

SYMPOSIUM:**ECOLOGY AND MANAGEMENT OF SOUTH ISLAND
BEECH FORESTS****NEW ZEALAND FOREST SERVICE PROPOSALS
FOR MANAGEMENT AND UTILISATION OF
SOUTH ISLAND BEECH FORESTS**

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The Forest Service proposals for fuller use of some South Island beech forests have focussed unparalleled attention on the management of indigenous forests; and the fact that the New Zealand Ecological Society has conducted a symposium on the ecology of beech forests is a manifestation of this widespread interest. This paper is an attempt to place the proposals directly before ecologists so that final evaluation can follow a reasonably complete understanding.

MOTIVATION

To appreciate the details of the proposals it is necessary to understand the motivation behind them. The potential for managing beech forests for the sustained production of wood has been recognised for at least 50 years. Soon after its formation in 1920 the Forest Service commissioned the eminent botanist Leonard Cockayne to study the potential of New Zealand beech forests as a perpetual source of timber supply. He dealt fully with the distribution, ecology and regeneration of the forests and reported that, subject to proper management, the potential was high (Cockayne 1926, 1928). Subsequent work by foresters confirmed Cockayne's conclusions, but the proper management which he advocated has never been fully achieved, largely because of the absence of major market development for the species.

There is a simple reason for this. Although the beeches, particularly red and silver beech (*Nothofagus fusca* and *N. menziesii*), produce fine decorative woods rarely more than a quarter of the wood in the forest can be used for sawn timber or veneers. The remaining three-quarters

or so, because beeches are highly susceptible to rots and insect attack, is either too defective or too misshapen to use economically with existing markets. Its use depends on chipping and reconstitution — for example as panel boards or papers. The technology now exists, however, to solve the longstanding problem of inefficient utilisation of beech forests, provided markets can be developed.

Now, as in the past, the beech forests are being logged primarily for the rimu (*Dacrydium cupressinum*), which grows in mixture with beech, and for the non-defective logs of red beech and silver beech. Hard and mountain beeches (*N. truncata* and *N. solandri* var. *cliffortioides*), which are more difficult woods to use, are almost unmarketable. The result is that the logged-over forests are "creamed" for their finest woods and an often dense cover of unusable trees remains.

Although some shade helps the establishment of beech seedlings, they require full light to grow vigorously. While even a cover of defective trees remains, development of a second crop is not possible, and the forest is suspended indefinitely in a state which has the values neither of the virgin forest nor of a properly managed regenerated stand. Conservation of the forest as a renewable resource is impossible under such essentially exploitive logging. Only use of currently wasted wood can break the deadlock.

The lowland forests of the world are generally a potentially renewable resource of immense value, and wood will be a versatile raw material long after the stocks of many non-renewable resources, such as coal and oil, are exhausted; but

on the global scene, exploitation is more common than sustained-yield forest management. New Zealand's resources of land are such that we need to use our production forests in many areas on a sustained-yield basis; but we are not doing so.

The present and long-term livelihood of people in the rural areas of the West Coast and western Southland depends to a large degree on the proper use and management of forests. Under present standards of utilisation and levels of podocarp cut the life of the industry cannot be longer than 40 years and little pride can be taken in the condition of much of the logged-over forest. If there are no schemes for better use, the forests will continue to be worked wastefully over an area almost as extensive as that covered by the Forest Service proposals for sustained-yield management, and they will be left in a degraded condition.

The motivation for the proposals is thus threefold:

1. The need to make use of wood now wasted in the forest and in the mills.
2. The desire to end the long era of exploitation and to manage all production forest lands for a sustained yield of wood.
3. The recognition of the social benefits which would result from the better short- and long-term employment opportunities provided by efficient processing and sustained-yield management of forests in harness.

ENVIRONMENTAL CONSEQUENCES

The substance of the Ecological Society's critique of the beech forest proposals (New Zealand Ecological Society 1973) is that they should be held in abeyance until many of their consequences are more clearly appreciated. The criticism endorses the view that research teams and field experts should be called in during the planning stages and not after the action, and it recommends for example a 10- to 20-year research programme on regeneration of beech forests. Many of the fields of research in which further work is required were also recognised by the Officials' Committee for the Environment (1973), which recommended general guidance from a Scientific Co-ordinating Committee.

Were the use of beech forests being approached for the very first time a delay to gather more information would be reasonable. This is not the case, however. The forests have been used for wood production for 100 years, and if the present exploitive industry is maintained the time available for attempting better use is not great.

The question then is whether enough information and experience are available now, or will be available before a further commitment is made, to justify the advancement of the proposals. Much of the available evidence is empirical, but it is no less valid for this reason. We know the beeches are vigorous and often aggressive in regenerating. We know that a wide range of forest types have successfully regenerated under planned or fortuitous and generally selective methods of logging, given appropriate conditions. The nature of these conditions is reasonably well understood. The application of this knowledge to regenerating forest under more intensive logging practices will require continuing research and considerable practical skill, and it will be aided by more refined ecological typing of forests. We know that large areas of native forest can be clear felled and converted to exotic plantations on certain hill-country soil types without significant erosion or flooding risk and without any problem from weed competition. Much less is known of the effect of such operations on freshwater enrichment and aquatic fauna and of the impact of small (by agricultural standards) requirements of pesticides, herbicides and fertilisers. A large part of New Zealand constitutes a laboratory for anyone who wishes to research these fields.

We know that good rates of growth have been achieved by exotic conifers on hill soils even when such areas have been subject to periodic burning for long periods and, presumably, nutrient depletion; but the need for research on maintenance of fertility in the second and later rotations is indicated by chemical analyses. More information is needed on what proportions of nutrients detectable in soils are available to trees over a rotation. The major gap in current knowledge is data on the distribution and ecology of native wildlife. Ascertaining the

possible effects of the proposals on the distribution of native wildlife will require a major effort over the next several years.

Work on the more detailed appraisal of forest types, soil types and hydrological implications of the proposals is under way. Work on wildlife will soon begin. If approval is given to proceed with the proposals this work must be rapidly intensified, and its very considerable cost is the price of that decision. The possibility of a major development should stimulate work which in the past has been sporadic or very general in some fields and absent in others, because no priority was attached to it and more cogent demands were made on the available research resources, or because the necessity for research was simply not appreciated before the environmental awakening.

The Forest Service view therefore has been that the problem of better utilisation is urgent and that the available information is sufficient as a basis for broad proposals aimed at solving the problem. Inventory-oriented research must be intensified before a commitment is made, and continuing research will be needed as any scheme develops. Utilisation of beech forests is occurring now. Any change will be incremental rather than fundamental; it is rather late in the day to stop and allow newly awakened scientific interest to catch up on the backlog of research.

ACTION ON PROPOSALS

If the general motivation for the proposals is accepted there may still be criticism of the way in which the motivation would be translated into practice; this also requires clarification.

Various aspects have been recognised in the planning of the proposals. First, the use of lower-quality wood, particularly for paper, commonly requires a large plant and in turn a substantial supply area of forest. Secondly, beech forests have many values (protective, scientific, recreational, scenic, wildlife and spiritual) other than wood production. Thirdly, the preservation of some of these values and the production of wood were not compatible and a balance would have to be struck. Finally, such a balance required values judgments and, in zoning the forests for the various purposes and values

covered by the Forests Act, public criticism and comment should be invited. The last step was unprecedented and led to a lengthy public examination. It indicates that the Forest Service was sensitive to the fact that these were public forests and that the views of many interested groups should be elicited and evaluated before any major new commitments were made.

Another aspect taken into consideration was that there were a variety of possible options for best use of beech production forests and that, if all of these were to be weighed objectively, the maximum area available for wood supply would have to be defined at the outset, together with the maximum sustainable input of wood. These maxima were arrived at by subtraction. First, the mountain land forests were zoned out. These have overriding value for soil and water conservation and an important secondary value for recreation. They will not be touched. Then in the potential production forests remaining reserves for preservation of scenery, recreational values, flora and fauna were delineated. Much work is still required to finalise these. The production forest area then remaining provided an area ceiling for any possible development — the wood-supply ceiling depends upon how the forests on this area are managed and over what period they are cut.

The definition of a ceiling does not in itself imply that the biggest possible industry is the best or only option, but obviously the limits of any resource must be known if long-term plans for its use are to be soundly based.

The most criticised aspect of the proposals as put forward has been the zoning of some of the production area, including both cut-over and virgin forest, for conversion to exotic trees. Although viable developments requiring a lesser area than the maximum zoned for production are in no way precluded, if pulping proves to be the only satisfactory means of using otherwise wasted wood, something approaching the full area could well be needed. Should this prove necessary the beech forests themselves could not sustain in perpetuity an industry of the scale involved. The only practicable solution would be to convert some forests least suited to beech regeneration to fast-growing exotics.

I must emphasise that the area zoned for conversion is also a maximum. It is the area least suited to sustained native production forestry and it can only be finally decided by considering:

1. The appropriate balance of land use between highly productive plantations and regenerated beech forests of considerably lower productivity but with other less tangible values.
2. The type and scale of industry best suited to solve the problem of wastes and the area of exotics needed to ensure continuing supplies of wood to this industry.

It is proposed to manage all the production forest area other than that which is finally converted to exotics as native forest. The forests with highest potential for beech management, the red and silver beech areas, would be managed for sustained yield over an 80- to 100-year cycle. Eucalypts could be used to supplement beech regeneration in mainly hard beech forests on the West Coast.

I believe that by approaching possible developments in stages, by dealing with environmental matters first, and by receiving and making modifications in the light of this environmental examination, the Forest Service has acted responsibly and in the best interests of the public.

Government, after considering all reports and submissions, has decided to proceed with the proposals (N.Z. Forest Service 1973). I believe that the next stage, that of inviting specific development proposals from industry within defined environmental constraints, is also in the public interest. Before the feasible range of alternatives in any development of natural resources can be decided the environmental needs must be clear. This has been the intent of the first stage. Thorough economic as well as social and environmental analyses of alternatives have been planned from the outset as part of the second stage — the detailed scrutiny of real industrial proposals.

Little purpose would be served, and a great deal of effort would be wasted, by attempting economic or benefit/cost studies *in vacuo*. In entering stage two, no commitment would be given or implied by Government. The submission and analysis of industrial proposals, without commitment, is a standard and well tested practice in securing the best available use of state-owned wood resources by way of long-term sales. It is one that has commonly led to the successful development of new markets using technology previously untested in New Zealand, and it allows the fullest possible expression of industrial expertise and ideas.

The most important aspect of this procedure is its flexibility. Rather than being directed at a single development, or a narrow range of choices, the invitation of proposals for the use of all or part of a specified volume and quantity of wood allows the submission of any development conceived as practical and profitable by industry.

Finally, so long as the forests of the West Coast and Southland are used for wood production, the choice is not simply between preservation and use but between the present essentially exploitive use and conservation in the sense of wise management. Without improved utilisation there is no possibility of better forest management and thus no choice.

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