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Change in the high country: Environmental stewardship and tenure review

April 2009



Parliamentary Commissioner for the **Environment** Te Kaitiaki Taiao a Te Whare Pāremata

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Preface

The high country of the South Island is a special place. As a teenager I kayaked on Lake Heron, and can still recall the silence. Many New Zealanders feel a similarly strong emotional pull from those great mountain valleys and basins.

For many decades most of the high country has been leased by the Crown to farmers who have chiefly run merino sheep on the land. Over recent years, many of these leases have been terminated in the process called 'tenure review'. In almost all cases, this has resulted in a splitting of the leased land into productive land owned by the former lessee, and conservation land still owned by the Crown but managed by the Department of Conservation (DoC).

An investigation into the outcomes and process of high country tenure review has resulted in this independent report to Parliament. Although many aspects of tenure review are controversial, the report is focused on environmental issues, not on legal and financial issues. The last section contains several recommendations to Ministers.

A major driver for tenure review is that the continuing economic viability of high country pastoral farming has become marginal on many properties and the pressure is on to diversify. Tourism has become increasingly important and is linked into the marketing of the fine merino wool clip. It seems that the pastoral legacy and the image of the sheep have become more important economically than the wool from the sheep.

Although review of the high country pastoral leases was widely supported in the early 1990s, this is no longer the case. The positions of different groups are strongly polarised, and battle lines have been drawn across the land and between the people and groups trying to manage it. Publishing opinions on tenure review has led to verbal attacks, calls for professional sanctions and physical threats. Debates in the media have been heated. Farmers report being abused by members of the public. Ngāi Tahu report racial tension, abuse, threats to significant Maori sites, and denial of tangata whenua access to sites in tenure review.

The objectives and process governing reviews of leasehold properties were formalised in the Crown Pastoral Land Act in 1998, although the underlying 'philosophy' is that of the reforms of the late 1980s and early 1990s. During that era, one guiding principle was that the state should not be involved in production that can be undertaken by the private sector. It followed that publicly owned farmland and forests should be split into privately owned production land and publicly owned land to be used for conservation and recreation.

The dissolution of high country leases can be seen as a last stage of this land reform. Two of the government agencies created during the reform era play the central roles in the review of the leases. Land Information New Zealand (LINZ) runs the process, and DoC advises on individual reviews and takes over the management of the land retained by the Crown. Almost a quarter of the leasehold properties have been through the tenure review process.

While the logic of single use and clear ownership is appealing, it became clear during this investigation that its application to the high country is challenging and that the simple 'split model' is leading to some problematic outcomes. For instance, land that is of marginal value for production is not necessarily of particular value for conservation and recreation, but ends up by default in DoC management.

It is significant that in 2005 the Government confirmed its willingness to remain a high country lessor indefinitely.

Much of the controversy around tenure review is focused on property rights and the accompanying financial issues. Tenure review was originally expected to be fiscally neutral for the Crown, but the reality has been very different. The valuation method used by LINZ also has implications for setting rents on land still in leasehold.

These financial issues are outside the scope of this investigation which is centred on the public interest in the natural environment: biodiversity, landscape, soil conservation, replenishment of aquifers and streams, and water quality. The public interest in the natural environment has strong connections with economic and social dimensions, such as agriculture, tourism, recreation and access.

Public concerns have mainly focused on three issues: loss of lower altitude ecosystems, impact on landscapes, and public access to the high country. On becoming Minister of Land Information in 2006, Hon David Parker responded to these concerns by pulling lakeside leasehold properties out of the tenure review process and requiring Ministerial approval of reviews near completion. And over time in response to Cabinet direction, both LINZ and DoC have become more skilled in delivering better environmental outcomes from tenure reviews.

The concern about the preservation of lower altitude ecosystems follows from tenure reviews resulting in only a small amount of lower altitude land being denoted as conservation land. The opportunity to preserve whole altitude sequences has generally not been taken. Any remaining indigenous biodiversity at lower altitudes is likely to disappear under intensified production. Short of creating yet more high country parks that span a wide altitude range, the way ahead would be to place remaining patches of biodiversity under covenants when privatising productive land.

There are (at least) two concerns about the impact of tenure review on high country landscapes.

One concern comes from the potential division of privatised land into residential sections and lifestyle blocks, and its effect on lake views in particular. This is largely a 'bolted horse' issue, since a directive from Cabinet in 2007 required lakeside properties to be withdrawn from tenure review unless the Crown retained land close to the lakes or there were controls on development. LINZ now exerts much more control over this. It is worth noting that houses can be screened by trees, painted to blend in with the landscape, and even demolished, and so the environmental impact may be able to be mitigated. As always, the devil is in the detail.

The other main landscape concern is the visual effect of straight horizontal lines separating green fertilised private land and brown DoC land. This occurs because altitude is a simple way of distinguishing between productive and non-productive land. However, some altitude shifts are natural, for example, the tree line. Vertical lines predating tenure review separating forest from grassland seem more intrusive, at least to my eyes. And wilding conifers dotted around like an unshaven chin and wandering above the treeline are surely a larger visual offence.

The potential loss of public access is the third concern. Fish and Game New Zealand have been significantly involved in individual property reviews, and so this concern has been systematically addressed.

I am more concerned about some other environmental issues.

The first is water quality. Increased production on newly privatised waterside land must lead to increased concentrations of phosphate and nitrate in water. The clarity of the high country lakes should not be taken for granted.

The second is the spread of weeds: broom, gorse, briar, lupins and conifers. The high country is on a trajectory back toward woody species. A slow advance of scrubland and even beech forests in limited areas can occur, but a general return to the original indigenous species is not feasible.

Many of those anxious about the impacts of tenure review are concerned about its incremental nature, namely that it is a change in the ownership and use of a huge amount of Crown land that is happening without oversight or strategic direction. This concern is valid. For this and for other reasons I have recommended the creation of a High Country Commission.

I am aware that the timing of a recommendation to form a new government agency could scarcely be worse. Yet the cost of such a body would be small compared with the expenditure Government has already made on tenure review. And such a Commission could be given a limited lifetime to accomplish a set of clear tasks.

A High Country Commission would provide a locus for the many diverse interests in the high country, and could get people talking to, rather than past, each other. LINZ is focused on private financial transactions between leaseholders and the Crown; DoC is focused on creating and managing a network of high country conservation parks. But a strategic overview that spans all the issues is lacking.

One major issue deserving of high level strategic attention is the spread of wilding conifers. It is not an exaggeration to describe the proliferation of weed trees in much of the high country as dramatic. Reduced numbers of sheep and rabbits (due to calicivirus) in recent years have led to less grazing of seedlings. DoC have a good control strategy but do not appear to be winning the battle. There could be potential for job creation here.

If this issue is looked at from a whole-of-environment point of view, a number of questions arise. Are there areas of the high country where we should seek to eradicate wilding conifers and other areas where we should allow them to grow? Trees store carbon and conserve soil. On the other hand, allowing trees to cover certain catchments such as the Waitaki would decrease the available flow of water used for generating hydroelectricity by as much as 40 percent. Wilding conifers have already changed landscapes.

The only high level strategy for the high country is DoC's plan for the creation of 22 high country parks. Yet much of the land going into those parks has no special biodiversity value, and comparatively few people will be hardy enough to use them for recreation. With the addition of each park must come the need for significant ongoing Crown expenditure on pest and weed control, access roads, fences, tracks and huts. It is hard to see how this strategy yields the best national value for the conservation dollar.

Public funding for conservation will always be limited. Other models that sit between the extremes of unfettered private ownership and management on the one hand and pure DOC ownership and management on the other should be used more widely. Covenants and possibly performance-based financial incentives as well as local authority rules can all be used to support farmers and other owners in the stewardship role many already play.

Perspectives on the high country vary widely and different issues are entangled together. I hope this report goes some distance toward disentangling them.

Finally, I would like to thank the many people who were interviewed and provided a great deal of information and insight. I would also like to thank the staff who worked hard on this complex project, in particular Dr David Bull whose dedication and competence have been outstanding.

Contents

Prefa	ace		3
Con	Contents		7
1.	Intro	duction	11
	1.1	Change in the high country: environmental stewardship and tenure review	11
		Purpose of this report	11
		How this report is structured	12
		Where to from here? Recommendations for future policy	12
		Other aspects of tenure review Figure 1.1 Pastoral lease land as of October 2008	12 14
	1.2	Pastoral leases	15
	1.3	The tenure review process	15
		Historic rationale	16
		Current mechanism	16
		Box 1.1 Other relevant legislation	18
	1.4	Objectives of tenure review	19
	1.5	Outcomes of tenure review	21
		Table 1.1 Achievements of tenure review, extracted from 2008 objectives report	22
2.	Envir	onmental Changes in the High Country	25
	2.1	State of the high country	25
		Acknowledging cultural values	25
		Figure 2.1 The Church of the Good Shepherd, Lake Tekapo, with Mt. Hay pastoral lease and the	26
		Describing the physical environment	20
			20
		Box 2.1 Ecosystem health	27
		Figure 2.2 Indigenous grassland replacing Hieracium swards at an arid Mackenzie Basin site under DoC	20
		management, 1992 and 2009	28
		Pactoral farming in the high country	29 20
		Tourism in the high country	31
	2.2	A time of change	31
	2.2	Demographic changes	31
		Climate change	31
		Economic stress	32
	2.3	Land control and use	33
	-	Approaches to managing public assets	33

		Table 2.1 Land management models in tenure review	33
		Split between conservation and pastoral use	34
		Table 2.2 Actual land management models in	
		completed tenure reviews	35
		Sustainable management	35
		Treaty of Waitangi issues	37
	2.4	Public conservation land	38
		New public conservation land	38
		Box 2.2 Mandate of the Department of Conservation	38
		Figure 2.3 Public conservation land in the South Island	39
		A network of conservation parks	39
		Figure 2.4 Lake Hawea and surrounds	41
		Conservation values	41
		Box 2.3 Black stilt – a case study	42
		Threatened environments	43
		Table 2.3 'Threatened Environment' categories	43
		Box 2.4 LENZ environments	44
		Figure 2.5 Tenure review outcomes by 'Threatened Environment'	46
		Landscape	47
		Figure 2.6 Brown over green in the Ahuriri valley	49
	2.5	Freehold land	49
		Multiple uses possible	49
		Resource Management Act controls	50
		Box 2.5 RMA Authorities	51
3.	Envirc	onmental Issues	55
	3.1	What is the 'end game'?	55
		Outcomes of tenure review to date	55
		Taking a longer view	56
		Potential outcomes of tenure review	57
		Table 3.1 Potential management of reviewable land on completion of tenure review, from DoC GIS database Table 3.2 Potential management of reviewable land	57
		by elevation, on completion of tenure review, from DoC GIS database	58
		Table 3.3 Potential management of reviewable land by productivity, on completion of tenure review, from DoC GIS database	58
		Table 3.4 Potential management of reviewable land by land cover, on completion of tenure review, from DoC GIS database	58
	3.2	Cumulative consequences	59
		Cumulative consequences for high country pastoral farming	59

		Cumulative consequences for water quality	59
		Box 3.1 Eutrophication of Lake Hayes	61
		Opportunity costs	61
		Controlling pests and weeds	63
	3.3	Alternative approaches	65
		Fencing marginal strips	65
		Conservation in private hands	66
		Productive use of Crown land	67
		Box 3.2 Molesworth Station	68
		The prospect of planting more trees	68
		Allowing residential growth	69
4.	Cond	clusions and Recommendations	71
	4.1	Achievements of tenure review	71
	4.2	The need for oversight and monitoring	72
		Functions and nature of a High Country Commission	73
		Environmental reporting for the high country	74
	4.3	The middle way - more mixed outcomes	75
	4.4	Safeguarding national interests	77
		Protecting water quality in the high country	78
		Controlling wilding conifers	79
	4.5	Parks and prioritisation	80
Арр	endix 1	: High Country Timeline	82
Endi	notes		83
Glos	sary		91



Introduction

1.1 Change in the high country: environmental stewardship and tenure review

The South Island high country stretches across nearly a quarter of New Zealand. Its iconic pastoral landscapes encompass mountains and basins, tussock grasslands and clear blue lakes. It is home to various rare plants, animals and ecosystems. The high country rivers feed major hydroelectric schemes and bring water to the East Coast plains.

The high country is no longer in its natural state. The land has been substantially modified by several hundred years of human settlement. Native forests have been burnt and cleared to make way for tussock grasslands and improved pasture. Introduced pests and weeds are widespread.

Almost all the high country is technically owned by the Crown. Much of the land has been leased to farming families for generations. Since the early 1990s, the Department of Conservation has sought to acquire land retaining its natural and historic values, while leaseholders have secured freehold ownership of productive land. The processes of dividing up the land held under these pastoral leases have come to be generally known as 'tenure review'.

Purpose of this report

This is a report to the House of Representatives pursuant to sections 16(1)(a-c) of the Environment Act 1986. It reviews the allocation, use and preservation of Crown pastoral lease land in the South Island High Country by Government agencies including Land Information New Zealand (LINZ), the Department of Conservation (DoC), regional councils and territorial authorities.

This report summarises the findings of an investigation that began in May 2006. The then Parliamentary Commissioner for the Environment, Dr. Morgan Williams, had become increasingly concerned that the 'tenure review' process under the Crown Pastoral Land Act 1998 (CPLA) would have adverse results on the environment. He had also been requested to investigate the tenure review process. Complainants included the High Country Accord, a group representing those who farm Crown pastoral land, and the Royal Forest and Bird Protection Society (Forest and Bird).

How this report is structured

Chapter One, Introduction, sets out the basis of pastoral lease tenure, summarises the tenure review process and its objectives, and presents a brief factual overview of the outcomes to date.

Chapter Two, Environmental Changes in the High Country, summarises the environmental state of the high country, the nature of high country pastoral farming, and the external forces that are changing them. It describes the general outcome of tenure review to date as a split between high-altitude public conservation land and lower-altitude production land in freehold title. Combined with whole property purchases, this has led to the creation of eight new conservation parks, though these are presently short of lower-altitude land. This chapter also considers Resource Management Act 1991 (RMA) controls on newly privatised land and concludes that local authorities will find it difficult to protect significant environmental values from any inappropriate development.

Chapter Three, Environmental Issues, discusses the potential outcomes of tenure review. It highlights the lack of 'end-game' planning and looks at what some of the cumulative effects of present approaches are likely to be. It questions whether further expansion of similar public conservation land is the best use of limited conservation resources, and highlights the importance of pest and weed control programmes. It also examines some alternative solutions such as more conservation on private land, planned tree planting and unobtrusive low-density residential subdivision.

Where to from here? Recommendations for future policy

The Parliamentary Commissioner for the Environment has no powers to intervene in land management or take any enforcement action. Rather, the Commissioner is bound to advise the House of Representatives on the remedial actions that are considered necessary.

To meet this aim, the fourth and final chapter of this report provides nine recommendations covering the following:

- Proceeding with tenure review under the current legislative framework (the CPLA)
- Establishing a High Country Commission to advise on significant aspects of the public interest in the high country
- Adopting a wider range of land ownership and management models in tenure review
- Safeguarding national interests by 'calling in' development applications, introducing regional plan rules to manage nutrient discharges to iconic lakes, and stepping up efforts to control wilding conifers and other woody weeds
- Reviewing policies relating to the creation of high country conservation parks.

Other aspects of tenure review

Concerns have also been raised about financial and legal matters related to tenure review, such as the means by which land values are determined, the legal rights given by Crown pastoral leases, and the effectiveness of the resource management controls placed on high country pastoral land. These matters are discussed in this report as they are part of the context in which tenure review takes place. They can also pose constraints on the ability of Crown agencies to address the environmental demands of the high country through tenure review.

However, this report does not presume to undertake legal, valuation or planning analysis. Specialist ecological advice has also been sought. Consequently, in preparing this report, the following background reports have been commissioned:

• Legal aspects of high country pastoral leases and the tenure review process, by Professor Barry Barton¹

13

- Valuation issues relating to the high country tenure review process, by Dr. Basil Sharp²
- Analysis of RMA plans and issues arising from the tenure review process for Crown pastoral leases, by Pippa Player³
- Ecological processes in the South Island pastoral high country, by Wildland Consultants Ltd.⁴

These are available on the website of the office of the Parliamentary Commissioner for the Environment (PCE),www.pce.parliament.nz

An advanced draft of this report was reviewed for fact checking purposes by LINZ and DoC, and for legal purposes by Greenwood Roche Chisnall. Their prompt and comprehensive responses were very helpful.

Figure 1.1 Pastoral lease land as of October 2008



1.2 Pastoral leases

The high country comprises around six million hectares extending from the South Island's spine – the Main Divide – east to the coastal plains, approaching almost to the coast in Marlborough, South Canterbury and Otago.

The Crown 'purchased' the high country from Ngāi Tahu in the 1840s and 1850s, in the time of early European settlement.⁵ Land with agricultural potential was initially managed on limited term licenses.⁶ This evolved into the Crown Pastoral Leasehold (CPL) system. The Land Act 1948 (Land Act) then provided for transferable, perpetually renewable pastoral leases on 33-year terms.⁷ As of December 2008, there were approximately 1.7 million hectares of high country in pastoral leasehold tenure. Locations of pastoral lease land are shown on Figure 1.1.

These pastoral leases give exclusive grazing rights over the land. Pastoral lease tenure is considered to provide the leaseholder with exclusive possession,^{8,9} though this has been questioned.^{10,11,12} The High Court is expected to rule on the rights included in pastoral leases in mid-2009, following an application for a declaratory judgment by Fish and Game New Zealand (Fish and Game).

Under pastoral lease tenure, the Commissioner for Crown Lands (CCL) at LINZ can control the number of stock grazed on the land. Rent is charged at an annual rate of 2.25 percent of the land value 'exclusive of improvements' (LEI) and reassessed every eleven years. Any improvements are the property of the leaseholder. If the lease is terminated, the land reverts to the Crown. The Crown can also control exploitation of minerals on such land.

Because the high country was considered environmentally sensitive, and to maintain pastoral potential,¹³ pastoral leaseholders are required to farm the land diligently, practise good husbandry, keep the land clear of rabbits and other pests, keep waterways clear of weeds, and avoid "committing waste".¹⁴ Leaseholders also require 'consent' from the CCL for activities that affect or cause disturbance to the soil. This includes planting trees, burning vegetation, clearing or felling bush or scrub, cropping, cultivating, draining, ploughing, topdressing or sowing seed, and tracking or forming any path or road.¹⁵

Non-pastoral commercial activities such as providing accommodation require a recreation permit from the CCL.

At the start of tenure review, sixteen titles were also held under special leases and seven under pastoral occupation licences. These are similar in approach to pastoral leases, but generally under more restrictive conditions and for fixed terms. In all, 'reviewable land' prior to tenure review totalled approximately 2.6 million hectares.¹⁶

1.3 The tenure review process

In practice, 'tenure review' of a pastoral lease most often results in terminating the lease, and dividing the land between the leaseholder and the Crown. This may be beneficial to both parties, because the restrictive terms of pastoral leases only facilitate sheep, deer and cattle farming. The Crown may want to unlock conservation, recreation or development potential, and the leaseholder may want to pursue other business opportunities like any other landowner.

Historic rationale

The productivity of high country pastoral land increased throughout the 1950s to 1970s. Pastoral land was transformed by aerial topdressing, oversowing with improved pasture species, fencing, erosion control, improved vehicle access, feral animal control, access to finance and farm advisory services. A Cabinet Committee of Inquiry in 1981 concluded that pastoral lease tenure as a protective measure had outlived its usefulness, and that so long as areas of recreational and ecological value were retained in public ownership, leaseholders should have the opportunity to freehold and develop.¹⁷

During the 1980s, Crown asset management was subject to economic and administrative reforms, driven partly by the belief that productive sectors of the economy were best managed by private interests, rather than the state.¹⁸ Pastoral leasehold was inconsistent with this stance, and in its early days, tenure review was seen as a means for ending state control of production land.¹⁹

In the early 1990s, some Otago high country farmers came under pressure from rabbits and low returns, and began to look for alternative land uses on their pastoral leases. They were able to come to agreements under the Land Act with the then Department of Survey and Land Information (now LINZ) and with DoC.²⁰ The leaseholders acquired freehold title over part of the land. The remainder was retained by the Crown, and placed in DoC management under the Conservation Act 1987 (Conservation Act) or Reserves Act 1977 (Reserves Act). During this period 36 leases were reviewed. This resulted in approximately 107,000 hectares of land transferring to freehold ownership and 69,000 hectares transferring to public conservation land.²¹

In 1994, a study of high country land management²² recommended a review process for Crown pastoral leasehold termination. This was brought into law as the CPLA. Since then, all tenure reviews have been undertaken under the CPLA.

A timeline for tenure review is appended to this report as Appendix 1: High Country timeline.

Current mechanism

Tenure review is the responsibility of the CCL, some of whose powers have been delegated to LINZ officials.

In the current tenure review process, the CCL's representative and the leaseholder²³ negotiate on division of the lease land, and on a financial settlement. Leaseholders may apply to the CCL for a tenure review, or the CCL can invite a leaseholder into the review. Participation remains voluntary thereafter. Either the CCL or the leaseholder can withdraw from negotiations at any time.

LINZ has prepared a due diligence report for each pastoral lease, which confirms that the land is legally available for tenure review, and identifies any rights, obligations or issues relating to the land. LINZ consults with DoC and any other party the CCL deems appropriate, including:

- Fish and Game
- Iwi authority Te Rūnanga o Ngāi Tahu (TRoNT).
- The Crown Minerals Group at the Ministry of Economic Development
- The relevant regional council and territorial authority

In preparing their conservation resources report, DoC typically invites comments from Federated Mountain Clubs, Forest and Bird, and recreational groups.

Based on this information, the CCL may put a preliminary proposal to the leaseholder for further negotiation. The preliminary proposal details which portions of the pastoral lease land are to be retained by the Crown and which are to be transferred to the leaseholder or any other party, as well as any other arrangements that are to be included in the agreement.

For land in Crown control there is provision in the CPLA for access easements, grazing permits and the like. Concessions must be subject to rents, fees or royalties that are reviewed by the CCL at least every three years. Concessions that are leases, licences or easements cannot be granted for more than thirty years (sixty in exceptional circumstances). Permits cannot be granted for more than five years and cannot be renewed.

For land being made freehold, a range of mechanisms to protect Crown interests is available, including access easements and covenants. Depending on their purpose, covenants may be in favour of various parties including the CCL, Minister for Conservation, Queen Elizabeth the Second National Trust, Historic Places Trust, Fish and Game, Ngāi Tahu, or local authorities.

Additionally, Part 4A of the Conservation Act 1987 requires marginal strips to be created along waterways more than three metres wide whenever the Crown sells land, including tenure reviews. These marginal strips provide public access, and are intended to protect conservation values of the marginal strip and waterway.

The CPLA does not include rules or principles for determining financial settlements, though it refers to "equality of exchange" in sections 34(3) and 46(3). The settlement sum, in effect, is the difference between the market value of the lease and the market value of that part of the land sold to the leaseholder.²⁴ This may result in payment to the Crown, or payment to the leaseholder. Valuations are informed judgements by an independent registered valuer based on sales of comparable properties, and are peer reviewed. The valuation for the freehold land explicitly takes account of its new potential for other uses this includes whether it is capable of residential subdivision, or suitable for viticulture or commercial recreation enterprises, within the constraints posed by any covenants. (Different interpretations appear to have been applied in some early tenure reviews under the Land Act). Detailed reviews of the process can be found elsewhere.^{25,26}

Since August 2006, the Minister for Land Information then reviews the preliminary proposal, and decides whether to approve any necessary funding, in consultation with the Minister of Conservation.²⁷

If a preliminary proposal is put to the landowner, the CCL must then issue a public notice describing the proposal but excluding financial information. A copy of the public notice must be provided to the local iwi authority. This is TRONT in almost all cases. At this stage any person or organisation can make a submission. All public submissions are analysed, and all points are considered. They are "disallowed" if they fall outside the legal scope of the review. "Allowed" points must be explicitly considered for inclusion in the review. This is the only opportunity for general input into the process.

Following this, a substantive proposal is prepared, including all 'accepted' points from public submissions. Since August 2006, this is again submitted to the

Minister for Land Information for funding approval, in consultation with the Minister of Conservation.

If the leaseholder agrees to the substantive proposal, it becomes final. A number of actions then need to be carried out. Boundaries must be formally surveyed. The Minister of Conservation is generally required to take various administrative actions in relation to new conservation areas, reserves and marginal strips. Fencing, destocking, removal of improvements or ecological assessment may also be required. When all actions are complete, the final settlement occurs and funds are exchanged.

Box 1.1 Other relevant legislation

Other than the CPLA and Land Act, the following statutes are relevant to the tenure review process:

- The Reserves Act 1977 establishes powers by which small areas of land are protected and managed for a range of purposes.
- The Conservation Act 1987 established DoC, and sets out the purpose and broad principles of management of conservation, natural and heritage areas, including marginal strips along waterways.
- Easements for public access may be granted under the New Zealand Walkways Act 1990.
- The purpose of the RMA is to promote sustainable management of natural and physical resources. Environmental effects of future land-use change and development on private land is managed by regional councils and territorial authorities through regional plans and district plans prepared under the RMA.
- Covenants for protection of historical values may be created under the Historic Places Act 1993.
- The Ngāi Tahu Claims Settlement Act 1998 sets out rights of the Ngāi Tahu iwi to be consulted in relation to land and water management.
- The Local Government Act 2002 establishes the role of local authorities in the provision of services to communities and the promotion of their wellbeing through Long Term Council Community Plans.
- The Overseas Investment Act 2005 requires conditions of public access and protection of conservation values when pastoral lease land is sold to overseas persons.
- The Soil Conservation and Rivers Control Act 1941 included provisions for land improvement agreements, prescribing measures such as retiring land from grazing, erosion control and firebreak schemes. Although this Act has been repealed, some of these agreements are still in force.
- The Biosecurity Act 1993 empowers regional councils to prepare Regional Pest Management Strategies that classify which organisms are pests, and set out relevant control programmes.
- The Queen Elizabeth the Second National Trust Act 1977 establishes the QEII Trust to promote the protection, preservation and enhancement of open space, including through covenant with private landowners.

Public documentation for each pastoral lease in the tenure review process is available on the LINZ website.²⁸

In practice, LINZ has contracted due diligence reporting, preparation of proposals, and consultation out to 'service providers'. Since the start of 2007, all preliminary and substantive proposals became subject to internal review by a Tenure Review Quality Assessment Board comprising LINZ and DoC senior management and an independent adviser.

1.4 Objectives of tenure review

Section 24 of the CPLA establishes several "objects" for tenure reviews. Its primary objects are:

- promoting "the management of reviewable land in a way that is ecologically sustainable"
- enabling the protection of the significant inherent values (SIVs) of reviewable land, by creating protective mechanisms, or preferably, by restoring the land to full Crown ownership and control.

The subsidiary "objects" of tenure review are:

- enabling reviewable land capable of economic use to be freed from management constraints resulting from its tenure status (subject to promoting ecologically sustainable management)
- making easier the securing of public access to and enjoyment of reviewable land (subject to promoting ecologically sustainable management, freeing land capable of economic use from management constraints, and protecting SIVs)
- making easier the freehold disposal of reviewable land (subject to promoting ecologically sustainable management, freeing land capable of economic use from management constraints, and protecting SIVs).

The objects of tenure review are not a mechanical system of rules. The CCL must take these objects into account in making decisions, but can exercise discretion and judgment as to how that is to be done. It is not mandatory to achieve the objects on all occasions, and other matters can also be taken into account so long as they are consistent with the objects. Nonetheless, administrative law generally requires decisions to be taken on reasonable grounds. The CCL must have adequate information, suitable advice and expertise available, especially on specialist matters. The CCL must carry out an adequate assessment and evaluation of alternative decisions.²⁹

Additional matters to be taken into account under section 25 CPLA are:

- the principles of the Treaty of Waitangi
- any particular purpose for which the Crown uses, or intends to use, the land.

A series of ministerial reports to Cabinet developed a formal set of objectives for the South Island High Country in 2003.^{30,31,32} These were considered further in 2004 ³³ and a revised and partly prioritised set of High Country Objectives was adopted in 2005. ³⁴ The High Country Objectives are almost identical to the CPLA "objects". Additional matters to be taken into account (in this report they will be jointly referred to as 'objectives') include the following:

- ensuring that conservation outcomes are consistent with the NZ Biodiversity Strategy
- progressively establishing a network of high country parks and reserves
- fostering sustainability of communities, infrastructure and economic growth and the contribution of the high country to the economy of New Zealand
- obtaining a fair financial return to the Crown on its high country land assets.

Further policy clarification has followed on:

- the establishment of 15-20 high country conservation parks³⁵
- the identification of SIVs and the application of protective mechanisms to reviewable land³⁶
- the calculation, review and potential adjustment of rental on leasehold land.³⁷

In February 2005, Cabinet made it clear it was willing for the Crown to remain a high country pastoral lessor indefinitely if that was consistent with the High Country Objectives.³⁸

In June 2007, Cabinet confirmed that the CCL would withdraw from tenure review of properties with significant lakeside, landscape, biodiversity or other values, if the review was unlikely to protect those values to the Crown's satisfaction³⁹

In November 2007, Cabinet concluded that lakeside environmental values were unlikely to be protected. They directed that 65 properties adjacent to lakes (36 of which were already in process) be excluded from tenure review, unless lakeside land could be retained by the Crown, or leaseholders were prepared to accept conditions severely restricting development, particularly within five kilometres of the lakeside.⁴⁰

Cabinet noted in 2003 that rentals on pastoral leases may be as low as 25-33 percent of the rental paid on comparable freehold land.⁴¹ In November 2007, Cabinet indicated that it would seek to increase pastoral lease rentals, by including market perceptions of amenity values (the right to exclusive enjoyment of landscapes, views and natural features) in the value of the 'land exclusive of improvements', though it did not intend to make rentals unaffordable.⁴² A test case involving Minaret station near Wanaka was heard by the Land Valuation Tribunal between October 2008 and January 2009. At the time of writing the hearing has been completed and the Tribunal has reserved its decision.

The outcomes of tenure reviews may also be relevant to many other Government policies and programmes, including:

- the Conservation General Policy 2005, as revised⁴³
- the New Zealand Biodiversity Strategy⁴⁴ and the Statement of National Priorities for biodiversity on private land⁴⁵
- the Government Programme for Sustainable Development⁴⁶
- statutory provisions and policies relating to climate change, currently including the Emissions Trading Scheme⁴⁷
- the New Zealand Energy Strategy⁴⁸

- the Water Programme of Action⁴⁹
- the rural access initiative and the New Zealand Walking Access Commission⁵⁰
- economic policies
- primary production policies
- rural community policies.

1.5 Outcomes of tenure review

Three Crown agencies – LINZ, DoC and the Ministry of Agriculture and Forestry (MAF) – are required to report annually to government on the achievement of the High Country Objectives. The latest report,⁵¹ ('the 2008 objectives report') covered the three years ending 30 June 2008.

This report states that tenure review has been effectively completed for 66 of the 303 leases (22%), totalling 368,976 hectares or approximately 18 percent of the original pastoral lease area. This land has been divided almost equally between transfer to freehold title and full Crown ownership.

As of November 2008, LINZ has spent approximately \$67 million on acquiring pastoral lease land from leaseholders and on fencing, and received approximately \$20 million for land transferred to freehold title. The net capital cost to the Crown has therefore been approximately \$47 million.⁵²

As of 30 June 2008, 137 pastoral leases totalling approximately half the overall pastoral lease land area were not in tenure review. This includes fourteen withdrawn by the lessee, eight withdrawn by the Crown, and 58 either "suspended" or "ceased". This latter category includes many of the 65 lakeside leases excluded from tenure review in 2007, although twenty have since re-entered the process despite the new restrictions.

There is no simple set of measures to evaluate the outcomes of any one tenure review, let alone of the process as a whole. There is no public database by which overall outcomes can be tracked and monitored. The 2008 objective report lists a number of achievements, which are summarised in Table 1.1.

Separate to the tenure review process, the Crown has purchased at least 170,000 hectares of high country property, including Birchwood, Hakatere, Michael Peak, St. James, Tarnbrae and Twinburn stations. The National Heritage Fund spent approximately \$62 million on these purchases while LINZ spent approximately \$13 million.⁵³ A further 24,000 hectares was surrendered to the Crown on expiry of pastoral occupation licences, together with 34,000 hectares of pastoral lease land via five land improvement agreements. The Crown-owned, 179,000 hectare Molesworth Station special lease in Marlborough was redesignated as conservation land in 2005. These additions to public conservation land total approximately 430,000 hectares. This is two and a half times the area restored to full Crown control to date through tenure review under the CPLA.

More than half of the high country was protected by the Crown before tenure review began, principally unproductive high-altitude land with a high degree of naturalness. This includes three national parks: Arthur's Pass, Aoraki / Mt. Cook and Mt. Aspiring. The latter two are part of the South-West New Zealand World Heritage Area. There were also eight substantial forest parks and conservation areas, and many smaller reserves.

Table 1.1 Achievements of tenure review, extracted from 2008 objectives report

Promote the management of reviewable high country land in a way that is ecologically sustainable	No data provided.
Enable reviewable land that is capable of economic use to be freed of current management constraints	Approximately 298,000 hectares of predominantly lower altitude land has been transferred to freehold title, although approximately 25,000 hectares of this is still under Reserves Act or Conservation Act covenants.
Protect significant inherent values of reviewable land by the creation of protective measures	 The following have been transferred to the public conservation land or placed under protective covenants: parts of approximately twenty significant landscapes extensive areas of distinctive or rare ecosystems (more than 70,000 hectares from tenure review and whole property purchases combined) numerous historical sites.
Secure public access to and enjoyment of high country land	 More than 150 public access easements created, with a total length of over 600 kilometres. Recreational opportunities have been secured on numerous properties, including nationally significant tramping, fishing (six) and rock climbing (two) sites. Recreational developments on ex pastoral lease land include: Waiorau Snow Farm and Southern Hemisphere Proving Ground on Waiorau station near Wanaka 34 km 'Dusky Trail' mountain bike route, Ruataniwha Conservation Park.
Take into account the principles of the Treaty of Waitangi	At least seven taonga sites protected by covenant vested in Ngāi Tahu or DoC.
Take into account any particular purpose for which the Crown uses, or intends to use, the land	Crown did not advise of any such purpose.
Ensure that conservation outcomes for the high country are consistent with the New Zealand Biodiversity Strategy	No data provided.

 	Progressively establish a network of high country parks and reserves	 Eight high country parks opened: Korowai / Torlesse 22,000 hectares Te Papanui 20,000 hectares Ahuriri 48,764 hectares Taka Ra Haka / Eyre Mountains 65,160 hectares Ruataniwha 37,000 hectares Hakatere 68,000 hectares Ka Whata Tu o Rakihouia 88,065 hectares <i>Te Kahui Kaupeka 90,000 hectares.</i> <i>Two further parks publicly notified during 2008 (Hawea, Oteake)</i> High country reserves increased by: 96 hectares of recreational reserves 513 hectares of historic reserves 378 hectares of scientific reserves 5,237 hectares of scenic reserves.
	Foster sustainability of communities, infrastructure and economic growth, and the contribution of the high country to the economy of New Zealand	The supply of merino wool has decreased, ascribed to a shift from merino sheep to crossbreeds, in turn partly ascribed to a loss of high-altitude summer grazing. Tourism activities have expanded greatly, especially in the Wakatipu Basin around Queenstown and the Upper Clutha around Wanaka. Employment opportunities <i>(unquantified)</i> have been created relating to the management of the new public conservation land. Water supply catchments for Dunedin City and the West Otago Rural Water Supply Scheme have largely become public conservation land.
	Obtain a fair financial return to the Crown on its high country assets	No data provided.

Notes and updates from subsequent developments are italicised.



Environmental Changes in the High Country

This chapter summarises the environmental state of the high country, the nature of high country pastoral farming, and the external forces that are changing them. It describes the general outcome of tenure review to date as a split between highaltitude public conservation land and lower-altitude production land in freehold title. Combined with whole property purchases, this has led to the creation of eight new conservation parks, though these are presently short of lower-altitude land. This chapter also considers Resource Management Act controls on newly privatised land and concludes that local authorities will find it difficult to protect significant environmental values from any inappropriate development.

2.1 State of the high country

Acknowledging cultural values

The South Island high country is of special symbolic significance to New Zealand. The dramatic mountain lands and lakes are part of the spiritual and cultural identity of Ngāi Tahu, challenge and evoke respect from farmers and recreationists, inspire artists and poets⁵⁴ and draw tourists from the rest of New Zealand and the world. The tapestry of pastoral leases is draped over this breathtaking countryside.

The high country has been shaped by extensive pastoralism practised continuously over several generations, sometimes within the same family. To the rest of New Zealand this pastoral life is epitomised by the 'Southern Man' ideal of a taciturn, rugged, self-reliant sheep farmer and hunter, often seen in advertisements for beer, outdoor clothing, rugby and utility vehicles (reality does not always conform to the image, not least in that some high country farmers are women.)

Today the high country also supports diverse communities and economic activities and provides a range of recreational experiences. Though agriculture is still the largest employer, tourism is a significant contributor.⁵⁵

The largest urban centre is Queenstown in Otago, population 10,422 in the 2006 census, followed at a distance by Wanaka, Cromwell, Alexandra, Twizel and Hanmer. Outside of these towns, the high country is sparsely populated, with less than 12,000 in the 2006 census.

Figure 2.1 The Church of the Good Shepherd, Lake Tekapo, with Mt. Hay pastoral lease and the Two Thumb Range in the background



Describing the physical environment

The high country principally comprises steep alpine ranges separated by glacial river terraces and fans, and interspersed with wide basins. Canterbury is dominated by greywacke slopes that are prone to erosion and scree formation. In contrast, the Central Otago area features comparatively flat, even-topped schist topography with rocky outcrops. The most important soil loss process is wind erosion, especially of bare ground.⁵⁶

The high country climate is harsh and unpredictable with long winters and dry summers. Growing seasons are short, frost frequency is high in all seasons, and temperature constraints increase significantly with altitude.⁵⁷ Precipitation is high close to the Main Divide, but in the alpine rain shadow to the east the land becomes increasingly arid. Pristine high country headwaters feed the East Coast rivers that power major hydroelectric schemes in the Clutha and Waitaki catchments, and irrigate the lowland plains.

Major high country lakes include Lakes Tekapo, Pukaki, Ohau and others in the Mackenzie Basin, Lakes Wanaka and Hawea in the Upper Clutha, and Lake Wakatipu in the Queenstown district. These are deep, cold water lakes with very low levels of nutrients and long residence times. Glacially fed lakes, particularly Tekapo and Pukaki, are characterised by very fine silt content that gives them their remarkable blue colour. Others have very high clarity. The lakes are not significantly stratified and have little variation in water temperature. There are also numerous smaller lakes, relatively shallow, with large variations in temperature and low to moderate nutrient concentrations.

Ecosystems

Prior to human arrival in the South Island about 800 years ago, the high country was predominantly covered in trees. Ecosystems varied with rainfall, from closed-canopy beech in the west and south to open podocarp and broadleaved forest in the east and the inland basins. Tussocks were dominant at high altitude above the treeline, and also present in patches within forest, especially in areas cleared by natural fires.

With Polynesian and then European settlement, extensive deforestation by fire resulted in manuka / kanuka shrubland and tall tussock grassland across the high country. Stock numbers peaked in the early 1870s, and this intensive pastoral

farming further transformed the landscape, reducing the coverage and height of tussocks, and increasing abundance of unpalatable or fire-tolerant species.

Rabbits compete with sheep as browsers of both exotic and native grasses, destroying both pastoral and conservation values. Numbers reached epidemic proportions in the 1880s and have required constant efforts to control ever since, often with government support. Rabbit populations are currently down following the 1997 introduction MOST OF THE HIGH COUNTRY NATURALLY SUPPORTS WOODY VEGETATION; GRASSLAND IS ONLY SUSTAINED BY FIRE, GRAZING AND SCRUB CLEARANCE.

of rabbit calicivirus. Other feral browsing animals include thar, chamois, red deer, goats, pigs, hares and wallabies.⁵⁸ Possums are also present in some forest remnants.

Pastoral use brought exotic pasture grasses and weeds. These range from hawkweeds (*Hieracium* species) through woody weeds to wilding conifers such as lodgepole pine (*Pinus contorta*) and radiata pine (*P. radiata*). By definition, weeds grow fast, spread readily and have little value. Many of them are unpalatable to stock and resistant to herbicides. However, for soil and water conservation purposes even weeds are preferable to bare ground.

Box 2.1 Ecosystem health

Several different concepts are needed to describe high country ecosystems. Some of the important considerations include:

Coverage – how much of the land is covered by vegetation. When coverage is low, erosion degrades the exposed soil, removing important constituents such as carbon and nitrogen, and physically removing soil as dust and as sediment-laden runoff. High coverage is essential for both conservation and production purposes.

Naturalness – the degree to which human disturbance and intervention is absent. Relatively natural ecosystems are prized for conservation purposes, partly for their own sake but also because natural character is difficult to restore once lost.

Biodiversity – how many species are present. For conservation purposes, it is important to have a wide range of indigenous species.

Abundance – how many individuals of a particular species are present. For conservation purposes, it is preferable that indigenous species are abundant.

Succession – the process by which plant communities develop over time. To the extent that climate, soil and other constraints permit, grasslands tend to become shrublands, low forests, and eventually climax communities of closed-canopy forest. Pastoral management halts succession at open grassland landscapes.

Hieracium species rapidly invade severely depleted grasslands, especially in Canterbury. Some species can form a ground cover that offers no grazing, depletes soil nutrients and restricts regeneration of indigenous species, though it is not shade-tolerant.⁵⁹ *Hieracium* infestation may be managed only by excluding sheep and rabbits to optimise regeneration (Figure 2.2) or by fertilising and adding seed so that grasses can compete.⁶⁰

Most of the high country naturally supports woody vegetation; grassland is only sustained by fire, grazing and scrub clearance. Woody weeds including gorse, Scots broom (*Cytisus scoparius*), sweet briar, thyme and hawthorn. They are locally abundant and extremely difficult to eradicate due to pesticide resistance and persistent seed banks. Fringe spread of palatable species such as broom and gorse can be minimised by regular intensive grazing, but at the expense of indigenous species that are also consumed, and only on productive land that can sustain intensive grazing. Moreover, such measures can be counterproductive as sheep also appear to spread seeds, especially of broom.⁶¹ In some circumstances there can be limited benefits from some woody weeds, possibly including gorse and briar, that restore nutrients to the soil or are 'nursery species' providing safe sites for tree seedlings to grow.⁶²

Exotic conifers, especially pines, are well adapted to take advantage of high country opportunities because they can grow in relatively nutrient-poor soils and have seeds that are spread long distances by wind. By contrast, beech forest usually regenerates by slow phases of fringe spread,⁶³ though there are examples of beech spread up to 2.5 km from seed sources.^{64,65} Wilding conifers, particularly *P. contorta*, already affect tens of thousands of hectares of both pastoral lease and public conservation land.^{66,67} If unchecked they will form dense stands across much of the high country, including areas above the high-altitude limit of indigenous trees.⁶⁸

Figure 2.2 Indigenous grassland replacing Hieracium swards at an arid Mackenzie Basin site under DoC management, 1992 and 2009



Photos: courtesy of the Department of Conservation



Black stilt or kakī, one of the world's rarest birds, are endemic to the Mackenzie Basin. The riverbeds and wetlands of the high country are important breeding grounds for black stilt and other endangered species such as black-fronted tern, wrybill, Australasian bittern and southern crested grebe. There are also significant populations of native falcon and kea, and other birds including the introduced Canada goose and chukor. A range of threatened native lizards are present on rock outcrops and high tussock grasslands. Braided rivers are habitats for native fish including bullies and galaxiids, and also provide excellent trout and salmon fishing. Aquatic pests (unrelated to pastoral activities) include the waterweed *Lagarosiphon* in the Clutha catchment Lakes Wanaka, Dunstan and Roxburgh, and the freshwater alga *Didymosphenia geminata* ('didymo'), which can form smothering blooms across stream beds and affects a number of high country rivers.

How the grasslands are changing

Since the pastoral lease system was set up, great efforts have been made to restore the grasslands. These include tree planting to reduce erosion, topdressing with fertilisers to replace nutrients, and pest and weed control programmes. Grazing intensity has typically been low. Farming groups consider that due to modern land management practices, high country grasslands are now "in the best condition in over a century",⁶⁹ indicating that vegetation coverage and pastoral productivity is generally much improved. Recent monitoring by LINZ found that, of a sample of 37 leases, just one had severely depleted ground cover, in that particular case due to rabbits.⁷⁰

Nonetheless, pastoral intensification is a major cause of soil degradation and indigenous plant biodiversity loss in high country grasslands.⁷¹ Intensive grazing alone can reduce almost all indigenous vegetation to exotic pasture or wasteland. Fertiliser and seed application increase the abundance of exotic grasses and the cover and vigour of native tussocks, while reducing *Hieracium* cover.

While tussocks can slowly recover, slower growing palatable herbs and shrubs may not. Between 1964 and 1989 there was widespread reduction in indigenous plant diversity in snow tussock and red tussock grasslands in the Mackenzie country.⁷² The relative abundance of many species, both indigenous and exotic, appears to have been generally declining in the tussock grasslands of both Otago and Canterbury, especially at lower altitude⁷³ although the most recent study showed an increase in species diversity in tussock grasslands over the last ten years.⁷⁴ Some high country ecosystems may have fallen below ecological thresholds that cannot readily be reversed.⁷⁵ Degradation of habitats is likely to adversely affect indigenous fauna too.

High altitude tussocklands generally have more intact indigenous vegetation and can still be relatively easily managed for conservation by retirement from grazing,⁷⁶ but mid- and low-altitude indigenous shrublands and forest will be hard to restore. DoC states that in nearly all cases where land is under conservation management and grazing has ceased, indigenous woody vegetation has increased.⁷⁷ Yet significant areas of indigenous forest remain only on western and southern high country land. Pollinators, seed dispersers, and nursery communities are lacking, and there is intense competition from exotic species better suited to the modified conditions.⁷⁸ Matagouri scrub is common on lower slopes, but there are relatively few known instances where bog pine, hebe and kanuka appear to be re-establishing in valleys and basins.⁷⁹

Pastoral farming in the high country

Around 40 percent of the high country is principally used for pastoral farming, and most of this land is held under pastoral lease tenure. Leaseholds can be bought and sold. Despite the restrictive terms of use, leaseholds have sold for much the same price as freehold high country farmland. They are subject to Crown rental

based on LEI at a rate that has been considered relatively low in market terms since the pastoral leases were established in 1948.⁸⁰ There is also a small number of special leases for grazing.

The great majority of high country farms include areas of high historical, landscape, ecological and recreational value. Further, notable stations such as Mt. Cook, Mesopotamia and Erewhon have significant historical value *because of* their long-standing pastoral occupation. Access to pastoral leases is only with the leaseholder's permission, which may reasonably be refused, for example, to avoid stock disturbance or health and safety incidents.

The average high country farm size is approximately 10,000 ha, although farms that are predominantly pastoral lease land are often larger than freehold farms.⁸¹ The average farm directly supports 2.8 full-time workers and one part-time worker.⁸² The traditional stock are merino sheep, whose thick, fine wool allows them to flourish at altitude. Most farmers also run some cattle and some also run deer. Average stocking rates have recently been estimated at 1.7 stock units per effective hectare, well below the national farm average of 6.4.⁸³ Many farms have summer grazing above the snowline, though almost all have some areas that are not grazed at all.

Usually there is a small cultivated area, often with some irrigation.⁸⁴ Fertiliser inputs averaged approximately 11 kilograms per stock unit in 2006, about half the national farm average of approximately 20 kilograms per stock unit.⁸⁵ There have been historical disincentives for intensive land use on pastoral leases,⁸⁶ including legal constraints on cultivation, large remote areas and limited productivity.

LINZ has recently instituted an inspection programme to assess pastoral leaseholders' performance against the 'good husbandry' requirement of their leases. The first report, issued in June 2008, identified six facets of good husbandry, developed eighteen indicators and assessed a sample of 37 leases on that basis.⁸⁷ Overall compliance was greater than 95 percent. The report adds that, where non-compliance issues were identified, in the majority of cases remedial action was taken or is underway.

In 2005, total high country farm gate revenue was \$113 million, with follow-on effects on the local economy estimated at four times that. Wool was the main source of revenue. Annual wool production is currently relatively high, at almost five kilograms per head, because the 1997 introduction of rabbit calicivirus has temporarily reduced rabbit numbers and hence grazing competition.⁸⁸ Merino wool is the finest and softest sheep wool, and the high country farms are the principal source of New Zealand's superfine wool clip. This iconic product is used in a variety of high quality fabrics and garments, increasing further the overall economic contribution of the high country farms.

Despite the high quality of merino wool, some high country farmers are moving from merino to crossbreeds in order to improve lambing and growth rates, and to take advantage of better returns for lamb.

Some form of tourism / hospitality / active recreation enterprise sometimes provides a diversified income stream. This is most frequently accommodation in renovated farm-worker or shearers' quarters.⁸⁹ However, such enterprises seem to contribute less than 1 percent to farm income overall.⁹⁰

High country farming produces a small but perceptible part of New Zealand's greenhouse gas emissions. Methane is formed from enteric fermentation and from manure, while nitrous oxide is produced from urine and manure and from nitrogen fertilizers if applied. The total calculated CO_2 -equivalent emissions associated with high country farming appears to be on the order of 2 percent of 1990 national calculated greenhouse gas production.⁹¹

Tourism in the high country

The high country is a major drawcard for international and domestic visitors. Along with the renowned lake and mountain landscapes comes a long list of outdoor and adventure opportunities such as skiing, jetboating and bungy-jumping. Much of this involves public conservation land, though Walter Peak and Lilybank stations are special leases of pastoral land for tourism purposes.

In 2007, the urban centre of Queenstown alone accommodated 2.29 million international visitor nights and 1.19 million domestic visitor nights. The Central Otago, Hurunui, Lake Wanaka, Mackenzie and Waitaki tourism regions accounted for a further 1.46 million international and 2.63 million domestic visitor nights between them. In all, the high country saw more than seven million visitor nights that year, 23 percent of the country's total.⁹²

THE VALUE OF HIGH COUNTRY TOURISM TO THE NATIONAL ECONOMY APPEARS TO BE CONSIDERABLY MORE THAN THAT OF HIGH COUNTRY SHEEP FARMING.

In 2007, tourism made a direct contribution of

\$7.9 billion to gross domestic product, which was 5.1 percent of the total.⁹³ International tourists added \$6.3 billion of foreign-exchange earnings to the economy. Tourism earned more in foreign exchange than dairy, meat or wood,⁹⁴ and considerably more than wool, which brought in only \$0.9 billion,⁹⁵ most of which was from crossbred wool rather than fine wool. Therefore, to the extent that they are separable, the value of high country tourism to the national economy appears to be considerably more than that of high country sheep farming.

2.2 A time of change

Demographic changes

Urban centres in the high country have grown rapidly in recent decades, faster than anywhere else in New Zealand. In rural areas, growth is concentrated in lakeside lifestyle and residential subdivisions; elsewhere in the high country, population remains stable. New industries including viticulture and wind farms are also spreading. These developments are fundamentally changing the rural nature of the high country, and many farmers are coming to feel marginalised from local communities.⁹⁶

Climate change

Climatic change over the next several decades is projected to increase the contrast between the conditions along the main divide and those on the eastern hill and high country in the alpine rain shadow. Higher rainfall is predicted for the west and the alpine zone, with drier and more drought-prone conditions to the east. The snowline is predicted to rise, and wind and rainfall events to become more intense.⁹⁷

Greenhouse gas emissions from pastoral activities currently account for almost half of New Zealand's gross emissions.⁹⁸ This means efforts to mitigate climate change by reducing greenhouse gas emissions⁹⁹ are likely to place economic penalties on pastoral activities. When and how such penalties might be applied is yet to be determined. Conversely, there are likely to be incentives to support carbon reduction initiatives, which may favour other land uses such as new forest sinks or biofuel production.

Agricultural intensification on the east coastal plains and further inland already creates heavy demand on water resources recharged from the lakes and rivers of the eastern high country. This demand is expected to intensify in the increasingly drought-prone conditions predicted for the future.¹⁰⁰ Water allocations to upstream users in the high country may therefore be limited by water management policies to ensure downstream users sufficient supply. Any agricultural intensification within the high country will also put high country lakes and rivers at increasing risk from nutrients in runoff.

Economic stress

The viability of traditional farming on the remaining leasehold farms is in question. There is typically little capacity to increase productivity on high country pastoral land, because of the constraints posed by climate, landform, soil quality, and water and nutrient availability, though there has been increased reliance on lamb finishing to improve returns. In consequence, high country farming businesses are lagging behind other farming classes in productivity. These leave high country farmers in a vulnerable position when input costs increase and when there are large fluctuations in prices of wool and meat.¹⁰¹

Over the past decade, land prices in the high country have increased considerably,

at higher rates than the average for rural land in general.¹⁰² Newcomers, including international buyers, are driving market values of land well above pastoral production values, especially where the landscape value is high.^{103,104} As the previous Cabinet indicated that it considers amenity values should properly be included in LEI,¹⁰⁵ depending on the outcome of the Minaret test case, this could result in substantial increases in rentals. Whereas the rental in MAF's

THE AVERAGE HIGH COUNTRY FARM HAS BEEN JUDGED FINANCIALLY VULNERABLE.

South Island merino farm model was \$15,475 in 2006/07, proposed annual rentals for properties similar to the model property range from \$10,500 to \$70,000, depending on location.¹⁰⁶

On average high country farms have been facing low stable or slightly declining real farm incomes for most of the last decade, while real farm operating costs have remained relatively stable. This has meant that farm cash surpluses have been insufficient to meet the needs of farm families and farming investment for a number of years. Moreover, costs of debt servicing have been increasing. On this basis, the average high country farm has been judged financially vulnerable.¹⁰⁷

2.3 Land control and use

Approaches to managing public assets

Before the economic and administrative reforms of the 1980s, Crown land was typically managed for multiple objectives by government agencies such as the Department of Lands and Survey, NZ Forest Service and the NZ Electricity Department. During the reforms, these multifunctional organisations were replaced by new focused agencies tasked with commercial return (the Forest Corporation, LandCorp and Electricorp) or conservation (DoC).^{108,109} Crown land that was assessed as capable of productive use was assigned to one of the new state-owned enterprises. Where no such use was evident, it was added to the public conservation land managed by DoC. That is, land was designated and managed for either production or conservation.¹¹⁰

Table 2.1 shows a spectrum of land management models, ranging from the single use of unconstrained private production through to the single use of conservation without public access. Intermediate models allow for simultaneous production and conservation. The CPLA enables such models by allowing for private concessions on public land, and for covenants and easements on land that is transferred to freehold.

Potential results of tenure review under CPLA	Model can meet CPLA objectives of
 Unencumbered private production	Freehold disposal of reviewable land capable of economic use, freed from management constraints
 Private production subject to environmental management requirements	Freehold disposal of reviewable land, promoting ecologically sustainable management by means of sustainable management covenant
 Private production subject to the protection of public interests	Freehold disposal of reviewable land, protecting significant inherent values by covenant, or securing public access over easement
 Public conservation with limited private production	Protecting significant inherent values on land capable of economic use, restored to Crown ownership under special lease or grazing permit
 Public conservation subject to private use	Protecting significant inherent values on land capable of economic use, restored to Crown ownership under recreation concession
 Open public conservation: low- impact recreation only	Protecting significant inherent values through restoration to full Crown ownership and control, while securing public access and enjoyment, under DoC management
 Closed conservation: scientific access only	Protecting significant inherent values through restoration to full Crown ownership and control, under DoC management

Table 2.1 Land management models in tenure review

Split between conservation and pastoral use

The 2008 objectives report indicates that up to June 2008, approximately 107,000 hectares of pastoral lease land was transferred to freehold under the Land Act, and a further 191,286 hectares under the CPLA, for a total of almost 300,000 hectares. 336,308 hectares were retained under DoC management as public conservation land.¹¹¹ That is a 47:53 split between private and public ownership.

As of September 2006, the Crown retained 18 percent of reviewed land below 800m altitude, and 82 percent of land above 1000m.¹¹²

No land appears to have been set aside for any Crown purpose other than conservation and recreation, though there have been access easements¹¹³ and a provision to take land in future¹¹⁴ for purposes related to electricity generation. DoC advises that there is public access to all new public conservation land obtained through tenure review.¹¹⁵

THE RELATIVELY PRODUCTIVE LOWER ALTITUDE TERRACES, FANS AND BASINS HAVE BEEN TRANSFERRED TO UNENCUMBERED FREEHOLD TITLE, WHILE THE COLDER, STEEPER, HIGHER ALTITUDE TUSSOCK GRASSLANDS HAVE BECOME PUBLIC CONSERVATION LAND.

Up to June 2008, covenants were created over approximately 8 percent (24,795 hectares) of the land transferred to freehold, in order to protect SIVs. This small proportion is consistent with the subsidiary objective of removing management constraints, and with the CPLA preference for SIVs to be protected through Crown ownership. Covenants have generally been made under the Reserves Act or Conservation Act. As of September 2006, the proportion of freehold land subject to covenant was lower for lower altitude land.¹¹⁶ DoC has advised that 16 percent of land retained by the Crown has been subject to ongoing or transitional grazing.¹¹⁷

The general outcome of tenure reviews to date is that the relatively productive lower altitude terraces, fans and basins have been transferred to unencumbered freehold title, while the colder, steeper, higher altitude tussock grasslands have become public conservation land (see Table 2.2).

One outcome of this split is to reduce opportunities for high-altitude, low-intensity, summer grazing, to which merino wethers are best suited.¹¹⁸
	Potential results of tenure review under CPLA	Approx. proportion of reviewed land, by area, as of June 2008
\top	Unencumbered private production	43%
	Private production subject to environmental management requirements	<1%
	Private production subject to the protection of public interests	4%
+	Public conservation with limited private production	8%
+	Public conservation subject to private use	<1%
	Open public conservation: low-impact recreation only	45%
	Closed conservation: scientific access only	Not used

Table 2.2 Actual land management models in completed tenure reviews

Sustainable management

The term 'ecologically sustainable management' is not defined in the CPLA, and 'ecologically' is not found elsewhere in New Zealand legislation.¹¹⁹. This presents a problem when seeking to achieve the CPLA 'object' of *"promot[ing]* the management of [reviewable] land in a way that is ecologically sustainable", or measure progress against this objective.

In 2008, DoC and LINZ agreed that they take this objective to mean safeguarding the life supporting capacity of the land's ecosystems, including the ability of those ecosystems to support life outside the reviewable land.¹²⁰

DoC and LINZ also considered that returning land to full Crown ownership under DoC management "safeguards its capacity to support indigenous life by removing development pressure and facilitating the removal of other forms of pressure such as grazing, fire and pest incursion."¹²¹ Effective conservation management generally maintains or improves some ecosystem services such as erosion control, carbon storage¹²² and providing refuges for indigenous species. In tenure review, the CPLA indicates that this is the 'preferable' means of protecting SIVs.

DoC and LINZ further agreed that depending on terms, covenants can also remove development pressure and can sustain indigenous species and ecological processes. Section 97 CPLA specifically allows for sustainable management covenants on land to be transferred to freehold, presumably as a tool for ensuring ecologically sustainable management, though it does not give any guidance as to the form such covenants should take. Nineteenth century experiences showed that overstocking high country land can have disastrous effects on soil and pasture, and this is reflected in the limitations imposed by pastoral leases. Yet sustainable management covenants have been put in place by only two tenure reviews. In the first such case, a 2,107 hectare area of Muzzle Station, northern Canterbury, was placed under a sustainable management covenant, with the aim of preventing stock from getting into adjacent conservation areas.

The second case relates to the 2,120 hectare Henroost block, located in northern Southland and freeholded as part of the Cattle Flat tenure review. This land had been seriously degraded by rabbits in the past, and is under threat from a wilding pine infestation on adjacent land at Mid Dome, which is owned by the Ministry for the Environment. The Henroost block was retired from grazing for many years, but was farmed under a special lease allowing for very limited stocking from 1992 until review was completed in 2008. Although the Henroost remained in very poor condition, vegetative cover was recovering slowly. As the block lacked any significant inherent conservation values it was of no interest to DoC.

A sustainable management covenant was considered both necessary and desirable for the Henroost, based on the vulnerability of the block and the need to control wilding trees by grazing and targeted measures. It includes the following features:

- An annual "rentcharge", initially of \$10,000 and increasing in accordance with the consumer price index, to be waived if there is no substantial breach of the covenant.
- Stocking limits set by the CCL, equal to the limits previously set by a special lease on the Henroost block. The CCL can order the land destocked if deemed necessary.
- LINZ are able to remove stock in excess of limits.
- The landowner is to control rabbits and other vermin, wilding pines and other weeds. DoC officers are also able to enter the land and carry out pest and weed control.
- No burning of tussock, no damage to indigenous trees, no use of soil, gravel or sand, no diversion of waterways.
- The CCL is to set up an ecological monitoring programme to assess ground cover, species present, tussock height, and including photographic records. The landowner is to pay for this to be carried out every five years.
- General wording committing the landowner to weakly defined undertakings such as restoring vegetation and protecting soil.

Note that it does not prescribe any specific restorative action; future land managers can decide how best to meet the requirements of the covenant, so long as monitoring shows no further degradation. LINZ have indicated that they are likely to use this general form of sustainable management covenant in the future.¹²³

To some extent, sustainable management can be required within *status quo* pastoral lease tenure. The CPLA, and the Land Act before it, already have good husbandry provisions, and require farmers to obtain the CCL's consent for activities such as burning vegetation and clearing scrub. Pastoral leases can be subject to stock restrictions or complete retirement, and some reviewable land, like the Henroost block, is held under even more restrictive special leases.

Land improvement agreements under section 30A of the Soil Conservation and Rivers Control Act 1941 have also been used in Canterbury, Marlborough and North Otago. These agreements are to retire land from grazing, protect soil by fencing to keep stock out, create windbreaks to reduce wind erosion, to plant trees to stabilise slopes or to create firebreaks. In Canterbury alone, about 1500 of these agreements are thought to remain legally binding. Of these, around 120 are considered necessary for ongoing land management obligations, though the rest are being phased out.¹²⁴

Farmers are free to implement sustainable management practices without reference to legal agreements with others. Researchers at the University of Canterbury, supported by the High Country Accord, Merino Inc., the High Country Section of Federated Farmers and the MAF Sustainable Farming Fund, have recently developed whole-of-property management planning guidelines¹²⁵ for this purpose.

These guidelines describe how to set out:

- the context of a farming operation, its goals, management approach, opportunities and constraints
- a division of the property into management units and the identification of management objectives for each unit, reflecting the underlying economic, environmental and social values
- strategies for finances, infrastructure, pasture and soils, stock, plantations and woodlots, plant and animal pests, native biodiversity, recreation and historic resources, agrichemicals, energy and water efficiency, water quality, and health and safety
- monitoring and plan implementation.

Treaty of Waitangi issues

The CPLA requires the CCL to take into account the principles of the Treaty of Waitangi (s25) and to consult with iwi authorities as part of tenure review (s44). Representatives of Te Rūnanga o Ngāi Tahu (TRONT), the relevant iwi authority for almost all pastoral lease land, expressed overall satisfaction with its current involvement. The opportunity to visit high country land, collect historical and anecdotal information, advocate for taonga and exercise kaitiakitanga has been significant for TRONT.

The 2008 objectives report identifies a number of sites of significance to TRONT that have been recognised and protected so far, including two for which covenants have been made in favour of Ngāi Tahu. Nonetheless, TRONT representatives had some concerns about the adequacy of the methodology and expertise used for identification and evaluation of significant cultural and archaeological values, and about a lack of protection of SIVs, especially in some early CPLA reviews.

2.4 Public conservation land

New public conservation land

The complementary mechanisms of tenure review, whole property purchase, redesignation, and so on have transferred approximately 800,000 hectares of high country pastoral land to DoC management. Figure 2.3 shows the extent of public conservation land in the South Island as of early 2008.

These land transfers have placed much of the vast, vulnerable and distinctive tussock grasslands into the hands of an organisation that is in all senses dedicated to caring for them. It has also allowed recreational groups and the general public free access to this huge area of high country.

INCLUDING WHOLE-STATION PURCHASES AND FENCING, NEW PUBLIC CONSERVATION LAND HAS COST MORE THAN \$120 MILLION.

These acquisitions come at a cost. Aside from

settlement sums and purchase costs, because tenure review frequently divides properties, new internal fencing can be extensive despite work by LINZ to simplify boundaries. The largest amount spent on fencing for a single property in tenure review was \$473,000.¹²⁶ Including whole-station purchases and fencing, new public conservation land has cost more than \$120 million.

Fencing and roading will need much ongoing maintenance. All fences in the high country are at risk from snow damage from time to time. Control of rabbits, wilding pines, broom and other pests and weeds is an expensive and ongoing issue. During pastoral lease tenure, these costs were the farmers' responsibility, but now they will fall on the Crown. In 2005, the government increased DoC's annual budget by \$4.5 million for management of new high country public conservation land, and \$0.5 million for high country wilding tree control.

In terminating pastoral leases, the Crown also foregoes the rent that it previously received, offset to some extent by the income from new concessions. While much land is now under DoC management, costs of administering the leases are no longer incurred. It is not clear whether administrative costs to the Crown have increased or decreased overall.

Box 2.2 Mandate of the Department of Conservation

DoC was created by the Conservation Act 1987 and administers that Act together with other statutes including the Reserve Act. Its mission is "to conserve New Zealand's natural and historic heritage for all to enjoy now and in the future". Its functions under the Conservation Act are to:

- Manage land and other natural and historic resources for conservation purposes.
- Preserve as far as practicable all indigenous freshwater fisheries, protect recreational fisheries and freshwater fish habitats.
- Advocate conservation of natural and historic resources of New Zealand (including Antarctica).
- Promote the benefits of conservation (including internationally).
- Prepare and provide conservation information.
- Foster the use of natural and historic resources for recreation and tourism, so long as that is not inconsistent with conservation.



Figure 2.3 Public conservation land in the South Island

A network of conservation parks

DoC's official vision for the South Island high country¹²⁷ is for a "network of conservation parks and reserves" (refer Figure 2.3). These are to be based on areas subject to tenure review, where "an accumulation of property for conservation" is emerging, where high conservation or public recreation values are located. They are to include iconic properties.

Cabinet noted in 2003 that, to be categorised as a conservation park, an area generally should:¹²⁸

- 1. be at least 10,000 hectares in size
- 2. have a distinct ecological character
- 3. be contiguous, of an appropriate shape for long-term ecological viability
- 4. be accessible to the public, by car in dry weather or within a one-hour walk from a road end in wet weather
- 5. provide for a range of recreational opportunities, including opportunities that can be provided by concessionaires

6. contribute to the full range of large scale landscape / ecology that is found in the rain shadow eastern South Island high country from Marlborough to Southland.

As well as the parks shown in Figure 2.3 there are proposed Pisa, Kopuwai and Rock and Pillar Range conservation parks in Central Otago, a proposed Remarkables Conservation Park in the Otago Lakes area, and a proposed Mackenzie Basin Drylands Park in Canterbury. In combination with the existing holding of more than three million hectares, these acquisitions will form an extensive belt of conservation parks running the full length of the high country. In all there are 21 existing or proposed high country parks of more than 10,000 hectares, plus Molesworth Station recreational reserve at 179,000 hectares and St. James Conservation Area at

78,000 hectares. This matches a 2005 Cabinet minute noting that "the current level of tenure review and lease purchase is trending toward the establishment of a comprehensive network of 22 high country parks."¹²⁹ The general trend of completed tenure reviews is that new public conservation land is predominantly high altitude tussock grassland, with little (lower altitude) lakeside land and river flats, and hence relatively few whole altitude sequences.

THESE ACQUISITIONS WILL FORM AN EXTENSIVE BELT OF CONSERVATION PARKS RUNNING THE FULL LENGTH OF THE HIGH COUNTRY.

As one example, the proposed Hawea Conservation Park currently surrounds upper Lake Hawea, yet excludes almost all of the lakeside land and most of the hillsides facing the lake (Figure 2.4). This land remains in pastoral use, and while presently of little or no conservation value, intrudes spatially and visually into the park.

Hawea Conservation Park currently excludes the Hunter River flats, which were not reviewable land. Another initiative, separate from tenure review, is a proposed transfer of the Hunter River bed from LINZ management to Hawea Conservation Park.¹³⁰ Other river beds close to conservation parks, such as the Rangitata, may be redesignated in the same way.

Of the high country park network, only the proposed Mackenzie Basin Drylands Park (approximately 30,000 hectares) is predominantly at low altitude. It would therefore contribute to the range of ecologies represented in the high country conservation park network.

Figure 2.4 Lake Hawea and surrounds



The dark green line indicates the border of Hawea Conservation Park.

Cabinet's criterion that conservation parks be accessible to the public also appears only partly fulfilled to date. While it is often appropriate for conservation parks to include remote areas, all parts of Te Kahui Kaupeka and Te Papanui conservation parks, and the proposed Hawea and Oteake conservation parks, appear far from highways and population centres. They are reached over unsealed roads and easement routes across private land. There is little added value in new conservation parks, if acquired land is difficult to access for management purposes, let alone by users.

Conservation values

Protecting SIVs is one of the primary objectives of tenure review. The 2008 objectives report does not discuss conservation SIVs as such, but describes many examples of distinctive or rare ecosystems that have been added to public conservation land through tenure review and whole property purchase, totalling more than 70,000 hectares.

Individual species whose habitats were protected were said to include the nationally critical black stilt, Otago skink and leafless pohuehue (*Muehlenbeckia ephedroides*), and several nationally threatened birds, galaxiid fish, invertebrates and vascular plants, along with many other endangered species. These achievements support National Priority Four of Protecting Our Places, and hence the New Zealand Biodiversity Strategy.

Tenure review has also contributed much to DoC's knowledge of high country ecosystems. The opportunity to conduct wide-ranging ecological surveys over such a large area of land in private management is rare and welcome.

However, the 2008 objectives report does not discuss conservation values that have not received protection through tenure review.¹³¹ Cabinet's November 2007 decision not to fund certain tenure reviews unless lakeside land could be retained by the Crown, or there were severely restrictive conditions on its development,¹³² acknowledged that significant inherent values associated with lakeside land were not always being protected through tenure review.

There is no absolute requirement that all SIVs be protected and tenure review outcomes are dependent on negotiation. But lower altitude SIVs are of particular

Box 2.3 Black stilt – a case study

Black stilt are a species of particular interest since they are endemic to the high country, being restricted to braided rivers and wetlands of the Mackenzie Basin. They are considered the world's rarest wading bird, and have been managed intensively by DoC since 1981 when their population had declined to just 23 birds. Thanks to this intervention, black stilt now number more than 100, but remain threatened by introduced predators, habitat loss and human disturbance.

Black stilt are known to frequent the Ahuriri River valley. The Ahuriri River has been identified as a Recommended Area for Protection and a Site of Special Wildlife Interest. In recognition of the outstanding conservation values a National Water Conservation Order was placed on the Ahuriri River in 1990. The parts of the property that extend into the riverbed provide habitat for a wide range of wetland bird species.¹³⁵ The Ahuriri Conservation Park is particularly known for black stilt, although it has also become internationally renowned for trout fishing, which must bring increasing human disturbance to the river.

Ahuriri Conservation Park was formed around the whole property purchase of the Birchwood station, and restoration of most of Quailburn station to Crown control through tenure review. Both of these leases were in the upper Ahuriri valley. Pastoral leases in the lower valley included Ben Avon, Birdwood (not currently in review), Killermont and Longslip stations.

The 2008 objectives report states that black stilt were protected through tenure review of Killermont and Longslip. Public documentation confirms that small conservation areas were created along the river on both stations, and patches of scenic reserve were created from wetlands on Ben Avon. There are also marginal strips along both banks of the river. But the protected area of all three lower valley stations appears to be only a small proportion of the area identified as having high ecological value by DoC in the conservation resources report. Moreover, most of this "protected" area is not fenced and is still subject to grazing and to vehicle access.

Similarly, the 2008 objectives report credits the tenure review of Richmond station on Lake Tekapo with protecting black stilt. The DoC conservation resource report for Richmond stated that black stilt "sometimes use the lower Coal River for feeding and nesting", and identified all that part of the station north of the Coal River as having high ecological value. Nonetheless, only a small part of this area, near the mouth of the river, became public conservation land. The Coal River bed, "prime habitat" for black stilt,¹³⁶ was not part of the pastoral lease, and though the river and its unstable, eroding banks¹³⁷ were 'protected' through creation of marginal strips, these were not fenced. (The tenure review also created a second lakeside conservation area, and placed a covenant over a 3.4 hectare wetland, elsewhere on the property.)

Overall, protection of black stilt habitat via tenure review seems partial only, especially in comparison to whole property purchase, though there is still an opportunity to improve this record should the Birdwood station review recommence.

concern because lower altitude land is generally suitable for intensive agriculture, which is not compatible with management for conservation. Indigenous land cover in the high country appears lower on freehold land than on pastoral leases, suggesting that transfer to freehold is likely to result in a decrease in abundance and biodiversity of indigenous vegetation.¹³³

The 2008 objectives report states only that: "up to 58 percent of lowland [sic] biodiversity values identified in property assessments have been protected", which seems to mean that at least 42 percent have not. No information is provided in relation to other SIVs on lower altitude pastoral land, such as landscape, historical or Māori values.

In theory, lakeside and riparian ecologies are also protected during tenure review through the creation of marginal strips alongside water bodies under the Conservation Act. According to s24C the Conservation Act, marginal strips have multiple purposes including conservation, public access and public recreational use.

SIGNIFICANT INHERENT VALUES ASSOCIATED WITH LAKESIDE LAND WERE NOT ALWAYS BEING PROTECTED THROUGH TENURE REVIEW.

This protection appears to be in name only. LINZ consider that the CCL is unable to take new marginal strips into account within tenure review under the CPLA, and therefore has no authority or funding to have them fenced off.¹³⁴ Consequently, while the adjacent pastoral land remains in pastoral use, there is no physical barrier to prevent stock entering the marginal strip. This is not protection; stock grazing, trampling and manuring will not maintain conservation values. Even considering access, it does not seem a good idea from any viewpoint for the general public to mix with stock, especially large deer and cattle. And since the marginal strip is not protected in practice, neither is the corresponding water body.

Threatened environments

The 2008 objectives report also discusses the conservation outcomes of tenure review using the 'threatened environment' paradigm.

Combining Land Environments of New Zealand (LENZ) environments with LCDB2 land cover types allows desktop estimation of remaining indigenous cover in each environment nationwide. Further, combining this with datasets for land areas with legal protection gives rise to a 'threatened environment' classification (Table 2.3).

Table 2.3 'Threatened	Environment'	categories
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Threat category	Indigenous vegetation	Legal protection
Acutely threatened	<10% remaining	
Chronically threatened	10-20%	
At risk	20-30%	
Critically underprotected	>30%	<10% protected
Underprotected	>30%	10-20%
Less reduced, better protected	>30%	>20%

Box 2.4 LENZ environments

The land environments of New Zealand ('LENZ environments') are groupings of land sharing similar climate, landform and soil type, covering the whole of New Zealand.¹⁴⁰ In theory, because climate, landform and soil type are powerful drivers of biological patterns, each LENZ environment is expected to support a characteristic assemblage of flora and fauna. The LENZ variables were chosen via statistical analysis of the distributions of New Zealand's native tree species.

At the 'national' level of detail there are 20 'level 1' LENZ environments, designated by the letters A through to T, of which E, K and M-S are represented in the high country. These are divided at the 'national-regional' level into 100 'level 2' LENZ environments (A1-A7 etc.), which in turn are divided into 200 'level 3' and then 500 'level 4' environments.

For the high country, the principal level 2 LENZ environments by area are:

- 'Central Dry Foothills' E1 and E4
- 'Eastern South Island Plains' N3-N8
- 'Central Mountains', principally P1 with some P2 and P5
- 'Southeastern Hill Country and Mountains' Q1-Q3
- 'Southern Alps' R1.

There are also small areas of environments K, M, O, S and T. Although steep, cool, wet mountain environments such as P and R largely remain in indigenous forest, 80 percent of N is now in developed pasture, and Q has been almost completely deforested to tussock grasslands, or to pasture at lower altitudes.

The distinction between 'chronically threatened' and 'at risk' LENZ environments may be particularly significant; some ecological models suggest that a minimum level of protection for indigenous cover might be around 20 percent.¹³⁸ National Priority One for biodiversity protection is to "protect indigenous vegetation associated with [level 4 LENZ environments] that have 20 percent or less remaining in indigenous cover."¹³⁹

The threatened environment paradigm should not be over-interpreted. It necessarily relies on several gross assumptions and simplifications:

• LENZ environments are mathematical constructs based on a limited amount of data about selected physical and geochemical parameters. LEGAL PROTECTION DOES NOT NECESSARILY MEAN ACTUAL PROTECTION.

- LCDB2 land cover classes are interpreted from satellite imagery circa 2001, and often 'ground truth' poorly in the high country.^{141,142}
- LCDB2 land cover classes do not contain information about botanical health, wealth, age, natural character or supported fauna.
- LCDB2 land cover classes are assumed either wholly indigenous or wholly exotic in character. The 'Low Producing Grassland' class, which is common in the high country, is particularly contentious; it is generally classified as indigenous because, although predominantly exotic in character, it may contain numerous indigenous species.^{143,144}
- Legal protection does not necessarily mean actual protection from disturbance or biological attack, nor imply ongoing active restoration.
- Threatened environments are built to a strictly limited spatial resolution, and should not be applied at anything less than regional scale.

Classification of an area of LENZ environment as a 'threatened environment' does not take the size of the area into account nor whether it is adjacent to similar environments. DoC have concerns that some nominal National Priority One areas may not be realistically salvageable.^{145,146} The LENZ technical guide cautions that:

"The [LENZ environment] classification is designed to indicate areas having similar ecosystem character at a community level, with emphasis on functional groups rather than defining the distributions of individual species. In this regard, LENZ contrasts with historic, speciesoriented classifications of New Zealand's land cover that define units geographically, based on distributions of structurally dominant species. Correspondence between LENZ and species distributions are likely to be lowest for species with poor dispersal ability, such as...beech species or our native snails, and where we would expect correspondingly weaker sorting in relation to environment than in species with strong dispersal ability... where weakly dispersing species play a dominant role in determining ecosystem structure, inclusion of data layers describing their distributions will be required to adequately predict ecosystem character."

There may be no real benefit in providing legal protection to a parcel of land that is classified as a threatened environment. An 'acutely threatened environment', by definition, has lost at least 90 percent of its indigenous vegetative cover. Visiting any random site within that LENZ environment, there is no more than a 10 percent chance of finding dominant indigenous vegetation. If indigenous vegetation is not present, the 'natural' ecosystem is highly unlikely to recover except through great efforts,^{147,148} especially if there are no seed sources, or there is pressure from exotic pests and weeds.

With these caveats in mind, acutely and chronically threatened environments retaining viable areas of indigenous vegetation must be protected to comply with the New Zealand biodiversity strategy and hence the high country objectives. But a 2004 report to LINZ¹⁴⁹ and a Cabinet review in 2005¹⁵⁰ expressed concern that tenure review was not achieving this outcome for low-altitude environments.

The executive summary of the 2008 objectives report states that in the reporting period, "88,377 hectares of the highest priority LENZ environments were protected" via tenure review and whole lease purchase. But that area was predominantly 'at risk' (third tier) threatened environments; only 3 percent of it was in the national priority one categories. It is not made clear whether any of this land has retained its indigenous vegetation. Again, no figure is given for land in threatened environments transferred to freehold title without protective covenant.

A draft paper by DoC authors¹⁵¹ analyses tenure review outcomes as of September 2006 with respect to threatened environment classifications. Figure 2.5 presents data extracted from that draft. Note that Figure 2.5 does not include land purchases outside tenure review.





This analysis shows that approximately 34,000 hectares of acutely or chronically threatened environment apparently retaining indigenous cover has been sold as unencumbered freehold, while only about 4,500 hectares was covenanted or retained as public conservation land. That is, the area of apparent high priority conservation land opened up for development has been about six times greater than the area actually protected.

In the same process, the Crown has paid to retain ownership of a much larger area (approximately 140,000 hectares) of land including SIVs but in the 'no threat' category.

For completed tenure reviews up to December 2007, only 51 percent of national priority one land was recommended for protection by DoC. This probably reflects the lack of actual indigenous cover on the reviewed land, but then only 31 percent was actually retained by the Crown or covenanted.

As pastoral lease land is predicted to lose indigenous cover when converted to freehold title, it has been argued that the outcome of THE AREA OF APPARENT HIGH PRIORITY CONSERVATION LAND OPENED UP FOR DEVELOPMENT HAS BEEN ABOUT SIX TIMES GREATER THAN THE AREA ACTUALLY PROTECTED.

tenure review to date has been an increase in risk to the ecologies of approximately half the LENZ environments of the high country nationwide,¹⁵² principally those at lower altitudes.¹⁵³

Given the serious concerns discussed above, it is not clear whether or not the apparent overall failure to protect national priority one land represents a real loss of lower altitude high country indigenous biodiversity. It does at minimum indicate a restricted range of land environments within high country public conservation land, and hence a loss of opportunity for restoration in the future.

Again, there is the potential for this situation to change in the next year or two as lakeside properties re-enter tenure review, with the establishment of the proposed Mackenzie Basin Drylands Park, and if certain high country river beds can be redesignated as public conservation land.

Landscape

Widespread concern has been expressed about threats to high country scenery through tenure review, both generally¹⁵⁴ and in submissions regarding individual tenure reviews. Indeed it seems to be one of the most contentious and passionately debated aspects of the process.

For example, Richmond Station, rising from the eastern shore of Lake Tekapo back to the summits of the Two Thumb and Richmond ranges, completed tenure review in August 2006. The chief executive of Environment Canterbury (ECan) took the unusual step of writing to the CCL at a late stage, asking for the substantive proposal to be withdrawn:¹⁵⁵

"The Richmond pastoral lease is a prominent part of the Mackenzie Basin high country landscape and the backdrop to the lake surrounds vistas viewed from Tekapo village and the main highways. It is the backdrop often featured in tourism publications. The key features of this landscape, as identified in the Conservation Resource Report, are its extensive nature, predominantly natural vegetation cover, the unbroken vista from the lake edge to the tops of the mountains, and the 'cohesiveness' of the landscape, unbroken by built elements. The Substantive Proposal contains no provision for the protection of lake-to-mountain-top landscape sequences, no protection of the lake edge environment, and no protection for the extensive and cohesive landscape as a whole."

The substantive proposal, which did transfer lower areas of Richmond station to unencumbered freehold title, was accepted unaltered within the month.

One objective of tenure review is to remove management constraints on land transferred to freehold. In theory this does create the potential for pastoral open grasslands to be replaced by a patchwork of other activities, eliminating the appeal of 'visual unity'¹⁵⁶ and the pastoral heritage value of the landscape.

However, 'lines on landscapes' have already appeared on much of the high country. These include roads, canals, fences and electrical transmission lines. Fertilising, oversowing and irrigation, whether undertaken on existing freehold land or on pastoral leases under permit, already creates sharp divisions between vivid green improved pasture and brown grassland (Figure 2.6). Existing townships, woodlots, airstrips, weed infestations and farm buildings are common 'unnatural' features. To some, the most offensive visual impact is that of wilding pines now spreading across tussock-covered hills, even above the natural treeline. While tenure review may add to these perceived detractions, it did not create them, and cannot mitigate any that are not on pastoral lease land.

Moreover, the landforms of the high country, the great mountain ranges and wide intermontane basins are not themselves susceptible to change by human agency.

There are many individual tenure reviews where threats to landscape SIVs have been identified, and land has been transferred to public conservation land accordingly. The tendency of tenure review to partition lease land by elevation seems unlikely to have a substantial effect on landscape because that division is likely to follow or resemble natural stratification of vegetation types with altitude.

Lakeside landscapes such as Richmond have been considered particularly vulnerable. However, in 2008, tenure review of Mt. Cook station, one of the lakeside properties that had been excluded pending effective restrictions on development, resulted in a covenant preventing exotic forestry or subdivision of the freeholded area. This is expected to remove constraints on pastoral use while protecting the famous Mt. Cook landscape from any dramatic change in appearance. Nonetheless, it does not seem capable of preventing the 'brown over green' effect shown in Figure 2.6.

Figure 2.6 Brown over green in the Ahuriri valley



The 2008 objectives report lists large areas of many significant landscapes that have been partially placed under legal protection through tenure review. This is promising, however high country landscapes include very large units such as wide basins, lakes and ranges. These are divided into multiple pastoral leases that are assessed separately, and at different times, in the tenure review process. It is conceivable that a discordant feature on a single lease might adversely affect a whole landscape. Similarly, protection may not be effective if it does not cover the whole visible altitude sequence. So it is not clear that measurements of protected area are helpful in demonstrating landscape protection.

With these caveats, it remains difficult to assess whether tenure review as a whole has yet had a significant adverse effect on landscapes.

2.5 Freehold land

Multiple uses possible

When pastoral lease land is transferred to unencumbered freehold title, many potential forms of development open up:

- changing the stock balance toward cattle or deer, or conceivably alpaca
- improvement by scrub clearance, land drainage, irrigation or topdressing
- tourist enterprises such as farmstays, horseriding or 4WD trekking, hunting and fishing
- dairy farming
- carbon storage and agro-forestry (conifer, eucalypt,¹⁵⁷ manuka, beech)
- cropping or viticulture

- residential developments including lifestyle blocks, holiday accommodation, hotel complexes
- commercial enterprise, including rural service industry, and wind farms and other electricity generation schemes
- private conservancy, perhaps with QEII covenant
- reduction of the land to woody weeds, Hieracium or desert.

The first three options are all possible on pastoral lease with the CCL's consent.

Not all of these developments are practicable or economically viable on all pastoral lease land, much of which is remote, dry and relatively unproductive. Soil, water and nutrients may be significant constraints, especially for dairy, viticulture and cropping. Wind farms, for example, require not only sufficient wind, but construction access and suitable grid connections.

Some changes away from pastoral use have already occurred, principally in Otago. Former pastoral lease land has become lifestyle blocks, vineyards, forestry plantations and recreational developments, such as Waiorau Snow Farm, a venue for cross-country skiing and other winter sports on the Pisa range near Queenstown.

It is neither possible nor desirable for future activities on freehold land to be directed by mechanisms created under the CPLA. To the contrary, one of the objectives of tenure review is to remove management constraints (subject to the promotion of ecologically sustainable management). The CCL can only investigate whether the potential for more profitable use exists, and ensure that any such use is taken into account in valuation, so that the Crown can receive fair value in settlement.

This approach was not applied to earlier tenure reviews in Otago, such as the Land Act reviews of Closeburn station near Queenstown and Hillend station near Wanaka. Closeburn was subdivided into multiple sections, and Hillend has had consent to subdivide part of the land. These sections have sold, or may in future sell, for substantial sums¹⁵⁸ to no Crown benefit. Indeed for Hillend and neighbouring Glendhu, the Crown's interest in developable land appears to have been valued at less than the leaseholder's grazing interest on other parts of the station.

Overall, the Crown gained just \$120,000 from the Hillend tenure review, and paid out \$5,000 to retain just a small proportion of Glendhu.¹⁵⁹ Other pastoral leases including Mt. Pisa, Bendigo, Queensberry Hills and Queensberry were also transferred to freehold and subdivided before current valuation practices were introduced.¹⁶⁰ In these older cases the Crown seems to have lost opportunities for financial return.

Resource Management Act controls

The purpose of the RMA is to promote the sustainable management of natural and physical resources. The use, development and protection of land is managed under the RMA. This includes:

- sustaining the potential of natural and physical resources to meet the foreseeable needs of future generations
- safeguarding the life-supporting capacity of soil, air, water and ecosystems

• avoiding, remedying or mitigating any adverse effects of activities on the environment.

Whether pastoral lease land that has been transferred to freehold title can realise potential new uses depends on:

- the rules in the relevant regional and district plans
- how resource consent decisions give effect to the relevant regional and district policies
- whether enforcement is carried out.

Box 2.5 RMA Authorities

At the top of the RMA hierarchy is the Minister for the Environment. The Minister has a variety of powers including the ability to prepare and implement national environmental standards that have the force of regulations. Local authorities cannot grant resource consents for activities prohibited by the standards. The Minister can also intervene in decision-making processes for "proposals of national significance" if the relevant local authority lacks the capacity to determine the matter, and considers it appropriate for the Minister to do so.

Under the RMA, regional councils are responsible for controlling, among other things:

- taking, use, damming, and diversion of surface water, groundwater and geothermal water
- discharge of contaminants to land, air or water
- effects of activities in the coastal marine area (with the Minister of Conservation)
- introduction of plants into water bodies
- maintaining indigenous biodiversity
- land-use in relation to soil conservation, maintaining and enhancing ecosystems in water bodies, water quality and quantity, and controlling natural hazards and hazardous substances.

Regional councils are responsible for preparing regional policy statements and regional plans, issuing resource consents, taking enforcement action, and monitoring. Most pastoral lease land is in the regions managed by ECan and the Otago Regional Council (ORC).

Territorial authorities (city and district councils) also have RMA responsibilities. The Mackenzie, Waitaki, Queenstown Lakes and Central Otago districts are wholly within the high country, as are significant proportions of Marlborough, Kaikoura, Hurunui, Waimakariri, Selwyn, Ashburton, Timaru, Waimate, and Southland. The territorial authorities are primarily responsible for controlling:

- effects of the use, development or protection of land (including considerations of hazardous substances, natural hazards and indigenous biodiversity)
- noise
- effects of activities on the surfaces of lakes and rivers
- subdivision (to the extent that it carries out the above functions).

To address these responsibilities, councils must:

- prepare policy statements, long-term council community plans and district plans setting out how these matters will be controlled
- issue resource consents to permit and control new activities
- take enforcement action, and
- monitor.

An analysis of local authority plans as they stood in 2007 found that high country councils were under pressure to provide for activities other than farming,¹⁶¹ due to localised population increase, land use intensification, urban demand for rural lifestyle, and urban and tourism developments.

Policies clearly reflect aspirations to acknowledge significant values and protect them from inappropriate development. In practice this has been difficult and often unsuccessful, for several reasons:¹⁶²

- Several plans are still not fully operative, or are subject to challenge in the Environment Court.
- Partly due to Environment Court rulings that discouraged local authorities from classifying activities as 'discretionary', 'non-complying' or 'prohibited', first-generation plans are generally permissive to development.
- Because RMA decisions are made site-by-site, it is inherently difficult to manage the cumulative effects of many minor adverse contributions, especially on large-scale values like landscape or biodiversity.
- There has been a mismatch between aspirations and willingness to address issues in practice. Policy statements have generally not included practical means for delivering desired outcomes, and have used weak language such as "may include" or "consider using". District plans have only been required to "give effect" to regional policy statements since 2005, and even then do not have to do so until the next policy review.
- Some territorial authorities have scant resources for thorough investigation of values or issues.
- Land use intensification is occurring at a faster rate than the information, scientific data, issues and methods to address it can be debated and practical responses made through RMA plan processes.

For these reasons, tenure review cannot properly rely on RMA plans as a substitute protection mechanism for delivering 'ecologically sustainable management'.

Conversely, in Central Otago District, certain rules specifically do not apply to land transferred to freehold title through tenure review. These are discretionary rules for earthworks, building and establishing plantation forestry, within scheduled "outstanding landscapes" or on land over 900m altitude.¹⁶³ The Environment Court upheld these exemptions, concluding that tenure review was the most appropriate method of protecting the "areas of significant indigenous vegetation and significant habitats of indigenous fauna" per

TENURE REVIEW CANNOT PROPERLY RELY ON RMA PLANS AS A SUBSTITUTE PROTECTION MECHANISM FOR DELIVERING ECOLOGICALLY SUSTAINABLE MANAGEMENT.

section 6(c) RMA. The Court also found persuasive DoC evidence that the prospect of future RMA controls might deter leaseholders from going through the voluntary process of tenure review.¹⁶⁴ Since tenure review does not necessarily protect SIVs (of any kind), in this case it is an RMA authority that is forced to be over-reliant on the CPLA process.

It is undoubtedly challenging to draft generic rules and site-by-site assessment criteria that yield landscape-scale outcomes. In response, there appears to be a move toward a catchment planning approach, which may begin to close the

gaps between the tenure review and RMA processes. Queenstown Lakes District Council, in particular, has focused on pockets of development, and to that end has developed concept zones and special zones through variations and plan changes. It has refined and tested an approach to general categories of landscape, including outstanding natural landscapes, visual amenity landscapes, rural landscapes and (indicatively) historic landscapes.

In a similar vein, Mackenzie District Council considered that their district plan "provides little or no control over [subdivision and residential] development, creating considerable potential for adverse effects of sporadic subdivision."¹⁶⁵ They commissioned a comprehensive review of Mackenzie Basin landscape values,¹⁶⁶ which identified the whole Basin as a distinctive and highly valued landscape unit, albeit considerably modified in places. They further found that Mackenzie Basin resources, including the landscape, required ongoing, viable farming or "the problems of wind erosion, rabbits and wilding pines would rapidly become insurmountable".

Mackenzie District Council then developed their Plan Change 13 to channel further development into a pattern of small clusters of carefully sited buildings, consistent with existing farming practice. At the time of writing, Plan Change 13 is still in review, but appears likely to result in general rules seeking (among other things) to locate new building clusters in less visible locations that do not "break the line or form of skylines, ridges, hills or prominent slopes" or sit within existing Lakeside Protection Areas.¹⁶⁷ This would appear likely to reduce the potential for significant development-related changes to the landscape, whether on former pastoral lease land or otherwise.



Environmental Issues

This chapter discusses the potential outcomes of tenure review. It highlights the lack of 'end-game' planning and looks at what some of the cumulative effects of present approaches are likely to be. It questions whether further expansion of similar public conservation land is the best use of limited conservation resources, and highlights the importance of pest and weed control programmes. It also examines some alternative solutions such as more conservation on private land, planned tree planting and unobtrusive low-density residential subdivision.

3.1 What is the 'end game'?

Outcomes of tenure review to date

Through tenure review to date, approximately 300,000 hectares of pastoral lease land have been transferred to freehold title. This has generally included the relatively productive lower altitude terraces, fans and basins. In these areas covenants have been little used and consequently some SIVs have not been protected. Some change of use has taken place in Otago, mostly 'lifestyle' subdivision with some vineyard development in suitable areas.

Colder, steeper, higher altitude tussock grasslands have generally become public conservation land. Including complementary approaches such as whole property purchase, approximately 800,000 hectares of South Island high country has become public conservation land. This has enabled eight new conservation parks to be formed, and two more gazetted. This conservation park network currently has a restricted range of different land environments, especially at lower altitude.

Some of the last Government's initiatives were directed at mitigating this stark division between lower-altitude private and higher-altitude public land. The Cabinet directed that pastoral lease land adjacent to lakes be excluded from tenure review, unless lakeside land could be retained by the Crown, or leaseholders were prepared to accept conditions severely restricting development, particularly within five kilometres of the lakeside.¹⁶⁸ Twenty lakeside leases have recently re-entered tenure review, presumably accepting these conditions. Additionally, DoC plans to establish a Mackenzie Basin Drylands Park, and to have parts of some high country river beds redesignated as public conservation land.

Taking a longer view

As tenure review is only around a quarter complete, the ultimate outcome is far from certain. Tenure review proceeds by numerous separate negotiations rather than through a mechanical system of rules, and there is very little strategic direction. Certainly the CPLA and the high country objectives provide underlying principles. But there may be many different outcomes that are consistent with the New Zealand Biodiversity Strategy, foster sustainability of communities, infrastructure and economic growth, obtain a fair financial return, and so on. The decision-making discretion of the CCL is very wide and contains elements of judgement and policy.¹⁶⁹

Each pastoral lease is only a part of larger-scale features such as ecological districts, catchments and landscapes. Thus decisions made in respect of one pastoral lease are relevant to decisions about others. If there is no plan for the joint outcome, several individually reasonable decisions can have unforeseen cumulative consequences. It is in the national interest for LINZ and DoC to act within a wider strategy.

For DoC, policies and objectives are directed at a regional conservancy level, by conservation management strategies prepared in accordance with the Conservation Act. These ten-year plans are lengthy, detailed documents that have been subject to public consultation.

The Otago Conservation Management Strategy, prepared in 1997 so due for renewal, comprises more than 600 pages plus appendices. It divides Otago into four 'Zones' and describes the characteristic landscapes, ecosystems, historic, cultural and recreational resources of each. It further identifies some 41 'Special Places' of particular conservation importance, some of which are acknowledged to be partly on private land. Protection of representative significant resources through tenure review and through RMA advocacy is a consistent theme. Among many other objectives, the Otago CMS calls for seven new high country conservation parks; Rock and Pillar, Te Papanui, Oteake, Kopuwai, Pisa, Remarkables and Taka Ra Haka.

The Canterbury Conservation Management Strategy, prepared in 2002, contains both general objectives, and specific objectives for each of nine 'Places'. Seven of these are at least partly high country and tenure review is listed among the issues for each. Along with many other objectives, this management strategy aims to create the Hakatere, Ruataniwha, Korowai-Torlesse, Ahuriri, Te Kahui Kaupeka and Oteake conservation parks. The Mackenzie Basin Drylands Park is not listed as an objective.

By contrast, LINZ does not appear to have any strategic plans for tenure reviews, as neither the CPLA, the Land Act, nor Government policies make it an explicit requirement. To the contrary, LINZ argues that "tenure review cannot be held accountable for cumulative regional and catchment effects".¹⁷⁰ This is a disappointing stance. The CCL is able to take into account matters not mentioned in the CPLA if they are compatible with that Act as a whole, and the idea of ecologically sustainable management in the CPLA is plainly one of environmental protection. It is reasonable to expect that likely land uses after review would be assessed, and the consequences for ecologically sustainable management considered, when tenure review decisions are made.¹⁷¹

At this stage, when tenure review is well established, but a majority of pastoral leases have yet to complete the process, it is not too soon to examine what the overall consequences may be, and not too late to set out alternative visions. This chapter attempts that analysis.

Potential outcomes of tenure review

Since at least 2003, DoC has maintained a GIS database for internal use that shows all reviewable land, even leases yet to enter tenure review, divided into public conservation land and freehold title. Even in 2003 it included future whole station purchases such as St. James Station in north Canterbury. The database mapping is based on completed tenure reviews, conservation resources reports for tenure reviews in progress, and DoC's knowledge of SIVs from earlier work, such as surveys undertaken under their Protected Natural Areas Programme. This database provides one detailed vision of the future of tenure review, in which SIVs are largely protected through retention in full Crown ownership and DoC management.

The October 2008 version of the DoC GIS database indicates that SIVs are associated with at least 1.6 million hectares of high country pastoral land. If tenure review were to be completed, most of that area might become public conservation land (Table 3.1).

Table 3.1 Potential management of reviewable land on completion of tenure review, from DoC GIS database

Managed for	Area, ha		
Conservation	1,428,039	- Recreation concessions on Crown land	45,336
Multiple use	196,646	- Grazing concessions on Crown land	76,721
Freehold	910,552	- Freehold under covenant	74,589
Other	135,129		

'Other' includes land remaining in leases, DoC purchases, non-pastoral lease land included in reviews, and unclassified land.

All data are rounded outputs of GIS overlay calculations and total areas may differ slightly between tables.

The database suggests that the proportion of high country pastoral land managed for multiple uses may remain small, only 7 percent of the total. Covenants are shown on approximately 8 percent of freehold land, the same proportion as at present.

To date, pastoral land made over to public conservation land has largely been at higher altitude. Based on DoC's database, by comparison to a topographical landform, it appears that this trend may continue (Table 3.2). The majority of pastoral land over 1000m is shown as public conservation land, while most land below 600m is shown as unencumbered freehold.

Area, ha	Conservation	Multiple use	Freehold	Other
Above 1000m	937,544	99,668	139,314	93,927
600-1000m	431,583	69,759	458,443	31,885
Below 600m	58,912	27,219	312,795	9,318

Table 3.2 Potential management of reviewable land by elevation, on completion of tenure review, from DoC GIS database

All data are rounded outputs of GIS overlay calculations and total areas may differ slightly between tables.

One explanation for the division by elevation might be that historic use has largely extinguished conservation values on productive land, as productivity is generally much better at lower altitude. Comparing the DoC GIS database to the Land Use Capability (LUC) layer of the New Zealand Land Resource Inventory GIS database¹⁷², almost all land shown in freehold title is indeed in LUC classes 1-3 (Table 3.3). Those classes include land assessed as very good, good or moderate quality; versatile, arable land with little limitation on use. By contrast, class 4 is arable only with severe limitations, and classes 5-8 are not considered suitable for arable use, though they may be acceptable for pastoral use or forestry. The database shows land in these less productive land classes as divided more equally between public and private ownership.

Table 3.3 Potential management of reviewable land by productivity, on completion of tenure review, from DoC GIS database

Area, ha	Conservation	Multiple use	Freehold	Other
Land Use Capability 1-3	608	815	18,006	350
Land Use Capability 4-8	1,413,581	194,445	885,360	133,999

Total areas are less than in Table 3.1 because the DoC database and LUC define lake boundaries differently, and because the LRI has an inherent processing error at 45°S due to sheet edge matching.

Another explanation might be that land with a high naturalness, which is more common at higher altitude, may be desirable public conservation land. Table 3.4 compares the DoC GIS database with the Land Cover Database (LCDB2 ¹⁷³), after dividing its 61 vegetative cover classes into exotic and indigenous land cover.¹⁷⁴ This shows that potential public conservation land is almost all covered with indigenous vegetation, and very little is, for example, pasture. Nonetheless, very large areas of indigenous land cover are also shown as freehold.

Table 3.4 Potential management of reviewable land by land cover, on completion of tenure review, from DoC GIS database

Area, ha	Conservation	Multiple use	Freehold	Other
'Indigenous' cover	1,405,463	184,308	783,343	132,311
'Exotic' cover	22,575	12,338	127,209	2,818

Areas carry an error estimated at +/- 10 hectares due to the manner in which LCDB2 was generated.

These analyses suggest that, *if* tenure review is completed under current policies, existing trends in outcome will continue. Multiple use management will remain rare, higher altitude pastoral land will largely become public conservation land, arable land or land that is currently in pasture will largely be transferred to freehold.

3.2 Cumulative consequences

Cumulative consequences for high country pastoral farming

The general trend of transferring higher altitude pastoral land to public conservation land means that many sheep stations will lose the option of summer grazing on high-altitude tussock grasslands. This places a significant burden on merino farms that would otherwise be able to let lower-altitude land recover over summer. In a recent survey of 36 high country pastoral farms, five of nine farmers yet to enter tenure review believed that tenure review would "destroy the balance" of their farms.¹⁷⁵ Of course they are able to negotiate accordingly should they ever decide to enter the process.

An analysis of the DoC database estimated that the number of stock in the high country will drop by approximately 30 percent if existing trends continue

throughout tenure review. Although this would be partly offset by a reduction in costs, net loss of annual output is estimated at \$9-12 million.¹⁷⁶

Fewer merino would mean correspondingly lower volumes of fine wool. There has been no formal assessment of the long-term effect that this would have on the merino wool industry. It would seem likely to put textile and clothing manufacturers and designers at risk, with a slight effect on exports. However, the economic outlook for high country wool producers has been troubled in recent years, and some decline may occur irrespective of tenure review.

THE NUMBER OF STOCK IN THE HIGH COUNTRY WILL DROP BY APPROXIMATELY 30 PERCENT IF EXISTING TRENDS CONTINUE THROUGHOUT TENURE REVIEW.

In the survey cited above, more than half of the 36 farmers were considering significant pastoral intensification or improvement, and half of these regarded irrigation as a tool for achieving this. Many considered that there was potential on their pastoral land for some level of tourism or recreation development, but few had definite plans for change-of-use developments such as dairying, vineyards or orchards.¹⁷⁷ One general outcome of tenure review is likely to be pastoral intensification on lakesides and river flats.

Cumulative consequences for water quality

Current and future water quality in most high country lakes and rivers is inextricably linked to tenure review because much of the lakeside land and the upper catchments are, or have been, in pastoral lease tenure. Nonetheless, LINZ and the CCL have consistently considered water quality to be outside their mandate. For example, from the final analysis of public submissions on the Richmond preliminary proposal in 2006 (point 5.3):

"Concerns... seeking protective measures against future land use such as effect on water quality have been noted however the suggested measures are not accepted for inclusion in the proposal. Current and future land use is a matter for the land holder subject to rules under the District Plan and Regional [Plan]." Yet LINZ had been advised in 2004 that "ecologically sustainable management considers possible effects on ecosystems beyond the immediate tract of land. For example, leakage of applied nutrients may affect water quality".¹⁷⁸ (The concept of effects outside the land in review was reinforced in the 2008 agreement on ecologically sustainable management between DoC and LINZ.¹⁷⁹)

Potential impacts on water quality may have been discounted because DoC and LINZ had assumed that future management practices on pastoral lease land would maintain the chemical and physical properties of soil and water resources.¹⁸⁰ However, experience in the rest of New Zealand indicates that this is unlikely to be true in the event of extensive, unconstrained pastoral intensification on lakesides and river flats. This is likely to include year-round stocking, increased use of water, fertiliser and/or food supplements to offset the loss of high altitude grazing. Practices such as aerial oversowing and topdressing may also become commonplace. Taken together, these changes can be expected to have significant adverse impacts on adjacent water quality.

The general removal of restrictions on farming activities that follows free-holding of land under tenure review, opens up options for conversion to more intensive forms of land use (up to and potentially including irrigated dairying operations). Nitrogen losses to waterways from alternative agricultural land uses can be an order of magnitude higher than that from low intensity merino sheep farms.¹⁸¹

Relatively pristine high country catchments can be expected to be particularly vulnerable to such impacts. As with North Island lakes like Taupo and Rotorua,¹⁸² South Island high country lakes are open to abrupt eutrophication if nutrient inputs increase.¹⁸³ Lake Hayes near Queenstown is already being managed for a serious eutrophication problem (see Box 3.1). The problem of controlling waterweeds, such as *Lagarosiphon* in Lakes Dunstan, Wanaka and Roxburgh, will probably become more difficult if there is an increase in nutrient inputs into these lakes.

Such changes are practically irreversible. Much of the inflow of water into lakes comes from groundwater, which can take years or decades to reach the lake. Thus, trophic changes seen in a lake one year are the results of the accumulated nutrient use in the catchment over several years or decades previously.

Further, nitrogen and particularly phosphorus inputs accumulate in lake bottom sediments, and move between sediments and the water column depending on conditions.¹⁸⁴ In the large, deep high country lakes these sediments would be very hard or impossible to remove, and will maintain high nutrient levels for many years even if all additional external inputs could be halted. These changes cannot be easily addressed by reactive responses.

Taken together, these factors suggest a real likelihood of greatly increased discharges of nitrogen and phosphorus to lakes and rivers as a result of tenure review in its current form, with potentially disastrous consequences for the high country environment and economy. A decline in lake and river water quality would adversely affect aquatic ecosystems and water users including anglers. It would probably also have serious impacts on tourism, since lakes become increasingly green and murky as nutrient levels increase, and the colour and clarity of high country lakes is an important part of their appeal.

DoC has argued that managing high country land for conservation provides the 'ecosystem services' of maintaining or improving water quality and water yield¹⁸⁶. For example, for the Deep Stream and Deep Creek catchments in Te Papanui

Conservation Park, which provide Dunedin City's water supply, it has been estimated that conversion of the existing tussock cover to improved pasture would further reduce summer low flows by as much as half, although there would be little effect at other times of year.187 Tall tussock cover in good condition has been shown to maximise water yields in some Otago high country catchments.¹⁸⁸ Whether or not this finding can be generalised to the rest of the high country, the benefits of conservation management in upper catchments are likely to be greatly outweighed by the impacts of lower altitude pastoral intensification.

Opportunity costs

The new high country public conservation land has come at a net capital cost of more than \$120 million. The biggest item, the \$40 million St. James Station, was funded by way of a drawdown from the Nature Heritage Fund over the next six years. The resulting St. James Conservation Area is a notable acquisition, being:

Box 3.1 Eutrophication of Lake Hayes

The 2km² Lake Hayes¹⁸⁵ in the Arrow Basin is fed by a 44km² catchment predominantly in freehold pastoral use. It has become increasingly eutrophic over the last 30 years, principally due to a combination of intensive superphosphate use and wetland drainage in the 1950s and 1960s. Lake bed sediments have retained a "massive" load of phosphorus that is released into the water column in autumn, when the bottom waters become anoxic.

Algal blooms have occurred in recent summers and on several occasions during the 1970s and 1980s. At the same time, surface waters exhibit a toxic combination of high temperature, high ammoniacal nitrogen concentrations and low pH, while dissolved oxygen concentrations are very low at depth. These are very poor conditions for trout or other fish.

Since 1995, ORC has had a Lake Hayes Management Strategy to reduce ongoing external phosphorus inputs. However the amount of phosphorus already in the sediment is so large that water quality is unlikely to significantly recover even in the long term.

There are no simple solutions. Equipment for algal control by mechanical disturbance of the water column has been costed at approximately \$2 million. Adding an activated clay, such as the proprietary product 'Phoslock', to strip phosphate from the water column and cap contaminated sediments, has been costed at approximately \$1 million.

- almost 80,000 hectares in size
- comprised of beech forests, scrublands and valley floor native grasslands, and featuring glaciated valleys, wetlands, lakes and high altitude tarns
- adjacent to other public conservation land on all sides
- accessible straight off State Highway 7 or from Hanmer Springs
- crossed by the popular St. James Walkway, and containing Hanmer Springs Ski Area.

Nonetheless, that single purchase will reduce the scheduled appropriations from the Nature Heritage Fund for any other purposes to just over \$3 million per year.¹⁸⁹

These acquisitions therefore carry an opportunity cost; they spend money that could perhaps have been spent on other conservation objectives. Creating a

network of high country conservation parks is only one of many important activities carried out by DoC. Of the thirteen conservancies nationwide, only Canterbury and Otago are predominantly high country.

The Office of the Auditor-General audited DoC's strategic planning for land in 2005. The Auditor-General expected that DoC would "have comprehensive national strategic planning for the publicly owned land it manages. We expected this planning to be in writing, coherent, clear, and accessible." But no such plan was evident.¹⁹⁰ Consequently it is difficult to determine how DoC as a whole has prioritised land for acquisition or restoration.

DoC's latest annual report¹⁹¹ identifies lowland forest (below 500 m altitude), wetlands, and marine areas as the most at-risk environment types, least represented in legally protected areas nationwide. "Protecting Our Places" identifies sand dunes and wetlands as National Priority Two, because they are ecosystems that have become uncommon due to human activity.¹⁹² These concerns have been somewhat advanced in tenure review to date, which has protected more than 4000 hectares of wetlands, kettleholes and peat lakes. But the extent of expenditure on the high country, especially on tussock grasslands now comparatively well represented in public conservation land, must be constraining investment on other conservation priorities.

The annual DoC budget was increased by \$4.5 million from 2005 to allow for tenure review and ongoing land management. By way of context, DoC's total expenditure for the year ending 30 June 2008 was approximately \$290 million, of which approximately \$85 million was for the five South Island conservancies and the Southern Regional Office. Management of South Island high country is therefore still only a minor element of DoC's activities, though bigger in dollar terms than, for example, the 'mainland island' restoration projects (\$2.4 million).¹⁹³

Nonetheless, the DoC GIS database shows that, based on the principle of protecting SIVs by returning them to Crown control, tenure review and other mechanisms may eventually add another 800,000 hectares to public conservation land, doubling the area acquired to date. It seems unlikely that existing DoC funding would be sufficient to manage so much additional land. The New Zealand Conservation Authority has recently advised that:

"The Authority [has] increasing concerns that the level of funding received by Department of Conservation is inadequate for the discharge of its responsibilities and a loss of indigenous biodiversity and ecosystem health is the inevitable consequence...

It is worth noting that the Department has to make difficult choices about priorities as its resources continue to be stretched... We are not holding the line and New Zealand's unique flora and fauna are under continual siege. The Authority looks forward to the day when there are adequate resources 'to turn the tide' for both short- and long-term necessary conservation work."¹⁹⁴

If resources are not sufficient for existing conservation needs, the acquisition of more pastoral land for new conservation parks is questionable.

Further, active restoration requires resources over and above maintaining existing conservation values. Consequently, acquiring more conservation land to manage can entail yet another opportunity cost, that of forgoing opportunities for

restoration. In the case of high country pastoral land, some types of ecological community seem to have been completely destroyed by fire and vegetation clearance. Therefore, these losses cannot be remedied just by acquiring and conserving land with existing SIVs. By definition, restoration targets land that has lost its natural character, so would not generally be a priority acquisition for DoC under current policies.

For example, pollen records and statistical analyses suggest that many woody species now known only as individual remnant plants in fire refuges, or from subfossil records, were once common on Central Otago valley floors and alpine uplands. The problem is exacerbated because the extent and diversity of late-successional communities in the area are decreasing, and most remaining stands of canopy trees contain only mature or non-reproducing individuals. Consequently, some pre-settlement woodlands are very unlikely to re-establish without experimental programmes including research and monitoring.¹⁹⁵

Controlling pests and weeds

Key elements of conservation management in the high country include pest and weed control. Rabbits in particular have been a threat to the short grasslands of the high country ever since they were first introduced into New Zealand, and control has come at a considerable cost. As recently as the early 1990s, the Government, regional councils and landowners spent \$28 million over seven years on a Rabbit and Land Management Programme.¹⁹⁶ While rabbit numbers are presently down, populations are expected to recover in the medium term as rabbit calicivirus immunity spreads.

Perhaps the greatest weed control issue at present is wilding conifers.^{197,198,199} Conifers can rapidly and thoroughly colonise high country grasslands, preventing grazing and radically changing the character of the landscape. Even a single wilding pine can produce huge numbers of seedlings over many kilometres. Conifer forest will also replace other low-stature ecological communities such as rockland, herbfields and shrublands.²⁰⁰

Extensive afforestation reduces water yields and stream baseflows. Uncontrolled spread of wilding conifers could therefore have national consequences, by reducing water input to the major hydroelectric power schemes located in the Waitaki and Clutha catchments. Water sourced from the high country is also used for irrigation that is crucial to agriculture as it is currently practiced in large parts of lowland Otago and Canterbury. Afforestation of upper catchments does not even have benefits in terms of reducing large flood peaks, because large floods in South Island East Coast river systems result from heavy rainfall that extends down into the middle catchment.²⁰¹

Despite good husbandry provisions in pastoral leases, tens of thousands of hectares of pastoral lease land is affected by wilding conifer infestations, for example Braemar, Ferintosh, Balmoral, Irishman's Creek²⁰² and Coronet Peak²⁰³ stations. Former pastoral lease land affected by wilding conifers includes other Mackenzie Basin stations such as Mt. Cook and Pukaki Downs.

Approaches to this issue in tenure review have been inconsistent. On the one hand, at Rhoboro Downs, the final analysis of public submissions ruled that:

"The submitter has raised the matter of the potential of wilding trees to spread seedlings much further afield, and invade conservation areas. This is a matter that may be considered under Section 24(a)(i) CPLA: i.e. to promote management that is ecologically sustainable. The CCL is aware that wilding trees are dense on the eastern side of the land proposed to be designated for freehold disposal. There is no requirement under the CPL Act for the CCL to consider the spread of unwanted organisms such as wilding trees. The point is disallowed."

Yet in the recent Cattle Flat (Southland) tenure review, a sustainable management covenant was created over the freehold land that, among other things, requires the landowner to control pines and other weeds, in consideration of the threat posed by wilding pines on adjacent Crown land at Mid Dome. It also allows DoC officers to enter the covenanted land to conduct pest and weed control.

DoC is the leading agency for wilding tree control in the high country, on both public and private land, and has prepared a wilding conifer strategy to this end.²⁰⁴ Control of wilding conifers is a prevalent theme in the Otago CMS. DoC is assisted in this task by the regional councils, who have their own regional pest management strategies made under the Biosecurity Act.

The wilding conifer strategy identified more than 250 wilding conifer infestation sites on land managed by DoC and by others throughout the South Island, some of them covering thousands of hectares, and ranked them for intervention. It set out actions in the areas of advocacy, liaison, research and control. Prevention and control options were costed.

One key consideration in wilding conifer control is that if conifers are left to establish, they become much more expensive to eradicate. The DoC wilding conifer strategy states that contract removal of widely scattered lone outliers with chainsaws and hand tools can cost as little as \$2 per hectare, whereas clear-felling of dense stands by chainsaw can cost as much as \$12,000 per hectare. Moreover, if trees are allowed to reach coning age, they can spread further and further.

A second key consideration is that eradication programmes must remove all seed trees, and controls must be sustained for several years, until all dispersed seed is no longer viable. Follow-up control is essential to protect the investment in the initial control operation. For example, DoC cite a pine infestation at Kirkliston in the remote southern Canterbury high country, which was nearly under control in 1990, lost its funding for a period in the early 1990s, and after ten years' work is now back in the same state as it was in 1987.²⁰⁵

In 2004 DoC requested additional budget appropriations for South Island wilding pine control ramping up to \$5.3 million annually until 2014, based on their wilding conifer strategy. The actual budget allotted was just \$555,000 per annum.²⁰⁶ It is no surprise that concerns have been expressed at the prospects for effective pest and weed control on pastoral lease land set aside for public conservation.²⁰⁷

Other government weed control spending in the high country includes the Mid Dome wilding pine eradication programme (\$9 million over twelve years for one infestation affecting approximately 50,000 hectares) and an ongoing LINZ programme of woody weed control on high country land it manages, predominantly riverbeds (approximately \$700,000 in 2007/08).

Some other woody weeds, such as broom and gorse, have more persistent seed banks than conifers, and could well become a greater problem if left unchecked.²⁰⁸ DoC already consider that broom on the Cloudy Range between Canterbury and

Marlborough is out of control to the extent that containment is the only possible option.²⁰⁹

In many parts of the high country, wilding conifers and broom simply seem more of a threat to the environment than sheep. From this perspective, pest and weed management should be a higher priority for high country conservation resources than land acquisition.

However, there may be some benefit in bringing pastoral lease land back under Crown control and DoC management, *in order* to expedite pest and weed control, at least temporarily. The cost of such measures may be justifiable, especially since the value of land with serious pest or weed infestations is presumably low.

3.3 Alternative approaches

Completing tenure review along current lines can be predicted to result in further immense areas of high-altitude pastoral land becoming public conservation land. This may come at great cost, with predictable cumulative adverse effects including:

- long-term degradation of water quality in nationally important lakes and rivers, with knock-on consequences for the tourist industry
- significant reduction in fine wool production (though this might occur in any case)
- diversion of resources away from national conservation priorities such as lowland forest, wetlands and marine areas
- diversion of resources away from pest and weed management, with likely serious impact on high country farming, landscapes and eventually water yields.

Some options worth consideration are fencing marginal strips, alternative ownership and management models, and low-impact future uses such as forestry or low-density residential use. All of these have benefits and drawbacks that must be carefully weighed, and will not necessarily be desirable across the whole of the high country.

Fencing marginal strips

Fencing and planting marginal strips, to provide a protective buffer zone around water bodies, might be helpful in many circumstances. While the creation of marginal strips is a Conservation Act matter, protecting new marginal strips formed from pastoral lease land seems justifiable as part of tenure review. Under s25(1) CPLA, as well as taking "objects" such as securing public access into account, the CCL is required to take into account the Crown's purpose in using land. In the case of new marginal strips, the Crown's purpose is defined in the s24C Conservation Act, and includes "the maintenance of adjacent watercourses or bodies of water", "the maintenance of water quality", and "the maintenance of aquatic life".

However, LINZ advise that they are not currently funded to fence marginal strips. The length of qualifying waterways in the high country is enormous, so the initial expense of fencing would be considerable.²¹⁰ The visual impacts of narrow green margins might also be of concern to some. Moreover, high country waterways are dynamic, rivers and streams move and flood. While legal marginal strips can move accordingly, fences do not; they could be destroyed on one side of a river, and well

off the legal boundary on the other. Finally, the exclusion of lake, river and stream frontages from pastoral use could have significant farm management implications on a day-to-day basis, in terms of stock movement and control, loss of productive land, and restricted access to stock water.²¹¹

Conservation in private hands

The CPLA indicates that SIVs are 'preferably' to be protected by restoration to full Crown ownership and control. Nonetheless, it does provide for them to be protected in private ownership subject to covenant. Similarly, it allows for sustainable management covenants, presumably to address its other primary 'object' of promoting ecologically sustainable management. So even if acquiring pastoral lease land is not a priority for the Crown, tenure review offers other means of protecting the public interest.

In 2000, a Ministerial Advisory Committee on Biodiversity and Private Land argued persuasively and passionately²¹² that private landholders are "deserving of being trusted, respected and assisted to care for and manage our heritage". The Committee did not see deriving economic benefit from land, and sustaining and enhancing its natural values, as exclusive goals. They found that increasing numbers of landholders have the practice, technology and experience to manage all classes of land more effectively and sympathetically than has been done in the past. The committee saw little future in the Crown taking over land management, indeed felt that it would alienate rural communities:

"The Crown's poor standing as a rural neighbour has its genesis in the dread and frustration of having to treat with a faceless, inscrutable absentee owner... The financial resources to effectively manage Crown estates have never matched the ambitious rhetoric that has accompanied successive additions to a diverse and demanding portfolio of properties, all of which present daunting management challenges."

Instead they call for improved partnership and leadership by the Crown:

"Tolerance, patience and respect for rural culture will more effectively halt the decline in indigenous biodiversity by promoting a vision and engaging land managers to adopt a management style that enhances the values in their care."

Aside from biodiversity, there is a good case for important ecosystem services, such as water supply or even reforestation, to be provided by means of covenants or service agreements with leaseholders or freehold owners. Farmers of long standing are already committed to living on the land and managing it, are very familiar with the land, and in the current economic climate are likely to be appreciative of any income or rent reduction provided by such an arrangement.

There have been numerous cases where LINZ has reasonably concluded that areas recommended for protection were too small, too complex in shape or too essential to farm operations to warrant the expenses of surveying out, fencing off and subsequently managing as public conservation land. LINZ also considers whether SIVs are at risk in freehold use. If such SIVs can be protected by covenant, there is little reason for the Crown to retain the land.

There are other mechanisms for protecting SIVs on private land, completely independent of the CPLA. Open space covenants in favour of the QEII National Trust may be particularly popular among private landowners because of the

'arms-length' separation of the Trust from government. A recent count showed 42 QEII covenants already in place in the high country, covering more than 13,000 hectares.²¹³ QEII covenanting may have particular advantages for small areas of land, such as remnant forest stands or wetlands, where transfer to the Crown through tenure review might involve disproportionate administrative costs.

The Trust itself considers its covenants to be a versatile and rigorous means of protection on rural land. Each is tailored to meet the particular circumstances and values of the land in question. Its 2006 Annual Report shows that 98 percent of more than a thousand monitored covenants satisfied or exceeded their terms and conditions.²¹⁴ While the Trust has little coercive power to deal with poor performance, it provides a support programme to help landowners get back on track. It finds that significant breaches are frequently also offences under the RMA, which gives local authorities enforcement options to remedy breaches.

In opposition to this approach, Forest and Bird stress that the public are not a party to the covenant agreement.²¹⁵ The landowner is not directly accountable to the public for the way the land is managed. Members of the public cannot have covenant conditions enforced by appeal to the police or courts. Even for the covenant administrator, the law relating to enforcement is complex and less than certain. In theory, the Courts can modify or extinguish covenants without consulting the public.

Forest and Bird also raise concerns regarding public access. However, QEII policy is that their open space covenants provide walking access with prior permission from the landowner, subject to safety considerations and to the vulnerability of the feature being protected.²¹⁶

For effective monitoring and enforcement, covenants must be explicit, detailed, robust and comprehensive. The parties to the covenant need to know exactly what it is that is to be protected. Despite these stringent requirements, the QEII National Trust experience is that covenanting is cheap, efficient and effective when it is done as core business.²¹⁷ Efficiencies will be made as a 'library' of covenant forms is built up. Much of the work that went into developing and negotiating the Cattle Flat sustainable management covenant, for example, should not need to be repeated for future applications. There may also be time and cost savings made elsewhere in the negotiation process, if deals involving covenants are more acceptable to leaseholders.

Productive use of Crown land

Freeing pastoral lease land from management constraints is an objective of tenure review. But s24 CPLA does not specify that the freeing from constraints is to be brought about by transfer to freehold ownership. Making freehold disposal of reviewable land easier is certainly also an 'object', but one of lower priority. Retaining land in Crown ownership, but under other arrangements than pastoral leases, may often meet these goals. The CPLA specifically allows for grazing permits and recreational concessions. It is likely to be difficult for the Crown to maintain the pastoral character of a landscape without grazing, although in cases where that is a significant consideration it is hard to see why tenure review should be undertaken at all.

Management for purposes other than production, conservation, or recreation

The CPLA also allows for pastoral lease land to be transferred to parties other than DoC or current leaseholders. This may be particularly useful where land has little value for production, conservation or recreation. Regional councils may be best placed to take ownership of such land and manage it for water yield, soil conservation or carbon storage purposes.

It also seems possible to manage land for delivery of these ecosystem services under freehold tenure in future, using sustainable management covenants. Again, if the benefit lies with a local authority, the CCL can transfer administration of sustainable management covenants to them under s97(4) CPLA.

The prospect of planting more trees

When resources are insufficient to address all infestations of wilding conifers, the first fallback position is to adopt the cheaper solution of controlling spread rather than eradication at lower priority sites. Under DoC's wilding conifer strategy, because of funding constraints, this was the preferred option for sites scoring less than 12.5 on the DoC ranking calculation.

Next, infestations can be allowed to spread at those sites until greater resources become available. But costs of eradication escalate rapidly when wilding conifers are left to spread. Furthermore, uncontrolled spread of *P. contorta* will yield trees with very poor wood quality, so there is very little value to reclaim on felling. This option seems the worst of all worlds unless it is certain that help is on the way.

The last resort is to change land use at lower priority sites to plantation forestry, preferably involving tree species with a low propensity for wilding. Clearly afforestation would radically transform high country grasslands. However, forested landscapes are not necessarily offensive or unnatural. It is not so long ago that the high country was covered in trees, and it retains a powerful ecological drive toward forest.

Extensive afforestation can have many local and national benefits. Trees can minimise soil erosion by stabilising slopes, providing ground cover and reducing ground level wind speed; much of the wilding conifer problem, especially in Canterbury, arises from the historic use of pines for erosion control. Trees capture and sequester carbon dioxide

Box 3.2 Molesworth Station

Molesworth Station Farm Park, a huge recreation reserve in the Marlborough high country, is a good example of productive use of DoC land (although it was not acquired through tenure review). Beech forest remnants, tussocklands, shrublands, lakes, wetlands and kettlehole bogs form a variety of interesting habitats supporting many endemic Marlborough native plants, a diverse lizard fauna and some spectacularly large invertebrates. Recreational activities include tramping, driving, cycling, rafting, kayaking, horse trekking, fishing and hunting, supported by a number of professional concessionaires. In the meantime, Landcorp Farming Ltd. are able to lease much of the park for beef cattle farming. This stocking regime allows steeper areas inaccessible to cattle to recover from overgrazing by sheep and rabbits. A fencing programme is progressively protecting other selected areas from stock damage. This multiple use management could be a model for other whole stations or catchments in Crown control.

and promote methane uptake in soils. Forests can provide some refuge for some native flora and fauna, and are unsuitable habitats for some pests such as rabbits. They protect water quality by minimising discharges of sediment and nutrients into waterways. They offer socio-economic benefits including employment, and provide economic diversity.

All of these benefits are likely to be greater in native forest than exotic forest. Clearly native forest constitutes a better habitat for native species, and is more natural in appearance than plantation trees. In the long term, carbon storage is likely to be greater in beech or manuka-kanuka shrubland than in pine.²¹⁸ Beech forest soils are particularly effective at methane uptake.^{219,220} To a greater or lesser extent depending on species, exotic forestry would need to be accompanied by wilding control programmes to prevent spread into surrounding land, whereas native forest probably would not.

However, because exotic forests grow faster, can be self-seeding and are generally well understood commercial propositions, it appears unlikely that sizeable new native woodlands will result from unplanned privatisation without government support.

There are several North Island examples where reserves of hundreds or even thousands of hectares have been returned to native scrubland or forest by volunteers.²²¹ Despite this, even for DoC, it would be very difficult and resource-intensive to re-establish native forests over areas of tens or hundreds of thousands of hectares in a reasonable time. First suitable nursery vegetation would have to be established. Growing the huge number of seedlings required would be a huge task in itself, let alone planting them. Exotic competitors and grazing animals would have to be controlled throughout.

There will be numerous high country catchments where neither native nor exotic forest is appropriate because the resulting reduction in water yields and hence stream baseflows is unacceptable to water users, including hydroelectricity generators and aquatic ecosystems.

Allowing residential growth

Considering high country pastoral land that is close to lakesides, there may seem to be no good land use options:

- if low-density pastoral use becomes uneconomic
- and high-density pastoral use is not ecologically sustainable with respect to water quality
- and forestry results in unacceptable reduction in water yield or landscape transformation
- and there is no suitable wind resource or ski slope to develop.

What is left?

With many caveats, low-density residential subdivision does not seem such a terrible option. The cumulative impact on outstanding scenic values must be no more than minor. Buildings and constructed features must be sited, sized, coloured, etc. to be unobtrusive or preferably invisible from public viewpoints. Public access routes, historic and cultural sites, if any, would require strict protection. Other matters such as disposal of sewage, noise and traffic would require suitable controls. Ensuring restoration of ecological values as part of such

residential developments would be welcome. Control of pests and weeds would be essential and appears enforceable through the Biosecurity Act.

Conditions like these do not appear impracticable. For example, the Mackenzie District Plan Change 13 notes that many of the existing clusters of farm buildings are already well located from a landscape perspective. The larger high country lakes are many kilometres long: dwellings further up lakes from traditional tourist viewpoints would be very difficult to see, especially if screened by trees.

To reiterate, it is not the role of tenure review to specify future uses. But one objective of tenure review is to protect SIVs, and covenants are one protective mechanism for achieving this. In many cases it will be desirable for covenants to contain specific provisions relating to subdivision, because the relevant district plan is demonstrably inadequate to protect the SIV of concern. It would be unfortunate if such covenants prevented a future use that was optimal for the land in question. Cabinet did not direct that subdivision on lakeside pastoral land should be ruled out. It agreed that lakeside pastoral leases should be withdrawn from tenure review unless lakeside land was "retained in Crown ownership (preferably) or covenanted to restrict subdivision".²²²


Conclusions and Recommendations

4.1 Achievements of tenure review

An investigation that concludes with recommendations for change may be perceived as fundamentally negative. So it is important to stress that tenure review has led to some good outcomes, and has not been without innovation and improvement.

Tenure review provides a way forward for marginally economic leasehold farms that can enhance both public and private interests. It allows for diversification on high country land, which may enable more sustainable land uses.

At the same time, tenure review has provided opportunities to protect tussock grasslands and some remnant forests and wetlands across much of the eastern South Island. These are huge new recreational areas for trampers, mountain bikers, climbers, hunters, anglers, birdwatchers and others. There is the possibility of connecting the new parks through the Te Araroa track, which will eventually run the length of New Zealand.

Tenure review can also be used to maintain certain nationally significant landscapes. These are treasures for high country communities and visitors from all over the country, and also for international tourists, to the great benefit of New Zealand as a whole.

Refinements to the tenure review process have allowed the Crown to take a share in any potential windfall profits from subdivision and development of pastoral land. Potentially interested parties including state-owned enterprises, Fish and Game, TRoNT, conservation and recreation groups, scientists and local people have the opportunity to publicly express their concerns for the high country. A new form of sustainable management covenant has been devised. The national importance of high country lakes has been recognised.

Moreover, considering the dozens of individual reviews now in process, much time and effort has gone into assessing high country leasehold land and in negotiating tenure review proposals. It would be wasteful to abandon all this work, and potentially very stressful for lessees.

On this basis, the tenure review process as a whole should not be discontinued. Nevertheless, there is no justification for completing individual reviews where the public interest is not protected adequately. The previous Government wisely indicated that it is prepared to remain a lessor indefinitely where that is appropriate.

I recommend that:

1. The Commissioner of Crown Lands proceeds with individual tenure reviews of pastoral leases under the Crown Pastoral Land Act, provided that proposals and settlements are demonstrably in the wider public interest.

In particular, the CCL and the Minister for Land Information must be confident that SIVs on the land will be protected, and ecologically sustainable management will be achieved.

4.2 The need for oversight and monitoring

Prior to the CPLA, about 20 percent of the area of the South Island was Crown land under restrictive pastoral lease. Lease by lease, approximately half of that land is being opened up to private development, while the rest is retained for public conservation. Thus tenure review results in an immense change in land ownership and land use.

This change is coming at a considerable cost to the public. Quarter of the way through the tenure review process, at least \$120 million has been spent in settlements and in whole property purchases. At the same time, approximately 300,000 hectares of publicly owned land has been privatised.

Tenure review by its very nature is a sequence of incremental changes, leasehold property by leasehold property. Incremental changes lead to cumulative effects. The sheer area of pastoral lease land is such that the cumulative effects of tenure review decisions have implications for regional and even national environmental issues. These include biodiversity, lake and basin landscapes, alpine tourism, soil conservation, carbon storage and hydroelectricity generation. There may also be adverse effects on the fine wool clip, lowland irrigation and water supply to urban centres.

Good outcomes therefore require that individual tenure review decisions are made in the context of a long-term, high-level strategy for the high country as a whole. However, LINZ consider that they are not responsible for the cumulative effects of tenure review.²²³

The Minister of Land Information between May 2006 and November 2008, Hon. David Parker, saw the need for oversight. During his term, all preliminary and substantive proposals became subject to review by LINZ senior management, and subject to funding approval by the Minister of Land Information in consultation with the Minister for Conservation.²²⁴ At the same time, all lakeside properties were withdrawn from review unless stringent conditions were met.²²⁵

Tenure review under the CPLA is not merely a regulatory decision, but also a policy decision about Crown assets. It is elsewhere considered appropriate for elected Ministers to take such policy decisions. For example, under the Crown Minerals Act 1991, the Crown decides each year how much land should be made available for mining and gas or oil permits based on its energy policies. In that case, it is accepted that the Minister of Energy is best placed to act in the Crown's best interests in deciding what resources should be made available and when.²²⁶

However, direct Ministerial involvement in individual decisions is not sustainable. High country issues are complex, technical, interrelated and contentious, requiring considerable resources to address. Key objectives such as 'ecologically sustainable management' may mean something very different for one part of the high country than they do for another. The problem remains that the Crown's objectives can only reliably be realised in the long term through consistent oversight and the development of an explicit strategy.

Neither of the two principal agencies involved in tenure review has the capacity or the mandate to be concerned with the high country as a whole. LINZ's role is one of administering the Crown pastoral lease system, including lease termination, under the Land Act and CPLA. DoC's Southern Conservancies identify significant inherent values of high country land, manage land for conservation purposes, work for threatened species recovery, and provide for public access and recreation via the creation of a park network.

A new body is urgently needed to provide strategic overview and direction to tenure review. Such a 'High Country Commission' would monitor cumulative effects of tenure review, develop the detail of a strategy directed at achieving the objectives of the numerous relevant Government policies, and advise the CCL accordingly.

Recommending an institutional form for a High Country Commission is beyond the scope of this investigation, but it might be appropriately established as an Autonomous Crown Entity with a small core staff and others seconded from relevant government agencies. To be effective, the Commission must be chaired by a professional director and have a membership inclusive of all interests; those of farmers, environmental groups, Ngai Tahu, the tourism industry, local authorities and so on. The Commission should be based in the South Island, possibly at Lincoln University.

I recommend that:

2. The Government establishes a High Country Commission for a fixed period to advise on all significant aspects of the public interest in tenure review and in the high country more generally.

Functions and nature of a High Country Commission

The High Country Commission should be charged with particular advisory tasks with an attached timeline. Its principal task would be to identify desired and achievable end states for different parts and types of high country, addressing such questions as:

- Which parts of the high country are nationally high priorities for acquisition as public conservation land, because they are highly vulnerable environments that are inadequately protected nationwide, such as wetlands?
- Which parts of the high country are priorities for acquisition as public conservation land, because they will significantly improve the contiguity, accessibility, recreational opportunities or whole-of-landscape character of existing conservation parks?
- Which parts of the high country are marginal for both production and conservation? Who should manage them and for what purposes? What sustainable management covenants or other controls would be advisable to protect the public interest in these areas?

- In which high country lakes and rivers is water quality, colour and clarity at risk from agricultural intensification, and what controls on reviewable land are necessary to mitigate those risks?
- Which high country catchments, if any, can be afforested without significant adverse effects on water yields or indigenous ecosystems?
- Of those catchments or sub-catchments that could be afforested, which, if any, are suitable candidate areas for native forest restoration?
- Which high country landscapes are of national significance, and what controls on reviewable land are necessary to mitigate risks of inappropriate development or pest and weed infestation in those areas?

Other tasks should include:

- Advising the CCL as to which groups of pastoral leases should be reviewed together, which other land (if any) should be included in reviews, and which tenure reviews are high priority (refer s26, s27, s32 CPLA).
- Monitoring the progress and achievements of tenure review, with particular attention to the potential for undesirable cumulative effects.
- Devising a practical means of assessing 'ecological sustainability' with respect to high country pastoral land.
- Reporting to Cabinet, and, if appropriate, to interested parties.
- Advising on other aspects of the public interest in the high country, such as management of existing pastoral lease land,²²⁷ or the potential for carbon storage.

The High Country Commission should engage with:

- Te Rūnanga o Ngāi Tahu
- Regional councils, in regard to water quality and soil issues at a catchment level
- Territorial authorities, in regard to landscapes and development planning
- Fish and Game, Forest and Bird, and Federated Mountain Clubs, in regard to conservation and recreation uses of land
- Meat and Wool New Zealand and the High Country Accord, in regard to productive uses of land

The High Country Commission should seek advice from selected scientific experts from the universities and Crown Research Institutes as required. An inclusive high-level process is likely to be more meaningful, efficient, and appropriate to considering third party aspirations at a strategic level, than increasing public participation in individual reviews.

Environmental reporting for the high country

The Cabinet directed officials to report annually on progress against Government High Country Objectives,²²⁸ and deferred the second such report until 2008. That report by LINZ, DoC and MAF provided much valuable information about positive outcomes of tenure review. But it omitted virtually all mention of adverse outcomes.

I recommend that:

3. Cabinet directs the officials responsible for preparing the next South Island High Country Objectives report to include both environmental gains and environmental losses.

Matters covered in the report could properly include:

- Gains and losses of land assessed as having significant inherent value
- Gains and losses of land classified as acutely or chronically Threatened Environment
- Gains and losses of wetlands
- Gains and losses of rare environments
- Gains and losses of nationally threatened species and their habitats
- An assessment of changes in water quality and quantity in major high country lakes and rivers
- An assessment of the extent to which ecologically sustainable management has been attained on public and privately owned reviewed land
- An assessment of changes in agricultural productivity
- An estimate of capital expenditure required to complete tenure reviews in process
- An estimate of net increase or decrease in Crown return on high country pastoral lease land, including fencing, pest and weed control, income from leases and concessions, administration costs and tax revenue.

This information should cover the period from the start of tenure review under the Land Act, and all high country land.

4.3 The middle way - more mixed outcomes

The CPLA allows for a range of options for land use and management as outcomes of reviews of pastoral leases. However, most completed reviews have resulted in a division of the land between lower altitude production land in largely unencumbered freehold ownership, and higher altitude conservation parks. This simple split model:

- Does not provide effective protection to some waterside SIVs and endangered bird habitats
- Drives intensification on lakesides and river flats, threatening water quality
- Leads to a huge conservation park network, mostly high-altitude tussock grasslands reached through easements across private land
- Diverts resources from high conservation priorities such as lowland forests, dunelands and marine areas.
- Does not allow for restoration of ecological communities that have been virtually eliminated
- Breaks up whole altitude sequences, which have landscape and conservation value in themselves
- Changes the character of high country farms, threatening a loss of pastoral heritage and landscape

• Prevents high altitude grassland being used for summer grazing, which disfavours traditional merino farming and hence national fine wool production.

Overall, these effects could make the high country less attractive to tourists, with potential regional and national consequences.

This simple split model is fostered by a single word in the CPLA. S24(b) gives two options for enabling "the protection of the SIVs of reviewable land", namely:

- (i) By the creation of protective mechanisms; or *preferably*
- (ii) By the restoration of the land concerned to full Crown ownership and control.

As well as all the adverse effects above, this preference has added hundreds of thousands of hectares to public conservation land in the South Island, and appears likely to add as much again if carried to its conclusion. Protecting that land will place great demands on DoC resources. It is time to question how much grassland should be publicly owned conservation land. Any Government is of course entitled to have preferences, but these are better expressed in policy, not in legislation.

I recommend that:

 The Minister of Land Information proposes an amendment to the Crown Pastoral Land Act 1998, namely, to remove the word "preferably" from s24(b)(i).

One alternative approach is retention of just the highest priority whole altitude sequences as public conservation land. This is the philosophy behind the whole property purchases funded by the National Heritage Fund and LINZ, including the St. James and Hakatere stations.

Another alternative is management of a property for multiple uses, not just pasture or park. Controlled low-intensity grazing accompanied by pest, weed and erosion control may be sustainable in some circumstances, maintain the pastoral character of a landscape, and provide a source of productive income. Tools such as sustainable management covenants and whole farm management plans are available to guide management to multiple objectives. Such management can proceed under private ownership, or under public ownership using grazing permits and recreation concessions.

For smaller areas of high natural value, private ownership under covenant with the QEII National Trust may be a good approach. There are already more than forty QEII covenants on high country properties. Not only are they comparatively cheap, versatile and rigorous, QEII covenants enjoy exceptionally high compliance rates nationwide.

There seems to be a working assumption that all pastoral leases will go through tenure review. But it would be a mistake not to consider the status quo as a real option. High country pastoral farming is a highly valued cultural heritage. It has created and maintained the merino industry and the iconic open pastoral landscapes of the high country.

Finally, some high country land has little present value for either conservation or pastoral production. Rather than trying to 'shoehorn' such land into one box or the other, it may be appropriate to search for other solutions. This may involve transferring it to local authorities and managing it for environmental purposes such as clean water yield, soil conservation or carbon storage.

I recommend that:

5. The Minister for Land Information directs the Commissioner of Crown Lands to encourage and adopt a wider range of land ownership and management models within tenure review proposals.

In principle, management for environmental purposes, even biodiversity enhancement or recovery of indigenous species, can be done by farmers. Pastoral leaseholders are already required to control pests and water weed, limit stock numbers and obtain permits for environmentally detrimental activities such as scrub clearance.

The pastoral lease system provides for penalties including fines, further stock limitations and even forfeiture of lease, and perhaps incentives in the form of relatively low rentals. It may be appropriate for farmers to receive financial incentives for the provision of environmental services in the future, especially as the economic viability of high country pastoralism appears increasingly marginal.

There are several different ways in which farmers could be engaged to provide additional environmental services. If land is made freehold subject to stringent consent conditions, its valuation should be less than if it were unencumbered, and hence the financial settlement would move in favour of the farmer. The Henroost sustainable management covenant includes an annual "rentcharge" that is to be waived if there is no significant breach of conditions.

Even without going through tenure review, rentals of existing leases could be waived or reduced in recognition of superior stewardship.^{229,230} Grazing licence fees or recreation concession fees on public conservation land could also be reduced.

Whatever the arrangement, it is important that environmental goals are clear, measurable and accompanied by outcome-based penalties and incentives.

4.4 Safeguarding national interests

The lack of strategic direction in the tenure review process and the potential for cumulative harm can be addressed by the creation of a High Country Commission. But such a Commission could only influence future tenure reviews. It will not change any 'bolted horses', that is, any undesirable environmental outcomes of reviews that are already complete.

The potential for undesirable outcomes arises because there is a disconnection between the CPLA and the RMA. Tenure review seeks to remove management constraints from production land, taking for granted that any adverse environmental effects will be controlled by RMA authorities. But local authorities can only control use and development of land to the extent that relevant plans allow. While high country councils clearly want to acknowledge significant natural values and protect them from inappropriate development, regional and local plans as they stand may not be able to adequately manage land use intensification in practice.

One particular concern raised about tenure review has been that it has not provided legal protection for indigenous biodiversity on lower altitude land, and that intensification will destroy what remains. This investigation shows that there is some justification for that concern. However, there is a need for pragmatism and perspective. While there should be protection for the few remnant wetlands, gullies of native forest and so on, there is very little indigenous cover left on lower altitude high country except for matagouri and tussock. The forests that once covered most of the high country have been gone for centuries.

Another concern has been the effect of subdivision of privatised land, and construction of buildings intruding on iconic views, particularly around lakes. But buildings can be designed to blend in, can be screened by native trees, and because they can be demolished are not an irreversible change. Indeed, low density residential use of lakeside land may have relatively little impact on water quality and landscape, compared to intensive production.

So while adverse environmental effects could occur from inappropriate development of former pastoral lease land, such effects may be avoidable. There is even the potential for net positive environmental outcomes, especially if developments are encouraged to include elements of ecological restoration. A blanket ban on development is neither necessary nor constructive.

Nonetheless, the national significance of many high country lakes and outstanding landscapes is such that some effective means of control on development is essential. Fortunately the RMA provides for Ministerial intervention to address exactly such matters.

I recommend that:

 The Minister for the Environment calls in development applications that are proposals of national significance due to their potential for significant adverse effects on lakes or outstanding landscapes in the high country.

Protecting water quality in the high country

The purity and clarity of the water in high country lakes and rivers is of great national importance. New Zealanders treasure the intense blue of Lake Tekapo and the reflection of the mountains in Lake Hawea, and so do the tourists who come to see them.

Some lakeshore land privatised through tenure reviews is being fertilised and running stock, and there are few, if any, regulatory restrictions on future intensification. There is the potential for an irreversible decline in water quality and appearance, like that already seen in Lake Hayes and major North Island lakes.

Despite a clear understanding that ecologically sustainable management has due regard to water quality outside the land in question, LINZ and the CCL have consistently considered water quality issues to be outside the ambit of tenure review. Consequently no protective measures have been created to maintain water quality after review.

Nutrient discharge from land use activities including pastoral farming can be considered a discharge of a contaminant in circumstances where it may enter water in contravention of the RMA. It is a function of regional councils to control the use of land to maintain and enhance water quality, and this can be done through rules in regional plans.²³¹

There are already promising approaches to these resource management problems. One is Environment Bay of Plenty's Rule 11 of their Regional Water and Land Plan,²³² relating to catchments of five of the Rotorua lakes, and another is Environment Waikato's Proposed Waikato Regional Plan Variation 5 – Lake Taupo.²³³ In both cases, the regional council has aimed to set water quality targets for the lakes, and has developed 'cap-and-trade' models to manage nutrient use on land. These approaches set the environmental limits for land use intensity in the lake catchments, but leave options and decision making with individual land managers.

It is imperative that ECan and ORC promptly make rules that ensure the water quality of high country lakes is protected.

I recommend that:

7. Environment Canterbury and the Otago Regional Council introduce rules for monitoring and controlling discharges of nutrients, pathogens and sediment to iconic high country lakes.

As it will be some years before any such rules are operative, it may be advisable for future tenure reviews to contain provisions for protecting water quality. These could include sustainable management covenants allowing for nitrogen and phosphorus discharge limits to be set by the appropriate regional council. The proposed High Country Commission would appropriately advise on these matters.

Controlling wilding conifers

Wilding conifers are spreading over both private and public land in the high country. If uncontrolled they will rapidly and thoroughly colonise high country grasslands, preventing grazing and radically changing the ecology and the scenic character of the landscape. Extensive afforestation reduces water yields and stream baseflows, which in due course could have national consequences, by reducing water input to major hydroelectric power and irrigation schemes. Dense stands of *P. contorta* are not even a good resource compared to plantation forestry or native reforestation.

Key considerations in wilding tree control programmes are that, once established, eradication becomes much more expensive, and that controls must be sustained until dispersed seed is no longer viable. However, government support for conifer control programmes has been sporadic, and DoC are currently funded at a fraction of the level sought in 2004, based on a detailed wilding conifer strategy.

Other woody weeds may ultimately pose a greater threat than conifers, particularly broom and gorse due to their more persistent seed banks. Infestations of these species should also be addressed as a secondary objective of wilding conifer control.

Increased government expenditure is hard to justify in the current recession. Wilding conifer control appears to be a worthy exception. Not only will control costs increase exponentially if they are not addressed promptly and consistently, but also eradication is labour-intensive and hence could provide much-needed employment opportunities.

I recommend that:

8. The Minister of Conservation and the Minister of Tourism seek Cabinet approval for sufficient additional funding for a sustained woody weed eradication programme.

4.5. Parks and prioritisation

The land retained in Crown ownership after tenure review is given by default to DoC to manage. No other government agency has a use for 'unproductive' land.

The majority of National Parks are in the South Island. There are now eleven conservation parks (or equivalent) in the high country, and a further four in the rest of the South Island. DoC is also responsible for numerous reserves and 'conservation areas'. The conservation estate in the South Island now comprises more than six million hectares.²³⁴ At least five further high country conservation parks have been proposed, two of which (Hawea and Oteake) have already been gazetted.

In this investigation a number of concerns about the new high country conservation parks have arisen. Most contain little lower altitude land, and hence represent a restricted range of land environments with few whole altitude sequences, which have particular conservation and landscape value. Some new conservation parks, for example the Te Kahui Kaupeka and Te Papanui parks, appear relatively difficult to access. Riverbeds, which are valuable as endangered bird habitats and for recreational access, but are not reviewable land, have not yet been incorporated into the parks.

As highlighted by the previous Government,²³⁵ it is important that the high country park network contain "a full range of large scale landscape / ecology". More acquisitions may be advisable to strengthen the lower altitude components of some existing parks. This could also have the secondary benefit of improving accessibility. The objective would also seem to require allowance for restoring some of the high country woodland ecosystems that have been virtually or completely destroyed by historic vegetation clearance.

This objective should be achievable without completing the proposed park network. Further, the public interest in much of the high country pastoral lease land goes beyond DoC's key functions as set out in the Conservation Act, which centre on maintaining and conserving natural and historic resources. Ecosystem services that could be provided by such land, such as soil conservation, water yield and carbon storage, do not necessarily require ownership and management by DoC. Moreover, much of this land has some potential for productive use. It may be preferable for some high country conservation land that has relatively low conservation values to be managed for multiple uses, or even disposed of in order to fund other acquisitions.

At a national level, conservation parks are being oversupplied in one part of the country. Twenty parks in the rain shadow of the Southern Alps is simply not a good use of limited conservation resources. Of course, it is only in the South Island high country that such large areas of land are being made available for DoC acquisition. But our public conservation land should not be so dominated by dry high altitude pastoral land in one part of the country.

The imbalance between conservation lands in the South Island and those in the more populous North Island is becoming very marked, as is the imbalance between alpine / high country and coastal / lowland conservation land, let alone marine conservation areas. The case for nationwide strategic planning for conservation land is increasingly compelling.

"The effectiveness of systematic conservation planning comes from its efficiency in using limited resources to achieve conservation goals, its defensibility and flexibility in the face of competing land uses, and its accountability in allowing decisions to be critically reviewed."²³⁶

The apparent lack of any such system was identified as a concern by the Auditor-General four years ago.²³⁷

I recommend that:

9. The Minister of Conservation reviews the policies and Conservation Management Strategies relating to the creation of high country conservation parks. These strategies should aim to create a representative land holding of high conservation value, which can be effectively managed and restored without drawing resources away from high conservation priorities elsewhere in New Zealand.

Appendix 1 : High Country Timeline

c. 10,000 BC	End of the Otira glaciation. Retreating glaciers expose the high country landscape.
— 2,000 ВС	The high country is now largely covered with beech forest, with sub- alpine ecosystems such as tussock grasslands above the treeline.
— 1200 AD	Polynesian settlers use fire to extensively deforest the high country.
— 1840s, 1850s	European settlers acquire the high country from Ngāi Tahu, begin sheep farming, clearing remaining forest and scrub, introducing exotic pests.
— 1870s	Stock numbers peak.
— 1880s	Rabbit numbers peak.
— Late 1940s	Pastoral leases issued under Land Act 1948. 1080 poison and other means used to control rabbits. Topdressing introduced.
— 1977	Reserves Act passes.
— 1980	Land Settlement Board introduces conservation values into Crown pastoral land administration by Department of Lands and Survey.
— 1980s	Protected Natural Areas Programme pursuant to Reserves Act used to identify Recommended Areas for Protection, not to be developed.
— 1987	Conservation Act passes, establishing Department of Conservation.
— 1990	Farmers refuse access to Protected Natural Areas Programme surveys.
	Tenure reviews under the Land Act begin.
— 1994	Review process recommended for pastoral lease land disposals
— 1998	Crown Pastoral Land Act passes.
<u> </u>	Government issues first High Country Objectives.
<u> </u>	Latest version of High Country Objectives. Government confirms willingness to remain a high country lessor indefinitely.
— August 2006	Richmond station tenure review alienates many environmental interests.
	Funding approval for tenure review proposals now direct from Minister of Land Information, David Parker.
— Nov. 2006	"High Country Hijack" issue of North and South magazine popularises opposition to tenure review.
— June 2007	Cabinet indicates that it will withdraw from any tenure review that is unlikely to protect significant values to the Crown's satisfaction.
— Nov. 2007	Cabinet withdraws all lakeside pastoral leases from review.
	Separately, Cabinet indicates that it will look to raise pastoral lease rentals.
— August 2008	Ann Brower publishes Who Owns the High Country?, challenging sums paid by the Crown to retain pastoral lease land.
— Oct. 2008	Cattle Flat (Southland) tenure review includes first substantive sustainable management covenant.
	LINZ, DoC and MAF issue 3-year report against High Country Objectives.
	Minaret station test case heard, to determine whether the Crown can include amenity values in valuations for pastoral lease rental purposes.
Nov. 2008 ▼	Fish and Game apply for declaratory judgment on leaseholder rights in the High Court.

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85

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Glossary

Amenity value	Added value in a property based on desirable features of its surroundings.
Anoxic	With little or no dissolved oxygen.
Baseflow	The part of stream flow that comes from groundwater, not surface water runoff.
Catchment	The area drained by a river, or draining into a body of water.
CCL	Commissioner of Crown Lands. An official reporting to the Minister for Lands, with various statutory powers and functions relating to Crown-owned land.
CO2-equivalent	Used to describe a mixture of greenhouse gases (q.v.); the amount of carbon dioxide that would have the same global warming potential over a specified time, usually a hundred years.
Covenant	A legal agreement associated with an area of land, providing for protective measures to preserve or manage some value of that land.
CPLA	Crown Pastoral Land Act 1998.
DoC	Department of Conservation.
Easement	A right to use land in a particular way, but without the right of possession of that land. Access easements are rights of way over land.
ECan	Environment Canterbury, the Canterbury Regional Council.
Ecosystem services	Environmental benefits provided by ecosystems to surrounding land, or to national or global interests.
Endemic	Originating from, and restricted to, a particular region.
Eutrophic	Used to describe lakes; rich in nutrients, promoting a proliferation of plant life, especially algae.
Exotic	Used to describe plants or animals; foreign.
Fish and Game	Fish and Game New Zealand, statutory managers of New Zealand's freshwater sports fisheries and game bird hunting.
Forest and Bird	Royal Forest and Bird Protection Society.
Fringe spread	Expansion of forest or shrubland by establishment of new seedlings close to the parent plant.
Greenhouse gas	A gas such as carbon dioxide, methane or nitrous oxide, which contributes to lower-atmospheric warming by efficiently absorbing outgoing radiation.
Husbandry	Careful management of farming matters.
Indigenous	Native.
Intensification	Increased use of land.
Kaitiakitanga	Guardianship of natural and physical resources in accordance with Māori custom and ethics.
LEI	Land value exclusive of improvements.
LENZ	Land environments of New Zealand; mathematical groupings of land sharing similar climate, landform and soil type.
LINZ	Land Information New Zealand.
Local authority	A regional council or territorial authority (q.v.).

MAF	Ministry of Agriculture and Forestry.
Marginal strip	A strip of land in Crown ownership along the edge of a water body that is above a minimum size, as specified in the Conservation Act.
ORC	Otago Regional Council.
Pastoral	Used for raising livestock.
Pastoral occupation	licence An agreement for pastoral use of Crown land, under repealed s66AA of the Land Act or s14 CPLA (q.v.).
Pathogen	Disease-causing microorganism.
Public conservation	land Crown land held for purposes including conservation and recreation, usually by the Department of Conservation.
QEII	Queen Elizabeth the Second National Trust.
Rabbit calicivirus	A highly contagious disease that affects only rabbits, and has a very high mortality rate among populations with low immunity. Introduced into New Zealand in 1997.
Rain shadow	An area having relatively little precipitation, due to the effect of a barrier, such as a mountain range, that causes the prevailing winds to lose their moisture before reaching it.
Reserve	Land held by the Crown for a particular purpose, generally under the Reserves Act.
RMA	Resource Management Act 1991
SIV	Significant inherent value; in the CPLA (q.v.), defined as "inherent value of such importance, nature, quality or rarity that the land deserves the protection of management under the Reserves Act 1977 or the Conservation Act 1977".
Special lease	A lease, under s67(2) Land Act, of Crown land that is not properly classifiable as farmland, urban land or commercial land.
Stratified	Separated into layers.
Taonga	To Māori, a highly prized possession or intangible asset.
Tenure	A legal right to use land.
Territorial authority	A city or district council.
TRoNT	Te Rūnanga o Ngāi Tahu.
Unencumbered	In this report, land not subject to covenants (q.v.) or other legal mechanisms for environmental protection.
Viticulture	Growing of grapes for winemaking.
Water yield	The runoff from precipitation that reaches waterways.
Wilding conifer	Invasive, self-sown exotic (q.v.) trees of the biological class Coniferopsida, particularly pine species but including Douglas fir, larch, Lawson's cypress, macrocarpa, redwood, spruces and Western red cedar.
Woody weed	Any species of exotic (q.v.) tree or shrub spreading where it is not wanted.

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