

TREE FARM LICENCE No. 38

PROPOSED
MANAGEMENT PLAN No. 8
FOR THE PERIOD
JANUARY 1, 1998 TO DECEMBER 31, 2002

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1.0 INTRODUCTION

Management Plan No. 8 (MP #8) for Tree Farm Licence No. 38 (TFL 38), has been completed in accordance with requirements of Section 2.0 of the Licence document¹, and is based on the Statement of Management Objectives, Options and Procedures (SMOOP) for MP #8 for TFL 38². The plan has also taken direction from the *Forest Practices Code of B.C. Higher Level Plans: Policy and Procedures, June 1996*³, and from the Lower Mainland Protected Areas Regional Public Advisory Committee (LMRPAC) report *Recommendations for Finalizing the Protected Areas Strategy in the Lower Mainland, August 1996*.

MP #8 for TFL 38 was prepared by International Forest Products Limited (Interfor), the licensee responsible for forest land management on the land-base as described in the TFL 38 licence document (Appendix I - Corporate Profile). The draft management plan document is reviewed by government agencies responsible for Crown land management, as well as by public, community and First Nations representatives.

TFL 38 is adjacent to the Soo Timber Supply Area (TSA) and the two administrative units form the Squamish Forest District. At present, no Land and Resource Management Plan (LRMP) exists for the Squamish Forest District. Lower level plans that address Crown land management within Soo TSA follow the direction contained in the *1994 Soo Timber Supply Area Forest Management Strategy*. Lower level plans for TFL 38 will follow the land and resource management direction described in Management Plan No. 8.

The conclusion of the Lower Mainland Protected Areas Strategy (LMPAS) has had a significant impact on TFL 38. The creation of a new park within TFL 38 was part of the LMPAS announced by government in October, 1996. The impact of the park along with government approved recommendations for mitigation are documented in this plan.

All land use and resource management activities within the TFL 38 area are subject to existing legislation, policies and regulations for Crown land and resource management. This includes the Forest Practices Code (FPC), which has a significant influence on resource management. The resource management zones and landscape units proposed in this plan give direction to further planning that is required by the FPC. As stipulated in the FPC, such further planning must be consistent with the resource management objectives and strategies described in a designated higher level plan.

In the absence of Sea to Sky LRMP higher level planning process, Management Plan No. 8 is recognized as the principal document providing higher level planning objectives for Tree Farm Licence No. 38.

¹ Tree Farm Licence No. 38 replacement licence document, June 2, 1996.

² *Statement of Management Objectives, Options and Procedures (SMOOP) for Management Plan No. 8, Tree Farm Licence No. 38*, Approved August 20, 1996. Final Revision September 1996.

³ Section 5.0 of *Higher Level Plans: Policy and Procedures*, was updated October 31, 1996.

1.1 Location and Planning Area

Management Plan No. 8 encompasses an area defined by the boundaries of TFL 38. The planning area is within the of Squamish-Lillooet Regional District (SLRD) which includes the towns of Squamish, Whistler and the villages of Lions Bay and Pemberton. There are also several First Nation bands within the SLRD; the Anderson Lake Band, Burrard Band, Douglas Band, Mt. Currie Band, Samahquam Band, Skookumchuck Band, and the Squamish First Nation. In total, about 27 000⁴ people live in the SLRD. The largest community in the SLRD, and closest to TFL 38, is Squamish with a population of approximately 15 100.

TFL 38, beginning about 25 km north of Squamish, includes the watersheds of the Ashlu and Elaho Rivers, and the balance of the Squamish River system. The Elaho River is fed by two large secondary drainages: Sims Creek and Clendenning Creek. The location of TFL 38 is illustrated in Map 1. The TFL is 218 616 hectares in size, most of which is non-forested steep mountainous terrain and ice-fields. Only approximately 60 723 hectares is deemed productive forest land of which only 36 144 hectares are considered net operable. The mature forest is dominated by western hemlock and balsam and to a lesser extent cedar and douglas-fir.

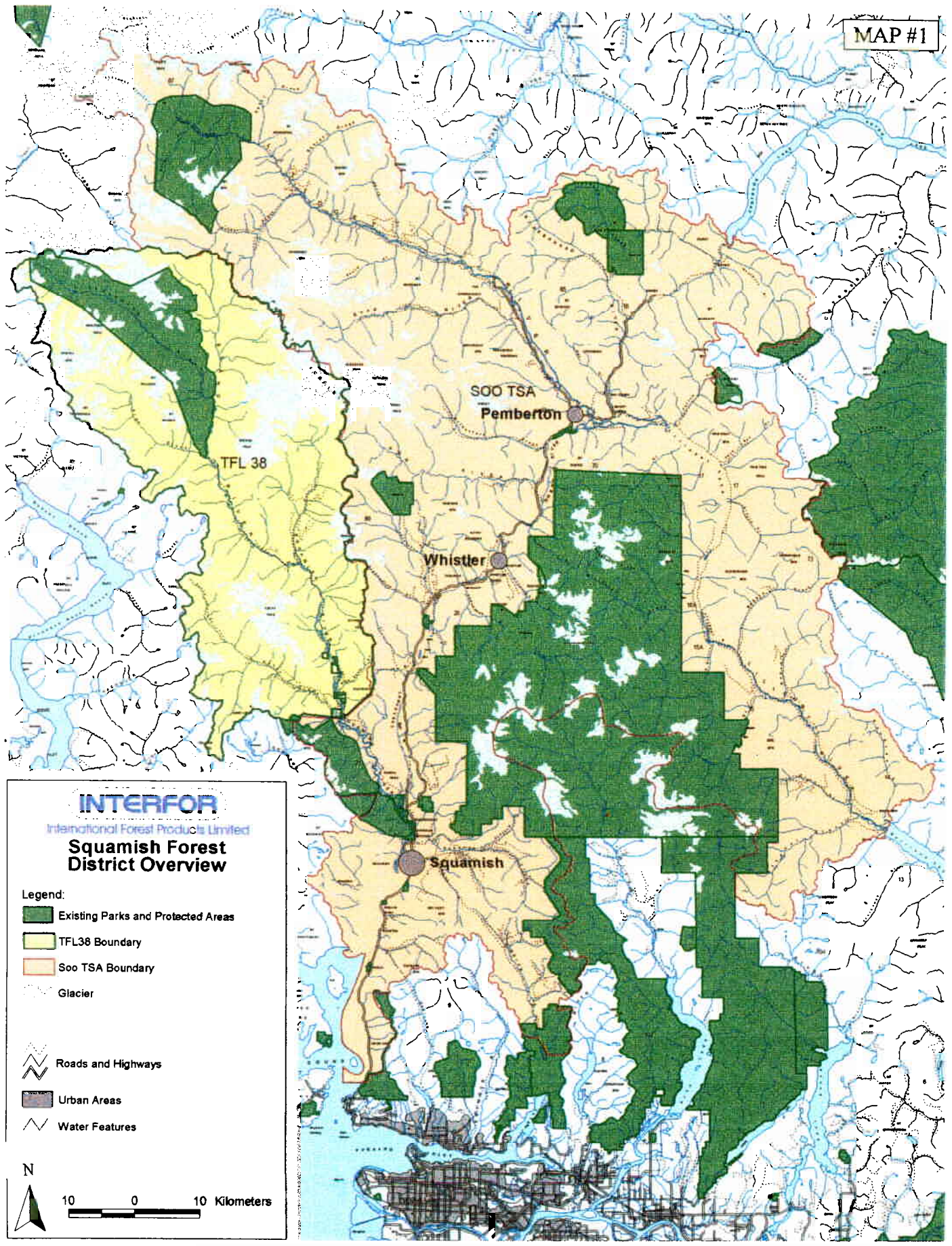
The TFL falls within two ecosections: Eastern Pacific Ranges and Southern Pacific Ranges. Three biogeoclimatic zones can be found within the TFL boundaries: Coastal Western Hemlock, Mountain Hemlock, and Alpine Tundra.

Two rivers are significant in TFL 38. The Squamish River has regionally significant spawning grounds and supports a significant steelhead run in the spring; anadromous (sea-run) cutthroat trout, bull trout and Dolly Varden char through the summer and fall; a significant spring, chum and coho salmon run in the fall; and resident trout and char values year-round. The Elaho River is known locally for its recreational opportunities, most significantly camping, fishing and river rafting.

On October 28, 1996 the provincial government announced 23 new parks and protected areas in the Lower Mainland. Among the newly protected areas is 29 730 ha of Elaho-Clendenning River drainages within TFL 38. The Clendenning Protected Area is an expansive, untouched watershed of mature Douglas-fir and Western red cedar forest. Along with the Upper Lillooet protected area lands (approximately 19 800 ha), this area makes up a significant portion of the original protected area proposal.

The economy of the SLRD is tied closely to natural resource development. Historically, the forest industry, the extraction, the manufacture and the transportation of forest and pulp products, has been the economic foundation of the area. Today, in Squamish, the largest employer when secondary and tertiary services are considered is still the forest industry. Tourism has increased in significance in recent years throughout the SLRD, however the focus has been in the Lions Bay to Whistler "Sea to Sky" corridor.

⁴ 1996 estimates from Sea to Sky Economic Development Commission.



INTERFOR

International Forest Products Limited

Squamish Forest District Overview

Legend:

- Existing Parks and Protected Areas
- TFL38 Boundary
- Soo TSA Boundary
- Glacier
- Roads and Highways
- Urban Areas
- Water Features



10 0 10 Kilometers

1.2 Management Plan Preparation Procedures

The Management Plan is part of the TFL planning process. Requirement for a management plan is legislated in the *Forest Act*. Tree farm licences are generally for 25 year terms. The licence area contains private forest land owned by the licensee plus an area of Crown forest. All are managed for sustained forest production under a management plan signed off by a professional forester and periodically approved by the chief forester. Stumpage (a payment based on government revenue requirements considering the final market value of the timber and average costs of getting the timber to market) is paid on timber from Crown land.

The management plan must include inventories, including a long-term timber supply analysis, of all forest resources and must comply with both the planning requirements and strategic zoning objectives in the *Forest Practices Code of British Columbia Act* (Code Act), regulations and standards. The plan must propose management objectives to tend, manage, protect and use the timber resources and roads, including a 20-year harvesting sequence (actual harvest is controlled by the periodic issuance of cutting permits). The plan must also show how non-timber forest resources in the tree farm licence area will be protected and conserved. Requirements for silviculture prescriptions and cutting permits ensure compliance with both the *Forest Act* and the Code Act. Identification of, and consultation with, non-timber forest resource users, particularly First Nations groups, must be provided for.

The Licence is subject to, and the Licensee will comply with, the *Forest Act* and the regulations under that Act, and the *Forest Practices Code of British Columbia Act* and the regulations and standards made under that Act. Interfor is not authorized to carry out any operations otherwise than in compliance with the aforementioned acts, and regulations. TFL Management Plan requirements are contained in the Tree Farm Licence agreement document that came into effect on June 2, 1996.

Management Plan #8 is submitted to the Chief Forester for approval and will apply for a 5-year planning period. The replacement process for Management Plans occurs in three stages as shown below.

- Identify Issues: The company invites opinion regarding the current management plan performance;
- Outline Plan: The company presents a Statement of Management Objectives, Options and Procedures (SMOOP) as an outline for a proposed MP; and
- Review and Submit Management Plan: The company presents a draft MP to the Regional Manager for review. Upon Regional Manager's acceptance, the MP is submitted to the Chief Forester for approval.

MP #8 is for the period January 1, 1998 to December 31, 2002. Public presentation and government review of draft MP #8 are required before approval. The review strategy and public involvement plan are included as part of this document (Appendix II).

1.3 Planning Objectives and Framework

The planning framework for the TFL consists of both strategic and operational plans. Management Plan No. 8 is intended to be a higher level plan that establishes the broad, strategic context for operational planning, providing objectives and identifying strategies that will guide operational planning in the context of the statutory framework of the Forest Practices Code.

The objectives of this management plan are:

- To provide government agencies, the public and First Nations the opportunity for periodic review of TFL 38 forest management;
- To assemble, review and present a knowledge base, and conduct analysis in support of TFL 38 forest management. The knowledge base contained in MP #8 includes formal inventories, local knowledge, expert opinion and reflects the guiding environmental, social and economic values;
- To develop a draft land and resource management plan for the TFL which will assist with the development of the Sea to Sky LRMP, and will provide strategic guidance for use in developing operational plans in the absence of established higher level plans;
- To recommend, to the Chief Forester of British Columbia, the allowable annual cut (AAC) which will provide for future social, economic, and environmental stability, of the TFL land-base and reliant communities, within the context of integrated resource management and opportunities associated with forest land zoning;
- To recommend the division of TFL 38 area into Draft Resource Management Zones that are based on government approved direction, and on a combination of resource use and biophysical characteristics;
- To provide the forthcoming LRMP with the licensee's preferred option with respect to resource management objectives and strategies, for each proposed resource management zone, that conform to provincial legislation and policy, and that reflect the principles of sustainable development; and
- To recommend Draft Landscape Units and their associated Biodiversity Emphasis Options, and biodiversity objectives.

The Forest Practices Code specifies planning and forest practice requirements, and the Ministry of Forest's range of enforcement powers. It also establishes a system of independent audits of forest practices. Some key features of the Forest Practices Code include:

- Strategic planning tools, such as the designation of resource management zones, landscape units and sensitive areas;
- Specified operational planning requirements. Requirements are to be applied consistently across the province and must be compatible with higher level plans. The

basic principle of integrated resource management (integrating use and protection of timber and non-timber resources, environmental values, and social values) underlies this planning process; and

- Forest Development Plans as central management documents, linking broad provincial strategic plans, such as results from the Lower Mainland Protected Areas Strategy, to operational planning including provision for public participation and review by several resource ministries. These plans identify projected harvesting and road development usually over a period of 5 years.

The current state of forest planning provides a process so that government policies are translated into integrated resource management plans. The forest planning framework consists of five levels that provide a context for setting resource objectives and management strategies (Table 1).

Table 1: Forest Planning Framework

Planning Levels	Examples
Provincial Policies	Protected Areas / Old Growth Strategy
Strategic Plans	
Regional Plans	Commission on Resources and Environment Plans
Subregional Plans	Land and Resource Management Plans Tree Farm Licence Management Plans Timber Supply Area Management Plans Forest Licence Management Plans
Local Resource Plans	Local Resource Use Plans Coordinated Access Management Plans Total Resource Plans
Operational Plans	Forest Development Plans Logging Plans Silviculture Prescriptions Stand Management Prescriptions Range Use Plans

Provincial, regional, and subregional plans focus on defining broad strategic management objectives and land use allocations. Principles of integrated resource management guide forest management planning in British Columbia, where all resource values, and social, economic, and environmental needs are identified and considered. Forest planning endeavours to reflect social values and incorporate clear commitments to conserve biological diversity, maintain the inherent productivity of aquatic and terrestrial ecosystems, and meet the needs of an economically viable and sustainable forest industry.

Management Plan No. 8 for TFL 38 provides the framework of management objectives, strategies and resource management issues within which the operational plans will be developed. Management plans, based on the publicly reviewed SMOOP, are also publicly reviewed during formulation and before approval by the Chief Forester of B.C.

Local resource plans establish more detailed direction at the watershed or landscape level. They generally aim to identify all known resource values, to establish landscape level zoning of acceptable activities, and to provide guidelines for the development of operational plans and prescriptions.

Forest Development Plans (FDPs) document the first five years or more of the proposed harvesting and are updated annually. They consider all known resource values and map out appropriate designated areas in entire landscape units within which forest development is proposed. The Forest Development Plan identifies, in part, the areas to be harvested, roads to be constructed, maintained and deactivated, drainage structures to be installed and removed, silviculture systems, and silvicultural activities to be carried out over the next five years.

FDPs are the recognized vehicle through which proposed forest harvesting units are reviewed and approved. The first and second years of the plan are well refined while the last three years are more general. As cutblocks move up in sequence from year to year they are fine-tuned, reflecting more site-specific knowledge and addressing licensee, agency, and public concerns. FDPs are updated and publicly viewed annually. Silviculture Prescriptions (SP) and Cutting Permits (CP) are submitted for approval consistent with approved FDPs.

Once site-specific field data are gathered, Silviculture Prescriptions are developed to define forest management prescriptions for cutblocks before logging takes place. SPs provide for cutblock specific forest management prescriptions including; silviculture system, harvesting plan, regeneration and stand tending plan, forest health and integrated resource management accommodations.

The SP forms a contract between the licensee and the MoF on how the area will be managed during and after harvesting. SPs and other operational plans are made available during annual Forest Development Plan public viewing. Assessments related to SPs which follow FDP viewing must be advertised and made available for a 60 day public review period.

Cutting Permits provide the authority for development and harvesting of the cutting area detailing site-specific harvesting rights and obligations.

Road Permits provide the authority for development and harvesting of the right of way and construction, use and maintenance of roads to be used in the extraction of timber authorized under CPs.

Logging Plans, if required by the District Manager, contain site-specific strategies designed to ensure that harvesting operations are managed to achieve required standards and obligations.

Public participation in operational forest planning is most effective at the management plan and development plan stages. It is at these planning stages that public participation in the strategic decisions of what activities will occur relative to another and concerning other resource values is most constructive. FDPs are advertised in local papers and made available for public review. Those resource users identified by the MoF as being involved with a specific issue are contacted during the development of the FDP. By identifying and recording issues and other resource values in advance and during development planning, potential conflicts are mitigated or minimized. Specific concerns over methods and results on specific sites are best-handled through requests for information from the SP. The MoF is informed of any input received and any resulting changes to the plans.

1.4 Participation

The key participants in the management planning process are the TFL licensee, government agencies (Ministry of Forests (MoF), Ministry of Environment, Lands and Parks (MoELP), Federal Department of Fisheries and Oceans), local communities, special interest groups and First Nations. The management planning process provides public participation opportunities to review management plan information through attending public viewings.

To provide the aforementioned opportunities:

- Pre-SMOOP public involvement period, to review Management Plan No. 7, was March 1 to March 29, 1996, with a deadline for written comments of May 3, 1996;
- SMOOP Public involvement period, to review the draft SMOOP, was May 27 to July 26, 1996;
- Advertising for the Pre-SMOOP and SMOOP were published in the Vancouver Sun, Squamish Chief and Whistler Question newspapers;
- Individual notification letters were sent to key government and community organizations, Mt. Currie Band, Squamish First Nation, and to previous respondents who requested further information;
- Public viewing, for the draft SMOOP, was held in the local community of Squamish, at the Sea to Sky Hotel, on May 24, 1996;
- Copies of the Draft SMOOP were sent to the Municipality of Squamish and the Squamish First Nation. Copies were also available for public review for a 60 day period at the Interfor's Squamish and Vancouver offices, the Squamish public library and the Ministry of Forests district office;

- Advertising for the public viewing of Draft MP #8 included the local radio station with a listening audience in excess of 35,000 listeners per day;
- Advertising for the Draft MP #8 was published in the Vancouver Sun, and Squamish Chief newspapers;
- Public involvement period, to review Draft MP #8, was July 15 to September 15, 1997;
- Public viewing, for Draft MP #8, was held in the local community of Squamish, at the Sea to Sky Hotel, on July 15, 1997; and
- Copy of the Draft MP #8 was provided to the Squamish First Nation. Copies were also available for public review at Interfor's Squamish and Vancouver offices, the Squamish public library and the Ministry of Forests district office.

Public notices soliciting Pre-SMOOP public comment did not produce any public or agency response. Public viewing of the SMOOP held in Squamish, May 24, 1996, received nine visitors; two from the local MoF, two from B.C. Parks, two from Squamish Municipal Council, and three from the public. The twenty-seven individual notification letters sent, according to the Public Involvement Plan Contact List, did not produce any response beyond the six agency and municipal representatives who attended the public viewing. Public viewing generated one letter responded to by telephone; a written response was not requested. The offer for community presentations did not receive any response, so none were held.

Public viewing of the Draft MP#8 held in Squamish, July 15, 1997. Nineteen visitors signed the guest register. Written comments were received from the Squamish First Nation, and Western Canada Wilderness Committee. Agency comments were received from the Ministry of Forests, and the Ministry of Environment, Lands and Parks.

The MP #8 public involvement plan for TFL 38 is provided in Appendix II. Comments received from agencies and the public, along with Interfor's responses appear in Appendix III.

1.5 Lower Mainland Protected Area Strategy

On October 28, 1996 the provincial government announced 23 new parks and protected areas in the Lower Mainland⁵. The 136 000 hectares of newly preserved land completed the Protected Areas Strategy for the Lower Mainland. The announcement followed a year and half of extensive discussion and debate by the Lower Mainland Regional Public Advisory Committee (LMRPAC) which reached consensus (Appendix IV). The committee included representatives from conservation groups, outdoor recreation, tourism, mining, fish and wildlife, labour, government agencies and the forest industry.

⁵ Office of the Premier news release, October 28, 1996. *Clark Unveils 23 New Parks And Protected Areas for Lower Mainland.*

Representatives from major environmental groups included, the Canadian Park and Wilderness Society, the Federation of B.C. Naturalists, the Outdoor Recreation Council and the Southwest Wildlands Alliance (B.C. Wild, Sierra Club and others).

Among the newly protected areas were 29 730 ha of Elaho-Clendenning River drainages within TFL 38. Also, a small portion of the Tantalus protected area includes Sigurd Lake, within TFL 38. As part of the protected areas announcement, government also accepted the recommendations and mitigation strategy of the LMRPAC⁶.

The recommendations made by the RPAC and approved by government make reference to specific recommendations (2-5 of the RPAC report) to be included in the Terms of Reference for the follow up Land and Resource Management Plan (LRMP) in the Squamish Forest District, and in the developing of the required Management Plan for the TFL.

The Committee's agreement with respect to the Recommended Protected Areas as described in *Recommendations for Finalizing the Protected Areas Strategy in the Lower Mainland, August 1996* (Appendix V), was conditional upon the following, all of which were agreed by members of the Committee and form an integral part of the Committee's overall package of recommendations. The LMRPAC recommendations specific to TFL 38 are:

1. *If minor boundary adjustments are required in the context of implementation (e.g. legal descriptions, surveying, dealing with issues of private land, etc.), the Committee recommends that a four-person subcommittee that reflects a representative cross-section of Committee, be consulted to ensure that the general intent of the Committee regarding the location of boundaries is respected.*
2. *The Committee recommends that, once the Recommended Protected Areas have been established, the remaining Crown land-base in all of the TFL's and TSA's within the Lower Mainland Region, other than settlement areas and private land, should be designated as forest land reserve under the Forest Land Reserve Act - this should be done in a manner that does not interfere with logical planning and administration of development approvals for agricultural and settlement developments.*
3. *The Committee recommends that the impact of the Recommended Protected Areas on jobs and on both the short and long term level of timber harvesting in the region should be mitigated against by the following measures wherever possible, on the clear understanding that such mitigation must be done in a manner that does not contravene the Forest Practices Code (i.e. unduly impact on wildlife, biodiversity, fisheries, water quality, or soil productivity, etc.):*
 - *designating portions/areas of each of the TFL's and TSA's within the region as high*

⁶ Land Use Coordination Office, October 1996. *Backgrounder: Completing the Lower Mainland Protected Areas Strategy.*

intensity timber emphasis zones - in agreeing to this it is recognized that portions/areas of the TFL's and TSA's will also be designated as special management zones;

- adjusting (e.g., relaxing within the parameters permitted by the Forest Practices Code) VQO's (Visual Quality Objectives) where appropriate;*
- the extent to which this is possible will vary throughout the region;*
- the extent to which this is possible in any given area within the region needs to be addressed at a larger scale than the entire region, recognizing that some areas have high visual sensitivity (eg. the whistler Corridor); and*
- adjusting where appropriate (e.g., relaxing within the parameters permitted by the Forest Practices Code) adjacency ("green up") rules.*

While ideally the mitigation measures outlined above would result in no net reduction in AAC as a result of creating new protected areas, it is recognized that the foregoing does not constitute a guarantee that there will be no reduction in AAC as a result of creating the Recommended Protected Areas nor is it intended to limit the mitigation of impacts arising from processes outside of the Protected Areas Strategy.

- 4. The Committee recommends that there should be no automatic designation of areas immediately surrounding protected areas as special resource management zones:*
 - each such area is to be considered on its individual merits;*
 - where special resource management zones are established adjacent to protected areas, these are not to be managed as "de facto" protected areas - industrial activity including forestry and mining may take place in these areas so long as it takes place in accordance with the management objectives established for that zone; and*
 - line agency staff (e.g. Ministry of Forests, Ministry of Environment, Lands and Parks, etc.) should be instructed to conduct themselves in accordance with the foregoing.*

It is understood that, except as otherwise specifically provided for in these recommendations, areas outside of protected areas are to be managed in an integrated manner until such time as direction to the contrary is given by an LRMP. This includes recognition of all existing formal designations such as ecological reserves, identified wildlife areas, etc.

- 5. The Committee recommends that in establishing the Clendenning protected area that:*
 - the area of TFL 38 south of the confluence of the Sims River and Elaho River should be designated as a timber emphasis zone;*
 - there be no special resource management zone immediately adjacent to this protected area - notwithstanding the foregoing, it is recognized that there are specific features/areas within TFL 38, including the timber emphasis zone, that should be specially managed including by way of example, features/areas such as river corridors, recreations sites, authorized waterfowl areas, bogs, identified wildlife areas, salmon habitat etc.; and*

-
- *an operationally acceptable alternate site for a bridge across the Elaho River be approved.*
6. *The Committee recommends that those matters referred to in recommendations 2 to 5 inclusive are to be implemented through incorporation in the Terms of Reference for the follow up LRMP's in each of the Squamish, Chilliwack, and Sunshine Coast regions and developing the required Management Plans for each of the TFL's within these regions - it is recognized that each of the LRMP's will include any of the TFL's within such regions. The Terms of Reference as finalized, must be entirely consistent with recommendations 2 to 5 inclusive.*
 7. *The Committee recommends that the uncommitted AAC in TFL 38 (12,463 m³) be deleted from the land-base of the TFL from within the Clendenning watershed and that this land subsequently form part of the protected area recommended in this watershed.*

Recommendations 8 - 18, and the Committee's complete report are in Appendix V for this management plan.

2.0 MANAGEMENT OBJECTIVES

The company's management of TFL 38 is guided by a corporate vision "to be leaders in growing forests and harvesting, manufacturing and marketing solid wood products". This plan recommends objectives for the management of identified resources and values. Interfor considers that the Forest Practices Code, associated regulations, and guidebooks are capable of ensuring the sustainability of the environment. Interfor's primary aim is to optimize the long-term use of the forest land-base of TFL 38, for the social and economic benefit of society, and the stability of Interfor. The following are the broad objectives for management of the forest resources in TFL 38. The objectives are further specified for each proposed resource management zone and landscape unit:

- Maintain an economically viable forest harvesting operation to provide continued employment and generate the highest long term benefit from all the resources;
 - to achieve a level of profitability over an economic cycle consistent with Interfor's cost of capital,
 - to contribute to the sustainability of the local economy,
 - to create and maintain continued employment opportunities in harvesting, silviculture, local forest product manufacturing, and other initiatives such as Forest Renewal British Columbia, and
 - to fully implement the land use recommendations of the LMRPAC including the creation of a new park and the incorporation of mitigation strategies.
- Provide stewardship over the resources with respect and care for people and the environment;
 - to maintain the percentages of old, and mature seral stage distribution as defined by the biodiversity guidebook, by individual landscape unit objectives, and by emphasis ratings, for the attributes and function of ecosystem maintenance,
 - to maintain and enhance for wildlife and biodiversity: temporal and spatial distribution of cut/leave areas, landscape connectivity, and species composition, and
 - to maintain and enhance, for wildlife, stand structure which may be met, in part, by target stocking levels to meet the needs of specific identified wildlife species.
- Maximize the volume and value of timber production while ensuring sustainability of the forest for future generations;
 - to enhance the productivity of the operable forest through intensive silviculture, alternative harvesting techniques, optimized utilization and innovation,
 - to enhance timber yields from the existing operable land-base and to work towards increasing the productive operable area through innovation, and
 - to seek intensive silviculture funding for those units determined to be best-suited for intensive silviculture practices and which provide the greatest benefit to timber

production and/or biodiversity.

- Coordinate the harvesting plans with other resource values based on the principles of integrated resource management;
 - to promote the maintenance and enhancement of legal recreation sites and trails based on their use,
 - to manage aesthetics in accordance with the Forest Practices Code impact objectives, and
 - to utilize cutblock design, that conforms to the landscape, that will enable a higher level of alteration to the viewscape, within each visual quality objective (i.e. the level of alteration for the viewscape may exceed the percentage for that visual quality objective if the cutblock is designed in a way that blends into the landscape and therefore is aesthetically acceptable).
- Respect relationships with communities and First Nations people.
 - to make every effort to provide opportunity to First Nations, whose asserted traditional territories fall within the planning area, to review and comment on planning processes, and
 - to make every effort to provide opportunity to communities, in the vicinity of TFL 38, to review and comment on planning processes.

Objectives for MP #8 were derived from the Statement of Management Objectives, Options and Procedures (SMOOP) document approved in 1996 (Appendix VI).

2.1 Land Use and Resource Stewardship

The land use objective for TFL 38 is to manage the forest land-base primarily for timber production while ensuring maintenance of biodiversity and environmental standards. This objective will be achieved by implementing the following through the management strategies and commitments in identified Sections:

- **Environmental Policy:** Foster the corporate policy to promote environmental responsibility and stewardship of resources including regular monitoring and auditing of performance.
- **Principles of Sustainable Forestry:** The company is committed to the sustainability of the environmental, economic, and social values on the forest land where it operates.
- **Land Use Planning:** Manage the forest resources in the TFL by applying broad level land use designations that zone the TFL land for activities that have varying intensities of use and specific objectives.
- **Forest Ecosystem Management:** Manage the sustainability of the forest resources

based on maintaining the integrity of forest ecosystems and the productive capacity of the land-base.

- Balance and Performance: Seek ways to constantly improve and adapt our resource management that would provide the best balance of economic, environmental and community needs.

2.2 Timber

The following management objectives for timber in TFL 38 will be achieved through the management strategies and commitments in identified Sections:

- Harvest the Allowable Annual Cut (AAC): To harvest during the MP #8 period the proposed AAC level of 250 537 cubic metres (m3) per year from the TFL 38 land-base, excluding the Clendenning Protected Area.
- Harvest the Timber Profile: Harvest in proportion, the profile of the various timber types, based on the approved operability assessment.
- Harvest Planning in Scenic Areas: Incorporate the principles of visual landscape design to enhance the management and protection of scenic resources.
- Increase the Operable Land-base: Without compromising other resources, seek expansion of harvest opportunities from previously inaccessible, sensitive, and low merchantability stands through more detailed operability assessments, the use of alternate harvesting methods, and/or alternate silviculture systems.
- Optimize Harvesting Operations: Provide sufficient flexibility with harvesting operations that will allow for optimal use of timber, capital and resources.
- Compliance with Government Resource Management Standards: Conduct harvesting operations according to regulations, practices and standards as approved by government for TFL 38.
- Maximize Long Term Timber Production: Implement enhanced forest management that will maximize the long term economical volume and value of harvestable timber. The specific product objective is to harvest timber suitable for the manufacture of wood products for competitive world markets. Currently this represents a range of species and diameters.
- Updated Timber Inventory: Maintain an updated timber inventory and growth and yield forecasts that meet MoF standards and corporate planning requirements.

2.3 Silviculture

The following management objectives for silviculture in TFL 38 will be achieved through the management strategies and commitments in identified Sections:

- Silviculture Program: Maintain a silviculture program that will ensure all harvested

areas are reforested promptly, with appropriate species, densities and stock types, and managed to meet government and corporate requirements.

- **Silviculture Systems:** Examine different silviculture systems to determine and implement the most appropriate forest management activities.
- **Protection:** Develop and implement appropriate strategies that will protect the forest and minimize losses from fire, insects, disease and windthrow by harvesting such areas, where appropriate, as they occur.

2.4 Resource Planning

The management objectives for resource planning in TFL 38 will be achieved through the application of management strategies and procedures, and commitment to legislation, rules and standards in identified Sections:

- **Non-timber Resources:** Coordinate with government resource agencies and the public on the identification, inventory and planning of non-timber resources.
- **Environmentally Sensitive Areas:** Identify and inventory environmentally sensitive areas and plan operations accordingly to minimize impact on such areas.
- **Recreation Resources:** Assess recreation and visual landscape values in consultation with recreation specialists and local tourism operators.
- **Incorporate Visual Landscape and Recreational Values:** Incorporate visual landscape and recreational values into forest management planning according to approved government guidelines.
- **New Environmental Issues:** Participate in discussions to help resolve local issues related to new protected areas, old growth preservation and wilderness reserves.
- **Promotion and Development:** Participate where appropriate in the promotion and development of recreation use and facilities.

2.5 Public Involvement

The following management objectives in TFL 38 for public involvement will be achieved through the application of identified Sections:

- **Public Input:** Invite and encourage public, and First Nations, participation in planning processes in accordance with the public consultation requirements of the Forest Practices Code; and incorporate public input where applicable.
- **Community Consultation:** Develop an effective consultation process with local communities that are closely associated with the TFL.
- **Public Information:** Present information about our forest management activities to the public.

2.6 First Nations

The following management objectives in TFL 38 regarding First Nations will be achieved through mutual understanding and through the management considerations in identified Sections:

- **Respect First Nations' Interests:** Respect Aboriginal interests and explore effective communications strategies in planning for resource use activities with First Nations with an interest in TFL 38.
- **Involve First Nations:** Seek to increase involvement of First Nations in forest management activities and processes within TFL 38.
- **Manage Cultural Heritage Resource Values:** Assess and develop management prescriptions for cultural heritage resource values identified within TFL 38 consistent with requirements of the Forest Practices Code and Heritage Conservation Act.

3.0 HIGHER LEVEL PLANNING

The principal statute governing forest practices is the *Forest Practices Code of British Columbia Act* (Code Act). The Forest Practices Code recognizes three types of plans: 1) Higher Level Plans, 2) Management Plans, and 3) Operational Plans. A higher level plan is defined as a) an objective for a resource management zone, b) an objective for a landscape unit or sensitive area, c) an objective for a recreation site, recreation trail or interpretive forest site, and d) an objective contained in a management plan for a tree farm licence. Objectives for Resource Management Zones (RMZ's) are established by written order of the Minister of Forests, the Minister of Environment, Lands and Parks and the Minister of Energy, Mines and Petroleum Resources. Landscape Units (LU's) must be established by the District Manager under direction from the Chief Forester and with the approval of the Minister of Environment, Lands and Parks. Sensitive Areas (SA's) may be established by the District Manager under direction from the Chief Forester and with the approval of the Minister of Environment, Lands and Parks. Recreation Sites, Trails and Interpretive Forest Sites (RST's) may be established by the Chief Forester of British Columbia.

An objective contained in a TFL Management Plan may be established as a higher level plan by the Chief Forester⁷. A higher level plan is deemed to be consistent with other higher level plans if the higher level plan does not materially conflict with them. Thus, notwithstanding the forthcoming Sea to Sky LRMP higher level planning process, in the absence of established higher level plans, Management Plan No. 8 will provide the strategic objectives and direction for TFL 38.

In light of the Code rules regarding the hierarchy of plans, operational plans must be consistent with higher level plans in effect when the operational plan is approved. The designation of resource management zones, landscape units and sensitive areas, plus their respective management objectives, comprises the strategic planning level. Therefore, in preparation for the Sea to Sky LRMP, and in order to facilitate the implementation of the recommendations of the Lower Mainland RPAC with respect to land-base zonation and resource management strategies, the following describes Draft Resource Management Zones (RMZ), and the objectives, strategies and future desired conditions for TFL 38. Following Draft RMZs, Draft Landscape Units (LU's) are identified. Discussion on sensitive areas, and recreation sites, trails and interpretive forest sites is addressed under Section 4.6 of MP #8.

The identified Draft RMZs and the specific objectives and management strategies for each resource management zone are the basis of MP #8 for TFL 38. The objectives for each zone recognize the directive contained in the *Recommendations for Finalizing the Protected Areas Strategy in the Lower Mainland, August, 1996*, and the consequent Protected Areas park designation within TFL 38. The accompanying strategies have measurable indicators that will be an aid to monitoring the effects of the plan over time. Along with indicators, the plan describes a desired future state of resource values for each objective.

The following information is presented to set the context within which TFL 38 will be

⁷ To date, Bill 47 with respect to establishing objectives has not been brought into force.

managed until such time that Sea to Sky LRMP higher level planning process can result in the official establishment of higher level plans. MP #8 is presented for consideration as the base case management scenario in the forthcoming Sea to Sky LRMP. As the information presented was prepared in the spirit of an LRMP, is based on government approved direction, and proposes RMZs and LUs consistent with those being developed for the Sea to Sky LRMP, it is anticipated that at such time that higher level plans are established, the interim strategic direction described in MP #8 for TFL 38 will not likely be significantly different and will not materially conflict with forthcoming higher level plans.

3.1 Draft Resource Management Zones

Resource Management Zones (RMZs) are divisions of the TFL planning area that permit specific geographically focused land and resource management direction. The Draft RMZs for TFL 38 have been proposed by the licensee through the collection of resource inventories, direction provided by the RPAC, direction provided by the Assistant Deputy Minister - Land Use Coordination Office⁸, and preliminary government agency review.

The intent of the Draft RMZs proposed is to identify resource units and their primary resource values throughout the TFL land-base, establish strategic objectives and special requirements to guide subsequent operational planning, recognizing that other values will also be integrated and managed in accordance with the Forest Practices Code. Three sub-categories of Draft RMZs are proposed:

- **Draft Enhanced Resource Development Zone:** A land use designation category proposed for the TFL 38 area that places emphasis on maximizing timber volume and quality through intensive forest management, including increased forest research, intensive silviculture, alternate forest harvesting, innovation, investment and certainty of access. These investments are expected to increase forest productivity and timber quality in the long-term. Key fish and wildlife habitats, community watersheds and opportunities for other users will be maintained in accordance with the provisions of the Forest Practices Code.

The resource management objectives for this zone are to maximize timber quality and quantity; develop new silvicultural practices; maintain fish and wildlife habitats and overall ecosystem health; and provide opportunities for other resource users consistent with the forestry management objectives identified for the zone.

- **Draft General Resource Management Zone:** A land use designation category proposed for the TFL 38 area that places emphasis on maintaining a broad range of existing values. The general provisions of integrated resource management and the Forest Practices Code will apply.
- **Draft Special Resource Management Zone (Protection):** A land use designation

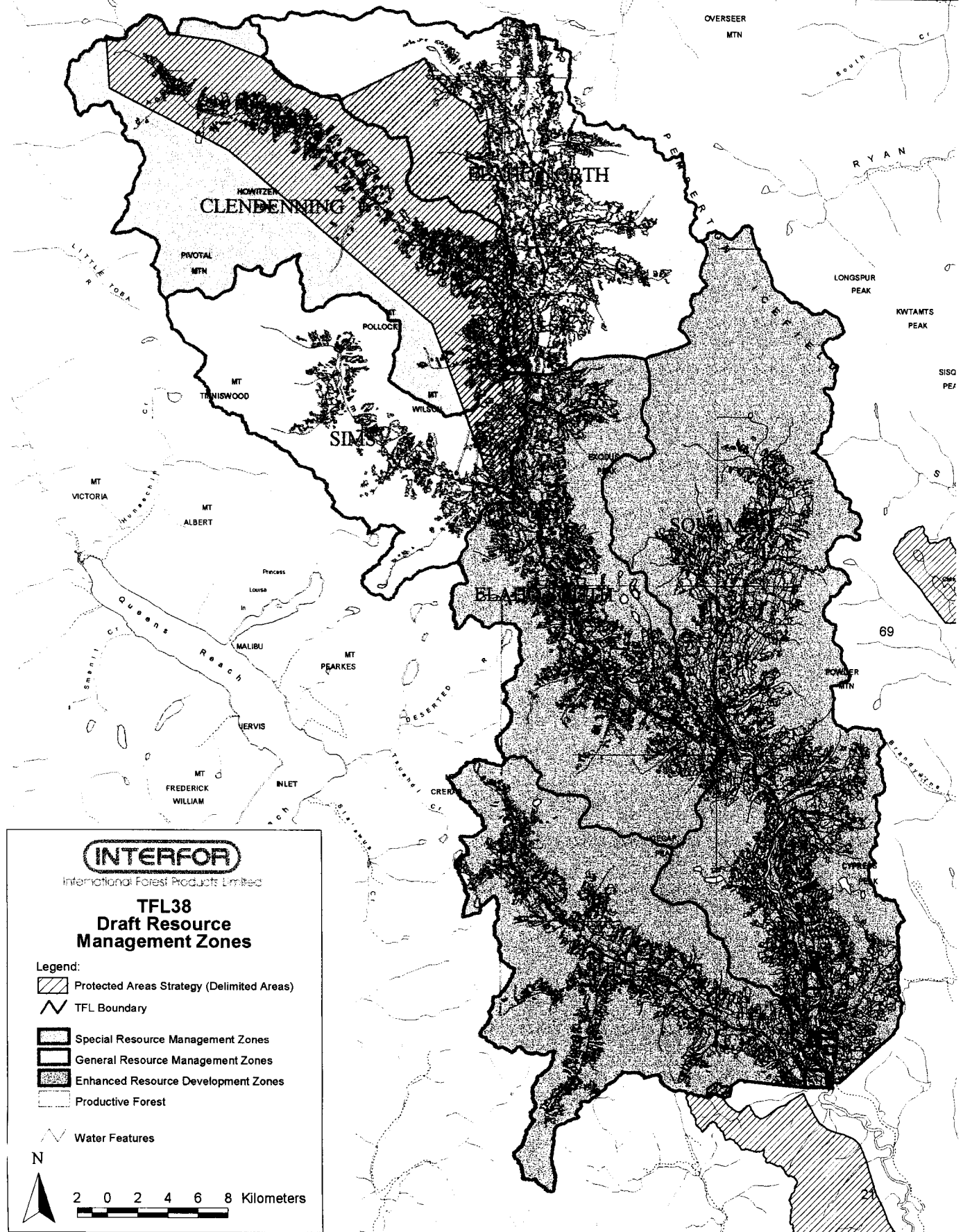
⁸ Land Use Coordination Office. August 16, 1996. *Instruction for the Development of Land and Resource Management Plans in the Lower Mainland Region.*

category proposed for the TFL 38 area that places emphasis on maintaining key non-extractive values such as the Clendenning Protected Area, recreation and wildlife habitat.

The following draft resource management zones by watershed unit, adapted from the RPAC recommendations, are proposed for TFL 38:

Table 2: Draft Resource Management Zones and Watershed Units

Resource Management Zone	Watershed Units
Enhanced Resource Development	Ashlu River Squamish River Elaho River South
General Resource Management	Elaho River North Sims Creek
Special Resource Management	Clendenning Creek



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**TFL38
Draft Resource
Management Zones**

Legend:

Protected Areas Strategy (Delimited Areas)

TFL Boundary

Special Resource Management Zones

General Resource Management Zones

Enhanced Resource Development Zones

Productive Forest

Water Features



2 0 2 4 6 8 Kilometers

3.1.1 Draft Enhanced Resource Development Zone

Three watershed units are proposed for Enhanced Resource Development Zone (High Intensity - ERDZ). The Ashlu River, Squamish River, and Elaho River South drainages constitute 40 735 hectares of productive forest area (26 049 net operable hectares). The Squamish basin is rugged, glacially eroded topography. Deeply incised, steep-sided valleys rise to alpine areas with extensive ice-fields. The valley bottoms are mainly in the Coastal Western Hemlock Biogeoclimatic Zone (BGCZ) and the upper side slopes are in the Mountain Hemlock BGCZ. The alpine areas are in the Alpine Tundra BGCZ. The Ashlu, Squamish and Elaho River South drainages have been subject to harvesting and forest management activities since the early 1960's. These management units have significant areas of mature timber and have a high potential for long-term intensive timber management.

Primary objectives for the Ashlu River, the Squamish River, and the Elaho South High Intensity ERDZs are to:

- Develop and maximize a sound strategy for the harvest of timber; the predominant objective is to maintain a timber base on TFL lands capable of growing well stocked, high quality timber, on areas where soil productivity and slope will allow for timber harvesting without compromising the sustainability of the land;
- Develop intensive silvicultural practices and alternative harvesting techniques that enhance timber yields from the operable land-base;
- Provide access for recreational hunting, fishing, river rafting and high country recreational pursuits; and
- Maintain a road network to minimize losses of forest resources to fire, insects and disease.

Secondary objectives include:

- Recognize the scenic values of the west side of the Squamish River, from the TFL boundary to the confluence of the Elaho River, and to develop a visually driven plan for this scenic area in consideration of the recommendations contained in *Managing Scenic Values in TFL 38 Consistent with Forest Practices Code Impact Objectives* (Appendix VII);
- Maintain or enhance biodiversity. Specific management is specified at the landscape unit level and will ensure conservation of a mix of major ecosystems over time;
- Maintain healthy aquatic ecosystems;
- Maintain adequate goat winter range; and
- Maintain existing moose habitat.

Table 3: Draft ERDZ Objectives and Strategies

Summary Objectives	Strategies
Timber Harvesting	<ul style="list-style-type: none"> • A full range of silvicultural systems will be used as appropriate for specific conditions. • Maximum clear-cut size is 40 ha, or as approved by the District Manager. • Plant genetically improved seedling stock where available. • Green-up provisions are the minimum required under the Forest Practices Code of BC Act and Visual Effective Green-up for scenic areas. • Wildlife tree patch requirements will be defined for each Landscape Unit. • Minimum harvest age will be that associated with log sizes that meet minimum merchantability standards. • Collect Site Index data in conjunction with free growing and pre-stand tending silviculture surveys, in accordance with approved procedures. • For timber supply review purposes, commission a review to provide Interim Site Index Estimates for Post-Harvest Regenerated Stands in TFL 38. • Promote stand tending by juvenile spacing of suitable stands to enhance the timber values. • Evaluate opportunities for fertilization and pruning to improve growth and increase value.
Maintain Soil Productivity	<ul style="list-style-type: none"> • Protect soil productivity in accordance with the Forest Practices Code of BC Act.
Maintain Access for Recreation	<ul style="list-style-type: none"> • Propose the designation of recreation reserves. • Maintain access to river fishing opportunities at sites along the Squamish River and lower Ashlu River. • Maintain access to camping areas along the Squamish and Elaho Rivers. • Maintain access to the Squamish and Elaho Rivers for commercial river rafting. • Formally manage designated recreation trails and pursue funding from the MoF and FRBC recreation funding programs.
Manage Visual Quality	<ul style="list-style-type: none"> • Recognize the west side of the Squamish River, part of the Scenic Area described in section 4.6.5 of MP #8, to be a known scenic area. • Assess Visual Effective Green-up (VEG) heights. • Implement identified strategies for reducing time to VEG. • Apply visual landscape management and design principals for freeing up wood and reducing short term adjacency constraints. • Assess the use of alternative silvicultural systems in visually constrained landscape units. • Employ angle of incidence / plan to perspective considerations in developing visually driven total chance planning in scenic areas.
Maintain Healthy Aquatic Ecosystems	<ul style="list-style-type: none"> • Develop a fisheries management plan for the RMZ that addresses site-specific protection of critical habitats, aesthetic qualities and access.
Maintain Moose Habitat	<ul style="list-style-type: none"> • Manage identified moose management zones (MMZ).
Manage for Mountain Goat	<ul style="list-style-type: none"> • Manage identified mountain goat management zones (MGMZ).

Table 4: The Desired Future State for the Draft ERDZ

Summary Objectives	Year 2018	Monitoring Indicator
Timber Harvesting	<ul style="list-style-type: none"> less mature timber inventory higher total growing stock higher harvest level increased productivity of the forest 	<ul style="list-style-type: none"> forest inventory age classes forest inventory age classes and volume estimates allowable annual cut forest inventory estimates of site index
Maintain Soil Productivity	<ul style="list-style-type: none"> no change from current conditions 	<ul style="list-style-type: none"> total area in productive forest land-base
Maintain Access for Recreation	<ul style="list-style-type: none"> continued access to recreation sites and trails continued trail development to alpine recreation areas new access to camping and fishing areas 	<ul style="list-style-type: none"> user satisfaction kilometres of public access forest roads kilometres of new trails number of recreation users number of new sites
Manage Visual Quality	<ul style="list-style-type: none"> modification VQO with integrated visual landscape design 	<ul style="list-style-type: none"> visual quality assessment % alteration, design criteria existing visual condition
Maintain Healthy Aquatic Ecosystems	<ul style="list-style-type: none"> no change from current conditions 	<ul style="list-style-type: none"> type of timber harvesting occurring in riparian management areas
Maintain Moose Habitat	<ul style="list-style-type: none"> continued thermal and hiding cover along the Elaho River 	<ul style="list-style-type: none"> habitat that meets forest cover objectives expressed type of timber harvesting occurring in moose management zone
Manage for Mountain Goat	<ul style="list-style-type: none"> continued thermal and hiding cover 	<ul style="list-style-type: none"> habitat that meets forest cover objectives expressed type of timber harvesting occurring in mountain goat management zone



Photo 1: Lower Ashlu River - looking north west



Photo 2: Upper Ashlu River - looking north west

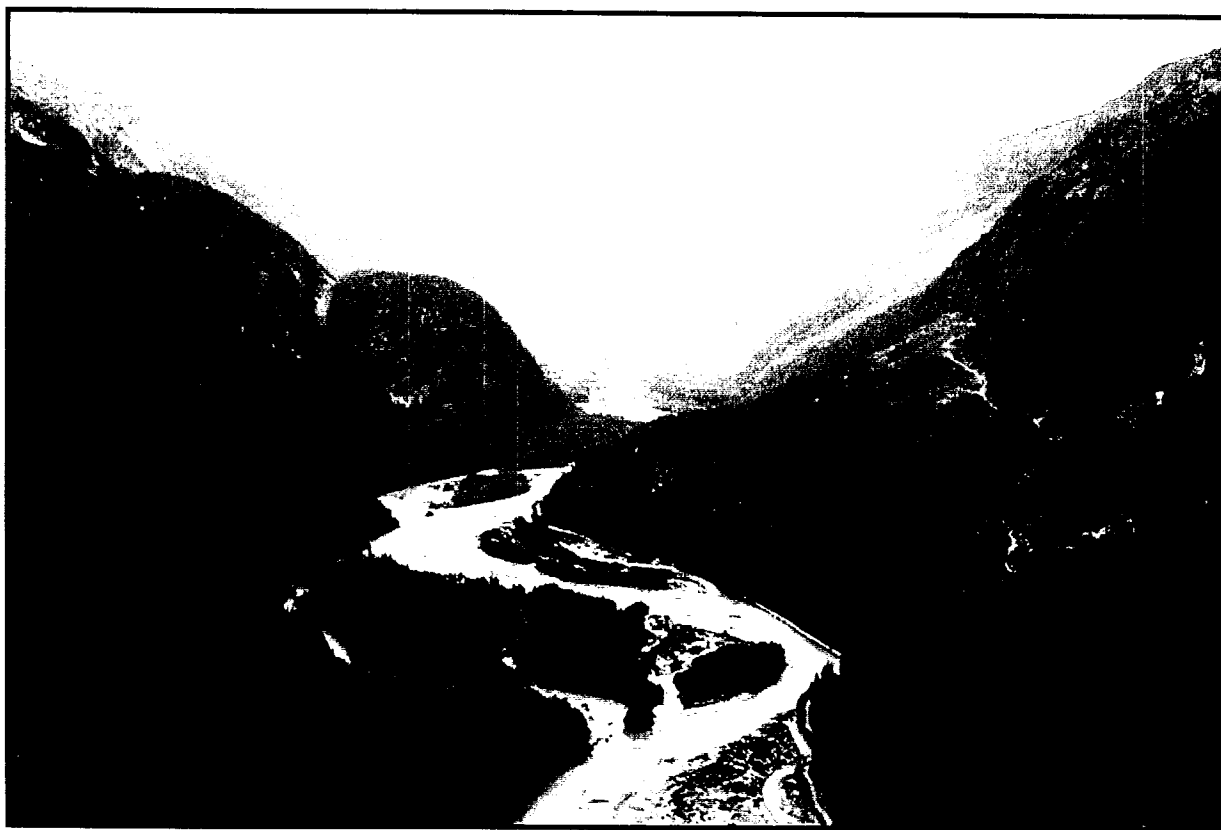


Photo 3: Lower Squamish River - looking north



Photo 4: Upper Squamish River - looking north

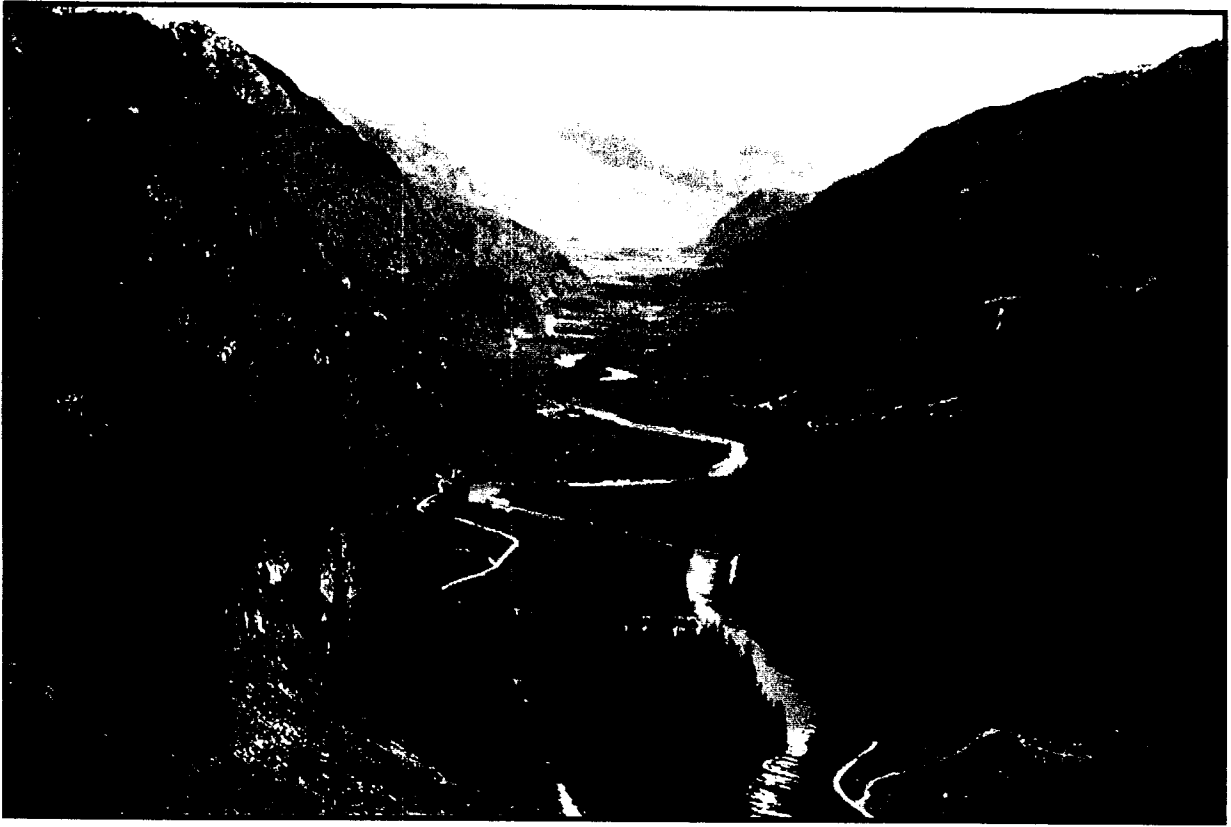


Photo 5: Elaho River South- looking north

3.1.2 Draft General Resource Management Zone

Two watershed units are proposed for Draft General Resource Management RMZ (GRMZ). Elaho River North and Sims Creek drainages constitute 15 298 hectares of productive forest area (10 070 net operable hectares). These drainages are also part of the Squamish basin with rugged, glacially eroded topography. Deeply incised, steep-sided valleys rise to alpine areas with extensive ice-fields. The valley bottoms are mainly in the Coastal Western Hemlock BGCZ and the upper side slopes are in the Mountain Hemlock BGCZ. The alpine areas are in the Alpine Tundra BGCZ. The Elaho River North and Sims Creek both primarily in the early development stages. These management units have a significant standing inventory of mature timber and have a good potential for long-term timber management and offer the opportunity to distribute the rate of cut across the TFL land-base.

Primary objectives for the Elaho River North and Sims Creek GRMZs are to:

- Develop a sound strategy for the harvest of timber; the predominant objective is to maintain a timber base on TFL lands capable of growing well stocked, high quality, timber, on areas where soil productivity and slope will allow for timber harvesting without compromising the sustainability of the land;
- Recognize the scenic values associated with the Clendenning Protected Area and to the south of the confluence of Sims Creek and the Elaho River; and to manage this scenic area in consideration of the recommendations contained in *Managing Scenic Values in TFL 38 Consistent with Forest Practices Code Impact Objectives, March 1997* (Appendix VII);
- Provide access for the Clendenning Protected Area, hiking, and high country recreational pursuits; and
- Maintain a road network to minimize losses of forest resources to fire, insects and disease.

Secondary objectives include:

- Maintain or enhance biodiversity. Specific management is specified at the landscape unit level and will ensure conservation of a mix of major ecosystems over time;
- Maintain healthy aquatic ecosystems;
- Maintain adequate goat winter range; and
- Maintain existing moose habitat.

Table 5: Draft GRMZ Objectives and Strategies

Summary Objectives	Strategies
Timber Harvesting	<ul style="list-style-type: none"> • A full range of silvicultural systems will be used as appropriate for specific conditions. • Maximum clear-cut size is 40 ha, or as approved by the District Manager. • Plant genetically improved seedling stock, where available. • Green-up provisions are the minimum required under the Forest Practices Code of BC Act and Visual Effective Green-up for scenic areas. • Wildlife tree patch requirements will be defined for each Landscape Unit. • Minimum harvest age will be that associated with log sizes that meet minimum merchantability standards. • Promote stand tending by juvenile spacing of suitable stands to enhance the timber values. • Evaluate opportunities for fertilization and pruning to improve growth and increase value.
Maintain Soil Productivity	<ul style="list-style-type: none"> • Protect soil productivity in accordance with the Forest Practices Code of BC Act.
Maintain Access for Recreation	<ul style="list-style-type: none"> • Maintain access to the Clendenning Protected Area. • Maintain access to Elaho Giant. • Formally manage designated recreation trails and pursue funding from the MoF and FRBC recreation funding programs.
Manage Visual Quality	<ul style="list-style-type: none"> • Recognize the west side of the Elaho River, part of the Scenic Area described in section 4.6.5 of MP #8, to be a known scenic area. • Assess Visual Effective Green-up (VEG) heights. • Implement identified strategies for reducing time to VEG. • Apply visual landscape management and design principals for freeing up wood and reducing short term adjacency constraints. • Assess the use of alternative silvicultural systems in scenic areas. • Review the Visual Absorption Capability (VAC) ratings in the existing landscape inventory.
Maintain Healthy Aquatic Ecosystems	<ul style="list-style-type: none"> • Develop a fisheries management plan for the RMZ that addresses site-specific protection of critical habitats, aesthetic qualities and access.
Maintain Moose Habitat	<ul style="list-style-type: none"> • Manage identified moose management zones (MMZ).
Manage for Mountain Goat	<ul style="list-style-type: none"> • Manage identified mountain goat management zones (MGMZ).

Table 6: The Desired Future State for the Draft GRMZ

Summary Objectives	Year 2018	Monitoring Indicator
Timber Harvesting	<ul style="list-style-type: none"> less mature timber inventory higher total growing stock higher harvest level increased productivity of the forest 	<ul style="list-style-type: none"> forest inventory age classes forest inventory age classes and volume estimates allowable annual cut forest inventory estimates of site index
Maintain Soil Productivity	<ul style="list-style-type: none"> no change from current conditions 	<ul style="list-style-type: none"> total area in productive forest land-base
Maintain Access for Recreation	<ul style="list-style-type: none"> continued access to recreation sites and trails continued trail development to alpine recreation areas new access to camping and fishing areas 	<ul style="list-style-type: none"> user satisfaction kilometres of public access forest roads kilometres of new trails number of recreation users number of new sites
Manage Visual Quality	<ul style="list-style-type: none"> modification VQO with integrated visual landscape design 	<ul style="list-style-type: none"> visual quality assessment % alteration, design criteria existing visual condition
Maintain Healthy Aquatic Ecosystems	<ul style="list-style-type: none"> no change from current conditions 	<ul style="list-style-type: none"> type of timber harvesting occurring in riparian management areas
Maintain Moose Habitat	<ul style="list-style-type: none"> continued thermal and hiding cover along the Elaho River 	<ul style="list-style-type: none"> habitat that meets forest cover objectives expressed type of timber harvesting occurring in moose management zone
Manage for Mountain Goat	<ul style="list-style-type: none"> continued thermal and hiding cover 	<ul style="list-style-type: none"> habitat that meets forest cover objectives expressed type of timber harvesting occurring in mountain goat management zone

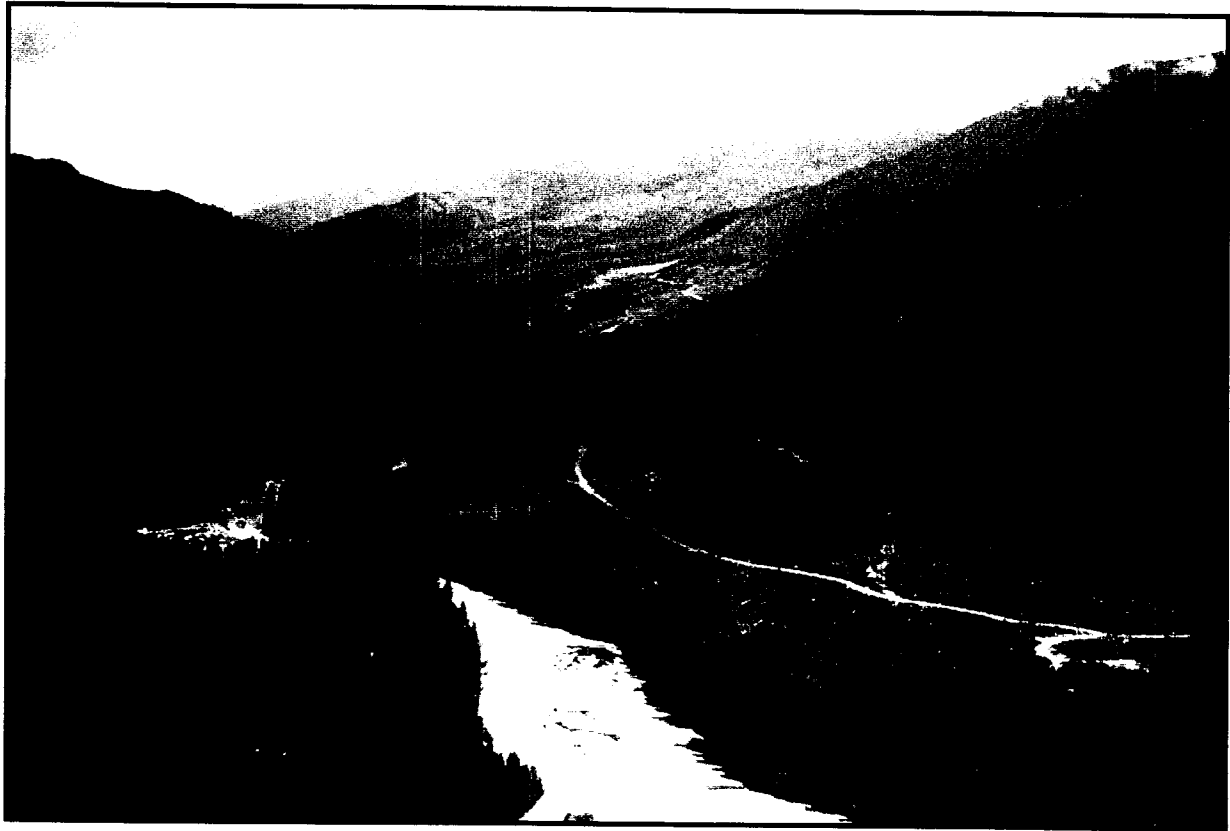


Photo 6: Elaho River at the confluence with Clendenning Creek - looking north

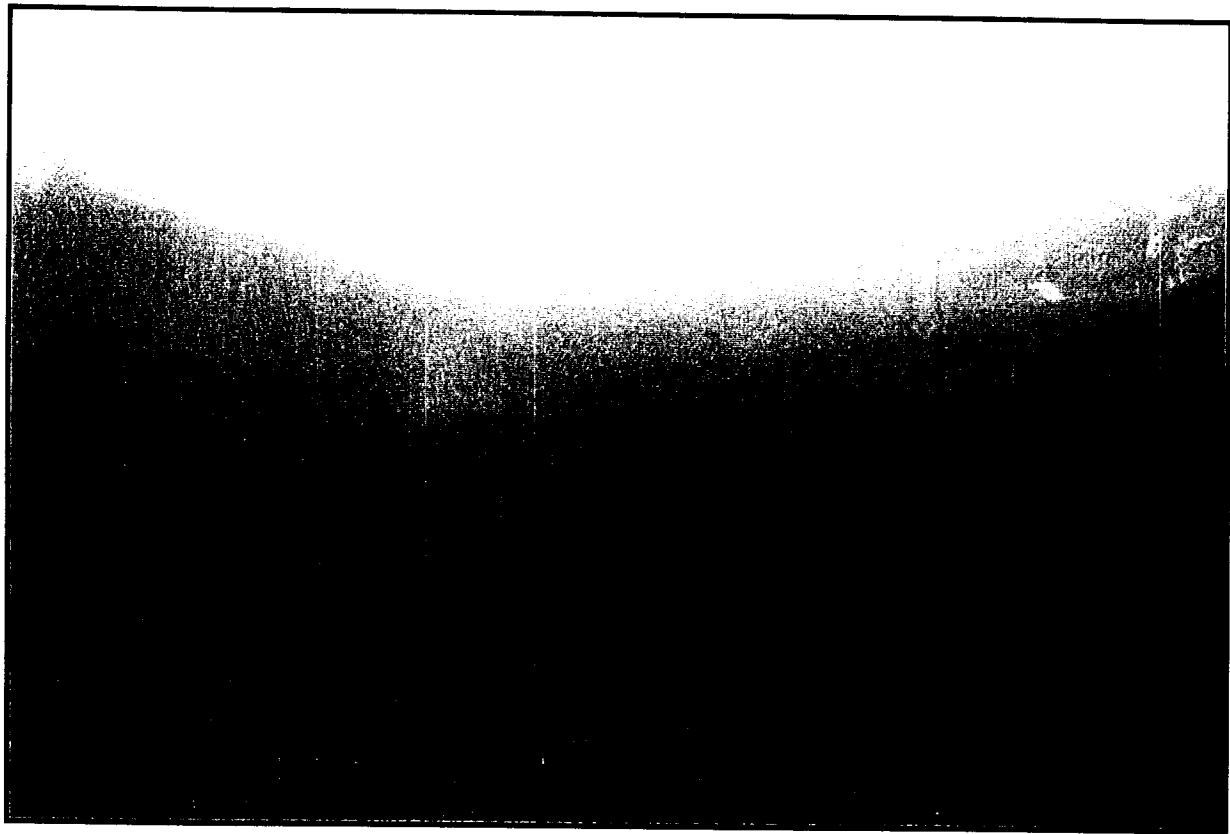


Photo 7: Elaho River North - looking north

3.1.3 Draft Special Resource Management Zone

One watershed unit is recognized for Special Resource Management Zone (Protection - SRMZ). The 4 691 hectare gross productive area is the Clendenning Creek watershed unit. The Clendenning is the farthest upper reach of the Squamish basin. Deeply incised, steep-sided valleys rise to alpine areas with extensive ice-fields. The valley bottoms are mainly in the Coastal Western Hemlock BGCZ and the upper side slopes are in the Mountain Hemlock BGCZ. The high elevation alpine areas are in the Alpine Tundra BGCZ. Clendenning Creek is undeveloped and designated as a Protected Area; it is an expansive, untouched watershed of mature Douglas-fir and Western red cedar forest. This management unit has a significant standing inventory of mature timber providing representation in the Eastern Pacific Ranges ecosection for Moist Submaritime Coastal Western Hemlock subzone (CWHms1), and the Dry Submaritime Coastal Western Hemlock subzone (CWHds1). The Clendenning Creek drainage contains one of the largest areas of CWHds1 of any undeveloped watershed in the Eastern Pacific Ranges. The area provides a significant contribution to satisfying the biodiversity seral stage/natural disturbance type account for the associated landscape unit.

Primary objectives for the Clendenning Creek SMP-RMZ are:

- mature forest preservation;
- biodiversity conservation; and
- high country recreational pursuits.

Table 7: Draft SRMZ Objectives and Strategies

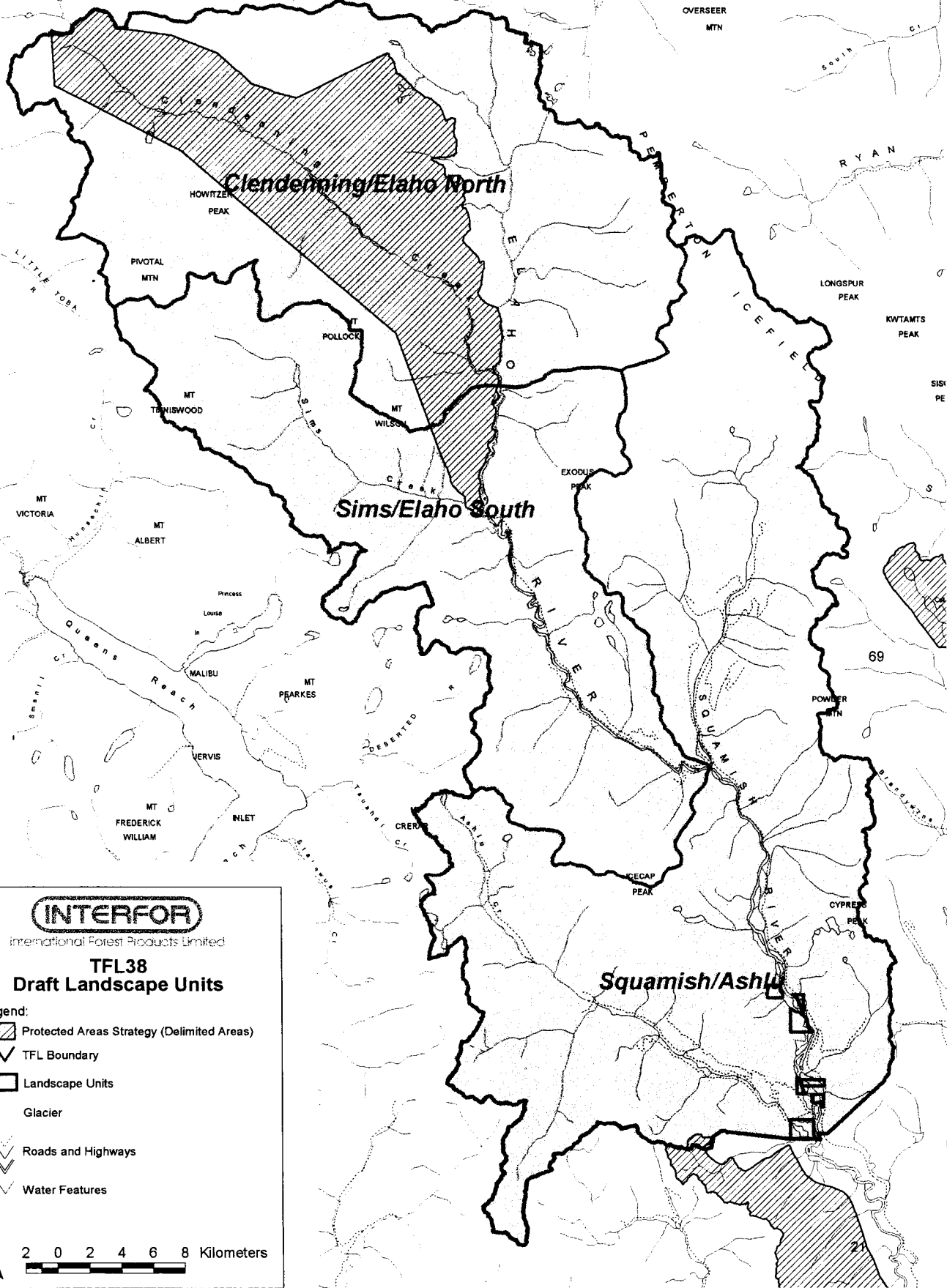
Summary Objectives	Strategies
Maintain Access for Recreation	<ul style="list-style-type: none"> • Maintain access to the Clendenning Protected Area. • Formally manage designated recreation trails and pursue funding from the MoF and FRBC recreation funding programs.
Biodiversity Conservation	<ul style="list-style-type: none"> • Respect the designation of the Clendenning Protected Area. • Account for the contribution of the Clendenning Protected Area to satisfying the biodiversity seral stage/natural disturbance type account for the associated landscape unit.

Table 8: The Desired Future State for the Draft SRMZ

Summary Objectives	Year 2018	Monitoring Indicator
Maintain Access for Recreation	<ul style="list-style-type: none">continued access to Clendenning Protected Area	<ul style="list-style-type: none">user satisfactionnumber of recreation users
Biodiversity Conservation	<ul style="list-style-type: none">high weighted biodiversity emphasis seral stage distribution	<ul style="list-style-type: none">forest inventory age classes



Photo 8: Clendenning Creek Protected Area



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**TFL38
Draft Landscape Units**

Legend:

Protected Areas Strategy (Delimited Areas)

TFL Boundary

Landscape Units

Glacier

Roads and Highways

Water Features



2 0 2 4 6 8 Kilometers

3.2 Draft Landscape Units

Management Plan #8 is prepared in consideration of three draft landscape units over the TFL 38 planning area. Interfor recognizes that under the strategic planning regulations of the FPC, the District Manager (Squamish Forest District) must establish landscape units and set objectives for each, in co-operation with the designated environment official. Established landscape units will be incorporated into the Sea to Sky LRMP. Interfor understands that the LRMP process will review landscape units for the entire Squamish Forest District. The draft landscape units in MP #8 are presented in order to facilitate the preparation of this plan in the spirit of the forthcoming LRMP, to enable biodiversity planning, and to apply a set of objectives to similar sub-units of the land-base.

Within TFL 38, the objectives for the draft landscape units will be to operate within the requirements of the FPC and MoF policy so as to ensure the protection of other resource values while enhancing the sustainable harvest level of the area.

The TFL 38 area is divided into three draft landscape units (Map #3). The landscape units are based on the *Third Draft of the Squamish Forest District Landscape Units, February 1997*, map. The gross area of the landscape units range from 55 580 hectares to 91 662 hectares. They are numbered from South to North.

Table 9: Draft Landscape Units

Landscape Unit	Watershed Units	Area (hectares)
Landscape Unit #1	Ashlu River Squamish River	91 662
Landscape Unit #2	Elaho River South Sims Creek	55 580
Landscape Unit #3	Elaho River North Clendenning Creek	71 374

3.2.1 Resource Values and Preliminary Biodiversity Emphasis Options

Draft landscape unit objectives are based on consideration of the ranking of different resource values identified for the landscape units. Within each draft landscape unit, the resource values have been given an emphasis rating of low, moderate or high. The ratings are based on the broad characteristics of the draft landscape unit for each particular resource value separately. Although it is recognized that there may be concentrations of values within a draft landscape unit that may be managed differently from the rest of the unit.

Table 10: Preliminary Landscape Unit Resource Value Ranking

Landscape Unit	NDT	Watershed Unit	RMZ	Resource Value Ranking					
				B	FP	TP	PA	R	A
# 1	1, 2	Ashlu R	ERDZ	Low	Mod	High	Low	Mod	Low
		Squamish R	ERDZ	Low	High	High	Low	Mod	High
#2	1, 2	Elaho R South	ERDZ	Low	Mod	High	Low	Mod	Mod
		Sims Cr	GRMZ	Low	Low	Mod	Mod	Low	Mod
#3	1, 2	Elaho R North	GRMZ	Low	Low	High	Low	Mod	Low
		Clendenning Cr	SRMZ	High	Low	High	High	High	High

B Biodiversity FP Fish Production TP Timber Production
PA Protected Area R Recreation A Aesthetics

In consideration of foregoing and the following:

- the Crown's timber production objectives for Tree Farm Licences;
- the relatively low topographic and ecosystem complexity;
- the regionally common level of wildlife and fisheries species diversity;
- the capacity to manage for fisheries, wildlife, and scenic values;
- the temporal and spatial distribution of seral stages;
- the direction resulting from the Lower Mainland Protected Area Strategy;
- the forthcoming Land and Resource Management Plan; and
- the economic and social objectives of the Crown;

the preliminary biodiversity emphasis options for the landscape units identified for TFL 38 are assigned as follows:

Table 11: Preliminary Landscape Unit Biodiversity Emphasis Option

Draft Landscape Unit	Preliminary Biodiversity Emphasis Option
Landscape Unit #1	Low
Landscape Unit #2	Low
Landscape Unit #3	Low

3.2.2 Biodiversity Objectives

Until such time that Resource Management Zones and Landscape Units, and respective objectives are established, as authorized by the *Forest Practices Code of British Columbia Act*, the default is that all of the TFL 38 area will be managed in consideration of the lower biodiversity emphasis option described in the *Biodiversity Guidebook*. Direction is also taken from the Deputy Minister of Forests and the Deputy Minister of Environment, Lands and Parks with regards to the government's objectives regarding balancing biodiversity objectives with impacts on timber supply⁹.

The objective for biodiversity management on TFL 38 is to maintain a level of biological diversity that provides habitat for a wide range of native species while recognizing that timber management is the primary objective and the pattern of natural biodiversity within the operable forested basin will be significantly altered.

The biodiversity objective and strategies for TFL 38, rely on several key principles and assumptions:

- Management of biodiversity must be flexible and adaptive;
- Not all elements of biodiversity can be, need to be, or will be, maintained on every hectare;
- Intensive forestry within managed landscapes can be compatible with the maintenance of biological diversity;
- By maintaining broad geographical distribution of forest ecosystems, genetic and functional diversity will be maintained;
- Scale of management will vary from the landscape level to the stand level;
- The maintenance of a variety of seral stages, stand structures and patch sizes, across a variety of ecosystems and landscapes will meet the habitat needs of most

⁹ Ministry of Forests, August 25, 1997. *Memorandum Re: Achieving Acceptable Biodiversity Timber Impacts*.

forest organisms; and

- Old seral forest retention, in conjunction with, managed rate-of-cut, riparian management, and constraint centric forest management practices prescribed by the Forest Practices Code, is a feasible way to maintain biodiversity at the landscape level.

As described in the previous section, there are two natural disturbance types (NDTs) in characterizing TFL 38. Landscape level biodiversity objectives for TFL 38 are based on the maintenance of old seral stage at the biogeoclimatic subzone level for the natural disturbance types found in the landscape units described in Section 3.2 of MP #8.

Table 12: Existing Seral Stage Distribution (December 31, 1996)

Landscape Unit	NDT	BEC zone	Productive Area (ha)	Area distribution (%) within landscape unit			
				<40 yrs	> 80 yrs	> 120 yrs	> 250 yrs
#1	1	CWH	936	28	59		41
		MH	5 598	7		88	85
	2	CWH	22 432	36	58		50
		AT	783				100
#2	1	MH	2 747	1		98	90
	2	CWH	11 581	22	72		67
		AT	288				100
#3	1	MH	4 595	0		91	85
	2	CWH	11 520	4	94		85
		AT	243				100

NDT (Natural Disturbance Type):

- NDT 1 are ecosystems with rare stand-initiating events containing the following biogeoclimatic subzones and variants: CWHvm1, CWHvm2, MHmm1, and MHmm2.
- NDT 2 are ecosystems with infrequent stand-initiating events containing the following biogeoclimatic subzones and variants: CWHdm, CWHds1, and CWHms1.

Caution is warranted with respect to detailed analysis providing breakdown of the biogeoclimatic subzone variant level representation within NDTs; this is best left until *Terrestrial Ecosystem Mapping* is carried out over TFL lands, under the Resource Inventory Program of Forest Renewal B.C. Interfor will apply for Site Index/ Biogeoclimatic Ecosystem Classification (SI-BEC) correlation and ecological mapping funding under Land-based Operational Inventories program of FRBC in 1998.

The current source data for biogeoclimatic analysis is 1:250 000 digital data provided by the Ministry of Forests, Research Branch. The table above shows the seral stage distribution within the NDT/BEC zones, as derived from the source data, when "rubber sheeted" on TFL 38 digital forest cover data base.

Operational observations indicate that CWHds1 in the Elaho River valley does not extend as far up the valley as indicated in the 1:250 000 regional biogeoclimatic maps. This is based on the presence of *Abies amabilis*, which is indicative of CWHms1. The southern end of Sims Creek appears to be CWHms1 with the CWHms1 extending south possibly as far as Peaches/Ponor Creeks. More detailed investigations are required to verify these observations. However, this kind of discrepancy between 1:250 000 scale mapping and operational level observations, a function of resolution limitations, highlights the point that 1:250 000 scale mapping is not suitable for variant level analysis.

Table 13: Recommended Seral Stage Distribution

Biodiversity Emphasis Option	NDT	Biogeoclimatic Zone	Required % Forest Area Within Landscape Unit			
			<40 years	>80 years	>120 years	> 250 years
Low	NDT 1	CWH	n/a	> 18%	n/a	> 13 %
		MH	n/a	n/a	> 19 %	> 19 %
	NDT 2	CWH	n/a	> 17 %	n/a	> 9 %
Intermediate	NDT 1	CWH	< 30 %	> 36 %	n/a	> 13 %
		MH	< 39 %	n/a	> 36 %	> 19 %
	NDT 2	CWH	< 36 %	> 34 %	n/a	> 9 %
High	NDT 1	CWH	< 23 %	> 54 %	n/a	> 19 %
		MH	< 17 %	n/a	> 54 %	> 28 %
	NDT 2	CWH	< 27 %	> 51 %	n/a	> 13 %

Source: *Biodiversity Guidebook*, September 1995.

Table 14: Timber Harvesting Land-base, Squamish Forest District

	TFL 38				Soo TSA*	Squamish Forest District
	LU #1	LU #2	LU #3	Total		
Gross Land-base	91 662	55 580	71 374	218 616	880 000	1 098 616
Total Forested	29 749	14 616	16 358	60 723	300 716	361 439
Timber Harvesting Land-base (THLB)	19 635	7 785	8 724	36 144	109 765	145 909
Percent THLB	13.5%	5.3%	6.0%	24.8%	75.2%	100%

* Source: Soo TSA Timber Supply Analysis, July 1994. Figures have not been adjusted to account for the new parks created in the Soo TSA as part of the October, 28, 1996 government announcement.

4.0 MANAGEMENT STRATEGIES AND IMPLEMENTATION

To achieve the management objectives set forth in Section 2 and 3, management strategies related to Land Use, Environmental Practices, Timber Management, Silviculture Practices, First Nations Involvement, Community Stability, and Forest Renewal B.C. (FRBC) are being implemented.

Interfor will manage its operations so as to meet all legislation and regulations concerning integrated resource management so that the appropriate resource values identified are managed.

4.1 Land Use Decisions and the Protected Areas Strategy

At the time of the preparation of the SMOOP for MP#8, Interfor had identified the opportunity to be involved in land use issues or processes and to determine their effect on the TFL and communities. At that time the Lower Mainland Protected Areas Strategy (LMPAS) process was well underway. Interfor took a proactive role in LMPAS discussions, on behalf of the Coast Forest and Lumber Association, and in the proposal of candidate areas for protection, through the publication of *A Protected Areas Network for Southwestern B.C.* brochure. Interfor's proposal identified candidate protected areas that offered a balanced solution which satisfied the environmental, social and economic goals of the LMPAS. Of the nine areas proposed for completing the LMPAS, variations on five became part of the 23 parks and protected areas announced on October 28, 1996. This management plan accepts the resolution of the LMPAS and aims to present information concerning the impact on TFL management and the impact on timber supply of the land withdrawal resulting from the current PAS proposal.

As part of the parks announcement, the government also announced the long awaited Sea to Sky Land and Resource Management Plan (LRMP). As identified in the SMOOP, Interfor will continue to be proactive by maintaining support for a cooperative process that is creative in seeking solutions. MP #8 is written in the spirit of an LRMP and incorporates forest management strategies identified as part of a mitigation/transition strategy consequent to the resolution of the LMPAS.

4.2 Environmental Practices

Interfor is involved with several environmental initiatives that include a corporate Environmental Policy, an Environmental Management Program, Audits and Principles of Sustainable Forestry.

4.2.1 Environmental Policy

The company's Environmental Policy appears in Table 15.

Table 15: Environmental Policy

International Forest Products Limited is committed to respect for and care of the earth. Our policy is one of continuous improvement, corporately and individually, designed to minimize the environmental impact of operations.

We will achieve this policy by:

- Working with our union, contractors and employees in setting the standard for cooperative and environmentally responsible and safe work practices in all operations,*
- Providing employee education and training in environmental matters.*
- Complying with all applicable laws pertaining to the environment.*
- Auditing environmental performance, with a status report being delivered to the Board of Directors and shareholders annually. (Commencing with 1995 Annual Report).*

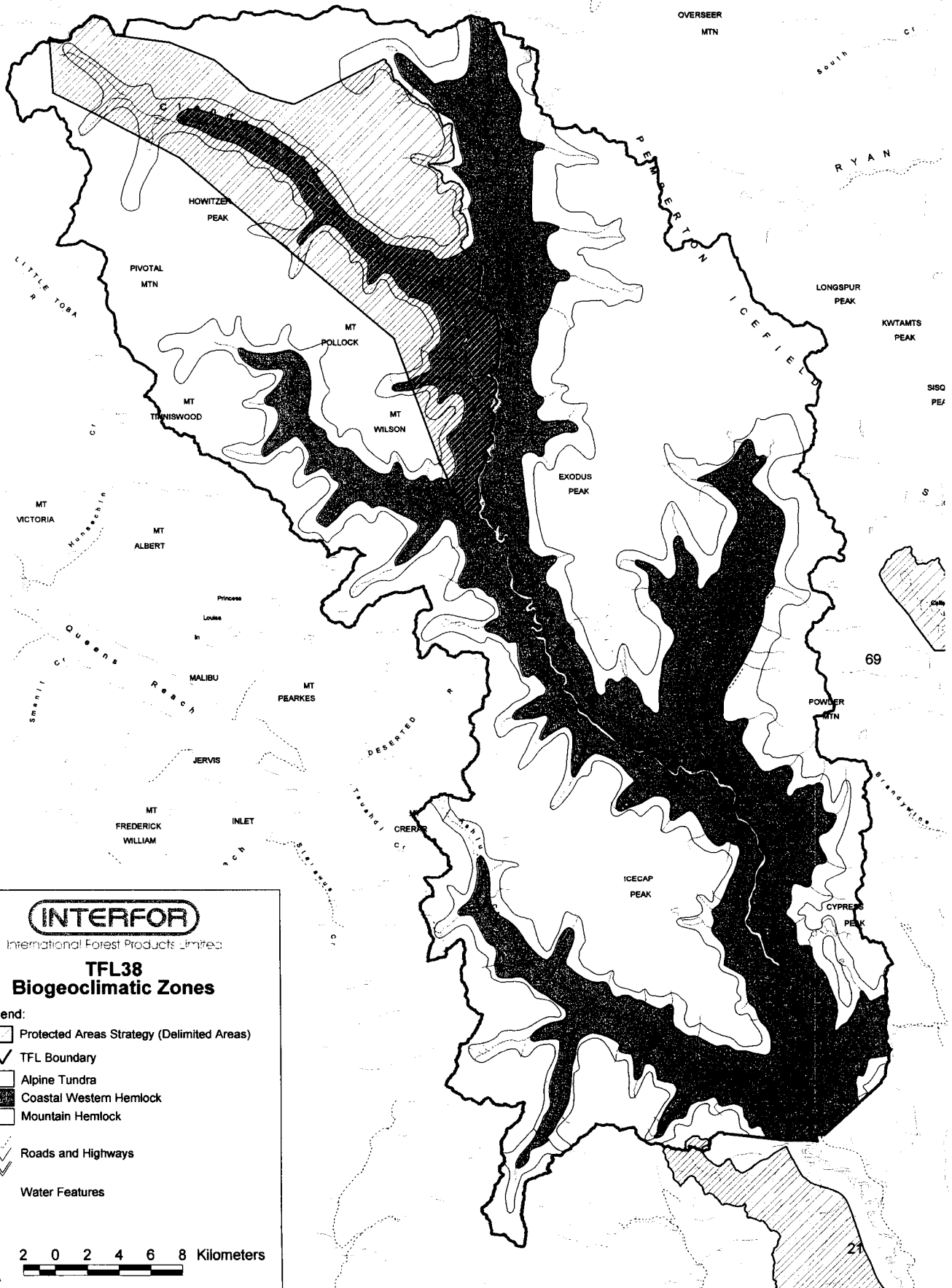
We will regularly review this policy to ensure that it reflects the Company's ongoing commitment to environmental values and principles.

4.2.2 Environmental Management Program

Interfor has been very proactive in its approach to environmental performance and has set in place programs such as the Joint Interfor/Industrial, Wood and Allied Workers of Canada (IWA) Environmental Initiative, Joint Environmental Committees and Joint Environmental Audits. The environmental management program is designed to ensure continued excellence in forest stewardship and environmental performance.

The system is composed of elements that combine to ensure compliance with both forest practices and environmental standards:

- The Joint Environmental Initiative between the IWA and Interfor manifests itself in the Joint Environmental Steering Committee which provides direction to the individual joint committees at the camp level;
- Joint Camp Environmental Committees established at each active logging operation, composed of hourly representatives from each work phase and Interfor and contractor representatives as appropriate;
- A comprehensive training program designed jointly by the IWA and Interfor to provide active training to the workforce; and
- A system of internal audits focusing on forest practices and forest management directed at key compliance issues and external audits focused on the effectiveness of the environmental management system.



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**TFL38
Biogeoclimatic Zones**

Legend:

Protected Areas Strategy (Delimited Areas)

TFL Boundary

Alpine Tundra

Coastal Western Hemlock

Mountain Hemlock

Roads and Highways

Water Features

N



2 0 2 4 6 8 Kilometers

Through this process, the combined concern for environmental responsibility of all our hourly and management people can help in the improvement and changing of forest practices.

4.2.3 Principles of Sustainable Forestry

The company is a signatory to the *21 Principles of Sustainable Forestry* as developed by the Forest Practices Committee of the Forest Alliance of B.C.

As signatories to these Principles, Interfor is committed to the sustainability of the environmental, economic and social values on the forest lands where we work. Interfor will strive for high levels of environmental performance in all aspects of the company's forest operations.

A guiding theme is to protect the environment, and ensure human health and safety, while maintaining a forest industry that remains economically competitive in a rapidly changing world.

By applying the *21 Principles of Sustainable Forestry* Interfor will endeavour to sustain sufficient commercial, cultural, and spiritual values in forested lands to satisfy society's needs. These needs will change with time and we will change with them.

The great variety of British Columbia's forests makes it necessary to develop site-specific management plans. The *21 Principles of Sustainable Forestry* will be interpreted within each unique region as they are applied across the province.

Our employees and contractors will be trained in the application of these Principles in the field. We will employ qualified personnel to ensure compliance in all aspects of our operations including planning, road building, logging, and silviculture.

We pledge to conduct all our forest operations, on both public and private lands that we manage, according to the following principles:

- 1 **Soil Conservation and Logging Roads:** All logging roads will be constructed and maintained or deactivated to engineering standards that provide for long-term erosion control. We will not build roads where major soil erosion is likely to occur.*
- 2 **Watershed Management:** In cooperation with other tenure holders in the area, we will plan our logging operations on a watershed basis to minimize soil erosion, stream siltation and flooding caused by excess run-off.*
- 3 **Fish Habitat:** We will protect fish habitat by carefully planning operations along waterways, using buffer strips or other measures to preserve water quality and streambank stability.*

- 4 **Wildlife Habitat:** We will arrange the forest to retain wildlife habitat by measures such as leaving wildlife corridors, protecting critical areas, and leaving wildlife trees standing where safety permits.
- 5 **Biological Diversity:** We will protect the biological diversity of management lands by ensuring that representative stages of forest succession, including old growth, are present throughout each forest ecosystem.
- 6 **Climate Change:** We will minimize our net contribution of greenhouse gases through energy efficiency, wildfire control, soil conservation, and rapid reforestation of harvested lands.
- 7 **Burning:** We will burn only when it is prescribed for reforestation, fire hazard control, forest health or the enhancement of wildlife habitat.
- 8 **Other Commercial Values:** We will manage forest lands to sustain other economically important activities such as tourism, livestock grazing, hunting, fishing, trapping, honey production, and berry, foliage and mushroom picking.
- 9 **Visual Impact:** We will make visual impact management a key element of planning along major travel corridors, near recreation areas and around communities.
- 10 **Inventory of Forest Resources:** We will work with government to ensure that there are accurate, up-to-date inventories of all forest resources on which to base forest management plans and to help determine the allowable annual cut (AAC).
- 11 **Harvesting Practices:** We will choose harvesting practices and equipment that are designed to minimize erosion, soil compaction, and damage to remaining vegetation and wildlife habitat.
- 12 **Clearcutting and Selection Logging:** Where clearcutting is silviculturally appropriate it will be done in a manner that satisfies all the requirements of the Principles of Sustainable Forestry. We will use other silvicultural systems, such as partial cutting, where they are silviculturally more appropriate, and can be done safely.
- 13 **Wood Utilization:** We will use all commercially viable wood cut during logging operations provided that this is balanced with the need to leave large woody debris for wildlife habitat and with the need to leave organic matter for future generations of forest.
- 14 **Forest Renewal:** We will ensure that all logged lands are reforested either by natural regeneration or by planting with appropriate species. Silvicultural treatments such as brushing and thinning will be used where prescribed to ensure the survival of the new forest and to improve quality wood production.
- 15 **Use of Pesticides:** We will minimize the use of conventional chemical pesticides.

Alternate methods of pest and weed control will be used wherever practical and environmentally sound.

- 16 **Recreation:** We will manage forest land with concern for recreational use by the public. This will include the appearance of roadsides and harvested areas, and assistance in providing campsites, picnic areas, boat ramps and trails.*
- 17 **Public Involvement:** We recognize the right of communities and individuals to access information and to be involved in forest planning and to monitor industrial performance. We will encourage and participate in initiatives that involve the public in an informed and effective manner.*
- 18 **Communities:** We will work closely with local communities to assist them in attaining stability, employment, economic viability, and a high quality of life.*
- 19 **Environmental Programs:** We will employ environmentally appropriate practices in our operations. This will include recycling programs, waste oil recovery, solid waste reduction and management, energy efficiency, pollution control, the appearance of industrial sites and a positive attitude towards environmental programs.*
- 20 **Research:** We will support research programs, including demonstration projects, that will lead to increased yield from managed forests, the generation of value-added products, and protection of the environment.*
- 21 **Monitoring:** We support an independent forest practices monitoring system that will report its findings to industry and the public.*

Interfor submits a report, to the Forest Alliance of B.C. each year, in regard to its performance on meeting these principles.

4.3 Timber Management

The management strategies for timber focus on attainment of the approved allowable annual cut (AAC) as set by the Chief Forester of the Province. This includes several aspects related to determining the rate, methods, and standards of harvesting as described in the following sections.

4.3.1 Timber Supply Analysis

The primary objective of a tree farm licence management plan is preparation of a timber supply analysis for the purposes of identifying the consequences of current forest management and forest practices, including the impact on short- and long-term timber supply.

The timber supply analysis for TFL 38 was conducted by Timberline Forest Inventory Consultants (Timberline) on behalf of Interfor. Timberline employed the Ministry of Forests timber supply computer simulation model, FSSIM.

For planning purposes, the TFL was divided into six watershed units: 1) Ashlu River, 2) Squamish River, 3) Elaho River South, 4) Elaho River North, 5) Sims Creek, and 6) Clendenning River. The designation of the Clendenning Protected Area is recognized.

The timber supply analysis and the inventory and growth and yield data used as inputs to the analysis form the technical basis for an allowable annual cut (AAC) recommendation to the Chief Forester of the Province. Notably, the analysis considered the following:

- Definition of the forest harvesting land-base consistent with current management direction, including the RPAC recommendations for resource management zonation, and a new operability assessment;
- Forest cover inventory modifications;
- Cruise based standing inventory estimates;
- Interim site index estimates for post-harvest regenerated stands;
- Application of the *Riparian Management Area Guidebook*;
- Terrain net down factor review;
- Wildlife management zones;
- GIS based road area land-base reductions;
- Application of the *Biodiversity Guidebook*;
- Landscape inventory review; and
- RMZ's adjacency and green-up parameters.

The complete description of the inputs into the analysis are in Appendix VIII:

- **Timber Harvesting Land-base**

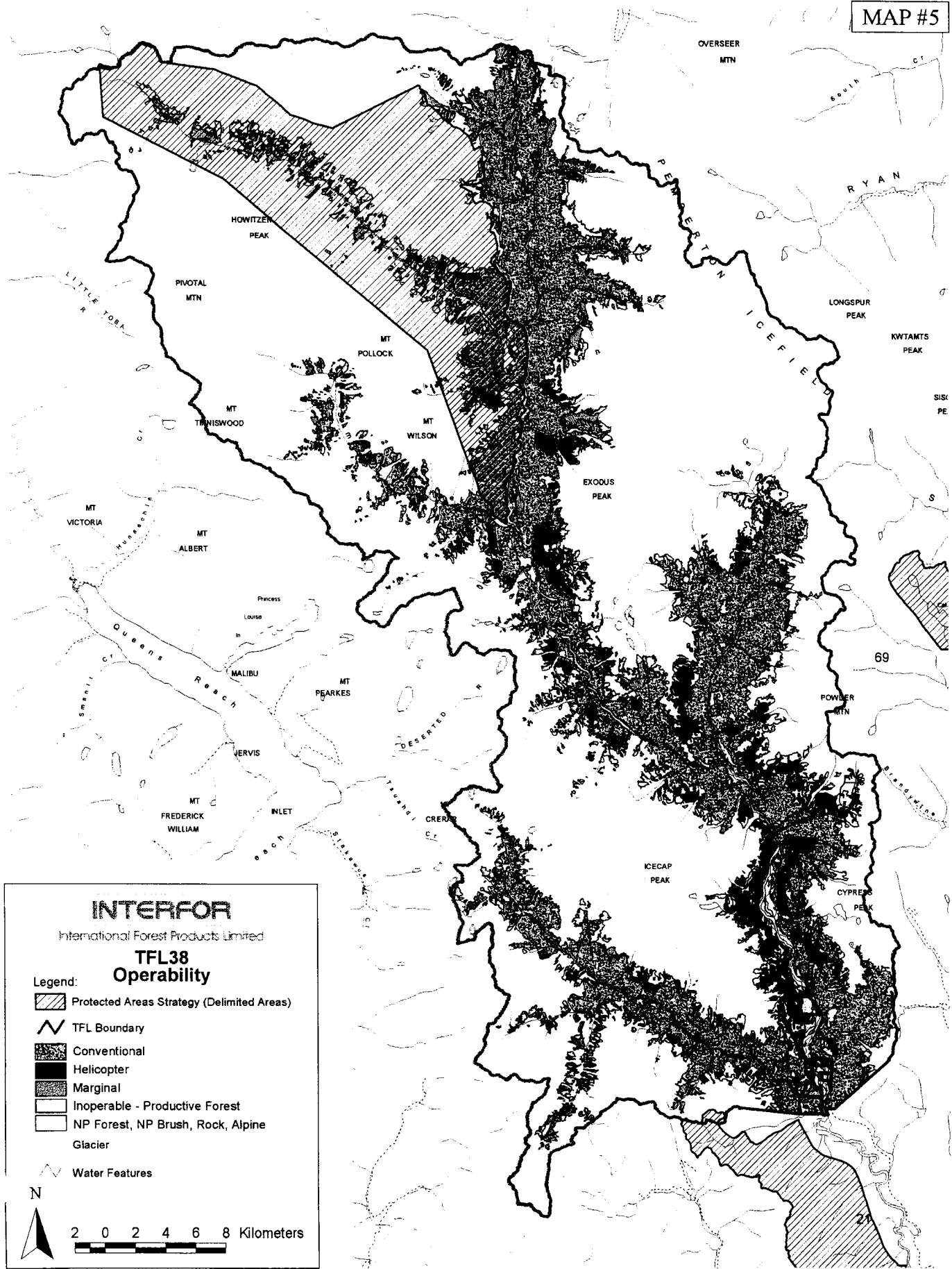
The total area of TFL 38 is 218 616 hectares. Non-productive areas including lakes, swamps, rock and alpine areas account for approximately 150 032 ha (68.6%) of the total area, non-productive area with forest cover attributes account for 7 861 ha. The productive forest land-base (60 723 ha) considered available for timber production is further limited due to land-base withdrawal resulting from the Clendenning Protected Area, operability considerations, existing roads, riparian buffers, and environmentally sensitive areas. The net productive land-base (36 144 ha) is considered to be the "timber harvesting land-base" which contributes to

determining a timber harvest.

The forest land-base of the TFL has been assessed for operability that categorized the potential harvesting areas into:

- Conventional logging systems;
- Aerial (helicopter) systems;
- Marginal stands (low merchantability); and
- Non-operable.

The areas found to be operable (excluding the Clendenning Protected Area) make up the gross contributing land-base from which yield forecasts are made (19.7% of the TFL land-base). The gross operable land-base in the TFL is classified as conventional, helicopter and marginal, 82%, 13% and 5% respectively (refer to Appendix IX for *TFL 38 Operability Mapping Terms of Reference*). The distribution of the operability classification is shown in Map 5 and the relative contribution of the operable categories to the net harvest is shown below in Figure 1.



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TFL38 Operability

Legend:

- Protected Areas Strategy (Delimited Areas)
- TFL Boundary
- Conventional
- Helicopter
- Marginal
- Inoperable - Productive Forest
- NP Forest, NP Brush, Rock, Alpine Glacier
- Water Features

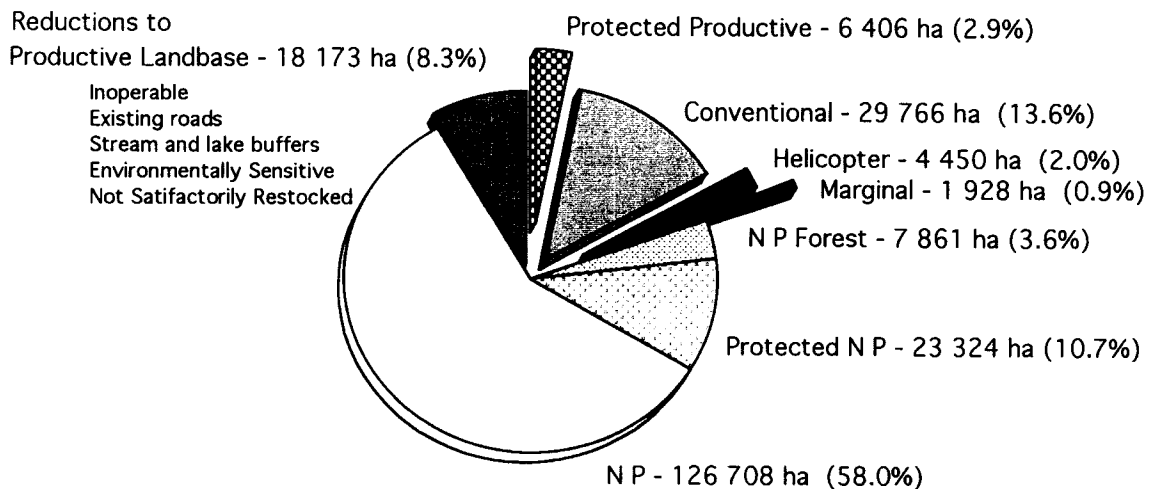


2 0 2 4 6 8 Kilometers

TFL 38

Total Area (1996 Digital Database) = 218 616 hectares (100.0%)

Productive Landbase = 60 723 ha (27.8%)



Non-Productive Landbase = 157 893 ha (72.2%)

Figure 1: Net Area Designation by Operability Class

Operability mapping includes a marginal category (2 759 ha gross area), due to the current economic value of the timber. Interfor believes that log prices will continue to increase in response to global demand for timber, and harvesting technology will continue to improve. Therefore, all the accessible mature timber identified in the operability mapping for the TFL, within environmental and safety constraints, is economically available in the first rotation. In the timber supply model the marginal operability classification does not contribute to the available standing inventory until the third decade. The marginal classification does not directly support the current harvest level, however it does contribute, from decade 3 and beyond, to achieving harvest flow objectives.

The majority of low site stands were classified as inoperable, and removed from the land-base as a part of the operability net down. Therefore no specific deductions were made to account for site with very low productivity in the base case. To address District concerns that perhaps some low regeneration potential sites remained in the land-base, a sensitivity analysis was performed by applying a netdown to Hemlock/Cedar Poor and Hemlock/Balsam Poor analysis units.

The analysis also assumes that the both the coniferous and deciduous components of the forest stands are commercially viable. 1 656 ha (gross area) of deciduous leading stands have been identified in the productive land-base, of which 619 ha (net area) are considered physically and economically operable. It is estimated that 50% of the deciduous area will be managed, and 50% will be considered for site conversion to conifer.

- **Existing Forest Cover Information, Species Profile and Age Class Distribution**

Due to the nature of the original forest attributes, the inventory had become incompatible, in some respects, with current Ministry of Forests data model.

In 1993, the TFL 38 inventory was modified in order to facilitate forest cover database use in current timber supply analysis processes, the preparation of maps with MoF style labels, and the translation of the TFL inventory data into compatible Intergraph design files. Modifications, to ensure compatibility with MoF processes and specifications, were as follows:

- the addition of crown closure estimated from TRIM based orthophotos or recent 1:15,000 aerial photos;
- the addition of stand height from recent silvicultural records on disturbed areas; and
- the estimation of stand age and height from age, height and site classes referenced to the leading species in the original site curves.

- **Cruise based standing inventory estimates**

Timber volumes on coniferous stands greater than 140 years of age were derived from prism cruise plots established within the TFL in 1979, 1980 and 1992. An inventory average line method was used to group plots by analysis unit and to calculate volume. From an initial base of 920 inventory cruise plots within the TFL, 742 plots within the gross operable land-base were used to estimate standing inventory (Appendix VIII).

- **Interim Site Productivity Estimates**

Site indices in the existing TFL 38 inventory were estimated from old stands. These estimates are appropriate for growth and yield prediction with the MoF program VDYP (Variable Density Yield Projection), however these site indices under-estimate the growth expected in post-harvest regenerated stands. As an interim step to upgrading site index estimates for predicting the growth and yield of post-harvest

regenerated stands in the timber supply analysis for MP #8, J.S. Thrower & Associates Ltd. reviewed the existing data to recommend interim site index adjustments (Appendix X).

The interim site indices recommended for predicting the growth and yield of post-harvest regenerated stands are higher than the inventory. The estimates were developed using conservative methods. The review recommended that the site index adjustments be made in consideration of the base case timber supply analysis for MP #8. The base case timber supply analysis with site index adjustments applied is referred to as the Licensee Scenario.

Table 16: Recommended Site Index Values for MP#8 Timber Supply Analysis

BEC Subzone	Leading Species	Existing Inventory Site Index (m)	Recommended Base Case 'Alternate Scenario' SI Adjustment (m)	% Productive Forest Area
CWHds1	Ba	na	20	
	Cw	19.4	20	5.8%
	Fdc	21.4	25	12.7%
	Hw	15.2	22	2.1%
CWHms1	Ba	14.2	18	17.3%
	Cw	18.3	18	3.5%
	Fdc	20.5	23	10.3%
	Hw	12.7	20	17.7%
MHmm2	Ba	10.6	12	11.5%
	Hw	9.3	11	8.5%

- Riparian and Environmentally Sensitive Areas**

Base stream classification information for TFL 38 timber supply analysis consists of operational information. The information was based on classification that appears on operational plans where it existed, and on first-hand knowledge of staff members who have worked in the area.

The prescribed buffers are based on the *Riparian Management Area (RMA) Guidebook (December 1995)*. For the purpose of the timber supply analysis no S1 river was considered to be a "large river". Therefore as per the RMA Guidebook resultant buffers, for each side, were derived for timber supply modelling purposes.

Table 17: Riparian Buffers for Timber Supply Modelling

Riparian Class	Reserve Zone (m)	Management Zone (m)	Total Riparian Management Area (m)	Maximum Management Zone Retention	Resultant Buffer 100% netdown for TSA (m)
S1	50	20	70	50 %	60
S2	30	20	50	50 %	40
S3	20	20	40	50 %	35*
S4	0	30	30	25 %	10*
S5	0	30	30	25%	10*
S6	0	20	20	5 %	0

The resultant buffer for S3 should be 30 metres based on the total RMA and the maximum retention. However due to the uncertainty associated with base stream classification an additional 5 metre allowance, for a resultant buffer of 35 metres, was made to account for the fact that a portion of the creeks classified S3 may actually be S2.

The resultant buffer for S4 and S5 should be 7.5 metres. However due to the uncertainty in the classification, and that the 1:20 000 scale map base used in the analysis does not capture all the creeks that will be encountered in operational planning, a resultant buffer of 10 metres was used to account for all creeks classified S4 and S5. S6 streams were not buffered.

To simplify the classification of wetlands and lakes, and to eliminate the need to be concerned for whether wetland complexes are ≤ 5 ha or > 5 ha, all lakes, swamps and wetlands were buffered 10 metres with a 100% netdown. This adequately accounts for RMA requirements and the maximum retention level of 25% specified in the RMA Guidebook.

Identification of ESA areas for wildlife is primarily for Mountain Goat and Moose. The management of Environmentally Sensitive Areas for wildlife habitat is achieved primarily through the identification of Wildlife Management Zones discussed in this Section under Resource Management Zones.

ESA net down factors for Terrain Stability Classes IV and V were estimates from J.M. Ryder and Associates (June 1995), who completed terrain stability mapping for TFL 38 (Appendix XI). Two approaches were used to verify these estimated net down factors (Appendix XII): the use of terrain attribute data to identify unstable landforms in logged areas and a review of recent air-photos in the TFL to examine landslide activity for logged areas not covered as part of the terrain attribute study.

Recently, terrain attribute data has been collected in TFL 38 as part of a Ministry of

Forests research program into landslide activity in the Coast Mountains. This data records terrain types and attributes for logged terrain which is about 6 to 15 years old, as well as landslide presence or absence. A preliminary review of this information revealed that much of the logged terrain does not have open slope clearcut landslides. Terrain types with specific attributes associated with the absence of landslides have been categorized, and correlated with similar terrain in other parts of the TFL which have yet to be logged.

Recent air-photos have been used to determine landslide activity in other areas of TFL 38 and the terrain types and attributes associated with these landslides. Net downs for terrain of these types in unlogged areas of the TFL have been estimated, based on FPC harvesting standards. Estimates of landslide occurrence for Class IV terrain have been determined on a per hectare basis, using polygon areas from the terrain map information contained in the GIS database of TFL 38.

During final development of the procedure for determining the net down factors, discussions were conducted with Research Geomorphologists at the Ministry of Forests, Nanaimo. These discussions ensured that the approach used to determine the net down factors was consistent with previous approaches as well as the strengths and limitations of the terrain attribute data.

A total of 40 614 ha of TFL 38 productive area are classified as environmentally sensitive area (ESA) due to important recreation values and terrain classification. Of the total, 27 271 ha are within the gross operable land-base. From the total, 18 145 ha of have been withdrawn when deriving the timber harvesting land-base, either specifically as ESAs (3 016 ha) or during deductions for protected areas, inoperable, marginal, non-commercial, roads, riparian and not satisfactorily restocked.

Environmentally sensitive areas for recreation are derived from the recreation inventory (Appendix XX). A total of 1 463 ha productive area are classified as Er1. After the consideration for operability and a 90% Er1 netdown, 14 ha net area remain in the analysis. Er2 represents a total of 24 306 ha productive area of which 15 933 ha are operable, and 14 891 ha remain in the net land-base. Consistent with the Soo TSA Timber Supply Analysis, Er2 area is not netted down. Er2 areas default to GRMZ for the timber supply analysis.

- **Estimates of Roads and Landings**

Existing roads are identified in the geographic information system (GIS) database as line features. These line features are coded and identify four classifications of road; 1) double lane, 2) 1 lane gravel, 3) 1 lane rough, and 4) 1 lane rough overgrown. An average width, based on an estimate of the permanently non-productive component of the road right-of-way, was assigned to each road class to allow the area in roads to be calculated.

The rationale is based on the following: 585 km of current roads are identified as passing through the operable land-base. Average width allowances by road class were applied to come up with a net area. These widths were assumed to represent the net stand productivity losses at rotation. The majority of these road (85%) pass through stands <41 years of age, and the net area lost (456 ha) represented 4% of the 0-40 year age class operable area.

The underlying assumption in the 4% allowance is that actual losses in productivity are less than the actual area initially tied up in roads (SP road allowances are averaging 6%). This is due to two factors: 1) crown occupancy of border trees naturally extends into the space above the roads, and 2) studies suggest that trees adjacent to road openings exhibit higher growth rates than those in the interior of the stand. These two factors indicate that the net effect would be that actual volume reductions in roaded stands would be less than the area initially lost to roads.

Furthermore, blocks with high site degradation numbers require road rehabilitated to limit site degradation to the maximum stated and approved in the Silvicultural Prescription. Therefore, the 4% road allowance is all that is required to account for site loss due to access and harvesting. The timber supply analysis contains sensitivity analysis addressing concerns that a 6% road allowance may more appropriately reflect current practice.

Future roads, trails and landings will be estimated for the operable land-base based on the percentage of existing roads for the area harvested to date.

- **Biodiversity**

At the time of the preparation of this plan, landscape units planning was well underway, however, biodiversity options had not been established for TFL 38. Therefore, management for landscape level biodiversity, with low biodiversity emphasis option, is represented in the base case. Also, the base case does account for stand level-biodiversity.

For the purpose of recommending the AAC, the landscape units and the recommended biodiversity emphasis options, aforementioned in this management plan, have been modeled as mature forest retention constraint. It has been assumed that in conjunction with the approval of this management plan in late 1997, landscape units will be established for the Squamish Forest District, including TFL 38.

Stand level biodiversity objectives for wildlife tree patches (WTPs) are typically modelled as a yield curve reduction. For TFL 38 spatial analysis capabilities of ArcView 3.0 was used to determine the land-base area that would be affected by WTP requirements.

Analysis was conducted to determine the amount of unconstrained area with forested stands greater than age class 2 (40 years), greater than 500 metres from already constrained area. For the WTP analysis constrained area was defined as inoperable and productive forest, Es1, Er1, Es2, R and PR VQO, Protected Areas, stream buffers, wildlife management zones, inoperable "alpine forest" and non-productive brush. Constrained areas were buffered to identify zones, 250 to 375 metres, 375 to 500 metres and greater 500 metres from a constrained area. Table 18 identifies the resultant zone area from land-base, with forest cover attributes, that already has a level of constraint exceeding WTP requirements.

Table 18: Wildlife Tree Patch Requirement Analysis

LU	NDT	BGCZ	Productive Forest Area (ha)	Area between 250 to 375 metres from already "constrained area" (ha)	Area between 375 to 500 metres from already "constrained area" (ha)	Area beyond 500m from already "constrained area" (ha)
#1	1	ATp	782	0	0	0
		CWHvm	936	3	0	0
		MHmum	5 598	66	15	6
	2	CWHdm	705	27	10	4
		CWHds	6 756	194	66	6
		CWHms	14 971	211	59	47
			Sub Total	501	150	63
#2		ATp	288	0	0	0
	1	MHmum	2 747	3	0	0
	2	CWHds	5 519	19	1	0
		CWHms	6 062	37	5	0
			Sub Total	59	6	0
#3		ATp	242	0	0	0
	1	MHmum	4 595	36	0	0
	2	CWHds	2 604	40	9	0
		CWHms	8 917	330	38	0
			Sub Total	406	47	0
T F L 38		ATp	1312	0	0	0
	1	CWHvm	937	3	0	0
		MHmum	12 940	105	16	6
	2	CWHdm	705	27	10	4
		CWHds	14 879	253	76	6
		CWHms	29950	578	101	48
	Grand Total			60 723	966	203

Table 18 demonstrates, as a result of spatial analysis, the amount of area that may require a netdown for WTP retention totals 1 233 ha (assuming areas >250 metres from an already constrained area will require WTPs). WTP requirements have been determined in Tables 21 and 22. Applying TFL level requirements from Table 22 (MP #8), the resulting netdown for WTPs is 128 ha. A 128 ha netdown applied to the timber harvesting land-base equates to 0.35%. Therefore, based on the results of the WTP requirement analysis, no adjustments were applied to the timber supply analysis for WTPs.

- **Landscape Inventory Review**

The SMOOP for MP#8 identified the opportunity to manage activities within the TFL in a manner responsive to the visual resources identified in the Landscape Inventory. Actions proposed and completed for incorporation into MP#8 include a review of the *Landscape Inventory and Analysis, February 1996*, (Appendix XIII) in the context of managing scenic values in TFL 38 consistent with Forest Practices Code impact objectives. The report *Managing Scenic Values in TFL 38 Consistent with Forest Practices Code Impact Objectives, March 1997* (Appendix VII) was prepared.

As a result of the aforementioned review two areas are identified for consideration as “known scenic areas”, having established visual quality objectives, in accordance with the *Operational Planning Regulation* (OPR). The scenic areas described in MP #8 Section 4.6.5 are factored into the timber supply analysis.

- **Resource Management Zones**

For the purposes of prescribing visually effective green-up, adjacency criteria, and seral stage distribution limits in the timber supply analysis the six watershed units described previously have been subdivided into 8 management zones.

- 1 Partial Retention Visual Quality Objective < 40% slope;
- 2 Partial Retention Visual Quality Objective ≥ 40% slope;
- 3 Modification Visual Quality Objective < 40% slope;
- 4 Modification Visual Quality Objective ≥ 40% slope;
- 5 Mountain Goat Management Zone (MGMZ);
- 6 Moose Management Zone (MMZ);
- 7 General Resource Management Zone (GRMZ); and
- 8 Enhanced Resource Development Zone (ERDZ).

The visual quality objective(VQO) zones are based on the aforementioned scenic areas identified in this management plan. The VQO zones are subdivided to allow for the consideration of slope zone dependant green-up requirements.

The Mountain Goat Management Zone (MGMZ) is based on winter track counts in 1994. The areas delineated for consideration as MGMZ pre-dated the refined

mountain goat habitat zonation delineated as part of the *Procedure for Forest Harvesting Activities Adjacent to Mountain Goat Winter Range* (Appendix XIX). As the areas identified as Mountain Goat Habitat are more expansive than the subsequent habitat zonation delineated for operational planning consideration, the timber supply analysis over estimates the area managed for goats.

The Moose Management Zone (MMZ) is based on the 1988 habitat assessment. The report *An Investigation of Moose Winter Habitat, Elaho Watershed, 1988* was appended to MP #7.

The Wildlife Management Zones are modelled as follows:

Mountain Goat (MGMZ): within the operable portion of the MGMZ

- no more than 20 % is in age class 1 (1 - 20 years)
- at least 20 % is greater than or equal to age class 5 (≥ 81 years)

Moose (MMZ): within the operable portion of the MMZ

- no more than 30 % is in age class 1 (1 - 20 years)
- 20 % should be greater than or equal to age class 4 (≥ 61 years)

The General Management RMZ is area within the Sims Creek and Elaho River North watershed units, and area designated Er2 (recreation ESA), that is not already identified as a Scenic Area or a wildlife management zone.

Enhanced Forestry RMZ is area within the Ashlu River, Squamish River and Elaho River South watershed units that is not already designated Er2, a Scenic Area or a wildlife management zone.

4.3.2 Allowable Annual Cut

Under the Forest Amendment Act, 1988, the portion of the allowable annual cut (263 000 m³/year) attributable to Schedule B Land, available to the Licensee was apportioned 249 251 m³/year - Licensee; 13 118 m³/year - Small Business Forest Enterprise Program (SBFEP). Schedule A lands have an allowable annual cut of 631 m³/year.

The AAC set for MP #7 in 1993 was 263 000 m³/year. The transfer of TFL 38 from Weldwood of Canada Ltd. to Interfor was approved in February 1995. The AAC for the Crown portion of TFL 38 was reduced by 5 percent (12 463 m³/year). Interfor's AAC was reduced accordingly to 236 788 m³/year.

The Timber Supply Analysis Report for TFL 38 (Appendix XIV), forms the basis for a recommended AAC of 250 537 m³/year for the MP #8 period January 1, 1998 to December 31, 2002 (including SBFEP apportionment) for the whole of TFL 38.

The land-base supporting the proposed AAC is an aggregate for the conventional, helicopter, and marginal operability classes. However, as previously noted the marginal operability classification does not contribute to the available standing inventory until the third decade. The marginal classification does not directly support the current harvest level, however it does contribute, from decade 3 and beyond, to achieving harvest flow objectives.

Table 19: TFL 38 Allowable Annual Cut Apportionment

	Approved AAC Apportionment Effective February 27, 1995	AAC Apportionment MP No. 8
Schedule A	631	751
Schedule B		
- SBFEP	13 118	13 118
- SBFEP Weldwood takeback	12 463	12 463
- SBFEP Clendenning PA	0	(12 463)
- Licensee	236 788	236 668
TOTAL(m3/yr)	263 000	250 537

The AAC represents a target harvest rate for TFL 38 that supports management objectives, issues and opportunities contained in this plan. It establishes a stable base for the planning period from which other factors can be applied and tested.

4.3.3 Cut Control

Periodic cut requirements for TFLs are legislated in the *Forest Act*. The holder of a tree farm licence must ensure that:

- The volume of timber harvested during a calendar year is not less than 50% nor more than 150% of the allowable annual cut;
- The volume of timber harvested during a 5 year cut control period is not less than 90% nor more than 110% of the total of the allowable annual cuts available during that 5 year period; and
- “Volume of timber harvested during a calendar year” includes: avoidable residue, unavoidable residue, avoidable waste, and unavoidable waste, as determined by an assessment.

As specified in the licence document, for the purposes of the definition of “5 year cut control period” in the *Forest Act*, the 5 year period for TFL 38 begins on January 1, 1992.

Cut control periods effected by the term of MP #8 are:

- January 1, 1997 to December 31, 2001
- January 1, 2002 to December 31, 2006

4.3.4 Product Objectives

The timber management strategies and the implementation of the Draft ERDZ and Draft GRMZ are guided by fibre requirements which focus on the manufacture of solid wood products. Strategies and development aim to optimize the long-term use of the forest land-base of TFL 38, and stand development and growth, for the benefit of society, the stability of Interfor, communities and employment. Determination of product objectives contributes to this goal and provides objectives for silviculture treatment planning, budgeting and harvest scheduling.

Product objectives are intended to ensure that:

- To as great an extent as possible, H and I grade sawlogs, or better, suitable for manufacture of clear, appearance merch, select and structural lumber are produced (with 50 cm \pm 15 cm average DBH for final harvest and 30 cm \pm 5 cm average DBH for commercial thinning);
- A spectrum of log grades, including clear material will be produced over the long-term to provide opportunity for value added manufacturing;
- Rotation ages will dovetail with requirements for other resource values such as visual quality and biological diversity;
- Incremental silviculture and commercial thinning opportunities will only be considered when they achieve positive rates of return. Where FRBC or Ministry of Forests is funding incremental silviculture or commercial thinning etc., projects will be considered in light of government specified discount rates and economic assumptions for calculating rates of return.

- **Late Seral Stage Forest Product Objectives**

The current log production objective for TFL 38 is:

- Harvest primarily late seral stage forest to produce conifer logs suitable for manufacturing of solid wood products ranging from 'specialty products' through to commodity structural lumber.

Late seral stage timber production will be the primary focus for at least the next 7 decades. Second growth stands will likely not significantly contribute to the gross harvest until beyond the year 2060. Figure 2 details the gross harvest profile for both the "base case" and the "licensee scenario" resulting from the timber supply analysis (Appendix XV).

Company wide coastal log production dictates manufacturing facility upgrades and modifications to match the timber resources with customers' lumber requirements.

- **Second Growth Product Objectives**

Strategies that will be implemented specifically in consideration of product objectives are:

- Species selection will be based on ecological suitability, reliability, productivity and value; and
- Where feasible, target stocking levels, rotation ages, and silviculture treatments will be planned to achieve sawlog grade specifications with highest value.

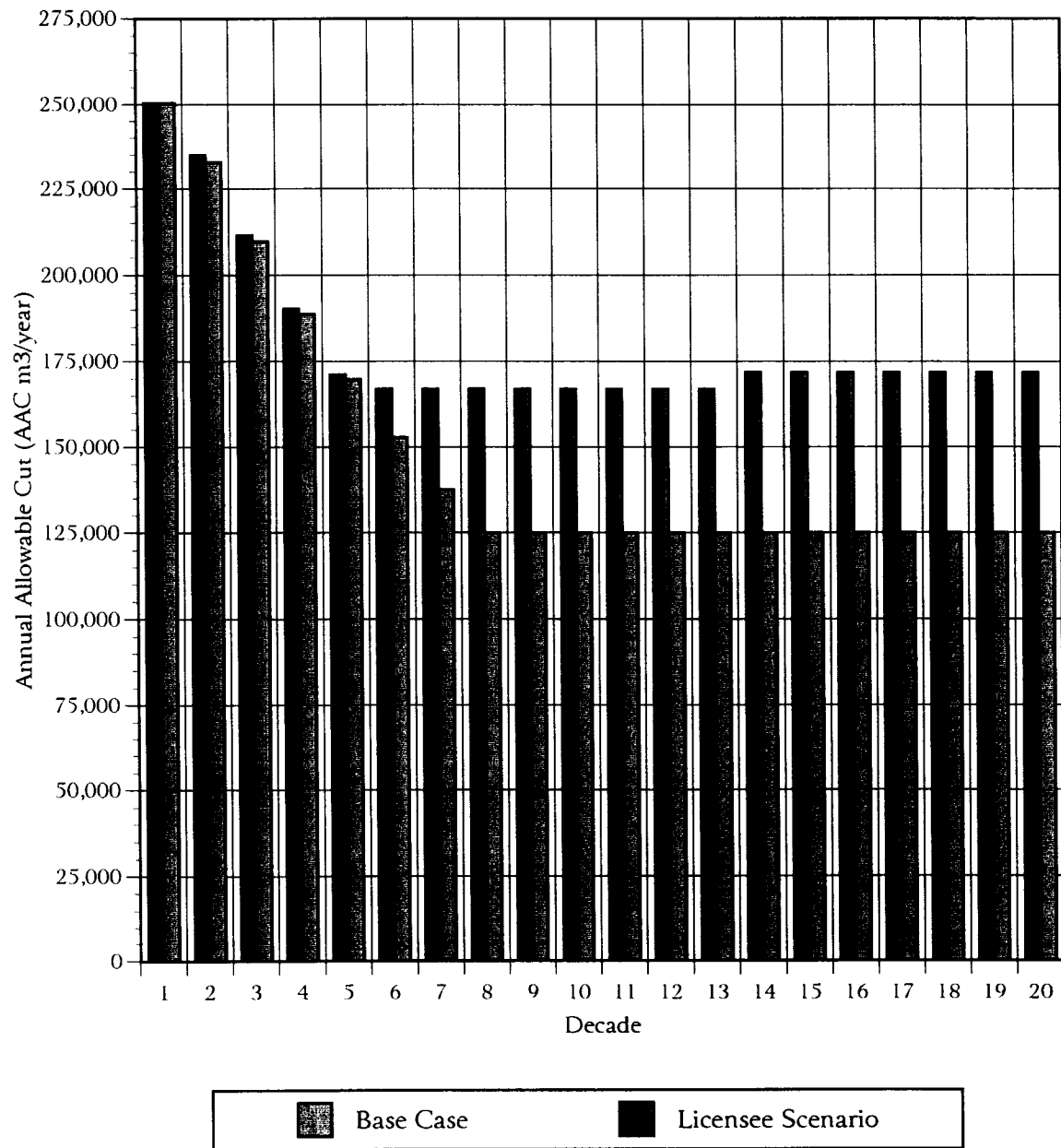


Figure 2: Base Case and Licensee Scenario Timber Flow

4.3.5 Maximizing Value from the Harvest

As part of the strategy for timber management, Interfor pursues ways to increase the economic value from the forest. The company investigates economically viable opportunities, will continue to do so during the MP #8 period and implement programs where feasible. Strategies currently being considered to increase values are:

- The development of sufficient operating areas available to optimize:
 - Market conditions;
 - Operational efficiencies;
 - Environmental objectives;
 - Employment stability;
 - Seasonal accessibility; and
 - Silvicultural systems and harvesting methods.
- The increased utilization levels derived from:
 - Minimizing fibre loss due to breakage; and
 - Examining commercial thinning opportunities.
- Higher product value recovery obtained from:
 - Cooperating with complimentary businesses¹⁰ for entrepreneurial utilization of wood and wood by-products; and
 - Encouraging value added initiatives both internal and external to the company¹¹.

4.3.6 Harvesting the Profile

Harvesting the full profile of the contributing forest land-base, to the extent feasible, is part of a timber planning strategy. In TFL 38, the profile of the forest is considered in terms of both its operability classification and by site distribution. Interfor is

¹⁰ Interfor acquired Westminster Wood Products Ltd. In 1990; the facilities include: dry kilns, and resawing, sorting and planing equipment to process 26 million board feet of kiln-dried lumber per year.

¹¹ In February 1996, Interfor announced a \$150 million five-year mill modernization program; including the conversion of Flavell Cedar to a small log mill, plus the construction of a value-added plants for high-grade recovery (Mackenzie Seizai) and fingerjointing (McDonald Cedar) to complement our existing Value Added Recovery Centre (VARC at Hammond Cedar) and remanufacturing facility (Albion). In April 1996, Interfor opened Avalon, a new central dryland sort located 15 km northeast of Gibsons; Avalon is scheduled to sort 700 000 m³/year, with the goal to maximize value through efficient sorting and optimized log manufacturing.

currently harvesting a spectrum of operable classes including helicopter. The AAC for MP #8 is based on the aggregate of conventional, helicopter and marginal operability classes.

Previous harvesting patterns within the TFL were primarily based on operating units that included the full range of species types. The operability classification completed for MP #8 identifies different harvesting opportunities. Interfor will assess the appropriateness of the operability classification and the harvest by site over the term of MP #8.

4.3.7 Small Business Forest Enterprise Program

For the 1987 to 1991 cut control period the SBFEP commitment was 45 913 m³. For the cut control period 1992 to 1996 the SBFEP apportionment in TFL 38 was 13 118 m³ for 1992 to 1994, and 23 635 m³ for 1995 and 25 581 m³ for 1996, for a total of 88 570 m³. The total SBFEP commitment for 1987 to 1996 is 134 483 m³. To the end of 1996 the SBFEP “commitment control” ledger indicates that 116 395 m³ has been scaled, including residue and waste.

The management strategies for SBFEP in TFL 38 will conform to the following principles:

- The SBFEP apportionment will be derived from identified areas representing the profile both in terms of timber quality and harvesting chance (including helicopter logging), to be determined by mutual agreement of Interfor and the MoF District Manager, Squamish Forest District (SFD). It is recognized that as a dispute resolution mechanism, the Regional Manager may identify and dispose of blocks that he has determined to meet the profile;
- SBFEP allocation will be offered on an annual basis for a five year period. The SBFEP harvest plans will be identified in the Forest Development planning process that will be completed in cooperation with the SFD;
- Information on proposed areas will be made available in both map based and digital format;
- During the term of MP #8 explore the issue of intermixed blocks versus operating areas; and
- The SBFEP will be responsible for engineering and administration activities related to the planning and harvesting of SBFEP blocks.

4.4 Forest Practices and Operational Plans

Forest practices are guided by a planning framework that directs the management of both strategic and operational activities. Key components of this framework for TFL 38 include:

- Strategic Planning Directives (Lower Mainland Protected Areas Strategy);
- Forest Practices Code of BC Act, Regulations, Standards and Guidebooks;
- TFL Management Plans; and
- Operational Plans.

Interfor will administer forest practices within TFL 38 in a manner that is consistent with government approved procedures associated with the planning framework.

The *Forest Practices Code of British Columbia Act (FPC Act)* is the legislative umbrella enabling the Code's other components to establish mandatory requirements for planning and forest practices, set enforcement and penalty provisions, and specify administrative arrangements.

- The regulations layout the forest practices that apply province-wide;
- Standards may be established by the chief forester, where required, to expand on a regulation. Both regulations and standards are mandatory requirements under the Code; and
- Forest Practices Code guidebooks support the regulations, but are not part of the legislation. Guidebook recommendations are not mandatory requirements, however once a recommended practice is included in a plan, prescription, or contract, it becomes legally enforceable. They describe procedures, practices and results that are consistent with the legislated requirements of the Code.

The information provided in each guidebook is used to aid professional judgment in developing site-specific management strategies and prescriptions designed to accommodate resource management objectives. Flexibility in the application of guidebook recommendations is required to adequately achieve land use and resource management objectives specified. Recommended practice may be modified when an alternative could provide better results for forest resource stewardship. Guidebooks are not intended to be definitive and will not be interpreted as being the only acceptable option.

It is recognized that specific forest practices that are appropriate for TFL 38 will be developed and be adjusted over time. This will reflect the application of new knowledge and techniques that are considered part of adaptive management. The company will apply those forest practices that are environmentally sound, operationally achievable, economically prudent and safe to employ.

Appendix XVI details Interfor's *Slope Stability Policy*. The policy was developed prior to

the FPC. The policy is under review and a *Slope and Stability Policy for Evaluation of Worker Safety* is being prepared. The revised policy is intended to provide guidance for operations personnel for evaluating the safety of crews in work areas with respect to potential landslide hazards. This policy does not replace the requirements for stopping operations due to potential downslope / downstream environmental impacts, such as those outlined in the *Road Works Shutdown Indicators and Procedures (Forest Road Engineering Guidebook)*.

4.4.1 Forest Development Plans

The scope, content and term of forest development plans are described in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: log drop areas, harvest patterns and cutblock designs, harvesting prohibited in certain instances; maximum cutblock size; variations on cutblock size limits; green-up considerations; silvicultural systems; identification of unstable or potentially unstable terrain; cultural heritage impact assessment; visual impact assessment; assessment of streams, wetlands and lakes; of forest health factors; terrain stability assessments for timber harvesting; terrain mapping; community watersheds; and watershed assessment.

In addition to the regulations, all forest development plans for the TFL will be completed in consideration of the *Forest Development Plan Guidebook*.

These plans will involve the public, community groups, First Nations, and interested parties through formal consultation and when plans are presented for public viewing. Comments received from public and government agencies and First Nations will be considered before finalization of the plan and submission to the respective ministries.

Other guidebooks that will be referenced in forest development planning include: the *Mapping and Assessing Terrain Stability Guidebook*; the *Gully Assessment Procedure Guidebook*; the *Visual Impact Assessment Guidebook*; the *Coastal Watershed Assessment Procedure Guidebook*; the *Channel Assessment Guidebook*; and the *Boundary Marking Guidebook*.

4.4.2 Engineering Standards

Standards for engineering apply to roads, bridges, facilities and other structures that will be designed, constructed or maintained within TFL 38.

All engineering plans and structures will be developed in consideration of the *Forest Road Engineering Guidebook*. The *Forest Road Regulation* of the FPC Act pertain to road layout and design, construction and modification, maintenance and deactivation. Recommended engineering practices are contained in the *Forest Road Engineering Guidebook*.

On an annual basis road building, maintenance and deactivation plans are reviewed with the MoF District Manager. As part of the process, older roads and structures are continually assessed for rehabilitation requirements. Assessments will be conducted in consideration of the most current revision of the *Resource Road Rehabilitation Handbook: Planning and Implementation Guidelines (Interim Methods)*, *Watershed Restoration Technical Circular No. 3*. Plans for specific projects will be reviewed by the appropriate government agencies as required.

4.4.3 Timber Evaluation and Appraisal

All engineered harvest blocks included in cutting permit applications are cruised to evaluate timber quality and assess profitability. The licence document specifies that cruises must be carried out in accordance with the MoF's *Cruising Manual*. Cruise data submitted must be compiled in accordance with the *Cruising Compilation System, Change Specifications, Detailed Requirements and Design Manual*.

Stumpage is determined in accordance with the *Coast Appraisal Manual*.

4.4.4 Cutting Permits

Cutting Permits (CPs) provide the authority to implement development and harvesting as proposed in forest development plans and silviculture plans.

The *Forest Act* provides for cutting permits to be issued, within TFLs, by the district manager, within the limits specified in the tree farm licence document, to authorize harvest of portions of the allowable annual cut from specified areas within the tree farm licence area (i.e. Schedule A and Schedule B).

Cutting Permit application format, contents, and conditions are specified in *Section 10 of the TFL 38 Licence* document. CPs detail site-specific harvesting rights, including: term; timber mark; stumpage; felling, bucking and utilization specifications; and obligations.

4.4.5 Harvesting Methods

Interfor will conduct its operations in TFL 38 in compliance with the *Timber Harvesting Practices Regulation* of the FPC Act. The regulation pertains to both general and special harvesting practices associated with carrying out a timber harvesting operation.

The selection of a harvesting method is a function of terrain, resource values and management considerations. Specific harvesting and silvicultural systems are described in the silvicultural prescription and logging plan for each opening.

The scope, content and term of logging plans are described in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements, in part, pertaining to: excavated or bladed trails and landings; restriction on stream crossings and in-stream operations; protection of resource values; and type of equipment.

The majority of the TFL is dominated by rugged terrain and soil conditions which will limit the use of ground-based equipment versus traditional cable systems. Interfor is an industry leader in the use of helicopters to log in areas where accessibility and terrain sensitivity are of concern. Skyline systems are also being explored. Recently, Interfor collaborated with the Forest Engineering Institute of Canada (FERIC) to implement a skyline system for application to high-retention silvicultural systems in mature stands on steep, sensitive slopes¹², at Interfor's west coast operations at Chamiss Bay on Vancouver Island. Although results are encouraging, it is too early to determine the extent to which skyline systems will be used on TFL 38. Interfor will continue to investigate skyline configurations with a focus on methods that retain stand structure, are safe to apply and are economically feasible to operate.

Cable systems, ground skidding and hoe-forwarding methods are used on specific sites where they are economically and environmentally feasible. Backspar trails or skid trails used in conjunction with these methods will be rehabilitated, consistent with the planning documents, to maintain the maximum feasible productive growing site.

The previous silvicultural system in TFL 38 was predominately large expansive clearcutting. Presently a wider range of ecologically based alternate systems are considered and applied. This has resulted in cutblock sizes that have been dramatically reduced.

The procedures for harvesting in the TFL consider harvesting pattern, stand conditions and utilization standards. The harvesting pattern is dictated by the operability, resource sensitivity, green-up requirements and logistics associated with development plan submissions. The pattern of dispersed road and forest development throughout all drainages will continue. New road development will continue up the Elaho River and Sims Creek. Timber harvesting will be dispersed throughout the TFL in order to:

- Balance seasonal harvesting;
- Balance hauling distance;
- Allow for reasonable "green-up" periods in adjacent areas;

¹² Bennett, D.M. 1996. *Implementing high-retention silvicultural systems on steep slopes: Harvesting system design and productivity*. Forest Engineering Research Institute of Canada (FERIC), Vancouver, B.C., Canada

- Rationalize block sizes to produce a mosaic of variable sizes and shapes of new forest;
- Distribute the rate of cut across the TFL land-base; and
- Maintain access throughout the TFL for recreational use and fire protection.

Stand condition is also a factor in harvest block selection. The largest portion of the total growing stock in TFL 38 is made up of over-mature timber. Harvesting will target these stands as the primary objective. Operationally, the minimum harvest age considered will be that associated with log sizes that meet the minimum merchantability standards. No allowance has been made in the Timber Supply Analysis for the contribution that may be realized from commercial thinning opportunities.

Harvesting procedures will be modified where stand conditions have been affected by fire, disease, windthrow or other factors that may necessitate a salvaging operation.

Felling, bucking and utilization specifications and requirements that apply to the TFL are specified in *Section 6 of the TFL 38 Licence* document and in Cutting Permit documents. Harvest residue and waste assessment requirements are specified in *Section 7* of the licence document. Assessments must be carried out in accordance with the *Provincial Logging Residue and Waste Measurement Procedures Manual*.

4.4.6 Fire Protection

A fire protection program is part of the timber strategy to reduce the risk of fire and to prevent timber loss. The company's objective is to have all fires contained by 10:00 a.m. the day following initial attack.

Interfor will submit a Fire Preparedness Plan before April 1 of every year, as required by the *Forest Fire Prevention And Suppression Regulation* of the FPC Act. The plan will outline the Company's response procedures including details of operating conditions and safeguards, responsible personnel, equipment, fire tool locations and initial attack actions.

The *Forest Fire Prevention And Suppression Regulation* of the FPC Act specifies requirements for: 1) personnel and equipment: including fire watch, fire fighting tools, water delivery systems, and central equipment cache; 2) fire prevention precautions relating to large and small engines, hot work, cable logging, sawmills, fireworks, combustible material, explosives, and restrictions on industrial activities; 3) open fires: including fires for cooking, warmth and ceremony, fires for disposal of waste, fires not permitted; 4) planning for protection operations: including requirement for a fire preparedness plan, content of fire preparedness plan, and training requirements; 5) fire hazard assessment and abatement: including requirement for carrying out a hazard assessment, content of a fire hazard

assessment, what constitutes a fire hazard, and abatement or removal of a fire hazard; 6) initial fire suppression and site rehabilitation; 7) forest fire fighting compensation, and offenses.

The requirement for a schedule of fuel management measures that will be undertaken in each of the first 2 years of 5 year silviculture plans is specified in the *Operational Planning Regulation* of the FPC Act.

Fire history and historic weather information from both Ministry of Forests and Licensee records will be considered in the preparation of fuel management plans. Appendix XVII details TFL 38's fire record for 1977 to 1996.

Operational weather stations are established near active logging operations during fire season. Logging operations are curtailed during high and extreme fire hazard conditions and public access to the TFL will be restricted during these periods.

4.5 Silviculture Practices

Silvicultural management and treatment regimes on TFL 38 are designed to produce conifer logs suitable for lumber manufacturing at the lowest cost. Interfor is committed to carrying out basic silviculture to support the TFL resource management objectives. Silviculture activities will be conducted in accordance with the *Forest Practices Code of B.C. Act* (FPC Act) and associated Regulations. The company's aim is to be guided by future changes to these and other pertinent Acts, Regulations and Standards. Interfor will adjust silviculture strategies to accommodate new objectives and to incorporate new information about the science of silviculture. Objectives are to:

- Maintain a silviculture program that will ensure all harvested areas are reforested and managed to meet government and corporate requirements;
- Utilize silviculture systems appropriate for the achievement of forest management objectives;
- Protect the forest and minimize losses from fire, insects, disease, windthrow and other biotic and mechanical factors; and
- Convert hardwood stands to coniferous plantations where economically and ecologically justifiable. If hardwoods are the most ecologically suitable species for a given site then hardwood management will be employed. This fibre may be used by Interfor mills or traded for softwood logs.

As some stands will be managed for wildlife, visual or terrain stability objectives and also timber production, product objectives require flexibility. The concurrent application of multiple management objectives will affect rotation periods and this will influence stem diameter and stem quality. Stands that have primary management objectives other than timber production will have varying silvicultural/harvesting regimes.

Interfor's basic strategy is to establish and manage conifer stands in even-aged silviculture systems utilizing regeneration and crop tending regimes that include:

- Harvesting to create stand characteristics that may range from commercially thinned to clearcut openings;
- Site preparation of site-specific areas where stocking standards are not achieved;
- Planting within one year of harvesting on most areas. Natural regeneration is prescribed on a site specific basis generally on high elevation, north facing cooler aspect, low site blocks;
- Brushing of site-specific areas, as early as operationally feasible, where stocking standards are not achieved or when improved crop growth performance is desirable. Brushing may occur at various times until plantation establishment has reached free growing; and
- Enhanced silviculture designed to enhance resource values and yields will be carried out in conjunction with funding from FRBC, or similar funding mechanism.

4.5.1 Enhanced Silviculture

As part of the establishment of Resource Management Zones, Interfor is committed to pursuing an enhanced silviculture program, with the intent to meet the objectives for enhancing the forest's timber-producing capability, including increased volume, improved quality, and higher value. Interfor will evaluate and implement programs that are of incremental value to the basic silviculture responsibilities. This program is on-going through the implementation of Forest Renewal B.C. proposals planned for the term of MP #8. Components of this program currently being considered include the following:

- Prompt reforestation with larger-sized genetically improved stock, where available - to reduce time to achieve visually effective green-up, allowing for increased operability on visually sensitive areas;
- Stand conversion from deciduous to coniferous stand types - to expand the contributing operable land-base;
- Use of alternate harvesting methods and alternate silviculture systems - to increase operability in environmentally sensitive areas, buffers, wildlife management zones, and visually sensitive areas;
- Growth and yield measurements, particularly those related to site index (SI) - to validate timber supply analysis SI adjustments;
- Commercial thinning opportunities - to increase operability on visually sensitive areas, and to optimize timber flow profile;
- Pre-commercial thinning activities - to effect piece size and quality;

- Spacing and thinning - to effect piece size and quality;
- Fertilization opportunities - to improve yields from managed stands; and
- Pruning opportunities - to meet second growth product objectives.

Silviculture prescriptions for activities will be prepared, to meet the management objectives for the TFL. The objective of incremental silviculture is, in general, to accelerate tree growth and to improve the value of the final crop through reducing competition and increasing nutrition. The most common intensive silviculture treatments used for live-crown management are spacing, thinning, fertilization, and pruning.

Intensive silviculture must consider site quality and the limitations imposed by poor site. All silvicultural interventions must be based on economic efficiency as the potential benefits may not always realized.

There is an optimal combination of stocking density and harvest age, for each species and site, which will produce the highest value combination of volume and quality. Product objectives will be the basis for specific prescriptions. No single prescription can serve as a general treatment. On each site the objective is to balance the costs of silviculture against increased future value, and to choose the economically optimum rotation age.

- **Research**

The Licensee cooperates with the MoF, MoELP, and DFO, and other independent research institutions such as the Forest Engineering Research Institute of Canada (FERIC), in operational, field level research. TFL 38 contains seven long term progeny plots established by the MoF Research Branch which the Licensee assists in maintaining. These plots were established in the 1970's to provide long-term growth comparisons between planted trees grown from seed taken from various locations in coastal B.C. and the U.S. northwest. The numbers and locations of these research plots are indicated in Appendix XVIII.

4.5.2 Silvicultural Systems

The company will examine alternate silviculture systems and different harvesting methods. Key aspects to consider in the application of alternative silviculture systems include:

- Silvics;
- Ecological suitability and forest health concerns;
- Terrain limitations;

- Exposure to high wind conditions that increase blowdown concerns;
- Worker safety;
- Economic feasibility;
- Equipment limitations; and
- Other resource values (visual, wildlife, etc.).

Interfor will apply a variety of silviculture systems that address the above concerns to meet the objectives for forest management on the TFL. Licensees currently operating in the Vancouver Forest Region are required to harvest some of their blocks using non-clearcut systems. Interfor will use alternative silvicultural systems, consistent with District Manager direction or higher level plans, the FPC and this Management Plan. Silviculture system selection will make consideration for the *Silvicultural Systems Guidebook*.

Alternative silviculture systems will be utilized under special conditions. Typically, an alternate system is used to meet management objectives for visual quality, wildlife habitat or terrain stability. Alternative systems that will be employed include 'strip selection', 'group selection', 'seed tree', and 'shelterwood'.

Alternate silvicultural systems will be used over the next twenty years, however, the type and extent to which any given system will be used is unpredictable. Interfor expects to meet all government policy regarding the use of alternate silvicultural systems.

The 20-Year Plan (Appendix XV) was prepared to indicate a potential harvest pattern and demonstrate that the recommended harvest level is spatially plausible within the context of current planning, riparian, and biodiversity guidelines. The 20-Year Plan does not attempt to estimate the breakdown of silviculture systems that will be utilized over the twenty year planning horizon.

4.5.3 Silviculture Prescriptions

Silviculture prescriptions (SPs) will be prepared for all areas to be harvested and will be submitted to the District Manager for approval, in accordance with the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: evaluation of forest health factors; harvesting methods; gully assessments; silvicultural systems; silvicultural systems in a riparian reserve zone; retention of streamside trees; soil condition; forest floor reduction and displacement; soil disturbance; excavated or bladed trails; regeneration method; silviculture treatments; and species selection.

SPs are prepared in consideration of the *Site Diagnosis*, *Tree Species Selection and Slash Burning Guidelines for the Vancouver Region*, the *Guidelines for Preparation of*

Silviculture Prescriptions for the Vancouver Forest Region, and the *Silviculture Prescription Guidebook* of the FPC. The objective is to have approved SPs for the first two years of the Forest Development Plan.

Species selection will reference *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region*, *Land Management Handbook Number 28 1994* and the *Establishment to Free Growing Guidebook - Vancouver Forest Region*.

- **Site Productivity Reductions**

The proportion of productive growing site, permanently converted for access and forest development, will be limited to that compatible with safety and long-term resource management objectives. Area converted to permanent access will be limited to the maximum stated and approved in the SP.

Anticipated, unavoidable losses in productivity attributed to landslides will be fully evaluated with a detailed terrain overview assessment and submitted with the FDP. The risk of landslides is recognized. Risk of landslides will be assessed for impact on resource management objectives, and for significant risk of damage to resource values. The *Operational Planning Regulations* of the FPC Act, requires that the licensee must collect and analyze data, and submit in conjunction with the FDP, assessments in consideration of site and soil conditions; terrain, terrain stability and hazards associated with instability.

If new slides are noted, they will be reported to the Squamish Forest District (Field Operations Supervisor and/or Engineering Officer) as well as MoELP. Reporting of slides will be in accordance with Squamish Forest District landslide reporting procedures. As part of the individual event report an action plan for remediation work will be prepared.

Slides that have a detrimental impact upon the resource management objectives will be evaluated and where appropriate stabilized to:

- Control surface erosion by revegetation and/or other techniques; and
- Re-establish conifer crops.

Other than the reductions in site productivity required for access, management strategies will strive to maintain or enhance site productivity. The *Hazard Assessment Keys For Evaluating Site Sensitivity To Soil Degrading Processes Guidebook* will be considered in the assessment of the inherent sensitivity of a site to the following soil-degrading processes: soil compaction and puddling; soil displacement (including exposure of unfavourable subsoil and slope hydrology changes); forest floor displacement; surface soil erosion (exposed mineral soil); and mass wasting.

- **Site Preparation**

The necessity for, and method of site preparation, is prescribed in the SP through assessment of potential slash loading, planting spot availability, species preference, regeneration method, biodiversity requirements, and fire and pest risk. The prescription is reassessed and amended if necessary upon post-logging inspection. It should be noted that site preparation treatment(s) may not be of benefit to achieve regeneration on many of the harvested area(s). Therefore, the majority of the areas will receive no treatment.

Site preparation prescriptions will make consideration for the *Site Preparation Guidebook*. Site preparation may occur on individual areas:

- Greater than 0.2 ha in area, dispersed throughout the harvest block, and
- On roadside patches greater than 50 m² area.

As well as achievement of target stocking objectives, site preparation treatments may be carried out as part of integrated vegetation management strategies, or to improve soil or other site conditions for tree growth. These treatments may be considered where compatible with resource management objectives and scheduled in an approved SP.

Most site preparation will be done with machines (excavators), however, other techniques will be employed where appropriate.

- **Reforestation**

Reforestation is accomplished as soon as it is practical following the completion of harvest and any necessary site preparation treatments. In accordance with the approved SP the majority of harvested areas will be:

- Planted within one year of completion of harvest to minimize regeneration delay. Natural regeneration is prescribed on a site-specific basis. Fill-in planting may be required to achieve regeneration delay;
- Planted to ensure the presence of ecologically suitable and preferred species;
- Planted at densities that, along with natural regeneration, will ensure prompt achievement of target stockings standards;
- Planted with appropriate sized stock types (in general larger stock types are planted where vegetation competition, climatic conditions and animal browse are problematic);
- Planted with a component of genetically improved stock where available; and
- Fill-planted within one year of plantation failure, if that occurs.

The *Establishment to Free Growing Guidebook - Vancouver Forest Region*, will be referenced. Exceptions to these stocking standards will be proposed, after assessing the use of alternative silviculture systems, to overcome or reduce the effect of the following:

- Colluvial sites (precluding achievement of minimum stocking standards);
- Sites with high water table (within 30cm of mean soil surface and restricting productive sites to mounds);
- Shallow organic soils over rock or other impermeable layers (Folisols); and
- Sites where lower stocking standards are deemed in accordance with wildlife management objectives.

Unique standards for these and other sites will be defined in the SP.

Colluvial sites, sites with high water tables, and sites with folisols will be harvested only if they are capable of sustainable forest management. Where regional stocking standards cannot be achieved, acceptable minimum stocking densities will be proposed similar to those present before harvesting. In some cases, longer than normal regeneration delays will be recommended.

- **Brushing**

Deciduous and brush competition in planted and natural stands will be controlled to allow stands to reach a free-growing condition as prescribed and approved in SPs. Stands are monitored from completion of harvesting to determine the need for brushing treatment.

Interfor will brush where stocking standards cannot be achieved, due to brush competition, or if improved crop growth performance is financially desirable. In most cases, the objective will be to avoid the need to brush by promptly planting suitable stock types. If brushing is required then the methods employed will be manual and/or chemical. The brushing technique used will consider the specific site, stand, social and regulatory conditions.

All stands are monitored, from completion of harvesting, for brushing and weeding treatment. Alder encroachment, as well as some maple coppicing, is a significant problem on richer, southerly aspect sites. These stands can be effectively weeded by manual or a combination of manual and herbicide methods.

Woody brush species including salmonberry and Red Osier Dogwood are a serious problem on alluvial sites along many of the rivers and creeks, and can only be treated effectively with herbicides. As these areas often have significant fish and wildlife values, herbicide treatment is planned and conducted with the approval of the MoELP and DFO. Of particular concern and sensitivity is the area along the

Squamish River, below the mouth of the Elaho River. Any consideration of herbicide use among potential brush control methods will be carefully and thoroughly weighed using the following variables.

The method of brush control, whether manual, mechanical or chemical, is chosen on a site specific basis to provide the most efficient means of achieving the brush control objectives. The following variables are considered in selecting a treatment method for each brush site:

- The brush species competing, the present and potential degree of competition, terrain and site conditions;
- The effectiveness of different control methods available;
- Potential for re-treatments;
- The health risks to workers, employees, neighbours, and others;
- Risk to wildlife and fish;
- Risk to soil and water;
- Acceptability of methods to other resource agencies and forest users; and
- The cost of effective control by various methods.

Chemical site preparation methods are considered where it is necessary to reduce existing vegetation competition or when planting into established vegetation communities. The commercial herbicides that will be considered are Vision (Glyphosate), and Release (Triclopyr). The proposed use of herbicides will be specified in the Silviculture Prescription. Use of herbicides is regulated under the *Pesticide Control Act* and Regulations. The Act and regulations are administered under the Pesticide Management Program of MoELP. MoELP regulates Pesticide Use Permits and their issuance.

- **Site Rehabilitation**

Site rehabilitation opportunities exist for backlog Satisfactorily Restocked stands to improve stocking on sites with less than optimal spacing (i.e. old roads and landings). The majority of good and medium, low elevation sites now growing cottonwood and alder are best-suited ecologically to those species, and conversion to slower-growing, longer rotation coniferous species may only be justifiable where ecologically appropriate. Several cottonwood plantations are located in the lower Squamish river area. Most cottonwood and alder stands occupy sites adjacent to the Squamish and Elaho rivers. These sites are relatively unstable, subject to occasional flooding and river channel change and contain fish spawning and rearing habitat, as well as recreational and wildlife values. Nearly all Cottonwood and Alder mix stands (mature and immature, accessible area only) are alluvial, river flat sites suited to cottonwood or alder as the primary species. As these deciduous species, the majority

of which are cottonwood, become merchantable, they may be managed on suitable sites.

Target sites for conversion will make consideration for the type, quantity and distribution of deciduous stands that would be expected under natural disturbance regimes.

- **Seed Supply**

Interfor attempts to have available a five-year or greater supply of seed, except where seed orchard supply is dependable and available, necessary to meet planting stock requirements for the TFL. Genetically-improved seed orchard seed, will be obtained whenever it is available. The Licensee is neither an owner nor partner in any seed orchards, and therefore purchases suitable seed from other producers.

Interfor will collect, trade, and purchase seeds to ensure adequate supply.

- **Spacing**

Stands will be spaced as a part of our basic silviculture obligation as defined by regulation and committed to in the Silviculture Prescription.

The *Spacing Guidebook* will be considered in developing site-specific management strategies and prescriptions to accommodate resource management objectives identified in this management plan. The guidebook is not definitive and is deemed to allow reasonable flexibility to vary and adapt juvenile spacing practices to site and stand-specific conditions and to achieve a wide range of forest management objectives.

Stand density plays an important role in the growth function of regenerated stands, and the production of merchantable sawlogs, and is monitored in second growth inventory and regenerated stand assessments. Excessive stand density, which may result in both depressed stand growth and reduced average stem diameter, is not considered to significantly reduce the Long Run Sustained Yield (LRSY) in TFL 38. Average total stocking levels are in the range of 800 to 2,500 stems per hectare, with few stands exceeding 3,000 stems per hectare being considered consistent with the natural stand yield curves used for volume prediction in the yield analysis. Stands of densities exceeding 1,000 stems per hectare may benefit from juvenile spacing to increase the size and uniformity of average stem diameter and decrease time to harvest of these spaced stands.

Stands will also be considered for juvenile spacing where stocking control can be reasonably expected to result in a positive financial return from an earlier harvest of sawlog-sized conifers, or where stocking control is appropriate to achieve other resource management objectives. In addition, social objectives and stands that

qualify for incremental funding will be considered for spacing as funding (FRBC) becomes available.

- **Silviculture Surveys**

An appropriate regime of surveys and inspections will be maintained to support the basic silviculture program.

Sites will be:

- Inspected at harvest completion to identify and prescribe site preparation and planting treatments and to amend the SP, where this is required;
- Inspected after site preparation to determine the need for additional treatments and to prescribe planting;
- Surveyed during planting to determine quality of plantation and survival chance;
- Inspected between the first and second growing seasons after planting to determine the need for additional planting;
- Regeneration surveyed before regeneration delay to determine stocking levels, plantation growth rate and species composition;
- Inspected at or before the anticipated onset of undesirable levels of vegetation competition;
- Surveyed for Free Growing condition; and
- Considered for other surveys and inspections as required to manage site conditions and to achieve resource management objectives.

Silviculture surveys are planned in consideration of the *Silviculture Surveys Guidebook*.

- **Free Growing**

A free-growing condition will be achieved on all regenerated stands according to the FPC Act and *Silviculture Practices Regulation* and approved SP. The free-growing standards are specified in the approved SP for individual growing sites and stands. Target objectives for free-growing stands will conform to the *Establishment to Free Growing Guidebook - Vancouver Forest Region*. Stocking standards for regenerated stands, established prior to the FPC or the approval of this management plan, will conform to the approved SP.

Determination of the free-growing condition will be made for each individual stand type and site using the standards and criteria detailed in the approved SP. The determination of free-growing shall include the criteria of size and proximity of crop

trees to competing vegetation, and the effects the competing vegetation has on crop tree performance.

A program will be developed to monitor the free growing status of pre-1987 stands. This program will focus on stands that are understocked with conifers, have a significant deciduous component, or are areas with known root rot infestations.

4.5.4 Stand Management Prescriptions

The scope and content of Stand Management Prescriptions (SMP) are described in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: evaluation of forest health factors, silvicultural systems, species selection, soil disturbance, and silviculture treatments.

An approved SMP is required under the authority of the *Forest Practices Code of British Columbia Act* prior to the commencement of any silvicultural treatment on free growing stands. Stand management prescriptions for TFL 38 will make consideration for the *Stand Management Prescription Guidebook*. SMPs describe actions to be carried out on a free growing site to:

- Ensure that stand management activities are planned and implemented to maintain or enhance the inherent productivity of the site;
- Ensure resource values including biological diversity are identified and accommodated; and
- Set out a series of stand management activities to produce a stand capable of meeting the stated management objectives.

As this plan includes a variety of end-product or stand-use objectives, the primary stand management objective is the production of high value sawlogs, the SMP provides a stand-level action plan for achieving the target stand conditions to meet these management objectives. The SMP provides for setting stand level objectives and identifying the treatments necessary to achieve these objectives.

An SP approves all silviculture activities from pre-harvest of the original stand to free growing of the new stand. Collectively, the SP and SMP provide a stand strategy or full-rotation plan that schedules all silviculture activities required meet specific stand management objectives. The life span of an SMP is from free growing to the time when the next SP is approved. Though an SMP is in force for this period it is not a static document. The SMP may be amended at any time during its life to authorize alternative objectives and treatment(s) for that stand.

The SMP does not have the same legal requirements as the SP, it is expected to be an adaptive document. The SMP carries no obligations to fund or implement the prescription. However, if an activity is undertaken, the management objectives and

the minimum treatment standards specified in the SMP must be adhered to. If there is more than one activity scheduled in an SMP and one or more of the prescribed activities have already been carried out, there is no legal obligation to carry out the remaining activities in the SMP.

If no activities are planned for the site after free growing, no SMP is required.

- **Pruning**

Stands will be considered for pruning where stand manipulation can be reasonably expected to result in a positive financial return from a harvest of higher quality sawlog-sized conifers, or where stand manipulation is appropriate to achieve other resource management objectives (i.e. wildlife habitat). In addition, stands that qualify for incremental funding will be considered for pruning as funding (FRBC) becomes available.

Planning and implementation of pruning activities will consider direction and standards recommended in the *Pruning Guidebook*.

- **Commercial Thinning**

Commercial thinning will be considered to satisfy various resource management objectives, including product objectives. Commercial thinning may be used in order to harvest wood from a hillside where protection of scenic values is the primary management objective. Other resource objectives that may dictate the use of commercial thinning are wildlife habitat, biodiversity emphasis, terrain stability, water quality or social values.

4.6 Resource Management

Resource planning and management in TFL 38 is guided by several inventory requirements and planning initiatives. As part of the planning process, new resource inventory data has been collected for MP #8 according to government standards. The resource planning objective for TFL 38 is to maintain a comprehensive set of inventories that will facilitate strategic planning requirements.

A Geographic Information System (GIS) for the management of broad-scale TFL resource inventories has been set up. Information collected is registered to government TRIM standard map base, at a 1:20,000 scale. The GIS facilitates analysis and map presentation requirements for MP #8.

Management activities for TFL 38 will integrate resource planning procedures that are responsive to changing standards in recognition of the general needs for industry, environment and society. The integration of planning new activities is anticipated to

occur through the planning period, as they are approved for implementation by government.

4.6.1 Access Management

Access management concerns the public use of existing roads, and also planning issues pertaining to new road development. The scope and content of Access Management Plans are described in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: cultural heritage impact assessment; identification of unstable or potentially unstable terrain; terrain stability mapping; community watersheds; visual impact assessment; and assessment of streams, wetlands and lakes.

The public and other resource users will be given access to roads in the TFL, unless otherwise approved by the MoF District Manager. Under some circumstances road access will be restricted, for reasons of safety, security, environmental conditions or other conditions that may affect the operations of the licensee. The commercial use of roads by others within the TFL may result in road use charges that apply to the maintenance costs or costs of road modification arising out of such use. The public assumes reasonable risk associated with the use of forest roads.

Non-operational roads are maintained in a condition suitable for fire or emergency access wherever they effectively service this purpose. Roads not required will be “put to bed” using methods such as waterbarring, crossditching, and removal of culverts and bridges if necessary to stabilize roadbeds and reduce erosion risk. Access management concerns will be addressed in the Forest Development Plan, identifying the current road construction, maintenance and deactivation program.

Post harvesting site degradation due to temporary and permanent access structures, and harvesting related soil disturbance is monitored as part of the Environmental Management Program (Section 4.2.2). The *Inspection Report for New Roads*, the *Inspection Report for Road Deactivation, Site Rehabilitation or Roadside Site Preparation* and the *Post-Logging Block Inspection Report* of Interfor’s *Monitoring and Reporting System (MRS -1997)* reports total area of permanent site degradation and identifies outstanding post harvesting works. The reports produce a priority risk assessment of any identified concerns. The MRS requires that an *Environmental Action Plan* be prepared and carried out.

4.6.2 Forest Health

Interfor’s forest health management conforms to the draft guidelines on forest health planning for the Vancouver Forest Region.

The primary forest health management objectives are:

- To maintain forest resource losses from insects, diseases, windthrow, and other damaging agents at levels below socially and economically acceptable thresholds; and
 - To ensure that forest health issues are managed in a manner that maintains, recovers, or enhances the short- and long-term productivity of the forest resource.
-
- **Significant Pests and Impacts**

Field staff continuously monitor the incidence and levels of insect pests and disease within the TFL and maintain communication with the Ministry of Forests regarding aerial and other detection surveys. Several pests are of concern at the present time.

An endemic population of Sitka Spruce Weevil has caused severe leader damage to Sitka spruce plantations along the lower Squamish River. No control action is planned at this time, as effective controls for this pest are not available. No Sitka spruce has been planted since 1977, and no further planting of this species is planned. Western Red Cedar can usually be substituted for Sitka spruce on the rich alluvial sites.

Future consideration will be given to using Sitka spruce as a minor component of mixed species plantations on some alluvial sites. Where the spruce can be afforded protection from weevil attack by other crop species, particularly cottonwood, cedar and alder, it may form a valuable component of future stands.

Dwarf mistletoe has always existed in mature hemlock stands within the TFL at a moderate level. Preventive action such as residual falling of stems on cutover areas and planting of non-susceptible species is carried out. Reserve and green tree retention areas with hemlock will have non-host species planted in the vicinity of their perimeter to minimize further spread of mistletoe.

Windthrow is a natural occurrence and is evident throughout the TFL. It may occur as the result of some major windstorm event and could attract disease and pests, and become a fire hazard. Harvesting may exacerbate windthrow on areas prone to heavy winds, therefore blocks are designed to minimize their potential for blowdown. In the event windthrow occurs, then an assessment will be done to determine its potential for salvaging and what actions may be necessary to stabilize the boundary to a windfirm edge. At this time a strategy dealing with the requirement for an SP will be reviewed with the District Manager.

A population of Douglas-fir bark beetles exists in a limited area of young, mature Douglas-fir subject to high water stress near the mouth of Shovelnose Creek. Control measures over the past 15 years have included traptree baiting and removal, pheromone traps and thinning of the poorest, attack-prone trees. The beetle

population did spread to adjacent, more vigorous stands and but remains at a low-risk level. Some salvage harvesting took place in 1996. The host stand of timber is subject to frequent water course changes in the Squamish River, and removal is constrained by environmental concerns.

Balsam wooly adelgid has spread throughout the Squamish Forest District and is now commonly found infesting a damaging immature amabilis fir. Although there is a lack of information about the occurrence of this introduced pest within TFL 38, Interfor is aware that there maybe a risk involved in relying on amabilis for reforestation. Interfor's strategy is to interplant alternate species.

Armillaria root rot disease is also commonly found in plantations within the Soo TSA. *Armillaria* is less common on TFL 38. Sporadic pockets of root rot disease are evident in young, mature Douglas-fir stands in the vicinity of Mud Creek. The locations of the disease centres are marked during preparation of silvicultural prescriptions, and these areas will be regenerated with coniferous species not susceptible to the disease, but ecologically suited to the sites, principally western red cedar and western hemlock. In the case of *Armillaria*, cedar and western hemlock are moderately susceptible. In the case of *Phellinus weirii*, western hemlock is moderately susceptible while western red cedar and deciduous are immune. This will reduce the spread of the Douglas-fir specific root rots, and improve the productivity of subsequent forest stands. Consideration will also be given to using more aggressive treatments options (i.e., push-felling and stumping) in productive areas where root rot disease levels are high and physical conditions permit.

- **Strategies and Detection**

Surveys and control work for pests and insects will be done in co-operation with the Ministry of Forests and Forestry Canada. Treatments will be based on the best data available, and will be designed to solve the specific problem in the most effective and cost-efficient manner. These may involve biological or manual methods approved for use on Crown Lands.

Detection will occur initially at the planning stage (Forest Development Plan) and again at the SP stage. As stands are monitored from establishment to final harvest, inspections will occur by ground and air checks.

4.6.3 Riparian Management

Base stream classification information for TFL 38 consists of operational information. The information was based on classification prepared for operational plans where it existed, and on first-hand knowledge of staff members who have worked in the area.

Overview information is updated as part of the annual development planning

process and will be complemented with any information obtained from the Ministry of Environment, Lands and Parks (MoELP) and the Department of Fisheries and Oceans (DFO).

Under the guidance of trained fisheries biologists detailed fisheries inventories are collected through extensive field evaluation. They will also be consulted to gather site specific information for road construction, culvert or bridge installation. Stream classification inventories are collected in consideration of the *Fish-stream Identification Guidebook*.

Planning requirements for riparian areas are contained in the *Operational Planning Regulation* of the FPC Act. The regulations specify requirements pertaining to: riparian classes of streams; minimum widths of riparian reserve zones and riparian management zones; riparian classes of wetlands; minimum widths of riparian reserve zones and riparian management zones for wetlands; riparian classes of lakes; minimum widths of riparian reserve zones and riparian management zones for lakes.

Interfor is committed to cooperative management of salmonoid and other anadromous fish resources and will comply with the new regulations for managing riparian areas in consultation with MoF, MoELP, and DFO. As more comprehensive operational fish and fish habitat inventories are collected under Forest Renewal BC Operational Inventories land-based programs, they will be used to provide guidance to management of identified fish species.

Of primary concern are salmon (coho, chinook, pink and chum), and steelhead spawning and rearing habitat in the Squamish and lower Elaho rivers, and Dolly Varden char (resident and anadromous), rainbow trout, bull trout and potential cutthroat trout populations throughout the Squamish, Elaho and Ashlu, and the maintenance of both habitat and water quality in those systems. Protection of sensitive stream reaches from both streamside and upstream activities is accomplished by a variety of techniques, and is addressed through development plan review and on-site inspections. The *Riparian Management Guidebook* is considered in determining stream protection strategies, as part of the forest development planning process.

In 1993 the former licensee initiated a cooperative committee targeting the enhancement of anadromous fish spawning and rearing habitat within TFL 38. Working with government agencies and sports fishing groups, the committee prioritized and conducted work on specific creeks Interfor will continue to support these efforts by contributing assistance and machinery time where possible, while the others contribute labour, minor funding and expertise in acquiring provincial and federal funding.

Maintenance of water quality in all watercourses including those identified as having specific resource concerns is addressed jointly by Interfor and the local fisheries

resource agency staff both through the forest development plans and on site by site inspections prior to operations.

- **Squamish River Wood Salvage**

For preparation of the SMOOP for MP#8, the MoF requested that Interfor commit to salvaging lost wood where feasible.

Interfor has no plans for recovering wood volume from below the high water mark of the Squamish River. The liabilities associated with the Forest Practices Code, the beneficial contribution of Large Organic Debris (LOD) to the maintenance of fish habitat, and the likely increase in sedimentation associated with in river salvage preclude any consideration for a salvage program.

Mitigating action will be considered where large logjams are considered to be impassable to migrating spawners, where there is risk of severe channel scouring, or risk of property loss. No action will be taken without prior consultation with local Ministry of Environment, Lands and Parks (MoELP) and/or Department of Fisheries and Oceans (DFO) offices.

4.6.4 Wildlife Management

Large mammal numbers and values are generally low within the TFL with exception of mountain goats, and a small unique population of moose in the Elaho River drainage. British Columbia Environment (BCE) has identified mountain goats and mountain goat habitat as having significant values in TFL 38 and require special management (i.e. wildlife management zones). Mountain goats are dispersed throughout all six watershed units. Consistent snow packs limit ungulate production within the TFL. Past management of the species has been limited to mapping general polygons for winter habitat.

In 1994 a joint winter survey was conducted between the former licensee and BCE to confirm mountain goat winter ranges and re-evaluate previous work. The flight data was recorded on 1:50,000 National Topographic Series (NTS) maps. An inventory summary was generated rationalizing polygon choice by describing the type of goat sign found, the topography associated with the sign and the snow conditions along the flight transect.

Mountain Goat Management Zones (MGMZ) have been identified and habitat requirements will be protected through a seral stage distribution approach such that within the operable portion of the MGMZ:

- no more than 20 % in age class 1 (1 - 20 year);
- at least 20 % is greater than or equal to age class 5 (≥ 81 years); and

- openings should no greater than 5 ha.

Interfor is developing operating procedures for conducting forest harvesting adjacent to mountain goat winter range based on seasonal variability of snow depth and snow pack conditions rather than on a rigid calendar window (Appendix XIX). By utilizing seasonal variability of snow depth, snow pack conditions and local snow zones, Interfor can build flexibility into harvesting operations that will widen the operating window when weather conditions permit. The operating procedure will be an integral part of the Forest Development Plan document.

Maintenance of a non-consumptive moose population in the Elaho drainage is a specific management objective of the BCE. The latest assessment of the moose population and its specific habitat requirements was conducted in 1988. The information report and its recommendations were appended to MP #7. Those area are identified in Geographical Information System (GIS) data base for the TFL as Moose Management Zones (MMZ).

It is the intent of the BCE to manage the Elaho moose herd primarily for non-consumptive purposes. Management emphasis will be placed on the preservation of a stable moose population by protecting minimum winter range requirements through a seral stage distribution approach such that within the operable portion of the MMZ:

- no more than 30 % in age class 1 (1 - 20 years);
- 20 % should be greater than or equal to age class 4 (≥ 61 years); and
- openings should no greater than 20 ha.

Black-tailed deer, black bear, wolves, cougars and other fur-bearing mammals are also found throughout the TFL. There is evidence of grizzly bears within the TFL from infrequent sightings, however the numbers, territories, or movement of the grizzly population is unknown.

Bald eagles feed along the Squamish River below the Elaho junction during the September to November salmon runs, overwintering values continue from fall to spring each year (peak overwintering numbers occur between November and February with peak abundance in December). Bald eagles likely do nest within the TFL. Any nests which are located will require protection in accordance with the *Wildlife Act*.

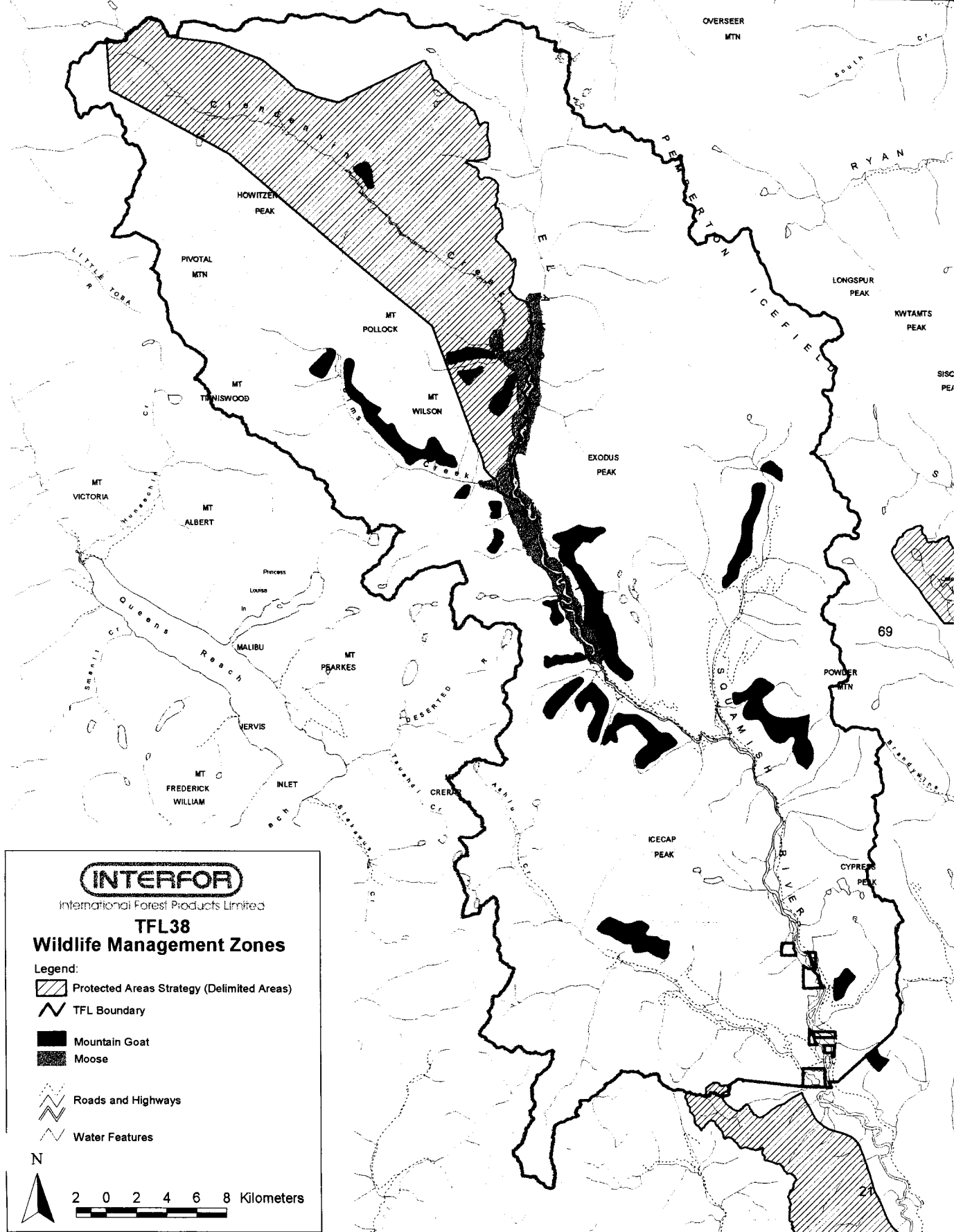
BCE has done extensive Spotted Owl surveys throughout Soo Timber Supply Area including TFL 38. To date no Spotted Owls have been found in TFL 38. There is however a *Spotted Owl - Special Resource Management Zone* overlapping with the Tantalus Protected Area. A portion of the Squamish *Spotted Owl SRMZ* may be associated with the lower Ashlu River drainage. As more detailed mapping is provided by BCE the *Spotted Owl Management Plan* will be implemented.

Table 20: Wildlife Values

Watershed Unit	Wildlife Habitat Values
Ashlu River	<ul style="list-style-type: none"> • Goat Winter Range/Summer Range • Deer Winter Range/Summer Range • Black Bear Spring/Summer/Fall • Potential Grizzly Spring/Summer/Fall (low due to amount of human activity)
Squamish River	<ul style="list-style-type: none"> • Eagle Winter Feeding / Potential Nesting along river. • Goat Winter Range/Summer Range • Deer Winter Range - Lower Squamish - near TFL boundary • Black Bear Spring/Summer/Fall Range
Elaho South	<ul style="list-style-type: none"> • Moose Winter/Summer range • Goat Winter Range/Summer range • Black Bear Spring/Summer/Fall range • Some winter feeding by eagles at confluence of Squamish and Elaho
Elaho North	<ul style="list-style-type: none"> • Moose winter/summer range • Goat winter/summer range • Black Bear spring/summer/fall range • Potential Grizzly spring/summer/fall range (low values)
Sims Creek	<ul style="list-style-type: none"> • Goat winter/summer range • Black Bear spring/summer/fall range • Potential Grizzly spring/summer/fall range (low values)
Clendenning Creek	<ul style="list-style-type: none"> • Goat winter/summer range • Black Bear spring/summer/fall range • Potential Grizzly spring/summer/fall range (low values)

Wildlife management efforts will be restricted to moose and mountain goat population maintenance and managing in accordance with the biodiversity requirements of the FPC. No particular emphasis will be placed on the management of other wildlife species (ie. deer, bear, small game, etc.) within the TFL. Interfor believes that the Forest Practices Code, associated Regulations, and the *Biodiversity Guidebook* are capable of ensuring the sustainability of existing wildlife populations.

There are currently three active registered traplines within the TFL as shown in the resource atlas. There are no licensed hunting guides operating within TFL 38.



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TFL38

Wildlife Management Zones


Legend:

 Protected Areas Strategy (Delimited Areas)

 TFL Boundary

 Mountain Goat

 Moose

 Roads and Highways

 Water Features



2 0 2 4 6 8 Kilometers

- **Biodiversity**

The maintenance of biological diversity will occur through the resource planning procedures employed in the TFL. Planning for biological diversity at both the landscape and stand level will be in consideration of the procedures outlined in the *Biodiversity Guidebook* and the strategies outlined previously in this management plan. Other guidebooks that provide recommendations for maintaining biological diversity from a 'coarse filter' approach to the 'fine filter' approach are the *Riparian Management Areas Guidebook*, and the *Managing Identified Wildlife Guidebook*.

Resource Management Zones, Landscape Units, and respective objectives, will be established through a government initiated higher level planning process. Until such time that biodiversity emphasis options are established, the default is that all of the TFL 38 area will be managed using the lower biodiversity emphasis option.

- **Landscape Level Strategies**

Landscape level strategies to achieve low biodiversity emphasis objectives include:

- Maintain a well-distributed variety of seral stages, stand structures, patch sizes, and habitat types across the landscape, through time such that:

NDT 1 CWH biogeoclimatic zone:

- greater than 13% must be older than old seral stage (250 years).

NDT 1 MH biogeoclimatic zone:

- greater than 19% must be older old seral stage (250 years).

NDT 2 CWH biogeoclimatic zone:

- greater than 9% must be older old seral stage (250 years).

- Minimize the negative effects of fragmentation due to harvesting such that:

NDT 1 and NDT 2, all biogeoclimatic zones:

- 30-40% of the productive forest area may have harvest openings less than 40 hectares in size;
- 30-40% of the productive forest area may have aggregations of blocks, meeting green-up, up-to 80 hectares in size; and
- 20-40% of the productive forest area may have aggregations of blocks, meeting green-up, up to 250 hectares in size.

- **Stand Level Strategies**

Stand level strategies to achieve low biodiversity emphasis objectives include:

- Upon the approval of MP #8 and without establishment of LUs for TFL 38, wildlife tree patch requirements for the TFL as a whole will be determined in accordance with the recommendations of *Table 20(b) of the Biodiversity Guidebook* (MP #8 Table 21 and 22);
- Upon the establishment of LUs for TFL 38, by the District Manager, wildlife tree patch requirements for each LU will be determined in accordance with the recommendations of *Table 20(a) of the Biodiversity Guidebook* (MP #8 Table 21 and 22);
- In all situations, to as great an extent as possible, all wildlife tree patch and old seral requirements will be captured from constrained and non-contributing land-base (i.e. areas which do not contribute to the AAC such as riparian; wildlife; ESA; gullies; inoperable; and other constrained areas)¹³;
- Where required, wildlife tree patch areas will be designed in consideration of the recommended distribution of suitable WTPs across the landscape contained in the *Biodiversity Guidebook*;
- Design areas referred to as wildlife tree clusters. Wildlife tree clusters are groupings of 2 - 10 trees with at least one tree being >50 cm DBH. Clusters are no bigger than 0.02 ha, with 4 - 6 clusters distributed across a cutblock, usually along a yarding split line. As total area in wildlife tree clusters will be ≤ 0.1 ha they do not effect calculation of net land-base.
- Silviculture Prescription will assessed wildlife tree requirements on or adjacent to a proposed cutblock, and describe how values are accommodated; and
- Wildlife tree patches will be mapped and recorded as part of the documentation of the Silviculture Prescription or the Stand Management Prescription for an area, and removed from the net area to be restocked.

Table 21: Wildlife Tree Patch Requirements - Biogeoclimatic Subzone Level

LU	NDT	BGCZ	Productive Forest Area [A]	Gross Operable Area [B]	% Available for Harvest [B/A *100] Rounded	Area Harvested w/o WTPs [C]	% Area Harvested w/o WTPs [C/B *100] Rounded	Table 20(a) % cutblock area required as WTPs	Table 20(b) % cutblock area required as WTPs
#1		ATp	782	103	10%	0	0%	0	
	1	CWHvm	936	675	70%	199	30%	7	
		MHmnm	5 598	2 567	50%	364	10%	3	
	2	CWHdm	705	613	90%	131	20%	8	
		CWHds	6 756	5 904	90%	2 481	40%	10	
		CWHms	14 971	12 836	90%	4 673	40%	10	
#2		ATp	288	1	0%	0	0%	0	
	1	MHmnm	2 747	849	30%	1	0%	0	
	2	CWHds	5 519	4 328	80%	1 769	40%	9	
		CWHms	6 062	4 340	70%	340	10%	5	
#3		ATp	242	8	0%	0	0%	0	
	1	MHmnm	4 595	1 917	40%	0	0%	1	
	2	CWHds	2 604	1 204	50%	285	20%	4	
		CWHms	8 917	6 338	70%	39	0%	4	
TFL 38		ATp	1312	112	10%	0	0%		0
	1	CWHvm	937	675	70%	199	30%		10
		MHmnm	12 940	5 333	40%	365	10%		5
	2	CWHdm	705	613	90%	131	20%		11
		CWHds	14 879	11 436	80%	4 535	40%		12
		CWHms	29 950	23 514	80%	5 052	20%		10
			60 723	41 683	69%	10 282	25%		

As discussed under Section 3.2.2 Biodiversity Objectives, caution is warranted with respect to detailed analysis providing breakdown of the biogeoclimatic subzone level representation within NDTs. The current source data for biogeoclimatic analysis is 1:250 000 digital data provided by the Ministry of Forests, Research Branch “rubber sheeted” to the TFL 38 digital forest cover data base. Due to the resolution of the data source it is not suitable for variant level analysis. This is demonstrated by the fact that ATp (Alpine Tundra - parkland) biogeoclimatic subzone contains productive and operable timber in Table 21. It is recommended that Table 22 be used to assess wildlife tree patch requirements to the biogeoclimatic zone level.

Table 22: Wildlife Tree Patch Requirements - Biogeoclimatic Zone Level

LU	NDT	BGCZ	Productive Forest Area [A]	Gross Operable Area [B]	% Available for Harvest [B/A *100] Rounded	Area Harvested w/o WTPs [C]	% Area Harvested w/o WTPs [C/B *100] Rounded	Table 20(a) % cutblock area required as WTPs	Table 20(b) % cutblock area required as WTPs
#1	1	AT	782	103	10%	0	0%	0%	
		CWH	937	675	70%	199	30%	7%	
		MH	5 598	2 567	50%	364	10%	3%	
	2	CWH	22 432	19 353	90%	7 285	40%	10%	
#2	1	AT	288	1	0%	0	0%	0%	
		MH	2 747	849	30%	0	0%	0%	
	2	CWH	11 581	8 668	70%	2 109	20%	6%	
#3	1	AT	242	8	0%	0	0%	0%	
		MH	4 595	1 917	40%	0	0%	1%	
	2	CWH	11 521	7 542	70%	324	0%	5%	
T F L 38	1	AT	1312	112	10%	0	0%		1%
		CWH	937	675	70%	199	30%		10%
		MH	12 940	5 333	40%	365	10%		5%
	2	CWH	45 534	35 563	80%	9 718	30%		11%
			60 723	41 683	69%	10 282	25%		

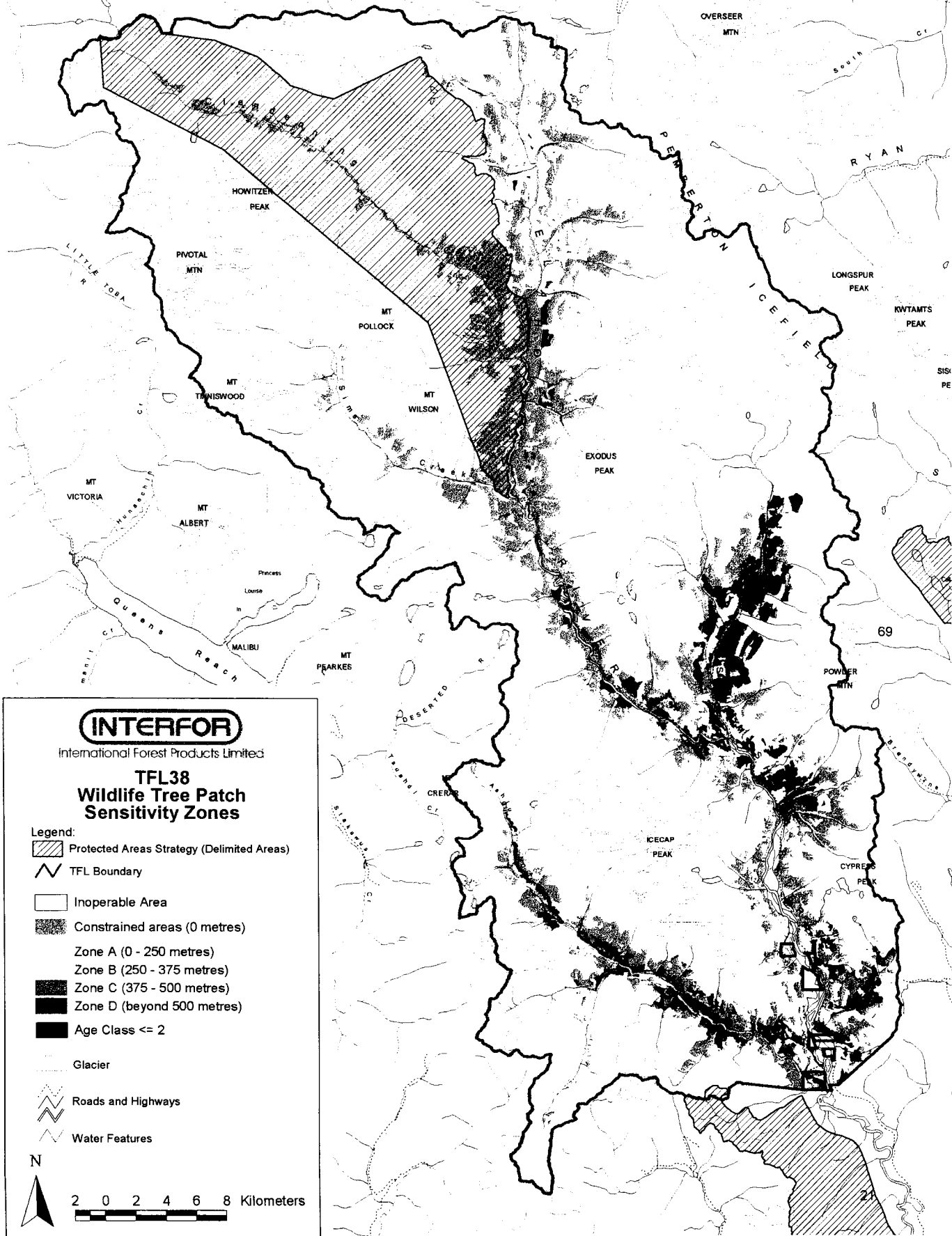
- Application Of Wildlife Tree Patch Requirements**

During preparation of the Silviculture Prescription, Interfor will assess wildlife tree requirements on or adjacent to a proposed cutblock, and describe how values are accommodated. Wildlife tree patch areas will be designed in consideration of the recommended distribution of suitable WTPs across the landscape contained in the *Biodiversity Guidebook*.

Review of the data presented in MP #8 Table 21 and Table 22 indicates that less than 3 000 ha of total area within the gross operable land-base is required to satisfy wildlife tree patch requirements (assuming the establishment of Landscape Units and an appropriate spatial distribution of WTPs). Accordingly, a minimum of 75% of that requirement will come from already constrained areas, such as areas deferred for riparian zones, environmentally sensitive areas, gullies and other areas netted out of the gross operable land-base when determining the timber harvesting land-base for timber supply purposes. Therefore, a minimum of 2 250 ha of well distributed “already constrained” area is required to satisfy the aforementioned 75% minimum.

Review of Appendix VIII, indicates that some 19 000 ha of productive, protected and inoperable forest surround the gross operable land-base. In addition, some 4 600 ha are removed from the gross operable land-base specifically to further account for water buffers, and environmentally sensitive areas. As there are in excess of 23 600 ha of well distributed area, to satisfy WTP requirements, netted out of the productive and gross operable land-base, it is highly likely that up to 100% of WTP requirements will be satisfied in identified areas outside of proposed cutblocks, while achieving the maximum recommended distance between WTPs of 500 metres. Furthermore, non-productive area with forest cover attributes provide an additional 7 800 ha toward achieving wildlife tree patch requirements.

The results of WTP spatial analysis conducted in consideration of the timber supply analysis demonstrated that only approximately 64 ha of operable land-base was more than 500 metres away from an already constrained area (MP #8 Section 4.3.1 Table 18).



4.6.5 Visual Landscape Management

The *Landscape Inventory and Analysis, February 1996*, has been reviewed in the context of managing scenic values in TFL 38 consistent with Forest Practices Code impact objectives. The report *Managing Scenic Values in TFL 38 Consistent with Forest Practices Code Impact Objectives, March 1997* was prepared (Appendix VII). The review:

- Assessed and revised the recommended visual quality objectives (RVQO) of the Landscape Inventory;
- Identified and rated the scenic values in the TFL;
- Identified scenic corridors within the TFL in consideration of recreation use intensity and scenic values;
- Confirmed that a modification visual quality is generally appropriate for the operable land-base of TFL 38;
- Suggests opportunities to increase availability of volume in scenic areas through use of innovative management practices;
- Suggests strategies to reduce adjacency constraints; and
- Outlines strategies for incorporating the principles of integrated visual design in harvest planning in scenic areas in order to maximize long term harvest levels while still maintaining scenic area objectives.

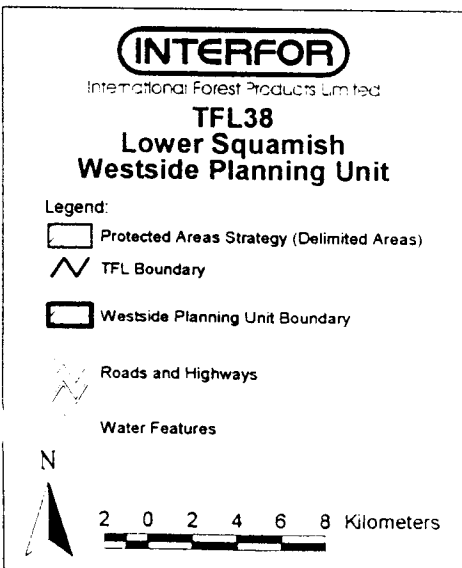
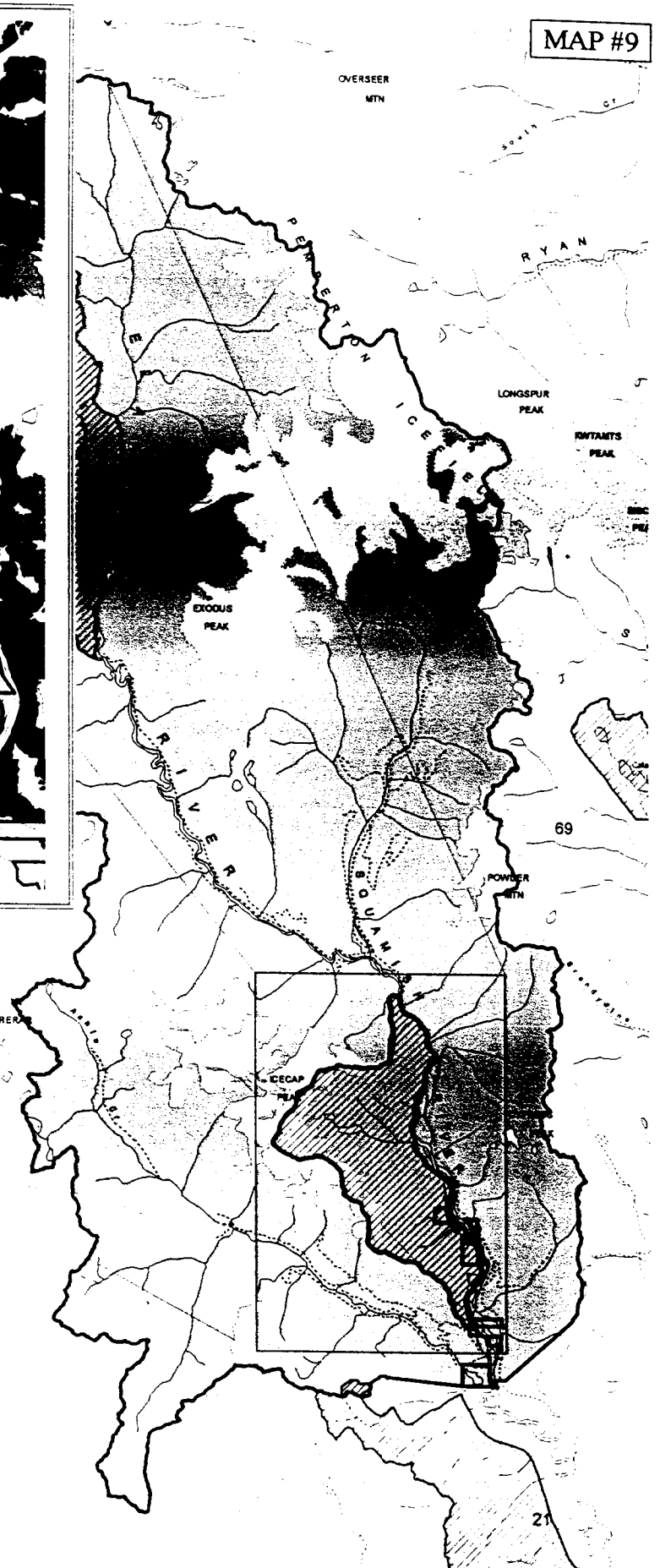
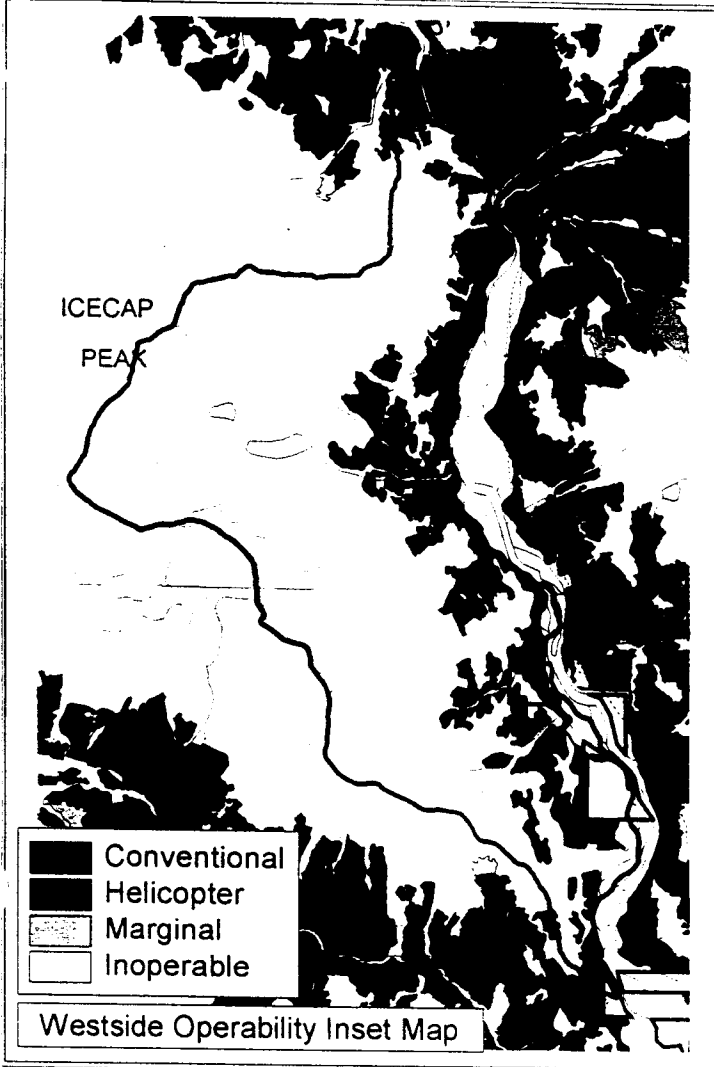
As a result of the review, and discussion with Squamish Forest District staff, one area is identified for consideration as “known scenic area”, having established visual quality objectives, in accordance with the *Operational Planning Regulation* (Map 7):

Scenic Area: The west side of the Squamish River, from the TFL 38 boundary, through the confluence of the Ashlu River to the confluence of the Elaho River, continuing on the west side of the Elaho River through the confluence with Sims Creek to the Clendenning Protected Area.

Visual landscape design principles will be employed in forest development planning in scenic areas to better integrate timber harvesting and road building activities with the visual landscape setting within which they occur.

Interfor will employ a variety of visual landscape information such as photo mosaics, Digital Terrain Models, angle of incidence analysis, plan-to-perspective analysis and written descriptions of proposed development to support Forest Development Plan submissions for the identified scenic areas.

The portion of the Scenic Area on the west side of the Squamish River, from the northern edge of the historic conventionally logged areas at Buck Mountain (approximately 4 km north of the Ashlu/Squamish River confluence) to Endurance Creek (approximately 1.5 km south of the Elaho/Squamish River confluence), is the area referred to as the "Lower Squamish - West Side" planning unit (Map 9). In MP #7, the former licensee made a commitment for the preparation of a local resource plan prior to any development proposals south of Mud Creek. Interfor, concurs with the commitment and will prepare a visually driven twenty year plan for the Lower Squamish - West Side planning unit during the term of MP #8. Preliminary conceptual digital terrain renderings will be presented at the February 1998 FDP public viewings. The objective is to have an approved plan for the Lower Squamish - West Side by the end of 1998.



4.6.6 Forest Cover Inventory

- **History**

Up to now, all forest cover inventories were prepared by the previous Tree Farm Licence holder, Weldwood of Canada Ltd. An initial inventory of TFL 38 was carried out in 1962 and 1963.

The present inventory was completed in 1981. In 1987 an inventory of second growth stands over 10 years of age was conducted and integrated into the mylar map base.

In 1993 the mylar map base was transferred to a 1988 orthophoto map base made to photo control from the Ministry of the Environment, Lands and Parks TRIM format (NAD 83). Forest attributes were added to make the database compatible with current Ministry of Forest's standards and the inventory was converted into a GIS Arc/Info digital format.

The planimetric base, including forest cover, was also updated to 1994 1:15,000 colour photography. This project updated both altered geographic features, such as meandering rivers, and photogrammetrically unverified harvest block boundaries. Indistinct areas in the original orthophotography were also upgraded.

The inventory and planimetric base has been maintained annually for harvesting, road construction, reforestation, silvicultural treatments, and TFL area amendments. The most recent updating of the inventory records occurred in 1996.

- **Current Forest Attribute Treatment**

Due the nature of the original forest attributes, this inventory had become incompatible, in some respects, with current Ministry of Forests data model.

In 1993, the present TFL 38 inventory was modified in order to facilitate forest cover database use in current timber supply analysis processes, the preparation of maps with MoF style labels, and the translation of the TFL inventory data into compatible Intergraph design files. These modifications were as follows:

- Addition of crown closure estimated from TRIM based orthophotos or recent 1:15,000 aerial photos;
- Addition of stand height from recent silvicultural records on disturbed areas; and
- Estimation of stand age and height from age, height and site classes referenced to the leading species in the original site curves.

These enhancements ensure compatibility with MoF processes and specifications.

- **Future Requirements**

The current forest cover inventory standards for TFL 38, while adequate for the past, need to be reviewed in consideration of today's resource information demands.

The mature inventory component was created solely for the forest cover data needs of the 1970's. The mature forest (141+ years) was classified to a very broad level. Some data attribute requirements, such as precise age and height, were not collected to today's standards.

Government standards for forest inventory are being revised within a larger context of a Vegetation Inventory for the Province of British Columbia. When these standards are finalized, Interfor will review the inventory design of TFL 38. Avenues of funding, such as Forest Renewal BC, will be pursued to aid in the development of resource inventories.

Any required forest inventory work completed in the TFL will be done to current government standards of the day. The MoF Inventory Branch will be consulted about this work and the Terms-of-Reference of any new inventory information will be submitted for review by the Research Branch. Forest inventory information collected will be incorporated into the base data and ready for use in preparing Management Plan No. 9.

One of the primary uses of the inventory is the assignment of site index values and their relationship to growth and yield predictions. Current site index values for mature forest stands have been recognized to be undervalued on the coast. Interfor will pursue the reassignment of new site index values for TFL 38 prior to submission for MP #9.

The validation of site index will consider using information available from:

- Site index - biogeoclimatic ecological classification correlations;
- Permanent sample plot (PSP) data; and
- Paired plot analysis.

Interfor plans to use ecological mapping in combination with field site index measurements, a method known as Site Index - Biogeoclimatic Ecological Classification Correlations (SI-BEC), to address mature forest site index issues. The exact type of SI-BEC project will be determined by the level of available Forest Renewal BC funding for both BEC mapping and SI-BEC field work.

A PSP establishment program has been started in the TFL. Results will be only at a preliminary phase by the next management plan. The intention of this data is to assist in obtaining managed stand yield curve information for both pooled, coast-wide and long-term, localized yield curves.

Site index information from the MoF paired plot analysis will also be incorporated where appropriate.

4.6.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESA) have been determined and submitted to the Ministry of Forests as part of the preparation of the MP #8 for TFL 38. Mapping procedures were completed according to MoF standards. ESA categories of high and moderate sensitivity have been assessed for:

- Terrain stability; and
- Recreation.

Reconnaissance level terrain stability mapping has been prepared for the whole of TFL 38. Detailed terrain stability mapping has been prepared for the Squamish River drainage basin. Appendix XI contains the consultant's reports.

Identification of ESA areas for wildlife is primarily for Mountain Goat and Moose. The management of Environmentally Sensitive Areas for wildlife habitat will be achieved primarily through the identification of Wildlife Management Zones. Wildlife management is discussed in Section 4.6.4. These management zones contribute to achieving biodiversity emphasis requirements.

4.6.8 Recreation Management Planning

The topography of TFL 38 ranges from near sea level to a maximum of 2 882 metres in elevation (Elaho Mountain).

Five large river and creek drainages traverse the TFL. Above the valley bottom areas there is generally dense, conifer forest cover extending up to tree line. Upland area with the exception of some large ice-fields, are steep, with sub-alpine and alpine vegetation at higher levels.

A complete recreation inventory was completed, submitted to the MoF in April 1996, approval was pending in conjunction with approval of the Timber Supply Analysis Information Package for TFL 38. Procedures for mapping were done according to the Ministry of Forests' Recreation Manual.

The inventory includes biophysical, cultural and historical features and their current and potential recreational use. The map information has been loaded into the GIS. The inventory and analysis will be used for operational planning and to determine environmental sensitivity.

A Recreation Analysis and Management Strategy Report has been completed according

to Vancouver Forest Region guidelines. The report plus the *Recreation Inventory Report* is included in Appendix XX. The analysis presents options and recommendations for the management of the recreation resource. In response to the analysis report recommendations, Interfor has produced a new recreational brochure welcoming recreational users to TFL 38. Also, in response to the local community support for forestry activities on TFL 38, Interfor has created a documentary video that offers candid viewpoints from Squamish residents about the resolution of the Lower Mainland Protected Areas Strategy and how it has affected them and their families ("*Squamish - Protecting People, Protecting Parks*").

The *Recreation Analysis and Management Strategy Report* forms the basis for planning recreational development during the term of MP #8. Interfor will continue to maintain, and enhance recreation opportunities, as identified in the strategy report, in co-operation with the MoF, where appropriate. Recreational use is expected to increase, largely due to the creation of a new park within the TFL and the proximity of the Vancouver population. Recreational focus is expected to be concentrated in the fishing, hunting, sightseeing and hiking activities. The major management concerns are the safe public use of roads and minimizing hazardous conflict with industrial traffic through adequate warning signage, speed limits, radio control and closure of dangerous road sections.

The location of key features in TFL 38 is illustrated in Map 2 of *Recreation Analysis and Management Strategy Report* (Appendix XXI).

- **Lakes and Rivers**

There are no lakes of significant size (over 100 ha surface area) in TFL 38. In addition, of the small lakes within the TFL, few are located in areas with road access.

There are numerous lakes located in alpine areas. Tricouni (Seagram) Lakes, Sigurd Lake, Teare Lake and Goldbrick Lake are back country recreation destinations and are well known to local outdoor groups.

Three main river systems are located in TFL 38.

- **Squamish River**

Length of the Squamish River within TFL 38 is approximately 49 km. The main stem rises from 30 metres elevation to 1066 metres elevation at the headwaters near Table Mountain. The river supports the following fish species: Salmon, Steelhead, Dolly Varden, rainbow trout.

Commercial river rafting is established on the Squamish and Elaho Rivers. Four rafting companies conduct rafting trips in TFL 38.

Formal and informal campsites are found along the river bank.

- **Ashlu River**

The Ashlu River is 36 km long. Elevation rises from 30 metres at the confluence with the Squamish River to 1158 metres at the height-of-land headwaters.

- **Elaho River**

The Elaho River is 60 km in length. Elevation rises from 152 metres at the confluence with the Squamish River to 1128 metres elevation at the headwaters. Angling, camping, river rafting, canoeing (on suitable sections) and kayaking, wildlife viewing, photography. Devils Elbow canyon is a well known feature. Rainbow trout and Dolly Varden. Steelhead are present to just above Devils Elbow. Moose, wolf, goats, and grizzly bears are also evident.

- **Trails and Routes**

There are numerous high quality mountaineering traverses and routes in TFL 38 (Appendix XXI). Most of the routes are accessed off the end of logging spur roads, some of which are passable by four wheel drive vehicle up to a certain point.

There are three formally designated trails in TFL 38. In addition there are numerous hiking and climbing routes In TFL 38. Routes are considered to be different from trails as they are generally not clearly marked and have no improvements such as cleared paths.

- High Falls Creek Trail - #6133
- Deminger Trail - #6326
- Elaho Giant Trail - #6358

As part of the LMRPAC recommendations for the Tantalus Protected Area, Interfor has agreed to leave a 50 metre buffer on either side of the Sigurd Creek trail where it passes through approved Block 104 and that any subsequent development that affects the integrity of the trail will involve consultation with the Federation of Mountain Clubs of B.C.

Hiking and climbing routes are well described in several books. Trails and routes are mapped on current operational maps. Files are maintained by the Squamish Forest District. The most recently constructed trails are the Deminger Trail located at 35 Mile, and the Elaho Giant Trail located at Mile 63 on the Elaho Mainline.

Formal management plans for the maintenance and protection of these trails are being developed. Improvements to the Deminger Trail include the addition of

interpretative signs.

Under the Code Act, trails or paths which qualify as formal trails would be assigned a T2-Managed Trail designation. Project numbers and Schedule A exhibits are prepared for each trail. Further work, maintenance or trail building, without formal permission from the Ministry of Forests is not permitted.

The High Falls Creek Trail is informally maintained by members of the North Shore Hikers Club.

Interfor currently has no trail building or maintenance building program. Existing trails have been built by local outdoor groups under their own initiatives.

No native trails or archaeological sites have been identified to date in TFL 38. Early exploration of the Squamish, Elaho and Clendenning Rivers is recorded in an account by Stanley Smith who travelled the area in 1893 in search of an overland route through the Coast Mountains to the Pacific Ocean.

An extensive road system has been developed in TFL 38 to access areas for logging. The road network provides access to the Squamish, Ashlu and Elaho Rivers. In addition, spur roads, vary in condition. Some are passable by four wheel drive vehicles provide access at least a part of the way to sub-alpine lakes and to the start of several alpine traverses, while others are deactivated. There are approximately 140 km of mainline road in TFL 38.

Extensive travel on foot or on skis takes place in the sub alpine and alpine areas of TFL 38. Mountaineering and ski-touring routes are identified in Appendix XXI.

- **Access**

Logging roads go through a cycle of activation and deactivation as areas are developed and then undergo recovery. While seasonal and permanent road deactivation is part of normal forestry practice, there are implications for recreational users.

In TFL 38 there are several mountaineering routes which access the back country areas of TFL 38. Access to many of these mountaineering routes is via mainline and spur or secondary logging roads. The condition of roads in TFL 38 varies from two wheel drive to four wheel drive or non vehicular traffic.

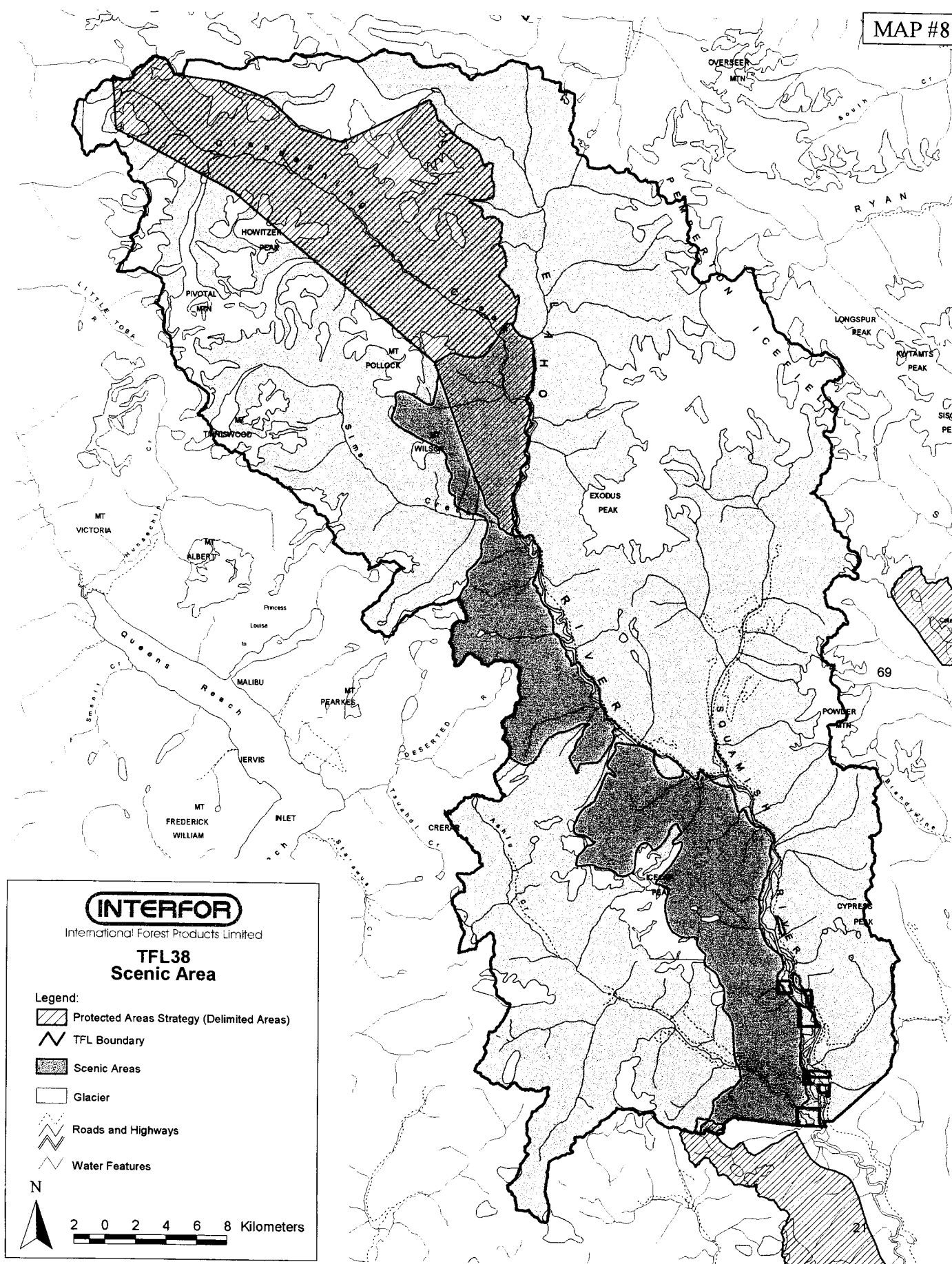
Road status information available to help potential visitors to plan their recreation activities in TFL 38 is available at the Empire Operations office in Squamish.

In cases where access is particularly important for recreation use such as to an alpine traverse, campsite or high quality lake, consideration for maintaining the





access will be given (i.e. Interfor maintains the Branch 200 road for recreation access to Tricouni Alpine Access Route).

Many visitors and potential visitors to the TFL are largely unaffected by logging road deactivation, which is confined to secondary and spur roads. Mainline roads are kept open, allowing motorized vehicle access to the Squamish, Ashlu and Elaho drainages.

Visitors wanting detailed road information and a map of mountaineering routes and access roads can contact Interfor at its Squamish office. Additional information is available through the Outdoor Recreation Council, the Federation of Mountain Clubs of B.C., the Alpine Club of Canada or through regional and local tourism centres.



ICECAP
PEAK

-  Conventional
-  Helicopter
-  Marginal
-  Inoperable






Westside Operability Inset Map

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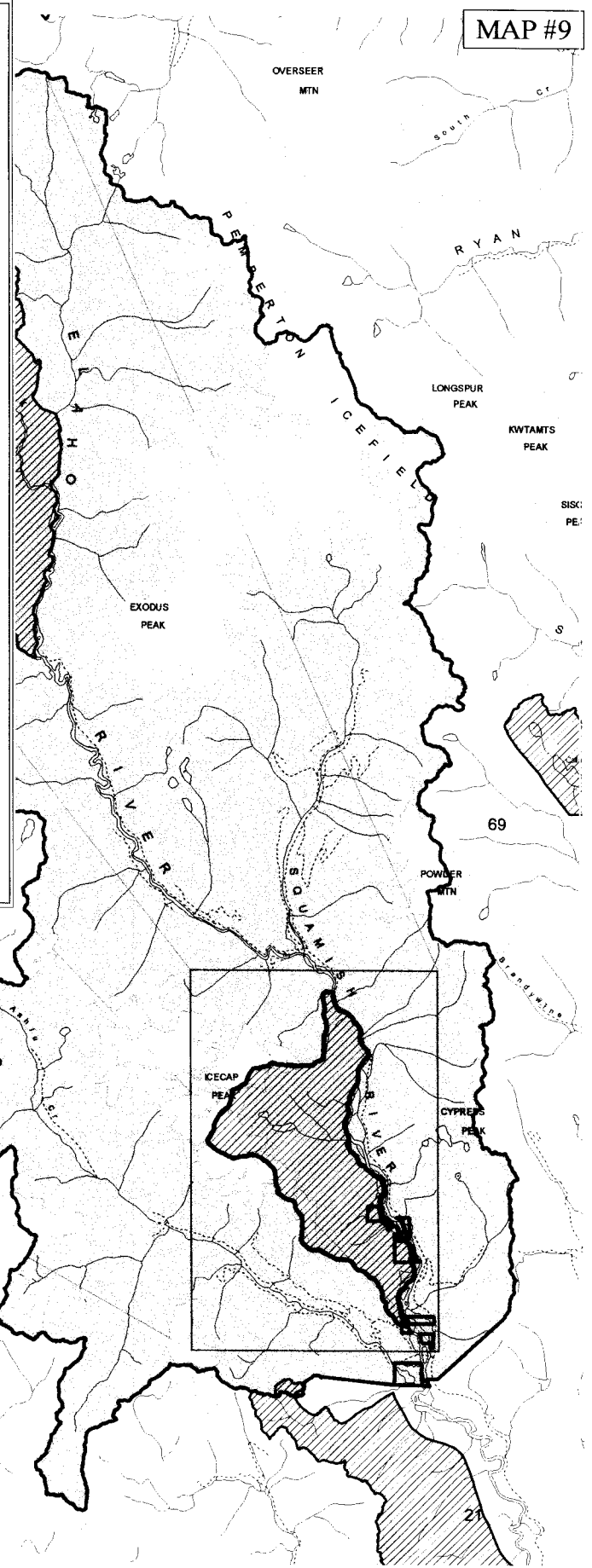
**TFL38
Lower Squamish
Westside Planning Unit**

Legend:

-  Protected Areas Strategy (Delimited Areas)
-  TFL Boundary
-  Westside Planning Unit Boundary
-  Roads and Highways
-  Water Features



2 0 2 4 6 8 Kilometers



- **Facilities**

Recreation facilities are limited relative to the numbers of recreation users. The existing facilities include picnic tables, outhouses and fire rings at some sites.

Upgrading of recreation site facilities, in cooperation with the Ministry of Forests and with local outdoor recreation clubs or public service groups will be considered to improve recreation site conditions.

Some of the recreation sites are formally managed while others are informal (i.e. Are not maintained and have no facilities). Formally managed sites are maintained and have limited facilities.

In addition to the campsites which are accessible by road, there are numerous "informal" trails and campsites in back country areas. These sites are not managed by Interfor, or any agency. Some sites are be maintained by users (eg. The High Creek Trail is maintained by volunteers from the North Shore Hikers Club).

Only two recreational sites, Hideaway (#900-0266) and Riverside (#900-0265) have actual Schedule "A" designated site status. Formal status of both sites dates from November 28, 1979.

Small river accessible or isolated forested sites are the types popular with TFL 38 visitors. The following recreation sites are located within TFL 38:

- Riverside (#900-0265 - formal recreation site) - 21 mile Ashlu Main;
- A4 Bridge, Ashlu River (informal recreation site) - 22.1 mile Ashlu Main;
- Ashlu Canyon (informal recreation site)- 25 mile Ashlu Main;
- High Falls Creek - (informal recreation site) - 23 mile TFL Main;
- Squamish River - (informal recreation site) - 29.5 mile TFL Main;
- 30.5 Mile (informal recreation site) - 30.5 mile TFL Main;
- Turbid Creek - (informal recreation site) - 33 mile TFL Main;
- Hideaway (#900-0266 - formal recreation site) - 36.5 mile TFL Main;
- Elaho/Squamish River Bridge (informal recreation site) - 37 mile TFL Main;
- 38 Mile Elaho (informal recreation site) - 38 mile Elaho Main; and
- Molson picnic site (informal recreation site) - 44.5 mile G Main.

In the back country of TFL 38, there are several popular informal campsite areas which have no motorized access. These include sites at Racoon Pass, base of

Doolittle Glacier, Seagram/Tricouni Lakes, Relay, Falk, Tearne and Goldbrick Lakes, and on an open plateau area south of Meager Creek along the TFL boundary. Refer to Appendix XXI for the location of these sites.

- **Commercial Tourism**

Commercial recreation activities within TFL 38 include guided river rafting, kayaking, fishing, back country skiing, mountaineering, heli-skiing and glacier skiing.

There is no hunting guiding territory (MoE Management Unit 2-6) in TFL 38.

There are nine licensed angling guides who use the Squamish, Elaho and Ashlu Rivers in TFL 38. Angling is well established on the Squamish River.

Six rafting companies (1996) are permitted by BC Parks Commercial River Rafting Program, to conduct trips on the Squamish and Elaho Rivers in TFL 38.

4.6.9 Archaeological Resources

The Squamish Forest District completed an archaeological overview assessment covering both the Soo TSA and TFL 38 in August of 1997. The results of the overview assessment indicate that archaeological impact assessments will be required where the potential for these resources exist. In addition, both the Mt. Currie Band and the Squamish Nation have significant cultural heritage resource inventories (either in progress or complete). This information is not directly available to the licensee and will likely be brought forward during the consultation process and will require appropriate management prescriptions to be developed. Interfor will consult with the Squamish Nation to identify and locate important spiritual and cultural areas within TFL 38.

Inventories of known archaeological resources values do not exist for TFL 38. Archaeology Branch has delineated some areas within TFL 38 as having archaeological potential.

Interfor will conduct assessments, in cooperation with the Squamish Nation and the Mt Currie Band, where required to ensure the protection of significant archaeological resource values within the TFL as required by the *Forest Practices Code and Heritage Conservation Act*

Should previously unrecorded cultural heritage resource features be discovered during operations, Interfor will notify the appropriate agencies and take steps to manage these resource features as required.

4.6.10 Trappers and Guide Outfitters

There are three registered trapping licences within TFL 38. The Licences are shown on an overview map contained in the resource atlas. Although none are known to be active at this time, information concerning development activities is normally sent to the registered licence holder as part of the development planning process.

4.6.11 20-Year Plan

A 20-Year Plan has been prepared and submitted along with the timber supply analysis as part of the normal requirements of the management planning process (Appendix XV).

The plan was prepared to indicate a potential harvest pattern and demonstrate that the harvest level is spatially plausible within the context of current planning, riparian, and biodiversity guidelines. Actual harvesting pattern, roads to be constructed and deactivated, block and road specific information (drainage structures and silviculture prescriptions), use of alternate harvesting methods, and prescribed use of alternative silviculture systems will be detailed in Forest Development Plans.

4.7 Forest Renewal B.C.

In a concerted effort to enhance the use of FRBC funding, in the spring of 1996, Interfor and FRBC formed a unique agreement to retrain IWA workers. At Squamish, 12 employees of Empire Logging and Squamish Lumber took part in a 4 month training course to become multi-skilled forestry workers.

Interfor gained a skilled crew, able to play an active part in long-term improved forest management while making better use of acquired funding. It is expected that the crew will have a longer work year than previously available, and their newly attained skill set makes them more employable throughout the industry. Currently, the FRBC crew has limited activities funded indirectly through Ministry of Forests.

To address enhanced forestry objectives, Interfor operations staff are actively preparing comprehensive Forest Renewal Plans for TFL 38 for the term of MP #8. FRBC project proposals are submitted periodically, to deal with various aspects of forest management including projects relating to:

- Watershed • Road deactivation and rehabilitation of disturbed areas;
- Restoration • Enhancement of fisheries and wildlife habitat;
- Inventories • Addressing site productivity assignments;

- Terrestrial Ecosystem Mapping;
- Non-timber resources such as fisheries and wildlife;
- Upgrading the current timber inventory;
- Forestry • Experimenting with alternate silviculture systems in original forest and second growth stands;
- Expanding the productive land-base including harvesting of sensitive areas and low site stands;
- A variety of silvicultural treatments such as spacing;
- Education • Training for company staff, contract crews, local and First Nations communities.

- **Watershed Restoration Program**

Watershed Restoration Program (WRP) funding, when available, is used to physically correct to current standards, roads built in the past. These projects will eventually increase the stability and ensure the proper drainage of areas logged years ago.

In cooperation with the Steelhead Society of B.C., Interfor is taking part in a number of fish habitat enhancement projects using WRP funding.

4.8 First Nations

The Squamish Nation (Skwxwumish7ulh) claim territory in TFL 38, as does the Mount Currie Band.

The Squamish Nation has the largest traditional territory and is a member of the Lower Mainland-based Alliance Tribal Council. The Mount Currie Band is based in Mount Currie and is not affiliated with any tribal council.

The British Columbia Treaty Commission (BCTC) facilitates the treaty process in British Columbia under an agreement signed in September of 1992 between the provincial and federal governments and the First Nations Summit. The Squamish Nation is in early stages of negotiating a treaty within the BCTC process, and it is unclear as to when negotiations will be complete. At this time, there are no formal changes to land designation resulting from the treaty negotiation process.

Meetings will be held with the above First Nations focusing on identifying and locating important spiritual and cultural areas within TFL 38. Once located and mapped the areas will be submitted to the government ministry responsible for aboriginal and/or archaeology issues for assistance in determining the significance and management required for the identified area. Consultants engaged to carry out such assessments will be agreed to by the appropriate First Nation.

Management Working Plan No. 8 and all lower level plans will conform to the public and First Nations review and comment procedures as outlined in MoF policy regarding the protection of aboriginal rights.



Photo 9: Deminger Trail

5.0 SOCIOECONOMIC CONSIDERATIONS

In support of continuing forest management activities outlined in MP #8, for TFL 38, consideration has been made of the socioeconomic contribution on the local community, and the Provincial economy. In order to make the assessment, some assumptions, facts, and statistics were borrowed from a report produced for the Economics and Trade Branch of the Ministry of Forests, and a 1995 forest industry review by Price Waterhouse. While TFL 38 is not considered part of the Soo TSA, it is part of the Squamish-Lillooet Regional District (SLRD), it's proximity to the communities discussed in the Soo TSA Socio-Economic Analysis¹⁴, primarily Squamish, allow for similarly based projections.

5.1 Economic Profile

Squamish is the largest community in the SLRD and is the closest to TFL 38. In 1996, the total population was estimated at 15,100¹⁵. Because of it's proximity to TFL 38, and it's role as a regional service centre, the majority of those employed in TFL 38 forestry and logging activities reside in Squamish and changes to the AAC will have the greatest impact here. Provincially, approximately 313 direct logging and milling jobs and 658 indirect and/or induced jobs for a total of 971 Person Years (PYs) of employment can be attributed to TFL 38 (Table 23). Direct jobs are those in harvesting, silviculture, administration, and wood processing. Indirect jobs are found in shipping at Squamish Terminals and BC Rail, and in forestry related construction, consulting and associated government ministries. Induced jobs are those in government services like health care and education, and in local retailing of daily purchases like groceries and more significant purchases like homes and cars.

The average pre-tax compensation and benefits for forestry employment is approximately \$61 918 (1995)¹⁶. This is significantly higher than the average pre-tax compensation and benefits for B.C. of approximately \$42 175 (1995)¹⁷. In the event of forest industry job loss, there is a significant negative impact on individuals and affected families. This is attributable to "a stable work history in an industry with relatively good wage levels. Displaced forestry workers suffer emotionally and in some instances they do not qualify for social assistance programs because of their accumulated property"¹⁸. A significant adjustment in the standard of living should be expected. Many forestry jobs are specialized and it is doubtful that acquired skills would be transferrable to industries like tourism. FRBC funded projects are expected to mitigate job loss, but not necessarily income loss. Further to this, it is noted that unemployment levels in the Howe Sound

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| 14 | Crane Management Consultants Ltd., <i>Soo TSA Socio-Economic Analysis</i> , Ministry of Forests, Economics and Trade Branch, December 1994. |
| 15 | 1996 estimates from the Sea to Sky Economic Development Commission. |
| 16 | Price Waterhouse, <i>The Forest Industry in British Columbia</i> , - 1995, May 1996. |
| 17 | Ibid. |
| 18 | Commission on Resources and Environment, <i>Vancouver Island Land Use Plan</i> , February 1994, cited in Crane Management Consultants Ltd. |

Labour Market Area are “extremely high, the highest on a five tier scale”¹⁹ and it is suggested that SLRD communities are “not well positioned to respond to further forest industry layoffs”.

Employment from TFL 38 also plays a significant part in generating local revenue and in the provision of community services. Continued employment levels help to stabilize or improve property values, thereby maintaining revenue from property taxes. These taxes are derived from both the residential and commercial sector, which rely on secure employment levels in the forest industry.

Forestry and tourism have become the main engines of the local economy and provide the greatest source of employment. Tourism appears to be on the rise despite AAC levels that have remained relatively constant. This serves to indicate that the health of one industry does not necessarily preclude the other. This is supported by two facts: 1) the vast majority of outdoor activities most visitors engage in are localized and generally away from the working forest; and 2) road building for forestry activity provides greater access to more remote areas. This also suggests that opportunities exist to maximize sustainable output from both industries while diversifying the regional economic base.

Through the LMPAS, unique areas were set aside for biodiversity preservation. This also expanded the existing regional parks network which already included Porteau Cove, Shannon Falls, Murrin Lake, Alice Lake, Lake Lovely Water, Brandywine Falls, Blackcomb Glacier, Garibaldi Park, Nairn Falls, Birkenhead Lake, Joffre Lakes, and Golden Ears Park. The Soo TSA socioeconomic report, deals with tourism and recreation issues and recognizes the PAS as a proactive step in addressing future demand for recreational space. However, the report does not point toward overuse of the previously existing parks network

The report also noted that SLRD residents have much higher outdoor recreational activity participation rates compared to the residents of the Greater Vancouver Regional District (GVRD)²⁰. It can be inferred from this that local recreationalists are presumably more informed about, and less sensitive to, forestry activity.

5.2 Provincial Contribution

Much of the harvested wood in the SLRD leaves the Squamish area to be processed. As a result, changes in AAC levels impact beyond the Squamish economy. Lower Mainland mills rely almost exclusively on logs supplied from coastal sources, including TFL 38. Based on the Soo TSA coefficients for Person Year per 1 000 m³ of harvest, logs supplied by TFL 38 supports approximately 313 Person Years of direct logging, silviculture,

19 Human Resources Canada, December 1993, cited in Crane Management Consultants Ltd.

20 Crane Management Consultants Ltd., *Soo TSA Socio-Economic Analysis*, Ministry of Forests, Economics and Trade Branch, December 1994.

administration, and processing employment. Indirect and induced employment is estimated at 658 Person Years (Table 23). It is estimated that the former 263 000 m³/year AAC of TFL 38 generated in the order of \$47.1 million in pre-tax compensation and benefits, \$6.3 million in stumpage revenue, and \$15.7 million in Employment Insurance and Canada Pension Plan contributions, personal income tax, corporate income tax, provincial sales tax, property tax, taxes included in electricity rates, B.C. Corporation tax and other taxes. The weighted average pre-tax compensation and benefits for TFL 38 related employment is estimated at \$48 500 per year. Estimated government revenue is \$83 700 per 1 000 m³ of AAC.

Table 23: TFL 38 Economic Impacts

Base AAC 263 000 m ³	Person Year (PY) per 1 000 m ³ (1)	Number of Jobs	Estimated Compensation and Benefits ⁽²⁾	Estimated EI, CPP and Income Tax ⁽³⁾	Estimated Induced Taxation ⁽⁴⁾
Local logging, silviculture, administration and processing	0.63	166	\$10,278,000	\$3,189,000	\$561,000
Provincial processing	0.56	147	\$9,102,000	\$2,824,000	\$497,000
Indirect/induced employment	2.5	658	\$27,751,000	\$6,412,000	\$2,223,000
Total direct and indirect	3.69	971	\$47,131,000	\$12,425,000	\$3,281,000
Stumpage ⁽⁵⁾	\$6,312,000				
Total Government Revenue EI, CPP, taxes and stumpage	\$22,018,000				
Weighted average compensation and benefits per job	\$48,500				
Government Revenue per 1 000 m ³ of AAC	\$83 700				

- (1) Based on Person Year (PY) per 1000 m³ of harvest coefficients, determined in the *Soo TSA Socio-Economic Analysis*,
- (2) Based on Price Waterhouse, *The Forest Industry in British Columbia - 1995*, May 1996. Total forest industry compensation (\$47,713) and benefits (\$16, 205) = \$61.918 per direct job. B.C. average compensation is \$31,011 plus 36% benefits = \$42,175.
- (3) Ibid: Direct employment taxation = \$1,873,000,000 per 97,500 jobs = \$19,210 per direct job. Indirect employment taxation = \$1,900,000,000 per 195,000 jobs = \$9,744 per indirect/induced job. Taxation includes Employment Insurance (EI), Canada Pension Plan (CPP), and personal income tax.
- (4) Ibid: Includes provincial sales tax, corporate income tax, property tax, taxes included in electricity rates, B.C. Corporation tax, and other taxes. Estimate is based on total taxation of \$988,000,000 per total forestry induced employment (292,500) = \$3,378 of corporate taxation per direct, indirect and induced job.
- (5) 1996 average stumpage paid by Interfor = \$24/m³.

6.0 ANNUAL REPORT

Under the terms of the *TFL 38 Licence* document, *Section 13*, on or before April 1 of each year during the term of MP #8, Interfor will deliver to the Chief Forester, Regional Manager, and District Manager a TFL 38 Annual Report for the preceding calendar year. This report will contain information regarding the Company's management performance for activities such as:

- Silviculture;
- Harvesting;
- Engineering;
- Inventory;
- Protection; and
- Integrated resource management.

The Annual Report will be used to provide information to the public regarding TFL activities and will be available for public viewing.

7.0 CONTRACTOR CLAUSE

Some timber within the tree farm licence area must be available for harvest by others under timber sale licences, pulpwood tenures and woodlot licences. A minimum portion of the harvest must be harvested by contractors.

In accordance with the Licence agreement and to meet the requirements under the legislated in the *Forest Act*, the Company will ensure that each calendar year during the term of the Licence:

- The Licensee will ensure that not less than 50% of the AAC volume harvested from Schedule B Land within the Licence area is harvested by persons under contract to the Interfor;
- Compliance is calculated in accordance with the method prescribed under the *Forest Act* and regulations;
- If the volume of timber harvested by contract is less than the volume required, the Regional Manager may require the Licensee to pay an amount determined as follows: the volume required minus the volume harvested by contractors multiplied by the average stumpage rate charged for sawlogs in statements issued to the Licensee in respect to timber harvested under this Licence; and
- That the contractor clause conditions will be amended if required, to meet new harvest standards or cut control requirements that may occur because of changing environmental practices.

7.1 Schedule B Prorate

Table 24: TFL Land-base Schedule AAC Prorate

	Schedule A	Schedule B	Total
Total TFL Land-base	222	218 394	218 616
Non-productive	43	157 850	157 893
Productive	179	60 544	60 723
Reductions to Productive Land-base	71	24 508	24 579
Net Operable Land-base	108	36 036	36 144
Prorate	0.3%	99.7%	100%

8.0 PLAN REVISION

The Management Plan may need revision to accommodate changes as identified by the Chief Forester of the province or by the company. The Chief Forester in a notice given to the Company, may require that the Management Plan be amended or replaced. The notice will specify why the Management Plan needs revision and the extent of changes required in accordance with the Licence agreement.

Changes to the Management Plan may be made in consideration of:

- Damage to timber in the Licence Area as a result of fire, flood, wind, insects, disease, or other causes;
- A determination by the Chief Forester that operations conducted according to the management plan are causing or could cause serious damage to the natural environment, including soils, fisheries, wildlife, water, range, and recreation resources;
- Approval, amendment or replacement of other land use plans, a change in the allowable annual cut as a result of a determination by the Chief Forester under the Forest Act; or
- Other special circumstances.

9.0 REVIEW STRATEGY

The strategy for reviewing the TFL 38 Management Plan provides several opportunities to receive comments from persons interested in or affected by activities planned under this Licence. This review process will include the following:

- Resource agencies;
- Licensed resource users;
- First Nations;
- Local governments; and
- Public.

The measures for inviting comment concerning the plan will be dependent upon the target audience and issues identified. A variety of methods such as referrals to agencies, public viewings and community presentations will be used.

Public involvement in TFL 38 occurs as a continuum during the different planning stages. A review strategy at the management plan level consists of three stages:

- 1) Identification of issues for current plan;
- 2) Review of draft Statement of Management Objectives Options and Procedures; and
- 3) Review of draft Management Plan.

A Public Involvement Plan had been prepared for draft MP #8 as shown in Appendix IV. It outlines the activities for public involvement associated with the draft MP #8 and was approved by the MoF Regional Manager.

9.1 Management Plan No. 9

The 28 month timeline for the preparation of MP #9 will begin in August of 2000.

Key dates in the preparation of MP #9 include:

August, 2000	Licensee will invite comments regarding the Licensee's performance in respect of MP #8;
December, 2000	Public Review of Draft State Management Objectives, Options and Procedures (SMOOP) for MP #9;
March, 2001	Licensee will submit SMOOP and a summary of public review comments to MoF;
June, 2001	Ministry of Forests Regional Manager accepts SMOOP;

August, 2001	Licensee will submit Timber Supply Information Package to Timber Supply Branch;
November 2001	Timber Supply Branch accepts Timber Supply Information Package;
March, 2002	Licensee will submit Timber Supply Analysis Report;
June, 2002	Timber Supply Branch accepts Timber Supply Analysis;
July, 2002	Public viewing and agency review of Draft MP #9 and 20 Year Plan;
September, 2002	Licensee will submit Proposed MP #9 and a summary of public review comments; and
December, 2002	Chief Forester of B.C. approves MP #9 for TFL 38.
January, 2003	Management Plan No. 9 will take effect.

9.1.1 Statement of Management Objectives, Options and Procedures

• Pre-SMOOP and SMOOP Public Input

The management plan in effect (MP #8) under this licence (TFL 38) will be available for review by interested persons, during normal business hours, at Interfor's Squamish office for a period of two months.

Individual notification letters, of the Pre-SMOOP public comment period, and the draft SMOOP, will be sent to government agencies and key community organizations and to previous respondents who requested further information. The letters will be mailed 1-2 weeks prior to public viewing. Advance notice will be sent to the Squamish First Nation.

Notification of the Pre-SMOOP public comment period, and the draft SMOOP public viewing, will be advertised in three newspapers. Advertisements will run consecutively for two weeks starting three weeks in advance of the public viewing:

- Vancouver Sun
- Squamish Chief
- Whistler Question

Pre-SMOOP Public Input

- August, 2000 Advertising will invite comment on MP#8;
- August - September, 2000 MP #8 available for public review;

SMOOP Public Input

- December, 2000 Advertising will invite comment on Draft SMOOP;
- December - February, 2001 Draft SMOOP available for public review;

One public viewing day will be held for the draft SMOOP in the local community of Squamish in December, 2000 at the Sea to Sky Hotel from 1:00 p.m. to 8:00 p.m.

The format of the viewing will consist of an informal greeting to view a static display of the proposed plan and supporting resource materials. Company staff will be present to record the number of visitors, guide viewers and answer questions. A take home response sheet which outlines key points and public response procedures will be provided to all viewers. A copy of the draft SMOOP will be made available at the local library, and the Ministry of Forests - District office, in Squamish during January and February, 2001. Copies of the draft SMOOP will be sent to key government agencies, municipal councils and First Nations.

The public will be invited to respond within a 60 day period following the viewing date. The response period for receipt of public input will end at the end of February, 2001. A summary of public comments received and our response will be forwarded to the MOF Regional Manager.

9.1.2 Draft Management Plan No. 9

In an effort to encourage better public participation we intend to use radio based advertising. Radio ads will run for one week prior to the public viewing and on the day of the public viewing, for a total of 8 days. The ads will be approximately 30 seconds long, aired 6 times a day, during prime-time. Two scripts will be prepared; the first will air for four days informing listeners about the management plan process; the second will air for the remaining four days reminding listeners about the management plan, the importance of public involvement and support, and inviting them to attend the public viewing.

Mountain FM's listening audience ranges from Horseshoe Bay to D'Arcy in the Sea to Sky corridor and over to the Sunshine Coast. Radio advertising on Mountain FM can be expected to reach in excess of 35 000 listeners per day.

Individual notification letters will be sent to government agencies and key community organizations and to previous respondents who requested further information. The letters will be mailed 1-2 weeks prior to public viewing. Advance notice will be sent to the Squamish First Nation.

Newspaper advertisements will run consecutively for two weeks starting three weeks in advance of the public viewing.

Draft MP #9 Public Input

- June, 2002 Advertising will invite comment on Draft MP #9;
- July - August, 2002 Draft MP #9 available for public review;

One public viewing day will be held in the local community of Squamish in January,

2001 at the Sea to Sky Hotel from 1:00 p.m. to 8:00 p.m.

During the viewing period, July - August, 2002, a copy of Draft MP #9 for TFL 38 will also be available for review by interested persons, during normal business hours, at Interfor's Squamish office.

The public will be invited to respond within a 60 day period following the viewing date. The response period for receipt of public input will end at the end of August, 2002. A summary of public comments received and our response will be forwarded to the MOF Regional Manager.

9.2 Forest Development Plans

Interfor will participate in the annual All Licensee Forest Development Plan Public Viewing tour coordinated by the Squamish Forest District. The annual public viewing opportunity is held in Squamish, Whistler and Pemberton. Timing, and presentation requirements are defined by the Squamish Forest District.