Manager. Riverside acknowledges the Ministry of Forests' SBFEP Policy for harvesting within the TFL.

Riverside is a member of the Forest Alliance of British Columbia. We follow the "Principles of Sustainable Forestry" which are included in Appendix I.

3.1.1 Operating Areas

Harvest operations will be dispersed throughout the TFL, wherever possible, so that operations will not adversely affect other resource values due to concentrated harvesting.

3.1.2 Local Resource Use Planning

Currently (1998) there are no local resource issues requiring special plans for this planning period. Should the need arise, Riverside will actively participate in the local resource use planning process. Although not requiring special plans at this time, some areas that warrant special consideration are:

- The viewscape from Okanagan Lake;
- Mature cover on the Bolean plateau (TFL 49 Block C);
- Critical ungulate winter range areas;
- Lambly Creek and Powers Creek Community watersheds; and
- Native access concerns.



3.2 RATE OF HARVEST AND YIELD ANALYSIS

The Management Option in the Timber Supply Analysis Report forms the basis for the proposed allowable cut. This option reflects Riverside's commitments and intentions for management on TFL 49. The proposed rate of harvest for this planning period is 380,000 cubic metres per year. The Timber Supply Analysis (see Appendix V) provides substantial evidence that this harvest level can be maintained for decades to come without compromising future harvest levels.

3.3 ALLOCATION OF THE ALLOWABLE ANNUAL CUT

The allocation of the 1998 Allowable Annual Cut (AAC) is indicated in the following table. Proration between Schedule B (.49%) and Schedule A (99.51%) land is by current net harvesting land base (608 ha and 124,414 ha respectively). The allocation to the Small Business Forest Enterprise Program in the two districts is based on the allocation in MP No. 2.

Harvest Level

Licensee	Schedule A Lands (m ³)	Schedule B Lands (m ³)	Total	Percent
Riverside	1,862	341,233	343,095	90.29
SBFEP Vernon	0	24,357	24,357	6.41
SBFEP Penticton	0	12,548	12,548	3.30
Total	1,862	378,138	380,000	100.00

The SBFEP will be accommodated at these indicated volume levels, as agreed with the District Managers.

3.4 FOREST RESOURCE INVENTORIES

This Section documents the status of all resource inventories. Full details are available in the Timber Supply Analysis Information Package. Resource inventory maps can be found in Appendix VIII.

3.4.1 Phase I Vegetation Resources Inventory

Completed in 1997, the TFL 49 Vegetation Resources Inventory includes forest cover attributes to MoF Phase I standards in a fully digital and spatial format compatible with the Provincial inventory database. Colour photography flown in 1994 was used to delineate strata to Vegetation Resources Inventory standards. Non-productive polygons were delineated to 0.5 of a hectare or less. The forest cover inventory is updated for disturbance and projected for growth to January 1, 1996. The MoF has undertaken a phase II sampling project on the TFL and the results confirm a 15% underestimate of current volumes using inventory attributes and the MoF model VDYP.



3.4.2 Environmentally Sensitive Areas

A 1991 inventory of environmentally sensitive areas (ESAs) covering the entire TFL was captured digitally as an overlay to the forest inventory. Areas are classified as non-contributing to harvest based on:

- Actual or potential sensitive or unstable soils;
- Severe regeneration problems caused by geoclimatic factors; or
- Areas having critical importance to wildlife.

3.4.3 Recreation and Landscape

Recreation and landscape inventories are complete to MoF standards for the entire TFL area. For timber supply analysis, visual quality objectives as defined in the Landscape inventory are used to identify management zones in which visual management will be emphasized. (See Map 4a Appendix VIII). In accordance with the Chief Forester's approval of MP No. 2, the Landscape inventory was updated, and this version was approved after analysis work was underway but will be used for future strategic and operational planning (See Map 4b).

3.4.4 Biogeoclimatic Ecosystem Classification (BEC)

Mapping of biogeoclimatic zones and subzones/variants is based on the MoF Provincial coverage. Riverside will consider undertaking a full site series BEC inventory for the TFL.

3.4.5 Site Association Mapping Block B

A site association inventory was completed in 1982 on TFL 49 Block B (former TFL 16) to MoF standards of the day. Site associations are correlated to current site series.

3.4.6 Canada Land Inventory of Wildlife Capability

The wildlife habitat inventory is loaded as a data overlay to the forest inventory from the Canada Land Inventory of wildlife habitat capability. This inventory, as updated and refined by the MoELP, was used to define ungulate winter range management zones for timber supply analysis, following the lead of the Okanagan TSA Integrated Resource Management Timber Harvesting Guidelines and the Okanagan TSA Timber Supply Review.

3.4.7 Roads Classification

Riverside has previously committed to implement a computerized road information system and to link it to a geographic information system to track all road activities. This project is incomplete. Some backlog data entry is required and no map linkage is yet in place.

In order to address this information gap, all roads and trails have been classified based on MoF standard categories of main road, secondary road, and trail. In addition to this, roads are classified according to width to reflect area lost to the long-term production of trees. This information has been digitally captured as input to the analysis (see Map 8 Appendix VIII).



3.4.8 Interim Forest Practices Code Riparian Classification

In order to model riparian reserves as required by the Forest Practices Code, streams and wetlands must be classified using the FPC system. Formal classification based on field verification has been completed on approximately 10% of the streams in the Penticton Forest District and 60% of the Vernon District. Where this classification is not available, it is based on the local knowledge of the Riverside engineering staff. This represents best available information. Riverside will continue to build a complete inventory of streams, wetlands and lakes to FPC standards.

3.5 GROWTH AND YIELD

Growth and yield modeling is significantly improved over methods used in support of MP No. 2. Key changes are as follows:

- Actual stand site index information based on inventory age/height data;
- Use of current base age 50 years site index curves;
- Actual stand level crown closure data;
- Use of the best available site index information for regenerated stands to compensate for old growth site index bias;
- Use of managed stand yield curves; and
- Yield prediction based on TFL specific pooled inventory attributes.

Yield curves for stands of natural origin have been prepared using the MoF program Variable Density Yield Prediction (VDYP) version 6.4. These are referred to as natural stand yield tables. Managed stand yields have been prepared for stands regenerated and conforming to minimum stocking standards. These managed stand yield tables were created using the Table Interpolation Program for Stand Yields (WinTIPSY).

Permanent sample plots within the TFL have been incorporated into the MoF Growth and Yield Program. All measurements are now carried out by the MoF, as a part of that program.

Further details on growth and yield can be found in the Timber Supply Analysis (Appendix V).

There are always opportunities to improve growth and yield estimates. In preparation for the next Management Plan, and once Riverside's data needs are reviewed, a growth and yield program will be developed. Issues such as local volume adjustment factors, green-up ages and complex stand volumes will be addressed.

3.6 ENGINEERING DEVELOPMENT

Most of the main road network is in place on TFL 49. Secondary and spur road construction will facilitate development of new Cutting Permits identified in Forest Development Plans.



Roads will be constructed, maintained and deactivated to Ministry standards. Haul roads will be deactivated, as required, after harvesting and reforestation operations have been completed. Road deactivation plans will be submitted to appropriate District offices in conjunction with the Forest Development Plan. The Forest Practices Code and the Okanagan TSA IRM Guidelines, where appropriate, will be used as a guide in construction, maintenance and deactivation of roads.

3.7 HARVESTING

3.7.1 Harvesting Systems

As addressed individually in each SP, the appropriate harvesting system will be used. The options include the clearcut, selective (single tree and group removal), shelterwood, and seed tree systems. Generally, Lodgepole pine, Engelmann spruce, Subalpine fir, and Western red cedar should be managed as even-aged stands, and are therefore clearcut harvested. Existing even-aged stands of Western larch and Douglas-fir will also be harvested using the clearcut harvesting system. Harvesting uneven-aged stands of Douglas-fir, Yellow pine and Western larch will use the selective harvesting system, where appropriate stand characteristics exist.

In most cases the system will be chosen to accomplish ecologically based silviculture goals. When there is a higher resource management objective, alternative silviculture methods will be considered to address integrated resource management needs. All proposed harvesting systems must be able to meet basic ecologically sound forestry principles and basic forestry obligations, as identified in the SP.

3.7.2 Planning and Layout

TFL 49 is completely covered by a Total Chance Plan, which was completed in 1997. The total chance layout concept will normally dictate the harvest pattern. Total chance layout is defined as planning for the best overall realization of all objectives over the entire development area. In this planning phase, the design of the cut block size, the percentage of area harvested in the first pass, and the timing of the harvest passes, each considers the implications upon the water, fish, wildlife, range, recreation and other resource values. Proposed layout and rate of harvest are presented in detail in the Forest Development Plan.

3.7.3 Logging Methods

The logging method is based on the specific site constraints and the economics of the logging chance. The appropriate harvesting method is selected to ensure that the potentially detrimental soil disturbance is below the allowable level as indicated in Forest Practices Code guidelines, as outlined in Silviculture Prescriptions. Conventional logging, roadside logging, cable yarding, helicopter logging, and other systems are considered in all developments.

Harvesting plans for environmentally sensitive areas will be considered on a site-specific basis with the objective of maintaining the integrity of the soil to allow the growth of the new forest.

Riverside requires both summer and winter harvesting operations in order to provide balanced log delivery and employment. An appropriate balance of areas and season of logging will be developed to maintain the contractor force at optimum efficiency, while at the same time



minimizing waste and environmental impact. The logging season will be determined on site-specific basis. Several factors such as soil, moisture, slope and terrain will determine the time of year a block can be logged. The season of logging will be determined when developing the SP.

3.7.4 Steep Slopes, Harvest Profile and Haul Distances

The total chance layout system addresses steep slopes and harvest profile. In the total chance layout, harvesting occurs on a variety of sites and timber types. In effect, the harvest profile (good and poor quality timber) and the site characteristics (steep, flat, wet sites, etc.) are incorporated into each development plan.

Based on the TRIM digital terrain model, the net area of mature timber on slopes 50% or greater is 5,488 ha or 8.6%. For slopes over 60% the figures are 2,891 ha and 4.5%. During this Management Plan, at least 5 percent of the harvested volume from TFL 49 will be from steep slope areas (slopes 50% or greater), in order to approximate harvesting the slope profile. Steep slopes harvesting identified in the Twenty-year Plan indicates that Riverside will achieve or exceed required performance for the twenty year period.

We consider mature and over-mature timber as our first harvest priority. The economics of logging this over-mature timber will be considered on a site-specific basis. Second harvest priority is thrifty mature timber. We may need, in the near term, for reasons of low snow areas in the winter and early spring access, to develop these second priority stands for winter and spring logging sites.

Priorities for harvest scheduling are dynamic. If stands suffer heavy mortality due to insects, disease, fire damage, or blowdown, these stands will become first priority harvesting areas. Stands that are highly susceptible to losses from insects and disease will also increase in harvest priority. Considering these factors, we must also address the manufacturing requirements for a minimum of 40% of the annual harvest to be peeler size and peeler quality. These objectives continue to influence the balancing of harvest scheduling.

Traditionally, harvesting operations on TFL 49 have been balanced between near and far operations. This approach will continue during this plan.

3.7.5 Soil Disturbance

The Forest Practices Code Soil Conservation Guidebook will be used in planning and harvesting decisions. The calculation of maximum allowable site disturbance is included in each SP.

3.7.6 Utilization Standards

Specific utilization standards are indicated within each cutting permit. Generally, all trees and parts of trees three (3) metres and over in length, which are better than sawlog-reject grade, are used. Some material below these standards may also be removed and used. All harvesting areas will be monitored during and after harvesting to ensure that logging waste and residue is minimized. The inventory volumes were compiled using the same procedures applied to cutting



permit cruising and include standard MoF allowances for decay, waste and breakage, based on the 1976 metric diameter class factors developed by the Inventory Branch of the MoF.

All TFL operations in the Penticton and Vernon Forest Districts are currently (July 1998) under scale-based stumpage assessment. It is Riverside's intent to apply for cruise based stumpage assessment in suitable stands in the Vernon and Penticton Forest Districts during the term of this plan. All cruising and scaling on TFL 49 will conform to MoF Provincial and Regional standards. Cutting permit documents, cruise reports, and appraisal data sheets will be submitted to the District Manager as required.

Utilization levels that will be used in the development of the yield tables are documented in the table below. A utilization level of 12.5 for all species reflects current management on TFL 49. Also standard on TFL 49 is a 20-cm stump which can not be modeled using standard yield models.

Table 8-7 Utilization levels

Stand Types	Utilization		
	Minimum DBH (cm)	Stump Height (cm)	Top DIB (cm)
All species	12.5	30	10

3.8 SILVICULTURE

Riverside is committed to ensure that all areas harvested will be restocked with commercial species to a "free growing" state. This commitment to a basic forestry program will maintain an economically viable forest products operation through sound forest management practices.

The most important document for the silviculture program is the Silviculture Prescription (SP). Prior to any harvesting, a SP will be completed, and subsequently approved by the District Manager. In some cases, the salvage harvesting of small areas or small volumes less than 2,000 m³ may instead use an amendment to a general form generic SP. The SP makes the silviculture commitment on the block to be harvested in accordance with current regulations and the Forest Practices Code. During the period of this Management Plan, Riverside will achieve an STI of 2.0 years, according to the Fibre Flow Agreement. In addition, Riverside will strive towards having an additional 0.5 years of available timber harvest in approved Silviculture Prescriptions, for a total of 2.5 years of available SP.

3.8.1 Basic Silviculture

Basic silviculture activities, in accordance with the Forest Practices Code of BC Act and The Forest Act and Regulations, will be carried out in accordance with approved SPs, on all area harvested after October 1, 1987, unless exempted. Riverside is responsible for all activities to reach free growing status on these areas. Areas denuded before October 1, 1987 are known as "Industry Outstanding" areas and the licensee is responsible for direct funding through FRBC to meet free growing status. Silviculture treatments will be conducted on these areas to bring them to free growing standards.



3.8.2 *Stand Establishment*

Riverside's objective is to regenerate all denuded, productive forest land to target stocking levels, within the regeneration period specified in the specific SP. On occasion, an area may not be restocked within the regeneration delay period, due to a variety of reasons which may include adverse weather conditions, insect damage, cattle damage or mammal damage. Should the site not be restocked to the stated stocking objectives set forth in the SP, Riverside will propose and implement actions to meet the stated free growing commitment.

Where planting is the prescribed reforestation method, the planting will occur prior to the end of the regeneration delay period as indicated in the corresponding SP. Most of the seedlings used in the planting program are grown at our own nursery near Armstrong. Some seedlings may also be purchased from other nurseries.

Where natural reforestation regeneration is the planned reforestation method, the area will be stocked to the standards and within the regeneration delay period indicated in the corresponding SP. Areas found not sufficiently restocked after a stocking survey will be examined to determine the need for planting or to determine processes to rectify the area to become satisfactorily restocked within the prescribed delay period.

3.8.3 *Seed Collection and Tree Improvement*

With the exception of naturally regenerating areas, pine and spruce will be regenerated using genetically improved seed, where available.

The genetic tree improvement program is an important aspect of maintaining or increasing current harvest levels. Improved tree seed will result in both volume and quality gains when compared to ordinary wild land seed collections. Riverside has established both Engelmann spruce and Lodgepole pine seed orchards.

Genetic gain is reported in terms of volume gains in the table below. It is felt that the best modeling method to incorporate these gains is an increase in site index as input to volume curve production. There is some question as to the relationship between percent volume and percent site index genetic gain. Knowing that the relationship is likely not direct, and based on discussions with MoF Research staff we divided the volume values by 2 to get percent site index gain. This results in conservative estimates of genetic impact.

Genetic gains:

	Genetic Gain (Volume)	Genetic Gain (Site Index)
orchard spruce planted 1992 through 1997	4%	2%
orchard spruce planted after 1997	7%	3.5%
pine planted 1998	8%	4%
pine planted after 1998	11%	5.5%



Genetic worth (volume increments) of seedlots currently in storage is reported in the following table. It is Riverside policy to use the best seedlots on the TFL.

Genetic worth of seedlots in storage:

Seedlot Number	Species	Genetic Worth (% Volume Gain)
6842	Sx	4.64
6844	Sx	6.50
6845	Sx	4.28
6846	Sx	3.48
60094	Sx	3.87
60095	Sx	1.91
60131	Pli	8.92
60137	Pli	12.07
60142	Sx	4.99
60143	Sx	1.28
60144	Sx	6.42
60145	Sx	0.90
60146	Sx	14.4
60147	Sx	12.83

Riverside is completely self-sufficient with respect to its needs for Engelmann spruce improved seed. Lodgepole pine improved seed is currently (1998) used for 10% of the PI plantations on TFL 49. Our Timber Supply Analysis assumed 100% usage in Pine, however we expect this number to reach 100% before the end of this management period. Given our conservative approach to enumerating gains this is felt to be a small factor.

The two seed orchards and their planning zones are:

Orchard Number	Species	Planning Zone	Elevation (metres)
303	Interior spruce	Thompson Okanagan Arid and Dry	1450 - 1850
310	Lodgepole pine	Thompson Okanagan Arid	1450 - 1650

3.8.4 Site Preparation

Site preparation will be carried out as necessary to facilitate reforestation, to control pests and/or reduce fire hazard. Prescribed burning and mechanical or chemical site preparation techniques (individually or in combination) accomplish this. Factors that influence the choice of site preparation techniques include:

- Slope;
- Fire hazard and risk;
- Expected brush competition;
- Site sensitivity to equipment and/or fire;
- Number of available or required planting spots;
- Pest or disease problems;
- Conditions desirable for best survival and growth; and
- Anticipated costs of alternatives.

Mechanical site preparation techniques will adhere to the intent of the recommendations in the FPC Soil Conservation Guidebook.

Smoke management is an important factor. Site preparation and harvesting methods that minimize the amount of smoke in sensitive areas, while at the same time accomplishing basic silviculture and protection requirements, are favoured. Slash burning is generally used on sites when it is ecologically beneficial for the site, including sites that are too steep or wet to treat mechanically. Burning is only conducted under atmospheric conditions that favour good venting. Burning is followed by rapid mop-up to reduce hang-over fires and smoke. The public is informed by radio broadcast in advance of broadcast burning.

3.8.5 Silvicultural Surveys

Many different types of surveys are conducted on each harvested area to assist in decision making and to monitor results. The level of survey may vary from a walk-through to detailed sample plots, depending upon the information requirements. Copies of surveys are available for review at Riverside's offices in Kelowna and Armstrong as outlined in the Silviculture Regulations.

a) Survival Surveys

Riverside monitors plantation survival using one or a combination of the following methods: line plots, staked circular plots and walk-throughs. Usually each cut block is monitored during the summer following the first and second growing season. Weather, stock quality or other conditions may warrant further surveys.

Example: Planted in 1996, survival check 1997 and 1998.



b) Stocking Surveys

Where natural regeneration is planned, a post-harvest and/or post site preparation assessment is completed to ensure site conditions and seed sources are appropriate for regeneration. Walk-through surveys are planned to occur two years after harvesting. Prior to the expiration of the regeneration delay period a stocking survey will be completed.

Areas that are greater than one hectare in size, and classed as not sufficiently restocked (NSR - current), will be examined and alternatives implemented to meet free growing commitments. Areas classed as NSR that are less than one hectare in size will be reviewed individually to determine the level of stocking and if additional treatments are practical or warranted.

For those areas that are being planted, a stocking survey is done concurrent with the planting inspection procedure. The area is reported as stocked and the regeneration delay is met. During the fifth year after planting, a stocking survey is conducted to confirm stocking status. Weather, brush concerns, or other conditions may also warrant additional stocking surveys.

Example: Planted 1996, stocking survey 1996, stocking survey 2000.

c) Free Growing Surveys

Free growing surveys will be conducted to the standards and time frames indicated in the relevant SP. The time frame may be advanced where regeneration establishment is declared earlier than specified in the SP.

3.8.6 *Brushing and Weeding*

Brush control is carried out on a site-specific basis and is only undertaken on those sites where it is needed to prevent tree mortality or to ensure that the free growing status will be met. Brush control will be accomplished by mechanical means, grazing, or through the use of approved herbicides. All chemical work will be done under the direction of a Certified Pesticide Applicator, according to the terms of the Pesticide Control Act (1978) and specific Pesticide Use Permits.

All available options are considered prior to choosing the most appropriate brush treatment method. When the herbicide option is the desired option, the proposed treatment will be discussed with local resource users. Programs will be chosen and carried out with due regard to the environment and to the safety of the workers.

3.8.7 *Incremental Silviculture*

An Incremental Silviculture Plan can be found in Appendix II. Incremental silviculture activities are optional treatments that will shorten rotations, increase future wood yield and/or increase stand value beyond that achievable through basic silviculture. All activities will be in accordance with Silviculture Practices Regulation.

3.8.8 *Site Rehabilitation*

No rehabilitation of deciduous areas is planned during this management plan period. It is expected that, within the next three decades, the market values of aspen (*Populus tremuloides*) will improve to allow the economical harvest of this species. After harvesting, these areas may be



converted to coniferous or mixed coniferous/deciduous stands. Some aspen and aspen/coniferous patches may be rehabilitated in conjunction with the harvest of adjacent coniferous areas. Proposals will be referred to other agencies for their input.

Backlog areas that have restocked primarily to aspen leading species types will be assessed. Currently there are 3,854 ha (age class 0 and 1) in this category that were identified in, and excluded from, the TFL Yield Analysis.

Within the TFL there are 978 ha Stocking Class 4 Lodgepole pine stands which have been removed from the productive forest. This is a significant decrease from estimates in the previous plan.

3.8.9 Commercial Thinning

The opportunities for commercial thinning have been investigated. Thrifty Douglas-fir stands, spruce/balsam stands with a Lodgepole pine component, and overstocked Lodgepole pine stands are three types of stands where thinning will be considered. A crucial consideration for the viability of a commercial thinning program is the general acceptance of thinning as a means of salvaging natural mortality which will not negatively affect the quality or quantity of wood for the final harvest. The opportunities for commercial thinning may improve in the future; if the need to maintain stands beyond their normal rotation is identified.

3.8.10 Conifer Release

Activities undertaken during the basic silviculture program should prevent the suppression of potential crop trees by overstory weed species. Areas identified as requiring conifer release after free growing status is met may be treated either by mechanical or chemical techniques to insure that the desirable conifer trees are released from excessive competition.

3.8.11 Fertilization

Large-scale operational fertilization is currently not viewed as an economically viable treatment for TFL 49. Riverside will reassess the economics of fertilization as more test results are made available.

3.8.12 Juvenile Spacing

Juvenile spacing is a silviculture tool that provides for control of the final quality and yield from the forest. Through spacing, growth rates on remaining trees can be increased and merchantable volumes removed sooner. This can be very beneficial in bringing age class distributions into line, in order to avoid possible short-term AAC reductions. At this time, no age class distribution problems have been identified which will affect operations in the immediate future. Please refer to the proposed enhanced forest management project that can be found in Appendix II.



3.8.13 Pruning

Pruning is carried out on approximately 100 hectares per year, in order to increase the quality of the first log at time of harvesting.

3.8.14 Stand Conversion

In the Timber Supply Analysis, Douglas-fir stands in the IDF biogeoclimatic zone were modeled to show a conversion from Douglas-fir leading to 90% Lodgepole pine and 10% Douglas-fir. Concern has been raised that this modeled conversion would negatively impact deer winter range. In actual practice, this conversion does not take place and the resultant stands will maintain their structure over time. Where harvesting is carried out through the patch cut silviculture system, planting will normally be mixed species. Where root rot is a major concern, the conversion will be 50% Lodgepole pine and 50% larch. Where root rot is a minor concern, the conversion will be 50% pine and 50% Douglas-fir. It is also anticipated that these stands will have longer than normal rotations, and the Lodgepole pine component will be selectively harvested prior to the final harvest of predominantly Douglas-fir or larch. Seeding from the mature edges of the surrounding stands of Douglas-fir is also anticipated to increase the fir component in the stands regenerated after patch cuts.

3.9 PROTECTION

3.9.1 Fire Control

Riverside places major emphasis on the protection of operational areas from fire. Riverside will adhere to the Ministry of Forests' policy to take rapid initial attack on all wildfires with the goal of having the fire under control by 10:00 a.m. of the day following discovery.

A Preparedness Plan covering operational areas within TFL 49 will be submitted annually to the Kamloops Fire Centre. This plan includes statements regarding Riverside's commitment to initial attack and control of wildfire.

Since the inception of TFL 49, there have been only twelve fires over one hectare in size (December 1997). The detailed listing of the specific fires is provided in Section 11. Because of salvage programs, timber losses from these fires have not been significant.

Riverside is committed to a program of fire management. Each year, all recently logged blocks are assessed to determine which treatments are needed for reforestation and hazard abatement. Where areas require treatment for hazard abatement only, consideration is given to not treat the area and instead accept some level of hazard and risk. Where the risk is too great, appropriate site preparation methods are implemented to reduce the hazard.

3.9.2 Pest Control

Riverside will continue its monitoring program to identify susceptible or infected stands. Annual pest surveys will be conducted to determine the incidence of pests within the TFL. These incidences will be reported and addressed in Forest Development Plans. Harvesting priority is given to active pest epidemics to minimize losses in damaged stands. Access will be developed



into priority stands to expedite timber removal and to assist in the control of the spread of the specific pest. Appropriate treatments will be detailed in Forest Development Plans.

3.9.3 Insects

Every effort will be made to harvest beetle infestations on a priority basis to keep outbreaks at manageable levels. In the case of Spruce bark beetle (*Dendroctonus rufipennis*), trap trees and/or pheromones will be used, where feasible, to concentrate and reduce beetle populations. The Bark Beetle Guidelines will be utilized for Mountain pine beetle (*Dendroctonus ponderosae*) management. Pheromone lures and single tree disposal (using MSMA and single tree harvesting) will also be used in the management of the Mountain pine beetle.

To some degree, Western balsam bark beetle (*Drycoetes confusus*) continues to be a concern. Hazard rating of stands and management using pheromones will continue to reduce losses caused by this insect. Proposals to minimize losses from bark beetle will be submitted in Forest Development Plans.

Spruce budworm (*Choristoneura* sp.) has periodically been a problem. Growth and yield plots were established in 1987 to measure the long-term impact of this pest. Aerial spraying of *Bacillus thuringiensis* (Bt) has been used to control this insect during 1990, 1992 and 1993. Direct control using Bt will be considered only in thrifty, uneven-aged stands located on better sites or where stand tending investments have been made.

Management of sites prone to Spruce budworm will favour the establishment of mixed species and single layer canopies in order to minimize the impact of this pest. The drier Interior Douglas-fir ecosystems, in particular the IDFxh, are most susceptible to the budworm. Even-aged management will be practiced where appropriate. Areas where some canopy is required for site protection will be harvested using shelterwood, seed tree or group selection to promote even-aged stands and minimize the creation of multi-layered uneven-aged stands. Where planting is required in these zones, Ponderosa pine or Lodgepole pine will be favoured. On sites that are uneven-aged, management will consist of favouring multiple species in an open grown state to promote full crowns and vigorous growth. Better growing sites in the IDF ecosystems will be ranked high in juvenile spacing programs. Spacing will not be carried out in these stands during periods of budworm outbreaks.

Populations of the Douglas-fir tussock moth (*Orgyia pseudotsugata*) are also a concern. If these insects become a management problem during the term of this plan, actions will be undertaken to manage the populations. The budworm management program will aid in reducing damage by this pest.

3.9.4 Disease

The most significant diseases within TFL 49 are the root rots (*Phellinus weirii*, *Armillaria ostoyae*, and *Leptographium wageneri* (particularly in the Siwash Creek drainage)). Where these diseases



are found within the TFL, the intent of the applicable guidebooks for the detection, management, and free growing criteria and assessment will be followed.

Mistletoe infestations from both *Arceuthobium douglasii* and *Arceuthobium americanum* must also be considered in some areas. These diseases will be identified during surveys or during pre-harvest assessments. All phases, from stand development through to reforestation, will take into account the presence of these and any other disease. The normal treatment will consist of harvesting with the clearcut system and sanitation removal of any remaining mistletoe infected stems.

3.10 ACCESS MANAGEMENT

Riverside recognizes the public's need for, and right to, access to publicly owned forests. Therefore, a policy of unrestricted access is in place. Where appropriate, road maintenance agreements will be entered into with other resource users.

Road signs and kilometer markers will be installed and maintained in harvesting areas. During active harvesting, warning signs will be posted along with the operational radio frequency being used.

Road rights-of-way (R/W) will be seeded and R/W landings will be ripped and seeded. Annual road deactivation plans will be submitted to the Ministry of Forests showing the roads scheduled for deactivation, and proposed deactivation procedures as proposed in the FPC Soil Conservation Guidebook. Some form of restricted access or deactivation may be necessary in the interest of safety, for environmental reasons or for wildlife management purposes. Roads in the Blackwell Lake area have been deactivated as part of a plan to maintain walk-in only status to that lake system. Road closures may also be necessary during periods of high or extreme fire hazard. Restrictions will be applied after consultation with the District Managers.

3.11 RESEARCH

To attain its major goals, Riverside is committed to pursue beneficial research projects, either on its own or in co-operation with the Ministry of Forests, other government agencies, other licencees, or other organizations. Although specific research projects have not been identified for TFL 49, Riverside does participate in many forms of research within the forest industry.

Examples of these projects, which directly benefit operations on the TFL, include the following items.

- Riverside is an active member of the Forest Engineering Research Institute of Canada (FERIC) and Riverside has directors on FERIC's harvesting and silviculture committees.
- Riverside is conducting experiments to determine the feasibility of chipping debris and non-merchantable material in the bush.
- As a member of Forintek Canada Corp., Riverside also participates on applied research projects to enhance manufacturing processes. Riverside also supports employee involvement on Forintek's standing committees.



- Riverside is a member of the Interior Tree Improvement Council that has cooperated in the past on progeny test sites required as a part of the tree breeding program. In conjunction with the MoF Research Branch, Riverside is involved with establishing progeny sites for second generation seed orchards.
- Trials are continuing to select the best high elevation stock types for cold soil conditions.
- In conjunction with MoF Research (Kamloops), Riverside is involved with a high elevation alternative harvesting system project. This project will impact harvesting systems in spruce/balsam forest types throughout the Southern Interior of British Columbia.
- Riverside is a member of the Southern Interior Growth and Yield Cooperative (SIGY), as well as the Interior Research Extension Cooperative.
- Riverside is an active participant in a project called: “Incremental Silviculture of Lodgepole Pine: Integrating Stand Density, Optimum Nutrition, Wildlife Habitat, and Range Resources”.



4.0 OTHER RESOURCES

Water, fish, wildlife, range, and recreation are important resources within TFL 49, and Riverside recognizes the impact of road building, harvesting, and silviculture activities on these resources. Riverside's integrated management goal is to maintain these resources. Integrated management begins at the earliest planning stage. The Forest Practices Code and the Okanagan TSA Integrated Resource Management Timber Harvesting Guidelines, where appropriate, are used as a guide in planning for these resources. As described in the Review Strategy, referrals and/or advertisements of Management Plans, Forest Development Plans, and Silvicultural Prescriptions will provide opportunity for all agencies and concerned parties to ensure that specific concerns will be addressed in the integrated management proposals.

4.1 RANGE

Riverside believes that forest management goals can be achieved in harmony with goals of range management, provided there is good coordination and communication. A good working relationship will be maintained with range tenure holders. The impacts of grazing and/or domestic grass seeding on the establishment of conifers will continue to be monitored. Where possible, opportunities to achieve mutual benefits from integrated use management will be developed. Where functional range improvements (fences, cattle guards, corrals, loading ramps, trails and water holes) are damaged as a result of harvesting, these will be repaired or replaced. Grass seeding, if necessary, will be applied for erosion control, rehabilitation and aesthetic purposes on newly developed roads, landings and skid trails in co-operation with the MoF's District Offices. The impact of cattle on attainment of silviculture responsibilities will be monitored. Construction of cattle enclosures may be deemed necessary.

Riverside will continue to meet with grazers to discuss and invite comments and proposals for:

- Range and Plantation Protection Plans (RAPP).
- Forest Development Plans and Silviculture Prescriptions.
- Grass seeding and range improvement plans;
- Scheduling of blocks, where possible, in order to provide an even flow of forage; and
- The control of noxious weeds through cattle management, rapid right-of-way seeding, and cleaning of equipment.

Grazing maps and reports, to be provided by the MoF, were not available for inclusion in this plan. We do not expect any increase in available AUMs during this plan.



4.2 FISH AND WILDLIFE

Close liaison will be maintained with the MoELP and the Federal Department of Fisheries and Oceans (DFO). Areas having high fisheries or wildlife value will be identified and considered in all phases of planning. Important fish streams are identified on the Interim Riparian Classification (Appendix VIII - Map 10 of this plan).

Where control of access is identified as being critical to game management, Riverside will cooperate to implement acceptable proposals for controlling this access. Where trapping and/or guiding activities are identified as being active in an area scheduled for development and/or harvesting, Riverside will notify the affected parties in order that resource use conflicts may be resolved prior to commencement of operations.

Wildlife migration patterns, breeding areas, thermal and protective cover requirements as well as feeding requirements will be considered in all resource plans. Of particular concern is deer and moose winter range. Special consideration will be given to harvesting within these areas on a timely, planned basis, to ensure that integrated management will yield the greatest benefits to both wildlife and timber resources.

A portion of old growth stands or specific trees will be reserved intact on specified areas. The retention of trees for cavity nesting birds and the set aside of over 900 ha of productive forest land for the Shorts Creek Sheep Reserve are examples of this strategy.

Fisheries and water values will also be identified and integrated in development proposals. FPC riparian reserves and management zones will be given careful consideration in all phases of timber management. The integrated management goal will be to maintain required quantity and quality of water within each watershed.

4.3 BIODIVERSITY

Landscape and stand level biodiversity are addressed in the management on TFL 49 as directed by the Forest Practices Code and implemented as per current MoF policy. The Timber Supply Analysis implements riparian management, stand level biodiversity in the form of wildlife tree patches, and landscape biodiversity through forest cover constraints to maintain old seral stage requirements in draft landscape units provided by the MoF.

4.3.1 *Habitat Age Diversity*

A major part of TFL 49 consists of even-aged stands of mature timber. Harvesting increases the distribution and diversity of age classes of timber and their associated habitats. A patchwork of diverse, interrelated forest ecosystems will be maintained through time. Each ecosystem or habitat is a unique combination of forest resources, with distinct opportunities for a variety of future management options.



4.3.2 Species Diversity

Efforts will be made to maintain the current diversity of species that exist on TFL 49. Most stands within TFL 49 contain more than one tree species. Riverside's practices have concentrated on planting the most ecologically appropriate species. The planting program includes both single species planting and mix species planting.

Recent studies by the MoF have indicated that an increase in species diversity occurs within the first 15 years of the stand establishment. Planting a single species does not create a monoculture since natural regeneration will augment the planted trees. The critical time to maintain species diversity is when an area is proposed for spacing. More than one species of crop trees should be left standing to meet species diversity goals.

4.3.3 Genetic Diversity

The seedlings planted on the TFL are generally grown from locally collected seeds or from our seed orchard. Seed produced in our seed orchard is registered with the MoF to ensure that genetic diversity is maintained or enhanced. Each of our many seedlots is made up of seeds from over 40 families or nearly 100 trees. This is sufficient to capture a large proportion (over 95% of the genetic diversity) of the existing stands. These seedlings, when augmented with natural regeneration, capture virtually all of the genetic diversity on the site. Using a number of different seed sources in our operations maintains genetic diversity and provides opportunities for new genetic crosses to occur. These additional genetic crosses will also increase genetic diversity.

4.4 RECREATION

TFL 49 is located in the Shuswap-Thompson and Okanagan drainages. Portions of the TFL (for example, the West side of Okanagan Lake) have aesthetic values important to local communities and tourism, however, the major recreation experiences on the TFL are on the plateau areas. These recreation activities are experienced largely by local users and to a lesser degree by tourists.

a) Activities

The recreation activities enjoyed on TFL 49 include: fishing, hunting, firewood cutting, trail riding (motorcycle and horseback), viewing, camping, hiking & bicycling, ice fishing, nature studies, rock hounding, hang gliding, snowmobiling, sled-dog racing, cross country skiing, swimming, and picnicking. These uses are detailed in the Recreation Inventory (Please see the Inventory and Analysis in Appendix VII and Map #3 in Appendix VIII). This inventory will be updated and improved as additional information is gathered.

b) Landscape

Recreation Opportunity Spectrums (ROS) and Visual Quality Objectives (VQO) have been identified according to recognized Ministry standards to ensure visual quality objectives are met. Riverside recognizes these values and will consider them in all forest management activities. Riverside will work in cooperation with the MoF to develop plans that provide for maintenance and enhancement of these recreational opportunities. Specific recreational projects will be planned and included in the Forest Development Plan. The Landscape Inventory in place for this



MP and analysis is represented on Map #4a in Appendix VIII. Map 4b is an updated Landscape Inventory, for use in future planning.

4.5 WATER

Riverside recognizes the importance of the water resource in the Shuswap-Thompson and Okanagan Regions. Close liaison will be maintained with irrigation districts and water users to identify and address concerns regarding quality and quantity of water produced from the watersheds within the TFL. Water resource information is presented in Appendix VIII – Map 9.

There are five registered Community Watersheds (Lambly Creek and Powers Creeks in the Penticton Forest District, as well as Hope Creek, Norris Creek and a small portion of Silver Creek in the Vernon Forest District) within TFL 49. In addition to these Community Watersheds there are several water licences, for domestic and irrigation purposes, on creek drainages originating within TFL 49. Riverside recognizes the importance of these water resources, and will consider them in road construction, harvesting, site preparation, and reforestation plans. Where required, watershed analyses will be undertaken on specific watersheds.



5.0 FOREST DEVELOPMENT PLANS

The Forest Development Plan will be consistent with the planning framework identified in this Management Plan. The concepts and guidelines covering all of the resource values existing on the TFL 49 land base have been provided for in the previous Sections of this Management Plan. They will be implemented on a site-specific basis in the Forest Development Plan.

These Forest Development Plans will be:

- Submitted annually or bi-annually as agreed with the MoF Districts by April 1;
- Referred to the MoF, MoELP, DFO, and each Water District managing a community watershed covered by the plan;
- Advertised at least twice within a period of two consecutive weeks in newspapers with circulation in the vicinity of the proposed operations;
- Made available for the public input for at least 5 days at places and times convenient to the public; and
- Made available at a series of scheduled open houses in adjacent communities.

In their final form, these plans will include of a summary of input from all appropriate resource agencies and the public, and the actions to be taken in response to that input.

In addition, specific written invitations will be sent to all licenced resource users and local native bands and tribal councils that may be affected by the Plan. This procedure will assist Riverside in obtaining additional information to be considered in the planning process. Those notified will include ranchers, guides, trappers, resort operators, and water licensees (specifically those identified by the MoELP).

Riverside is committed to continue meeting and establishing regular communications links with First Nations communities in an effort to secure their input into management planning. In the development planning process, Riverside has established regular communications meetings with the Okanagan, the Neskonlith, the Spallumcheen, and the Upper Nicola Bands.

There are several examples of cooperative work between local Bands and Riverside with respect to planning. Most of the local Bands have been active in planning the watershed restoration projects in the TFL. The Okanagan Band initiated a fish habitat project on Whitemans and Naswhito Creeks and Riverside will continue to co-operate with this. Regular meetings and other communications take place with local bands, details of which can be found in the Development Plans.

Riverside will follow Ministry of Forests Aboriginal Rights policy and work with the districts to identify and resolve issues.



6.0 CONTRACTING

Riverside will comply with the Timber Harvesting Contract and Subcontract Regulation (B.C. Reg. 22/96).



7.0 REVISIONS

The Management Plan will be amended in accordance with MoF requirements. These amendments will form an integral part of the Plan and will be attached.

8.0 HISTORY OF THE LICENCE

Tree Farm Licence 49 was designated as a result of the previous Licensee's application of June 4, 1984 to amalgamate Tree Farm Licences 9, 16, and 32. The amalgamated Licence, referred to as the Okanagan Tree Farm Licence, has a 25-year term, beginning July 1, 1995.

The licence to manage the former Okanagan (West) Forest Management Licence (No. 9) was granted to S. M. Simpson Ltd. under a contract with the Province of British Columbia on August 16, 1951. The Licence was subsequently designated the Okanagan (West) Tree Farm Licence (No 9) following amendments to the Forest Act. On December 1, 1970, S. M. Simpson Ltd. was acquired by Crown Zellerbach Canada Ltd.

Tree Farm Licence No. 16 (the Monte Lake Tree Farm Licence) was first granted to Pondosa Pine Lumber Company Ltd. on April 22, 1954. On December 1, 1970, Pondosa Pine Lumber Company Ltd. was acquired by Crown Zellerbach Canada Ltd.

Tree Farm Licence No. 32 (the Bolean Tree Farm Licence) was granted to Vernon Box and Pine Lumber Company Ltd. on June 29, 1959. Vernon Box and Pine Lumber Company Ltd. was purchased by Armstrong Sawmills Ltd. in 1964, but no formal merger took place. In 1969, Crown Zellerbach Canada Ltd. purchased Armstrong Sawmills Ltd. and in December 1970 Tree Farm Licence No. 32 was registered in Crown Zellerbach Canada's name.

On March 30, 1983, Crown Zellerbach Corporation sold its interest in Crown Zellerbach Canada Ltd. to Fletcher Challenge Limited of New Zealand. As a result of the ownership change, Crown Zellerbach Canada Ltd. was renamed "Crown Forest Industries Limited" (CFIL), effective October 1, 1983.

Fletcher Challenge Limited subsequently acquired a majority interest in British Columbia Forest Products Limited, and on September 2, 1988, its shareholders approved a name change from British Columbia Forest Products to "Fletcher Challenge Canada Limited" (FCCL).

Coincident with the change of name was the implementation of a management agreement between FCCL and CFIL, whereby FCCL agreed to manage the assets and business of CFIL. The collective corporate entity was known as FCCL, and included the operation and management of TFL 49.

On November 14, 1992, certain assets of Fletcher Challenge Canada Limited, including the rights associated with Tree Farm Licence 49, were acquired by Riverside Forest Products Ltd. Riverside Forest Products Ltd. subsequently was organized as a public company, and the corporate name of the current licensee is "Riverside Forest Products Limited" (Riverside).



9.0 WITHDRAWALS AND ALIENATIONS

Amendments to the former contract documents to December 31, 1992 are summarized as follows.

TFL 49 BLOCK A (FORMER TFL 9)

Amendment Number	Date	SUP No.	Area Hectares	Location - Description
TFL9-1	Mar. 2/56	2431	0.6	Paynter & Dobbin Lakes - Cabin Sites
TFL9-2	Nov. 7/56	939		Cancelled by Amendment #23
TFL9-3	Aug. 1/57	6531 3101	2.0 16.7	Blue Grouse TV transmitter site power line R/W
TFL9-4	Dec. 12/57	Unstated	27.9	Terrace Mt. L/O & Access Road
TFL9-5	Oct. 14/58	MN.219322	7.3	Bouleau Lake - Cabin Site
TFL9-6	Feb. 24/59	2368	0.7	Esperon Lake Cabin Site
			0.3	Terrace Mt. (South of L.O.) Cabin Site, Cancelled June 28/79
			0.5	Loch Drinkie Cabin Site Cancelled June 28/79
			0.1	Shorts Creek Cabin Site - Cancelled June 28/79
TFL9-7	Nov. 30/59	3699		Cancelled by Amendment #15
TFL9-8	Dec. 23/59	Schedule A	15.1	Bear Cr. - Lot 3749 Title 175791E
TFL9-9	Jan. 27/61	Unstated	23.9	Wilson Landing - (portion of L.2549) Girl Guide Camp
TFL9-10	May 2/61	4163	1.7	Jackpine Lake – dam site
TFL9-11	Sep. 13/61	4155	0.3	Jackpine Lake - fishing camp
TFL9-12	Nov. 29/61	1970	0.2	Esperon Lake - campsite (CF)
TFL9-13	Nov. 26/62	4724	0.7	Blue Grouse Mt. (L.3748) Hydro R/W L. Replaced by Amendment 29
TFL9-14	Feb. 25/63	4824	2.4	Morden Cr. (L.2183) - R/W SUP expired
TFL9-15	May 9/63	Unstated		Cancelling Amendment #7 (Clause 9)
TFL9-16	May 30/63	Unstated	32.8	Whiterocks Mt. (L.3089) Blocks A & B returned to Schedule B
TFL9-17	Aug. 19/63	4969	7.3	Whiteman Cr. - Recreation SUP expired. Area Returned to the TFL
TFL9-18	Oct. 2/63	2431	0.5	Bear Lake - Cabin Site
TFL9-19	Oct. 2/63	5047	1.3	Bear Cr. - (L.2175) - R/W SUP expired - area



Amendment Number	Date	SUP No.	Area Hectares	Location - Description
				returned to the TFL
TFL9-20	Feb. 8/65	Schedule A	48.6	Whiteman – Bouleau Cr. Jct. (L.3789 converted to Schedule A)
TFL9-21	Mar. 25/65	5047	Unstated	Addendum to Amendment 19 SUP cancelled, area returned to the TFL
TFL9-22	Mar. 25/65	5499	0.2	Shorts Cr. - Cabin sites (2) SUP expired area returned to the TFL
TFL9-23	Sep. 6/65	939		Cancelling Amendment #2
TFL9-24	Jan. 7/66	4949	2.3	Esperon L. – Campsite SUP expired area returned to the TFL
TFL9-25	Mar. 7/68	Unstated	15.0	Lambly L. - flood area
TFL9-26	Dec. 9/68	6267	1.6	R/W - Bear L.
TFL9-27	June 23/70	6615	1.0	Morden Cr. - Dept. Highways radio site (L2183)
TFL9-28	Mar. 23/71	n/a	n/a	Amendment of Clause 29 of TFL contract
TFL9-29	Mar. 12/71	3101	16.7	Hydro R/W (replaces Amendments 3 and 13)
TFL9-30	June 8/71	n/a	4.0	Stream gauging site - Whiteman Creek
TFL9-31	Mar. 6/72	7223	20.8	R/W - Powers Creek
TFL9-32	Dec. 16/74	3101	1.4	Hydro Line R/W
TFL9-33	May 30/77	8801	4.0	Sanitary Landfill Site Deleted from TFL
TFL9-34	May 30/77	n/a	5.2	Dept. of Highways Gravel pit. Deleted from TFL
TFL9-35				
TFL9-36	Aug. 5/81		3.1	D.L. 3789 Whiteman Creek Road R/W
TFL9-37	July 23/84	9676	2.1	N. of Whiteman Creek. Road R/W to L 3788
TFL 49	Sept. 16/92	Instr. 4	0.2	DL. 3746 Water Reservoir, Pine Point Developments
TFL 49	Sept. 16/92	Instr. 5	1.8	DL. 3746 Water Reservoir, Pine Point Developments

TFL 49 BLOCK B (FORMER TFL 16)

Amendment Number	Date	SUP No.	Area Hectares	Location - Description
TFL16-1	Feb. 28/56	n/a	n/a	Adjustment of metes and bounds
TFL16-2	Nov. 5/56	(939)	1.3	Woods Lake – Fishing Camp SUP has since lapsed
TFL16-3	May 7/66	3319	0.2	Near Stephen's Lake
TFL16-4	Sep. 20/61	n/a	n/a	Incorporated Pondsosa Pine Timber Sales from Schedules A to Schedule B lands
TFL16-5	July 18/61	n/a	53.5	Incorporated (Lot 475) Lot 3 Plan 8176 to Schedule A of the TFL
TFL16-6	Jan. 24/64	n/a	2.3	Deleted area from TFL in vicinity Lot 511 on Douglas Lake Public Road
TFL16-7	Jan. 7/66	5651	2.2	Cancelled by Amendment #8
TFL16-8	Apr. 2/69	5651	2.9	Replaces area covered by #7, located in Sec. 23, TP 17, R14, W6M. SUP deleted July 27/84
TFL16-9	Mar. 19/71	n/a	n/a	Amends Clause #30 for TFL Licence document
TFL16-10	Dec. 19/78	n/a	8.2	Removal of area for Dept. of Highways gravel pit
TFL 49-1	Nov.25/85	n/a	78.0	B.C. Hydro R/W

TFL 49 BLOCK C (FORMER TFL 32)

Amendment Number	Date	SUP No.	Area Hectares	Location - Description
TFL32-1	May 2/61	n/a	n/a	Incorporated Timber Sale X80368 into the TFL
TFL32-2	July 29/74	n/a	232	Blair & Spa Lakes temporary map reserves. Returned to Schedule B
TFL32- 3	Oct. 20/70	464	1.2	Addition to existing SUP 464 (south end of Bolean Lake) Replaced by Amendment 5
TFL32-4	Mar. 19/71	n/a	n/a	Amends clause #31 of TFL Licence Document
TFL32-5	June 28/77	464	1.9 1.3 0.5	Bolean L. - Fishing Camp Blair/Arthur L. sub area 1 Spa L. sub area 2 Replaces Amendment 3
TFL32-6	Feb. 6/80	9194	1.0	Removal of garbage dump from the TFL (north of Bolean L.)
TFL 49-2	Jan. 23/86	n/a	1.82	F.S. Road #4123.06 R/W

10.0 ALLOWABLE ANNUAL CUTS

The following tables indicate the historical change in the Allowable Annual Cut (AAC) for each of the three former TFLs and TFL 49. Note that increases in AAC are mainly attributable to changes in utilization levels.

Block A (TFL 9)

Management Plan	Period	AAC (m ³ /year)
No. 1	1951 - 1953	50,971
No. 2	1954 - 1962	47,573
No. 3	1963 - 1971	101,941
No. 4	1972 - 1979	210,395
No. 5	1980 - 1985	207,500

Block B (TFL 16)

Management Plan	Period	AAC (m ³ /year)
No. 1	1954 - 1957	28,317
No. 2	1958 - 1962	28,317
No. 3	1963 - 1969	42,476
No. 4	1969 - 1973	65,129
No. 5	1974 - 1980	127,993
No. 6	1980 - 1985	135,000

Block C (TFL 32)

Management Plan	Period	AAC (m ³ /year)
No. 1	1959 - 1964	15,574
No. 2	1965 - 1967	17,273
	1968 - 1969	22,937
No. 3	1970 - 1974	24,636
No. 4	1975 - 1980	33,980
No. 5	1981 - 1985	30,000

TFL 49

Management Plan	Period	Licensee AAC (m³/year)	SBFEP AAC (m³/year)	Total AAC (m³/year)
No. 1	1985	372,500	0	372,500
	1986 -1987	380,000	0	380,000
	1988	370,537	9,463	380,000
	1989 -1991	361,074	18,926	380,000
	1992	359,576	20,424	380,000
No. 2	1993-1998	343,095	36,905	380,000
No. 3 (Proposed)	1999-2003	343,095	36,905	380,000

11.0 HISTORY OF FIRES ON TFL 49

Since the inception of TFL 49 (originally TFLs 9, 16, and 32) there have been only 12 fires over one hectare in size, to December 1997.

- 1952 Grouse Fire on TFL 9 (324 ha)
- 1960 Goat and Stew Fires on TFL 9 (4 ha)
- 1967 Arnold Fire on TFL 32 (162 ha)
- 1970 Mer Fire on TFL 9 (26 ha)
- 1974 Bolt Fire (escape) on TFL 32 (375 ha)
- 1979 Wash Fire on TFL 9 (13 ha)
- 1985 Monte Fire on TFL 49 (9.9 ha)
- 1987 Mor Fire (escape) on TFL 49 (5.8 ha)
- 1988 Brown Fire (escape) on TFL 49 (14.2 ha)
- 1989 834/3 (escape) Fire on TFL 49 (10.7 ha)
- 1994 Rett Fire (human caused) (1.3 ha)
- 1995 Dump Fire (human caused) (3.5 ha)

Appendix I
PRINCIPLES OF SUSTAINABLE DEVELOPMENT



Appendix II
INCREMENTAL SILVICULTURE PLAN



Appendix III
PUBLIC AND AGENCY REVIEW STRATEGY FOR MP NO. 4

(Review Strategy for MP No. 3 can be found as an Appendix to the SMOOP)



Appendix IV
STATEMENT OF MANAGEMENT OBJECTIVES, OPTIONS
AND PROCEDURES (SMOOP)



Appendix V
TIMBER SUPPLY ANALYSIS



Appendix VI
TWENTY YEAR PLAN
UNDER SEPARATE COVER



Appendix VII
RECREATION INVENTORY AND ANALYSIS



Appendix VIII
MAP PORTFOLIO



1. FOREST COVER

2. ENVIRONMENTALLY SENSITIVE AREAS

3. RECREATION INVENTORY



4. LANDSCAPE INVENTORY

- 4a. For the purposes of Timber Supply Analysis
- 4b. Updated for future strategic and operational planning



5. BIOGEOCLIMATIC ECOLOGICAL CLASSIFICATION

6. SITE ASSOCIATION MAPPING – BLOCK B



7. WILDLIFE CAPABILITY INVENTORY



8. ROADS CLASSIFICATION

9. COMMUNITY WATERSHEDS



10. INTERIM RIPARIAN CLASSIFICATION