



Guest Editorial

Plantation forests protect our biodiversity

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SUMMARY

New Zealand's plantations have been criticised because it is claimed they are breaking our commitment to the 1992 Biodiversity Convention. If we look at the world human population and its interrelationships with agricultural and horticultural systems, it is obvious that all are totally dependent on the control, manipulation or even elimination of unwanted species, (i.e. biodiversity). It is questionable, therefore, if we are sincere when we claim that the protection of *all* biodiversity is essential to life.

Within New Zealand, plantation forests now provide almost all our wood needs. This will allow almost all the remaining indigenous forest of New Zealand to be protected from wood harvest. Plantation forestry is saving and enhancing our indigenous biodiversity, not reducing it.

A key factor that is often ignored in plantation forestry is the importance of attracting investment. That investment will only be forthcoming if plantation forestry has a proven record in growth, utilisation and marketing. Unproven or expensive plantation forestry will not be funded. The best means of protecting indigenous forest biodiversity will be to have profitable, proven plantation forestry such as our radiata pine.

INTRODUCTION

Just when we thought we were getting it right in modern plantation forestry we are being told we have got it all wrong. We are told, especially by today's environmentalists, that we do not care enough. Among other things, our environmental critics claim that:

- our planted forests are not natural;
- our plantations are biological deserts;
- they are not sustainable;
- we are not meeting our commitments to the 1992 Biodiversity Convention;
- we use too much water.

All these criticisms are often very poorly founded, and too simplistic. Very often they can be responsibly answered. However, in this paper I will follow only one. Of these environmental concerns I have chosen the criticism that plantation

forestry conflicts with the commitment to protect biodiversity.

THE BIODIVERSITY QUESTION

Biodiversity is about all the species of plants and animals in our total living environment. It is not limited to just forestry. If, as some preservationists claim, the maintenance of biodiversity in our forests is critical to human survival, then it must be just as important to protect *all* the biodiversity in nature. Forest biodiversity is only part of a much larger environment, the biosphere.

When we look at our total biodiversity we find that the human species is amazingly selective. Our 5.5 billion population has become incredibly efficient at controlling all biodiversity which in any way interferes with the human race. Almost all life-threatening major diseases have now been controlled. At least one, smallpox, has even been eliminated. If the protection of all biodiversity is critical for our survival, then we might have expected at least one environmental group to have vigorously opposed this deliberate elimination of a species. We now vaccinate our

population, and our pets and livestock, and have drugs that can reverse the course of most serious diseases. We now so control our environment that we even eliminate unwanted insects (mosquitoes, flies, lice etc.), and seek to control many species of mammals. Our comfort and convenience comes before any concerns about biodiversity.

We may genuinely believe that maximising global biodiversity is critical to our survival. However, when it comes to humans we have only survived in very large numbers, and enjoyed an unprecedented quality of living, because we have controlled all the biodiversity that in any way interferes with us or our enjoyment of life. No one today would seriously advocate a return to nature if that means putting biodiversity ahead of human needs. If we removed all biodiversity controls from agriculture, horticulture and public health, then, within a couple of generations, there would be hardly any of us left alive on earth. The lifestyle for these few would be most unpleasant.

To adequately feed earth's massive human population our agriculture has achieved unbelievable advances. Ten



Pine plantations have very high populations of both indigenous and introduced birds. This photo of nesting white-faced herons in a radiata pine tree testifies to this. (Photo by courtesy of Geoff Moon)

thousand years ago in the hunter/gatherer era, about 100 hectares of natural forest barely provided enough food to sustain one person with enough food over a year. It seems that, in the course of a year, the hunter/gatherer used about 200 food items (nuts, berries, fruits, shoots, leaves, roots, birds and animals). However, the edible portions of most plants were available for a short time – a few days to a month. Some plant material was inconvenient, took a great deal of preparation and was often far from appetising (e.g. fern roots). The huge advances in agricultural production have come from accessing the biodiversity of the whole world and selecting these species which are the most productive, most convenient, most desirable, and the most responsive to genetic improvement. Of equal importance is that a species selected for development must be very adaptable to domestication, (responsiveness to field management, and the ability to grow or survive on a wide range of sites). We have a major paradox. On the one hand we appear to have more choice than ever. The United Nations recently estimated that there were about 50,000 species of edible plants on earth. Yet, on the other hand, most of our food comes from just a few species. About 70% of all human food needs are supplied by just nine species of plants, one bird and three animals.

From the total biodiversity of the whole planet we have concentrated our food-producing efforts on the very few species which combine all the desirable characteristics. We also manipulate and control the growing conditions of our agriculture crops – we prepare the site, we control the competing weeds (which usually means removing all other species), we eliminate diseases and insects, we irrigate, and we fertilise. We also very strictly control the harvesting process and prevent deterioration in storage and subsequent distribution. We do much the same for our flower gardens, the plants in our parks and our pets.

When it comes then to biodiversity in all these categories (agriculture, horticulture, gardens, parks and pets) we are again very, very selective. We cannot tolerate any biological agent that in any way interferes with any aspect of those activities which society deems important or pleasurable. There is no way earth could currently support a global population of over 5.5 billion people, let alone with a lifestyle unprecedented in the history, if we did not have total control over all the biodiversity that affects either the human population or our food, fibre or personal needs and wants.

I'm not saying that we should ignore biodiversity issues, especially the loss of



Most plantations have been, and will be, established on pasture. Plantations have more biodiversity of both plants and birds than would be found on pasture. (Photo by courtesy of NZFRI.)

species. I'm simply questioning the reasoning of those who passionately and sincerely claim that when it comes to areas like forestry, maintenance of all biodiversity is absolutely crucial to human survival, but who would equally passionately and sincerely claim that we must do all we can to prevent an epidemic of the plague, cholera, influenza, childhood diseases etc. Very likely these same people would want control of any disease, insect or other agent that reduced harvest volume and quality, or storage life, of any food product. Very few, of course, see any contradiction in these propositions.

Little thought has been given to how we most efficiently achieve maximum biodiversity, or even what it is for. Many sincere people believe in it as an article of faith, a principle to be adopted universally and applied in all places, totally indiscriminately. This can only lead to hopelessly inefficient confusion of objectives. A solution to achieving maximum biodiversity may be the simple old-fashioned concept of zoning. We determine that some places will be optimised for the production of plant and animal crops, and other places will be set aside for protection (of biodiversity and other non-production values). The ratio of production area to protection area will be determined by society. Some societies have left it too late to decide. In Europe there is hardly a single hectare of unmodified forest remaining at the lower altitudes. So far as plantation forests are concerned, a key point not recognised by some opponents is that trees such as radiata pine are noth-

ing more than a long-term crop to be managed as efficiently and productively as possible. Any biodiversity gain on that crop site is an incidental bonus, secondary to the production of wood (this solution will be developed further later in this paper).

In truth, the whole biodiversity debate has become a farce. It is totally lacking in logic. Some even use the Biodiversity Convention to claim that in forestry we should only use indigenous species. If this thinking applies to forestry then on the same logic it must also apply to our agriculture, our flower gardens, our parks, and our pets. The 3.5 million New Zealanders would have a miserable existence. We would have virtually no animals to eat – a few birds and whales and seals (or maybe other human beings). We would have even fewer vegetables to eat – New Zealand spinach and celery and a few other unappetising plants, such as fern roots. Even puha, kumara and the Maori rat would be prohibited, because they too were introduced. We would have no pets other than a few birds. There would be very few flowers (even the Chatham Island forget-me-not is introduced to the New Zealand mainland). There would be no fruit trees and of course, no non-indigenous trees. It is really a ludicrous argument.

WOOD IS A MAJOR RAW MATERIAL

Globally we use as much wood as we do food. Wood is simply carbon dioxide plus water plus solar energy. These are combined to produce by nature the most ver-

satellite material we will ever have on earth. There is no wood substitute that is either as environmentally friendly as wood or as versatile. Globally, we still use more wood than the combined total use of cement, steel, plastic and aluminium. Yet wood requires 1/10th to 1/30th as much energy in its production and use as do wood substitutes (Koch 1992, Sutton 1993). If we really want to reduce the use of fossil fuel then the solution is obvious. Simply use more wood. It is difficult to imagine a sustainable world (with its huge population enjoying a high living standard) without wood (unless we have a major breakthrough on the energy front – like a friendlier form of nuclear energy). On the other hand a world economy based on wood is not only sustainable but is also very environmentally friendly.

Wood substitutes are not only significantly greater energy users but most involve processes which are not environmentally friendly. Mining and metal refining are considered by some to be environmentally unfriendly. Aluminium production is very energy intensive. Portland cement making is not only energy intensive but the process is a significant producer of fossil carbon. Limestone (calcium carbonate), which may have been formed up to 400 million years ago, is mixed with clay and heated to about 1500°C. The fossil carbon is released as carbon dioxide. When the Portland cement is eventually used in concrete making, atmospheric carbon dioxide is not reabsorbed. Setting concrete forms first an aluminate and finally a silicate. The released fossil carbon stays in the atmosphere.

The more wood we use, the less wood substitutes we will need. There is no environmentally acceptable alternative to the use of wood. The question then is: where will that wood come from? To some, especially those concerned about the environment, the use of indigenous forest for wood harvest is becoming less and less acceptable. Even where it is acceptable, wood extraction can be so restricted and so subject to regulation that any wood extracted will be expensive.

The New Zealand solution to this dilemma (which is a result of the Tasman and NZ Forest Accords) is to separate the production and protection functions of forestry. Wood production comes from deliberately created plantations (most of which are radiata pine). Plantations are nothing more than long-term crops, managed in an environmentally responsible manner. Forest protection, which includes all forest biodiversity, is provided by the proportionally large areas of protected indigenous forest that remain in New Zealand. It is totally unjust to claim, as

some critics have, that New Zealand's plantations are somehow breaking our commitment under the 1992 Biodiversity Convention. The reality is exactly the opposite. New Zealand's plantations are now protecting our forest biodiversity by providing an environmentally acceptable alternative source of wood. Increasingly they will allow our indigenous forests to remain free of wood harvest and so be protection forest. Production and protection are optimised, each on its own site. Any biodiversity gains on the production forest (plantations) are a temporary bonus.

If this simple concept of viewing a plantation forest as a crop on a designated site could be understood, it may clear the way to more intensive cultivation and silviculture of high-value, fast-growing New Zealand native species such as silver beech, kahikatea, and kauri. At the moment, excessive claims as to protecting all things native make such a project too risky. Twenty years hence a campaign may be mounted to "protect" what started off as a commercial investment. So far we have fudged this issue by assuming all plantation crops will be introduced species, but it does not require much imagination to see that inclusion of some native species in the portfolio of cropping species will further enhance total biodiversity gains for the country. Much of the rest of the world uses indigenous species for wood production in plantations. We must be allowed to also do the same in New Zealand. For the reasons that I discuss next the areas of plantations of indigenous tree species will be small.

THE CAPITAL NATURE OF FORESTRY

Before concluding, I want to discuss a very important key issue which very few fully appreciate (and that includes some in the forestry sector). That is the capital-intensive nature of plantation forestry. Planted forests are not only expensive, but most of that expense occurs early in the life of a stand. However, the investment provides little or no return until the stand has been felled and sold 25 years (or longer) after planting. I find it hard to understand that this most important factor is very often ignored.

Attracting large sums of private money for investment in plantation forestry is very difficult. However, if a good case can be made, it is possible. Investors are only interested if there is a proven record as well as well-founded predictions of future costs, yields and markets. Forestry schemes around the world will fail to even get started because they are unable to attract the necessary finance. Governments, because of other social demands, are becoming less and less able to provide

the hundreds of billions of dollars that will be required globally for the wood supply plantations of the future. Private investors, on the other hand, will need predictability, low risk, and good returns before they will invest. To date this very important factor has been very largely ignored in the global forestry debate. As one who has been involved in this process of attracting capital for plantation investment, I am fully aware that it is almost impossible to attract investors if all one has is an unproven, untried (and expensive) vision of what might be grown, utilised and marketed. New Zealand's experience with radiata pine has shown it to be a versatile species of high productivity which can be profitable.

If the timber needs of an ever-increasing world population are to be met, plantations will increasingly require huge amounts of capital. That capital will come from neither Governments nor the environmental movement. Increasingly that money will come from institutional investors. It will only go to those plantation ventures that offer good returns with relatively low risks. The assessment of risk will be largely based on the historical track record of the species and proven experience of the promoter in growing, harvesting and marketing. Without both a proven record and the prospect of good returns, little or no investment money will be forthcoming. The least attractive investment option in New Zealand is unproven management of a slow-growing indigenous forest.

CONCLUSIONS

It is illogical, unjust and totally unfounded to claim that our plantations are breaking New Zealand's commitments under the 1992 Biodiversity Convention. That Convention conveniently ignores the fact that the human survival, with its unprecedented lifestyle, is dependent on the total control and manipulation (and even the elimination) of any biodiversity which affects humans, their plant and animal crops, their flowers, their parks and even their pets.

In New Zealand, the ability of plantations to now provide almost all our wood needs has almost eliminated the need to harvest wood from our indigenous forests. Our indigenous forests are now mostly protected. Since that protection should mean biodiversity protection, it can be argued that our plantations have saved biodiversity rather than the opposite.

Continued plantation investment is very much dependent on the attractiveness of that investment. Unproven and low-profitability forest management practices in both plantations and indigenous forests will not attract funding.

There are global implications of the New Zealand experience. Advocacy of wood-producing plantations reduces the need for wood harvests from the world's remaining indigenous forest. This reduces threats to the world's forest diversity.

We should be justly proud of our plantation management. We should be especially proud of its contribution to the New Zealand economy, to employment, to the environment and to the protection of forest biodiversity.

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Plantations and the promotion of sustainability

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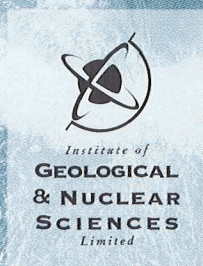
We feel more often these days the pressures to exploit the notion of sustainability of our plantation forests as a marketing advantage in overseas or even domestic markets. This is evident in product brand names (EcoPly) or statements about products from New Zealand's radiata pine resource. The essence of the sustainability argument is to compare the trend in New Zealand's plantation wood supply with the wood supply trends of North America or tropical Asia. In contrast to New Zealand's growing plantation resource, these other regions are often undergoing reductions in timber supply due to overcutting, poor logging or regeneration practices, or environment with-

drawals of land. The trend in wood supply is thus linked to some notion of sustainability of forest utilisation.

In a forestry context, this notion of sustainability is typical. Sustainability is associated with harvesting the mean annual increment (MAI) of a 'forest' or determining an annual allowable cut (AAC) which can be carried out in perpetuity. In other words, there is some aggregation of forested areas, which collectively is called a forest, and is treated as a capital asset. The forest asset yields an annual interest payment in the form of a harvest. As long as the principal is preserved, or there is no over-cutting and adequate reforestation, the interest payment, or harvest, is sustainable. Promotion of New Zealand's growing forest estate as a measure of sustainable forestry fits into this traditional view of forest sustainability.

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