EDITORIAL COMMENT

A Management Policy for Forest Land in New Zealand

The 1981 Forestry Conference, widely representative of all components of the forestry sector in New Zealand, is concerned principally with the issues of forestry as they relate to the generation of wealth, or improvement of the common good through expansion of the national economy based upon the management, expansion, utilisation and marketing of the products of our plantation forests. (It is irrelevant in this context that they are dominated by exotic, and not native species.)

A previous editorial comment in this journal* argued the desirability of having a single policy for the national forest estate, both exotic and indigenous. It is difficult, however, to formulate, or interpret, such a policy unless there is available a commonly agreed set of principles against which the component parts of the policy can be tested. How, for example, are terms such as "generation of wealth; improvement of the common good; highest long term economic return" to be interpreted? What shall determine the balance between the quantity and quality of life to be pursued by forest managers and the forestry sector as a whole, when the number of options available in terms of land husbandry, forest management, patterns of administration, tenure and employment, and alternative end-uses and markets, are so great, and the consequences of decisions made so long term and far-reaching in character?

The dilemma might be resolved by the recognition by the sector of such a set of management principles; one formulation, based upon that given in *Land Alone Endures* (DSIR, 1980, pp. 7-10)† is given below.

Forest Characteristics

Forests, whether natural or man-made, have an enormous potential to meet a multiplicity of mankind's needs. While plantation forests are usually established primarily for the production of wood, they have a great many other potential uses. Forests

N.Z. Jl For., 25 (2): 111.
†Reviewed in *N.Z. Jl For.*, 25 (2): 237.

have a unique potential to meet multiple use goals because they have:

— a capacity to protect the soil resource, protect water quality and buffer water flows.
— infrequent harvest.
— constantly changing form and opportunity with time.
— multi-tiered character.
— inherent flexibility in management and harvest.
— capacity to absorb human use without major impact on other functions.
— a relatively low intensity of management.
— a capacity to maintain by appropriate management other values such as wildlife while permitting a continuing harvest of wood.

Plantation management in New Zealand must realise the potential for multiple use management conferred by the unique characteristics of forest land uses. This need is implicit, but is emphasised by the desirability of fostering the greatest degree of public understanding of forests as a land use in the face of:

— a tradition which is almost entirely based on values dependent on forest clearance, not forest creation or maintenance.
— an increasingly urban population whose demand for rural experience cannot be easily accommodated in the intensively managed complementaary sphere of farming land use.
— a sector whose patterns of ownership and size of holding differ markedly from the national tradition and towards which antagonism may be easily created on those grounds alone.
— a sector characterised by a land use having a long time horizon and low apparent intensity of management, factors which can easily lead to a failure to recognise that the land is "occupied" or used in any conventional sense and a consequent demand for recognition of its capacity to meet more immediate needs of society.
— a lack of any widespread understanding of forests, the need for their products, and the economic benefits derived from them.

A Land Use-Forest Management Ethic

"The greatest material resource available to mankind is its land; the way in which we use our land will determine the future of our society."*

*After E. F. Schumaker (1973), quoted in *Land Alone Endures, vide supra.*

A significant part of New Zealand is covered by natural and plantation forest. The extent of plantation forestry is increasing in response to

— the natural forest climate characteristic of New Zealand, and the rapid growth of introduced conifers.
— a perception that there is a need for the productive use of land to improve the economic wellbeing of the country and that plantation forestry has a capacity to meet that need.
— a need to repair land and restore productivity lost through clearance of natural forest for settlement and pastoral use beyond the capacity of the land to sustain.

The character of forest land is determined by the nature of the constraints it imposes on, and the opportunities it affords for, management. Wise management must fully recognise these constraints as well as the opportunities. Such management will be achieved only if the natural ecosystems of the land itself, and those affected by the harvesting, processing and use of the crops are recognised as the determinants of appropriate use. The management of forest thus is design with nature.*

Man now has the capacity to overcome many aspects of the natural environment that hitherto were constraints on his land husbandry and subsequent dependent economic activity. As the means employed to overcome the constraints become more technically oriented and capital-intensive, so does the range of potentially damaging but perhaps unanticipated side effects also increase, and damage occur to many of the natural values whose maintenance had not previously been seen to need positive management or protection.

Society is the ultimate beneficiary of forest management, and human needs are an essential component of the management systems adopted. Although man is an integral part of the ecosystem, his capacity to modify it is such that the values of the natural (non-human) ecosystem must be separately evaluated before a pattern of land or forest management can be determined.

Definition of an optimum form of land management will forever be beyond reach; societies and their needs are constantly changing. The most appropriate range of uses for land in general, and for forest land in particular, will be achieved if the following principles are implicit in its management:

*Refer *Design with Nature,* by I. L. McHarg. Doubleday/Natural History Press, N.Y., 1969.

(1) *Land (and forest) use is ecosystem management.* Understanding of the functioning and particular value of ecosystems is fundamental to the sustained use of existing systems and their resources, and the sustainability of systems which might be created.

(2) *Forest use is stability.* Planning and management must recognise the probability of "abnormal" events or risks. Management should be designed to withstand this quantified risk by an inbuilt flexibility and diversity.

(3) *Forest use is counting the cost.* Appropriate use can only be determined if all costs, incuding the hitherto unquantified costs of environmental impact, are properly attributed. Land use decision making must take into account all costs and benefits; no element of cost can be ignored on the grounds that it falls elsewhere, or that its impact is delayed.

(4) *Forests satisfy intangible needs.* Forests produce not only physical commodities, but should be a source of recreation and inspiration. Landscape beauty and character is a product of diversity, and a blend of natural and cultural. Physical production should be such as to protect these other values.

(5) *Land is finite.* The land resource is fixed; its uses must recognise that the maintenance of its capacity to produce renewable resources in perpetuity is fundamental to the continuance of society. Land and the forests on it must be passed to the next generation in a condition at least as good as that in which they were inherited.

An ecosystem approach in accordance with these principles will take into account both natural and human or social ecosystem demands and realise the capacity of forestry to complement the traditional rural industries in patterns of employment, maintenance of rural skill bases, and diversifying the income base in local, regional and national terms.

Forest Industry Development: The Role of Government

A topic of specific interest to foresters aand those in the forest industry, but also of wide general interest, is presently the question of the propriety of government financial involvement designed to enable the continuation of a particular forest-based industry which might otherwise have been unable to weather an existing difficult period preceding a predicted satisfactory future.

The problem is a major one, and not one which will go away, or which can be ignored. New Zealand has a large and expanding forest estate which is being established and managed in accordance with goals determined to be those most appropriate to future market opportunities. Forestry is not, however, a short-term business, and we must necessarily expect a degree of imprecision in the forecasts. It follows, therefore, that the location of the forests and distribution of product type within the mature crops, may not be ultimately exactly that which the forest industries might have chosen, no matter how careful the present planning, and that profitability might be therefore impaired. It also follows, that forest management strategies shoud be those which have the greatest degree of inherent flexibility.

But is this not precisely the basis of the present controversy? In good faith our forebears established the forests upon which the thermo-mechanical pulpmill of Winstone Samsung Ltd is presently dependent. The constraints of available forest management tools and knowledge of those days dictated that the species should be *P. contorta,* and the prevailing attitudes to land use determined that the forest should be far from ports and population centres. Problems said to derive in large measure from these aspects of location and species have led to the intervention of the government.

The management policies of foresters are still, as they have proved to be in this case, critical to the establishment and ultimate success particularly of comminuted wood industries, dependent on the supply of relatively low cost wood in large quantities. By and large our forests are being managed to maintain the maximum degree of flexibility in end use, and regimes designed to produce sawlogs predominate. Large quantities of wood suitable for industrial use are nevertheless being generated as a by-product of these regimes; if the chance of future contradictions between the resource characteristics and the industry requirements is to be minimised, the lessons from the Karioi forest saga should be absorbed.

— There is a need for co-operation between forest planners and managers in the derivation and constant monitoring of sectoral strategy, from forest establishment to ultimate end use.

— The forests cannot be divorced absolutely from the usage system.

An examination of proposals to utilise any forest must recognise not only the constraints imposed by past management, but the advantages accruing to the forest from their removal (in this case the replacement of *P. contorta* by radiata pine, and the associated conversion of derelict farmland to productive forest).

There is an inherent contradiction between the planning and investment horizons for forest management (say, 30 years or more) and those for industrial development, which may be only 5 to 10 years. This contradiction constantly raises the question: Is the forest dog wagging the industrial tail, or does the industrial tail wag the forest dog? There is no single answer, particularly where the ownership of the industry (the usage system) and the forest is not the same, and the objectives and constraints of each owner may be expected to differ. Nevertheless, an answer must be found; it lies in the maintenance of maximum flexibility and adequate sectoral planning.

There is a case to be made out for the more direct sharing of both the risks and the benefits by some form of joint venture between forest owner and industrialist. The forestry sector as a whole, facing as it is a future in which its role is considerably more significant in the national economy, and at the same time a public not conversant with the principles or techniques of forestry, must endeavour to avoid the necessity for such *ad hoc* government rescue. Far better that the potential difficulties were foreseen and appropriate provision made.

The Bush: Forestry, Foresters and New Zealand History

A recent paper by Judith Johnston in the *New Zealand Geographer** examines the origins of the term "bush", in its unique New Zealand usage, to mean native forest. It is intriguing to follow the author as she traces the path by which the word acquired that distinctive New Zealand flavour, well known to most present generation foresters, and certainly to all those of previous generations nurtured in indigenous forests.

There is a great deal of absorbing history yet to be written on the many aspects of forestry in this country, notwithstanding the efforts made by various members of this Institute over the years, of whom Poole and Simpson come most readily to mind. The Forest Service has, for instance, just transferred to National Archives some 400 boxes of records dating from its inception in

*Johnston, Judith A., 1981. The New Zealand bush: Early assessments of vegetation. *N.Z. Geographer,* 37 (1): 19-24.

1919; from these papers may be unravelled, for instance, what will be the fascinating story of policy development for exotic forests, of the industries of the central North Island, and of indigenous forest utilisation and management. The forests, and the organisations responsible for administering them, have been reasonably well served by the enthusiasm of amateur historians; the time is now ripe, and the material available, for a professional evaluation of our history. We may learn from it some valuable lessons for the coming era.

Monocultures: Can We Now Lay the Shibboleths to Rest?

In this issue of the *Journal* appears an important trilogy of papers (by Whitehead, Chou and Bain) dealing with the questions of the risk of disease or insect outbreak in radiata pine plantations occasioned or magnified by the practice of growing the crop in single species, even-aged stands. It would be with considerable relief that we could now relax, in the belief that the persistent doubts and fears expressed about the supposed "dangers" of monocultures, by both the lay public and by some members of the scientific community had been comprehensively demolished. It seems doubtful that this goal will have been achieved, but significant progress toward it has been made nevertheless. The authors' record the results of an exhaustive search of the world literature for evidence to support the previously received beliefs enshrined in many of the current texts, and report failure. They examine carefully the arguments for and against the likelihood of increased risk in forest monocultures in terms of the principles of ecological systems, and similarly report a failure to find justification for altering our forest management.

We have advanced a good deal from the days when de Gryse* could report to the Forest Service that the growing of radiata pine in extensive monocultures was "tantamount to challenging the laws of nature". As Fenton† has pointed out, our attempts to reduce the risks of monocultures by finding alternative species, prior to and in response to de Gryse's report, have cost New Zealand dearly.

There is indeed a degree of risk in plantation management. These papers demonstrate conclusively that the risk is not likely

*de Gryse, J. J., 1955. Forest pathology in New Zealand. *N.Z. For. Serv. Bull. No. 1.*

†Fenton, R., 1978, *in* James, R. N.; Bunn, E. H. (eds). A review of Douglas fir in New Zealand. *N.Z. For. Serv., For. Res. Inst. Symp. No.15.*

to be avoided or mitigated by the adoption of the remedies usually suggested: alternative species, mixed species forests, mixed-age forests nor even (supposing the forests could sustain the demand) by the management in plantation form of native species. The risks must be recognised and lessened by a continuing and adequate investment in research capability, by the deliberate maintenance of a diverse genetic base, by an effective quarantine and port inspection service, and by an efficient system of forest inspection. These we have (indeed, the Institute has recently contributed to a review of quarantine initiated by the N.Z. Forest Service), although we cannot afford to relax our vigilance. Nor can we afford to skimp on the allocation of sufficient resources to the task, or fail to utilise the best available technology (such as satellite monitoring of forest conditions), since the stakes are enormous, even if the risk is low.

The misapprehensions about monocultures, particularly of radiata pine, are too widely and deeply held* to be dispelled overnight; the question has been put yet again to a working party of the Forestry Conference this year, which has found no justification for abandoning our reliance on radiata.

Reassuring as the trilogy is, however, we must remember that we plant and tend forests for reasons other than the generation of softwood fibre, and profit alone. We must not allow the reaffirmation of our current concentration on radiata to inhibit our ability to establish significant quantities of the other species for a multitude of other reasons, considered individually or simultaneously. A scientifically sound and cogently presented rejection of the monoculture shibboleth will be to no purpose if the foundation of the objector's belief is emotional and aesthetic.

Nor should we allow the success of radiata, and the apparently low risks we incur by cultivating it in a simple ecosystem similar to that in which it naturally occurs (and simple ecosystems are being demonstrated to be more robust than complex ecosystems like tropical forests) to blind us to the need to maintain a healthy body of research into the potential alternatives which would be needed should the unforeseen disaster occur.

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*See for example Popovich, Luke; 1980. Monoculture, a bugaboo revisited. *J. For.*, August: 487-9 (Society of American Foresters). "In fact tree improvement programs are everywhere tempting foresters to plant fast growing species, off-site or on. It's an elementary and widespread mistake. Monterey pine was heavily planted in New Zealand and Australia, often to the exclusion of other species with greater disease resistance. Now these stands are vulnerable to severe disease attacks."