YIELD REGULATION WITHIN TIMBER SUPPLY AREAS

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A White Paper For
Discussion Purposes

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Ministry of Forests

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FOREWORD

The purpose of this paper is to outline proposed changes in yield regulation within timber supply areas. These changes are either explicitly required by the new Forest Act or are supported by it.

Management of Crown forests and direction of wood supply from them to the forest industry of British Columbia is a statutory responsibility of the Forest Service. Policies and procedures relative to this responsibility have been major concerns of the several Royal Commissions enquiring into forest management in the Province. Need for improvement in management of the Crown wood supply led to a recommendation in the most recent (1976) Royal Commission Report that a task force be established to advise the Forest Service on the implementation of new yield control policies to effect those improvements that were identified in the Report. The Forest Policy Advisory Committee considered ways of setting realistic timber production goals through a better definition of the available timber supply and by use of a method for predicting the long-term consequence of short-term harvesting rates. This method is called the Production Forecast Method and is described in Appendix 1.

The 1976 Royal Commission also recommended that timber supply areas (TSA's) be delineated as a basis for yield regulation. These areas comprise a grouping of all or parts of existing management units which supply industrial centers. That is, they are geographically distinct areas that reflect an efficient pattern of wood movement from harvesting site to the primary manufacturing plants. Generally their boundaries are set by cost considerations and represent the equal cost points for transporting logs between competing centers. The TSA supports the income and employment base of the manufacturing centers.

The revised system of yield regulation by TSA has several advantages over the present method of regulating by PSYU. The most obvious is the flexibility gained from scheduling harvest and management activities over a larger area. The forest is largely heterogeneous in terms of stand characteristics. Imbalance in certain characteristics such as age and species distribution can create supply problems if the harvest rate is calculated for small areas. While imbalances may still exist in a larger area, the problem will be more manageable. Further, ther are more options available for locating harvesting operations that will satisfy wood requirements.

The new method enables the Forest Service to predict the future state of the wood supply. In particular, the likely consequence of short-term (20 year) harvest rates on the future wood supply can be demonstrated (Fig. 1). Given this ability, short-term timber production objectives can reflect present day economic, technological, and environmental variables. The Forest Service will not permit short-term rates of harvest which would cause the future wood supply to be less than the sustainable yield which results from basic silvicultural practices (see Glossary).

If projections of the future wood supply for a particular TSA indicate significant future deficits, then maintenance of the harvesting rate will require a corresponding silvicultural commitment. However, Provincial development objectives may direct silvicultural investment to other areas. If this happens it will be necessary to reduce the current harvesting rate in the TSA until it is in harmony with the sustained yield level (Fig. 2). Nevertheless, the indicated wood deficit in a TSA will be an important factor in setting silvicultural goals and estimating the costs of suitable improved yield programs.

Determine if projected yield falls below long-term sustainable level.

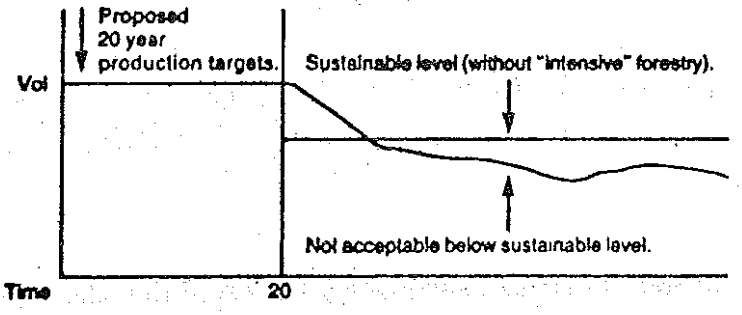

Figure 1.

Re-run calculations for TSA until long-term timber projection is acceptable.

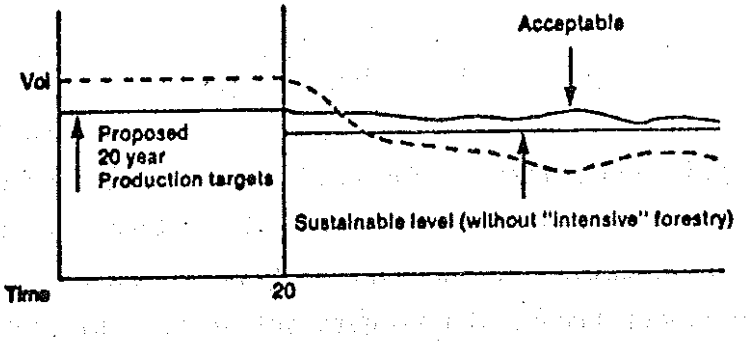

Figure 2.

In addition, the larger areas will provide administrative advantages. Under the present system, wood is allocated to operators from separately administered management units. The TSA encompasses a number of management units and allows tenures previously held in these units to be consolidated on a more rational basis. In so doing it will frequently be possible to match the wood requirement to the nature of the wood supply. These measures can add to the efficiency of the industry and the Forest Service.

The realization of these advantages by adopting the TSA as a basis for administering the rate of harvest depends largely on how well the TSA's are delineated and on how readily changes can be made in response to new conditions. To organize the system initially requires an overview of the whole region to enumerate the major trends that influence resource use. This study should include a description of the existing forest industry along with its wood requirements and production costs, the transportation network, and the development priorities within other industrial or resource sectors. From this overview the Forest Service will be able to place the TSA's in a regional context to estimate the implications upon other areas and other resource uses. This will require consultation between the Forest Service and other resource agencies.

Neither the revised yield calculation procedure nor the delineation of TSA's is expected to cause major disruption to location of existing industrial operations. The calculation procedure will establish timber production targets for each supply locality or block within the TSA. The location of the harvest will be controlled by a plan based on the timber production targets set in the cut calculation. The detailed plan for each TSA will be prepared by the zone forester with forest industry input. These plans will be available for evaluation by other agencies and the interested public. It is intended that yield calculations and plans will be completed for each TSA prior to the issuance of tenures under the new Forest Act.

Implementation of these revised procedures requires additional information not only about the timber supply but also about industrial requirements.

In assessing the timber requirements, the following data are required:

1. The annual wood requirement for each mill in the TSA by log class (peelers, sawlog and pulp),
2. The projected demand for wood by broad log class and species for each mill for the next five years and for the ensuing three 5-year periods,
3. The present use of private wood and a prediction of how this level of use may change over the next 20 years,
4. An approximation of the relative value and quantity of logs supplied from each area,
5. A summary of known plans for major expansion in the existing industrial plants and a general assessment of expected market trends for the ensuing 20 years.

The yield calculation requires a realistic assessment of the forest base including economic conditions, integrated use programs, expected changes over time, and the long-term sustained production policy. More effort is being expended to estimate:

1. Recent logging history,
2. Land removals from the forest land base,
3. Environmental Protection Areas (EPA's),
4. Integrated resource management requirements,
5. Yield losses from fire, blowdown, insects and disease,
6. Regeneration periods.

The method uses more information including local utilization standards and adjustments, by time period, of the timber supply available for use as a result of planned access development, new technology, changing price structures, and yield curves, where available, for managed stands.

The Forest Service will seek the cooperation and assistance of the forest industry and other government agencies in collecting the foregoing information.

This paper is an introduction to the changes in yield regulation being proposed for implementation. Persons wishing further information on the subject should contact Forest Service Regional Managers or Planning Division, Victoria.

APPENDIX 1 - THE PRODUCTION FORECAST METHOD

INTRODUCTION

Of all the decisions facing forest policy makers probably the most critical in terms of its economic importance concerns the rate at which timber is to be made available for harvesting. The timber producing land base is diminishing through increased recognition of an array of legitimate non-timber users, through environmental protection measures and through changes in the economics of logging. The nature of the productive forests is changing from unmanaged large old growth to young growth forests whose products will be smaller and have different species proportions. In this changing world the Forest Service must maintain a continuing wood supply to support a healthy, competitive forest industry and ensure the productive integration of land uses. All these factors generate an increasing need to clarify the long term wood supply implications of present timber harvesting rates.

In 1976 the Royal Commission on Forest Resources recommended changes in the current methods of timber yield regulation. In particular it recommended that yield controls should:

(i) apply to Timber Supply Areas (TSA's) serving manufacturing areas and communities

(ii) recognize log supply patterns and transportation facilities within the timber supply area

(iii) embody reasonable expectations about future trends in forest growth and values

(iv) recognize the uncertainty surrounding long term forecasts.

TIMBER SUPPLY AREAS

Within the regions of the Province, timber supply areas can be identified which serve manufacturing areas and communities. The supply areas have largely evolved from establishment of forest industry and the development of associated communities. Insofar as public policy is to be directed toward supporting the income and employment base of forest dependent communities, yield controls should be designed to apply to the relevant timber supply areas. There should be some flexibility in setting short term harvesting rates together with a mechanism for clearly showing their long term implications for the future wood supply.

PRODUCTION FORECAST METHOD

To meet the described requirements for revised yield controls the approach separates the relatively short term (the next twenty years) from the very long term (about two rotations). In defining timber production objectives over the twenty year horizon the Forest Service must ensure that the short term rate of cut will not result in an unacceptable decrease in future wood supply. Accordingly a practical, conceptually simple process, consisting of two phases has been developed, from which timber supply area wood production goals can be derived.

Phase 1 (Short Term)

Develop and describe twenty-year production goals in the form of a simple wood flow plan. The plan describes a feasible, efficient movement of wood from the different localities within the timber supply area to the different broad industrial sectors. In practice this twenty-year "look ahead" would be used to set ten-year objectives. The ten-year production objectives are to be reviewed every five years.

Phase 2 (Long Term)

Determine the projected timber production curve over one or two rotations for the entire timber supply area setting the overall cutting rate for the first two decades equal to that developed in phase 1.

If the results of phase 1 cause the long term rate of cut to drop below the long run sustainable yield, then phase 1 must be modified until it is in harmony with the long term goals.

THE SHORT TERM CALCULATION

The supply area can be described as a network in which there are localities (supply points) supplying several industrial sectors (demand points). The twenty-year horizon can be divided into four five-year periods. Each supply point has an inventory of accessible, useable timber while each demand point has a minimum demand to be satisfied and a physical capacity which cannot be exceeded. The objective is to select, for the duration of the horizon, a routing plan which satisfies all the demands, does not exceed the supplies and physical plant capacities, and attempts to maximize the value of the routing plan.

THE LONG TERM WOOD SUPPLY

Obviously it is not sufficient to allocate existing mature timber inventories from the management units within the supply area, without looking at the long term consequences for the supply area as a whole. The Forest Service has two working tools for assessing the long term wood supply picture. For in-depth assessment a version of the Computer Assisted Resource Planning system (CARP) is available. For a less detailed assessment or to answer quickly simple specific questions relating to the long term wood supply, a forest estate simulation model is available. Both tools can be used to project the future consequence of present and proposed harvesting rates, and to set goals for improved yield silvicultural programs.

APPLICATION OF THE METHOD

After assessing present and projected industrial demands and the net timber supply, a simple question and answer sequence can be followed to arrive at a set of timber production goals. Those questions, in the order that they are addressed in the process are:

a) can the present cutting rates be maintained over the next twenty years?

b) what effect will maintenance of the present cutting rate have on long term timber supply?

c) what are the projected increased industrial demands over the next twenty years and can cutting rates be raised to meet them?

d) if increased demands can be met over the next twenty years, what will be the effect on the long term supply?

The method also has the following capabilities:

a) Likely periods of scarcity for a particular industrial sector can be highlighted.

b) Areas that have to be developed by a certain time to meet wood supply needs can be pinpointed.

c) The effects of changing sector demands on the wood supply picture can be predicted.

d) The effects of changing the log supply pattern on the wood supply picture can be predicted.

d) A long range strategy to ameliorate impending wood supply problems if they are indicated can be developed from the results.

RELATING TO NON-TIMBER RESOURCE USES

An initial wood supply analysis provides valuable information for determining overall resource use policy. With this information "out on the table" other resource managers can participate effectively in the development of alternatives for a timber supply area, and later on, for a complete region.

Once alternatives are developed which express the needs of other resources one can be chosen by the decision makers or additional alternatives prepared prior to the decision.

RESULTS OF THE PROCESS

After review by the Regional Manager the results are used to set timber production and silvicultural goals. These goals form the basis of Forest Service resource management programs and budgets. In addition, tables and graphs are generated showing planned rates of harvest for the timber supply area in each of the next four, five-year periods. Planned harvest rates are broken down by management unit and industrial sector.

For the long term, graphs and tables are generated allowing an assessment of the long term wood supply which will result from implementing the twenty-year harvesting plan.

GLOSSARY OF TERMS

The Long Run Sustainable Yield

The long run sustainable yield for any T.S.A. is equal to the culmination of mean annual increment weighted by area for all productive and utilizable forest land types in that T.S.A. including all not satisfactorily restocked, disturbed stocking doubtful, and potentially useable noncommercial cover.

The sustainable yield represents the baseline forest management standard with respect to Provincial resource stewardship responsibilities as embodied in the Ministry of Forests and the Forest Acts.

Notwithstanding the offsetting effects of surplus increment in accessible old growth stands and possible improvements in wood utilization, the sustainable yield is a major controlling factor in the establishment of current and future rates of harvesting as well as the identification and priorities of silvicultural treatments required to meet that basic forest management standard.

Basic Silvicultural Practices

Maintenance of the productivity of forest sites, restocking of denuded forest lands with commercial tree species within 3 years for areas west of the Coast Range and 5 years for areas in the Interior, protection against damage by fire, insects, and diseases to predetermined standards.

Intensive Silvicultural Practice

Any silvicultural practice, or level of silvicultural practice, which in conjunction with basic silvicultural practices, constitutes an investment in securing future wood yields over and above those possible under basic silvicultural regimes.