

The estimated harvest shown includes both clearfelling and extraction thinning.

The Ministry of Forestry produces statistics on estimated removals from the plantation estate (4). Removals are largely inferred from surveys of industrial plants and therefore have some inherent element of inaccuracy.

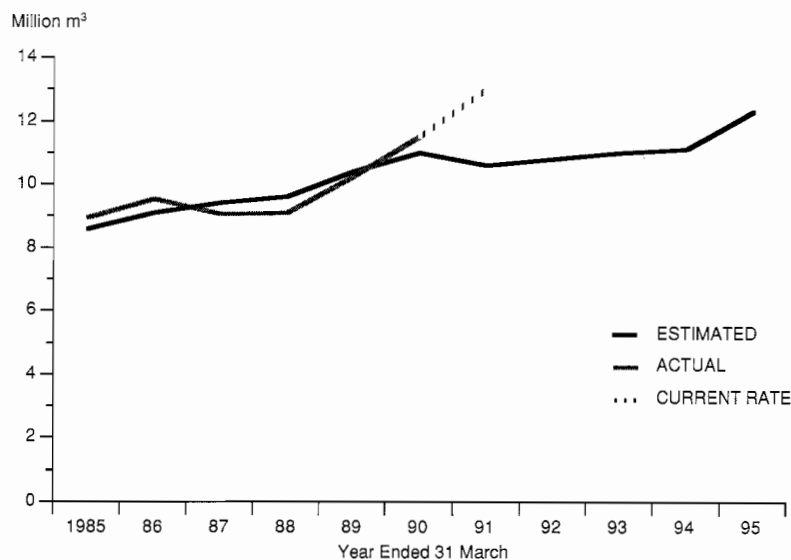
When removals are compared with the 1986 forecast the following is obtained:

ward by five years through the new forest ownership forces that are now at work.

- During the past six years the national estate has been cut in a fashion commensurate with the ultimate attainment of a rotation length of 30 years for radiata pine. (There is, however, still a high degree of choice open to New Zealand in target rotation.)

The production from a forest estate is determined mainly by three factors:

N.Z. PLANTATION HARVEST



Some observations to be made are:

- During the six years 1985 to 1990 actual plantation production has closely followed the 1986 simulation based on April 1, 1984 data.
- Even if the high correlation between actual production and forecast is largely a result of "cancellation of errors" in the forecasting and statistical recording systems, the result nevertheless can give comfort to statisticians and planners.
- The inception of the New Zealand Forestry Corporation as from April 1, 1987 does not show up in any marked increase in production immediately from that date.
- Of more interest is the current rate of production extrapolated to March 31, 1991 on the graph. It is based on actual production from April 1, 1990 to September 30, 1990 (six months) multiplied by two. This could well be a result of the sale of State plantation forests, mooted in mid 1989 and officially launched in October 1989, building upon the prior corporatisation of the New Zealand Forest Service. The 1986 simulation did show a sharper climb in production during the second half of the 1990 decade. Possibly this has been brought for-

- the inherent ability to produce, determined primarily by age class structure;
- market forces;
- aspirations of the owners.

The first is measurable and largely predictable and cannot be changed in the medium term (natural disasters permitting). The second is constantly changing, more difficult to measure, and cannot be forecast with certainty. The third factor, ownership and aspirations, is the one that has changed greatly during the past year or so and is the one that may have the greatest effect on the national plantation production during the remainder of the 1990s. For this reason a national simulation produced now may not enjoy the six year "honeymoon" that the 1986 simulation enjoyed. Nevertheless, a national simulation does provide a basis for monitoring and the important thing subsequent to its formulation is not necessarily how close it matches reality but interpreting the divergences between it and reality. In this way trends in the measures of productive capacity (e.g. average harvest age; rotation length) of the national estate can be observed. The steering committee of the National Exotic Forest Description does have on its agenda the production of a

new national simulation. It would be timely for this to be produced now.

REFERENCES

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- (3) New Zealand Forest Service. 1985. Harvesting and Marketing Strategy for State Forest Plantations. NZ Forest Service.
- (4) Ministry of Forestry. 1990. Statistical Release. Estimate of Roundwood Removals from New Zealand Forests. Year ended March 31, 1990. Ministry of Forestry, New Zealand.

BOOK REVIEWS

Handbook of NZ Mammals

THE HANDBOOK OF NEW ZEALAND MAMMALS, edited by Carolyn M. King. Oxford University Press, Auckland. 600 pages. Retail price \$69.95.

This book describes the physical characteristics, field sign, variation, history of colonisation, distribution, habitat, food, social organisation and behaviour, reproductive behaviour, population dynamics, predators-parasites-diseases, adaptations to New Zealand conditions, and the significance to the New Zealand environment of the 46 species of land-breeding mammals which now live (or have lived) in the wild in New Zealand. It includes all the introduced species, the native bats, and the seals and sea lions, but excludes whales and dolphins.

The editor has achieved remarkable stylistic consistency, given that 29 people contributed to the descriptions. The standard format and style for each species makes the huge amount of information easily accessible, and this alone will ensure the success of the handbook as a ready source of technical data on most aspects of introduced and native mammals. The information itself is up-to-date, the latest references being from the late 1980s.

The Handbook is not just a digest of facts and figures about various mammals, but attempts to summarise the place of each species in an ecological context. In many ways this latter function may be the most important contribution of the work as it will stimulate the debates and research needed if we are to manage wild mammals (particularly the introduced species) in any rational way.

A significant proportion of information is taken from non-peer reviewed unpublished sources or is presented for the first time in the Handbook. This is both an advantage, as it allows inclusion of recent information, and a disadvantage, as it includes some information which may not stand closer scrutiny. For example, the lists of islands on which each species occurs are incomplete as they include only those known to have the mammal. Many other islands within swimming distance of the mainland undoubtedly have rodents and stoats but no one has checked. Similarly, the claim that the Department of Conservation's mouse control campaign on Mana Island is the only such anti-mouse action in the wild in the world is wrong – the Australians spend considerable money on controlling wild house mice to protect crops.

The references (some 1700 are listed) are not up to the high standard of the rest of the Handbook. About 21% of the 400 I checked were incorrectly cited. Most errors were trivial or minor and would not affect a reader's ability to find the original. However, three references (Myers and Poole, 1963; Silvester, 1964; and Wallis and James, 1972) actually refer one to a different journal. I presume the editor relied on her authors to check their own references, and most did not – a pity.

Despite these quibbles, the Handbook of New Zealand Mammals is a worthy successor to Wodzicki's 1950 survey of introduced mammals and will undoubtedly be a much-used reference book, a spur to future research directions, and a stimulus to debate where authors and readers disagree. As such, no one with a professional or amateur interest in the New Zealand environment can afford not to have access to a copy.

John Parkes
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'Prospects for Australian Forest Plantations'

This book, edited by John Dargavel and Noel Semple, was published by the Centre for Resource and Environmental Studies, of the Australian National University, Canberra in 1990. (\$A30).

The book presents edited versions of a set of papers presented at a conference organised jointly by the Centre for Resource and Environmental Studies and the Department of Forestry at the Australian National University in August 1989. The object of the conference was to assemble a record of the current state of knowledge and experience of growing forest plantations in Aus-

tralia, so that two major proposals for the substantial expansion of the Australian plantation resource might be the focus of more informed debate.

The two proposals were the "Forest Industries Growth Plan", put forwarded by the Forestry and Forest Products Industry Council in December 1987, and the "Conservation-oriented Forest Industry Strategy", put forward by the Australian Conservation Foundation in May 1988.

In spite of the extremely polarised views of these two Australian interest groups, both proposals had advocated a substantial expansion of the plantation estate.

The first, involving an investment of \$A49 million, had proposed the addition of 523,000 ha of pine plantations, and 76,000 ha of eucalypt plantations to the existing estate of 900,000 ha by the year 2030. The proposal was based on the conviction that Australian wood-using industries could be internationally competitive with respect to the domestic, and selected export markets, as long as new mills were of "world scale". The new plantings would be complementary to existing plantations and to ongoing access to managed natural forest.

The second proposal was aimed at stopping all "high intensity" clearfelling of native forest in Australia over the next 15 to 30 years, and at meeting all of the domestic demand for pulpwood, and most of the demand for sawntimber, from plantations. The only logging that would remain in native forest would be the low impact harvesting of high-value timber for the furniture and veneer industries. This goal was to be achieved by planting an additional 200,000 to 350,000 ha of eucalypt plantations and another 230,000 ha of pine plantations over the next 30 years.

Only a brief outline of each proposal is included in this collection of papers, which concentrates on the presentation of information, based on experience and research, which is relevant to the evaluation of the technical feasibility, the likely commercial viability, and the social and environmental impact of further plantings of introduced conifers and indigenous eucalypts, and to the establishment of processes for resolving the conflict between the advocates of development and conservation.

The conference was well structured and its papers have been well chosen to include contributions from a broad range of authorities with relevant knowledge and experience. All of the State forestry and conservation agencies, the major private forestry companies, several divisions of CSIRO, several departments of the major universities, and representatives of a number of conservation and industry interest groups

have contributed, and there are papers from invited overseas authors covering the international market for wood products (R.A. Sedjo, USA), the effective use of mediation in environmental disputes in North America (Alana S. Knaster, USA), and privatisation in New Zealand (D.J. Evans, NZ).

There is concise introduction by John Dargavel which describes the circumstances which have led to the bitter public and political conflict over the practice of forestry in Australia, and John contributes a final chapter which discusses the strengths and weaknesses of the knowledge which should be the basis for the analysis of development proposals, and the formulation of plantation policies.

The conference papers are organised into chapters covering:

POLICY AND PROPOSALS, which covers a history of plantations in Australia, a discussion of the rationale for plantation policies and the concentration on coniferous softwood production for general purpose sawlog production, an overview of the economic issues which have, in the past, and which should, in the future, influence public and private investment, and presentations promoting the two major plantation proposals from representatives of the Australian Conservation Foundation and the Forests and Forest Industries Council;

INTERNATIONAL AND TRADE SETTING, which covers an overview of the global trade in forest products and the emerging dominance of plantation resources in the Pacific Basin, a description of the status of the forestry sector in New Zealand, its recent restructuring and the Government's Asset Sale, a discussion of approaches to the marketing of the future increase in Australia's plantation production, and an argument in favour of the potential of an expanded forestry manufacturing industry;

THE AUSTRALIAN EXPERIENCE, which includes papers presented by representatives of the State forest services of NSW, Queensland, South Australia, and Tasmania, and of the two major private forest growers, APM and APPM. These cover Australian operational experience in the establishment and silviculture of both coniferous and eucalypt plantations. They reveal the generally low rates of return achieved and expected by State agencies (3 to 4% real), and an emerging interest in eucalypt pulpwood crops, especially by the private forest growers;

IMPLICATIONS OF RESEARCH, which provides a comprehensive coverage of the status of Australia research into the breeding, establish-