



## New RMA implications for prospective high-country foresters\*

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### Introduction

Most New Zealanders involved in land-use management are well aware of the RMA (1991) and its focused concern for the sustainable management of natural and physical resources. It is a relatively new Act and, to date, it appears that more has been written by the legal and administrative academics on its interpretation and planning implications (e.g. Fisher 1992; Harris 1993; Perkins and Memon 1993), than on its implications for practical land-use. Suffice it to say that, from a landowner's point of view, gone are the days when they could make land-use decisions based primarily on owner self-interest.

Responsibility for the implementation of the RMA is largely devolved to regional and territorial authorities (Sections 6 and 7, RMA 1991). Regional and district plans are the local expression of the RMA and aim to produce sustainable land use at those levels. Within a plan, activities may be classed in one of five categories: permitted, controlled, discretionary, non-complying and prohibited. In the high country, and indeed in most extensively-grazed rangelands which have traditionally been used for pastoral purposes, forestry is most frequently classed as a controlled or discretionary activity, which means that a resource consent (RC) from the council is likely to be required before any planting can take place. Depending on the perceived level of adverse effect, a council may require the consent application to be notified by means of a newspaper advertisement. This leads to a statutory process which may involve a hearing.

An RC must include an assessment of any (if an unrestricted discretionary activity) or only specified (if a controlled or restricted discretionary activity) actual or potential effects that the activity may have on the environment, and the ways in which any adverse effects may be avoided, remedied or mitigated. This paper deals with the topics and costs likely to be part of an RC application procedure, using experience gained from two 'test-case' applications. Both of these were notified and hearings were held.

### Case Studies - Lake Hill and Balmoral

#### Lake Hill

This 500 ha block of land is situated near Lake Coleridge in inland Canterbury. The dominant cover is unimproved natural short tussock grassland. The area also contains patches of indigenous tall red tussock and shrublands, and a wetland identified as a Recommended Area for Protection (RAP) by the Department of Conservation (DOC). Grazing by sheep and cattle has been the

only land use since settlement over 100 years ago. The owners applied to establish 180 ha of commercial forestry primarily for investment reasons.

Lake Hill lies close to the eastern margin of the Rural C (high country) zone of Selwyn District. In this zone commercial forestry is treated as a discretionary activity, and an RC is required before any planting can proceed.

#### Balmoral

Balmoral Station is a high-country farm of 9600 ha situated in the Mackenzie Basin near Lake Tekapo. As with Lake Hill, the dominant cover is depleted, unimproved tussock/ *Hieracium* grassland, and income is earned primarily from the grazing of sheep and deer, with some arable cropping. Permission was sought for forestry on approximately 1300 ha, an area of glacial moraine and fault block landforms containing a small percentage of red tussock, wetlands and riparian strips, but no identified significant sites for conservation. The owners, Andrew and Karen Simpson, are well aware of the declining profitability of pastoralism. An extract from their consent application reads: "Many farmers feel that unless they diversify into alternative forms of land use, their properties will not remain viable units. As owners of Balmoral, we share these fears for the future, and feel that forestry offers one of the best options for reversing our eroding financial position."

Balmoral Station lies in the Rural 1 zone of the Mackenzie District. Commercial forestry is treated as a discretionary activity, which requires an RC before any planting can proceed.

### Major Resource Consent Considerations

The major aspects currently addressed by any applicant for an RC application are listed in Table 1.

#### RMA Considerations

##### Conservation

In any RC application where there are conservation values which may be threatened, the applicant should consult a professional ecologist or flora / fauna expert. In addition, district councils may consider DOC to be a potentially adversely affected party, which should be consulted.

- (i) Flora and fauna. Although not all the high country has been surveyed, many significant areas of indigenous vegetation or fauna habitat have been identified by the DOC in RAPs, Sites of Special Wildlife Interest (SSWIs) and published and unpublished reports. Councils sometimes recognise these and other sites of their own selection as Sites of Natural Significance. These are usually marked on maps which are included in District Plans. Planting is unlikely to be permitted within any significant site, and conditions are also likely to be imposed on planting on adjacent land, particularly upwind to decrease risk of invasion by wildings from wind-blown seed. If the proposed planting area involves wetlands or riparian areas, an assessment of

\* This article is an abbreviated version of a paper entitled "Gaining consent for new plantations in New Zealand's high country" presented by Nick Ledgard, Bruce Arnold (DOC) and Andrew Simpson ('Balmoral' Station, Tekapo) at the ANZIF conference held in Canberra in April, 1997. It is based on experience gained by the authors in two 1996 'test case' resource consent applications for forestry in the Canterbury high country.

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**Table 1.**  
**Major aspects to be addressed in a Resource Consent application**

Impact fields	Impact on:	Assessed by:	Importance
<b>RMA</b>			
Conservation	Indigenous flora and fauna, wetlands, soil degradation and loss	Expert report by ecologist / botanist	High - especially if RAP/SSWI involved
Landscape	Currently accepted landscape values, plantation/woodlot appearance	Professional report/plan	High
Water resource	Quantity, quality, current usage, fish habitat	Expert report	Medium - often not needed
Wilding spread	Landscape and conservation values, land-use opportunities	Spread risk assessment sheet. Expert report and management/control plan	High - poor Council knowledge base
Ngai Tahu	Culture, traditions/ancestral values, food sources	Consultation with local iwi (sub-tribe)	Medium - often overlooked
Socio-economic	Income, jobs, recreational opportunities	Consulting references	Not high priority to most Councils
<b>MANAGEMENT</b>	Silviculture, fire, roading / tracking, harvesting		

**Table 2.**  
**Resource Consent Procedure (Legislative requirements are bolded. Extra steps recommended by the authors are italicised)**

Procedural steps	Council timeframe
<b>Consultation</b>	
<i>Consult Council re: application content and likely affected people/parties</i>	
<i>Obtain professional landscape opinion for whole farm or topographic area (with neighbours)</i>	
<i>Contact forestry consultant (if no experience in this area). Draft forest establishment/management options</i>	
<i>Identify interested/affected parties, the most important of which are likely to involve:</i>	
<ul style="list-style-type: none"> <li>a) <i>conservation issues</i> <ul style="list-style-type: none"> <li>– <i>obtain ecologist/botanist report if necessary</i></li> <li>– <i>obtain hydrologist report if required</i></li> </ul> </li> <li>b) <i>wilding spread risk</i> <ul style="list-style-type: none"> <li>– <i>obtain professional opinion if risk high</i></li> </ul> </li> </ul>	
<i>Consult local iwi re Maori values</i>	
<i>Have draft application checked by solicitor</i>	
<b>Write and send Resource Consent application to Council</b>	Council response to applicant usually within five working days. If insufficient detail, procedure stops, or stalls until more information supplied.
<b>Council decides if Consent requires notification</b>	If not notified, council decision within 20 working days
<b>Council notifies application, seeking submissions</b>	Within 10 working days of receiving complete application
<b>Submissions close</b>	Within 20 working days
<i>Council may arrange for pre-hearing meeting with major submitters</i>	
<b>Hearing of resource consent application</b>	Within 25 working days
<b>Council's decision</b>	Within 15 working days
<b>Appeal to Environment Court</b>	Within 15 working days
<b>Environment Court decision</b>	Commonly 6-12 months after appeal lodged

the effect of any adjacent planting on water quantity could be requested. This was the case at Lake Hill, where a hydrologist's report was requested to assess the likelihood of the trees affecting the water flow through an adjacent wetland.

- (ii) Soil degradation and erosion are major issues in the high country. On the positive side, forests insulate soils from erosion and there is evidence that they can improve the structure and increase the available nutrient status of some high-country soils (Davis 1991). Adverse effects can occur during harvesting and where tracking or roading is required on steeper slopes. These issues are usually addressed in the forest management and/or harvesting plans, and do not normally require specialist attention at the consent application stage.

These two conservation issues are not solely related to forestry and should be considered in any major land-use change.

#### *Landscape*

In the high-country tussock grasslands commercial forestry has the potential to significantly alter existing landscape values, the most obvious impact being visual (Ministry of Forestry 1994). Tourism and recreation are major income earners for the area and councils view the landscape aspects of land use very seriously. Therefore, it is unlikely that any council will accept any reasonably large forestry proposal without the input of a professional landscape architect. Professionals were employed at both Lake Hill and Balmoral. A proper landscape assessment should involve more than just assessing visual impact of the proposed planting site. It should also identify how the site fits into and contributes to the values of its wider landscape context, and should assess the broader implications of the planting proposal.

#### *Water Resource*

Plantations of introduced conifers can significantly reduce water yield from formerly non-forested catchments (Fahey 1994). Therefore, in the high country, this is another sensitive issue in an environment which can get very dry. However, most high-country water is derived from rain or snow falling at high altitudes or in the Southern Alps where no commercial forestry will ever be practised. Therefore, water yield is only likely to be an issue in certain situations, as for example where whole (or large proportions of) small catchments are to be planted. It would also be an issue if wetlands or riparian conservation values are threatened. In contentious cases, a hydrologist may need to be consulted (as in the Lake Hill case study), but in most instances compromise can be reached with recreation and conservation groups by not planting too close to waterways or seepage areas.

#### *Wilding Spread*

Wilding spread, or the natural regeneration of introduced trees, is of concern to many rangeland managers and administrators. In the South Island hill and high country the major plantation species are Douglas-fir (*Pseudotsuga menziesii*), and Corsican, ponderosa and radiata pine (*Pinus nigra*, *P. ponderosa* and *P. radiata* respectively), the first two of which will spread readily in lightly-grazed tussock grasslands. There are many instances where wilding spread is considered a problem (Belton and Ledgard 1991) in that it is altering landscapes and lowering conservation and grazing values. Prospective tree planters can assess the risk of wilding spread by using a spread risk assessment sheet (Ledgard 1994). However, except where plantations will be surrounded by improved pasture which is regularly mob stocked by sheep (which reduces the risk of spread), it is likely that most councils will require a professional assessment and report accompanied by a control strategy. Both were supplied for Lake Hill and Balmoral, and in both cases the final council decisions con-

tained stronger conditions on the management of wilding spread than any other environmental effect.

#### *Maori (Ngai Tahu) Issues*

Councils are required by the RMA to take into account the Treaty of Waitangi and any relationships between local Maori and the proposed plantation site. In the high country the local tribe is the Ngai Tahu. Their links with high-country sites are generally poorly known, and can often only be uncovered by direct consultation with local iwi (or tribe). Good responsive consultation should satisfy any concerns of iwi. Most landowners and forestry developers are happy to protect Maori values, once they are aware of their existence.

#### *Socio-economic Issues*

The 'Purposes' of the RMA include a reference (Section 5(2)) to 'provide for social, economic and cultural wellbeing of people and communities'. However, the Environment Court has interpreted this section as being conditional to the 'environmental bottom lines' being met. In the Lake Hill and Balmoral RC applications, the implications of the proposal on farm income, recreation potential, and local, district and regional job prospects were assessed but they attracted no comment in the final decision of the District council.

#### **The Resource Consent Procedure**

Table 2 outlines the RC procedure which applicants and councils are obliged to follow, plus the steps which the authors recommend to maximise the chance of a successful application. At this stage it is important to introduce an approach to gaining an RC which has many advantages, not the least being to make the whole procedure less costly relative to area of forest under consideration. *An application should endeavour to gain consent for not just one plantation, woodlot or shelterbelt, but for the sympathetic environmental integration of trees over the whole property, or even a group of properties.* Although most RCs require the activity to be completed within two years, it is possible to obtain consent for a land use to be initiated within two years, but completed over an extended period (as was the case at Balmoral).

#### ***Preparation before a Resource Consent Application to Council***

The key element here is *consultation* with all parties likely to be affected by the proposal. If consultation is done completely, the council may decide that notification is not warranted (in cases where it is not obligatory). Full and effective consultation will also mean fewer submissions and less time and money spent on consultants, hearings and council decision-making. Prior to beginning consultation it is wise to obtain an understanding with a council on application content and the people or parties likely to be affected.

Table 2 indicates that it may be wiser to consider landscape / environmental impacts concurrently with, or even ahead of, those involving technical forestry aspects. The main reason for this is not only because landscaping is a critical consideration in high-country forestry, but also because a good landscape professional would also consider the broader (not detailed) context, covering possible environmental impacts on conservation values, water resources and wilding spread – the overall objective being the sympathetic integration of all trees with other land uses and with the topography and environment generally. This was the approach taken by the landscape professional employed at Balmoral.

Once the basic outline of a holistic landscape assessment (with all acceptable tree sites clearly shown) has been drafted (but before its final presentation), more details on conservation, wilding risk, hydrological and Maori values should be gathered – if

appropriate.

All the above investigations should take place before any RC application for council consideration is drawn up. This may appear rather involved, but these steps are likely to be considered essential by most councils, and it is best to explore them early on, before the council expenses and probably those of a solicitor are involved. The process can be terminated at any stage if indications are that environmental effects may be unacceptable. If termination comes after the landscape and conservation input, the expense may not be wasted as these aspects will probably need attention in the course of other farm development in the future.

At Lake Hill and Balmoral not all this preparation was carried out prior to the application stage. However, their need was soon highlighted by submissions, and they had to be undertaken in a rush at probably greater cost, before the Hearing stage could be successfully negotiated.

### ***Application and Public Notification***

Most councils have forms or layouts which should be followed in any RC application. The application should be checked by the applicant's solicitor prior to sending to the council, although experience has shown that such legal (and potentially expensive) input is not vital. If it is considered that there is insufficient detail, more information will be requested. Once the application is complete, it will be formally received and acknowledged by the council. If public notification is required, an advertisement with an invitation for submissions will be placed in a major newspaper within 10 working days of acceptance.

### ***Submissions***

After public notification, submissions will be accepted by the council for a period of 20 working days. For Lake Hill and Balmoral, submissions of support were received from local landowners and community groups (no local people objected), and the Ministry of Forestry. Submissions expressing concern were received from the Department of Conservation, Electricity Corporation of NZ, Canterbury Regional Council, Royal Forest and Bird Protection Society of NZ, NZ Defence Force (an army training camp and grounds sits alongside Balmoral), Federated Mountain Clubs of NZ, North Canterbury Conservation Board, NZ Institute of Landscape Architects and the Christchurch Environment Centre. The major concerns focused on wilding spread, loss of conservation (particularly wetland and riparian) and landscape values, decline in water yield, and fire risk.

### ***Hearings***

A hearing before a panel of the councillors, or occasionally before an independent commissioner, is part of the statutory RC procedure where submissions have been received. Where there has been no notification or submissions received, councils can arrive at a decision without a formal hearing. Hearings are structured to hear cases for and against the application, mainly for the benefit of the adjudicating council members. They are not structured or timed (being too late) to assist with reaching compromise between the applicant and objectors.

In the ideal situation, as mentioned above, compromise should have been reached before the application was submitted, but in many cases areas of disagreement may only be exposed through submissions. Even then, some degree of compromise is usually possible, and it is worthwhile to hold an informal meeting between all affected parties prior to the formal hearing. Such a meeting is sometimes called a pre-hearing meeting (Section 99, RMA 1991), and is usually chaired by a council member. At this meeting objectors are encouraged to discuss differences with the applicant and his/her advisers so that all parties can better understand each others' perspective, and perhaps reach a compromise agreement. It is vital that it be well chaired with this objective

firmly in mind.

The process by which an RC application can be amended to include compromise reached in a pre-hearing meeting has yet to be clarified. The present system of revealing compromises at the formal hearing is unsatisfactory, because for many of those present, they are being heard for the first time and there is little chance for clarification or further minor amendment. Pre-hearing meetings were held as part of both the Lake Hill and Balmoral proceedings and were essential for reaching the compromises which the Council was eventually prepared to approve. If unanimous agreement is reached at a pre-hearing meeting, a council may adopt this as its decision without recourse to a full hearing. Pre-hearing meetings should be an integral part of all RC application procedures.

### ***Costs***

If any article on any topic does not wish to become out-of-date quickly, then it should not discuss economics. For this reason, the author hesitated to discuss costs involved in RC applications to date. It is inevitable that these will change considerably, probably in the near future. However, as excessive costs are probably the most daunting aspect of the RC application procedure described above, the topic cannot be avoided. Total costs, estimated from the basic procedures followed at Lake Hill and Balmoral, are likely to range between \$17,000 and \$25,000, with the majority of these (over 70%) going to landscape and forestry consultants and the district council. They do not include compensation for the applicant's time, or any charges from DOC.

### ***Case Study Decisions***

Both the Lake Hill and Balmoral RC applications were successful, but not before considerable involvement with consultants and discussion with objectors. These negotiations resulted in significant reductions in the area actually approved for planting. At Lake Hill, the area approved dropped by 56% to 80 ha (original application was for 180 ha), while at Balmoral approval was given for 900 ha (69%) of the original application for 1300 ha. Landscape and conservation considerations were the major reasons for the reductions in area. The approvals were given subject to a number of conditions. These dealt mainly with adherence to agreed landscape design, planting area, wilding control strategies and tracking/roading conditions. At Balmoral, notice of intent to harvest plus a harvesting plan was required three years prior to harvesting. At both sites councils reserved the right to annually review the consents and any conditions attached, in order to deal with any adverse effects on the environment, in particular with respect to the spread of wilding trees.

### ***Conclusion***

There is little doubt that appropriately located and designed commercial farm forestry has an important role to play in the future sustainable management of the high country. Farmers must diversify their income if they are to remain as viable and efficient custodians of this unique part of New Zealand – as Hughes (1991) pointed out, sustainable land use cannot be achieved if the communities and people responsible for land management are not themselves sustainable. Forestry is seen by many as one of the very few practical land-use options available to those living in the high country (Hughes 1991; Martin 1994; O'Connor 1994). However, a decision to commit finance to growing forest trees has always been difficult to make, mainly due to the large gap (20–40 years in the high country) between initial investment and return. There is a perception that a further hurdle has been placed in the path of the forest investor. Although few would deny that proper environmental impact assessments are essential for wise land-use management (and that reasonable costs must be anticipated for such assessments), the costs incurred to date could well

be seen as too great for some land owners and managers in the high country.

The Resource Management Act has been the target of much criticism and praise since it came into law in 1991. It is acknowledged that it is new far-reaching legislation, which has most people struggling to come to terms with what is required and how it is to be achieved. The reality is that a huge implementation task has been placed with regional and district councils, and that first-up cases testing its meaning are likely to be more time-consuming and expensive than in the future. These test cases will have a major influence on future RC land-use decisions, which, in turn, should be less costly once the ground rules are clearer.

Suggestions have been made for reducing the time and costs presently involved in gaining an RC for forestry. These involve early recognition of the need to meet environmental concerns, seeking long-term approval for integrating forestry over whole farms or groups of farms, and considerate consultation between all affected parties. In this way just one RC application may be needed for all planting, costs can often be shared, problem areas can be identified at the outset, and compromise can be more readily attained. The consequence should be less discord, lower individual costs and better overall environmental outcomes.

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# Development of a large-scale, aerial photography technique to assess the severity of Upper Mid-Crown Yellowing (UMCY) in *Pinus radiata* trees

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## ABSTRACT

A number of photographic variables were evaluated for assessing Upper Mid-Crown Yellowing in *Pinus radiata* D. Don trees. These included comparing: vertical and oblique photography, several image scales, different camera look-angles, two film types, various light conditions, mono versus stereo imagery and fixed wing versus helicopter camera platforms.

As a result of this work, a technique has been developed and used operationally for surveying the extent and severity of UMCY in several forests. The method is based upon colour, oblique stereo photography taken from a helicopter flying at approximately 100 m above the canopy. A Global Positioning System (GPS) is used to navigate to the photo-site and a radar altimeter for determining the required flying height.

A methodology was also developed to quantify the severity of UMCY, when viewed on the stereo-photographs. This involves assessing approximately 30 trees per stereopair using a four-point classification. The results obtained are converted to a compound value for each photo-site which can be used to map the

distribution of UMCY throughout a compartment or forest.

The methodologies described could have application for assessing other disorders in tree crowns.

## KEYWORDS

Aerial photography; Forest health assessment; GPS; *Pinus radiata*; Upper Mid-Crown Yellowing.

## INTRODUCTION

The symptoms of UMCY vary from yellowing of needles in the upper section of the crown, to premature needle loss. They can include twig die-back and, in severe cases, branch death. This disorder affects many stands of *Pinus radiata* in New Zealand and is thought to be related to a nutritional imbalance (Beets, Payn & Jokela, 1993). Although the severity of a tree's UMCY symptoms can be assessed by an observer standing on the ground (Beets *et al.*, 1991), this approach becomes impractical when undergrowth restricts movement, when the canopy is closed or when the information is required on a forest scale. For these situations, use of aerial photography is more appropriate because it can provide high resolution images using proven technology and many sites can be visited in a short space of time.

## OBJECTIVES

The objective of this study was to develop a practical remote

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