

# Representative areas: Research needs of indigenous forestry

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## 1. Introduction

This workshop is timely, given that research is essential to developing truly sustainable production forest management. While our input today is from the biodiversity protection perspective, we acknowledge that sustainability has three components: ecological, economic, and social. These three components need to be thoroughly addressed in any real attempt to achieve sustainability.

What are the criteria for setting aside representative areas? The Forests Act (1949) (second schedule, s10 (2)(a)) states that *an area that is representative of the forest area and does not exceed 20 percent of the total forest area may be set aside and be unavailable for logging.*

Firstly we address the concept and history of representativeness and why it has been considered an important strategy for conservation. Then we will outline criteria for identifying representative areas, and finally look at its potential role in sustainably managed forests.

## 2. Concept and history

Identifying and protecting areas that are representative of the range of plants, animals, and ecosystems existing has been a fundamental goal of nature conservation advocates for at least 30 to 40 years. The aim, internationally and in New Zealand, has been to protect a viable network of protected areas. This is embodied in our Reserves Act (1977), which requires the protection of areas which in the whole are representative of New Zealand's original natural character.

Representativeness has not always been the driving force of protecting areas. Indeed, in the past, land developers set aside areas that appealed to them (or, we might add, were too difficult to clear), and many of these are now our Scenic Reserves. Successive Governments also protected National Parks which were notable for their outstanding scenery, but also notable for not being areas considered suitable for development and production.

We suspect that the view that conservation (or to use common jargon, the protection of biodiversity) was in conflict with natural resource use led to the either/or land use approach - either setting aside areas for conservation or using them for production.

There is a new paradigm in the world now, that of sustainability. This paradigm still acknowledges that people require the use of natural resources, for economic or social purposes. But it also acknowledges that these natural resources have an ecological value, and must be managed in ways that allow them to meet the needs of future generations. This we believe is the essence of sustainability.

### 3. Criteria for identifying representative areas

Representativeness is not a directly measurable ecological parameter, but rather a composite of several measures. These include:

- a biogeographical classification of a country or region, to define discrete areas or landscapes assumed to be internally homogeneous at the scale used, or to have similar repeating patterns of natural diversity (Margules & Usher 1984);
- the extent (area or proportion) of elements of natural diversity in the original natural landscape and how much each has been reduced - where the original natural landscape cannot be identified this, less preferably, may be a percentage of their extent in the present landscape (O'Connor *et al.* 1990);
- the degree to which each species, ecological community, or natural feature is represented in protected natural areas, as a percentage of its extent in reserves and in the original natural landscape (Allen 1978);
- a comparison of the quality of representative sites with one another (e.g. poor, typical, exemplary etc.) (Myers *et al.* 1987).

A process for identifying representative areas can be found in O'Connor *et al.* (1990) *Land evaluation for nature conservation*. This process uses a combination of the following:

- Biogeographical classification. This has already been done for New Zealand, in the form of 268 Ecological Districts identified on the basis of distinct physical and ecological characteristics (McEwen 1987, *Ecological Regions and Districts of New Zealand*).
- Ecological classification and survey. This establishes patterns of plant community distribution based on major environmental gradients.
- Evaluation using ranking or threshold criteria. In this each ecosystem or other feature of natural diversity is listed and ranked. Similar ecosystems are grouped and ranked together. This allows the "best" examples, or those not meeting minimum criteria, to be identified.

- More recently, overseas workers have sought to develop more systematic algorithms for ensuring that natural features (typically species) are fully protected in future protected natural areas. A lack of adequate large-scale data sets would appear to preclude the use of these methods in New Zealand at the present time.

## 4. Role of representativeness in sustainably managed forests

The Forest Amendment Act is prescriptive in all but the provision for setting aside representative areas of forest. This provision states that representative areas may be set aside to be unavailable for logging. The emphasis is on *may*.

Because in practice representativeness is assessed on the basis of what is represented in adjoining or adjacent protected areas, in some instances it may not be necessary to set aside *representative* areas. However, the Department of Conservation will assess each application on its merits, and strongly advocate for the protection of representative areas where necessary.

This is not to say that it is not necessary to set aside some areas from logging within a sustainably managed forest, even if representative areas are not required. In designing ecologically sustainable management regimes we believe that there needs to be a focus on the maintenance of the forest's structure, composition, and ecological processes.

Therefore setting aside key *functional* areas within the forest landscape may be necessary. These areas may play a key role in the functioning of the ecosystem. Riparian zones, interior habitats, and buffers with other protected areas, are examples that come to mind. It may also be necessary to protect "benchmark" areas, that is, areas against which change in the managed forest can be monitored.

As an example, we are aware that Timberlands on the West Coast have made provisions within their beech scheme plans to not log emergent podocarps because of their role in the functioning of the forest ecosystem. This is laudable and, we believe, a step in the right direction.

Recent ecological theory suggests that some habitats act as sinks and others as sources for species within the landscape. This needs to be explored in the context of ensuring functioning ecosystems.

This leads us to some suggestions for research.

1. It seems that we need a better understanding of the key functional components in our range of forest ecosystems, that is, the components essential to maintaining viable ecosystems and species diversity.

2. What are the natural processes in our forest ecosystems? For example, we may be on the road to ecologically sustainable use if we mimic the disturbance regimes. Of course this will need to be tested.
3. Following from this is a need to understand the spatial and temporal scale at which forest ecosystem processes occur.
4. Our last suggestion for research is laterally related to forestry, and does not include log extraction, but the other products that a sustainably managed forest could produce: fruit, fibre, natural medicines.

## 5. Conclusion

In this brief presentation we have gone beyond merely giving criteria by which we can assess representative areas in sustainably managed forests. Representative areas do have an important role to play in maintaining viable ecosystems and ensuring that we do not lose more of the natural indigenous character than we already have.

We believe that we now have an opportunity to move beyond the either/or dichotomy of use or protection. Where forests are allocated for sustainable use, then the challenge is to maintain viable ecosystems. We do believe that the setting aside of functionally important areas in these forests is likely to be necessary in developing truly ecologically sustainable forestry, and wish to see scientists rise to meet this challenge.

## 6. Acknowledgements

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