SLOCAN FOREST PRODUCTS LTD.

TREE FARM LICENCE 3

TWENTY YEAR HARVEST PLAN

FINAL REPORT

May 1998

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1.0 INTRODUCTION

Slocan Forest Products Ltd. - Slocan Division (SFP) is preparing Management Plan #9 for Tree Farm Licence #3 (TFL #3) - Little Slocan Lakes for presentation to the Chief Forester for approval in June 1998. As part of the process, SFP must prepare a twenty year harvest schedule to confirm that the harvest level identified in the timber supply analysis is achievable for TFL #3, considering current operational rules and guidelines governing forest management.

The 20 Year Harvest Plan is meant to be a tactical plan that links the strategic timber supply analysis to the operational forest development plan. The purpose of the plan is to validate the spatial feasibility of attaining the harvest level specified in the first twenty years of the timber supply analysis. Twenty year paper plans meet the above objectives, but are not able to model forest management scenarios, and therefore, have limited use beyond their role as an information source in AAC determination.

One of the challenges facing SFP during the term of Management Plan #9 is to find the best solution for implementing the Kootenay Boundary Land Use Plan (KBLUP), while simultaneously managing the TFL in an optimal operational manner. SFP's goal is to produce a twenty year plan that shows the implications of management options related to issues created by the KBLUP. In addition to the traditional paper plans and harvest schedules, SFP proposed in the Terms of Reference to use the forest estate model, ATLAS (A Tactical Land Analysis System), to show the effects of various forest management strategies over a longer planning horizon.

Since the Terms of Reference were prepared and accepted, SFP discovered a newer forest estate model, FSOS (Forest Simulation Optimizing System), which has many advantages over ATLAS in undertaking an analysis such as this. A descriptive comparison of the models, as well as comparative analysis results, are presented in sections 2 and 4.

2.0 BACKGROUND

Twenty year paper plans use a set of rules to define the location and harvest schedule of cutblocks. In adhering to these rules, landscape units become highly fragmented. The Forest Practices Code recognizes that the landscape must more closely mimic natural disturbance patterns to ensure the maintenance of biodiversity. The Forest Practices Code, through the *Biodiversity Handbook*, has altered the philosophy of managing landscapes - from accepting an end forest structure design created by following a set of prescribed rules - to a philosophy of predesigning the target forest/landscape and undertaking tactics that work to the end target.

The primary elements that are considered when developing a 20 Year Plan with biodiversity objectives are:

- seral stage distribution
- temporal and spatial distribution of the cut and leave areas "patch size distribution"
- old seral retention and representativeness
- stand structure
- species composition
- visuals

(FPC, *Biodiversity Guidebook*)

The concept of emphasizing patch size over adjacency rules is referred to in Section 3.2 (*Management for General Biodiversity*) of the KBLUP Implementation Strategy, Section 3.1 *(Guidelines for Timber Management in Timber Enhanced Resource Development Zones*), and in both the 1997 and 1998 *Memoranda of Understanding (MOU)* between the Nelson Forest Region and the Kootenay Region of the Ministry of Environment, Lands, and Parks. The KBLUP Implementation Strategy (KBLUP-IS) has assigned the biodiversity emphasis levels and patch size distributions that are used in this plan.

2.1 General

TFL #3 is located in the West Kootenays, about 50 km north of the town of Castlegar. (See Figure 1). Total size of the TFL is 79,796 ha, of which 39,630 ha are considered operable. SFP has recently a silviculture review of the TFL and revised the operability lines downward because of poorer than expected high-elevation regeneration performance.

The KBLUP has resulted in much of TFL #3 being situated within a Enhanced Resource Development Zone, in addition to being classified as a low emphasis biodiversity unit. TFL #3 was not formally identified in the 1998 Memorandum of Understanding as a tenure where low biodiversity emphasis units may be harvested down to 1/3 of the old growth target. However, this approach has been taken for some of the scenarios analyzed in this project.

Areas outside the TFL have been allowed to contribute landbase to assist in meeting biodiversity targets. Over time, these areas will likely satisfy most or all of the mature and old growth requirements for the adjacent landscape units. Specifically, the Hoder unit includes part of Valhalla Park and the Perry unit includes the sensitive east side of Perry Ridge.

ARROW FOREST DISTRICT

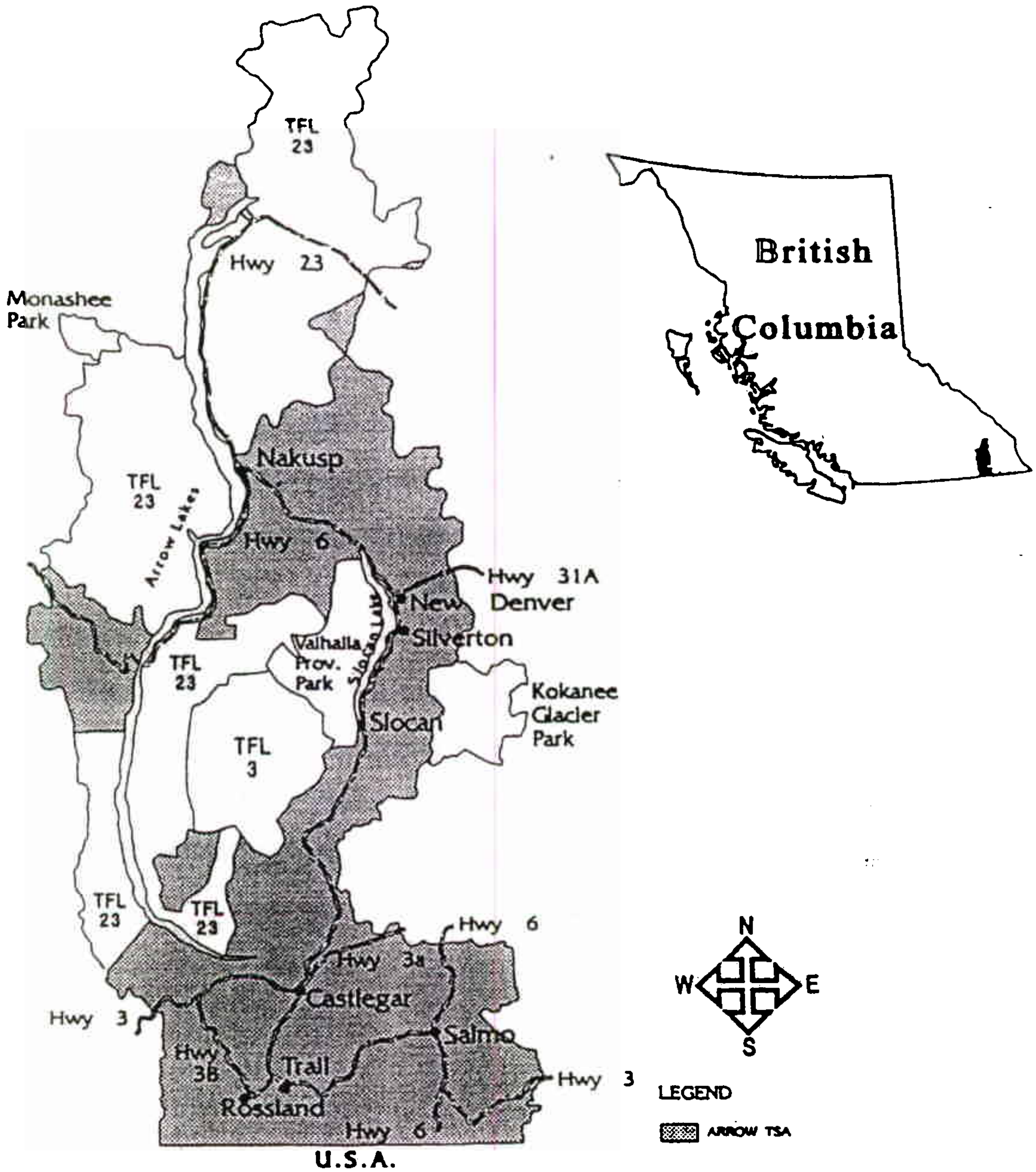

Figure 1. Key Map

The incorporation of biodiversity in the twenty year harvest plan has a significant influence on the planning methodologies used. A Total Chance Plan, along with the component Engineering Plan, were prepared and used as background for the preparation of the twenty year plan. The Total Chance Plan, which was prepared by SFP development staff, shows all the potentially operable timber within a landscape unit.

The twenty year plan Terms of Reference (September 1997) and the Timber Supply Analysis (Sterling Wood Group, November, 1996), have defined most of the input parameters, such as minimum harvest ages, calculated green-up ages, equivalent clearcut areas (ECA) limits, biodiversity targets, environmentally sensitive area (ESA) descriptions and netdowns, stand group descriptions and growth and yield curves.

2.2 Traditional Paper Plan

Twenty year Paper Plans are a series of maps which show the locations and scheduling for harvesting over the next twenty years. Current operational rules and regulations (e.g. 3 m green-up of adjacent blocks) constrain when and where cutblocks can be located when preparing the plans.

2.3 ATLAS Modeling

ATLAS (A Tactical Landscape Analysis System) Version 2.91 is a spatial, forest level, simulation planning model developed at the University of British Columbia (UBC). It allows many different constraints and forest management targets to be set, including both landscape level (e.g. seral stage) forest cover targets and green-up delays (of adjacent cutblocks). Blocking patterns on the landscape are predefined and a priority list of potential cutblocks is established. Priorities are be based on the distance to the mill. The user can vary the constraints and the model then selects cutblocks from the priority list. The output from the model is a harvest schedule over time (e.g. 200 years) by period (e.g. 5 years) and a visual representation of where the cutblocks are located in each period. As is generally the case with simulation models, the harvest schedule presented by the model is the only solution that the model can give based on the input criteria and meets the rules imposed on harvesting. ATLAS cannot optimize the many solutions that could meet the criteria. Also, the model cannot create a particular forest structure at any point in time; it produces a timber harvest schedule and location pattern subject to the pre-established criteria.

The ATLAS model was found to be useful for assessing the impact of various guidelines on harvest levels. It can perform some sensitivity analysis by adjusting guidelines and rerunning the model, but it was not well suited to two tasks that were important to SFP:

- Selecting the optimal mix of cutblocks for harvest from the Total Chance Plan. This is a particularly important question in the well-roaded management units which have a focus on timber production (e.g. the Enhanced Resource Development Zone (ERDZ) designation from the KBLUP).;

- Predefining the end product design of a forest that meets patch size and other objectives, rather than accepting the forest created by default through imposing numerous process rules.

These two limitations with the ATLAS model led to the use of the FSOS model as described below.

2.4 FSOS Modeling

FSOS is a computer simulation and optimizing model, developed at UBC, that uses a process called simulated annealing to optimize the output (defined as maximizing a specified criterion or criteria). The model undertakes a series of iterations, with each iteration utilizing a unique combination of cutblock size, configuration, placement and scheduling on the landscape. The results from each iteration are compared to the last (or best previous) iteration, and the best one of the two (as set by predetermined criteria) is kept. The cutblocks are altered and a new iteration is carried out. This process is continued several hundred thousand times, until further improvement in the specified management objective is minimal.

The fundamental difference between FSOS and ATLAS is that FSOS focuses on creating a forest according to a set of objectives defined by the user in the shortest time possible, whereas ATLAS prepares a harvest schedule subject to a series of rules and accepts the resulting forest landscape, regardless of fragmentation.

FSOS describes the ultimate structure of the forest landscape in two key parameters:

- **PATCH**

  Patch is defined as a contiguous area with forest cover in a defined seral stage regardless of changes in other forest cover attributes, such as species composition (*Biodiversity Guidebook*). 'Patch size distribution' is defined as the statistical or frequency distribution of patch sizes within a Landscape Unit.

- **SERAL STAGE**

Seral stage is the age range assigned to an individual patch or class of patch. Seral stage classifications are taken directly from the *Biodiversity Guidebook* and are applied by Natural Disturbance Type (NDT) within Landscape Units. They are viewed as an target to be achieved over time rather than an absolute constraint. Other resource guidelines, such as the maximum visual alterations in the early seral stage or the equivalent clearcut area (ECA) requirements for domestic watersheds, are also applied here. FSOS uses optimization to achieve these targets in the shortest time possible.

The user ranks the relative importance of the two key user-defined parameters (patch size distribution and seral stage) relative to each other and to the three other model output parameters listed below:

- **Total Volume Flow** - This is a measure of the total volume harvested in the planning horizon (i.e. 200 years).
- **Even volume flow** - This is a measure of the variation harvest volume between periods. The variation is limited to +- 10% of the average volume for the planning horizon.
- **Cutblock Size** - This is a measure of the actual cutblock size. This value is constrained within a specified range to eliminate small inoperable cutblocks or excessively large ones.

A "weighting" is assigned to these parameters to show relative importance and is key to tradeoffs between harvest level and length of time to achieve patch or seral distribution targets.

The model calculates a "penalty" based on the difference between the target for each parameter and the value actually attained in each period. The "penalties" are summed for all periods and weighted by the pre-defined weights. To minimize the total "penalty" over the planning horizon, the model attempts to achieve targets quickly for highly weighted parameters.

Weights and penalties are used to make the transition from the traditional cut, leave, adjacency, and maximum block size approach to controlling harvest level and distribution to one based on seral stage and patch size targets. When considering this approach, compromises are necessary to reach the desired targets in the most optimal way.

The strength of this model is its focus on specifying the desired result in terms of age and patch size distribution rather than creating a forest indirectly as a result of applying numerous rules. This quality when combined with the optimization feature, leads to a forest that achieves the goals of the KBLUP and has a near optimal timber flow.

3.0 METHODOLOGY

3.1 Traditional Paper Plan

A Total Chance Plan prepared by SFP development staff for most of TFL #3 used the following guidelines:

- the major connectivity corridors, primarily in the southern and eastern parts of the TFL (See Figure 3, in Appendix XI) were excluded because the management strategy for the corridors is to maintain or create mature or mature-like forests through patch cuts and selection systems;
- the 1996 operability line was used (See Figure 2, in Appendix XI);
- cutblocks were allocated within areas designated for both the conventional and alternate systems areas. Conventional operable area includes terrain that can be roaded and harvested with ground or cable systems. The alternate area utilizes non-roaded harvest methods, including forwarders and aerial systems.;
- cutblocks were located outside of riparian management areas;
- other timber supply analysis netdowns, including Environmentally Sensitive Area's and problem forest types, were incorporated (See Appendix IV, Terms of Reference);
- biodiversity and wildlife provisions were made using current policies and regulations; e.g. valuable known ungulate movement corridors were excluded;
- adjacency between patches was set at 3 m green-up, because the paper plan was prepared prior to the finalization of the KBLUP;
- cutblocks were located within all remaining mature timber types and many immature timber types;
- cutblocks were designed to be feasible with current harvest systems and FPC regulations;

- cutblock sizes were typical of today's operations, rather than being the individual setting units typical of some engineering plans specifically designed to be used with a spatial modeling system;
- the SBFEP area was not included;
- the existing Forest Development Plan approved cutblocks were incorporated as the first five years within the twenty year plan;
- Slocan Forest Products development staff scheduled 20 years of blocks using traditional operational rules (e.g. 3 m green-up, ocular estimate of landscape level constraints).

3.2 ATLAS Modeling

The Paper Plan described in Section 3.1 was digitized, translated into an ATLAS format and used for the ATLAS modeling. The following criteria were used in transforming the paper plan into an ATLAS data set:

- cut blocks were not designed within connectivity corridors. The stated goal of creating or maintaining mature-like forests within the connectivity corridors was achieved by removing a percentage of volume through patch and partial cutting systems. The patch and partial cut volume from these corridors was generally limited to 3000 m^3/year for operational reasons.;
- A percentage reduction in volume removed (calculated from Table 20a of the *Biodiversity Guidebook*, See Appendix V) was applied to account for stand level biodiversity;
- Alternate harvest system blocks were scheduled separately (and manually) from the ATLAS analysis in a manner that was compatible with the operational realities of the particular system.;
- Some early immature stands (age class 1 and 2) were not blocked in the engineering plan, but were included in the ATLAS analysis if they were deemed

operable, because the ATLAS analysis was done over long planning horizons (generally 200 years).

Three scenarios utilizing various parameter combinations were analyzed using ATLAS. See Table 1, on the next page for a detailed description of the parameter combinations for each scenario.

3.3 FSOS Modeling

The data set used in this FSOS analysis was similar to the data set used in the ATLAS and is based on the data utilized in the timber supply analysis.

3.3.1 Weighting

Weighting of the objectives and parameters is a key consideration to the operation of the model. Table 2, below shows the weighting used in this analysis. The weightings show the relative importance of each parameter (i.e. patch size distribution is 1.6 times more important than total volume flow). A high importance was placed on achieving biodiversity objectives, therefore high weights were attributed to patch size and seral stage. The low weight was attached to the even volume flow parameter because it is an easy target to achieve.

Table 1-Summary of Input Parameters and Results from ATLAS and FSOS modeling

	Scenario	E.P.	FDP for 5 years	Adjacency Regulation	Biodiversity	Visuals	ECA	Harvest in Connectivity corridor	Model	Harvest level (SFP conventional)
1	Unconstrained	Yes	Yes	No	No	No	No	No	ATLAS	177,000
2	Traditional KBLUP implementation approach (full bio)	Yes	Yes	2m 3m in visually sensitive areas	Full	SFP visuals (includes Little Slocan)	<30% ECA yrs in DWS, <20% in Airy Cr.	13%>100 yrs for 20 yrs and 70%>100 yrs to max> of 3000 m^3/yr	ATLAS	50,000
3	Traditional KBLUP implementation approach (1/3 bio)	Yes	Yes	2m 3m in visually sensitive areas	1/3 in LEB, Full elsewhere	SFP visuals (includes Little Slocan)	<30% in DWS, <20% in Airy Cr.	13%>100 yrs for 20 yrs and 70%>100 yrs to max. of 3000 m^3/yr	ATLAS	63,000
4	Patch size distribution approach (full bio.)	Yes over -lay	Yes	2m between patches	Full	SFP visuals (includes Little Slocan)	<30% in DWS, <20% in Airy Cr.	13%>100 yrs for 20 yrs and 70%>100 yrs to max. of 3000 m^3/yr	FSOS	76,586 conventional 7045 alternate 83,631 total

Table 2. The weighting of parameters used in the FSOS analysis

Parameter	Weight
Patch size	1.6
Seral stage	1.5
Total volume flow	1.0
Even volume flow	0.3
Cutblock size	1.5

Adjacency between patches was set as a user defined parameter of 2 m green-up. This is consistent with the KBLUP.

The effect of any choice of weighting is specific to the forest being modeled. The choice of weighting used for this analysis results in seral stages, already in deficit, (e.g. old seral) not being reduced further and allows some flexibility when the patch size and seral stage targets are achieved.

3.3.2 Patch and Seral Distribution Targets

Percentage targets (Table 4, *Biodiversity Guidebook,* See Appendix V) were assigned to 1-40 ha patches (30-40%), 40-80 ha patches (30-40%) and 80-250 ha patches (20-40%) within each seral stage (early, mature and old). The model's first focus is on amalgamating cutblocks in fragmented areas with regular adjacency rules applying between patches, and cutblocks within patches.

3.3.3 Harvest Criteria

In this application of FSOS, the first five years of harvest were fixed to the current approved Forest Development Plan. After that, the Engineering Plan blocks are used only as an overlay (e.g. they were over-laid in GIS with forest cover polygons, operability lines, biogeoclimatic subzones, etc., to create resultant polygons or slivers). This allowed the model to harvest all or part of an engineering plan block or a combination of engineering plan blocks. The model could be limited to combinations of engineering plan blocks if they were smaller units so that all parts of the patch size spectrum could be achieved. In this case, since the average size of the engineering plan blocks was about thirty to forty hectares, it would not have been possible to achieve the *Biodiversity Guidebook* patch size distributions using the EP blocks directly.

4.0 RESULTS

Five scenarios were undertaken in preparing this plan. The traditional paper plan, and ATLAS Scenario #1were prepared as benchmark analyses. The traditional plan which utilized a traditional scheduling approach showed an available conventional volume of 80,000 m^3/year, whereas the ATLAS Scenario #1, which had no biodiversity constraints, showed a volume of 96,000 m^3/year. However, both of these scenarios showed a significant AAC falldown after twenty years.

A second run of ATLAS (Scenario #3) utilized a strategy of one third biodiversity constraints in the low diversity emphasis units and full diversity constraints in the remaining units. Full biodiversity seral targets were achieved well before the 210 year target. The run showed an AAC of 63,000 m^3/year available for the whole planning horizon. The flexibility provided by reducing the biodiversity constraint to one third is particularly important in the first twenty years..

A third run of ATLAS (Scenario #2) was set using the same input parameters as the FSOS run (Scenario #4) and are directly comparable. These runs were based on achieving full biodiversity constraints as quickly as possible. The ATLAS run showed an SFP conventional available of 50,000 m^3/year, while the FSOS model showed a harvest level of 76,586 m^3/year. FSOS showed an additional 7045 m^3/year in the alternate harvesting areas for a total SFP harvest of 83,631 m^3/year.

The 21,000 m3/year harvest level difference can be attributed to the increased flexibility and optimization effect that FSOS has in achieving the biodiversity targets. The seral targets are set as goals in FSOS rather than constraints that ATLAS. The 21,000 m^3/year penalty clearly shows the cost of superimposing landscape level constraints on traditional adjacency regulation in terms of timber flow.

Figures 4 and 5 show the general harvest pattern across the landscape. Cutblock amalgamations are necessary to create the desired larger patches.

Appendix VIII is a set of graphs that show the old seral percentage targets at the start and end of the twenty year period. In all of the Landscape Unit/Natural Disturbance Unit Type (LU/NDT) polygons, the old seral targets are met in 10-70 years, except for NDT 16 LU A16 where the target is met in 185 years. This, however, is within the three rotation allowance.

Appendix IX shows the patch size distributions for each LU/NDT polygon. In viewing these tables, it must be noted that the targets for the smaller sized patches, ie 0-40 ha are maximum targets, whereas the targets for the larger sized patches are minimum targets. If the targets for large patches are met or exceeded, then the targets for the smaller patches will not be met.

By altering the patch size distribution targets, adjacency can be regulated in visual or watershed zones.

A FSOS scenario was run using one third biodiversity constraints in the low emphasis biodiversity zones. The results showed an insignificant improvement over the run using full biodiversity constraints. The negligible improvement is the result of FSOS treating the seral targets as goals rather than absolute constraints.

5.0 RECOMMENDATIONS

Slocan Forest Products, upon review of the various scenarios and methodologies, recommends Scenario #4 (FSOS - Full Biodiversity Constraints) as the preferred twenty year plan.

This plan complies keeps with the overall intent and goals of the KBLUP and *Biodiversity Guidebook*, while allowing the timber flow potential of the land base to be realized. In keeping with the KBLUP, this approach emphasizes timber production in some areas (ERDZ's, low emphasis biodiversity) and de-emphasizes timber production in others (SRMZ's, areas with high concentrations of resource guidelines). Modest tradeoffs between time to reach old seral targets and patch size distribution objectives will be required. SFP will have enough flexibility to undertake a long-term landscape design approach that will result in a forest being created, that is in keeping with the vision of the *Biodiversity Guidebook*. The resulting forest will have a greater biodiversity value and provide an increased short term timber supply than a forest that is attained by preserving small existing fragments.

5.1 Timber

The advantages of FSOS Scenario #4 for the timber resource are as follows:

- increased short-term timber supply availability as compared to the present AAC and the ATLAS runs, which represent traditional management approaches;
- operational flexibility eases the transition from the present harvest pattern to a forest that meets KBLUP objectives;
- feasible engineering units based on the initial engineering plan and a final check of amalgamated units;

- provides the flexibility necessary to emphasize fiber production from the ERDZ areas.

5.2 Biodiversity

The advantage of FSOS Scenario #4 for biodiversity are as follows:

- attains patch size distributions as per the *Biodiversity Guidebook,* within or ahead of the scheduled time frame;
- further fragmentation of the forest is limited and guided by long term goals;
- all units reach old seral targets in 10-70 years, except for NDT 2 in LU A16 where the target is reached in the three rotation guideline;
- old growth stands are located logically, in areas that maximize it's biodiversity value, rather than being reserved in isolated patches. The amount of interior habitat will increase.;
- provides connectivity corridors in accordance with the KBLUP guidelines on connectivity.

5.3 Wildlife

The advantage of FSOS Scenario #4 for the wildlife resource is summarized as follows:

- the harvesting pressure on much of the ungulate winter range is reduced because the required volumes can be attained from other sources, while meeting other biodiversity targets.

5.4 Watersheds and Fisheries

The advantage of FSOS Scenario #4 for the watershed and fisheries resource is summarized as follows:

- all ECA's for all non-domestic watershed sub basins stay below the 35% limit, except for Heimdal, which is already above the threshold. Heimdal's ECA does not increase.;
- The ECA's for the Airy Creek sub-basins already exceed the 20% maximum threshold, but the ECA's do not increase, except in already approved FDP cutblocks and in isolated instances, where small areas were taken to achieve long term patch size objectives.

5.5 Visuals

The advantage of FSOS Scenario 4 for the visual resource is summarized as follows:

- visuals for the Little Slocan visual management area exceed requirements of the KBLUP.

6.0 CONCLUSION

The objective of this twenty year plan is to provide a harvest schedule that confirms that the harvest level determined in the timber supply analysis is achievable, considering the current operational rules and guidelines. This plan was developed by comparing three separate planning methodologies for the ability to meet the guidelines of the various regulations especially the Kootenay Boundary Land Use Plan, and the ability to provide an even long term timber flow from TFL #3. This plan shows that using the computer simulation and optimizing model FSOS (Forest Simulation Optimizing System) best meets these objectives. This plan comprises: background information on the methodologies and computer models utilized; a discussion on the input data; results with the various methodologies and supporting tables and figures. With this plan, Slocan Forest Products Ltd. is confident that the recommended Annual Allowable Cut level can meet current and future forest management guidelines and allow it to practice superior environmental stewardship within TFL #3.

7.0 REFERENCES

Slocan Forest Products Ltd., TFL #3, Twenty Year Harvest Plan, Terms of Reference

Forest Practices Code of British Columbia, Biodiversity Guidebook, Anon, September, 1995.

Kootenay Boundary Land Use Plan

Ministry of Forests - Ministry of Environment Lands and Parks, Memorandum of Understanding (October, 1996)

Supplement to Forest Development Guidebook for Nelson Forest Region and Arrow Forest District (October 28, 1996)

Implementation Strategy (June, 1997)

Management Plan #8, Tree Farm Licence #3.

Timber Supply Analysis, Tree Farm Licence #3, Sterling Wood Group

APPENDIX I
MODELING ASSUMPTIONS

APPENDIX I

MODELING ASSUMPTIONS

Green-up ages

- derived from SFP silviculture records.

Visuals

- five metre visually effective green-up;
- ages are derived from the timber supply analysis height – age curves;
- applied as a maximum early seral constraint, 5% - retention areas, 15% - partial retention areas, and 25% - modification areas.

Watershed Equivalent Clearcut Areas (ECA)

- applied to sub basins;
- Airy Creek divided into nine separate sub basins;
- nine metre hydrological green-up;
- ages derived from the timber supply analysis height – age curves;
- ECA thresholds derived from KBLUP Implementation Strategy Domestic Watershed Guidelines except for Airy Creek;
- Airy Creek ECA threshold set at 20%, due to an Arrow District directive regarding ECA's below Class IV and Class V terrain.

Biodiversity

- seral targets are derived from the *Biodiversity Guidebook* for the relevant NDT;
- patch definition criteria are based on the ages used in the *Biodiversity Guidebook* to define seral stages

APPENDIX II
RATIONALE FOR HARVEST VOLUME FROM "ALTERNATE" OPERABLE AREA

APPENDIX II

RATIONALE FOR HARVEST VOLUME FROM "ALTERNATE" OPERABLE AREA

- The "alternate harvesting" classification was used to define areas which are not economically or physically feasible for conventional road access;

- Presently, over 2100 hectares of mature timber is located in the "alternate" area, with a total volume of 775 000 m^3;

- An additional 1000 ha of immature stands are located in the "alternate" area and will provide an additional volume 370 000 m^3 when it matures (100-150 years);

- Nine hundred hectares of the mature timber located in the "alternate" area (2100 ha) are within the current engineering polygons. These polygons are the basis for determining operational feasibility for the 20 Year Plan. Therefore, with current technology 346,000 m^3 (900 ha) of timber located in the "alternate" area is immediately available for harvest;

- Within the currently approved Forest Development Plan, there are 6 cutblocks, which total 42 200 m^3, located in the "alternate" area(average of 7000 m^3/yr).

- SFP is currently investigating new harvesting techniques, such as non-roaded forwarder trails, as an alternative to helicopter logging in areas where conventional roads are not feasible.

** Volume estimates are based on VDYP volumes used for the 20 Year Plan.

Years of harvest in the "alternate" areas by annual harvest level

	7000 m^3/yr
Years of harvesting with only the current mature volume available (775 000 m^3)	110
Additional years of harvesting available in the future from currently immature stands (1000 ha = 370 000 m^3 mature volume)	53
Total rotation (years)	164
Years of harvest from areas identified in Eng. Plan as feasible using currently technology	49

APPENDIX III

UNGULATE WINTER RANGE AND CONNECTIVITY CORRIDOR STRATEGIES WITHIN TFL #3

APPENDIX III

UNGULATE WINTER RANGE AND CONNECTIVITY CORRIDOR STRATEGIES WITHIN TFL #3

Within the TFL Management Plan, the management of ungulate winter range has been combined with the connectivity corridor strategy.

Over the past 5 years, three major projects have mapped ungulate winter range areas within the Slocan Valley area, including TFL #3. These projects were the Slocan Valley CORE Project (1993-95); KBLUP-IS (1997); first phase of the SFP/FRBC Deer & Elk Winter Range and Inventory project (1997). The SFP/FRBC Winter Range project is a multi-year project, which began in 1996, and is intended to better define the ungulate habitat requirements and identify more specifically the ungulate winter range areas within the TFL.

The SFP connectivity corridor strategy started with the KBLUP regional connectivity corridor mapping. More landscape level detail, including information that had been gathered in the initial phase of the SFP/FRBC Winter Range project, was added. The initial connectivity strategy was reviewed by Greg Rowe in March 1997, who recommended following this course of action in managing ungulate habitat in the TFL.

Within the 20 Year Plan, timber harvest within the connectivity corridor has been constrained to 30% removal to ensure that mature seral conditions are maintained (as per the *Biodiversity Guidebook*). Using these constraints, FSOS was run (and reviewed by MoF and MELP personnel on January 12, 1998) using full biodiversity requirements and 52 blocks fell within the KBLUP ungulate winter range area.

Block Size	Number of Blocks
< 5 ha	30
5 - 20 ha	14
> 20 ha	2

Two of these blocks are within the current Forest Development Plan, one is a 35 hectare partial cutblock on Koch Face and the other is a 14 hectare cutblock in the lower Berry Creek area. It is recognized that on an operational level, the larger cutblocks will have to be designed and developed to ensure suitable habitat is available and maintained. Management practices, such as retention (patch, selection) silviculture systems and the recognition of stand level connectivity, will be included in the operational plans to ensure appropriate forest cover attributes are present and winter range requirements are met.

In addition to the connectivity constraints, visual management constraints above the KBLUP-IS guidelines were used. According to the KBLUP-IS, the only area within the TFL that is visually sensitive is a small portion of the Airy Creek watershed. However, at the request of the Arrow Forest District, the visual management area has been expanded to include the Highway 6 and the Little Slocan Lakes view corridors. The majority of the polygons along the Little Slocan Lakes corridor have a RVQO rating of Partial Retention which constrains the harvesting to a visual disturbance of less than 7%.

It is felt that sufficient constraints have been made in the landbase, through reductions to harvestable area in the connectivity corridor and the visual management area, that no further reductions need to be made with regard to the ungulate winter range.

APPENDIX IV

TERMS OF REFERENCE

SLOCAN FOREST PRODUCTS LTD

TFL 3

TWENTY-YEAR HARVEST PLAN

TERMS OF REFERENCE

September 1997

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1.0 INTRODUCTION

Slocan Forest Products Ltd. - Slocan Division (SFP) is preparing Management Plan #9 for TFL 3 - Little Slocan Lakes for presentation to the Chief Forester in June 1998. As a part of the management plan process, the licensee must prepare a twenty-year harvest plan to confirm that the harvest level identified in the timber supply analysis is achievable for TFL 3 considering current operational rules and guidelines governing forest management.

The purpose of this term of reference is to serve as a forum between the licensee and the associated ministries to establish the strategies and direction for the upcoming twenty-year harvest plan. This will allow the parties involved to voice their interests and concerns regarding the proposed process as well as understand and keep informed of the twenty-year harvest plan development.

The twenty-year harvest plan is meant to be a tactical plan, which links the strategic timber supply analysis to the operational forest development plan. The purpose of the plan is to validate the spatial feasibility of attaining the harvest level specified in the first twenty years of the timber supply analysis. Traditionally, twenty-year paper plans met the above objectives but were inflexible with respect to modelling various forest management scenarios. Therefore, the conventional plan was unable to provide an effective link between the strategic and operational plans since it was impossible to manually consider all the spatial, temporal requirements and regulations on the forest landbase. SFP believes their approach to developing this twenty-year harvest plan will create a plan, which is more effective and can be used as a guide for preparing future five-year development plans.

In developing the twenty-year harvest plan, SFP must consider:

1. the net operable land base (as used in the timber supply analysis),
2. areas to be harvested characterized by the harvesting methods,
3. existing and proposed roads & trails to be used during harvesting within the operable land base,
4. IRM areas, and
5. landbase constraints such as green-up and forest cover requirements.

The terms of reference is divided into three key sections:

Objective

- Identifies project scope and limitations.

Approach

- The phases that SFP will go through preparing the twenty-year harvest plan, including basic methodology and constraints in.

Plan Schedule and Timing

- Identifies the procedures, information flow and timing required by all parties to complete each phase of the project.

2.0 OBJECTIVE

The primary objective of the twenty-year harvest plan is to identify the proposed harvest blocks and associated volumes needed to meet the suggested harvest level targets for the upcoming 20 year time period. By definition, the twenty-year harvest plan is dynamic and does not determine an absolute number which limits timber harvesting, but actually gives a representation of the harvest opportunities within the TFL landbase given the current and proposed spatial and temporal constraints. Areas identified for harvest are tactical in nature and will give some guidance for planning and further detailed operational planning and site examination.

The upcoming twenty-year harvest plan will incorporate all landbase constraints, current resource inventories, and present and future management regimes to create a plan to guide future forest management decisions. Given the varied information required to prepare the plan as well as the range of subjects covered in the plan's preparation, SFP believes that the preparation of the final plan will be a joint process involving various agencies. The inclusion of these agencies will allow individuals to voice concerns and address changes in current guidelines, as well as accelerate the review and approval of the plan. SFP will use the MoF/MoELP Memorandum of Understanding (October 1996), the Supplement to the FDP Guidebook for the Nelson Forest Region and Arrow Forest District (Oct. 28, 1996) and the KBLUP Implementation Strategy (June 1997) for guidance during the preparation of the twenty-year harvest plan.

The twenty-year harvest plan will identify the sequence of cut blocks in 5 year increments over a 20 year period to validate the harvest level calculated in the timber supply analysis. The first five years of the twenty-year harvest plan will be a reproduction of the approved five-year development plan. The twenty-year harvest plan will be prepared with consideration of the license type; all respective Acts, regulations and standards; higher level plans (including landscape units, RMZ's, sensitive areas and interpretive forest sites); the SMOOP; and the desired management options.

In this plan, SFP will consider:

1. harvest ages
2. green-up and adjacency
3. block sizes
4. hydrological requirements
5. wildlife habitat
6. biodiversity
7. silvicultural systems
8. access
9. visual quality
10. sensitive areas

The twenty-year harvest plan may link higher level plans, such as RMZ's or landscape units, and operational plans, such as the five year development plan which shows cut block sequences in 5 year intervals over 4 periods (20 years). The plan will utilize the TFL's GIS database to identify the net operable landbase consisting of the approved, apportioned operability line. Updated forest cover information (to January 1, 1996) will be incorporated from the most recent approved re-inventory. Volumes will be assigned by VDYP to each stand group, which corresponds to the timber supply analysis unit volumes.

3.0 APPROACH

The following section defines phases that SFP will follow, including basic methodology, in preparing the twenty-year harvest plan.

SFP proposes to undertake the twenty-year harvest plan in 3 phases. Phase I will consist of the preparation of the required data and an engineering plan (EP) for the entire TFL which considers all landbase constraints and regulations. Phase II will consist of incorporating the data, constraints, and EP into digital format and carrying out the simulation analysis. Phase III will consist of preparation of the twenty-year harvest plan tables, reports and maps.

An engineering plan is conceptually similar to the first phase of a Total Chance Plan whereby the entire harvestable, operable landbase is designed for harvest. This plan is the basis for identifying the harvest design opportunities and constraints. The harvest design process examines the shape and landform structure of the planning area and while considering terrain, operability, harvesting method and economics produces a plan that divides the harvestable area into optimal yarding polygons. In some cases, additional inventory information such as landscape, hydrology, and recreation, is included in the plan. Where such information has not been considered within the context of the engineering plan, it is identified and accounted for later in the planning process at the operational planning phase.

Considering the upcoming approval of the KBLUP, SFP is proposing two specific twenty-year harvest simulations with varying green-up heights. The initial simulation will apply a standard 3 metre green-up height over the entire TFL. The second simulation will apply a 2 metre green-up height in the proposed enhanced forest management zone and a 3 metre green-up height in the proposed integrated and special resource management zones (IRMZ and SRMZ). The differences in these simulations will show the effects of a reduced green-up requirement on timber availability over the twenty-year planning horizon. This management option allows the flexibility necessary to balance community stability with the requirements of wildlife and other environmental issues.

SFP will use the forest estate model ATLAS ver. 2.91 for the simulation component of the twenty-year harvest plan. ATLAS is a spatial, forest level, simulation planning model developed at U.B.C. Its use in B.C. has varied, but includes impact assessment on timber supply, analysis of Forest Practices Code implementation, analysis of LRMP implementation, and Total Resource Plan assessments. To SFP's knowledge, this is the first time that ATLAS will be used to assess temporal and spatial landbase requirements in the preparation of a twenty-year harvest plan.

3.1 PHASE I - DATA COLLECTION

There is currently a need for more intensive land and resource management planning, considering the amount of forest policies and constraints currently applied to the forest landbase. Because of the modification of current harvesting practices in order to protect non-timber resources, there is pressure placed on the timber resource causing an increased demand. This timber shortage can be addressed through local resource planning in order to provide operational direction for resource use while maintaining provincial, regional, sub-regional and local objectives.

No roads (as per FPC definition) will be proposed for the "non-road system" operable area. Instead, a combination of long-line cable harvesting, helicopter/aerial harvesting, and forwarding trails will be used to access this area.

Areas of special interest or special management will be identified and described for consideration during planning and operations. These areas might consist of riparian and wildlife habitat as well as connectivity strategies. Local connectivity strategies recently completed by SFP provide a more detailed, stand level application of connectivity corridors. This is in recognition of the KBLUP and the Forest Ecosystem Network (FEN) developed as part of the Slocan Valley Land Use Plan (CORE initiative). As well, SFP is in the process of completing a detailed riparian classification, which will provide an accurate representation of special interest conditions within the TFL.

SFP will use its updated road overlay to determine which blocks within the TFL will require new access and those, which have existing access routes. Access will be based on maximum skidding distances. In order to determine the amount of new roads required, SFP will prepare a road analysis to identify the amount of mature operable timber within 200, 300 and 400m of a road and any area beyond 400m for the TFL. This analysis will identify the amount of timber that can be accessed without requiring a road to be built and the amount of road that must be built in order to access future harvest blocks.

IRM constraints will be addressed through compliance with the Forest Practices Code, its regulations and standards. Some of the resources (biodiversity, wildlife) will be addressed in the modeling portion of the plan and those resources which cannot be developed (riparian reserve zones, wildlife reserves, and private land) will be net down spatially and removed from the operable landbase through SFP's GIS.

3.1.1 Resource Inventory Information

The preparation of the twenty-year harvest plan will require the most current data for various resource types within the TFL. Information that will be utilized in the preparation of the twenty-year harvest plan will include:

- updated digital forest cover information (including reforestation and silvicultural activities updated to January 1, 1996)
- TRIM data

- proposed landscape units
- landscape inventories
- biogeoclimatic subzone/variant
- fish and wildlife
- current air photo coverage
- green-up ages by species and BEC subzone
- minimum harvest ages
- proposed harvesting systems

3.1.2 Harvest Planning Guidelines

SFP believes the harvest planning guidelines used in the preparation of the engineering plan and the twenty-year harvest plan should be reviewed and agreed to jointly by the MoF and MoELP. The guidelines and requirements that will be used are derived from a variety of sources and must consider those factors indicated in the following section.

3.1.2.1 Block Size

A variety of block sizes will be proposed throughout the TFL on a site specific basis with the maximum continuous opening being 40 ha. It is understood that larger areas may be proposed in higher-level plans or by the District Manager, where opening size may be related to the size of naturally created disturbances. In the latter case, the District Manager may approve smaller or larger openings consistent with the objectives for:

- biodiversity
- visual quality
- hydrology
- wildlife habitat needs

3.1.2.2 Harvest Systems

SFP will utilize a variety of harvest systems throughout the TFL on a site-specific basis considering ecosystem type, cover type, terrain conditions, season of operation, environmental concerns, etc. The newly approved operability line for the TFL includes a "non-road system" partition above the conventional operability area. Harvest systems will be proposed to take advantage of the opportunity presented by this "non-road system" operability partition. Some of the types that are currently being used and those that will be proposed for future use include:

- conventional, including low-ground-pressure equipment
- cable, including intermediate supports
- aerial & non-road systems (ie. long-line systems)
- combination of the above, with forwarding equipment

3.1.2.3 Silvicultural Systems

SFP will utilize various silvicultural systems throughout the TFL on a site-specific basis in order to meet anticipated silvicultural requirements, landscape and recreation concerns, environmental concerns, and so on. Some of the current and future silvicultural systems include:

- clearcut (w/wo reserves)
- patch cut
- selective harvest (single and group)
- seed tree
- shelterwood (uniform and group)

The chosen silviculture system will be ecologically suited to the ecosystem and forest cover being managed in the area. SFP will further select the silviculture system based on the forest resource objectives contained in any local higher level plans, and ensure that reasonable measures are taken to promote a healthy and productive forest. The system will be designed to achieve a specified stand structure which considers objectives for other non-timber resources (wildlife, water, biodiversity, etc.) that are described within the current approved forest development plan for the TFL.

3.1.2.4 Leave Strip Width

In most cases, SFP will use a leave strip of 300 m unless directed otherwise by the District Manager and a lesser distance would be considered in areas where the topography, silviculture system (i.e. partial cutting), opening size, and vegetation conditions allow. Desirable characteristics of leave strips are windfirmness, ability to support a future harvesting opportunity, and provision of landscape connectivity. Leave strips will be similar in size to the proposed cut blocks and designed to mimic the natural forest and known management objectives. SFP will take guidance from the Biodiversity Guidebook, Visual Landscape Management Guidebook, and the Visual Landscape Training Manual to develop cutblock and leave strip layout and design at the landscape level. Small blocks (<20 ha) will have a leave strip consistent with block width.

3.1.2.5 Stream and Wetland Riparian Zones

SFP has recently completed a riparian zone classification for all streams and wetlands in the TFL. This information will be used in the preparation of the twenty-year harvest plan specifically for the establishment of riparian reserve widths. This information will also be used in the preparation of silviculture prescriptions for riparian reserves and management zones to meet the requirements of the Forest Practices Code at the stand level.

3.1.3 Landbase Requirements

3.1.3.1 Minimum Merchantability Standards

When performing analysis with any simulation model, stands may not be identified for harvest until they achieve a minimum volume and age requirement. In the twenty-year harvest plan analysis, a minimum harvest age is identified for each stand group and is described in Table 1.

Table 1: Minimum Harvest Ages

Stand Group	Existing Stands	Natural Regen	Planted Stands	Spaced Stands
1	59	59	50	59
2	86	89	78	87
3	85	96	84	93
4	60	62	53	61
5	103	96	84	93
6	140	124	110	119
7	77	76	65	74
8	104	98	86	95
9	157	125	112	121
10	56	57	53	61
11	70	69	63	72
12	69	74	68	76
13	51	54	50	59
14	66	73	68	76
15	76	86	78	87
16	67	59	55	59
17	83	71	67	71
18	117	112	110	113
19	61	60	59	62
20	69	67	67	71
21	95	94	97	100
22	53	49	50	59
23	62	56	56	65
24	88	83	73	83
25	64	63	53	61
26	91	90	78	87
27	131	113	100	109

3.1.3.2 Green-up and Adjacency

As stated in the approach, SFP will apply a standard 3 metre green-up height to the twenty-year harvest plan and will conduct other simulations by varying green-up heights (2m) to produce a sensitivity analysis. Green-up height will be applied based on stand group, which will also consider species composition, BEC, site class and elevation. The green-up ages were calculated based on average ages to reach the specific height (2, 3 or 5m) using the yield curves generated for the TFL. The green-up ages to be used in the twenty-year harvest plan analysis are described in Table 2.

Table 2: Calculated Green-up Ages

AU	Type	Area (ha)	%	Avg. (2m)	Avg. (3m)	Avg. (5m)
1	Sp, G, ICH	945	2.99%	16.8	19.9	27.8
2	Sp, M, ICH	1234	3.91%	18.3	26.7	38.7
3	Sp, P, ICH	68	0.22%	21.0	25.8	37.1
4	Ba, G, ICH	50	0.16%	16.6	20.0	21.6
5	Ba, M, ICH	220	0.70%	24.6	25.9	31.0
6	Ba, P, ICH	151	0.48%	26.9	33.8	43.1
7	SpBa, G, ESSF, high	1579	5.00%	21.0	27.0	30.4
8	SpBa, M, ESSF, high	2893	9.16%	27.5	28.7	33.5
9	SpBa, P, ESSF, high	636	2.01%	26.6	30.4	39.7
10	Ce, G, ICH-ESSF	178	0.56%	11.9	22.3	17.4
11	Ce, M, ICH-ESSF	588	1.86%	20.5	20.9	18.3
12	Ce, P, ICH-ESSF	569	1.80%	23.2	20.0	27.0
13	He, G, ICH-ESSF	256	0.81%	13.5	17.0	18.8
14	He, M, ICH-ESSF	3284	10.39%	18.5	21.4	27.8
15	He, P, ICH-ESSF	1828	5.78%	17.7	19.8	28.4
16	FdLPy, G, ICH-ESSF	6249	19.78%	8.7	12.5	21.2
17	FdLPy, M, ICH-ESSF	1870	5.92%	13.7	17.2	18.8
18	FdLPy, P, ICH-ESSF	118	0.37%	17.0	19.6	25.5
19	Fd, G, ICH-ESSF	1672	5.29%	7.6	14.6	20.1
20	Fd, M, ICH-ESSF	411	1.30%	13.4	17.0	18.7
21	Fd, P, ICH-ESSF	65	0.21%	14.3	20.7	21.0
22	PlPw, G, ICH-ESSF	1016	3.22%	7.2	17.3	19.2
23	PlPw, M, ICH-ESSF	1638	5.18%	6.0	19.4	17.6
24	PlPw, P, ICH-ESSF	110	0.35%	17.1	19.7	25.8
25	SpBa, G, ESSF, low	1805	5.71%	15.8	18.6	26.4
26	SpBa, M, ESSF, low	1719	5.44%	21.1	26.4	38.2
27	SpBa, P, ESSF, low	448	1.42%	28.2	28.9	39.0
		31600	**100.00%**	**17.6**	**21.9**	**27.1**

3.1.3.3 Maximum Opening Size

A maximum clearcut opening size of 40 hectares is incorporated into the twenty-year harvest plan through the EP exercise whereby no proposed openings were greater than the suggested maximum.

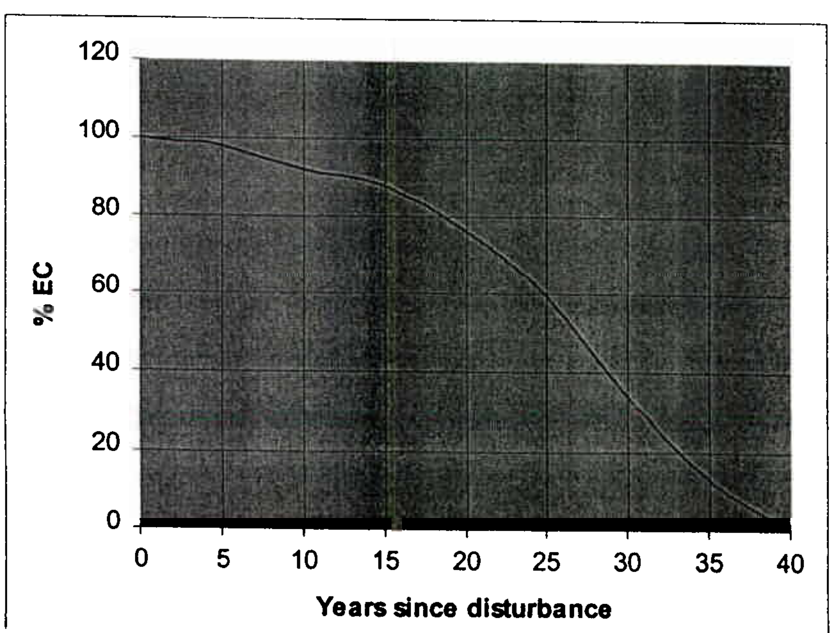
3.1.3.4 Equivalent Clearcut Area (ECA)

Following discussions with the MoELP and MoF, ECA limits for domestic watersheds will be applied as per Table 3.

Table 3: ECA Limits

Unofficial Name	Class	Percent of DWS in TFL 3	Recommended % ECA
Robertson Creek Face	1	75%	<30%
East Little Slocan River	2	100%	<30%
Talbot Creek	2	10%	<30%
Airy Creek	3	100%	<35%
Airy Face	1	25%	<30%
South Tedesco	1	5%	<30%

SFP will use the following ECA curve in the analysis:



The curve is derived from Table 8-1 of the Interior Watershed Assessment Procedure Guidebook. The "Years since disturbance" or stand age is based on the average age within the TFL for stands to reach various heights (3, 5, 7 and 9 metres) as calculated from the Timber Supply Analysis' yield curves.

3.1.3.5 Wildlife Habitat

Wildlife habitat requirements will be applied as per the MoF/MoELP Memorandum of Understanding (October 1996) regarding caribou and grizzly bear. Preparation of the twenty-year harvest plan will consider:

- the establishment of the engineering plan (EP) blocks outside of avalanche track management zones (AMZ);
- the creation of a TFL connectivity strategy to provide access opportunities through travel corridors linking significant habitat types (alpine meadows - riparian zones);
- the application of seral stage requirements, which follow the Biodiversity Emphasis Options, based on current draft Landscape Units in order to provide vegetation diversity with varying successional stages for forage and thermal cover requirements; and
- use of 3 metre green-up heights so that tracts adjacent to harvested areas maintain summer hiding cover.

The intent of the connectivity strategy was to develop a connectivity corridor, which would link late successional ecosystems throughout various topographical conditions and disturbance patterns in order to provide a continuous occurrence of specific ecosystems. As mentioned previously, SFP has prepared a connectivity strategy for TFL 3. The strategy is consistent with provincial connectivity guidelines as stated in the biodiversity guidebook.

Within the biogeoclimatic subzones in the TFL, the guidelines recommend high occurrences of stream riparian, cross-elevational, and upland to upland connectivity. These landscape features were the focus of the connectivity strategy. In addition, important wildlife and fisheries values were identified and incorporated into the strategy wherever possible. These values included ungulate winter range, grizzly bear habitat, wetland complexes, and low-elevation passes.

Connectivity areas are to be maintained in a mature forest state. Forest management activities will be restricted to those that are consistent with this goal. Some areas are currently not mature forest due to past events, but will be managed to provide future mature forest. In addition, the connectivity areas will form an important component in an old growth recruitment strategy for the TFL.

3.1.3.6 Riparian Zones

SFP has recently completed a stream riparian classification for TFL 3. This classification will aid in developing operational prescriptions within these areas, and will also identify for strategic planning purposes those streamside areas, which are sensitive to development. Following completion of a riparian classification, riparian management area (RMA) objectives can be identified and implemented. For the purposes of this analysis, the Riparian Management Zones will not be considered due to limitations in the ATLAS model. However, those areas that are classified as Riparian Reserve Zones will be excluded from the operable landbase. The width of these reserve zones will follow the guidelines put forth in the Riparian Management Zone Area Guidebook. Those reserve zones are described in Table 4.

Table 4: Riparian Reserve Zone Widths

Riparian Class	Riparian Management Area (m)	Reserve Zone Width (m)	Management Zone Width (m)
S1 (large rivers)	70 (100)	50 (0)	20 (100)
S2	50	30	20

S3	40	20	20
S4	30	0	30
S5	30	0	30
S6	20	0	20

* adapted from the Riparian Management Zone Guidebook.

3.1.3.7 Biodiversity

Management of biodiversity will be implemented as per the biodiversity emphasis assigned to the interim landscape units agreed to in the MoF/MoELP Memorandum of Understanding (October 1996). Since the landscape units include land within and outside of the TFL, SFP will summarize the seral stage distribution within the non-contributing landbase (park, inoperable, riparian reserve zone and connectivity strategy). SFP in all cases will attempt to satisfy the targets for seral stage distributions and wildlife trees requirements from the non-contributing landbase.

Initially, SFP must identify the amount of seral stage requirement and wildlife tree available in the non-contributing landbase. This summary will then identify the seral stage distribution that must come from the operable TFL landbase based upon the recommended seral stage distribution by Natural Disturbance Type (NDT) and Landscape Unit (LU). The seral stage targets, which must be met within the operable landbase, will be incorporated into the twenty-year harvest plan analysis. The total biodiversity targets (contributing and non-contributing landbase) are presented in Table 5.

Table 5: Biodiversity Targets

LU	BEO	NDT	Biodiversity Seral Stage Distribution Requirements							
			Early		Mid-seral*		Mature/Old		Old	
			Age (years)	TFL Target Area	Age (years)	TFL Target Area	Age (years)	TFL Target Area	Age (years)	TFL Target Area
36 - Hoder	Low	1	0 - 40	11 053	40 - 120	n/a	121 - 250	2593	251 +	2593
		2	0 - 40	8228	40 - 100	n/a	101 - 250	1356	251 +	814
		3	0 - 40	5551	40 - 100	n/a	101 - 140	904	141 +	904
16 - Koch	Low	1	0 - 40	15 253	40 - 120	n/a	121 - 250	3578	251 +	3578
		2	0 - 40	11 307	40 - 100	n/a	101 - 250	1864	251 +	1118

		3	0 - 40	1355	40 - 100	n/a	101 - 140	221	141 +	221
17 - Perry	Int.	1	0 - 40	2858	40 - 120	n/a	121 - 250	1270	251 +	671
		2	0 - 40	3137	40 - 100	n/a	101 - 250	1069	251 +	310
		3	0 - 40	6758	40 - 100	n/a	101 - 140	1807	141 +	1100

* Mid-seral ages and distributions were assumed to correlate with the age gap between the early and mature/old ages. There are no specific targets for mid-seral requirements.

SFP will address the Wildlife Tree Retention (WTR) requirement by applying a % reduction to each cutblock based on the target % WTR. The target WTR (Table 5) was calculated using Table 20 (b) (Biodiversity Guidebook), and has been further reduced by 50% to account for WTR requirements being satisfied in other constrained areas (FPC of B.C. – Biodiversity Guidebook).

Recognizing the letter released by the Deputy Ministers of MoF and MoELP (August 28, 1997), SFP will conduct sensitivity analysis around the early and mature plus old seral categories to determine their impact on timber supply. SFP will work with the Arrow Forest District to identify any necessary adjustments of the biodiversity requirements if they become limiting to timber supply.

3.1.3.8 Visual Quality Objectives

Visual quality objectives (VQO's) will be addressed in the twenty-year harvest plan through the establishment of an increased green-up height. The visual polygons exhibiting Retention and Partial Retention VQO's will be assigned a visually effective green-up (VEG) of 5 m.. Specific age to green-up will be applied by stand group as described in section 3.1.3.2 (Table 2).

3.1.3.9 Environmentally Sensitive Areas (E.S.A.)

E.S.A.'s were established to identify those areas, which are significantly valuable for other resources (water, recreation, fish, and wildlife) where the harvesting or the regeneration of a crop of trees following harvest may be detrimental. E.S.A.'s are incorporated into the forest inventory database so they may readily be identified for future integrated resource management planning. The E.S.A.'s were updated following current MoF standards during the 1993 forest cover inventory for TFL 3. E.S.A.'s will be incorporated into the twenty-year harvest plan through the identification of forest cover polygons with E.S.A. conditions and the application of a productive netdown (from information package) as described in Table 6.

Table 6: ESA Description and Netdowns

E.S.A. Type	E.S.A. Description	Reduction (%)	# of Polygons
Ea1	Avalanche	90	12
Ep1	Regeneration	80	193
Ep1r2	Regeneration/Recreation	80	2
Ep1s2	Regeneration/Soil	80	4
Ep1w2	Regeneration/Wildlife	80	3
Ep1w1r2	Regeneration/Wildlife/Recreation	80	1
Er1	Recreation	50	6
Er1p2	Recreation/Regeneration	50	1
Er1s2p2	Recreation/Soil/Regeneration	50	1
Er1w1	Recreation/Wildlife	50	1
Er2	Recreation	10	17
Er2w2	Recreation/Wildlife	10	6
Es1	Soil	80	191
Es1p2	Soil/Regeneration	80	13
Es1r2	Soil/Recreation	80	1
Es1w2	Soil/Wildlife	80	2
Es1a1	Soil/Avalanche	90	16
Es1a1p1	Soil/Avalanche/Regeneration	90	12
Es1p1	Soil/Regeneration	80	888
Es1p1r2	Soil/Regeneration/Recreation	80	3
Es1p1w2	Soil/Regeneration/Wildlife	80	12
Ew1r2	Wildlife/Recreation	50	2
Ew2	Wildlife	10	48
Ep2	Regeneration	10	113
Ep2r2	Regeneration/Recreation	10	2
Ep2r2w2	Regeneration/Recreation/Wildlife	10	1
Ep2w2	Regeneration/Wildlife	10	4
Es2	Soil	10	125
Es2p2	Soil/Regeneration	10	51
Es2p2w2	Soil/Regeneration/Wildlife	10	1
Es2w2	Soil/Wildlife	10	1
Total			1561

3.2 PHASE II - MODEL PREPARATION

SFP will use a temporal/spatial, simulation, forest-planning model to verify the scheduling of harvest blocks considering the harvest level defined in the timber supply analysis and the associated landbase constraints. The model will use pre-determined harvest blocks and a pre-existing road network (from EP) to simulate forest operations and dynamics over a specified period. Land-base constraints are selected from the constraint list within the model, allowing the user the flexibility to add or remove constraints quickly. The database for the twenty-year harvest plan contains the attributes, such as age, stand group type, status, etc for each harvest block.

For analysis purposes, all forest stand types will be defined by a stand group. Stand groups will be used to categorize polygons by treatment; assign growth curves; describe species composition, BEC zone and elevation; and so on. The stand groups that will be used in the twenty-year harvest analysis are similar to the analysis units that will be used in the timber supply analysis, and are described in Table 7.

Table 7: Stand Group Descriptions

Stand Group	Leading Species	Site Class	Biogeoclimatic Unit	Elevation (m)
1	Spruce	G	ICH	Any
2	Spruce	M	ICH	Any
3	Spruce	P	ICH	Any
4	Balsam	G	ICH	Any
5	Balsam	M	ICH	Any
6	Balsam	P	ICH	Any
7	Spruce, Balsam	G	ESSF	Above 1700
8	Spruce, Balsam	M	ESSF	Above 1700
9	Spruce, Balsam	P	ESSF	Above 1700
10	Cedar	G	ICH, ESSF	Any
11	Cedar	M	ICH, ESSF	Any
12	Cedar	P	ICH, ESSF	Any
13	Hemlock	G	ICH, ESSF	Any
14	Hemlock	M	ICH, ESSF	Any
15	Hemlock	P	ICH, ESSF	Any

16	Fd, La, Py (dry-belt)	G	ICH, ESSF	Any
17	Fd, La, Py (dry-belt)	M	ICH, ESSF	Any
18	Fd, La, Py (dry-belt)	P	ICH, ESSF	Any
19	Douglas-fir (wet-belt)	G	ICH, ESSF	Any
20	Douglas-fir (wet-belt)	M	ICH, ESSF	Any
21	Douglas-fir (wet-belt)	P	ICH, ESSF	Any
22	Lodgepole, white pine	G	ICH, ESSF	Any
23	Lodgepole, white pine	M	ICH, ESSF	Any
24	Lodgepole, white pine	P	ICH, ESSF	Any
25	Spruce, balsam	G	ESSF	Below 1700
26	Spruce, balsam	M	ESSF	Below 1700
27	Spruce, balsam	P	ESSF	Below 1700

Use of a spatial, forest-level planning model to develop a twenty-year plan is a new concept in British Columbia. SFP plans to utilize Atlas to simulate the harvest schedule according to spatial and temporal constraints. The results of the model simulations will be used in addition to SFP's local knowledge to identify a twenty-year sequence of blocks to be harvested over the TFL.

3.2.1 Twenty-year Planning Process

- Gather required information (photos and maps)
- Prepare planning base maps
- Develop harvest block and road design
- Conduct digital loading and modeling and prepare operating area map
- Prepare area and volume reports

3.3 PHASE III - PREPARATION OF TABLES, REPORTS AND MAPS

Several simulations will be conducted in order to determine the effects of changes in land-base constraints, various land-use decisions, alternating harvest blocks and management scenarios on the achievable harvest level. SFP will analyze the results of the model simulations and integrate them with the timber supply analysis, considering economic, ecological and societal interests, in order to develop the "best" achievable management scenario for the TFL. As mentioned previously, SFP will run a sensitivity analysis with various green-up heights to assess the impact of the KBLUP on timber supply and availability.

Following the simulations, reports are produced by the model which describe the volume and area harvested by stand and by period. These tables can be used to identify the desired harvest pattern over the TFL. The tables can be incorporated into the GIS to produce visual representations of the various scenarios, which consider other forest resources, in order to identify the desired pattern.

3.3.1 Products

SFP will prepare maps, tables and reports to describe the actions on the TFL for the next 20 years. Reports created will display information by year of operation for the upcoming Forest Development Plan operations. The balance of the proposed blocks will be summarized by five-year periods. Specific reports will include:

- an activity list including all polygons to be treated by polygon number, mapsheet, operating area, etc;
- an area summary displaying harvest and regeneration activities within each operating area by period;
- a total volume summary displaying commercial species harvested within each operating area by period; and
- a block summary (# and area) displaying silvicultural system by BEC zone within each operating area.

The maps to be produced will display proposed roads and blocks by year of operation for the upcoming Forest Development Plan blocks (1997 - 2001). The balance of the proposed blocks (2002 – 2016) will be summarized by five-year period. The twenty-year harvest plan maps will include the following information:

- current and proposed blocks with a unique polygon number
- current and proposed roads
- NSR
- greened and non-greened up blocks
- creeks, swamps and lakes
- operability line
- non-conventional harvest areas

SFP will also include in the final twenty-year harvest plan package, maps showing the current status of the TFL including reforestation, forest cover, NSR, etc. A map showing the future status of the TFL at the end of the twenty-year period, given the chosen management regime identified in the twenty-year harvest plan, will also be included. Maps will also be produced showing the results of the green-up height sensitivity analysis. The aforementioned maps will be part of the display for the public presentation of the twenty-year harvest plan.

4.0 TIMELINE AND SCHEDULE

The procedures used in the preparation of the twenty-year harvest plan for TFL 3, and the anticipated completion dates by phase are summarized in the table below:

Table 8

Anticipated Completion Dates (By Phase)
Preparation of Twenty-Year Harvest Plan

Phase	Description	Anticipated Completion Date
1	SFP to define process for twenty-year harvest plan. These Terms of Reference are to be submitted to the MoF (Arrow District) for acceptance of constraints, standards, blocking process, procedure and timing.	June 27
2	Written acceptance of standardized Terms of References by MoF (Arrow District).	September 30
3	SFP to complete draft plan as outlined in the accepted Terms of Reference and submit to MoF (Arrow District).	October 15
4	Joint SFP/MoF review of draft twenty-year harvest plan	October 31
5	SFP complete edits to draft plan	November 14
6	SFP submit final report and maps to MoF (Arrow District)	December 12

APPENDIX V

TABLES FROM THE *BIODIVERSITY HANDBOOK*

APPENDIX V

TABLES FROM THE *BIODIVERSITY HANDBOOK*

- Table 20 a - Percentage reductions for stand level biodiversity.
- Table 4 - Percentage targets for patch size ranges within each seral stage.

Table 4. Recommended distribution of patch sizes (harvest units and leave areas)[a] for NDT1

Note: These values represent a vision of desired future conditions and will not necessarily be initially achievable in a watershed where forest operations are just beginning.

Patch size (ha)	% Forest area within landscape unit
<40	30–40
40–80	30–40
80–250	20–40

[a] Patch size refers to a single cutblock or an aggregation of cutblocks.

Recommendations:

- To approximate the historic pattern of this landscape type, a combination of smaller dispersed clearcuts, some dispersed partial cuts, and a few large aggregated harvest units should be used, along with mature and old seral stage forests maintained in a connected network.
- Patch sizes greater than 40 or 60 ha can be created by harvesting the entire larger patch at one time or by aggregating small cutblocks over time. In either case, structural attributes (i.e., live and dead trees) consistent with the natural disturbance type are to be retained within the patch. If smaller cutblocks are aggregated over time, the district manager may waive or reduce green-up requirements to accomplish this. When approved cutblocks exceeding 40 or 60 ha are advertised, and appear in the *Gazette*, the fact that they meet biodiversity retention objectives should be indicated.
- The size range of leave areas should be the same as that for openings.

Old seral stage retention and representativeness (NDT1)

The target for old seral stage retention in this disturbance type is described in the recommendations below.

Recommendations:

- The total area that should be retained within the landscape unit in old seral stage condition is shown in Table 3. Rare site series should be retained in greater proportion than they occur in the landscape unit; other site series should generally be retained in proportion to their occurrence in the landscape unit. Where site series mapping is not available, a combination of forest cover and site productivity or site index information should be used to determine representativeness.

Table 20(a). Percentage of a cutblock area required as wildlife tree patches when landscape units have been designated and landscape level biodiversity objectives have been established

% of the area available for harvesting in a landscape unit that has already been harvested without recommended wildlife tree retention	% of the biogeoclimatic subzone within the landscape unit available for harvest				
	90	70	50	30	10
10	7	5	3	1	0
30	9	7	5	3	1
50	11	9	7	5	3
70	13	11	9	7	5
90	15	13	11	9	7

Note: The table axes refer to the area of the landscape unit.

Table 20(b). Percentage of a cutblock area required as wildlife tree patches when landscape units have not been designated

% of the area[a] available for harvesting that has already been harvested without recommended wildlife tree retention	% of the biogeoclimatic subzone within the landscape unit available for harvest				
	90	70	50	30	10
10	10	8	6	4	3
30	12	10	8	6	4
50	14	12	10	8	6
70	16	14	12	10	8
90	18	16	14	12	10

[a] Since no landscape unit objectives have been established, the area refers to the area of an interim landscape unit or a portion of a forest development plan that forms a contiguous geographic unit.

APPENDIX VI

AREA SUMMARY AND TOTAL VOLUME TABLE

Period	# of Blocks	Area (ha)	Volume (m^3)
1 (1-5)	63	1289	418954
2 (6-10)	149	1038	412730
3 (11-15)	145	1162	465252
4 (16-20)	124	1068	375692
20 yr Total	**481**	**4558**	**1672628**
Annual Average	**120**	**223**	**83631**

APPENDIX VI
AREA SUMMARY AND TOTAL VOLUME TABLE

AREA VOLUME SUMMARY

Period	Operating Area	Harvested (ha)	Volume (m^3)	Leading Species (volume m^3)						
				F	C	H	B	S	Pl	L
1	Conventional	1,184	385,086	74,961	11,090	77,953	21,927	113,479	43,020	42,656
1	Alternate	105	33,867	35		28	4,002	26,906	1,384	1,511
1	**Total**	**1,289**	**418,953**	**74,996**	**11,090**	**77,981**	**25,929**	**140,385**	**44,404**	**44,167**
2	Conventional	966	385,124	29,608	79,423	130,996	3,289	49,313	24,385	68,111
2	Alternate	72	27,606	2,036	696	7,471		6,453		10,949
2	**Total**	**1,038**	**412,730**	**31,644**	**80,119**	**138,467**	**3,289**	**55,766**	**24,385**	**79,060**
3	Conventional	1,065	430,997	39,318	70,945	139,882	12,568	104,327	23,741	40,216
3	Alternate	95	34,254	1,648			2,995	25,495	87	4,028
3	**Total**	**1,160**	**465,251**	**40,966**	**70,945**	**139,882**	**15,563**	**129,822**	**23,828**	**44,244**
4	Conventional	937	330,520	38,528	35,074	74,947	5,806	106,760	18,072	
4	Alternate	131	45,171	10,850	1,207	3,468	6,613	19,724		447
4	**Total**	**1,068**	**375,691**	**49,378**	**36,281**	**78,415**	**12,419**	**126,484**	**18,072**	**447**
TOTAL	**Conventional**	**4,152**	**1,531,727**	**182,415**	**196,532**	**423,778**	**43,590**	**373,879**	**109,218**	**150,983**
	Alternate	**403**	**140,898**	**14,569**	**1,903**	**10,967**	**13,610**	**78,578**	**1,471**	**16,935**
	Total	**4,555**	**1,672,625**	**196,984**	**198,435**	**434,745**	**57,200**	**452,457**	**110,689**	**167,918**

Project: 20 Year Plan, Management Plan #9

Area: TFL #3 Slocan Forest Products - Slocan Division

Date: March 31, 1998

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m^3)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m^3)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
1	1997	67	82F072	11.8	4,135.0		11.8			11.8		4,135.0			4,135.0
1	1997	68	82F072	20.6	7,806.7		20.6	4.1		16.5		7,806.7	1,664.4		6,142.3
1	1997	151	82F062	27.6	8,682.5		27.6		15.7	11.9		8,682.5		4,999.2	3,683.3
1	1997	166	82F062	13.1	2,656.3		13.1		13.1			2,656.3		2,656.3	
1	1997	182	82F062	13.8	5,536.7		13.8		13.8			5,536.7		5,536.7	
1	1997	195	82F062	23.7	10,980.1		23.7			23.7		10,980.1			10,980.1
1	1997	204	82F062	1.5	562.3		1.5			1.5		562.3			562.3
1	1997	249	82F062	0.8	217.9		0.8			0.8		217.9			217.9
1	1997	265	82F062	1.5	376.7		1.5			1.5		376.7			376.7
1	1997	268	82F062	14.5	3,057.0		14.5			14.5		3,057.0			3,057.0
1	1997	274	82F062	1.7	532.2		1.7			1.7		532.2			532.2
1	1997	279	82F062	4.6	1,461.3		4.6			4.6		1,461.3			1,461.3
1	1997	290	82F062	38.6	9,594.0		38.6		38.6			9,594.0		9,594.0	
1	1997	295	82F062	1.3	316.2		1.3		1.3			316.2		316.2	
1	1997	298	82F062	1.5	588.6		1.5		1.5			588.6		588.6	
1	1997	302	82F062	2.1	816.2		2.1		2.1			816.2		816.2	
1	1997	371	82F052	14.0	3,474.1		14.0			14.0		3,474.1			3,474.1
1	1997	373	82F052	6.1	1,178.4		6.1		6.1			1,178.4		1,178.4	
1	1997	382	82F052	4.1	1,454.4		4.1		4.1			1,454.4		1,454.4	
1	1997	401	82F052	6.8	3,555.7		6.8	0.1		6.7		3,555.7	26.9		3,528.8
1	1997	403	82F052	14.7	5,225.8		14.7	14.7				5,225.8	5,225.8		
1	1998	38	82F071	14.5	5,138.2		14.5	14.5				5,138.2	5,138.2		
1	1998	43	82F071	12.2	3,390.6		12.2	12.2				3,390.6	3,390.6		
1	1998	47	82F071	26.0	11,237.9		26.0	26.0				11,237.9	11,237.9		
1	1998	52	82F071	8.1	3,288.5		8.1	8.1				3,288.5	3,288.5		
1	1998	57	82F071	22.8	7,805.2		22.8			22.8		7,805.2			7,805.2
1	1998	80	82F072	31.2	10,559.5		31.2	31.2				10,559.5	10,559.5		
1	1998	85	82F072	12.6	4,399.0		12.6	12.6				4,399.0	4,399.0		
1	1998	92	82F071	5.9	1,729.5		5.9	5.9				1,729.5	1,729.5		
1	1998	106	82F071	25.0	5,770.0		25.0	25.0				5,770.0	5,770.0		
1	1998	183	82F062	23.1	11,532.9		23.1	3.8		19.3		11,532.9	1,803.0		9,729.9
1	1998	378	82F052	15.1	3,270.8		15.1		15.1			3,270.8		3,270.8	
1	1998	380	82F052	25.0	6,806.7		25.0	0.1		24.9		6,806.7	30.4		6,776.3
1	1998	386	82F052	33.7	11,860.4	0.9	32.8	0.1		33.6	251.8	11,608.6	26.7		11,833.7
1	1999	6	82F072	15.2	6,642.6	2.1	13.1	1.1		14.1	707.5	5,935.1	433.7		6,208.9
1	1999	45	82F072	18.1	8,403.4		18.1	3.7		14.4		8,403.4	1,791.0		6,612.4
1	1999	126	82F061	42.5	19,755.6		42.5	24.3		18.2		19,755.6	12,762.9		6,992.7
1	1999	155	82F062	13.0	4,542.6		13.0	13.0				4,542.6	4,542.6		
1	1999	208	82F062	34.1	9,873.4		34.1	34.1				9,873.4	9,873.4		
1	1999	220	82F062	11.9	2,979.2		11.9			11.9		2,979.2			2,979.2
1	1999	232	82F062	17.8	3,184.4		17.8			17.8		3,184.4			3,184.4
1	1999	306	82F061	11.2	3,182.0		11.2	11.2				3,182.0	3,182.0		
1	1999	353	82F051	11.9	4,034.2		11.9	11.9				4,034.2	4,034.2		
1	1999	359	82F051	61.4	17,715.5		61.4	61.4				17,715.5	17,715.5		
1	1999	365	82F052	25.3	5,706.8		25.3		21.8	3.5		5,706.8		4,825.3	881.5
1	1999	370	82F052	13.3	2,732.8		13.3		6.7	6.6		2,732.8		1,170.6	1,562.2
1	1999	376	82F052	27.1	6,047.3		27.1		2.7	24.4		6,047.3		477.3	5,570.0
1	1999	387	82F052	7.7	3,201.5		7.7			7.7		3,201.5			3,201.5
1	1999	389	82F052	33.3	16,571.3		33.3	24.7		8.6		16,571.3	11,814.2		4,757.1
1	1999	445	82F052	6.1	1,511.5	6.1		0.9		5.2	1,511.5		237.8		1,273.7
1	2000	9	82F071	4.4	2,366.1		4.4			4.4		2,366.1			2,366.1
1	2000	12	82F071	12.3	6,578.0		12.3			12.3		6,578.0			6,578.0

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m^3)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m^3)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
1	2000	120	82F062	48.9	12,932.7		48.9	14.4		34.5		12,932.7	4,248.6		8,684.1
1	2000	121	82F062	7.1	1,879.8	6.2	0.9	7.1			1,743.3	136.5	1,879.8		
1	2000	136	82F062	62.3	19,302.1		62.3	29.5		32.8		19,302.1	10,423.9		8,878.2
1	2000	199	82F062	52.7	16,639.8		52.7	42.2		10.5		16,639.8	12,524.8		4,115.0
1	2000	241	82F062	15.5	3,703.0		15.5			15.5		3,703.0			3,703.0
1	2000	260	82F062	25.7	7,966.3		25.7			25.7		7,966.3			7,966.3
1	2000	384	82F052	67.5	18,221.9		67.5		11.4	56.1		18,221.9		3,152.3	15,069.6
1	2000	388	82F052	41.0	11,545.7		41.0		3.8	37.2		11,545.7		1,230.8	10,314.9
1	2000	414	82F071	21.1	7,624.5	21.1		21.1			7,624.5		7,624.5		
1	2001	132	82F061	14.4	5,970.2		14.4	14.4				5,970.2	5,970.2		
1	2001	346	82F051	81.0	27,638.1	62.6	18.4	81.0			20,524.1	7,114.0	27,638.1		
1	2001	430	82F062	5.8	1,504.8	5.8		5.8			1,504.8		1,504.8		
Period 1 Sub Totals				**1,289.2**	**418,954.4**	**104.8**	**1,184.4**	**560.2**	**157.8**	**571.2**	**33,867.5**	**385,086.9**	**192,492.4**	**41,267.1**	**185,194.9**
2	na	7	82F071	6.5	3,487.3		6.5	3.0		3.5		3,487.3	1,604.5		1,882.8
2	na	8	82F071	5.9	3,124.1		5.9			5.9		3,124.1			3,124.1
2	na	11	82F071	0.0	17.1		0.0			0.0		17.1			17.1
2	na	14	82F071	12.5	3,101.2		12.5			12.5		3,101.2			3,101.2
2	na	17	82F071	2.9	1,471.7		2.9			2.9		1,471.7			1,471.7
2	na	19	82F071	0.2	123.1		0.2			0.2		123.1			123.1
2	na	20	82F071	2.8	674.7		2.8			2.8		674.7			674.7
2	na	21	82F071	0.0	6.7		0.0	0.0				6.7	6.7		
2	na	24	82F072	12.9	5,823.7		12.9	12.9				5,823.7	5,823.7		
2	na	29	82F071	8.3	3,625.4		8.3	8.3				3,625.4	3,625.4		
2	na	31	82F071	6.7	2,283.1		6.7	6.7				2,283.1	2,283.1		
2	na	35	82F071	5.8	2,545.9		5.8	5.8				2,545.9	2,545.9		
2	na	36	82F072	1.0	432.1		1.0	1.0				432.1	432.1		
2	na	40	82F072	6.4	2,616.5		6.4	6.4				2,616.5	2,616.5		
2	na	42	82F071	6.5	4,151.5		6.5			6.5		4,151.5			4,151.5
2	na	44	82F072	1.3	663.9		1.3			1.3		663.9			663.9
2	na	55	82F071	0.0	16.0		0.0			0.0		16.0			16.0
2	na	62	82F071	6.2	2,583.1		6.2			6.2		2,583.1			2,583.1
2	na	65	82F071	6.0	1,361.4		6.0			6.0		1,361.4			1,361.4
2	na	70	82F071	3.8	2,146.2		3.8	3.8				2,146.2	2,146.2		
2	na	71	82F071	1.7	715.5		1.7			1.7		715.5			715.5
2	na	74	82F071	16.4	2,898.2		16.4	16.4				2,898.2	2,898.2		
2	na	79	82F071	11.2	5,636.3		11.2	11.2				5,636.3	5,636.3		
2	na	81	82F071	7.6	4,201.5		7.6	3.2		4.4		4,201.5	1,785.8		2,415.7
2	na	82	82F071	7.0	1,855.1		7.0			7.0		1,855.1			1,855.1
2	na	83	82F073	12.7	2,813.9		12.7			12.7		2,813.9			2,813.9
2	na	87	82F071	0.0	2.3		0.0	0.0				2.3	2.3		
2	na	89	82F072	18.3	11,018.6		18.3		18.3			11,018.6		11,018.6	
2	na	95	82F072	5.9	2,080.4	5.3	0.6	3.2		2.7	1,870.3	210.1	1,130.6		949.8
2	na	101	82F072	0.0	9.9		0.0			0.0		9.9			9.9
2	na	102	82F072	0.2	53.9		0.2			0.2		53.9			53.9
2	na	104	82F072	0.1	47.2		0.1			0.1		47.2			47.2
2	na	108	82F072	2.6	1,110.9		2.6			2.6		1,110.9			1,110.9
2	na	111	82F061	0.2	88.8		0.2			0.2		88.8			88.8
2	na	112	82F061	1.5	430.5		1.5	1.5				430.5	430.5		
2	na	113	82F062	3.0	713.0		3.0	1.6		1.4		713.0	382.5		330.5
2	na	116	82F061	9.3	4,820.4		9.3			9.3		4,820.4			4,820.4
2	na	117	82F061	3.1	1,739.6		3.1	3.1				1,739.6	1,739.6		
2	na	118	82F062	6.0	2,049.6		6.0			6.0		2,049.6			2,049.6
2	na	122	82F061	16.5	3,910.6		16.5	16.5				3,910.6	3,910.6		
2	na	123	82F061	25.0	13,781.2		25.0	9.1		15.9		13,781.2	5,065.8		8,715.4
2	na	130	82F062	4.6	1,536.3		4.6			4.6		1,536.3			1,536.3
2	na	131	82F061	1.5	285.0		1.5			1.5		285.0			285.0
2	na	134	82F062	6.2	1,926.3		6.2			6.2		1,926.3			1,926.3

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m³)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m³)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
2	na	141	82F061	10.3	1,952.4		10.3	10.3				1,952.4	1,952.4		
2	na	142	82F062	9.0	2,413.3		9.0			9.0		2,413.3			2,413.3
2	na	143	82F061	7.2	3,884.6		7.2			7.2		3,884.6			3,884.6
2	na	149	82F062	7.3	1,512.2		7.3			7.3		1,512.2			1,512.2
2	na	150	82F061	7.6	1,754.7		7.6			7.6		1,754.7			1,754.7
2	na	152	82F061	0.1	70.4		0.1			0.1		70.4			70.4
2	na	154	82F062	9.5	3,363.3		9.5	9.5				3,363.3	3,363.3		
2	na	156	82F061	17.6	9,604.2		17.6			17.6		9,604.2			9,604.2
2	na	158	82F062	1.9	527.7		1.9		1.9			527.7		527.7	
2	na	160	82F062	1.8	632.0		1.8	1.8				632.0	632.0		
2	na	161	82F061	34.4	14,514.3		34.4	30.3		4.1		14,514.3	12,814.2		1,700.1
2	na	164	82F061	10.7	7,431.0		10.7			10.7		7,431.0			7,431.0
2	na	165	82F062	3.1	1,067.6		3.1		3.1			1,067.6		1,067.6	
2	na	167	82F062	3.6	1,364.6		3.6		3.6			1,364.6		1,364.6	
2	na	169	82F062	0.2	58.3		0.2		0.2			58.3		58.3	
2	na	170	82F061	1.3	841.4		1.3	1.3				841.4	841.4		
2	na	171	82F062	5.8	2,483.8		5.8	5.8				2,483.8	2,483.8		
2	na	175	82F062	5.1	2,472.7		5.1	5.1				2,472.7	2,472.7		
2	na	181	82F061	11.4	4,045.2		11.4	10.3		1.1		4,045.2	3,713.2		332.0
2	na	184	82F062	8.1	4,341.5		8.1	6.0		2.1		4,341.5	3,230.8		1,110.7
2	na	187	82F062	5.4	968.8		5.4		5.4			968.8		968.8	
2	na	191	82F062	12.0	5,790.1		12.0	12.0				5,790.1	5,790.1		
2	na	205	82F062	28.0	18,738.6		28.0	28.0				18,738.6	18,738.6		
2	na	209	82F061	0.2	68.4		0.2	0.2				68.4	68.4		
2	na	210	82F061	2.8	1,317.1		2.8	2.8				1,317.1	1,317.1		
2	na	211	82F062	4.0	941.4		4.0	4.0				941.4	941.4		
2	na	213	82F061	1.4	732.5		1.4	1.4				732.5	732.5		
2	na	217	82F062	14.4	5,140.6		14.4	10.9		3.5		5,140.6	3,683.7		1,456.9
2	na	230	82F062	4.2	1,166.8		4.2	4.2				1,166.8	1,166.8		
2	na	234	82F061	11.7	3,740.5		11.7			11.7		3,740.5			3,740.5
2	na	239	82F061	13.2	7,210.6		13.2			13.2		7,210.6			7,210.6
2	na	250	82F061	0.2	86.2		0.2			0.2		86.2			86.2
2	na	252	82F061	7.0	1,217.3		7.0			7.0		1,217.3			1,217.3
2	na	253	82F062	9.7	2,406.6		9.7			9.7		2,406.6			2,406.6
2	na	254	82F062	6.0	1,691.7		6.0			6.0		1,691.7			1,691.7
2	na	255	82F061	7.4	4,014.3		7.4			7.4		4,014.3			4,014.3
2	na	256	82F061	6.3	1,101.6		6.3	0.7		5.6		1,101.6	126.4		975.2
2	na	257	82F061	10.2	1,793.6		10.2	10.2				1,793.6	1,793.6		
2	na	262	82F061	1.9	1,051.7		1.9			1.9		1,051.7			1,051.7
2	na	263	82F062	11.0	3,635.1		11.0			11.0		3,635.1			3,635.1
2	na	266	82F062	27.1	9,675.2		27.1			27.1		9,675.2			9,675.2
2	na	270	82F062	9.7	3,743.4		9.7			9.7		3,743.4			3,743.4
2	na	275	82F062	39.7	11,296.8		39.7	0.0	39.7			11,296.8	11.8	11,285.0	
2	na	276	82F061	8.4	2,179.0		8.4			8.4		2,179.0			2,179.0
2	na	277	82F061	3.2	1,733.9		3.2			3.2		1,733.9			1,733.9
2	na	281	82F062	30.1	12,007.7		30.1		30.1			12,007.7		12,007.7	
2	na	282	82F062	0.0	0.4		0.0			0.0		0.4			0.4
2	na	286	82F061	12.1	2,279.3		12.1			12.1		2,279.3			2,279.3
2	na	291	82F062	11.1	4,699.2		11.1		11.1			4,699.2		4,699.2	
2	na	292	82F061	1.3	447.6		1.3			1.3		447.6			447.6
2	na	294	82F062	5.6	1,083.3		5.6		5.6			1,083.3		1,083.3	
2	na	300	82F062	12.9	2,722.9		12.9			12.9		2,722.9			2,722.9
2	na	303	82F062	13.7	4,432.9		13.7		13.7			4,432.9		4,432.9	
2	na	305	82F061	0.8	238.4		0.8			0.8		238.4			238.4
2	na	310	82F061	1.8	387.3		1.8	1.8				387.3	387.3		
2	na	311	82F061	7.0	2,780.7		7.0			7.0		2,780.7			2,780.7
2	na	312	82F061	2.1	359.9		2.1			2.1		359.9			359.9
2	na	315	82F062	3.8	567.3		3.8			3.8		567.3			567.3
2	na	323	82F051	4.8	714.5		4.8			4.8		714.5			714.5

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area (ha)	Block Volume (m^3)	Area Summary (ha): Operability (1996) Alternate	Operable	Biogeoclimatic Zone and Variant ESSFwc4	ICH-dw-	ICH-mw2	Volume Summary (m^3): Operability (1996) Alternate	Operable	Biogeoclimatic Zone and Variant ESSFwc4	ICH-dw-	ICH-mw2
2	na	325	82F062	14.4	8,140.7		14.4	8.4	6.0			8,140.7	4,743.4	3,397.3	
2	na	326	82F051	14.8	7,153.6		14.8	4.6		10.2		7,153.6	2,224.5		4,929.1
2	na	331	82F051	4.9	2,635.0		4.9			4.9		2,635.0			2,635.0
2	na	333	82F052	5.5	1,879.3		5.5		5.5			1,879.3		1,879.3	
2	na	334	82F051	1.0	579.4		1.0			1.0		579.4			579.4
2	na	336	82F052	11.1	3,269.8		11.1		11.1			3,269.8		3,269.8	
2	na	338	82F052	10.1	4,178.8		10.1	2.7	7.4			4,178.8	964.3	3,214.5	
2	na	339	82F051	6.0	2,909.0		6.0			6.0		2,909.0			2,909.0
2	na	341	82F051	4.2	1,425.7		4.2	4.2				1,425.7	1,425.7		
2	na	342	82F052	5.7	1,896.4		5.7		5.7			1,896.4		1,896.4	
2	na	344	82F052	6.4	2,759.5		6.4		6.4			2,759.5		2,759.5	
2	na	348	82F051	6.4	3,617.5		6.4	6.4				3,617.5	3,617.5		
2	na	351	82F051	0.5	148.8		0.5	0.5				148.8	148.8		
2	na	354	82F051	11.1	6,098.2		11.1	3.7		7.4		6,098.2	2,058.3		4,039.9
2	na	361	82F051	12.8	6,891.7		12.8			12.8		6,891.7			6,891.7
2	na	368	82F051	6.3	1,809.1		6.3	6.3				1,809.1	1,809.1		
2	na	369	82F051	10.0	1,763.4		10.0	10.0				1,763.4	1,763.4		
2	na	372	82F051	9.2	4,950.7		9.2			9.2		4,950.7			4,950.7
2	na	375	82F051	9.9	4,366.0	7.5	2.4	9.9			3,304.1	1,061.9	4,366.0		
2	na	377	82F051	4.4	2,294.4		4.4			4.4		2,294.4			2,294.4
2	na	383	82F052	7.0	1,947.4		7.0		7.0			1,947.4		1,947.4	
2	na	390	82F052	0.0	1.4		0.0			0.0		1.4			1.4
2	na	392	82F051	3.3	1,591.2		3.3	3.3				1,591.2	1,591.2		
2	na	394	82F052	2.3	1,236.9		2.3	2.3				1,236.9	1,236.9		
2	na	399	82F052	1.3	686.2		1.3	1.3				686.2	686.2		
2	na	402	82F052	4.8	2,618.1		4.8			4.8		2,618.1			2,618.1
2	na	404	82F052	7.9	4,358.9		7.9			7.9		4,358.9			4,358.9
2	na	405	82F052	0.0	22.4		0.0			0.0		22.4			22.4
2	na	411	82F052	0.1	46.0		0.1	0.1				46.0	46.0		
2	na	422	82F072	9.0	3,422.8	9.0		9.0			3,422.8		3,422.8		
2	na	428	82F072	7.1	1,903.8	7.1				7.1	1,903.8				1,903.8
2	na	434	82F061	21.5	9,078.9	21.5		21.5			9,078.9		9,078.9		
2	na	440	82F061	20.4	7,197.6	20.4		20.4			7,197.6		7,197.6		
2	na	451	82F051	0.3	132.5	0.3		0.3			132.5		132.5		
2	na	452	82F051	0.1	57.7	0.1		0.0		0.1	57.7		8.6		49.1
2	na	453	82F051	1.2	638.5	1.2		1.2			638.5		638.5		
2	na	460	82F062	1.9	1,108.6		1.9		1.9			1,108.6		1,108.6	
2	na	466	82F061	5.3	3,076.7		5.3			5.3		3,076.7			3,076.7
2	na	468	82F061	3.6	2,528.6		3.6			3.6		2,528.6			2,528.6
2	na	471	82F061	5.0	879.2		5.0			5.0		879.2			879.2
2	na	473	82F061	5.4	2,972.6		5.4			5.4		2,972.6			2,972.6
2	na	475	82F071	4.0	2,048.1		4.0			4.0		2,048.1			2,048.1
2	na	479	82F052	1.0	529.6		1.0			1.0		529.6			529.6
2	na	480	82F052	1.2	648.1		1.2			1.2		648.1			648.1
2	na	481	82F052	0.1	26.9		0.1			0.1		26.9			26.9
2	na	482	82F062	4.8	2,725.8		4.8		4.8			2,725.8		2,725.8	
Period 2 Sub Totals				**1,037.8**	**412,729.6**	**72.4**	**965.4**	**386.4**	**188.5**	**462.9**	**27,606.2**	**385,123.4**	**157,488.0**	**70,712.3**	**184,529.3**
3	na	2	82F081	0.1	10.5		0.1	0.1				10.5	10.5		
3	na	3	82F081	5.5	2,243.7		5.5	5.5				2,243.7	2,243.7		
3	na	4	82F081	0.1	12.7		0.1	0.1				12.7	12.7		
3	na	18	82F071	5.0	2,809.8		5.0	5.0				2,809.8	2,809.8		
3	na	22	82F071	0.3	155.2		0.3	0.3				155.2	155.2		
3	na	23	82F071	34.4	15,040.0	14.7	19.7	34.4			6,620.7	8,419.3	15,040.0		
3	na	27	82F071	49.2	16,984.2		49.2	49.2				16,984.2	16,984.2		
3	na	32	82F072	7.2	1,524.5		7.2	1.2		6.0		1,524.5	277.5		1,247.0
3	na	39	82F071	6.9	1,791.5		6.9	6.9				1,791.5	1,791.5		
3	na	41	82F071	4.0	2,656.9		4.0			4.0		2,656.9			2,656.9

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area (ha)	Block Volume (m³)	Area Summary (ha)					Volume Summary (m³)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
						Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
3	na	48	82F073	17.8	4,601.1		17.8		6.9	10.9		4,601.1		1,784.4	2,816.7
3	na	51	82F071	6.8	3,906.8		6.8			6.8		3,906.8			3,906.8
3	na	53	82F071	26.3	14,741.3		26.3			26.3		14,741.3			14,741.3
3	na	54	82F072	21.1	7,851.8		21.1			21.1		7,851.8			7,851.8
3	na	58	82F071	2.1	991.0		2.1	2.1				991.0	991.0		
3	na	61	82F072	9.4	3,209.7		9.4	9.4				3,209.7	3,209.7		
3	na	63	82F072	0.1	30.7		0.1	0.1				30.7	30.7		
3	na	66	82F072	3.9	1,480.8		3.9			3.9		1,480.8			1,480.8
3	na	69	82F073	8.2	2,186.4		8.2			8.2		2,186.4			2,186.4
3	na	72	82F071	1.9	776.6		1.9			1.9		776.6			776.6
3	na	73	82F071	3.5	1,958.0		3.5	3.5				1,958.0	1,958.0		
3	na	76	82F072	1.8	1,224.6		1.8			1.8		1,224.6			1,224.6
3	na	77	82F071	0.1	31.0		0.1			0.1		31.0			31.0
3	na	86	82F072	14.3	7,946.8		14.3			14.3		7,946.8			7,946.8
3	na	88	82F072	0.0	0.0		0.0			0.0		0.0			0.0
3	na	91	82F072	0.9	227.3		0.9			0.9		227.3			227.3
3	na	94	82F072	8.0	4,359.1		8.0			8.0		4,359.1			4,359.1
3	na	96	82F072	6.2	3,592.1		6.2			6.2		3,592.1			3,592.1
3	na	98	82F072	0.3	96.8		0.3			0.3		96.8			96.8
3	na	99	82F071	6.3	1,781.9		6.3			6.3		1,781.9			1,781.9
3	na	109	82F072	3.2	1,030.5		3.2			3.2		1,030.5			1,030.5
3	na	115	82F061	0.8	396.1		0.8			0.8		396.1			396.1
3	na	119	82F061	0.0	11.1		0.0			0.0		11.1			11.1
3	na	124	82F061	34.7	16,454.2		34.7	34.7				16,454.2	16,454.2		
3	na	127	82F062	7.7	2,269.8		7.7			7.7		2,269.8			2,269.8
3	na	129	82F061	1.1	581.7		1.1	1.1				581.7	581.7		
3	na	137	82F061	0.0	0.6		0.0			0.0		0.6			0.6
3	na	139	82F061	4.3	2,463.7		4.3			4.3		2,463.7			2,463.7
3	na	144	82F062	8.0	2,826.4		8.0	8.0				2,826.4	2,826.4		
3	na	147	82F061	16.0	9,338.1		16.0			16.0		9,338.1			9,338.1
3	na	153	82F062	10.7	3,020.4		10.7		10.7			3,020.4		3,020.4	
3	na	157	82F061	0.2	72.9		0.2			0.2		72.9			72.9
3	na	159	82F061	11.0	6,026.1		11.0			11.0		6,026.1			6,026.1
3	na	163	82F061	10.4	4,346.9		10.4	10.4				4,346.9	4,346.9		
3	na	174	82F062	9.6	3,321.0		9.6	9.6				3,321.0	3,321.0		
3	na	176	82F062	4.5	2,170.3		4.5	4.5				2,170.3	2,170.3		
3	na	177	82F062	3.5	1,768.1		3.5			3.5		1,768.1			1,768.1
3	na	180	82F062	8.1	3,946.6		8.1	6.8		1.3		3,946.6	3,297.3		649.3
3	na	190	82F062	15.2	3,865.8		15.2		15.2			3,865.8		3,865.8	
3	na	194	82F062	0.1	41.6		0.1	0.1				41.6	41.6		
3	na	197	82F062	1.1	530.6		1.1	1.1				530.6	530.6		
3	na	198	82F062	30.9	17,082.4		30.9			30.9		17,082.4			17,082.4
3	na	200	82F062	2.7	1,346.6		2.7			2.7		1,346.6			1,346.6
3	na	201	82F062	5.9	2,011.8		5.9	5.9				2,011.8	2,011.8		
3	na	202	82F062	0.1	30.2		0.1	0.1				30.2	30.2		
3	na	203	82F062	17.2	3,739.4		17.2		17.2			3,739.4		3,739.4	
3	na	206	82F062	14.1	9,731.5		14.1			14.1		9,731.5			9,731.5
3	na	212	82F062	3.7	2,001.4		3.7			3.7		2,001.4			2,001.4
3	na	214	82F062	8.8	3,286.1		8.8	8.8				3,286.1	3,286.1		
3	na	216	82F062	0.2	189.2		0.2	0.2				189.2	189.2		
3	na	219	82F061	19.5	3,412.5		19.5			19.5		3,412.5			3,412.5
3	na	222	82F062	2.4	1,020.2		2.4	2.4				1,020.2	1,020.2		
3	na	223	82F061	18.9	8,873.4		18.9	18.9				8,873.4	8,873.4		
3	na	225	82F062	5.8	2,049.2		5.8			5.8		2,049.2			2,049.2
3	na	228	82F062	8.8	3,549.9		8.8			8.8		3,549.9			3,549.9
3	na	236	82F061	0.1	39.5		0.1	0.1		0.0		39.5	26.8		12.7
3	na	240	82F061	26.2	5,508.0		26.2			26.2		5,508.0			5,508.0
3	na	243	82F062	10.9	2,371.5		10.9		10.9			2,371.5		2,371.5	
3	na	244	82F062	3.4	935.5		3.4			3.4		935.5			935.5

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m³)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m³)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
3	na	246	82F061	8.5	4,623.9		8.5			8.5		4,623.9			4,623.9
3	na	247	82F061	14.8	3,288.9		14.8	14.8				3,288.9	3,288.9		
3	na	248	82F062	20.1	10,235.0		20.1		20.1			10,235.0		10,235.0	
3	na	251	82F061	10.7	5,984.9		10.7			10.7		5,984.9			5,984.9
3	na	259	82F062	4.9	1,210.7		4.9			4.9		1,210.7			1,210.7
3	na	267	82F062	1.2	264.6		1.2		1.2			264.6		264.6	
3	na	271	82F061	3.9	1,219.3	1.9	2.0	3.9			782.7	436.6	1,219.3		
3	na	273	82F062	39.1	9,586.8		39.1			39.1		9,586.8			9,586.8
3	na	283	82F062	15.6	2,804.0		15.6		15.6			2,804.0		2,804.0	
3	na	284	82F062	0.0	7.6		0.0		0.0			7.6		7.6	
3	na	285	82F061	0.2	118.2		0.2	0.2				118.2	118.2		
3	na	288	82F062	9.3	4,011.4		9.3		9.3			4,011.4		4,011.4	
3	na	293	82F062	13.5	6,600.1	3.7	9.8	13.5			1,797.1	4,803.0	6,600.1		
3	na	297	82F062	4.4	1,127.7		4.4		4.4			1,127.7		1,127.7	
3	na	304	82F062	28.5	4,981.6		28.5			28.5		4,981.6			4,981.6
3	na	307	82F062	3.0	832.8		3.0		3.0			832.8		832.8	
3	na	309	82F062	2.8	825.3		2.8	1.0	1.8			825.3	314.1	511.2	
3	na	314	82F062	0.0	9.0		0.0		0.0			9.0		9.0	
3	na	316	82F062	0.5	113.3		0.5			0.5		113.3			113.3
3	na	320	82F051	5.1	2,693.8		5.1			5.1		2,693.8			2,693.8
3	na	321	82F051	0.0	0.1		0.0			0.0		0.1			0.1
3	na	322	82F061	0.2	120.7		0.2			0.2		120.7			120.7
3	na	324	82F051	6.9	2,460.7		6.9	6.9				2,460.7	2,460.7		
3	na	328	82F051	10.2	5,433.6		10.2			10.2		5,433.6			5,433.6
3	na	329	82F051	16.2	9,018.9		16.2	16.2				9,018.9	9,018.9		
3	na	332	82F051	11.2	2,363.3		11.2			11.2		2,363.3			2,363.3
3	na	337	82F052	13.2	3,649.5		13.2		13.2			3,649.5		3,649.5	
3	na	340	82F052	14.2	4,938.5		14.2	14.2				4,938.5	4,938.5		
3	na	343	82F051	24.2	12,315.7		24.2	0.3		23.9		12,315.7	127.2		12,188.5
3	na	350	82F052	19.8	8,542.5		19.8		19.8			8,542.5		8,542.5	
3	na	363	82F052	13.3	3,676.4		13.3		13.3			3,676.4		3,676.4	
3	na	366	82F051	6.5	3,536.3		6.5	6.5				3,536.3	3,536.3		
3	na	367	82F051	5.6	2,978.4		5.6			5.6		2,978.4			2,978.4
3	na	374	82F051	0.3	164.9		0.3			0.3		164.9			164.9
3	na	381	82F052	20.7	9,338.9		20.7	20.7				9,338.9	9,338.9		
3	na	385	82F051	5.2	1,228.8		5.2	5.2				1,228.8	1,228.8		
3	na	391	82F052	20.4	10,838.2		20.4			20.4		10,838.2			10,838.2
3	na	393	82F052	12.1	6,458.0		12.1	7.7		4.4		6,458.0	4,019.9		2,438.1
3	na	396	82F052	10.6	5,801.5		10.6			10.6		5,801.5			5,801.5
3	na	397	82F051	6.0	2,503.9		6.0	6.0				2,503.9	2,503.9		
3	na	398	82F051	19.6	7,243.3		19.6	19.6				7,243.3	7,243.3		
3	na	406	82F052	0.1	51.3		0.1			0.1		51.3			51.3
3	na	407	82F052	2.8	712.4		2.8	2.8				712.4	712.4		
3	na	408	82F052	0.0	11.6		0.0	0.0				11.6	11.6		
3	na	409	82F052	2.1	1,151.5		2.1	2.1				1,151.5	1,151.5		
3	na	410	82F052	6.9	3,392.9		6.9			6.9		3,392.9			3,392.9
3	na	412	82F052	2.5	1,215.3		2.5	2.5				1,215.3	1,215.3		
3	na	423	82F071	1.8	766.4	1.8		1.8			766.4		766.4		
3	na	425	82F072	6.1	1,879.7	6.1		6.1			1,879.7		1,879.7		
3	na	426	82F072	8.4	2,580.6	8.4		8.4			2,580.6		2,580.6		
3	na	427	82F072	7.7	1,648.1	7.7				7.7	1,648.1				1,648.1
3	na	431	82F061	4.8	2,021.9	4.8		4.8			2,021.9		2,021.9		
3	na	432	82F061	6.1	1,473.7	6.1		6.1			1,473.7		1,473.7		
3	na	433	82F062	14.8	3,210.5	14.8			14.8		3,210.5			3,210.5	
3	na	437	82F061	0.4	86.9	0.4		0.4			86.9		86.9		
3	na	438	82F061	12.9	5,795.4	12.9		12.9			5,795.4		5,795.4		
3	na	446	82F051	6.4	2,717.4	6.4		6.4			2,717.4		2,717.4		
3	na	454	82F051	2.8	1,242.8	2.8		2.8			1,242.8		1,242.8		
3	na	455	82F071	2.4	1,073.7	2.4		2.4			1,073.7		1,073.7		

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m^3)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m^3)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
3	na	456	82F071	9.1	5,119.3		9.1			9.1		5,119.3			5,119.3
3	na	457	82F061	5.0	2,913.0		5.0			5.0		2,913.0			2,913.0
3	na	458	82F051	1.4	659.2		1.4	1.4				659.2	659.2		
3	na	459	82F052	5.5	2,314.2		5.5	5.5				2,314.2	2,314.2		
3	na	461	82F062	7.2	1,591.4		7.2		7.2			1,591.4		1,591.4	
3	na	462	82F062	4.6	1,175.1		4.6		4.6			1,175.1		1,175.1	
3	na	463	82F072	3.0	1,392.7		3.0			3.0		1,392.7			1,392.7
3	na	464	82F072	6.0	4,161.0		6.0			6.0		4,161.0			4,161.0
3	na	465	82F061	1.7	980.9		1.7			1.7		980.9			980.9
3	na	467	82F061	0.6	336.6		0.6			0.6		336.6			336.6
3	na	469	82F061	3.7	2,198.2		3.7			3.7		2,198.2			2,198.2
3	na	472	82F061	2.1	1,130.9		2.1			2.1		1,130.9			1,130.9
3	na	474	82F061	9.7	5,623.9		9.7			9.7		5,623.9			5,623.9
3	na	476	82F071	1.4	730.7		1.4	1.4				730.7	730.7		
3	na	477	82F071	1.1	556.4	1.1		1.1			556.4		556.4		
3	na	478	82F052	5.5	3,026.8		5.5			5.5		3,026.8			3,026.8
3	na	483	82F071	2.2	1,274.8		2.2			2.2		1,274.8			1,274.8
Period 3 Sub Totals				**1,162.8**	**465,251.8**	**96.0**	**1,066.8**	**436.1**	**189.2**	**537.5**	**34,254.0**	**430,997.8**	**177,469.0**	**56,430.2**	**231,352.6**
4	na	5	82F081	10.5	1,710.5		10.5	10.5				1,710.5	1,710.5		
4	na	10	82F071	12.4	5,299.6		12.4	10.5		1.9		5,299.6	4,423.6		876.0
4	na	13	82F071	0.1	76.4		0.1			0.1		76.4			76.4
4	na	15	82F071	31.1	17,092.1		31.1	3.5		27.6		17,092.1	1,949.6		15,142.5
4	na	16	82F072	1.1	498.5		1.1	1.1				498.5	498.5		
4	na	25	82F071	19.7	6,925.5		19.7	19.7				6,925.5	6,925.5		
4	na	26	82F071	5.4	2,576.9		5.4	5.4				2,576.9	2,576.9		
4	na	28	82F072	9.2	3,202.7		9.2	9.2				3,202.7	3,202.7		
4	na	30	82F071	29.3	10,216.6		29.3	29.3				10,216.6	10,216.6		
4	na	33	82F072	10.7	3,401.3		10.7	10.7				3,401.3	3,401.3		
4	na	34	82F071	20.8	7,186.7		20.8	20.8				7,186.7	7,186.7		
4	na	37	82F071	10.3	1,808.1		10.3	10.3				1,808.1	1,808.1		
4	na	46	82F071	10.0	2,951.4		10.0	10.0				2,951.4	2,951.4		
4	na	49	82F072	30.8	7,626.8		30.8			30.8		7,626.8			7,626.8
4	na	50	82F072	30.8	16,334.9	1.4	29.4	30.8			690.7	15,644.2	16,334.9		
4	na	56	82F072	8.0	1,745.3		8.0			8.0		1,745.3			1,745.3
4	na	59	82F071	13.1	4,236.8		13.1	13.1				4,236.8	4,236.8		
4	na	60	82F072	6.8	2,823.5		6.8	6.8				2,823.5	2,823.5		
4	na	64	82F072	5.2	2,142.1		5.2			5.2		2,142.1			2,142.1
4	na	75	82F072	6.8	1,859.2		6.8			6.8		1,859.2			1,859.2
4	na	78	82F072	4.2	1,199.6		4.2			4.2		1,199.6			1,199.6
4	na	84	82F073	22.9	6,102.1		22.9			22.9		6,102.1			6,102.1
4	na	90	82F071	2.7	1,022.2		2.7	2.7				1,022.2	1,022.2		
4	na	93	82F071	5.3	2,122.4		5.3	5.3				2,122.4	2,122.4		
4	na	97	82F071	4.3	1,633.2		4.3	4.3				1,633.2	1,633.2		
4	na	100	82F072	26.7	14,965.6		26.7			26.7		14,965.6			14,965.6
4	na	103	82F072	6.4	1,416.0		6.4		6.4			1,416.0		1,416.0	
4	na	105	82F071	2.8	678.0		2.8			2.8		678.0			678.0
4	na	107	82F072	4.3	1,761.4		4.3			4.3		1,761.4			1,761.4
4	na	110	82F061	3.1	1,493.0		3.1			3.1		1,493.0			1,493.0
4	na	114	82F061	15.8	4,164.1		15.8			15.8		4,164.1			4,164.1
4	na	125	82F061	3.3	737.0		3.3	3.3				737.0	737.0		
4	na	128	82F062	7.7	2,768.5		7.7			7.7		2,768.5			2,768.5
4	na	133	82F061	15.0	6,299.7		15.0	15.0				6,299.7	6,299.7		
4	na	135	82F061	1.5	388.2		1.5	1.5				388.2	388.2		
4	na	138	82F062	9.4	4,978.1		9.4			9.4		4,978.1			4,978.1
4	na	140	82F062	8.9	3,761.3		8.9	8.9				3,761.3	3,761.3		
4	na	145	82F062	10.9	3,502.1		10.9	10.9				3,502.1	3,502.1		
4	na	146	82F062	11.1	2,591.1		11.1			11.1		2,591.1			2,591.1

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Summary (m³)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m³)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
4	na	148	82F061	14.8	3,650.4		14.8			14.8		3,650.4			3,650.4
4	na	162	82F062	2.6	627.9		2.6	2.6				627.9	627.9		
4	na	168	82F062	12.3	4,936.4		12.3	12.3				4,936.4	4,936.4		
4	na	172	82F062	7.1	3,377.1		7.1	7.1				3,377.1	3,377.1		
4	na	173	82F062	23.1	8,255.6		23.1	23.1				8,255.6	8,255.6		
4	na	178	82F062	5.3	1,951.1		5.3	5.3				1,951.1	1,951.1		
4	na	179	82F062	22.0	7,575.3		22.0	22.0				7,575.3	7,575.3		
4	na	185	82F062	1.5	745.8		1.5	1.5				745.8	745.8		
4	na	186	82F062	0.2	46.1		0.2			0.2		46.1			46.1
4	na	188	82F062	0.3	80.6		0.3			0.3		80.6			80.6
4	na	189	82F062	4.3	1,616.9		4.3			4.3		1,616.9			1,616.9
4	na	192	82F062	4.5	2,429.7		4.5	3.4		1.1		2,429.7	1,855.5		574.2
4	na	193	82F062	6.7	3,164.5		6.7	6.7				3,164.5	3,164.5		
4	na	196	82F062	0.2	88.0		0.2			0.2		88.0			88.0
4	na	207	82F062	8.2	2,467.2		8.2	8.2				2,467.2	2,467.2		
4	na	215	82F061	5.0	2,127.1		5.0	5.0				2,127.1	2,127.1		
4	na	218	82F062	10.2	2,515.9		10.2			10.2		2,515.9			2,515.9
4	na	221	82F062	0.2	74.9		0.2		0.2			74.9		74.9	
4	na	224	82F062	4.5	1,128.7		4.5		4.5			1,128.7		1,128.7	
4	na	226	82F062	16.9	6,263.3		16.9			16.9		6,263.3			6,263.3
4	na	227	82F061	11.0	2,354.7		11.0	11.0				2,354.7	2,354.7		
4	na	229	82F062	4.6	1,918.0		4.6	4.6				1,918.0	1,918.0		
4	na	231	82F062	2.4	1,023.2		2.4	2.4				1,023.2	1,023.2		
4	na	233	82F062	4.1	1,244.7		4.1	4.1				1,244.7	1,244.7		
4	na	235	82F061	10.2	4,136.0		10.2			10.2		4,136.0			4,136.0
4	na	237	82F062	4.7	1,224.7		4.7		4.7			1,224.7		1,224.7	
4	na	238	82F062	1.2	282.4		1.2	1.2				282.4	282.4		
4	na	242	82F062	5.7	1,242.9		5.7		5.7			1,242.9		1,242.9	
4	na	245	82F062	19.1	4,135.2		19.1		19.1			4,135.2		4,135.2	
4	na	258	82F061	0.7	276.0		0.7			0.7		276.0			276.0
4	na	261	82F062	4.4	957.0		4.4		4.4			957.0		957.0	
4	na	264	82F061	28.7	10,023.4		28.7	9.8		18.9		10,023.4	3,027.6		6,995.8
4	na	269	82F062	15.1	3,274.8		15.1		15.1			3,274.8		3,274.8	
4	na	272	82F062	10.2	2,212.6		10.2		10.2			2,212.6		2,212.6	
4	na	278	82F062	6.8	1,473.4		6.8		6.8			1,473.4		1,473.4	
4	na	280	82F062	3.6	793.5		3.6		3.6			793.5		793.5	
4	na	287	82F061	7.3	1,150.0		7.3			7.3		1,150.0			1,150.0
4	na	289	82F062	5.6	2,864.0		5.6	5.6				2,864.0	2,864.0		
4	na	296	82F062	21.4	8,758.9		21.4		21.4			8,758.9		8,758.9	
4	na	299	82F061	9.4	1,981.6		9.4			9.4		1,981.6			1,981.6
4	na	301	82F061	16.3	8,772.9		16.3			16.3		8,772.9			8,772.9
4	na	308	82F062	10.3	4,536.4		10.3	0.1	10.2			4,536.4	25.0	4,511.4	
4	na	313	82F062	8.2	2,818.0		8.2		8.2			2,818.0		2,818.0	
4	na	317	82F062	3.6	1,134.2		3.6		3.6			1,134.2		1,134.2	
4	na	318	82F061	13.7	6,784.7		13.7			13.7		6,784.7			6,784.7
4	na	319	82F051	9.2	2,157.5		9.2	9.2				2,157.5	2,157.5		
4	na	327	82F052	9.2	3,348.5		9.2		9.2			3,348.5		3,348.5	
4	na	330	82F051	2.9	1,595.9		2.9			2.9		1,595.9			1,595.9
4	na	335	82F051	15.4	7,424.3		15.4			15.4		7,424.3			7,424.3
4	na	345	82F051	12.0	3,754.5	0.1	11.9	12.0			45.5	3,709.0	3,754.5		
4	na	347	82F052	11.6	4,238.2		11.6		11.6			4,238.2		4,238.2	
4	na	349	82F052	3.2	1,023.0		3.2	3.2				1,023.0	1,023.0		
4	na	352	82F052	12.6	3,216.4		12.6			12.6		3,216.4			3,216.4
4	na	355	82F052	4.1	1,263.2		4.1		4.1			1,263.2		1,263.2	
4	na	356	82F052	2.6	1,251.3		2.6		2.6			1,251.3		1,251.3	
4	na	357	82F051	2.5	1,418.7		2.5			2.5		1,418.7			1,418.7
4	na	358	82F051	0.0	14.0		0.0	0.0				14.0	14.0		
4	na	360	82F051	1.2	317.7		1.2			1.2		317.7			317.7
4	na	362	82F051	3.9	1,519.8		3.9			3.9		1,519.8			1,519.8

20 Year Harvest Blocks by Operability (1996) and Biogeoclimatic Zones

Period	FYDP	Block Id	Sheet	Block Area	Block Volume	Area Summary (ha)					Volume Suumary (m³)				
						Operability (1996)		Biogeoclimatic Zone and Variant			Operability (1996)		Biogeoclimatic Zone and Variant		
				(ha)	(m³)	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2	Alternate	Operable	ESSFwc4	ICH-dw-	ICH-mw2
4	na	364	82F051	0.5	206.1		0.5	0.5				206.1	206.1		
4	na	379	82F051	9.1	1,571.8		9.1			9.1		1,571.8			1,571.8
4	na	395	82F052	3.9	1,311.5		3.9			3.9		1,311.5			1,311.5
4	na	400	82F051	8.4	2,871.3		8.4	8.4				2,871.3	2,871.3		
4	na	413	82F081	3.1	1,205.6	3.1		3.1			1,205.6		1,205.6		
4	na	415	82F071	11.4	5,390.0	11.4		11.4			5,390.0		5,390.0		
4	na	416	82F071	1.4	361.1	1.4		1.4			361.1		361.1		
4	na	417	82F071	2.4	761.4	2.4		2.4			761.4		761.4		
4	na	418	82F071	7.9	2,222.7	7.9		7.9			2,222.7		2,222.7		
4	na	419	82F071	0.1	9.3	0.1		0.1			9.3		9.3		
4	na	420	82F071	2.2	502.3	2.2		2.2			502.3		502.3		
4	na	421	82F071	12.7	2,271.9	12.7		12.7			2,271.9		2,271.9		
4	na	424	82F072	13.9	5,747.9	13.9				13.9	5,747.9				5,747.9
4	na	429	82F062	21.1	10,029.1	21.1		21.1			10,029.1		10,029.1		
4	na	435	82F061	3.4	996.0	3.4		3.4			996.0		996.0		
4	na	436	82F061	9.4	2,501.1	9.4		9.2		0.2	2,501.1		2,447.2		53.9
4	na	439	82F061	8.8	2,787.5	8.8				8.8	2,787.5				2,787.5
4	na	441	82F061	0.0	9.0	0.0		0.0			9.0		9.0		
4	na	442	82F051	8.0	2,904.1	8.0		8.0			2,904.1		2,904.1		
4	na	443	82F052	0.3	93.9	0.3		0.3			93.9		93.9		
4	na	444	82F051	10.9	3,401.3	10.9		10.9			3,401.3		3,401.3		
4	na	447	82F062	5.7	1,243.8	5.7			5.7		1,243.8			1,243.8	
4	na	448	82F051	1.9	436.8	1.9		1.9			436.8		436.8		
4	na	449	82F051	3.1	1,206.7	3.1		3.1			1,206.7		1,206.7		
4	na	450	82F052	2.0	353.7	2.0		2.0			353.7		353.7		
4	na	470	82F061	9.4	2,959.4		9.4			9.4		2,959.4			2,959.4
Period 4 Sub Totals				**1,068.0**	**375,692.5**	**131.2**	**936.8**	**514.0**	**157.3**	**396.7**	**45,171.4**	**330,521.1**	**184,164.3**	**46,501.2**	**145,027.0**
Grand Totals				**4,557.8**	**1,672,628.3**	**404.4**	**4,153.4**	**1,896.7**	**692.8**	**1,968.3**	**140,899.1**	**1,531,729.2**	**711,613.7**	**214,910.8**	**746,103.8**

Prepared by Hugh Hamilton Ltd. For Slocan Forest Products Limited March 31, 1998.
Note: values shown in this table may vary due to rounding.