

# **Strategic Silviculture Planning Initiatives in British Columbia**

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## Abstract

There has been a long-standing need to develop strategic plans for incremental silviculture investments in British Columbia (BC). A series of 3 different audits done during the 1990's have all clearly documented the need for strategic silviculture plans. With Forest Renewal BC (FRBC) funding the Ministry has developed the *Incremental Silviculture Strategy for British Columbia (interim)*. The strategy was developed in 1997, field tested in 1998 and released in 1999. The strategy is intended to provide broad general direction and encourage patterns of activities. The provincial strategy provides context for the development of management unit strategies, stand level analyses and FRBC required Resource Management Plans. It is expected that the strategy will be refined upon completion of management unit (Tree Farm License (TFL) or Timber Supply Area (TSA)) strategies.

In 1999 FRBC allocated \$3 million over two years to develop management unit incremental silviculture strategies. A number of analytical and forest level modelling approaches are used to produce specific harvest level, timber quality and habitat supply objectives. The strategies contain silviculture regimes and silviculture programs aimed at achieving the desired management unit objectives. The strategies include explicit evaluation of the role of tree improvement, spacing, fertilization and partial cutting in the achievement of management objectives. The strategies are intended to help guide the allocation of available funding towards the timber supply, timber quality and habitat supply goals. The strategies will be used to guide prescription development and silviculture regime implementation. There are 68 management units, which have a silviculture strategy underway or complete. One of FRBC's key performance indicators is to have a silviculture strategy in place for every management unit in 2001.

For more information and copies of the *Incremental Silviculture Strategy for British Columbia*, the workplan for *Forest Level Analysis for Silviculture Investments*, completed management unit strategies, training and workshop materials see the Forest Practices Branch Web site <http://www.for.gov.bc.ca/hfp/silstrat/index.htm>

# Presentation Agenda

In BC basic silviculture is required by law on all lands that are denuded since October 1987. Basic silviculture can include activities such as site preparation, planting, use of improved seed, vegetation management, density management on over-dense stands and pruning for specific forest health or wood quality issues. Once these areas have met prescribed regeneration and stocking levels they are declared free growing. Incremental silviculture is defined as anything incremental to that which is required by law. Incremental silviculture largely applies to areas harvested or denuded prior to October 1987 and to new free growing areas. In this presentation incremental silviculture includes backlog reforestation of areas denuded prior to October 1987 and includes spacing, pruning and fertilization.

In this presentation I will overview some significant current progress in British Columbia to plan and rationalize incremental silviculture investments. I will present this in four key parts:

1. *Incremental Silviculture Strategy for British Columbia* - a cornerstone document which provides a planning framework and guiding direction for incremental silviculture investments in British Columbia.
2. development of management unit (Tree Farm Licence or Timber Supply Area specific) silviculture strategies for all 71 units in British Columbia
3. The development of a management planning and implementation system to guide the allocation of government or crown corporation funds such as Forest Renewal BC.
4. Future directions in the planning and implementation of silviculture activities in British Columbia

## Part 1 - The Need for a Provincial Strategy

There have been a number of past attempts by government at developing silviculture strategies in British Columbia. In the early 1990's a series of documents entitled: *Towards a Silviculture Strategy* laid some of the ground work. A number of world wide reviews on silviculture strategies and the current and future markets for forest products were carried out. While a significant number of documents were produced, they never were formalized into a provincial strategy for incremental silviculture. During the period 1980–1995, over 1 million ha of incremental silviculture treatments were applied to crown land.

Audits done during the 1985-90 and 1991-96 Federal-Provincial Forest Resource Development Agreements identified the need to have a strategy to guide the investments of public funds on crown land. Between 1996 and 1999, Forest Renewal BC – (FRBC) a crown corporation spent \$80-130 million per year on incremental silviculture. The 1999 provincial auditor general's report of FRBC investments restated the need for an incremental silviculture strategy.

## Purposes of the Provincial Strategy

About 95% of the 95 million hectares of BC are crown land, of which only about 23 million hectares contribute to the current Timber Harvesting Landbase. About 40% of the timber harvesting landbase is now second growth forest. The Ministry of Forests plays an important role in the stewardship of the crown land. Given that the majority of land is publicly owned it makes strategic planning and incremental silviculture investments a unique challenge compared to

anywhere else in the world. The Ministry has needed an incremental silviculture strategy in order to:

- provide general guidance for incremental silv investments;
- provide context for TFL/TSA specific strategies;
- to help develop program plans and budgets (Resource Management Plans); and
- to give general guidance for stand level analyses and activities.

## Development & Release History

In September 1996 a group of headquarters Ministry of Forests (MoF) staff took on the challenge to develop a provincial incremental silviculture strategy for BC. Several draft ideas and concepts were developed which led to detailed background work being done in 1997 and 1998. Using funding assistance from FRBC and a contractor, a series of 6 detailed reports were produced including:

- [Working Paper 1: Project Information, References](#)
- [Working Paper 2: Concepts of Strategy and Planning, Proposed Framework](#)
- [Working Paper 3: Government's Goals, Proposed Guiding Principles](#)
- **[Working Paper 5: Proposed Financial and Socio-economic Analysis Framework](#)**
- [Working Paper 4: Proposed Log Quality Framework, Timber Supply and Demand,](#)
- [Working Paper 6: Summary of TSA Basic Data](#)

The 6 reports were based on 140 recent reports analyses, analyses and a review of both global supply and demand. The 6 contractor reports were used to develop the *Incremental Silviculture Strategy for British Columbia (interim)*. The strategy was reviewed with regional and district staff and was field tested in 1998 in the Vancouver Forest Region. After a series of reviews the document was released and implemented in 1999.

## Strategy Supports Achievement of Government's Goals

Any strategy must have goals and principles in order to provide context for its contents. Over the past 20 years, successive provincial governments have articulated its goals for forest management in a wide variety of government documents and supporting rationale for incremental silviculture investment. The provincial strategy is based on 3 key goals that government has consistently held:

- Sustainable resource use
- Community stability
- A strong forest sector

## Strategy is Based on Key Guiding Principles

BC's forests are developed by the one most diverse ecosystems in the northern Hemisphere. BC has 14 major biogeoclimatic zones and over 600 ecosystem associations. There are over 22 tree species being managed for and some of the most diverse habitat and wildlife conditions in North America. The inherent high diversity and values of BC's forests has resulted in the following principles being seen as key in guiding the strategy:

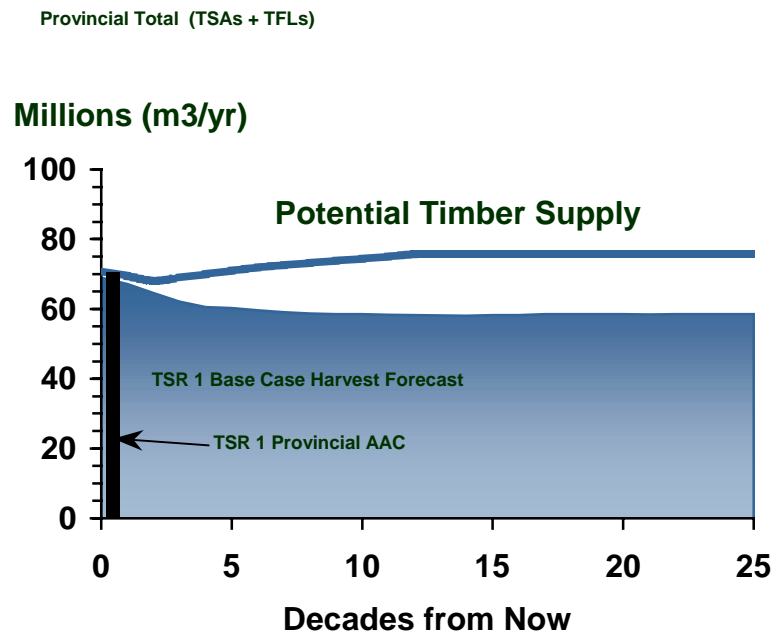
- BC's forests are important at all levels – from local to global;
- Because the land is crown land, stewardship and moral obligations to future generations must be met;
- Because future market demands and public values and desires cannot be forecast with certainty, the only course of action that must be taken is one that manages risk and maintains options for future generations;

## BC Situation – Current Forecast

To give context to the incremental silviculture we also looked at the 1999 forecasts for future harvest levels. The recently completed Timber Supply Review number 1 indicated that without strategic intervention, future harvest levels would fall by 17%. This would translate into a potential 5% reduction in provincial Gross Domestic Product and the potential loss of 46 000 direct and indirect jobs. In addition, it was projected that without appropriate management, wood quality and habitat supply needs may not be met

## BC Situation – Potential Supply

Analyses of potential timber supply in BC were done in 1994 and then by background work for this strategy. The estimates suggested that future harvest levels could be increased to 75 million m<sup>3</sup>. However the analysts making the projections recommended that this aggregate stand level projection would need to be confirmed on a management unit analysis for each of the 71 management units in BC.



The incremental silviculture strategy suggested that long rotation management coupled with the strategic employment of incremental silviculture there would be an upwards affect on wood quality. The strategy also recognized that habitat supply needs and impacts would need to be more fully incorporated into future projections of timber supply and wood quality.

## BC Supply vs Global Demand –

The strategy examined the key demand for wood products for the future. It became quite clear in [Working Paper 4: Proposed Log Quality Framework, Timber Supply and Demand](#), that externally to BC there were plentiful sources of cheap fibre. Currently in BC, about 95% of the pulp and paper mill furnish comes from sawmilling residues and not solid logs. The strategy suggests that BC will likely remain a sawlog economy and therefore should focus incremental silviculture investments in the production of sawlogs over fiber.

## Working Targets

To focus planning and silviculture investments the strategy contains a number of key working targets. These are targets which are intended to be refined over time and with more detailed analysis. The working targets are to:

- Minimize the anticipated interim reduction in timber supply so that it is not less than **65 million m<sup>3</sup>/yr**
- Increase timber supply over the mid-term to a long-term level of **75 million m<sup>3</sup>/yr**
- Maintain the production of premium quality logs at or above **10%** of total harvest volume

Premium quality logs are seen as those logs which command a higher than average price over sawlog and pulplogs. The current harvest profile suggests that about 15% of current logs are premium quality.

## Major Silvicultural Strategies

To achieve the working targets a number of key strategies have been developed for both timber quantity and quality. The major silviculture strategy for timber quantity would include:

- An increased use of alternative silvicultural systems where suitable, particularly commercial thinning;
- Reducing green-up ages through appropriate regeneration practices;
- Increasing regenerated stand volumes by 20%;
- Elimination of the treatable backlog of not satisfactorily restocked land.

In addition a number of other non-silviculture strategies must also be implemented such as improving inventory and growth and yield information.

In order to achieve increases in regenerated stand volumes by 20% there would need to be

- A substantial increase of fertilization on suitable stands
- acceleration in the tree improvement program so that by 2007 new plantations will have 12% increased volume;
- Where environmentally suitable, institute a void management program to ensure stand voids do not exceed 10%

- Intensify forest health management to reduce losses to insects and disease.

To maintain or manage for wood quality the strategy suggests that the province

- Initiate long rotation quality management program for stands where harvesting must be delayed
- Initiate a timber value-added strategy (including combinations of spacing, pruning and fertilization)

## Provincial Strategy - Concluding Remarks Part 1

The interim strategy is a *first step* – and is intended to be refined over time. It has successfully provided much-needed guidance for management unit strategies and FRBC’s Resource Management Program and investment planning. The strategy defines *broad general direction* and encourages *general patterns* of activities. It assumes in-depth mgmt unit analyses will be the basis for refined regional and provincial strategies

## Part 2 - FRBC’s *Forest Level Analysis for Silviculture Investments Initiative*

The provincial strategy was released by the Ministry of Forests Chief Forester in April 1999. Shortly thereafter the Auditor General Report was released and it identified the need for FRBC to do more work on investment strategies. FRBC committed itself to funding the planning process outlined in the provincial strategy. FRBC provided \$3.0 million over two years to support and fund the development of 71 management unit specific strategies. It is one of FRBC’s key strategic performance measures - a strategy for every management unit by 2001. This initiative is one of the key FRBC success stories in response to the Auditor General report and public concern over incremental silviculture investments.

## Purpose of Management Unit Strategies

The purpose of management unit strategies is to prioritize short, mid & long-term silviculture options to address identified issues and objectives. The management unit strategy is intended to provide a forward-looking planning and priority setting context for Timber Supply Review base case assumptions. Many of the management units in BC have had as part of their base case assumptions on the completion of backlog NSR/impaired area programs, explicit fertilization programs, and explicit or implicit density control or pre-commercial thinning programs. The management unit strategy is intended to provide context and direction for stand level prescriptions and FRBC investments

## Two Types of Strategies

Original estimates of cost for 71 management unit strategies were \$7.1 million. However, only \$3 million was available to fund the work. In order to put a strategy in place in all 71 management units within a period of 2 years, two main different types of strategies are being utilized.

**Type 1** - This approach uses existing TSR summary information to identify issues and opportunities for silviculture investments. It also uses stand level analyses and factoring estimates up to the forest level. This type of analysis produces interim management unit specific harvest level, timber quality and habitat objectives. Type 1 analyses provide plausible targets and strategies and silvicultural regimes which can be utilized as inputs in the more indepth type 2 analyses. These strategies are budgeted at \$15,000 per management unit.

**Type 2** - uses readily available info **plus** in-depth forest level modelling to develop silv strategies and funding needs. The type 2 approach is also intended to produce specific harvest level, timber quality and habitat objectives. These strategies are budgeted at \$75,000 per management unit.

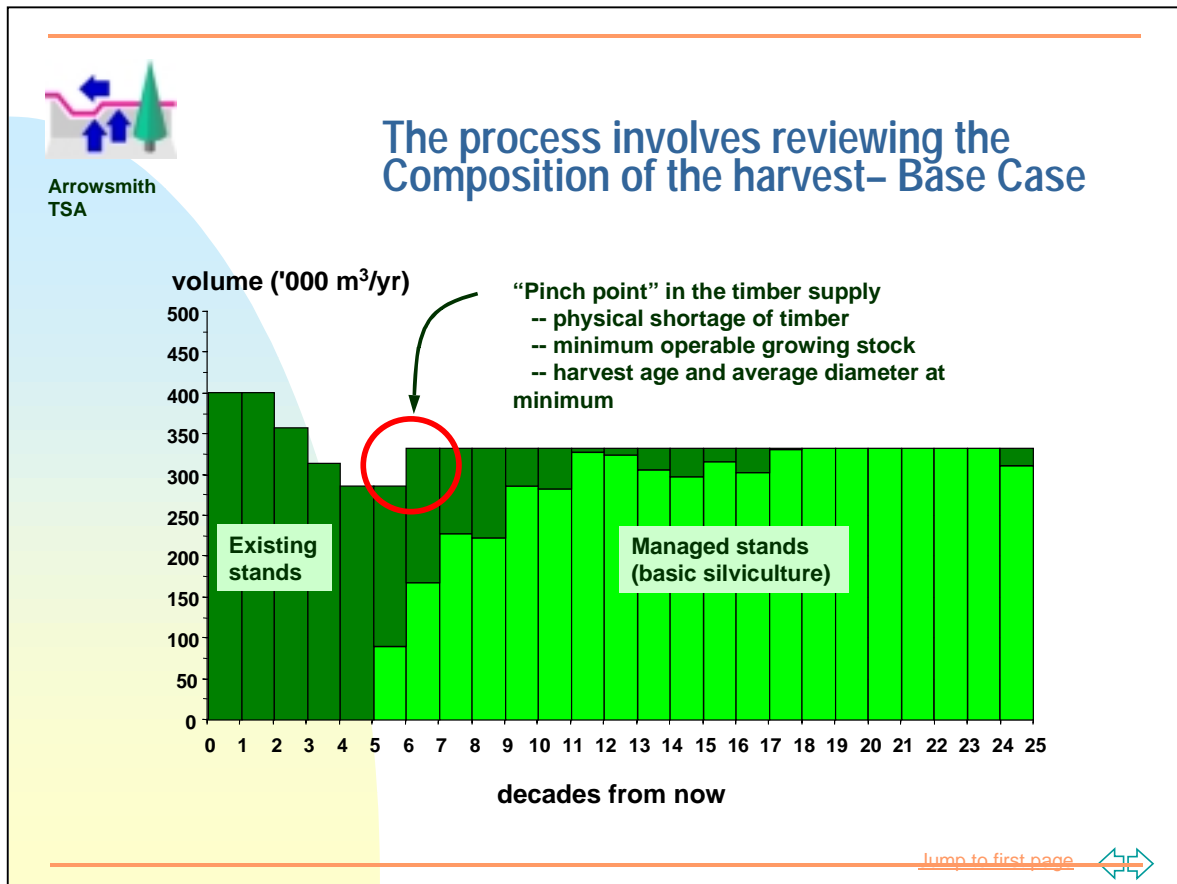
## Methodology

Strategies are developed by consultants under contract to MoF headquarters, regions or to Tree Farm Licence holders. The basic process is to identify issues and silvicultural opportunities & then develop prioritized cost-effective strategies that best address the issues. As part of the upfront development of a strategy a workshop is held. The usual workshop participants are licensees (40%), Ministry of Forests regional and district staff (50%) and others (10%) such as Ministry of Environment Lands and Parks (MELP) staff, FRBC staff consultants and first Nations participants. The workshop is used to identify issues, opportunities and silviculture regimes that are to be evaluated and examined by the consultants doing the in-depth analysis and strategy development.

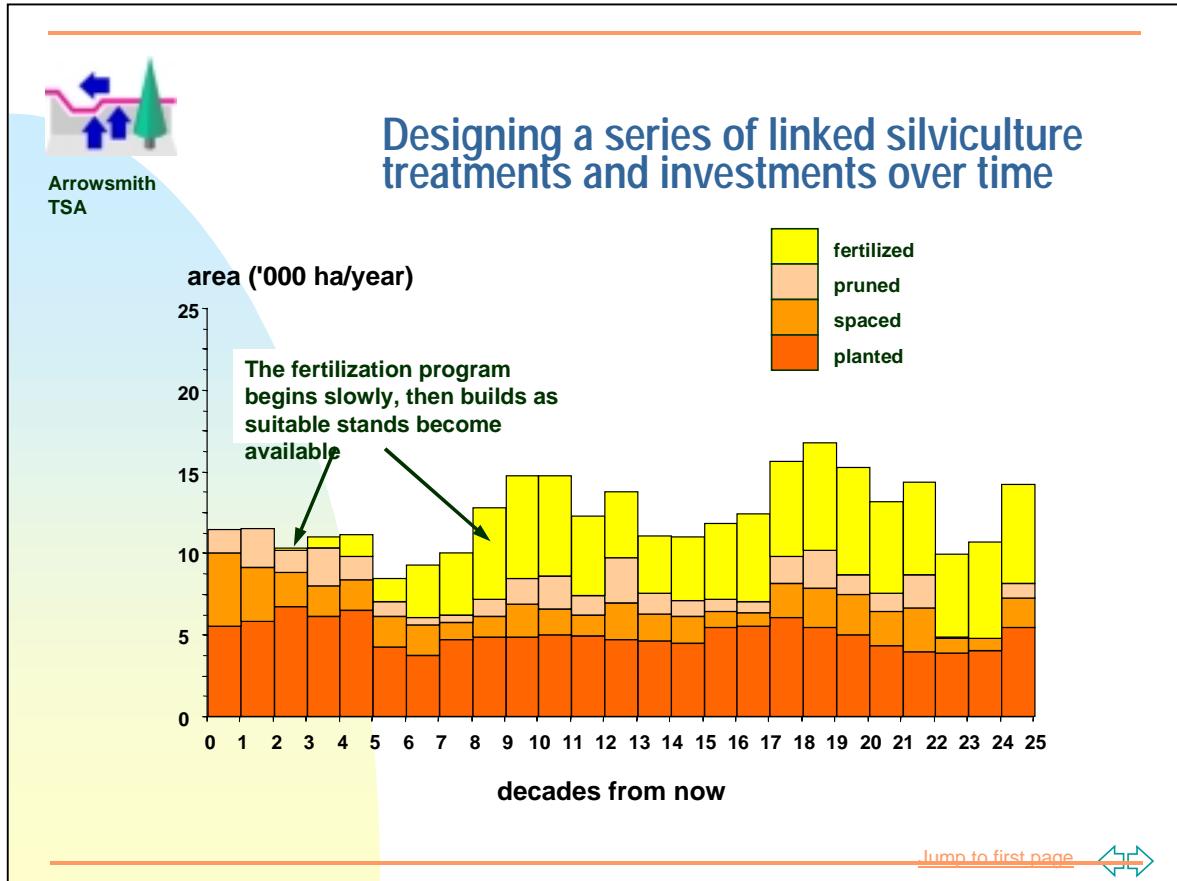
For many of the participants, the workshop has been one of the first opportunities they have had to think beyond the normal silvicultural regulatory and administrative process and to

1. closely consider and examine where and how silviculture affects habitat, timber supply and quality issues for their individual mangement unit;
2. discuss mgmt unit specific issues and opportunities for silv regimes & investment; and to
3. jointly work together to clarifying or set objectives and design a silviculture program to achieve them.

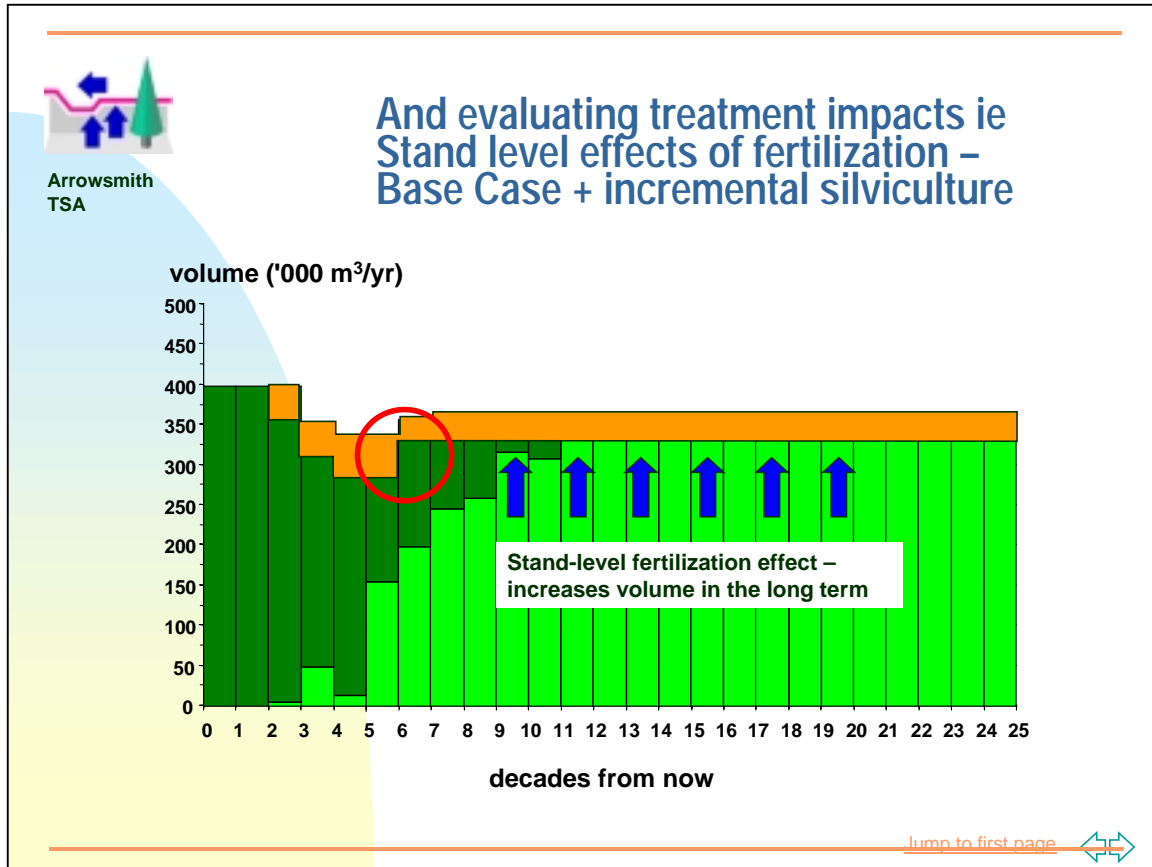
The process involves reviewing the objectives for the management unit for timber supply, wood quality and habitat over time. It also involves reviewing the composition of the current timber supply review base case harvest projections.



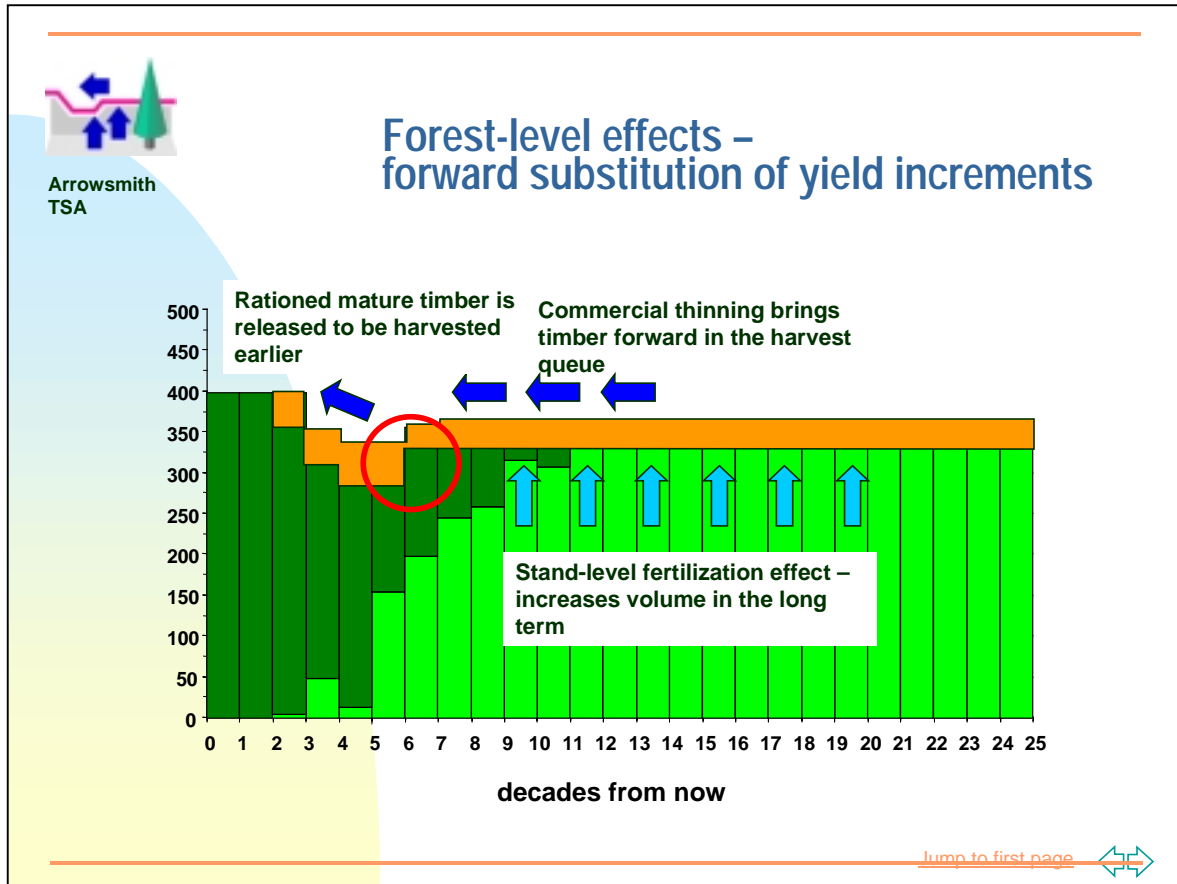
The process then involves the design of a series of analysis scenarios with linked silviculture treatments and investments over time that are aimed at achieving the management unit objectives.



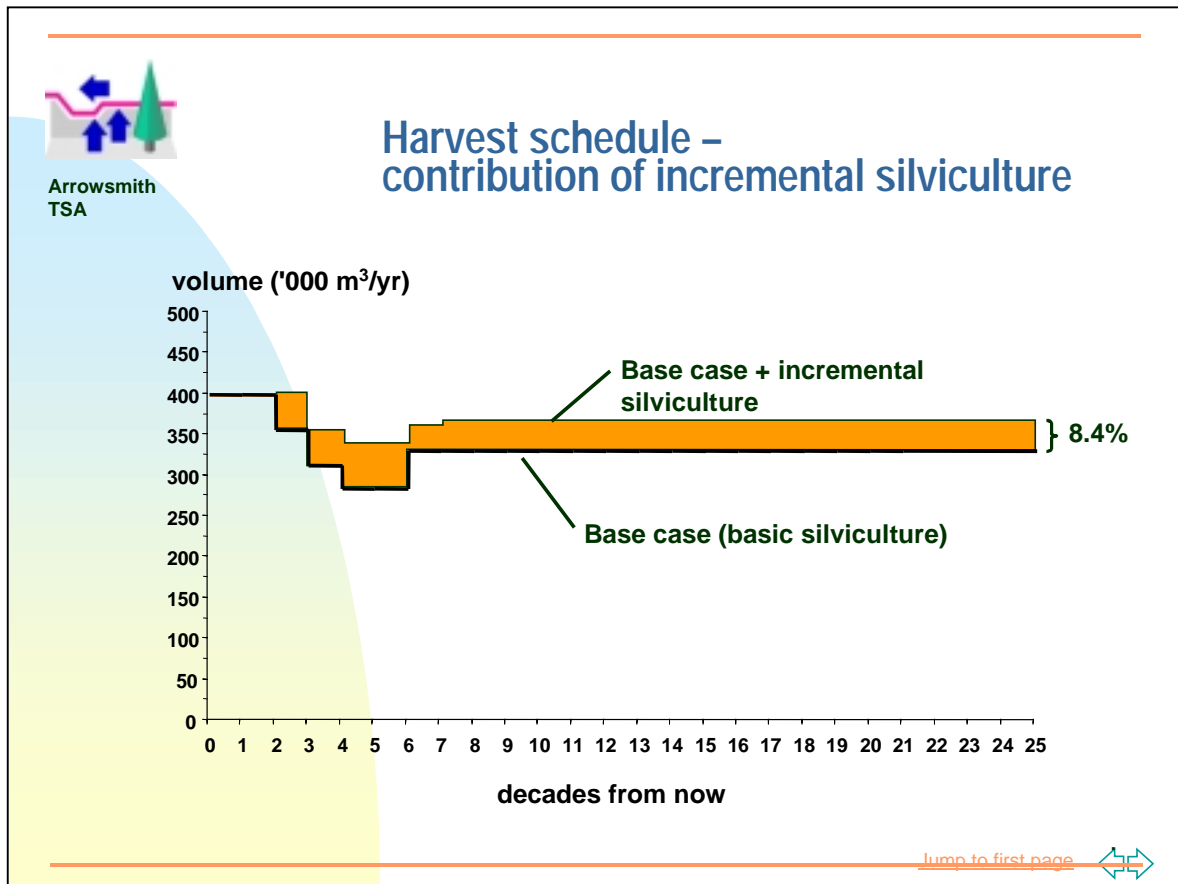
The process involves evaluating treatment impacts of a variety of silviculture investment and regime scenarios. It also involves evaluating how the incremental treatments would affect the achievement of management objectives (ie Stand level effects of fertilization – Base Case + incremental silviculture)



The process also examines the Forest-level effects of the investments such as the forward substitution of yield increments



And finally the process involves Choosing an incremental investment scenario which best achieves the desired volume, value and habitat supply objectives over time for the management unit.



Consultants take the direction and input of the workshop participants to complete analyses and develop the draft management unit strategy. The draft strategy is reviewed again by the participants either in another workshop or office review, revised and then edited to produce a final document. The following are some of the key contents that the consultants must include in a strategy:

**1 Basic Data**

Show (in graphical form where appropriate) any readily available information regarding the timber harvesting land base that may be relevant to the strategy, such as, Land Area, AAC, Current Harvest Forecast, Site Class Profile, Age Class Profile, Tree Species Profile.

**2 Issues**

Identify the key issues affecting timber supply, from both a timber quantity, quality, health and habitat supply perspective. The timber supply review as well as the TFL management plan can be useful sources of information. If incremental silviculture has a role in the TFL in managing habitat supply, also include issues that are relevant to this.

**3 Incremental Silviculture History**

Document recent incremental silviculture history. This should be classified according to whether or not it has been incorporated as part of the basis for the most recent AAC determination (and therefore a 1<sup>st</sup> priority for incremental funding). Recent program levels form a baseline comparison for the submitted strategy. A proposed program should not be unrealistic in comparison to historic levels.

**4 Opportunities to Increase Timber Supply**

Document opportunities to increase timber supply and provide supporting rationale. These may come from actual analyses that have been recently conducted or from inferences from timber supply analysis sensitivity test results (for example, timber supply is sensitive to a reduction in green-up ages, therefore a program to reduce green-up ages will result in an increased future supply).

**5 Potential Treatments and Treatable Area Information**

Indicate which are the most favourable treatments and/or treatment regimes. *The description should be specific enough to guide and prioritize the development of subsequent budget allocations, plans (Stand Management Prescriptions, Backlog Silviculture Prescriptions), multiyear agreements and standards agreements.* Where possible, provide any supporting research or growth and yield information that is directly relevant to the management unit.

**6 Potential Strategies by Response Time Frame**

Using the information from the preceding sections, develop, as appropriate, strategies which may be employed to increase future timber supply during each of the following three time frames (or other suitable breakdown):

- Short Term: 1 - 20 years;
- Mid Term: 21 years to the commencement of a steady long term harvest level (the transition period between the short and long terms); and
- Long Term: the period of a steady long term harvest level.

**7 Opportunities to Improve Timber Quality**

Where possible, specify the desired product objectives at the log level. If product objectives do not already exist, a simple breakdown into fibre log, sawlog and premium log is recommended. Describe the characteristics of each of these. For example, a sawlog could be defined as any log

with a top diameter inside bark  $\geq 10$  cm. Another way might be to characterize a sawlog stand. For example, any stand with a minimum DBH of 25 cm and/or a minimum volume/ha of 300 m<sup>3</sup>.

## **8 Potential Treatments**

Identify and discuss potential treatments that may achieve the desired product objectives. *The description should be specific enough to guide and prioritize the development of subsequent budget allocations, plans (Stand Management Prescriptions, Backlog Silviculture Prescriptions), multiyear agreements and standards agreements.* Where possible, provide any supporting research or growth and yield information that is directly relevant to the management unit.

## **9 Potential Strategies by Response Time Frame**

If strategies already exist, document these here. If strategies do not already exist, formulate potential strategies for maintaining or improving the quality of the timber supply. In the absence of any other target or strategy, consider what it may take to achieve a target of 15% premium logs. A specific target for sawlogs and fibre logs is may not be necessary where the standard silvicultural regimes and the AAC are based on sawlog quality second-growth stands.

## **10 Timber Quality Forecast Scenarios**

If available, include alternative forecasts of future timber quality profiles based on different silvicultural and investment regimes.

## **11 Habitat Supply**

If information is available, identify specific issues regarding habitat supply and biodiversity within the management unit. Identify opportunities for utilizing silviculture activities to mitigate habitat supply problems or opportunities to enhance habitat quality. Identify general geographical areas where there are opportunities exist. List opportunities to enhance habitat supply/biodiversity, based on existing strategies and guidelines (eg. Identified Wildlife Management Strategy, Biodiversity Guidebook, Landscape Unit Planning Guide, etc.). *The description of sites and opportunities should be specific enough to guide and prioritize the development of subsequent plans (Stand Management Prescriptions, Backlog Silviculture Prescriptions), multiyear agreements and standards agreements*

## **12 Working Targets**

In keeping with the above documentation, propose a set of working targets for timber quantity and quality. For example, a working target for timber supply might be to maintain the existing harvest level for the next 50 years, followed by a 10% increase of to a steady long term harvest level thereafter. A working target for timber quality might be to maintain the Year 2000 quality profile throughout the planning horizon. Develop and specify as appropriate, strategies to enhance habitat supply/biodiversity indicating time frames for realizing the desired values. *The Strathcona TSA contains an example of a regime table which should be attached to identify the treatment regimes and priority treatments that should be used to support the desired targets. The descriptions should be specific enough to guide and prioritize the development of subsequent budget allocations, plans (Stand Management Prescriptions, Backlog Silviculture Prescriptions), multiyear agreements and standards agreements.*

## **13 Incremental Silviculture Program**

Propose a program by incremental silviculture activity, by year for 5 years, that will be necessary to achieve the targets and strategies. See Strathcona TSA table formats. The program should be within reasonable range of historic funding levels. If the necessary program is substantially above historic levels, split the proposed program into two components - the first being commensurate with historic levels and the second being incremental to the first. If relevant,

indicate which parts of the program are necessary to achieve the assumptions regarding incremental silviculture in the current AAC determination.

**14 Job Outcomes**

Identify the job outcomes of the proposed program, both the immediate outcome directly associated with carrying out the program activity and, where possible, the long term job outcome associated with increased timber quantity or quality.

**15 References**

This section is optional. List relevant reference material used in the development or documentation of the strategy.

**16 Summary of Information and Research needs**

This section is optional, but can be used to identify needs for further information and research that have become apparent during the development of the silviculture strategy. The outcomes of the work may have implications for an incremental silviculture strategy. This section can be used to identify priority information and research needs, which FRBC should consider for funding under FRBC's Sustainable Harvest, Strengthening Sustainable Forest Management or Science Council funding programs.

An example completed type 1 silviculture strategy which follows this format is the Strathcona TSA. A copy can be found at:

<http://www.for.gov.bc.ca/hfp/silstrat/pdf/vancouver-tsa-strath-t1.pdf>

## Progress Report

About 90% of the management units in BC now have a silviculture strategy completed or nearing completion. By the end of March 2002 all units will have a strategy in place. About 40 completed management unit strategies have been posted on the Ministry of Forests Web site. More will be added as they are completed. Completed management unit Silviculture Strategies can be found at the Forest Practice Branch Website at <http://www.for.gov.bc.ca/hfp/silstrat/index.htm>

## Keys to Success

Stand level growth and yield tools (such as TIPSYS), forest level simulators (FSSIM, Woodstock, etc.) plus improved site productivity tools have only become widely available and used within the last 4 years. In addition, significant FRBC investments in training by the Silviculture Institute of BC and in other specialized courses provided by the Ministry of Forests have led to significantly increased knowledge of operational staff in the need for and methods for silviculture planning.

There have been few other initiatives in British Columbia that have been so widely deployed within such a short period of time without opposition. Operational staff have seen the need for strategic silviculture planning for years and have largely embraced this initiative. This FRBC initiative is a success because of:

- Keenly interested & generally supportive licensee, district and regional staff;
- Good collaboration at the strategy workshops;
- MOF, industry and MOELP taking leadership in setting objectives and development of strategies for timber supply, value and habitat; and
- local participants “owning” the strategies and desiring to rationalize and strategically align their incremental silviculture treatments.

## Other components - Habitat Supply

One of the clear objectives of the provincial strategy is to ensure that all management units include objectives and silviculture strategies for maintaining or enhancing habitat supply. Habitat supply objectives or constraints must be included in order to have a balanced forecast for future timber supply and quality projections. All the strategies incorporate existing Forest Practice Code requirements contained in any existing higher level plans such as Land and Resource Management Plans and Landscape Unit Plans. They also incorporate or consider any known requirements for Old Growth Management Areas, Wildlife Habitat Areas, greenup, or known habitat management practices such as for elk, moose, deer, and spotted owl.

It was recognized at the outset that more work needed to be done on developing tools and techniques for incorporating and including long term projections for habitat into the type 1 and type 2 strategies. Part of the FRBC initiative funds the development of new tools, techniques and information extension for habitat. Current projects underway include:

- Reviewing & evaluating current data, models, techniques & tools for habitat supply modelling;
- Carrying out model evaluations to determine their suitability for use in habitat projections;
- Utilizing knowledge gained in the United States Columbia River Basin on wildlife habitat and management impacts and adapting it for use in South Eastern British Columbia;

- Carrying out extension efforts such as the recent habitat supply decision support workshop, which presented to 180 participants the current state of the art on non-timber projection tools and techniques.

Work on this component can also be found at the [Silviculture Strategy Website](#).

## Related Activities

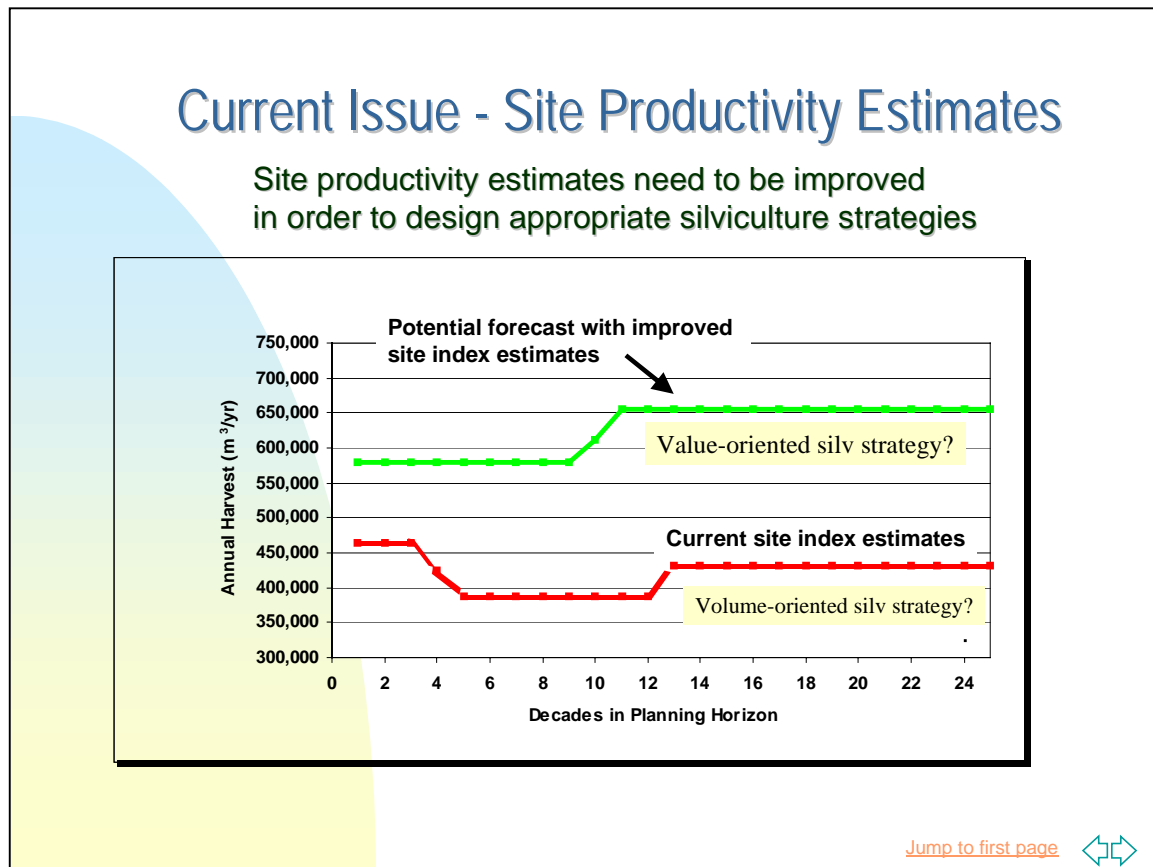
Another objective of this initiative is to provide more knowledge and understanding to planners and operational staff so that they could more meaningfully contribute to the development of the silviculture strategies and future timber supply reviews in their management unit.

FRBC has funded the development and delivery of a 4-day timber supply course, which includes basic concepts and hands on training in forest level analysis. The course has been extremely well received and very appreciated by all participants. Over the past 2.5 years 11 courses have trained over 250 students. The participants have included Ministry of Forests staff (50%), Licensee staff (25%), consultants (10%), Ministry of Environment Lands and Parks staff (10%), and Others (5%).

## Current Issue - Site Productivity and Growth and Yield Estimates

During the development of the strategies, it has become clear that site productivity on many of the management units, especially on Timber Supply Areas (TSAs) was underestimated for second growth stands. Second growth site index was underestimated from 20 to 60% in some management units. This translated into significant underestimates in projected volumes at the stand and forest level. Site index is also important from a habitat supply projection perspective because stand structures and their availability for suitable habitat are dependant on site index. Site index is one of the 2 key variables in any stand and forest level financial or benefit analysis of incremental silviculture. If site index is underestimated in a unit it dramatically impacts on the perception of the financial worthiness of an investment and also impacts the choice of silviculture regimes that might be appropriate for a stand or the forest.

In some units as shown below, it is clear that if the current site productivity estimates were to be used, a volume oriented silviculture strategy might be designed. However, if the site productivity were to be higher as indicated with improved site index estimates, the silviculture strategy might focus on a value strategy. The Ministry of Forests along with the Ministry of Environment Lands and Parks has developed funding proposals to FRBC to help refine site productivity estimates throughout BC.



There are another series of growth and yield issues being identified during the silviculture strategy process. There is mainly one stand level growth and yield model used to model second growth stands. In some management units there is a need to improve the tool for projections of tree growth and yield for some species (i.e. Balsam and mixed species stands) and for some silviculture regimes such as

- combination treatments of site preparation, planting, brushing;
- spacing and pruning; and
- complex regimes linking spacing, multiple fertilization entries and commercial thinning.

During the workshops some of the participants clearly articulated the need for more monitoring of growth and yield projections in the field. Some participants were concerned that stands that are projected to be operable according to model projections were not realistically operable when compared to field conditions. Currently there is little or no funding available to monitor and evaluate both the short and long-term growth and yield on stands. This is an important area, which will need more funding and work in the next few years.

## Communication

This FRBC initiative has received considerable favourable interest and press coverage. The Auditor General's staff saw early work from this initiative and were generally impressed with the content of the strategies. The initiative has been:

- used in FRBC news releases
- used by various ministry branch communications pointing to the forecasts in the strategies which can help address concerns about falldown, certification and international market issues;
- used by the tree improvement program to show the forest level implications and support for more tree improvement work and funding;
- presented to a wide variety of silviculture committees such as the Western Silviculture Contractors Association, and the Coastal Silviculture Committee meetings;
- included in studies such as the 1999 Forest Policy Review; and
- receiving keen interest and involvement by the forest industry and consulting community.

## To Conclude – Part 2

We have a good start with this initiative. The province, regions and districts are defining strategic priorities and direction to guide incremental silviculture. There has been good support and buy-in for initiatives and excellent team work and hard work by regions, districts, industry and consultants to date. A first version of management unit and regional silviculture strategies for all areas will be completed this year. *We used to say this was the beginning of the beginning. Now, the end of the beginning is in sight. There is no turning back. BC will never again be without management unit silviculture strategies.*

## Part 3 - Management Planning and Implementation System

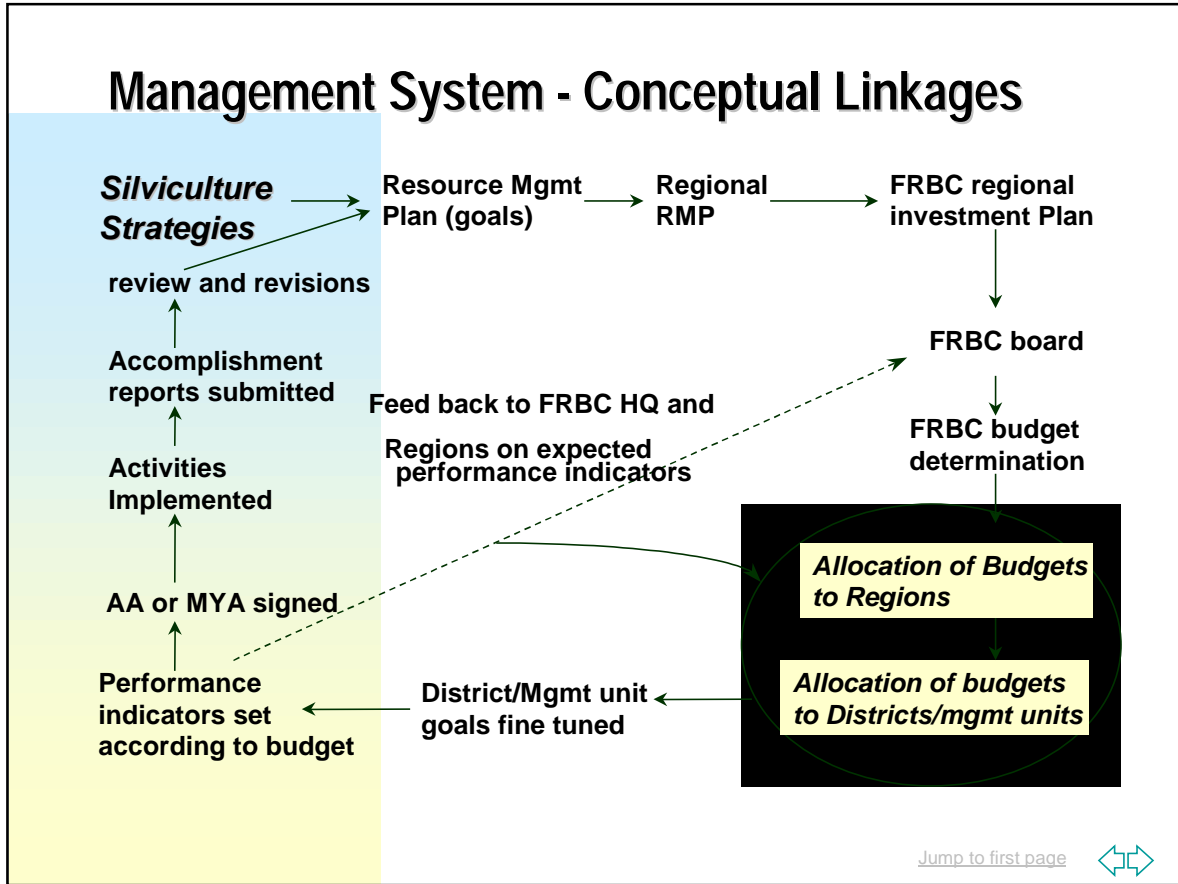
At the end of 2001 we will have a silviculture strategy in place for all 71 management units in British Columbia. There are 6 forest regions in British Columbia which receive incremental silviculture funds. Vancouver Region is one of them. Now that we have finished most of the strategies, the challenge becomes how to balance the proposed investment programs for 23 very different management units. How does a regional investment manager make decisions for allocating more or less funding to one management unit over another? How does he balance the silviculture funding needs for volume, value and habitat objectives across the 23 management units. What are the considerations for budget allocation and for development of associated performance measures or performance targets?

Government and FRBC need regional silviculture strategies to articulate how to balance priorities and funding and to develop realistic performance measures and targets for each management unit.

Initiatives are in place or under-construction for a complete management system for FRBC's Sustainable Harvest objective. These initiatives will provide a documented and transparent process for:

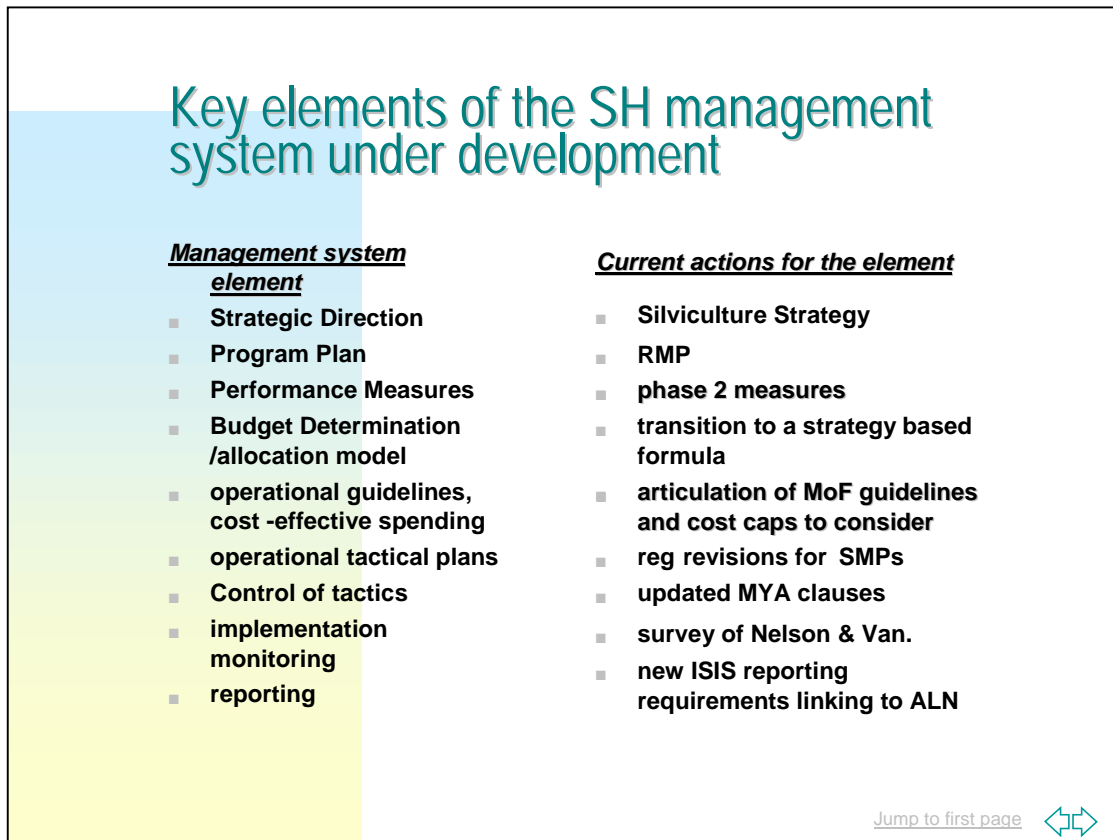
- articulating regional strategic priorities and direction;
- translating strategies into RMP plans and programs;
- determining budgets;
- fine tuning the FRBC performance measures or performance targets;
- carrying out activities, monitoring and reporting.

The silviculture strategies are an important component that helps guide the priorities, funding and performance measures for FRBC. The following diagram indicates the conceptual linkages of how the strategies link to the entire management system for FRBC’s sustainable harvest objective:



Both the MoF & FRBC recognized the need for an allocation system as part of an overall management system. With the 1999 Auditor General’s FRBC audit recommendations and the introduction of the *Budget Accountability and Transparency Act* in 2000 there was an increased need to ensure that public funds are strategically rationalized and have clear outputs and outcomes developed before funds are allocated.

The Ministry of Forests is working with FRBC staff to develop a comprehensive management system to meet these needs. The following diagram indicates a high summary of some key features of the management system that are under development.



The management system is attempting to explicitly link the silviculture strategies:

Source: Arrow Interim Silv Strategy Ver 1.3, Jan 31/00		Go To Arrow RMP	Strategy Reference	Description	Strategy Priority
<b>IFPA Base Case</b>					
<b>Issues:</b>					
<ul style="list-style-type: none"> <li>• Mid term timber supply shortfall 27% below current harvest level.</li> <li>• Timber availability very low in decades 2-3, 8-9.</li> <li>• Constraints are very binding; relaxation of a single constraint tends not to increase harvest levels significantly because others immediately become binding.</li> <li>• Shortage of 31-50 yr old stands and low level of older forests.</li> </ul>					
<b>Silviculture Strategy Objectives:</b>					
<ul style="list-style-type: none"> <li>• Minimize harvest reductions</li> <li>• Increase timber availability</li> </ul>					
<b>BACKLOG REFORESTATION / RESTORATION</b>					
ALL	Conduct approximately 1000 ha/yr of silviculture surveys in support of all backlog strategies.				1
No ref	Conduct approximately 1600 ha/yr of retrospective OAF1 surveys over a 20 year period.				1
LT1	Maintain the THLB by:				
LT1a	(a) surveying 2000 ha/yr of pre-1987 SR area to ensure they remain fully stocked				1
LT1b	(b) treating approximately 400 ha of backlog NSR				1
LT1c	(c) maintaining approximately 200 ha of previously reforested backlog plantations.				2
LT2	Increase the timber harvesting land base by 4.25% by:				
LT2a	(a) Rehabilitating 2000 ha of deciduous stands (=1% of THLB) at the rate of 100 ha/yr (Priority based on high cost and high risk of not achieving growth rates due to opposition to herbicides.)				6
LT2e	(e) Rehabilitating 500 ha of fume kill (=0.25% of THLB) at the rate of 100 ha/yr. (Requires integrated planning and				6
LT2f	(f) Rehabilitating 500 ha of poor growth stands based on high cost and low anticipated yield.)				5
<b>STAND TENDING</b>					
ALL	Conduct approximately 5000 ha/yr of silviculture surveys in support of all stand tending strategies.				1
ST4	Improve timber availability by achieving green-up 6-8 years earlier in existing stands aged 1-20 years in the VQO zone outside of watersheds by:				
ST4b	(b) spacing 150 ha/yr to prepare them for fert.				4
ST4e	(e) fertilizing 300 ha/yr to reduce time until 7 m green-up by 2 years.				2
ST2	Late rotation fertilize 400 ha/yr to produce approximately 3000 m3/yr of additional harvest volume by the 2nd decade				3
Q2	Prune 300 ha/yr of existing stands aged 1-30 years in two lifts (=150 ha/yr X 2 lifts) to create knot-free timber in the bottom 5.0 m log.				4
Q1	Space 400 ha/yr of existing stands aged 1-30 years so that at least 60% of harvested volumes in the latter half of the mid term are good quality saw logs				5

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to Management Unit specific Resource Management Plans describing the proposed budgets and (inputs), silviculture activities (outputs) and projected volume, value or habitat benefits (outcomes). The diagram below is a limited excerpt illustrating the concept:


GoTo Strategy		Show All		5,800	5,700	5,560	Rgn Tot	465,000	4.7	Rgn Tot	40				35					
Show Original				Proposed Treatment Area - (ha's)			Cost and Jobs - Year 1 Only				Stand level outcome of Year 1 activity									
Show Adjusted				Year (starting fiscal 2002/03)			Unit Cost	Year 1 Cost	Unit Jobs	Yr 1 Jobs	Maintain BaseCase	Timber quantity outcome (000's m3)				Timber quality outcome (# ha, by % change in stand value)				
Activity	Strategy Reference	Priority	Program Adj. Factor	1	2	3	(\$)	(\$)	(days/ha)	(p/y)		yr 1-20	yr 21-50	yr 51-100	yr 100+	1-20%	21-40%	41-60%	>60%	
<b>BACKLOG REFORESTATION</b>																				
Survey	LT1c	1	1	2,000	2,000	2,000	25	50,000	0.1	0.9	X									
										0.0										
										0.0										
Subtot				2,000	2,000	2,000		50,000		0.9		-	-	-	-	-	-	-	-	
Site Prep										0.0										
										0.0										
Subtot										0.0										
Seed/Seedling										0.0										
										0.0										
Subtot				100	100	60		50,000		0.5		-	-	-	35	-	-	-	-	
Brush	LT1a,b	1	1	400	300	200	500	200,000	1.0	1.8	X				40					
										0.0										
										0.0										
Subtot				400	300	200		200,000		1.8		-	-	40	-	-	-	-	-	
Space (Max. Density)										0.0										
										0.0										
Subtot										0.0		-	-	-	-	-	-	-	-	
Other (specify)										0.0										
										0.0										
Subtot										0.0		-	-	-	-	-	-	-	-	
Prog Total	All			2,500	2,400	2,260		300,000		3.2		-	-	40	35	-	-	-	-	
	Surveys			2,000	2,000	2,000														
	Core Activities			500	400	260														

**Mgmt Unit RMPs and performance measures**

The management unit Silviculture strategy priorities, the resource management program, budget requests, proposed performance outcomes are rolled up to a regional level to provide a comprehensive view of regional needs. Regional FRBC and Ministry staff can use the information to understand issues, opportunities and priorities for regional investment. The diagram is an excerpt illustrating the potential to understand management unit specific opportunities and outcomes:

Program by Management Unit	Proposed Outputs - (ha's)					Proposed Inputs				Stand level outcome of Year 1 activity			
	Proposed annual area to be treated					Unit Cost (\$)	Year 1 Cost (\$)	Unit Jobs (days/ha)	Year 1 Jobs (p/y)	Maintain / Increase AAC	Timber quantity outcome (m3)		
	yr 1	yr 2	yr 3	yr 4	yr 5						yr 1-20	yr 21-50	yr 51-100
<b>BACKLOG REFORESTATION / RESTORATION</b>													
Arrow TSA	1,000	1,000	1,000	1,000	1,000	20	20,000	0.10	0.45	M			
Boundary TSA	2,000	2,000	2,000	2,000	2,000	20	40,000	0.10	0.91	M			300,000
Cranbrook TSA	100	100	100	100	-	1200	120,000	3.00	1.36	M			
Golden TSA	50	50	50	50		600	30,000	1.00	0.23	M			15,000
Invermere TSA	1,600	1,600	1,600	1,600	1,600	20	32,000	0.10	0.73	I			24,000
Kootenay Lake TSA													
Revelstoke TSA	100	100	100	100	100	2000	200,000	5.00	2.27	I			
TFL 3	100	100	100	100	100	2000	200,000	5.00	2.27	I			
TFL 8	150	150	150	150	150	1500	225,000	4.00	2.73	I			
TFL 14													
TFL 23													
TFL 56													
	5,100	5,100	5,100	5,100	4,950		867,000		10.95		-	-	339,000
<b>STAND TENDING</b>													
Arrow TSA	5,000	5,000	5,000	5,000	5,000	20	100,000	0.10	2.27				
Boundary TSA										M			
Cranbrook TSA	150	150	150	150	150	800	120,000	1.50	1.02				
Golden TSA	300	300	300	300	300	300	90,000	0.10	0.14				6,000
Invermere TSA													
Kootenay Lake TSA	400	400	400	400	400	300	120,000	0.10	0.18		1,500		
Revelstoke TSA	300	300	300	300	300	1200	360,000	1.50	2.05				
TFL 3	400	400	400	400	400	800	320,000	1.50	2.73				
TFL 8													
TFL 14													
TFL 23													
TFL 55													
TFL 56													
	6,550	6,550	6,550	6,550	6,550		1,110,000		8.39				

while balancing regional program levels

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## Part 4- The Plans for 2001-2002 and the future

In 2001-2002 FRBC will be investing another \$750,000 in:

- the completion of ongoing type 2 strategies
- the development of new type 1 or type 2 strategies
- further extension of the timber supply course;
- implementing a new performance measure process
- carrying out strategy implementation monitoring

A further \$300,000 will be invested in the developing a habitat supply modelling strategy, developing and testing new habitat supply modelling approaches, and extension.

About \$100,000 will be used to develop 6 regional composite strategies using available mgmt unit strategies, and guided by the provincial strategy. These regional strategies will be developed with appropriate stakeholders and will clarify overall regional direction and priorities for silviculture investments to produce volume, value or habitat. A key challenge will be to determine how to equitably allocate funds, goals and performance measures to each management unit.

In 2002 the MoF and FRBC will either confirm or amend the provincial incremental silviculture strategy by taking into account new management unit and regional strategies. Again the purpose of the provincial strategy would be to give managers context on how to provincially emphasize and balance:

- volume;
- value;
- habitat supply;
- other objectives (First Nations involvement);
- revised performance measures; and
- budget determinations.

### Making the strategies work!!

One of the key concerns since the inception of this program was that this initiative should not just become another planning exercise, that dies over time and is not utilised to guide and direct budgets and on the ground activities. There have been many previous examples of planning initiatives failing or not being fully incorporated into changed business practices.

Over the next year we will continue to ensure that there is a tight linkage between the strategies and the development of Resource Management Plans, budget proposals and performance measures or targets. We will continue to build the management system so that the strategies are clearly linked to budget determinations. FRBC will be looking at making amendments to the Multiyear funding agreements with licensees to ensure that they carry out silviculture treatments consistent with the priorities and directions given in the management unit specific silviculture strategies.

The Forest Practices Branch is currently working on some policy and regulatory proposals which would provide for silviculture strategies to clearly articulate the silviculture regimes and standards that apply for a management unit. If the strategies or a higher level plan contain

sufficient detail, the policy work proposes that stand by stand officially required prescriptions can be eliminated or reduced. There are currently 1700 stand management prescriptions prepared each year at a cost between \$3.5 and \$4.5 million. If the essence of the silviculture regimes and associated standards can be incorporated into the silviculture strategy or an approved higher level plan, there is the potential for significant cost and administrative paperwork savings.

## The future

The vision is that the Silviculture Strategies will become a key component or an appendix of a broader forest management plan for a TSA or TFL. The TFLs are likely to be the first to really see it work. A number of TFLs have completed comprehensive Type 2 strategies and are including the strategy in their TFL management plans. The Ministry is considering developing Sustainable Forest Management Plans for TSAs and it is anticipated that the silviculture strategies can be incorporated.

With the development of comprehensive management plans with explicit silviculture regimes and associated operating standards we can avoid the development of unnecessary or excessive stand level official prescriptions. We see the development of comprehensive forest management plans as the basis for one-plan approval including streamlined plan development, approval and revisions.

Within the next 3-5 years we will migrate to having more explicit comprehensive management plans for every TFL/TSA and the elimination or reduction in the need for stand level prescriptions except where a special variance is needed from the management plan

In the past there had been concerns that many of the silviculture treatments, regimes and standards were applied in a one-size fits all approach. With the advent of silviculture strategies and comprehensive management unit specific plans we will have silviculture investments tailored to each specific:

- forest estate condition
- growth & yield and inventory info
- forest harvest and management objectives

With the full involvement of industry, MoF, MELP and others we are developing a coherent silviculture strategy across all planning levels - province, region, management unit. We are only now nearing the end of the beginning...we see the need for ongoing refinement and improvement of this process.

With FRBC funding we have developed a comprehensive silviculture planning & management system for responsible and cost-effective stewardship of a precious heritage – BC's forests.