

# INSTITUTE OF FORESTERS' SUBMISSION ON THE NEW ZEALAND FOREST SERVICE BEECH SCHEMES

(July 1975)

## BACKGROUND

The New Zealand Institute of Foresters prepared a report in 1972 at the invitation of the Forest Service on the latter's proposals to use beech forests in the South Island. Since then there have been several modifications to the original proposals and further information has come to hand.

The modified West Coast scheme, as outlined in the booklet entitled *Government Approval of West Coast and Southland Beech Forest Utilisation Proposals* (1973), now involves 241 500 ha, including 138 000 ha managed as indigenous forest, a maximum of 97 500 ha managed as exotic forest of which 85 500 ha will be converted from existing indigenous forest, and 6 000 ha released for farming after logging. The modified Southland project (excluding Waitutu State Forest) now involves a total of 58 000 ha, including a minimum of 15 000 ha managed as indigenous forest and 43 000 ha managed as exotic forest of which a maximum of 36 500 ha will be converted from existing indigenous forest.

The Forest Service produced a booklet early in 1974 entitled *Invitation for Proposals to Use Wood from Beech Forests, West Coast and Southland, South Island, New Zealand* in which proposals were invited for the establishment of a new industry or industries to manufacture products from the specified wood resources within the two beech project areas. The specified wood resources were: up to 785 000 m<sup>3</sup> of pulpwood and 63 000 m<sup>3</sup> of sawlogs per annum from the West Coast, and 170 000 m<sup>3</sup> of pulpwood per annum from Southland. Sales were advertised for a period of 20 years, with right of renewal for similar total volumes of indigenous or exotic wood for up to a further 20 years. The draft sale agreement for the West Coast project specifies the quality of logs suitable for producing veneers or sawn timber, and logs of the specified grade or better must be converted to veneer and/or sawn timber unless a proposer is able to show that some other end use is preferable.

The wood is offered for sale either as standing trees or as logs delivered to the industrial site, although the successful applicants have the option of doing the logging either *in toto*

or by management categories (exotic conversion, beech management and podocarp management) as well as not at all. If the successful applicants elect to do their own logging, Government reserves the right to take over the formation and maintenance of all roads, and to supervise the logging which must be done in accordance with practices adopted by the Forest Service in major schemes. Logging to at least 2 m lengths and 10 cm small-end diameter will be obligatory.

Prices paid at the start of any sale will be subject to an automatic annual review based on changes in the N.Z. Consumers' Price Index, a 5-yearly negotiated review based largely on changing circumstances in supply and demand, and special reviews should difficulty and hardship arise from unforeseen circumstances before the next periodic review is due. Proposals had to be submitted by 31 March 1975 and have now been briefly considered.

Only two proposals for utilisation of both sawlog and non-sawlog material on the West Coast were received, both of which envisaged the establishment of a large pulp mill (c. 600 tonnes/day). The Government has announced recently that further consideration of these two proposals is being deferred until investigations have been carried out by overseas consultants into the feasibility "of combining the native West Coast forest wood with introduced resources in Nelson and Marlborough to feed one major pulp mill" and also "of a separate panel board or other processing industry to use wood from sawmill and other forest residues in [the] West Coast region" (Prime Minister's speech at Greymouth, 13 June 1975).

#### GENERAL COMMENTS ON BEECH UTILISATION

The Institute is pleased to note that the Forest Service has already implemented improvements to both the West Coast and Southland schemes since they were first mooted, and congratulates the department on its obvious willingness to examine constructive comment from outside groups. The Institute is particularly pleased to see some extension of beech management areas to replace proposed exotic conversion, the emphasis placed on the need to manufacture high quality products from beech and podocarp logs as part of any proposal submitted, and the enunciation at the November, 1974 meeting of the Forestry Development Conference of management aims for indigenous forests generally. The Institute would look unfavourably on any proposal that did not envisage the manufacture of a reasonable amount of high quality products. The enlargement of areas reserved for uses other than production forestry, however, may be something of a mixed blessing,

as it could reduce the amount of wood available to such an extent that there may not be a sufficient supply of raw material in the long term for a major industry.

It seems timely for the Institute to comment once again now that proposals have been submitted, some changes have been made in zoning and more detailed information has become available since the last report was prepared. It is recognised that the Government's firm intentions on either the Southland or West Coast schemes are unlikely to be made public until the end of 1976 at the earliest, at which time the Institute should again comment in detail, but it is hoped that a further submission now may help the Government in some way to gain a better insight into possible ramifications of the proposals for utilising beech resources more fully than as of now.

### THE WEST COAST PROJECT

A utilisation scheme which would salvage material at present going to waste through current logging and milling practices appeals to the Institute, because it enhances the forest management potential for virgin resources and offers the possibility of restoring forest cutover and other under- or non-productive land to a productive capability. The Institute recognises that there are sound social reasons for further developing forest industries on the West Coast even though investment in forestry may be more profitable elsewhere in New Zealand.

Nevertheless, the Institute has strong reservations regarding the wisdom of establishing a major pulping industry to use the maximum advertised volume straight away, and would tend to favour proposals which are based on a slower build-up for the following range of reasons.

- (1) Economic and social.
- (2) Technical aspects of the existing resource.
- (3) Technical aspects of exotic conversion.
- (4) Technical aspects of beech management.

#### *Economic and Social Considerations*

Because industry does not have experience of chipwood logging in this region, time and experience are needed in order that sufficiently good data on costs of production to closer limits of utilisation can be accumulated under commercial rather than purely experimental conditions. Information from

similar industries elsewhere in New Zealand is not particularly applicable to the West Coast, since:

- (a) The resource consists of a variety of species.
- (b) A high proportion of the trees has considerable defect.
- (c) Volumes per hectare are variable (cutover/virgin) but generally low and spread over a wide range of size classes.
- (d) Much of the resource is located on steep, dissected hill country where roading, bridging and extraction costs are high.
- (e) Environmental constraints (*e.g.*, roading, preservation of riparian strips, amenity reserves and green belts) are likely to be more severe than elsewhere because of the climate and geology of the area, and because of recreational potential.
- (f) Transport costs for the finished product are likely to be high because there is a very small local market and there is no deep-water port nearby.

In view of the unknown combined effect of all these factors, it is reasonable to expect that industry will prefer to buy logs delivered to the mill door at a fixed price rather than incur the risk of high cost of logging the resource itself. It is imperative, therefore, that the Forest Service be adequately provided with funds to further the work of the experimental chip-wood logging unit under a sufficiently wide range of conditions before arriving at a realistic estimate of likely costs of production.

Furthermore, as already commented in an earlier report, the substance of which was relayed to the Minister of Forests in August, 1973, the Institute considers that the strain imposed on available resources to supply skilled labour for harvesting and silvicultural operations will be eased if a gradual build-up is planned, provided that prior steps are also taken to train and house adequately the extra staff needed as momentum gathers.

### *Resources*

There are technical aspects of quantifying the resource which are difficult to assess without access to the original inventory data, but which the Institute considers worthy of mention to assist the Forest Service in not over-committing itself. They are:

- (a) Changes in the protection/production forest boundaries.
- (b) Sampling errors and measurement bias.

- (c) Possible increases in defect.
- (d) Possible increases in reserves.
- (e) Riparian strips.
- (f) Areas unsuitable for conversion to exotics.
- (g) Unmerchantability of cutover forest.
- (h) Reduced recoverable volumes.

These aspects and their relation to contingency allowances are discussed in an appendix to this report.

The Institute has serious misgivings about the wisdom of allowing the establishment of an industry or industries to use the maximum advertised volume in view of the possible collective effect of these factors noted above; because, in the Institute's opinion, there are doubts that contingency allowances are sufficient for wood supply requirements and, to resolve these doubts, it will seek further information from the Forest Service. There are undoubtedly other resources outside State forest that could supply large amounts of wood, but, until they can be formally committed to the West Coast Project resource, it is unreasonable to include them in the contingency allowances.

The Institute reiterates its belief that the beech management area should not be logged over in less than a full rotation of future beech crops. Insufficient contingency allowances may make it difficult to fulfill this requirement, particularly if too short a time is also allowed for growing an adequate amount of exotic crops to supplement the beech resources as required. In this respect, the Institute supports the view of the Environmental Council, which assumed that a period of 35 years would be needed to complete a sufficient amount of exotic conversion to provide adequate supplies of exotic wood. The Institute would not support any proposal to fell beech resources which are presently zoned for other uses, and so, for all these reasons, the adequacy of the contingency allowances appears to be vital to the viability of a large scheme.

### *Exotic Conversion*

In a paper to the 1974 Forestry Development Conference on a proposed new indigenous forest policy, the Director-General of Forests stated, "Because it is virtually impossible (except by extremely costly artificial means) to restore indigenous forest once it is cleared for other productive purposes, the decision to clearfell should not be made before the need is clearly evident"; and again, "State indigenous forests should be clearfelled and converted to farmland or exotic forests

only when other land in the region is either unavailable or unsuited for further development to meet Government's social and economic goals, regionally or nationally".

Throughout New Zealand exotic stands established on areas converted from indigenous forests are often inferior to those established elsewhere, and establishment costs are generally higher. Such contentions certainly obtain on the West Coast where very little of the area scheduled for conversion to exotics is tractor country, establishment costs are high, and the stands produced are capable of being greatly improved.

The Institute recognises that there would be no major Beech Scheme on the West Coast unless a substantial exotic resource capable of supplying a large proportion of the raw material needed to satisfy the continuing, long-term demands of a major industry is established, since this effectively reduces the extent of indigenous forest in which undue interference takes place. It urges caution, however, in proceeding with a massive conversion to exotics, not only for the same reasons as those of the Director-General just quoted, but also because of the collective effect of the above and other adverse factors which could result in lower yields than could be otherwise expected from such crops.

This merely reinforces the claim of the Institute that a gradual build-up is needed and it indicates that an intensification of research work is warranted. Although the Forest Service has established several thousand hectares of radiata pine on the West Coast directly from indigenous forest, only a small proportion has been converted from beech forest, and much of all the conversion is concentrated in the one area (Ahaura District). Moreover, most of the stands are quite young and so final yields are by no means clearly determined. A few small trials have recently been established on previously untested sites and a few stands have reached a size where they could be utilised, but the ability of much of the land zoned for conversion to produce the sustained yield necessary to supply industries based on maximum utilisation is far from proven. If, as discussed in the previous section, contingency allowances prove to be inadequate, problems in sustaining a supply will be exacerbated if there is pressure to utilise the exotic forests at an earlier age than planned.

Other aspects which should be the subject of an even greater amount of urgent research are the most economically rewarding site preparation methods, tending regimes and harvesting systems, and also the impact of the variability in the soils. The paucity of data on productivity for these subjects must present a source of concern to the Forest Service and it is to be hoped that adequate resources of men, money

and material are available to help rectify the deficiencies in knowledge.

### *Beech Management*

The forest zoned for pure beech management is predominantly red beech on relatively easy topography and it is planned to log this forest over a period of about 80 years so that there can be a continuous supply of red beech in perpetuity. Much of the area west of the Victoria and Brunner Ranges consists of finger valleys which pose particular problems for management. Their shape and remoteness mean that the length of roading will be high in relation to the area serviced, and their particular amenity value may in future lead to pressure to have them reserved. It would therefore be wise to plan to log the eastern forests over a complete rotation so that if for any reason part or all of the western forests were withdrawn from the scheme, there would be no break in continuity of supply of red beech. Indications are that a certain amount of revision of the provisional maps along these lines has already been undertaken and that much depends also on what other neighbouring landowners may wish to do with the forest resources adjacent to these areas.

It had previously been thought that regenerating red beech forest would present few problems, but recent chipwood logging trials indicate that this may not be so. Logging for chipwood appears to destroy a large proportion of any advance growth present and surviving seedlings are often desiccated if they are small. This makes successful regeneration very dependent upon obtaining recruitment after logging. Good beech seedfalls occur irregularly and, if they do not occur soon after logging, there is a risk that the site will be invaded by vigorous weeds such as waterfern or that the seed trees will die from pinhole attack before adequate regeneration of beech is obtained. The Institute is gratified to learn that trials on these aspects are already under way, but suggests that urgent attention be accorded the desirability of incorporating advance growth or not, and the desired size of such advance growth.

Much of the area zoned for beech management with possible supplementary planting has already been logged for sawlogs. There is little doubt that the existing regeneration on these areas would benefit from the removal of overwood, but the damage caused by chipwood logging may in many cases more than outweigh any benefit gained. Unlogged forest in this category can be expected to present problems similar

to those described above for red beech forest. If the regeneration after chipwood logging is inadequate, the situation may be retrieved by supplementary planting of beech and eucalypts. The artificial establishment of beech, however, has hardly been tested on the West Coast, and there are many problems to be resolved before eucalypts can be widely and confidently used for this purpose.

Thus, the Institute considers that, before utilisation commences on a wide scale, sufficient time should have been given to evaluate the results of existing silvicultural and harvesting research trials, and to instigate and evaluate new ones over a wider range of conditions than the present range of trials covers. If this is not done, it is likely that these forests will not be kept fully productive.

#### *Conclusions and Recommendations on West Coast Project*

The Institute is aware of the large part that forestry plays in the West Coast economy and recognises that any expansion of forestry activities will have the effect of assisting a depressed economy. It is therefore strongly in favour of a utilisation scheme that would salvage material at present going to waste in current logging and milling operations, because not only would this benefit the West Coast but it would also enhance present forms of forest management. It is also in favour of expanding current operations to include beech management and salvage of chipwood from cutover forest provided that suitable techniques to manage large areas of these forests can be identified and applied. However, the Institute has strong reservations regarding the establishment of a major pulping industry to utilise the maximum volume advertised. In the Institute's opinion, there are reasonable doubts that the contingency allowances are sufficient for wood supply from scheduled sources. Moreover, the Institute is not satisfied that the major management problems in harvesting, land preparation and exotic and beech management have been sufficiently resolved to ensure a large-scale industry of a sustained supply of raw material. Hence, an industry based on the maximum volume could place extreme pressure on all production management aspects of the scheme. The Institute, therefore, welcomes the decisions, first, to defer further consideration of the two proposals received to establish a major pulp mill until a study of combining West Coast beech with the Nelson and Marlborough wood resources has been made and, secondly, to investigate the viability of smaller-scaled industry, such as panel board, on the West Coast alone.



## THE SOUTHLAND PROJECT

The Southland scheme is simpler and the Institute has fewer reservations about proceeding with it. Some problems in managing beech forest after chipwood logging are foreseen but because the cutting rate in the beech management zone is unlikely to be increased substantially above its present rate, there will probably be sufficient time to remedy present practice to cope with the changed circumstances. No major silvicultural problems are foreseen in the continued conversion of exploited podocarp/hardwood forest to exotics except perhaps at the higher altitudes where sites remain largely untested.

The Director-General of Forests stated at the 1974 Forestry Development Conference in regard to the proposed new indigenous forest policy that: "In indigenous forests which do not contain species yielding high quality and decorative woods, but which can be regenerated, and where the land is not required for any other productive purposes, logging should be conducted so as to ensure regeneration of a diverse indigenous forest. The decision to cut such forests should be made and the level of cut determined, after the costs and benefits have been evaluated. Examples are West Coast hard beech forests and Southland mountain beech forests."

The Institute of Foresters welcomes this policy statement and notes with pleasure, as an example of the implementation of this policy, the change proposed for Dean Forest from conversion to indigenous management. Accordingly, the Institute recommends that the Southland scheme be proceeded with, provided that manageable beech forest continues not to be converted to exotics, unless this can be clearly demonstrated to be in the national interest.

## APPENDIX

Comments on contingencies which should have been adequately allowed for in deriving the advertised maximum volume for the West Coast beech scheme:

*1. Protection Forest Boundary*

It is understood that the upper altitudinal boundary for production forest was set at 760 m, or where the average slope increased to greater than 26°, whichever was the lower. No chipwood logging trials have been carried out at the proposed limits of production forest to test the feasibility of logging to these boundaries, but some of these boundaries as shown on the resource unit maps are clearly unrealistic — *e.g.*, east of the Rappahannock River, Maruia Valley. Therefore allowance should have been made for the fact that production forest boundaries may have to be relocated.

## 2. *Sampling Errors and Measurement Bias*

Contingency allowances should be worked out on the reliable minimum estimate (*i.e.*, lower confidence limit), assuming that this estimate includes not only sampling errors of inventory but standard errors of volume functions as well. In addition, bias due to inappropriate volume functions should also be taken into account. If the Forest Service has applied the same mean volume/ha and confidence limits to different parts of the whole resource, it is open to technical criticism in this regard. Also, lack of National Forest Survey typing north of the Buller River and Maruia Valley and possibly inaccurate typing of other areas owing to the then incomplete aerial photo coverage, may have introduced errors of an unknown magnitude.

## 3. *Defect Allowance*

The physical impossibility of deriving a representative allowance for defect over the whole resource, far less all component parts, is well recognised. Nevertheless, now that detailed proposals have been submitted, it may be wise to give this important aspect more attention, particularly now that there has been substantial mortality recently as a result of the interaction between drought and pin-hole borers, and the significance of this as regards a build-up in the population of the insect.

## 4. *Reserves*

At the time proposals for utilisation were invited, reserves were delineated on the resource unit maps even though their size and shape had not been, and still are not, finalised. Informed opinion amongst the scientific community considers that the area in biological reserves should be greatly increased, and definite proposals for increased reserves are expected from the Scientific Co-ordinating Committee for Beech Research. Until the area of biological reserves is more closely finalised, the maximum area available for utilisation and its associated volume cannot be known with any degree of certainty. Because there has been no detailed assessment of the adequacy of amenity reserves, other than by Forest Service officers, the Institute is not in a position to say whether there is likely to be any great increase in their area. However, a number of major conversion areas will be clearly visible from the main highways — *e.g.*, Kinsella Peak south of Blackball — and, once conversion starts in these areas, there may be pressure for more amenity reserves to be created. Also, although Government has approved the retention of finger valleys in the production forest area, these are not likely to be logged in the early years of any utilisation scheme, and by the time they are required there may be considerable public pressure for their retention as amenity reserves.

## 5. *Riparian Strips*

In the 1973 booklet detailing Government approval of the beech schemes, it is stated that, "Because it is virtually impossible to define requirements for riparian strips along river and stream banks, adequate volumes of timber are to be reserved from sale and the final definition of these areas is to be done in consultation with the Scientific Co-ordinating Committee". However, as it is virtually impossible to define requirements for riparian strips, there is no way of knowing whether the volumes of timber reserved from sale are indeed adequate.

### 6. *Conversion Areas*

Research may show that substantial areas may be unsuitable for conversion to exotics because of the propensity of some soil types to erode badly after clearfelling. In many cases, these forests are also unsuitable for management as indigenous production forest, and therefore they should not be considered as available for utilisation at this stage. In view of the recent nature of this work, sufficient allowance may not have been made for this contingency in calculating the advertised volumes. Indeed, the adequacy of any allowance cannot be judged until the extent of the problem has been more clearly defined.

### 7. *Cutover Forest*

Saw logs have already been removed from a substantial area (18 000 ha) of forest zoned for beech management with possible supplementary planting. On part of this area the volume of chipwood may be so small that re-logging would not be economic. There is a need for further logging trials in cutover forest to determine the economic limits to logging, and, until such information is available, allowance should be made for the possibility that part of the volume in cutover forest may not be available commercially.

### 8. *Recoverable Volumes*

Even allowing that quite large areas originally zoned for exotic conversion may be removed from the scheme because of slope stability problems, the great majority of the proposed exotic conversion areas is located on steep dissected country with slopes often in excess of the 26° mentioned in the original Forest Service proposals. There appears to be very little information available as to what recoverable volumes are likely to be in such areas and on other difficult areas such as limestone country. Until such information is available from a variety of sites, problems in estimating recoverable volumes will remain. By any standards, this type of country and its associated growing stock is not a very attractive logging proposition, and the recovery of all material greater than 2 m in length and 10 cm small-end diameter is clearly unrealistic. Therefore, due allowance should be made for the fact that recoverable volumes may be lower than at present estimated.