

NEFD database. We want to segment these costs by operation (pruning, planting, etc) and other non-operational costs (such as overheads). The information would be strictly confidential to this project and no individual company's returns would be published. We will also require log price estimates for the log grades (aggregate FRI log grades) used in the NEFD yield tables."

Specific benefits of the research include:

- better forecasts of future contribution by plantation forestry to New Zealand's economy;
- soundly-based forecasts of future contribution of forest growing to New Zealand's economy;
- a model to quantify the national benefits of alternative forest management practices, tree-breeding programmes, research programme, etc.;
- Assistance with developing natural resource accounting principles, and with meeting New Zealand's commitments to the UNCED conference at Rio.

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Predicting and measuring new planting from nursery surveys

John Eyre, Ministry of Forestry

Summary

The Ministry of Forestry carries out two surveys a year, in spring and autumn, of the major nurseries producing planting stock for commercial planted production forestry. The results are used to provide the Minister of Forestry with (a) estimates of areas of new planting planted in the immediate past winter and (b) predictions of potential areas of new planting to be planted in the immediate following winter.

Introduction

Since 1992 there has been a dramatic increase in the number of hectares of new land planting in New Zealand's production forestry sector. New planting figures for this decade (rounded hectares) are 1990 – 16,000; 1991 – 15,000; 1992 – 50,000; 1993 – 62,000 and 1994 – 98,000 hectares. The 1993 and 1994 figures show

record levels of new planting, with the previous highest being 56,000 hectares in 1984.

The process used by the Ministry to estimate new planting from nursery surveys is in four stages:

- nursery surveys
- predicting potential planting area
- an estimate of clearfelling
- estimate of restocking and new planting.

Nursery surveys

Major forest tree nurseries are surveyed by Ministry area office staff by phone, mail and visits, in early November and in early April. The species are surveyed in the National Exotic Forest Description (NEFD) categories of radiata pine, Douglas fir, other exotic softwoods and other exotic hardwoods.

The November survey asks nurseries for the numbers of planting stock sold in that previous winter and a forecast of the net planting stock available at the nursery gate for the following winter. The March survey asks for a forecast of the net planting stock available at the nursery gate for the coming winter.

Results from individual nurseries are aggregated into six areas: Northern North Island (Northland + Auckland); Central North Island (Rotorua + Hawkes Bay + East Coast); Southern North Island (Wellington); Northern South Island (Nelson); Central South Island (Christchurch); Southern South Island (Dunedin).

Predicting potential planting area

A potential planting area (hectares) is calculated as follows:

The net available planting stock is reduced by two per cent. This is an allowance for stock which may be sold for "non production forest" purposes, e.g. Christmas trees. The two per cent figure was based on a sample survey of nurseries. This gives a "commercially available" figure, which (for the prediction exercise) is rounded down to the nearest 100,000 (a step towards providing a conservative result for the prediction).

A nominal stocking rate is set by species category for each area. This is obtained from local information, usually by Ministry staff talking to company foresters, contractors and consultants, to accommodate different stockings in different locations.

A field wastage factor of five per cent

Framework Convention on Climate Change

The Framework Convention on Climate Change (FCCC) came into force in March 1994. The first Conference of the Parties (COP I) under the FCCC was held in Berlin from March 28 to April 7, 1995.

COP I was attended by close to 4000 people, including representatives from 117 Parties to the FCCC and 53 observer states. There were NGO observers from 165 organisations and a very large media presence (556 organisations).

The FCCC currently contains a loosely-worded target which requires developed country Parties to aim to return emissions of greenhouse gases to 1990 levels by 2000. It has no target for the period after 2000.

At COP I it was agreed that some of the commitments in the FCCC are inadequate, particularly for the period after 2000. The "Berlin Mandate" was agreed for negotiating the strengthening of the FCCC. This mandate underlines several of the provisions of the Convention, including that developed country Parties should take the lead in combating climate change and its adverse effects. At the same time the mandate reaffirms the existing commitments of developing country Parties, including that to introduce policies and measures to mitigate climate change.

The mandate covers all greenhouse gases, their emissions by sources and removals by sinks, and all relevant sectors.

The process will aim to elaborate policies and measures as well as set limitation and reduction objectives within specified timeframes. No new commitments will be introduced for developing countries. The process is to take regard of the best available scientific information and assessment on climate change and its impacts, as well as relevant technical, social and economic information.

Negotiations are to conclude as early as possible in 1997 with a view to adopting the results at COP III which will be held during 1997.

A pilot phase for joint implementation or activities implemented jointly (AIJ), whereby two or more Parties can jointly engage in activities to implement their FCCC commitments, was also agreed to at the Berlin meeting. All relevant sources, sinks and reservoirs of greenhouse gases are included in the pilot phase. The Conference of the Parties will take a conclusive decision on the pilot phase and the progression beyond that before the end of the present decade. A key to the broad acceptance of this pilot phase for AIJ is that there will be no crediting of emissions reduced or sequestered during the pilot phase from activities implemented jointly.

**Helen Plume
Ministry for the Environment**

is applied to the nominal stocking rate to provide a "divisor" (e.g. a nominal stocking of 1200 stems per hectare is increased to 1260 stems per hectare). The five per cent figure was based on a sample survey of forest companies carried out by the Forest Owners' Association.

The commercially available figure is divided by the divisor to produce a nominal hectare figure, which for the prediction is rounded down to the nearest 100 hectares (the final step in the provision of a conservative prediction).

The result is a conservative estimate of the number of hectares which could potentially be planted (or were planted) from the available planting stock.

Estimate of clearfelling

Clearfelling is estimated by calculation using Ministry of Forestry Roundwood Removal statistics for the March year, as follows.

The roundwood removal in cubic metres (which is for all species) is split into the four NEFD species categories by applying the percentage of the estate under each category for the preceding year to the total roundwood removal.

A production thinning allowance of 10 per cent is subtracted and a yield (m³/ha) applied to give a theoretical national clearfell area. The yield is taken from the NEFD National Yield Tables using a national average clearfell age for each species category. The clearfell area is rounded up to the nearest 100 hectares to give an optimistic clearfell area by species category.

Estimate of restocking and new planting

It is assumed that all the area clearfelled during the March year is restocked that winter, so new planting is estimated by subtracting estimate restocking from the potential hectares.

The March survey **predicts** new planting, whereas the November survey **confirms and predicts** new planting.

Drawbacks to the nursery survey

There are a large number of assumptions in the methodology for estimating new planting from nursery surveys. Some examples include:

- survey replies are frequently quoted to the nearest 100,000 seedlings, which may imply a lack of accuracy in the survey returns;
- stocking rate estimates could vary by \pm 100 to 200 stems per hectare within an area, depending on the site, regime or forest owner's policy;
- the method of estimating clearfelling from roundwood removals may be imprecise;

- not all clearfelled areas may be restocked, at least not in the following winter;
- the system is designed for one-year-old planting stock. It does not account very well for stock older than one year, e.g. Douglas fir.

Also, the survey provides a national estimate of new planting area, but cannot accurately describe it by region or district because nursery sales across regional or district boundaries are difficult to measure with any precision.

Advantages of the nursery survey

The survey is the only vehicle available for making reasonably informed predictions, based on collected data, about new planting for the coming winter. This information is required by the Minister and is of interest to many other parties.

Also, it is the only way of producing a figure for new planting **immediately following** the planting season. This information is required by the Minister and is of interest to many other parties. There is a 12-to-14-month delay before new planting data is available from the NEFD.

Reconciliation with NEFD

The planted area estimation (both new and restock) can be reconciled with the NEFD when the NEFD survey results for the year which includes that particular planting season are available. For example, the 1994 planting season (June-94 to Aug-94) comes within the NEFD year Apr-1-94 to Mar-31-95. Allowing a reasonable time for the NEFD processing, and assuming a planting sub-set can be extracted from NEFD prior to the release of the main data, it is likely to be September 1995 at the earliest before planting areas for winter 1994 are available.

Discussion

Why use the nursery survey to predict and 'confirm' new planting? The main reason is the immediacy of the result vis-a-vis the only other forestry survey (the NEFD). An alternative could be to survey forest growers directly, in a sort of 'mini NEFD', just asking for their new planting area. There are two problems with this, (a) 'survey fatigue' and (b) incomplete address lists.

Regarding the last point about address lists. Since 1991, there has been a dramatic increase in new planting by growers not previously involved with forestry and most of the 'new growers' are in the small growers category. The ratio of 'small growers' to major forestry companies involved in new planting programmes is approximately 80:20. While it is difficult to quantify, most of the new growers are not on any current address

list, either Ministry or NEFD. So a direct survey of new planting would be compromised by a lack of coverage.

In an attempt to address this problem of "capturing" the new players, the Ministry has produced a return-paid planting survey card for distribution by nurseries to their customers. However, it is a voluntary system for both the nurseries (who – if they agree to participate – usually distribute the card in the same envelope as their invoices) and the growers (who don't have to complete and return the card if they don't want to). While this does pick up some growers previously unknown to the Ministry, it doesn't (a) meet the immediacy requirements, or (b) address the need to predict new planting levels, or (c) increase the coverage to anything like 100% (the return rate is quite low).

Conclusion

While the inadequacies of the nursery survey as a means of estimating new planting are recognised, the method is likely to continue to be used by the Ministry because of the need to predict new planting levels and provide the Minister with timely information which is not available from other sources.

Without the cooperation of nursery owners and managers the nursery surveys could not be possible, and their participation is gratefully acknowledged.

New fund for sustainable management

A new fund aimed at providing financial assistance for environmental projects has been established and began operation on July 1 this year.

Called the Sustainable Management Fund (SMF), it refocuses the Resource Management Subsidy programme to reflect the Government's long-term environmental aims. It provides support for projects aimed to achieve improvement in a wide range of environmental management areas. These will be consistent with the Government's environmental Strategic Result Areas (SRAs) which are set out in the Environment 2010 Strategy consultation document.

Projects considered for funding will be in two categories: Environmental Risk Assessment and Management, and the Development of Sustainable Management Options.

Within each category there will be certain projects that will have priority. These will be reviewed each year.