High Country Landscape Management Forum 2005

Proceedings

Otago Regional Council

HIGH COUNTRY
LANDSCAPE MANAGEMENT FORUM
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QUEENSTOWN

PROCEEDINGS

OTAGO REGIONAL COUNCIL

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Foreword

The South Island high country is a magnificent part of our country, a series of landscape jewels that together form a national treasure.

Over the years, many people have developed profound connections with the high country. Its dynamic, dramatic landscapes invite superlatives. They also generate intense debate among different groups over how best to manage them.

The Otago Regional Council was proud to host the High Country Landscape Management forum. It brought together a line-up of high calibre speakers, well established in their fields and representing different perspectives on the issues and pressures facing this unique area.

We are grateful for the support received from the High Country Accord, Federated Farmers, the farming community, the scientists, management agencies and artists who put so much time and thought into this forum.

I was heartened to observe the lively and frank discussion that took place among the participants over the two days. While opinions and approaches may diverge, there is a consensus that we all have a duty of care for these landscapes.

The challenge now is to build on the discussion, and to somehow balance human expectations with the natural characteristics of the high country.

Stephen Cairns

Chairman

Otago Regional Council

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Preface

The papers in these proceedings were compiled from presentations, speech notes and transcripts and edited by the speakers. Selected photographs and graphics have been included to the extent required for interpretation; however these comprise only a proportion of the rich material shown to participants at the forum. The willingness of the contributors to share their experiences, views and knowledge at the forum is warmly acknowledged, so too is the considerable time they gave to prepare for the forum and to finalise their papers for these proceedings. Thanks are also due to Federated Farmers, the High Country Accord, the District Councils and to the academics and professionals who gave advice and/or assistance to ensure the success of this forum.

Brian Turner's poem 'The Way Is Is', from his collection *Footfall,* is reprinted with permission from the author and the publisher Random House New Zealand.

WELCOME: OPENING THE THEME

Stephen Cairns - Chairman, Otago Regional Council

A warm welcome to all of you to the Otago Regional Council's High Country Landscape Management Forum. We are honoured and delighted by your presence. Our region, the second largest in New Zealand, extends over 30,000 square kilometres and about one third of that is more than 1000 metres above sea level. That's just one compelling reason why the Regional Council should facilitate this forum, to promote discussion of high country issues and explore pathways to their resolution.

Much further back in time, somewhere about 80 million years ago, ancestral New Zealand finally broke away from the primeval southern super continent of Gondwanaland and began its long era of separate evolution. Loaded with Gondwanaland plants and animals, it continued to evolve free from the diluting influence which subsequently affected all other pieces of this ancient tectonic jigsaw. It became in a very real sense a southern ark.

As well as its remarkable record of the imprint of the Pleistocene ice ages, *Te Wai Pounamu* also provides numerous outstanding examples of ongoing geological processes. These include evidence of the rapid rate at which the Southern Alps continue to rise along the alpine fault and the more obvious evidence of the equally rapid rate at which these rising mountains are being knocked back down by wind, water and ice. Dramatic examples abound of the way in which the glaciers and rivers of the region continue to shift vast volumes of shattered mountains down to lower altitudes. These are assisted by regular cataclysmic events. Spectacular landscape rearrangements are constantly taking place.

There are other major reasons why we invited you all to join us for these two days. This high country which so spectacularly surrounds us is the source of most of our history, our river flows, our electrical energy, our most interesting and fragile ecological systems, our economic strengths in recreational tourism, fine wool, fine wine and fine people. It influences our weather patterns, our inspiration, our creativity and our worries, especially about the inevitable earthquakes, floods and mass movements that will test our resolve and our preparedness.

This wonderful mix of high country features attracts not only up to two million visitors per year but the very best in dedicated scholars as well, and this room is proof of that. As a Council, we are especially honoured by the presence of people of international standing who understand and advocate the intricacies of the high country environments. I especially welcome Kevin O'Connor, Alan Mark, Brian Molloy, Morgan Williams, Peter Espie, William Lee, David Norton and Don Ross who have come from distant places to share their research and their learned views with us.

Talking of the inspiration that the high country evokes from us all, there are few, if any, who can turn that inspiration into visual images so brilliantly as Grahame Sydney and Gilbert van Reenen and I warmly welcome both of these artists too.

But none of us feel, understand and relate to the high country as much as those people who live and work within its challenges day by day, and we are especially grateful to have with us people like Iris Scott, Guy Mead, Andrew Simpson, Nicky Mead and Edwin Pitts who will give us their insights from Marlborough south to the Rees Valley.

The depth and detail of the knowledge and experience of our speakers and attendees augurs well for an excellent sharing of understandings. Many have had lifelong links and observations of the high country. These days are days to be relished and that's because your many perspectives are all here with us.

For the majority of us Kiwis who are not ecologists, artists and run-holders, the South Island high country contains many instantly recognised images of what we think of as 'our place': scenes of snow-clad rocky alps; panoramas of large open tussock and mountain ranges and valleys; vistas of merinos, mustering and farm homesteads in lonely mountain settings; images of waterfalls, rock tors and remnants of seasonal snows; records of alpine vegetation suited to seemingly impossible environmental niches (whether in the permanent mists of waterfalls, clinging to exposed or concealed hard rock surfaces, or sheltering on scree slopes exposed to desiccation, searing heat and enormous cold); tourism, marketing, tramping, snow sports, fishing, adventure experience, alpine lakes, warm chalets and sumptuous red wine.

We southern Kiwis are proud that internationally these same icons identify our products and us. It's no surprise that two of our Otago brands, Speights and the Highlanders, both draw their marketing strength from the landscapes that surround us. As Regional Councillors, we know that these vast South Island high country landscapes are our inheritance and will be our bequest. They exist as they are now because of the massive forces and wonders of nature dating back hundreds of millions of years, as I've mentioned, and because of just a few centuries of human endeavour and impact. From way back when groups of Maori plied these waters below us in raupo rafts heading for the pounamu outcrops north of Glenorchy, enormous human effort has been put into working with and understanding the high country - mining, tourism, farming, recreation and conservation. Often the effort and understanding gained has been used to nurture, promote or oppose presumed vested interests. Deeply divisive arguments have raged over land tenure, tourism activities, farming, conservation and recreation. All of us here for these two days recognise that these seemingly opposed vested interests seek to sustain values of the South Island high country which are widely cherished by everybody who has the high country on their actual or spiritual horizons.

The high country is our place and our heritage. Academics and professionals who work in the landscape field have termed the phrase 'heritage landscape' as a way of broadening our outlook beyond the aesthetic. This notion, as I understand it, embraces aspects of natural beauty and ecology and it also brings in many cultural elements. I'm thinking of the key stories of moa hunters, early pastoralism, the exploits of surveyors, gold mining, coal mining, the orchards, holidaymaking and recreation, right up to the modern day thrill-seeking.

Our high country has been a challenging place for people and it will continue to be so. With that in mind, we have convened this forum with the ambition to bring together great knowledge of the high country, with the sole focus of managing this awesome landscape so that it retains, where possible, its universally cherished values and, where necessary or desirable, so it changes in ways that do not detract from its icon status but do allow its use and values to be sustainably enhanced.

So what does the blueprint of sustainable management, the Resource Management Act 1991, have to say about landscape? Not a lot. Just a couple of lines in fact under Section 6, 'Matters of National Importance': those of us who are required to apply the legislation must recognise and provide for the protection of *outstanding natural features and landscapes from inappropriate subdivision, use, and development.* As you know, behind those lines lies a stupendous amount of debate and argument over the last couple of decades – at resource consent hearings, at District and Regional Plan hearings, and at forums such as this.

Likewise, our Regional Policy Statement makes only general references to landscape, which is not really surprising given that it is a high level strategic document. However, we intend to embark on a review of our Regional Policy Statement and so I hope some of what we discuss here may be incorporated into that review. The District Councils have led the field in some of these discussions and now, through the Resource Management Act amendments, we need to help them take the Regional Policy Statements into account.

So, on behalf of all my colleague councillors and our staff, I urge you to participate as much as you usefully can in this forum's discussion sessions and to take the opportunity for less formal discussions during breaks.

The only advice I will give you is from the poet Brian Turner, another wonderful Otago high country creative. Turner reminds us of the way things are in this environment and of our place in it, with his poem *The way Is Is*:

That you love nature is easy to say
until you learn that unless you act accordingly
it will call you to account in the end.

That's why
we're required to make the connection
between the sound the wind makes
when it starts the leaves quivering
and the way the white canes of sunlight
line the spaces between the mountains
on a summer's morning.

It's a case of
working out what's here
for the long haul
and if we want to be part of it.
It's marvellous, abominable, confusing,
exultant: the way things are,
the way is, is.[1]

Welcome to you all and I wish everyone an enjoyable and thought provoking forum.

[1]Brian Turner's poem '*The Way Is Is*', from his collection *Footfall*, is reprinted with permission from the author and the publisher Random House New Zealand.

LANDSCAPE AND MEANING

Grahame Sydney - Artist, Cambrian Valley

A close friend rather unkindly suggested to me that the reason I'm first out of the blocks at this High Country Management Forum is for the organisers to be able to assure those who arrive a little late that they haven't missed anything important.

And I have to admit there is merit in that thought. I am here, I think, partly to allow the stragglers in, and to set some sort of pace for the next few laps, with everyone in the stands knowing full well that I'll drop off the track as soon as the real contenders want to crank it up. A sort of 'rabbit' if you will, and like all rabbits I'm well aware that my time in the spotlight will be brief – and possibly fatal to elements of my reputation.

It has been my fortunate lot for the last 30 years to colour-in for a living, and artists like me learn slowly that being fair and reasonable and considerate of the needs of other people and the wider community does not make for great art. We work in solitary confinement and have to get used to the importance of a selfish and private pleasing of no-one but ourselves, to not giving a damn for the opinions of others, because good art depends so much on that secret inner life of personal experiences and responses, and finding the best way to give them a form. That's one of the reasons why the stories about many of the greatest artists are stories of flagrantly careless lives and spectacularly unorthodox lifestyles. A great deal of really bad art – and there is a mass of it about – is art which has grown from a painter's too obvious willingness to please others, not him or her selfish self, and time will quickly see that art forgotten.

For which reason I am by now quite accustomed to the fact that many of my beliefs are not shared by most others.

For example, of all the colours available to me, I dislike GREEN most. I hate green in the studio, and I'm not at all fond of it beyond the studio doors either. Perhaps that's why I felt so dislocated in England. Perhaps that's why I feel so much a stranger in the North Island. Perhaps that's why I cannot watch the artificial fertilising and watering of the Maniototo without a sense of anger and regret. Perhaps that's why the cancerous spread of forestry across so many of our previously honey-coloured tussocky hills infuriates me so much. In semi-arid regions like Central Otago, and the inland basins of the South Island, green is an alien visitor. Let Southland be green, and the North Island too; neither of them appeal to me.

I believe, you see, that landscapes have a power and a meaning far beyond any temporary economics. Landscapes, the natural theatres of our personal experiences and dramas, perform a symbolic and emotional function miles beyond their economic or geographical rationale.

It does not surprise me that I frequently hear people confessing – often with some bewilderment – that they 'feel at home' in a particular landscape, for reasons they themselves cannot explain. And the number of times one hears this 'feeling at home' and love of particular South Island landscapes expressed by those who have spent very little time amongst them is, if I can employ the obvious pun, remarkable.

Why is it we so often cling to the significance of one special PLACE, one special spot, one particular view, and hold that to our hearts for comfort, for a clearer sense of 'where we come from' and for confirmation of our identities? I believe that everyone has a deep secret spot, a special place, a landscape which brings them a profound and mysterious contentment, whether they carry it only in their memories, or can access it frequently: it could be called a 'G' spot, I suppose with, in this case, the 'G' standing for Geography.

But when we confess to this private G spot, we seldom know why it contains such power over us; it is mystical and complex, and we sometimes only recognise its anchoring in our private depths when it is changed, spoiled, or ruined, and then the sense of affront and anger we feel gnaws away at us incessantly.

Why DO landscapes affect us so much? Why is it that the high country and the wide empty basins of Central Otago, for instance, gather so much meaning for so many people? Is it because, in their raw-boned, skeletal geology (with only the thinnest veneer of soft comfort and fertility) they reflect something of the unforgiving nature of life itself? Is it some spiritual connection with the past? Is it that contrast makes effective: that in their vastness

and monumentality and permanence they remind us of all that is brief and transitory in our own insignificant lives? Is it pure escapism: that the silence - as Sam Neill so graphically wrote in our 'Timeless Land' book's introduction - 'the exhilaration of solitude, which is inseparable from the terror of loneliness' provides a vital alternative to the crowded, overpopulated, unnatural noisy artificiality of city and suburban life?

I read once a theory that people are finally shaped by the landscapes they live in, that they eventually start to resemble that land, in the same way husbands and wives managing to negotiate their way through long marriages often start to resemble each other: is the austerity and unadorned hardness of our landscapes in some way a reflection of our own subconscious, private stoicism? Is it simply that we see our own peculiar brand of Beauty there, beauty we know is ours alone, unique to where WE come from, and not somehow 'belonging' to others?

Whatever it is, I do believe in the power of landscapes to mean this much to people, and all over the planet people feel this way about some corner of their own country. When I am somewhere far away offshore and thinking of home, it is not the map of NZ I conjure up in my head, nor is it Auckland, or the verdant greenery of Waikato or Taranaki. It is not NZ as such; it is a particular place I love and miss, a hillside, a valley, a plateau glimpsed from a special corner, a mountain range ... a G-spot of my own.

Aucklanders may dream of Coromandel or Keri Keri, and good on them. But I dream of the Hawkduns, or Mount St Bathans glowing like an ember in the final hours of daylight, just as the rising shadow of night starts to push away the dull pink glow over the Kakanuis, and smothers the landscape with a cold grey pall.

It is part of the artist's task to give permanent form to these feelings of connection and deep anchoring, and to look for Beauty where it may be hidden to other eyes. But too often the paintings become the only permanent documents of a particular place and the feelings that place might have generated in me, because in the name of modernity or economic viability the visuals of that landscape have been radically altered, bulldozed into oblivion by the unquestioned engines of Progress.

I mentioned earlier my disdain for the greening of the Maniototo, the transformation of the magnificent McKenzie Basin into similarly artificial productivity. Anyone who can remain unmoved and careless about the pine forestation of the wonderfully sensuous, overlapping spurs of the Lake Onslow uplands, or the pine plantations on the rugged, desiccated hillscapes to the south side of the Pig Root near the Brothers, or dairying in the McKenzie Basin, just to name a few, is not possessed of the same heart as me.

Having been a teenager in the Arrowtown village of the 1960s, it is dreadfully hard for me to look out over the Lake Hayes basin as my plane flies in from the north and feel anything but disdain for the rampant development witnessed here in the 1980s and 90s, surely a desecration of a Landscape of National Significance: the shameful crowding of that Lake environment is unforgivable, and to see the insidious appearance of a house roof on the lower slopes of Coronet Peak defies belief. Much of the charm and magic of this magnificent corner of the province is already ruined by the incessant shot of the nailgun and scream of circular saws, but Mayor Geddes and his Council can still lift their eyes upward and into the future, and make sure that scandal is never again given legal approval.

I resent the rapidity of change, for I think that all fast change is most likely to be bad, and I see these rapid transformations in the name of productivity and greater income as being both ruinous and unsustainable: if it takes persistent application of artificial fertilisers and water to be piped or hauled vast distances to encourage production, then the earth will not sustain it. Fast changes are too often bad, the environmental equivalent of the phone call in the middle of the night, or news of an accident, or bad news conversations with the doctor. The changes to the face of this country in the few years since its settlement and arm-wrestle into submission have been rapid in anyone's language, especially if one speaks the slow language of this planet's evolution. Many of those changes will be seen to be ultimately unsustainable and will result in devastating consequences. Destruction is fast, the process of building is slow, and Nature is our witness to the truth of that.

If we are to preserve the unique landscapes we love, and which make us feel and understand

the specialness of where we belong, we must begin to put a value on qualities and outcomes which are not necessarily proven in monetary gain. There has to be acceptance of a concept of worth in terms which are not just monetary, and somewhere along the line someone has to accept that change personally, and concede to it with pride, and long view into the future.

Land owners present might take offence at my tone here, and say 'It's all very well for you, mate – I have to make a living off that farm, and it's getting harder and harder staying afloat on this property.'

I appreciate that, of course, and understand it. But I also suggest that the word 'ownership' brings with it very dangerous implications: implications, for example, that the land is 'ours' and we have a right to make it economic, to do better, or at least as well – financially – as our fathers. But we are not owners, any more than the purchaser of one of my paintings is an 'owner': we are no more than caretakers, brief renters, and I believe we have no right to impose those rapid and too often destructive, artificially-sustained changes on landscapes which Nature has sculpted and coloured so slowly, and so appropriately.

I read a lovely piece recently about we humans, discussing the phenomenon that we alone amongst the species can contemplate our future and have a concept of death. The beautiful statement was made that 'life is a flicker of consciousness between two great silences.' Two great silences: we will not get out of this alive, of course. We are not owners: we are merely caretakers, and we must think far beyond the immediate gratification of the balance sheet, regardless of what shifts and upheavals that requires, and hold to a vision of what we want our landscapes to mean and look like to our faraway, unknown descendants. If they're anything like me, green will be but one of the colours in the vast palette, not the only desired one.

The danger in the headlong stampede which regards every landscape, regardless of Nature's obvious intentions for it, to be transformed into something economically viable, is that the unique, unusual and separate landscapes with which we are singularly blessed in this province will all finally end up ploughed, tamed, artificially manicured, and, God forbid, GREEN. The rationale might well be economic viability, but that is an empty mantra in the long run: it is our acts which define us, not the cause we use as rationale, and our acts have the capacity to rapidly destroy what may have taken millennia to evolve and build.

I personally long for a different vision, and regret the many transformations already foisted upon the thin skin of our wrinkled province. I have no faith at all in their long-term viability, because Nature always wins in the end. Any process directed at changing our well-established patterns of thinking and behaving is going to be an extended one, and will involve efforts at gaining insight, re-evaluation, and trying new approaches. Under the very best of circumstances, such change takes time to gain toeholds in our way of thinking and valuing – slow time.

The characteristics which render each of us unique are seldom the product of rational choice. But the decisions which render landscapes unique, which preserve the natural look and balance, or which allow it to be restored and to reclaim its uniqueness on the surface of the earth, these are always the products of rational decision. And these rational decisions always require courage, sometimes sacrifice and, above all, a belief in the final objective.

I know I have been talking generally, my eyes and thoughts not focused on the higher altitudes alone. I am no expert, nor academic in these matters. Speakers at this conference will talk at length, and with greater expertise than a mere painter, about objectives and the need for patience, care and long consideration of the use we make of the landscapes we treasure. They will also concentrate their attentions more on the high country landscapes than I have here. I hope they'll not focus on the naturally spectacular, the most visited or just the most celebrated, for much of the meaning we wring from our environment is often from far less majestic places. Landscapes, like ideas, do not have to be celebrated or famous to be meaningful.

I want to read you two small pieces by my brilliant mate, the writer Owen Marshall, the first because it graphically demonstrates how symbolic and memorable modesty can be; the second, a poem which speaks on my behalf, and possibly yours.

See if you recognise anything of your own in them.

'There's a place, not far, sweet country if only it had summer rain. The sheep seek shade, and in these camps the loess clay of the ground is smooth and hard, or pooled to dust, and the droppings of the sheep are thickly spread, but dry and inoffensive, baked in the heat. In the odd sink-hole the briar seeks moisture and gorse blooms brighter than the clay. The ridges are worn almost bald, like the heads of the lean, brown farmers who ride farm bikes too small for them across the paddocks of their land. The creek beds are marked more by rushes and willows than running water, and the mallards come only in twos and threes. An easterly is always up after midday and burnishes the arc of pale blue sky. The shelter belts close to the road and the macrocarpa before the farmhouse, are dusted with a false pollen drifting in off the road. The rural delivery boxes are large so that stores can be left there as well as mail, and each has a name painted by hand. In the evenings the sheep come to the stock dams and troughs to drink, the magpies gather to imitate the noise of poets, and the barley grass and brown-top ripple at the sides of the shingle roads.
Is that so far away?'

And here's Owen's 'South Island Prayer.'

'God,
Don't let me die in Auckland.
Rotting in the heat before your
Eyes are closed, a greasy take
Away after the soul is gone.
Jesus, no.
Let me go with the old southerly
Buster: river stones in the grey
Flecked sky and that white wind
To keep your chin up.
Christ, yes.'

I said at the outset that bad art is always discarded and ignored by the heartless Judge of Time. So are bad, inappropriate decisions about our land use harshly judged by Time, strapped to the uncontrollably powerful fist of Nature. We must be intelligent, sympathetic caretakers, and remember the brevity of our occupancy, between two great silences.

I warned you of my self-centred opinions, my poor concept of pleasing others, and now you've heard something of them. If nothing else, I hope some of you are stimulated to argue or agree with me: as a painter, I'm well used to both responses. This conference will be a fine forum for discussion and debate, and my role was, remember, above all to allow the latecomers to sneak in.

Having done that, I thank you for your attention and patience, and wish you well for the coming days. This rabbit now miraculously, and gratefully, escapes the spotlight.

WHAT LIES BEHIND THE VISTA: TREASURE CHEST OR PANDORA'S BOX?

Gilbert van Reenen - Landscape photographer, Wanaka

Good morning everyone. Thank you for the opportunity to be talking to you today. I would like to compliment the Otago Regional Council and thank Stephen Cairns, Graeme Martin and their staff for taking the courageous initiative in hosting this very timely forum and for bringing together such a diverse range of interest groups and stakeholders. I believe that it comes at a time when we are at the crossroads in terms of coming to grips with high country landscape values. This is especially true for those of us living in the stunning landscapes surrounding us here in the Central Otago and Queenstown Lakes Districts. Similar pressures are also present in many other beautiful parts of New Zealand as well. I am really looking forward to the discussions and robust debates that will inevitably develop over the next two days. I fervently hope that at the end of the workshop we will all feel positive about the future management of these national treasures.

Since publishing my first book of Central Otago images last year, I have become aware that a high proportion of New Zealanders are absolutely passionate about the landscapes that surround us here; much more than I had ever imagined. It seems that they form part of our national psyche. However, we tend to forget that landscapes seem to be very personal things for each of us. There can be widely differing reasons to be so absolutely passionate about our landscapes – all of them valid. I think that a major challenge for this forum is to identify and recognise these various reasons. Then we need to devise means of accommodating and respecting them without having to make drastic compromises that affect the future integrity of those landscapes.

One of the biggest handicaps we face when we try to engage the broader community about the theme of this conference is that it is not possible or feasible to reduce the ideas and concepts surrounding the management of these landscapes to the thirty-second sound bites that have become the feature of most debates these days. Ironically, I have just been interviewed for the National Radio rural programme and was asked to summarise in about thirty seconds what this conference is going to be about! It is actually not possible to do justice to the theme and ideas of the forum with an hour long or even daylong précis, as we are about to discover.

You will recognise that our relationships with some of our own favourite landscapes have developed over a long time, often a whole lifetime. Many of the things that connect you to those landscapes are often difficult to articulate to others. I know that for me, and I suspect for most of you too, the landscape I live in has become an extension of my persona. Until quite recently, the idea of making a sustainable living from recording and interpreting high country landscapes for other people to appreciate had never arisen for me, not even in my wildest dreams. I never expected there would be so much interest in the subject material that I have become so engrossed in.

There has been no defining moment in my career as a landscape photographer that I can easily identify. Looking back though, I can see a number of serendipitous influences. Most of them stretch back to my teens and some well before then. They involve good people such as neighbours, teachers, family friends, scout leaders and parents, taking an interest and making a real effort to increase my awareness and understanding of the natural environment around me. I was also extremely fortunate to land a wonderful university vacation job for five long summers with the former Forest and Range Experiment Station of the Forest Service on ecological studies of the South Island alpine grasslands.

I believe that this raises a salient point for this forum. Because of the urbanisation and the relentless emphasis on technology and automation as well as the explosion of that vague thing called virtual reality, youngsters today are less conscious of their natural surroundings than previous generations. Most of us with the knowledge to help youngsters understand this better, find ourselves just too busy to do justice to this vital task. What I am asking is: will there be enough qualified people in our society in a few decades hence with sufficient depth of understanding and the requisite passion for the high country environment to be able to manage it competently?

I see my task now is to try to define what is actually special and visually distinctive about some of our high country landscapes, from a photographer's perspective, that could assist with managing and protecting them for future generations. Obviously this isn't all that easy

or you would have someone much wiser and better qualified than me standing in front of you now. I know too well that this topic is a very subjective one. I know that definitions are vague and inadequate and that disagreements amongst stakeholders abound.

How do I know this? Well I have spent many utterly frustrating hours sitting in the back of Environment Court hearings listening to very polarised debate and arguments about whether landscapes are significant and special or not, and how various developments are going to, or not going to, impinge on them with more than, or less than, minimal effects. Never much room for compromise in the eventual edicts from the learned judges though, either it does or it doesn't and all the parties then move on and get on with the consequences and their lives.

I've also spent many days preparing and presenting submissions to District Council hearings on District Plans. I need to confess with regret though that this hasn't been amongst my most productive uses of time and energy. You'll be relieved to know that, rather than get into detailed tortuous discussion about formal planning processes, I have decided on a different approach for this talk. Instead, I'm going to show you a few of my images that I know appeal to a significant number of people. I will attempt to deconstruct (for want of a better word) some of them to see what that might tell us about the landscapes they record.

Hopefully, we can find some clues that will be useful to those of you who are managers of these places or who are responsible for establishing policies for them. I intend to play the devil's advocate on occasions and draw your attention to some of the peripheral issues around some of these special places which may in many cases impinge squarely on their management in the future.

Firstly, to help you understand where I am coming from, I need to tell you that I don't actually **take** photographs as such; I haven't done so for several years now. In my work I consciously set out to **make** photographs and I usually do this quite strategically.

Recent developments in my own backyard have involved the destruction of several vital landscapes that were very important to me. In most cases this has been because of a lack of awareness of what has been at stake in developing them. In a few cases, the destruction has been the result of pure avarice.

I consider one of my missions as a landscape photographer to be to communicate some of my understanding and feeling of these important subjects and locations to others. I take this role quite seriously. Often it involves going back to a place many times to try to improve on what I have captured and created on previous visits.

Often the timing and lighting is difficult to predict accurately or the weather may change unexpectedly, so much trial and error is involved. It also means becoming aware of what else is going on at these places at various levels. Geology, soils, meteorology, botany, ecology, farming practices, etc.: I have found that the more that I know about and am familiar with the place or subject when I go to photograph it, the better my images of it are likely to be.

May I respectfully suggest though that this approach is inherently no different to when you are dealing with prudent management of these places. I believe that a salient lesson for all of us here is that we need a comprehensive understanding of the different layers and disciplines surrounding high country issues before we make long-term, often irreversible, decisions about them.

I believe that just applying generic management principles and basing all decision making on economic inputs and physical outputs - that (hopefully) almost forgotten paradigm that infected our institutions during the 90's - isn't likely to be adequate when it comes to managing precious high country landscapes.

As Grahame Sydney has just explained, you cannot place monetary values on things that are so dear to our hearts. I also believe that we are saddled with a major handicap - the knowledge base needed to manage our high country lands adequately is woefully inadequate. What seem like continual changes of emphasis to our so-called public good research funding system are actually exacerbating this problem in some vital areas. Institutional memory, critical mass of staff and the knowledge base are being rapidly eroded.

Figure 1: Moon rising over St Bathans Range

Many of our high country landscapes which are regarded by New Zealanders as iconic, have in fact been extensively modified by farming and other human activities (Figure 1, near Tarras).

Figure 2: From the North Dunstan Range

The 'big pretty picture' often belies the reality about the ecological values of some high country environments. Very few indigenous plant species now remain in the environment shown in Figure 2, on the North Dunstan range.

Figure 3: Autumn - Rippon Vineyard Wanaka

Viticulture has markedly transformed the landscape of many of the valley floors in the Central Otago high country (Figure 3). Vineyards evoke romantic impressions and overtly appear to be in harmony with the landscape and nature; however, the reality is that modern winemaking often requires high inputs of energy and synthetic chemicals, and detrimental environmental effects are not unknown.

Figure 4: Rock & Pillar Range Crest

An extensive wind farm has been proposed by a private company for near the site shown in Figure 4, in the Maniototo region of Central Otago. Even though this would result in production of renewable energy, the project has already encountered vigorous opposition from environmental groups.

The upper Ahuriri Valley (Figure 5) has been farmed as a Crown pastoral lease for nearly a century. Last year the Crown, through the Nature Heritage Fund, purchased this property (Birchwood Station) and has incorporated it into the Ahuriri Conservation Park. Some run-holders are critical of this on the grounds of lost production. Other groups have vehemently

Figure 5: Upper Ahuriri Valley

opposed the restriction of access to 4WD vehicles imposed by the Department of Conservation to foster and encourage solitude values among users of the park.

Figure 6: Poolburn Reservoir Central Otago

Poolburn Reservoir (Figure 6) was created in the 1930s to provide irrigation water for farms in the nearby arid Ida Valley. It is now much appreciated as an iconic Central Otago landscape. Several scenes from recent notable feature films were shot here. It is unlikely that a project of this nature would get approval under the Resource Management Act today.

Figure 7: Whare Kea Chalet Albertburn Saddle

The chalet on Albertburn Saddle (Figure 7) is a privately owned lodge at 1800 metres elevation on Crown pastoral lease alongside the Mt Aspiring National Park. Many recreational groups opposed the lodge because they considered that its presence would diminish the wilderness values of the locality.

Figure 8: Near the Lindis Pass

Even though the scenic reserve at Lindis Pass (Figure 8) has had protection for many years, the vegetation is substantially degraded due to previous burning and grazing practices, and weed infestation. Restoration of biodiversity is extremely slow in many of our high country environments.

Figure 9: Arrow Riverbed – 4WD route to Macetown

The phenomenally rapid adoption of 4WD recreational utility vehicles recently has made many spectacular, previously remote, high country landscapes much more accessible (Figure 9). The majority of visitors are responsible and appreciative. But the 'hoon' element in our society is also now able to visit these areas, often intent on doing considerable and often irreparable damage to these sensitive environments, spoiling the experience for others.

Figure 10: Branches Station Upper Shotover Valley

In recent years, several large high country properties (Figure 10) with exceptional scenic values have been bought by foreign owners to set up exclusive retreats and lodges. Public access has on occasions become restricted. Prices paid for such properties frequently far exceed the intrinsic value for farming purposes.

Below the surface, many precious landscapes are undergoing extensive modification too. The aerial photograph in Figure 11 (above Paddock Bay, Lake Wanaka) shows the extent of an infestation of the South African lake weed Lagarosiphon. It can rapidly become dominant and completely displace diverse indigenous plant associations. Control measures are costly, often of very limited effectiveness and are

frequently opposed by some environmental groups who object to the use of chemicals and herbicides in waterways.

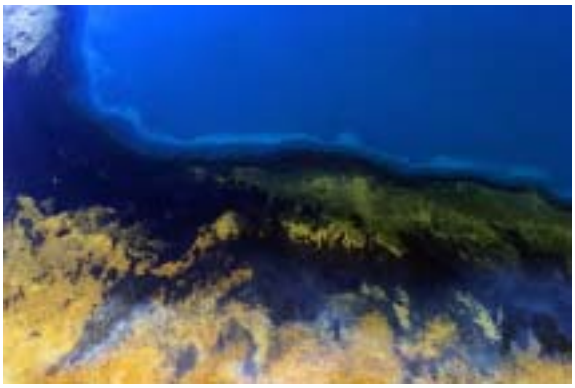

Figure 11: *Lagarosiphon* infestation, Paddock Bay Wanaka

Many high country landscapes are currently being further modified through changes of land use such as plantation forestry and intensive cultivation for winter crops. Parts of the

Figure 12: Red Tussock near Lake Onslow

distinctive remnants of the ancient Otago peneplain (Figure 12) near Lake Onslow, which has inspired many artists for over a century, are currently being planted in a monoculture of Pinus radiata. Such plantings drastically alter the water flows in adjacent streams and rivers and can also alter local microclimate.

Figure 13: The Sugarloaf near Lake Dunstan

The highly distinctive fluvial outwash landscape shown in Figure 13, formed during the last glaciation, has no special protection under the District Plan. Consequently, it is rapidly becoming modified through developments such as a large terraced vineyard on its northern flank and a major rural subdivision – enabling dwellings to be sited almost to the eastern terrace edge in this view.

Roy's Peninsula (Figure 14), a locality highly visible in the westward view from Wanaka township, has recently been extensively subdivided by a developer. Decision on approval for the construction of a large bunker style dwelling on the most prominent part of the peninsula is currently before the Environment Court.

Figure 14: Roy's Peninsula Lake Wanaka

The biota values of many of our high country landscapes are distinctly seasonal and vary markedly in response to annual rainfall (Figure 15). The abundance of weeds and pests such as *Hieracium* and rabbits also follows cyclical patterns.

Figure 15: Chain Hills near the Lindis Pass

A number of tourist and adventure industry developments have been allowed in sensitive alpine environments in close proximity to Queenstown. DOC has recently approved water abstraction from Lake Alta for artificial snow-making at the Remarkables Ski Field. DOC is also currently considering an application fora concession to build a large 40 bed privately owned tourist lodge at high altitude in the

adjacent fragile Wye Creek Basin (refer to Figure 16). If permitted, this would conflict very heavily with existing use of the valley by walkers seeking solitude and wilderness values close to Queenstown.

Figure 16: Felsenmeer, upper Wye Creek Basin Remarkables Conservation Park

The insidious spread and encroachment of wilding pines has become a major problem and ecological threat in many South Island high country areas. Control is costly and labour intensive. In some areas, the issue is confounded by the fact that many overseas visitors, and even residents who are not fully conversant with the risks posed by the spread of the trees onto open tussock land, find such trees picturesque. This is especially during autumn - as with the larches in the Mt Aurum historic reserve (Figure 17). A number of river flats in national parks and areas with high conservation values have been grazed by sheep and cattle for more than a century (Figure 18).

Figure 17: Wilding conifers, Mt Aurum Reserve, Skippers Canyon

This practice is being phased out as historic concessions come up for renewal. In some areas, such as at Schoolhouse Flat in the Nevis Valley, several of the very rare endemic plant and dependent insect species found there owe their survival to the historic grazing practices. They are likely to come under greater threat when the sheep are removed from the area on completion of the tenure review process for the property.

Figure 18: Sheep grazing in the Wilkin Valley adjacent to Mt Aspiring National Park

THE LAKES DISTRICT DILEMMA

Clive Geddes - Mayor of Queenstown Lakes District

I want to make some comments on behalf of the three Mayors at the start because, although local government areas differ, the statutory responsibilities that we have don't. Some of the comments I make as we go through the example of the Lakes District, in terms of process and statute, also apply obviously to Malcolm Macpherson (Mayor - Central Otago District Council) and Michael McEvedy (Mayor - Selwyn District Council).

The first thing is that local authorities have a statutory monopoly on the planning process, in terms of individual freehold titles, that is conducted under the Resource Management Act through a wide variety of processes that differ from Council to Council. However, the overall obligation does not differ when you shift from one territorial authority to another, although the final rules that any territorial authority may end up with (in respect to any matter which controls management of the landscape) may differ because of the role of the Environment Court. You would have no better example of that than the difference between the rules for the clearance of indigenous vegetation that currently exist between the Lakes District Council and the Central Otago District Council.

The Lakes District is a long angular piece of land and its single biggest feature is that virtually none of it is flat, and what that means is that the stand-up part of the landscape is fundamental to every person who lives in this district and a large part of that stand-up landscape is actively farmed. I'll run through some very brief vital statistics, which will give you some background to what local authorities are all about. Local authorities are about representing the whole of the community and within that community there will always exist a number and range of pressure and interest groups.

Our authority manages the following:

- Permanent population of 22,000.
- Peak population of 38,000.
- Annual visitors of 1,500,000.
- Ratepayers 16,000 only.
- Normally resident 57% (people who live and work here day by day, meaning 43% don't).
- Population growth rate of 5.9%.
- Visitor growth rate of 4.7%.
- Peak population estimated in 2025 of 90,000.

What do we want? Before I put the answers up, I need to tell you why we know. In 2002, government in its infinite wisdom introduced the Local Government 2002 Act. What this Act said (and I find it astounding that in 2005 it is still not generally understood what it said), *as local government, go out and find what is it that your communities want of you, that is, what are the community outcomes, what does the community want out of the processes that you administer? And having found those out, manage the resource that you are responsible for to meet those outcomes.*

Here's what our community told us:

- They want sustainable growth management.
- Quality landscapes in a natural environment.
- A safe and healthy community that is strong, diverse and inclusive.
- High quality urban environments.
- A strong and diverse economy.
- The preservation and celebration of our heritage.
- Effective and efficient infrastructure.

I can tell you that the Council's sole role in effecting its programme is to meet each of these expectations, either in part or in whole, and that is the way that territorial local government in New Zealand now works. I am sure Malcolm will be able to tell you, as will Michael, some of the experiences they have had in determining community outcomes. Ours were through a series of district-wide community workshops.

Our District Plan is our fundamental planning instrument that is used to express, through its rules, what the wishes of the community are in respect to development, and I put that in as a simple way as possible because I believe one of the great problems we have all suffered from is the complexity that has been driven into the Resource Management Act since its inception in 1991.

Our District Plan is founded on landscape protection. It started in 1992 and was published in 1995. There were 4,500 objectors on 22,000 points of objection. After 3 years of continuous hearings the Proposed Plan was issued in 1998. All the landscape provisions in the Proposed Plan were appealed to the Environment Court.

In 2005, four parts of our plan (remember the Act came in during 1991), in the fastest growing community in New Zealand, are still subject to appeal before the court. Our aim is to have our plan fully operative by December 2005. The cost to date is $9m. For $9m I could show you a book of maps and a book. The annual 'defence' and maintenance cost of our plan is $1.3m. We handle 1400 consent applications per annum, 100 of those are notified, 50 of those are appealed and we win 70% of them (and that's up from 40% two years ago). One of the reasons we think we win more is that now most of our planning decisions are made by professional planning commissioners.

What is the Lakes District dilemma? It is safeguarding the district's sole asset via a discretionary and enabling planning regime, and the districts' sole asset is its landscape; we have nothing else. The bungee jumping, the jet boating, the skiing, the skydiving - all of them are activities that you can do elsewhere in New Zealand. The rafting, the winter ice hockey, everything you can think of - you can do elsewhere in New Zealand. Why are they special here? They are special here because of the landscape. Our plan is driven to protect that from total and partial modification, and that modification is largely imposed by urban development and rural development. I don't want you to rush to the tiller and misunderstand that rural development is farming; it is development in the rural general zone.

I want to now show you a few very succinct and graphic examples of the tensions that local authorities deal with in administering their District Plan. And we need to start with this premise: *How do you effect landscape protection in a way that respects the rights of the individual property owner?* I believe it is a key and fundamental question for which the various processes that apply to planning, to landscape protection and to resource management in general have not adequately addressed or, if they have, they have failed to provide the answers. Rural landscape modification: don't get any angst and agony about what I'm going to show you, I'm sure they are fully consented activities. I don't have a view on them one way or the other except that, to me, they are graphic examples of the processes that local government is trying to manage and why those processes, I believe, are largely deficient.

Figure 1: Fairlight Face

The Fairlight Face is slightly out of our patch, but very important (Figure 1). Half a million people drive down this road every year to go to Milford Sound and probably another two hundred thousand to access the scenic attractions for Southland. In the last three years this face has undergone a significant and permanent change; a fence line now runs the whole length of it. I don't know whether it separates freehold from leasehold.

What I do know is that it has started what seems to me to be an irreversible process of landscape modification. I'm not making comment as to whether this is consented or not; I'm sure it is. The question I'm asking: Is this the type of modification that the process should or should not be able to control? A closer look shows tracks and further spraying of bracken.

Figure 2: Landscape modification in the national good.

Landscape modification in the 'national good' (Figure 2) – this is the Cromwell gorge. The dam was built, I think from memory, in the mid 80's, and you can see the areas scarified in order to provide protection for the highway. More than 20 years later, any reinstatement provisions either have not been enforced, have been enforced, or were not in place from the very start.

Figure 3: Lake Dunstan

The track clearance undertaken by Contact Energy on the opposite side of Lake Dunstan (Figure 3), within the margin they control, doesn't require consent. It is, I suggest, not the sort of track clearance any farmer in this room would even contemplate in the circumstance.

Figure 4: Urban development

This photo (Figure 4) shows an area scarified, roaded and cut into sections. Below the road the zone is high density residential and, if the plan changes that we are currently proposing - to break up large monolithic buildings and high density residential - do not succeed, then in twenty years time you will see continuous apartment development from the road down. An extension of what is there now. Land above the road is zoned low density residential, where this type of development is deemed to be appropriate. Above that line is rural general. Rural general is the landscape that we are spending most of our time and money trying to protect. The photographs in Figures 5 and 6 show the 'power of consenting process' because they're both fully consented.

So, I come back to the question I posed before: *In terms of being a local authority, how do you effect landscape protection in a way that respects the rights of the individual property owner*?

Figure 5: The power of the consenting process

The value of this forum I think, to local government, is that I think it's a great move by the Otago Regional Council to give us a starting point, because it seems to me that we can't go on constantly re-litigating the mechanisms and the mistakes of the past, and that what we have to do collectively is find a way forward that gives everyone as much as they can reasonably expect from the process. If we do not, I can promise you that within five years some other Mayor of Queenstown will be standing here talking about how the District Plan has now cost us $14m. The $9m to date is the cost to the Council. We believe the cost to the community is in the order of $21m, because 4,500 objectors and 200 appellants had their costs as well.

Figure 6: The power of the consenting process

For 16,000 ratepayers, the question I have to put to you is: *have we not, in a wider statutory sense, got the most fundamental thing about protecting landscapes wrong, and is it not time that we set aside our various differences and sought to find some common middle-ground and asked government to empower us to then move forward?*

CENTRAL OTAGO LANDSCAPE – DEMAND AND RESPONSE

Malcolm Macpherson - Mayor, Central Otago District

The view I am presenting will be a Central Otago District view, and those of you that know Central Otago will know that we sit in between the upstanding high country part of Otago and the less upstanding low country of eastern Otago. It is a local government perspective, but is a personal view, not a Council view.

Those of you who have had anything to do with Otago in the recent past will know that our landscapes and our way of life have been increasingly subject to new interests, new uses and new economic drivers. We're in year five of a remarkable period of growth - remarkable to the extent that we haven't seen anything like it since the gold rush.

My Council is deeply immersed in a whole series of community consultations on a range of landscape issues: Two years ago we had a community outcomes discussion called 'Central Prospects'; we did some focus township investigations called the 'Blueprint Studies'. We are in the midst of a rural study looking at all of our rural land. We're also in the midst of a destination management and branding exercise. We recently introduced Variation 1 to our District Plan, which has provoked some discussion, and we're in the final stages of District Plan negotiations. Emerging from all that work are a number of themes, some of which are barely recognisable, some of which are quite important, and that's going to be the topic of this presentation.

The first idea I want to run past you is that, in a Central Otago context, it's not sensible to separate out high country from the whole of the country, and I put that there in shorthand – high country equals whole country. Central Otago is not backcountry, it's in your face, it's on your TV screens and increasingly in the movies – the Lord of the Rings poster actually shows our front country. Our iconic land of the Rings terrain is as much about valley floors, foothills and water as it is about Clive Geddes' upstanding country. Where I come from, the perspectives that I'm familiar with, those are the views that are most familiar, and when people talk about landscape values in our environment, they tend to take 'whole-of-view' perspectives. Hold that thought, because we'll come back to it shortly.

The second key idea is about values and attributes. When we engage Central Otago people in discussions like the ones I've just outlined, and we've had halls full of people for two years and maybe a couple of thousand talk to us individually, what they value and experience and understand, the words, ideas, and the passions they express, are remarkably consistent. It doesn't matter what you ask people, in which hall, anywhere in Central Otago, we get the same key ideas fed back to us time after time, consistently, strongly and passionately held. We hold very well formed ideas about this place and we explain those views with striking consistency.

I'll give you a recent example. We're shoulder deep in a branding and destination management exercise, to build up what's called the 'back story' of Central Otago's district brand. We assembled a small group of people and asked them (as we have done all those other contacts over the last few years) to come up with some key ideas that they thought represented Central Otago and, as we go through these next two or three slides, from your perspective, from the perspective of someone who's interested in the high country and rural life, think about how many of the words and concepts that come up in these next slides refer to you and your interests. We asked them for some big picture words: these are about our rich history, block mountains, schist, distinctive seasons, the powerful river, knee high (not tree high) forests, space and scale, air and light, the silence, birdlife, the night sky and the length of the days.

How many of those things connect directly or indirectly to rural interests? We asked them about living a life in Central Otago and they told us that the important things were: farming, horticulture, viticulture, adventure/discovery, cross-country skiing, the Rail Trail, mountain biking, multi-sports events, four-wheel driving, hiking and walking, hunting and fishing, ice skating, horse trekking, golf and curling.

We even found in the discussion about what culture and events were important to people that there are elements of rural interests. The Brass Monkey, the cavalcade, even the Blossom Festival and, of course, Cromwell's

summer series, the mid altitude exercises. We asked them about icons and symbols and they came up with: landscapes, trails, wildflowers, merinos, rivers, the seasons, schist architecture, heritage, curling and the muster. So the point that I wanted to make, and I'll get you to hold that thought as well as we go on, is that the values, the self image that we have, the things we hold dear and wish to defend, strongly reflect the attributes and values of our countryside. We'll come back to that.

The third key idea I want to leave you with is that current land use rules are inadequate. In our district the 'eight hectare as of right' rule, which meant that if you owned rural land you could subdivide down to eight hectares as of right, has gone. That's what Variation 1 was about and, more important, new rules are coming. But before we get to the details I want to take a little field trip through my part of Central and show you what that means.

Figure 1: McArthur Ridge – subdivision for grape development

We'll start at McArthur Ridge, Springvale Road (Figures 1 and 2) – a very large subdivision of mid-terraced to high-terraced land for grape development, which used to be covered in thyme and the odd merino. Now it is covered for almost as far as the eye can see with green plastic and strips of lucerne.

Figure 2: McArthur Ridge grape development

We've been saying for quite a long time that, when McArthur Ridge is acknowledged as a commercial success, the rules change for that category of land in inland Otago, certainly in Central Otago, and others will regard this category of land quite differently; and sure enough they do.

Figure 3: Nowhere is immune to change

Nowhere is immune (Figure 3): if you know Central, you will know that up every road and in every valley, in every nook and cranny of the district, change is occurring.

Development is occurring in some of the strangest places (Figure 4), Bannockburn now has a number of vineyards on what were tailings and, again, not regarded as very highly productive land.

Figure 4: Development occurs in some of the strangest places

An example of controversial change is Rocky Ridge (Figure 5), which you see on your right as you drive into Alexandra from Dunedin, prominent on the skyline.

Figure 5: Rocky Ridge, Alexandra - once controversial

The conclusions from that little 'field trip' are that large tracts of our rural land are subject to new development pressures; and remember, in our context, rural and high country is effectively the same thing. Questions about outcomes (costs and benefits) are unavoidable, and are increasingly controversial.

What's driving that change?

- Overflow demand from Queenstown and Wanaka.
- The wine industry and new horticulture - it's not just about grapes, it's about cherries and new varieties of applies and new varieties of stone fruit.
- The baby boomers are coming home - my generation, the people born between '46 and '64 - cashed up, at the end of their careers, who always wanted to live in Central. They're arriving in increasing numbers and they're buying expensive homes or building them with cash. Central Otago is seen internationally as a safe haven for investment. If you're sitting in London or Sydney or even Auckland, and you want somewhere to retire and park your money, this is increasingly where your investment advisors are telling you to come.
- We have a District Plan that encourages subdivision of rural land.

There was an old joke that the Queenstown Lakes District Plan was one word, and in some respect, our District Plan is one word with regard to the rural zone, or has been, and that word was 'yes'. But that's changing, the 'down to eight hectares as of right' rule, which has been very helpful in developing the wine industry, is less desirable when applied to rural residential land. The effects of that are wasteful - rural lifestylers don't want eight hectares, they're looking just for rural separation, and subdivision into units of eight hectares for residential use is poor use of productive land.

There are issues of reverse sensitivity when you dump people who want quiet enjoyment into what is effectively a rural factory. They often don't like it and they complain and the High Court backs them up; and sometimes people who are conducting perfectly legitimate rural activities have to stop. There is also a loss of amenity - the wide open 'whole-of-view' vistas that people value. Large-scale subdivision for rural residential use of this sort destroys rural amenity.

Our best estimates say that the current economic activity is sustainable for as far forward as we can see, but it is always dangerous to say that - things are a bit soft and indeterminate at the moment. We're looking at 20,000 people by 2020 in Central Otago District. That's 2,000 more homes. On current

patterns of habitation, that's 1,000 more houses in our rural zone, and probably a lot more because that's just normal residents; second homes will also be built.

Built using appropriate materials and in sensible places, the landscape can absorb this number without losing its character. But the uncontrolled development possible in the past is already showing examples of buildings that don't achieve this result. Central Otago's rural study will affect property rights, so it is important that we work together to identify issues, options and outcomes. It is better that we do this around tables in community halls than in the Environment Court - hence the rural study.

In summary, my three key points are:

- High country = whole country: in my view, it doesn't make sense to separate out the interests of anyone in our rural zone.
- Rural values = community values: when we consult, we hear the strongly held values of our rural community, and they are the values that everyone signs up to, time after time.
- Current rules are failing us badly and they **will** change.

To finish with some talking points: First of all, the planners are back, and not always our planners, because we don't have very many. Increasingly people are bringing us proposals with sophisticated, highly developed, detailed plans that they've funded. We're not providing the planning expertise, the people who want to subdivide and develop our landscape are. But one way or another, regardless of who funds them, the planners are back.

Second, much more of the landscape - the whole landscape - will be deemed **sensitive** and in need of protection.

And third, new rules will limit development on sensitive landscapes. New rules are going to impinge on the property rights of people who currently own or farm that landscape. We'll need to find win - win solutions that deliver for both communities and property owners. For example, trade offs that permit clustered intensification down to urban densities, maybe down to a quarter hectare, but only in some places. That will benefit owners who want to subdivide, and communities who need somewhere to live.

To finish on a wild card, I believe that we'll soon find ways to do without surface and sub-surface water when we consider rural subdivisions, and when we do, you will be able to build anywhere in Central Otago and not be bound by the availability of water. It's now possible in some parts of the world and it's technically feasible here. When that happens, all bets are off.

ACHIEVING A BALANCE

Michael McEvedy - Mayor, Selwyn District

Ladies and gentlemen, I haven't come with a great list of beautiful sights. I didn't really want to put Canterbury at some variance with the south in competing for the very best of our historic views, which we all value, but I can assure you that every view you've seen this morning is replicated throughout the South Island and, in some way, in most eyes and by most people.

So the reality is that this is a world of high endeavour, but it's not a land in the South Island all of high country, and I think we need to recognise that. My district of Selwyn is one-third high country. It's the mighty Waimakariri and Rakaia River basins and part of that is in Waimakariri District and part of it is in Ashburton District. But the view of it all and the sense of it all is very much part of the South Island. A quarter of it is in the conservation estate, the Arthur's Pass National Park, of which Arthur's Pass has a million and a quarter visitors a year. The reality of the high country for you and me, and for the rest of New Zealanders and those who come from overseas, is an ability to see it at close hand, be in it at close hand, and believe it's their own even though they don't own it. In my district, historically there were probably 20 high country stations or runs. Those have been subdivided into forty smaller properties, a number of them still have Canterbury University leases and some of them have been sold.

I perhaps need to tell you a little about Selwyn, although I'm only reflecting what's happening in Canterbury. When I became Mayor in 1995, I had 18,000 people; I now have 31,000 and, by 2020, will have 45,000 to 50,000. Very few of them live in the high country. Very few of them know the high country, but all of them have a view of the high country in their minds.

Let me say right at the beginning so we don't get this wrong, that the caring and the conservation of the high country for the last 150 years is a credit to the early and present runholders, managers and people who have lived and worked in the high country. They have given us today's conservation model and, whatever we do, we shouldn't forget that. Clive Geddes gave you the most graphic account of the realities of local government in terms of planning documents. It doesn't matter whether you are a Regional Council, whether you're a government of the day or whether you're a District Council, we can tinker with the edges but I believe the Resource Management Act 1991 is relatively solid.

Over the last 20 years, there seems to have been a running need in the minds of most of us that planning documents could codify the high country landscape, in a land management way, to preserve and to enhance high country outcomes in a positive way. It's still a challenge and I believe it will always be a challenge. Principles, policies and plans all have high ideals but the rules very often fall short in understanding the best practice, or the big picture or the long-term outcomes. When we talk about the best practice, the big picture or the long-term outcomes, we have to recognise that everybody will have a different view. Seldom are they prepared to mould that view into the view of others and everybody believes that their outcome at the end of the day must be part of the final picture. I've got news for all those people: none of them are going to get what they want. That includes all of you and that, unfortunately, is the sad outcome of an inability to codify, in planning terms, what common sense has probably done for 150 years. I'm not criticising the planning process. I'm not suggesting we don't need it. What I'm suggesting is that the high ideals are unable for most of us to be a final outcome out of that planning process.

The public perceptions versus private property rights are miles apart in many cases. In reality, if the people in the high country took the intimate views of people's town sections and made submissions against what happens there, just as people around the nation decide they can do with areas of the high country, we would have mayhem. So the reality is that the high country is viewed by the nation as a whole as largely theirs, and that the owners are just tenants in time. That may be true but, in reality, don't let us forget those people have rights, and those rights cannot be walked over, cast aside and ignored in any planning process that is likely to succeed.

Could I suggest that we need to ask the question: how much of New Zealand should be in public ownership? Does it provide better conservation outcomes? Is the West Coast any better off for the fact that only 13% of the land is

in private hands and the rest is in the hands of the state? Imagine being the local government and only getting rates off 13% of the land? That's a reality; a third of my land – no rates – the rest of the people pay. It's an issue and it's got to be solved. But I would suggest to you that this is a situation where balance is an important part of the way forward.

Clive Geddes made it clear that Councils are creatures of statute, and we can be toothless tigers in this process. I'd have to say the Environment Court often fails to understand cumulative effects, or refuses to understand cumulative effects. You will never have the best of outcomes when you're not prepared to recognise that ten of something may be acceptable and twenty are not. This is part of the process that we will always have difficulty with in this planning process.

It's fair to say that farming successes in the high country have always been fickle and run-holders' dedication and innovation have often carried them through difficult times.

If I wanted to leave one real message, it is that conservation is about balance, not just ideals. We cannot save everything: good farming practice, preserving significant landscapes, sustainable change, deciding what is natural vegetation, altering the view, the right to develop, the place of forestry, and erosion (both natural and man-made) are all issues which, if we don't come to terms with, we're not going to find the ongoing solutions for the future. I believe that they are the issues, and that balance has got to be at the top of them. I think it's fair to say that we do have to recognise tourism, the good and the bad in it: Is a million visitors in a pristine spot too many? Or is it too few? What rights have we to stop people visiting? What damage do they do? Is it the way of the future for many of our areas? Maybe it is.

Public access versus private ownership is an ongoing issue; it always will be and it always was. One hundred and fifty years ago, the original run-holders were having exactly the same problem with people they didn't want on their properties. It's not going to go away, and I'm not terribly sure there's one solution to it.

Foreign ownership and absentee ownership - they're part of the package, they're part of the process, they're part of the investment in the high country future. Again, there needs to be a balance, there have always been absentee owners and, in some sense, there have always been foreign owners. Do we want more of them? Do we want less of them? The important thing is the care of the high country, whoever has it.

If we don't control the plant pests such as *Hieracium*, wilding trees, gorse, broom and other problems (not only on the DOC estate but also on the private high country lands) we are going to cause more damage in the long term to our high country. There's no doubt that the greatest destruction to our forests, including our national parks, are possums. If we don't find a solution to that, we probably are going to lose more than we are gaining by the regeneration process, and our national parks are continually going to be attacked. If half of the money spent on other things were spent on finding solutions to possums, deer and rabbit problems, our high country would probably gain far more.

But above all, let's not forget that we have to encourage future generations to take up and manage high country properties or otherwise the state will have to buy it all, and that's not what anybody wants. We have to make sure that we have the right set of conditions to ensure that future generations want to live and work and own and value the high country - as tenants, as owners, and as people who admire and support it. I believe we have to recognise that bankrolling and financing future investment in the high country properties is a serious business; it probably always has been. It's just as serious today, and I'd suggest that all the planning in the world doesn't solve that problem. But recognition from the nation that we've got to care for our high country may well be the issue that we really will solve this problem with.

In conclusion, I can only say to you all, that the high country is a special place, it needs special people, it is always changing and it will always be a challenge. It is New Zealand at its best and it needs all of us to care for its future.

LANDSHIP IN LANDSCAPE

Some implications of people acknowledging that they belong to biotic communities

Kevin F O'Connor - Emeritus Professor of Range Management, Division of Environment, Society and Design, Lincoln University

Searching History for the Origins of Words and their Meanings

The term 'landscape' vies with the word 'values' as one of the most often used but least defined, over-worked and problematic terms in resource management language. They are used separately and in combination by different people with various meanings and their meanings continue to evolve. Most people using such terms know what they intend but others reading or hearing them may not agree. Moreover, they are word-spawning terms. Some terms in resource management have generated interpretations like the spores of bracken fern. You walk through dry bracken as summer comes on and spores rise in blue-grey clouds at your passage. 'Landscape' is a word-spawning term. One can talk too much about landscape and landscape values, leaving little time or talent for managing it.

The other word in my title, 'landship', was an earlier form, differently spelled, of the same word as 'landscape'. I spell it in its up-to-date form, l-a-n-d-s-h-i-p, 'landship', resurrected from an Old English word 'l-a-n-d-s-c-i-p-e' that became 'land-s-c-i-p' or 'land-s-k-i-p' (probably pronounced as I pronounce its modern form). I use it in this modern form for its original meaning, long lost by the familiar process of countryside neglect and competition from imports. I shall soon explain that original meaning.

The Origins of 'Landscape'

The Oxford English Dictionary, 2nd edition of 1989, records that 'landscape' was introduced as a technical term of painters from the beginning of the 17th century. I emphasise it as an **introduction** into English whereas the earlier 'landship' in other spelling had a much longer ancestry in English language. Two forms of the one word, 'landskip' and 'landscape' (the latter from the Dutch 'landskap') competed for adherents in 17th century English, both with the same meaning - 1(a) or 1(b) below. Judging by the quotations in the OED, the two forms were both used until the end of the 18th century for at least the first three of the meanings that follow:

1(a) A picture representing natural inland scenery as distinguished from a sea picture, a portrait &c.

(b) The background of scenery in a portrait or figure painting.

2(a) A view or prospect of natural inland scene, such as can be taken in at a glance from one point of view, a piece of country scenery.

(b) A tract of land with its distinguishing characteristics, especially considered as a product of modifying or shaping processes (usually natural).

All of these meanings are concepts of land, especially land seen or visualised. The Dutch-derived form, landscape, won the competition for a place in modern English. It had a school of painters on its side, and we can all appreciate from this morning's presentation from Grahame Sydney the persuasive power of such communication. Furthermore, it was competing for usage in a progressively urbanising population in Britain where the context and meaning of the earlier 'landscip' was being forgotten. So 'landscape' with its new meanings arrived without English language roots.

The meaning 2(b) above, as a tract of land with its distinguishing characteristics and features, emerged in geological and geographical scientific literature towards the end of the 19th century. In this respect, it recovered one of the meanings of its old ancestor in English and its older cousin in High German, *'Landschaft'*. *'Landschaft'* the original High German word for landscape can be traced through several centuries of meanings, first to signify the human inhabitants of a country place, the community of people on a particular tract of land, then the tract of land itself, and so on, the use of the land, the visual image of the land, the representation of the land, the integral group of element forms of the land, and eventually in contemporary use, the biological community and ecological functioning of the land. In the German language the one word successively acquired these meanings in turn and carried them all through the whole course of post-Roman civilisation. In the English language its indigenous counterpart or stable-mate as we might call it, apparently lost its rider at a 17th century hurdle, and was not remounted. By the 19th century, it was no longer used. In the

mainstream of European geography since the 19th century, the meanings of 'landscape' and *'landschaft'* have now moved more in harmony with one another. Like many words, their meaning continues to evolve. Long may it do so!

The Origins and Meaning of 'Landship'

And what of the ancient and modern indigenous English word, landship? It is the word 'land' with the collective English suffix '-ship', just as 'landschaft' was built with the collective German suffix '-schaft'. Where did 'landship' come from? So far as most dictionaries reveal, its origins are, as they say, lost in antiquity. I am no philologist but I have been shown by a scholar of Old English, Icelandic and Middle English, the forms of 'landscipe' and 'tunscipe' in Old and Middle English and have been guided through some of their ancient evolution. Certainly, its analogues in other Germanic languages have long histories of use, as illustrated above: 'the human inhabitants of a country place, the community of people on a particular tract of land, the tract of land itself, and so on, the use of the land, the visual image of the land, the representation of the land, the integral group of element forms of the land,' and eventually its contemporary uses[1].

What then does the term 'landship' mean? Literally, it means the community of people living in and at work on a particular land, a particular definable tract or region. The ancient suffix '-ship' is the collective suffix, preserved from its original usage in only one or two other words in the English language, 'township' (originally, 'tunscipe' the inhabitants of the 'tun') and perhaps 'worship'. The same suffix '-ship' has also been invented and applied in modern English in not quite the same way as the collective suffix, but to name an abstract quality sometimes related to community practice, for example fellowship, stewardship, mateship. 'Landship' has antiquity, it has respectable ancestry, it has heritage value, and it deserves recognition as name for a social phenomenon that already exists in our midst. Failure to recognise it could put landship and landscape in danger of disaster or even extinction.

What then does 'landship' imply for landscape management? It is highly appropriate to our purpose in this forum to recognise 'landship' as "the community of people living in and working on a particular definable landscape". Particular landscapes are definable by natural features, especially landforms and climate, and they are characterised by a host of linked natural features, including past and present vegetation, soils and soil life, but they are often unified by sharing some pattern of concordant use, sharing in a common culture, whether as a strictly protected compartment or as part of the larger fabric of sustainable land use. At some particular scale then, a landscape will be a lived-in, lived-with ecosystem.

Landship is thereby an integral constituent of continuing landscape. Landcare by the landship is an essential ingredient of landscape continuity. We can imagine that we shall have little landscape quality if we don't have such landship. We may have other kinds of ecosystems, even scenery, beauty, nature as we imagine it, but it will hardly constitute landscape, except in some pictorial or visual sense. Moreover, if we have people in that landscape who are not collectively working their culture in it through landcare, we shall soon find that we won't long have the landscape we believed we valued.

Where did the old word 'landscipe' go? It fell into disuse and disappeared with little trace from urbanising, English-speaking society. Because our modern English form 'landscape', being a 17th century introduction, has never had such early primary meaning in English, I have felt the need to renew an authentic word for the vital concept that had been forgotten, the community of the land. I resurrect this old concept because it is vital to my topic, the implications of human ecology to the management of landscape.

Please don't misunderstand me or misrepresent what I say. I am not claiming that this old concept of 'landship' is the primary, valid meaning of 'landscape', because it's original. That claim would not be true, as I have pointed out from the Oxford English Dictionary, for the word 'landscape' is an introduction. Nor am I trying to have the use of the word 'landscape' expanded to include the meaning of a much earlier, even original word, 'landship'. I want the original English language word to be reborn as 'landship' in modern spelling, to be used for the original concept, because the original concept needs to be understood and used, and it deserves to have its own word.

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[1] This topic was first explored in S R Swaffield, K F O'Connor, 1986, *"Perceiving, conceiving, protecting and using New Zealand landscape systems",* paper presented to the International Conference on Landscape of the Southern Hemisphere, 2-7 September 1986 at University of Adelaide, South Australia. The paper was also published in full as *Centre for Resource Management Information Paper No 6*, Lincoln University, 40p.

Acknowledging the Ethical Imperative of Human Ecology

I am especially interested, as was Aldo Leopold, in the human dimensions of ecology and the implications of our belonging to the land community to our attitude to and use of land. It was Aldo Leopold, American wildlife ecologist and forester who erected his philosophical foundation of the "Land Ethic"[2] on the premise of people's recognition that they belonged to the land community, what he called the "biotic community" of soil, plants and animals. Whereas others may dwell on the botanical or zoological aspects of high country ecology, I am focusing today on humans in ecosystems that we interpret as landscapes.

I am conscious, as Leopold was, that humans are the species that can care about other species, that such care for the larger biotic community of which we are part requires a body of knowledge and understanding. Seeing where we are in space, in culture as well as in nature, is vital to our understanding of our unique role as humans.

All this implies that if we want to have landscape that functions with some kind of ecological integrity, and not just want to maintain 'a pretty face' on the land, the people who live and work as members of a landship have to have organised information for them to use land, to manage landscape with care. This is the real task ahead that Graeme Martin set us, "to understand some of the ecology of those landscapes, to identify information needs and to examine the practices that will help manage the landscapes and sustain the values and benefits enjoyed from them."

My contribution to understanding the implications of ecology for landscape management is to affirm the work of people in communities as an integral, essential, and continuing feature of high country landscape. You don't find the Resource Management Act defining ecosystems in such a way that they exclude people. Some ecosystems of their nature include people and demand their recognition in their care and management. Still more, all landscapes have their values as landscape rooted in human perception and human valuation. Attempts at representing landscape values as separate from and not related in any way to human communities are doomed to be barren of good effect.

[2] A Leopold, 1949, "*A Sand County Almanac*", Oxford University Press, New York

New Zealand Landscape Management in an International Perspective

There is nothing dreadfully new and revolutionary about my assertion that people are integral to landscape. More than fifty years ago Christopher Dawson, author of "The Making of Europe", described "culture" as:

> "the impact of work on an environment by a people acting under the impulse of a continuing tradition".

From another viewpoint, this was an affirmation in Europe of what I have described as landship, landcare and the moulding forces of particular environments. If you have doubts about this unity of ecology and culture in landscape, I invite you to read the founders of landscape ecology, even in translation from the German[3].

I emphasise this European ancestry for the word 'landscape' and for the wider ideas now caught up with it. By some of our antipodean or colonial standards, Europe has no natural landscapes. Other people, including one of my landscape mentors, Frank Boffa, along with several Environment Court judges, recognise that there may be a continuum of "natural character" from the pristine to the modified in 'natural' environments and continuing through the rural and urban phases of 'built' environments. However, there is among some New Zealand nature-lovers a tendency to deny the existence or persistence of nature, except when nature rules in its totality. Accompanying that tendency is an inclination to disparage the work of the human hand on nature. One of our earliest European settlers to demonstrate an appreciation of New Zealand landscape saw it differently. Thomas Potts, observant farmer, naturalist, and author of "*Out in the Open*" found that he could admire nature but still appreciate the work of human culture in enhancing what he could see elsewhere about him.

Europeans in Europe seem always willing to recognise the work of humankind in their own landscapes. They accept culture as normal. Maori have comparable attitudes, ascribing to their ancestors even the work of digging these lakes or clearing the forests by fire. In contrast we *pakeha* newcomers currently tend to confine our recognition of culture in open country to

[3] Troll G,1971, Landscape ecology (geoecology) and biogeocenology: a terminology study, *Geoforum 8:* 43-46; Tesdorpf J C, 1982, Theoretische veberlegungen zum begriff 'Landschaftsverbrauch', *Freiberger Geographische Mitteilungen 1/2:* 143-194; Naveh Z, Liebermann A S, 1984, *"Landscape Ecology"*, Springer-Verlag, New York.

relicts of the past, such as the burning pathways of the hunter-gatherers of Maori antiquity, or the rusting remains of a gold-mining era. In treating of culture, we prescind from or ignore the continuing cultural present of farming, forestry or even adventure tourism. Whereas European familiarity with their own cultural landscape history has strongly affected European landscape professionals, the powerful influences of American geography on the development of modern concepts in landscape analysis have acted with somewhat different weight on our colonial landscape mind, emphasising the significance of natural ecological forces in shaping, controlling, even determining the characteristics of landscape that we might treasure.

Both geography and landscape architecture in New Zealand have benefited from significant personal and scholarly influences from overseas, especially from Great Britain and from the United States and Canada. From these multiple sources of enrichment and from the growing New Zealand consciousness of its own endemic endowment, one would expect forces of nature and of culture to be both recognised and taken into account in the interpretation of landscape features and characteristics. Even in various careful writings of cultural influences on our high country landscapes, one may discern how we tend to neglect or find fault with the contemporary cultural effects of our pastoral present. We tend to value as culture only the past, and then only those elements of the past that we feel in danger of losing.

Perhaps none of us, whether landscape professionals, ecologists, economists, or cultural anthropologists, have shown sufficiently balanced vision in our prescriptions for landscape management. In the latest human generation, we have been more concerned with the vulnerability to change of the landscapes about us than we have been with our continuing responsibility in their evolution. Perhaps our admiration of particular landscapes and our apprehension lest they be altered has sometimes unbalanced our prescription for their care. Clearly, safeguarding of landscapes demands the landcare of landships.

The Rapid Evolution of Meaning of 'Landscape' in Landscape Practice

Roger Lough indicated that I should include from landscape professional sources some ideas of high country landscape classification. What are we dealing with as high country landscape or landscapes? It seems especially important to see how the meaning of the word has evolved. Twenty-one years ago, Land Settlement Board commissioned a High Country Landscape Seminar at the Tussock Grassland and Mountain Lands Institute at Lincoln College. More than six years later, when both Land Settlement Board and TGMLI had gone the way of institutional reform common at that time, Lincoln University published the proceedings[4], being conscious of the increasing value of this first governmental venture in New Zealand at fostering "landscape awareness".

There are signs in those proceedings that Land Settlement Board may have been a trifle confused by the dominant issue of scenery, but it was still ahead of its time. In preparation for that Seminar, a survey was made of "central, regional and local government agencies and private sector groups with responsibilities or interests in the high country" to discover formal policies if any, concerning landscape issues and values in the high country, and to unfold perceptions of the importance of high country landscape values[5]. Following the 1977 International High Mountain Conference at Lincoln where 'landscape' had first emerged as a concern for land policy, Land Settlement Board's High Country Policy of 1980 had specified its landscape aim in high country land management:

> "The preservation of natural landscapes of outstanding scenic quality and the management and preservation of culturally modified or integrated landscapes where they are compatible with natural landscapes."

This emphasis on visual and natural aspects in landscape appreciation persisted in the assessments made of the formal and informal expressions of landscape policy presented from governmental and non-governmental organisations. A different balance emerged in the first keynote paper at the 1984 Seminar, the work of landscape professionals[6]. Di Lucas and Simon Swaffield attended to four attributes: area, features, appearance and natural processes, but they stated that "perhaps the most significant aspect is the nature of the relationship

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[4] W J F Bishop, C Findlay 1991,*"High Country Landscape: Proceedings of the Land Settlement Board High Country Landscape Seminar 1984,"* Mountain Lands Committee, Lincoln University, 70p.

[5] Responses are summarised in Appendix B to Bishop and Findlay *op.cit*.

[6] D Lucas and S Swaffield 1991 "Philosophical and practical landscape management issues", pp. 7-10 in Bishop and Findlay *op.cit.*

between 'people-and-the-land'. In keeping with this relationship, they also noted:

> "Landscape design seeks to shape the people-land relationship. The central concern is to enhance the integrity of that relationship, developing a blend of culture and nature that is appropriate to a particular place at a particular time." p.9

From these beginnings amongst landscape professionals of a more genuinely holistic concept of landscape expressing a profound cultural relationship with a particular tract of land, further rapid evolution has occurred in high country practice, even though a national landscape classification overview of landscape as such has still not emerged. A little more than a year ago, Alan Rackham, one of New Zealand's more eminent landscape professionals, lamented that there wasn't such an overview and considered this lack a national disgrace. His lament emerged in writing a landscape architect's appraisal of the problem of identifying and protecting significant landscape values in the high country[7]. Alan Rackham acknowledged that there had been considerable discussion about landscape issues in the course of "Tenure Review", in part engendered by the Di Lucas-led High Country Landscape Group of the NZ Institute of Landscape Architects. That group was concerned that inadequate weight had been given to landscape in assessments by Department of Conservation (DOC) and in decisions by the Commissioner of Crown Lands (CCL). I suppose that this forum is itself a response to that concern.

Alan Rackham acknowledged that 'landscape' means very different things to different people. He pointed out how professional understanding of landscape had broadened from the purely visual by the 1990s. From an English County source he quoted:

> "Many things are encompassed in our understanding of the word landscape: the geological structure of the land, its soils, animals and vegetation; the pattern of human activity - fields, forests, settlements and local industries, both past and present. It is a matter not only of beauty, of expressive appreciation of nature and architecture, but of the whole ecology of an area and the history of its occupations, of use by people."

I would echo that eloquent comment. At the same time I suggest that it is the great variety in our New Zealand natural world, the great difficulty that we have had in discerning order in it, and the great variability in the way that landscape professionals have gone about the description of this all-encompassing concept of landscape, which has filled the air with so much bracken dust and left us so far from having a national overview. It is certainly difficult in logic to classify objects or perceptions when we haven't agreement on the meaning of the term we use for them. It is even more difficult when we bloody-mindedly use the term in legislation and leave to judges the burden of unfolding and applying what is meant by the term, whether in the mind of legislators, judges or landscape professionals, or in the mind of ordinary people.

I want to emphasise here that it is the landscape professionals who have emphasised the role of humans in landscape. It is only certain kinds of environmentalists who seem to want to describe landscape that prescinds from human influence. I believe that there should be little need to belabour the significance of human agency and residency in landscape. So far as high country and tussock grasslands are concerned, both the pastoral inhabitants and their landscape professional visitors seem to be of one voice in affirming the mutual significance of people and place. They both acknowledge that people, Polynesian hunter-gatherers and European pastoralists, have had important cultural influence on the land, not always for good effect, nor always for bad.

They are not the only people to whom these high country landscapes are significant. Artists and photographers have already demonstrated the significance to their callings of high country landscapes. Pastoral farmers and landscape professionals, both acknowledge that landscapes have pivotal value to their livelihood and their industry as well as growing significance to other users, whether for recreation or tourism, or for other commercial purposes such as vehicle testing, film making, advertising. Recreationists see the landscapes about them as axiomatic to their own pursuit of recreation.

The significance of high country landscapes to nature conservation has not been totally lost on any party, but there is some indication that intense concern with nature conservation and fear lest continued pastoral farming will destroy

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[7] A Rackham, 2004, "*Tenure Review – Identifying and Protecting Significant Landscape Values in the High Country*" Report prepared for the High Country Accord, April 2004, 13p.

values for nature conservation may have moved some critics to wish an end to pastoral use. Criticism of continuing human agency for any deleterious effects from recreation or other non-pastoral uses appears to be much more muted.

I have indicated earlier the beginnings of recognition of New Zealand land culture as an integral part of landscape. The place of culture in the landscape of the pastoral high country was summed up by Alan Rackham:

> "The high country is a mix of the largely natural and the modified. People, and particularly high country farmers and their activities, are a fundamental part of the landscape."

Michael Ashdown and Di Lucas[8] had written very succinctly of many of the important aspects of interactive cultural presence in tussock grasslands landscape:

> "The landscape values of tussock grasslands are visual, cultural, ecological and economic. Each of these can be described individually, but it is their relationship that gives a landscape its special character and importance and results in what we can perceive."
>
> "It should be realised that in this context, ecological, cultural and visual values are essentially human values, placed on the landscape at any one time. In a purely scientific analysis, these would be inappropriate. In an analysis of landscape, their consideration is essential, for 'landscape' is itself a cultural interpretation of reality. By definition, these ecological, cultural and visual values are subjective and difficult to quantify."
>
> "For this report, landscape is used in the broadest sense of environment, encompassing physical form and all natural and cultural processes and interactions between them. It may also be considered the character of land as perceived, shaped and experienced by a society generally inhabiting a particular place. Landscapes change and this must be recognised in management and planning. Landscapes are a result of natural and cultural processes, and it is essential this be understood, especially in tussock grasslands." p.3

It is doubtful if the full import of these comments has been taken account of in the zeal to take landscape values into account in the application of the Tenure Review process. I shall return to examine some of these matters later when considering the human dimensions of landscape care and conservation.

Accessing Information for Community Management of Landscapes

Community Responsibility for Managing Landscapes

Many of us are still without a national overview of land environments or of landscape, and without any really formal view of what an ecosystem-based management of landscape might mean. We have had such a din created in litigation by argument as to the meaning of 'landscape' that we have not given enough attention to equipping ourselves for our own community tasks.

There is a precedent in the governance of education for having our landships take on our own responsibilities for landscape care, just as rejuvenated school boards took on responsibility for *"Tomorrow's Schools".* The Ministry for the Environment has already sought "an ecosystem-based classification of New Zealand's landscapes for use in their Environmental Performance Indicators Programme". (LENZ p.9). Such a programme can only be as good as the work of the communities involved.

I am asserting that the primary responsibility for the management of landscape belongs to the landship, the community that lives and works in it. I justify that by the sociological principle of subsidiarity, arguing that a larger organisation of society should not be called on to intervene where a smaller social community can be competent. The landship has the right to have access to the judgements of law, the skilled services of professionals, and the logistic support of local government in carrying out its responsibilities. I am not therefore attempting to subvert the present order in society by taking work away from judges, lawyers, landscape professionals or resource planners, or from resource scientists or engineers. I am trying to restore order in society where it has been compromised by the ascription of power, in all sorts of ways including technical knowledge, to the state and its agencies. The public good is debased when only the wealthy and industrially or commercially powerful can afford to contest such concentration of informatics power.

Discovering Land Information for a Landscape Overview

In the absence of a national overview of landscape, Alan Rackham seemed to know that

[8] M Ashdown, D Lucas, 1987, Tussock Grasslands Landscape: Values and Vulnerability, NZ Environmental Council, Wellington

publication of *Land Environments New Zealand (LENZ)* was forthcoming and looked to it for help. John Leathwick and his colleagues[9] had just completed their labour of years in and out of Landcare Research, generating *"Land Environments of New Zealand",* which they called:

> "a classification of New Zealand's landscapes (sic!) using a comprehensive set of climate, landform and soil variables chosen for their roles in driving geographic variation in biological patterns." p.10

This may be a careless or confused use of the term 'landscapes'. This work is more properly a classification of New Zealand environments rather than a classification of landscapes. It certainly provides the land information for the kind of overview that Alan Rackham felt was lacking, but as we have just seen, 'landscape' is something more than the physical and ecological environment. This work of compiling a numerically-based, GIS-mediated ecosystem classification as a resource management database had been fittingly dedicated to their fellows in:

> "the former New Zealand Forest Service and Department of Scientific and Industrial Research, who through their long hours of fieldwork, often in difficult and arduous conditions, obtained the data that underpins (sic) this book."

This reminds us that any improvement on our information for landscape management in the high country will call for renewal of our national commitment to field science in rocks, climate, soils and biology, as well as making full use of what information a happier generation of scientists accumulated. Our present scientists more readily integrate data into geographic information systems (GIS), and retrieve such information. There is no longer excuse for data being irretrievable.

I shall try to show the relationship between a wonderful new mine of environmental information, *"Land Environments of New Zealand"* (LENZ), and our ordinary man-in-the-field or woman-in-the-street perception of the landscape that we live in. I am going to summarise my own path through 'high country landscape', when I was developing an information system for land management, so that you may find a similar path. I am going to point to some trail-markers, cachets of new tools you will find valuable for finding where you are going in whatever you try to do to respect and enhance landscape.

Integrating Land Systems Concepts with Land Environment Information

Here is the pathway of my own experience. From fifteen to thirty-five years ago, I was guiding students in the interpretation of land, especially learning to evaluate land from the point of view of its suitability for different uses, ranging from nature conservation and resource-based recreation to growing forests, crops and pastures, building villages and making airfields. I found myself especially dependent on soil science and on field and statistical records of land use experience. I was also anxious to have such recommended uses take on the valid character and function of ecosystems and to find their place harmoniously in a landscape.

On this journey I had learned two lessons that were especially liberating and empowering. The first was Lindeman's concept of an ecosystem[10] definable at any particular scale, whether a puddle or a pond, a patch of grass or a large and varied field. The second was Christian's concept of the land system[11] in which land units recurred in defined patterns, generally determined by landforms within a macro-climate. Both of these concepts could be applied to successively nested systems, systems within systems. This allowed work at different scales, an essential with landscapes and land systems.

We have not been firmly committed in New Zealand to the analysis of experience as a basis for planning of land use, even though this principle underpinned the land classification system of the soil conservation movement at the time. With the help of students from different vocational paths we developed at Lincoln a land evaluation process that would make systematic use of land use experience[12]. To apply this land evaluation process validly to accommodate different uses at different scales in ways in which they were compatible would

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[9] J Leathwick, G Wilson, D Rutledge, P Wardle, F Morgan, K Johnston, M McLeod, R Kirkpatrick, 2003, *"Land Environments of New Zealand: Nga Taiao o Aotearoa",* David Bateman, Auckland.

[10] R L Lindeman, 1942, The trophic-dynamic aspect of ecology, *Ecology 23*: 399-418

[11] C S Christian, 1958, The concepts of land units and land systems, *Proceedings of 9th Pacific Science Congress 20:* 74-81

[12] K F O'Connor, G W Batchelor, J J Davison 1978 *"Mavora: development of a planning process for reconciliation of interests in wilderness",* Lincoln Papers in Resource Management No 4, Centre for Resource Management for Tussock Grasslands and Mountain Lands Institute, Lincoln College.

require a new geography of landscapes. This was our grail.

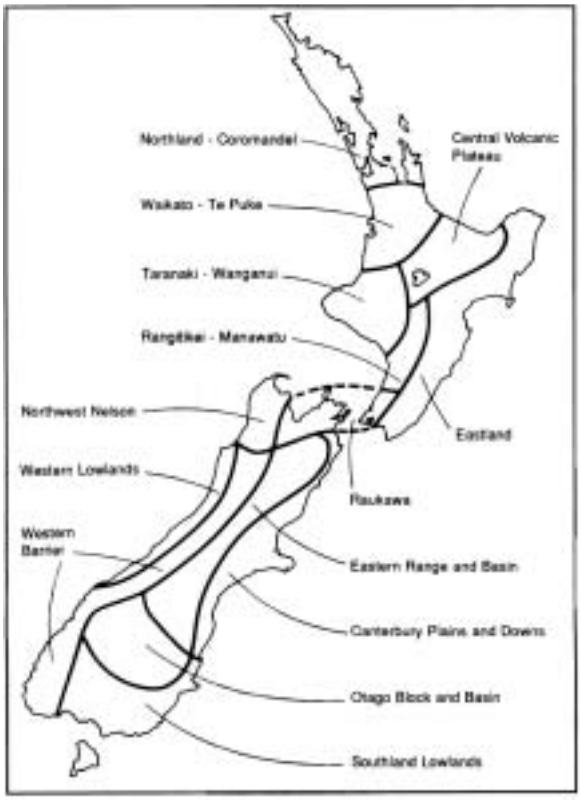

Figure 1: Proposed landscape provinces

Twelve years ago, I ventured forth an approximation of 14 landscape provinces of New Zealand[13]. It was founded on the concepts of Les Molloy[14] for twelve 'soil landscape regions', in which he described the principal soils in relation to the landforms distinctive of each region, and outlined the main uses and limitations to use of the principal soils. Following Peter Wardle's development of Cockayne's Botanical Provinces in describing the geography of New Zealand vegetation[15], I used the term province rather than region.

The high country is represented in three of those 14 landscape provinces, the Western Barrier, Otago Block and Basin, and Eastern Range and Basin as shown in Figure 1, presented first in 1993. Simon Swaffield and Ken Hughey adopted a similar presentation from the same source in their international discussion of the landscape challenges and future management of South Island high country[16]. Most of the pastoral high country lies within two of these landscape provinces. Table 1 shows how these two together accommodate eight major or generic land systems[17]. Although the detail is not presented here, within each of these major land systems several specific land systems can be defined, most of which could be perceived as delineating a specific landscape.

Now I should like to outline the relationships that emerge between these land systems concepts applied to landscapes and the "land environments" of the recent LENZ book. One of the three landscape provinces I had proposed, the "Western Barrier", extended from Fiordland above the Western lowlands to the Northwest Nelson Landscape Province, and included very little pastoral high country. It fairly closely corresponds to Environment R, Southern Alps in LENZ, differentiating at Level II into Environment R1 (encompassing the Southern Alps and adjacent range summits with a predominance of schist and greywacke soil parent materials) and Environment R2 in Fiordland where granite and gneiss predominate as soil parent materials. LENZ Environment S (with distinctive Ultramafic soils) and LENZ Environment T (Permanent Snow and Ice) are also for the most part included in what I named "Western Barrier".

The other two landscape provinces embracing the high country I named "Otago Block and Basin" (some P5 at the western lakes, mostly Q1, Q2 and Q3 in LENZ Environment Q, Southeastern Hill Country and Mountains); and "Eastern Range and Basin" (some Q1, mostly P1 and P2 in LENZ Environment P, Central Mountains). I should also note that my landscape provinces were, like land systems, very embracing sorts of concepts in other ways. They included many environments which are included in LENZ Environment E (Central Dry Foothills), from the rolling moraine and hill terrain from the Mackenzie Basin northward to Marlborough, and LENZ Environment N,

[13] K F O'Connor 1993, "Rural and Mountain Land Use", pp 120-149 in P A Memon and H C Perkins (Eds) *"Environmental Planning in New Zealand",* The Dunmore Press, Palmerston North.

[14] L F Molloy 1988, *"Soils in the New Zealand Landscape: the living mantle",* Mallinson Rendle in association with the New Zealand Society of Soil Science.

[15] P Wardle 1991, *"Vegetation of New Zealand"*, University of Cambridge, Cambridge.

[16] S Swaffield, K Hughey, 2001, "The South Island High Country of New Zealand: Landscape challenges and future management", *Mountain Research and Development 21 (4):* 320-326.

[17] By comparison, Ashdown and Lucas (*op. cit.*) identified nine "landscape regions" covering much of the pastoral lease land. The outcomes are comparable even if the approaches differ.

(Eastern South Island Plains), from the inland basin floors and drier surrounds in Otago and the Upper Waitaki. These "basin floor" environments include many undulating and rolling surfaces including depressed blocks in Otago. To outline the outcomes of the more subjective "land systems" approach, I present in Table 1 the physical characteristics of the "Otago Block and Basin" and the "Eastern Range and Basin" landscape provinces, more or less as I described them in 1993. In this presentation, I distinguish and label the principal major land systems for which landforms, climate and soils as summarised physical characteristics apply.

Landscape	Land System	Physical Characteristics	Principal Use Features
Otago Block and Basin	Harris (Western sector)	Deeply glaciated schist mountains with extensive valley systems; in humid, cool to cold climate; steepland soils and upland brown earths	Extensive pastoral farming for wool and beef with increased pastoral intensification throughout valleys and extensive recreation and tourism
	Dunstan (Central sector)	Summit-glaciated schist and greywacke block mountains, uplifted and tilted between broad basins; humid, cold upland climate; semi-arid to sub-humid cool climate in basins with warm summers; brown earths on summits and steeplands; dense grey and semi-arid soils on basins and foothills	Semi-extensive pastoral farming for Merino wool; more intensive pastoral farming at middle altitudes for wool and beef; irrigated pip and stone fruit growing and pastoral farming and some viticulture in basins; increasing recreation touring
	Lammermoor (Southeastern sector)	Unglaciated schist block mountains, uplifted and tilted between basins and low blocks; humid, cold, upland climate, sub-humid cool climate in basins with mild to warm summers; upland brown earths on summits and steeplands; dense grey soils on basins and foothills	Semi-extensive pastoral farming for Merino wool, lamb and beef production; substantial dryland pastoral development and irrigated pastoral farming but little horticulture or viticulture; extensive use for recreation throughout
Eastern Range and Basin	Upper Waitaki Gorges	Glaciated greywacke fold mountains with narrow valleys; cool to cold humid climate with mild summers; steepland brown earths	Extensive pastoral farming with Merinos and cattle, some plantation forestry and extensive recreation and tourism
	Waitaki Basin	Glacial moraines and fluvio-glacial terraces and fans; sub-humid climate with cold-winter mild to warm summer; loessial, till and stony brown and dense grey soils	Semi extensive pastoral farming for fine wool with plantation forestry, more intensive pastoral farming including cattle on deeper soils and under irrigation
	Canterbury Front Ranges	Greywacke fold mountains with some glaciation and loess deposits, subhumid climate with cool to cold winter and mild summer; brown and dense grey soils	Semi extensive pastoral farming with substantial development of pastures and plantation forestry on lower slopes; some niche horticulture and recreation
	Central Canterbury Gorges	Greywacke fold mountains with considerable glaciation and glacial and fluvio-glacial deposits in wide valley systems; cool to cold humid climate with mild summer; brown soils	Extensive pastoral farming for fine wool and beef with pastoral development on valleys and lower slopes, substantial plantation forestry and recreation and tourism development
	Wairau-Awatere-Kaikoura	Greywacke, schist or igneous rock on steep and deeply dissected mountains; subhumid with cool to cold winters and warm dry summers; brown and dense grey soils	Extensive and semi-extensive merino farming with some intensification on lower slopes; recreation and some niche viticulture and horticulture

Table 1: Land Systems, Physical Characteristics (Landforms, Climate, Soils) and Principal Uses of two High Country Landscape Provinces

What should now be recognised is that the classification of environments so well conceived and presented in LENZ is achieved by clustering together environments with similar characteristics chosen for their ecological relevance. This differentiates, for example, definable altitudinal zones in the mountains of Central Otago where the magnitude of difference in soil and climatic parameters calls for such separation, generally as Level II environments. Likewise difference in slope and its consequential environmental attributes will separate at environment Level I Otago block-mountains from intermountain basin floors.

For the purpose of seeing the difference in outcomes that result from clustering of data points to minimise heterogeneity in environmental space, such as is used in LENZ, compare the outcome in a land systems approach where the spatial relationship of such different environments is preserved, at least at a macro-system level, as units in the one system, as exemplified for the Dunstan Land System in Table 1. The land units within this land system of course can be now more explicitly described by reference to their illustration in LENZ (pp126-127) as level II environments within Environments E, G, N, and Q. If need be, by following the LENZ Technical Guide[18], further definition and characterisation of land units can be obtained at levels III and IV.

In short, the systems approach acknowledges the distinctions and emphasises the integrity. The LENZ approach recognises the spatial relationships but emphasises the distinction. These are complementary approaches. For the purpose of representing the physical and biological aspects of landscapes, both approaches might be employed together, the LENZ approach to identify environments at whatever level II, III, or IV is appropriate to the scale of the system, the land system itself to express the integrity of the landscape and the spatial relationships of the environmental units to one another. In this way, without limiting landscape to a purely visual term, the early 17th century distinctive feature of landscape as a concept is preserved, "a view or prospect of natural scenery, such as can be taken in at a glance from one point of view".

[18] J Leathwick, F Morgan, G Wilson, D Rutledge, M McLeod, K Johnston, 2002*, "Land Environments of New Zealand: a Technical Guide",* Ministry for the Environment and Landcare Research, 237 p.

Integration of Land Information with Biological and Ecological Science

Leathwick and his colleagues have already ensured that the environmental attributes selected to characterise and classify environments are ecologically relevant. This has been achieved by the analysis of experience with botanical surveys and experiments, especially by a "series of analyses of the environmental relationships of common New Zealand tree species". These analyses have already been shown as significant to the conservation of biodiversity in Canterbury as well as Otago.

One of these factors in the LENZ approach that I consider especially valuable is that the selected variables are likely to be significant to the distribution and productivity of most other groups of species besides native trees. As well as indigenous biota, other groups of plants are likely to gain explanatory benefit from use of the selected soil and climate variables, including introduced crop, pasture and forestry plants. I do not expect the relationships between the productivity of species and environmental variables to be the same for all species, or even for all members of an introduced species. I expect a robust, numerically-based approach to environmental classification, chosen "largely because of its greater objectivity, consistency and ability to hierarchically define relationships between large numbers of ecosystem units" to have considerable potential as a tool for the assessment of land use potential in forestry, pastoral agriculture and other forms of crop culture. I think that *Topoclimate South* and *Grow Otago* have already demonstrated such benefits.

Perceiving, Valuing and Caring for Landscapes

Perceiving the Human Dimensions of Landscape

I have reached in this review the point of presenting the **perception of landscape** as the key to discerning order in high country terrain variety. Maybe it is a subtle point. An old man like me may see it as more critical for our future purposes than it really is. What I see as vital to the value of landscape in our future resource management is that we should recognise that landscape is itself a human construction. It is not simply a figment of the mind, nor is it a totally objective phenomenon. It is a construction of the human mind with a real world basis. Like resources, which of their nature are not wholly of the real world nor wholly of the world of humankind, landscape is part of both worlds.

In a special way, landscape is not fixed in time, just as resources are not fixed in time but change from flow resources to fund resources with the time frame of our perception. In many respects, landscape change is cyclic and its cycles occur at different dimensions, from the long natural cycles of geologic change to the ebb and flow of trees and grass with adaptation to climatic stress and adjustment to disturbance; from the gradual cultural cycles from hunter-gatherer to pastoralist, farmer and park-maker, to the rapid intergenerational social cycles of exploiter and restorer.

In a special way landscape, like ecosystems, can be perceived at scales from the intimate to the extensive, just as landscape can be perceived and represented at different scales of time. In all these perceptions, humans are the arbiters of what is represented as landscape. Without humans there is no assessing or valuing of what is there as landscape, even though there may be intrinsic or inherent values in the realities that constitute the landscape.

In a very special way, landscape is a socially-shared human perception of a particular place. At the larger level of human society, we can nourish and respect the significance of World Heritage Sites, whether they be designated for reasons of natural endowment or of cultural significance, or like the holy mountains of Tongariro, Ruapehu and Ngaruahoe, because of both natural and cultural significance. At a national level of society, we can all share in the perception of the landscape of the icon, Aoraki, Mt Cook and its adjacent peaks and valleys. Yet every high country landscape is as perceived in the specially sharing community we have earlier called its landship. It is with each such landship that the responsibility for care primarily resides.

It is not enough to identify correctly the environmental attributes of particularly valuable ecosystems or to identify the biological values of those ecosystems themselves. If we are to be motivated to manage and protect such entities, we have to see them and comprehend them as part of our scene, our place, our patch. It is very questionable to my mind whether we as human beings can ever clearly see and fulfil our responsibilities to conserve if we do not see ourselves as part of the life system, the biotic community as Aldo Leopold described it. Scale of perception will especially affect the interaction of nested landships as involved communities of interest. It will be tempting for the bureaucrats to think big and work downward in the "consultative process". It may be wiser to think, and recall that "small is beautiful".

The leadership for wise innovative land use that Regional Councils have shown with the likes of *Topoclimate South* and *Grow Otago* could be expected to be repeated and enhanced in the application of the LENZ classification **in a landscape context** to the conservation of biodiversity, the redevelopment and restoration of degraded lands, and the promotion of productive land uses in traditional and novel fashion. It would take more time than we have today to expound how relevant and indeed essential to such a landscape management purpose is the establishment of natural area benchmarks and their constitution in networks in the manner of biosphere reserves with crop, pasture and forest use reference areas[19]. What I should emphasise here is the critical importance of including in any prospectus for landscape management, significant human considerations besides the alleviation of negative effects of human activities.

Discovering the Significance of Landscape in Law

> "It is our belief that if people understand what makes the landscape what it is, and how it has evolved, then they are more likely to be sympathetic towards it, and more conscious of the development and management practices that will change it. Statutory regulations and ordinances in the district scheme can go only so far in protecting and enhancing the landscape. It is people, individually and collectively, who shape it through their actions."

Sir Thaddeus McCarthy, 1st Chairman of the QE II National Trust, and one of New Zealand's more eminent jurists of recent times, uttered this statement of faith in humanity. I am grateful to Frank Boffa for having found it, treasured it and used it in his recent "*State of the New Zealand Environment*" lecture at Lincoln. I have no idea whether it was made by Sir Thaddeus in a judicial statement or not. For some people that sort of consideration affects the weight to be attached to it. I suggest it is fitting to use it to open our minds to the role of judges in ruling on the "protection of outstanding natural features and landscapes from inappropriate subdivision use and development", as required as a matter of national importance under Section 6(b) of the

[19] Individual and community initiative, with the assistance of the Landcare Trust, is establishing such a benchmark reserve in the high country at Balmoral, near Tekapo, despite the failure of national bodies to support it.

Resource Management Act 1991. It may also be prudent to relate to other landscape discernments. I personally see it as affirmation that people are more powerful than judges, that ethical pursuit of community well-being is more powerful for good than is statute.

Landscape has been a vexatious issue in Resource Management law, especially affecting the discernment of outstanding landscapes. The case law which had emerged up to Rackham's report for the High Country Accord was derived from decisions affecting landscape made under the provisions of the Resource Management Act, especially issues under s6(b), where outstanding landscapes were to be protected from inappropriate use and development. Rackham tried, as the High Country Group of NZILA had tried, to use case experience with resource management law to improve the way landscape issues were dealt with in Tenure Review. Both were indebted to the Canterbury region landscape study[20] of 1993, which in Rackham's words "reflected a significant shift in landscape assessment understanding." I recognise this shift and I recognise the significant development in judicial recognition of landscape from the late 1990s when cases involving section 6(b) of the RMA were dealt with from Kakapo Bay in Marlborough and Pigeon Bay in Banks Peninsula by Judge Kenderdine and Judge Jackson respectively. At the turn of the millennium came the advent of Queenstown Lakes District landscape issues in the hearings and judgements of the Environment Court.

This was a time of great judicial fortitude. I am not sure whether any of us has sufficiently appreciated what burdens we have placed on our judges by introducing into legislation and exercising in litigation terms like landscape whose meaning is still in the process of active and rapid evolution! I fear still more that our taking refuge in judgements in law may be weakening our wills to work through our community responsibility in managing landscape as Sir Thaddeus believed we could.

I am indebted at this point to the excellent review of the development of law on Outstanding Landscapes[21] under s. 6(b) just released by Professor of Law Barry Barton, from the University of Waikato. Professor Barton traces the difficult path that "landscape" had from being almost a minor matter in the Town and Country Planning Act to becoming eventually included, with qualification, as one of the matters of national importance in Section 6 of the RMA.

He also demonstrates from the Marine Hatcheries vs. Marlborough District Council case how landscapes were not to be limited to the natural or the visual, and from the Pigeon Bay Aquaculture case against the Canterbury Regional Council, identifying 'aspects' relevant to assessment of significance of a landscape (the Pigeon Bay list).

Barton records from the court the origins in policy statement and landscape expert evidence of these "criteria", noted their weaknesses and observed that "both marine farms were allowed, although doubt was expressed that there could be many more around Banks Peninsula".

The first Queenstown Landscape Decision was important because it was focused only on issues, objectives and policies of the Queenstown Lakes District Plan. It ushered in a series of cases in this high country district, which will be reverberating in this forum from better-informed sources than I. Suffice for me to note that Professor Barton has recorded that "the court held that in preparing its plan, the Council should have identified the outstanding natural landscapes and other landscapes to which particular regard should be had". The judgement considered how the RMA dealt with landscape, not finding dictionary definitions any more useful than we do, but it noted:

> "The word was used in Part II of the Act, which expresses in ordinary words of wide meaning the overall purpose and principles of the Act (in the words of Greig J), with a deliberate openness in the language that should not be subjected to strict rules of statutory construction that aim to extract a precise meaning."

In keeping with this attitude the court considered "landscape" as a large subset of the "environment", defined comprehensively along with "amenity values" in the RMA, recognised that "landscape" involved perceptual factors affecting natural and physical resources that appeared to fit well with "amenity values" in this context. The court also regarded "landscape" as a link between individual natural and physical resources and the environment as a whole, for two kinds of reasons both of which reveal the significance of cultural and other human features. In keeping with its own judgement

[20] Boffa Miskell Ltd and Lucas Associates, 1993, Canterbury Regional Landscape Study

[21] Barry Barton 2005, 2005, "Outstanding Landscapes" in New Zealand Law Society Continuing Legal Education Intensive Seminar, Environmental Issues - Insight and Inspiration, 22-23 August 2005, pp 65-110

summarised here, the court revised and confirmed the seven criteria of landscape assessment that arose from Pigeon Bay as follows:

(a) the natural science factors – the geological, topographical, ecological and dynamic components of the landscape;

(b) its aesthetic values including memorability and naturalness;

(c) its expressiveness (legibility): how obviously the landscape demonstrates the formative processes leading to it;

(d) transient values: occasional presence of wildlife; or its values at certain times of the day or of the year;

(e) whether the values are shared or recognised;

(f) its value to tangata whenua;

(g) its historical associations.

Learning to Value, Respect and Enhance Landscape outside of Court

Barton records that the *Queenstown*-modified *Pigeon Bay* criteria have been used in a wide range of cases since, without much dispute, so long as witnesses took care to apply the criteria properly and understand what the court had said in earlier decisions. He also notes that in other cases, including one at Wanaka, the *Pigeon Bay* criteria were not used when they might have been. Professor Barton makes a very profound comment on this continuing chapter of litigation of landscape:

> "Perhaps more to be regretted than much debate about the list of Pigeon Bay criteria is the lack of discussion in subsequent decisions about the meaning of landscape. It may be that there is reasonable consensus in the idea that landscape is to be understood in the context of environment and amenity value, that it links individual resources in the environment as a whole, and that it embraces social, economic, aesthetic and cultural aspects. One aspect of landscape that certainly could see more debate, and action in the shaping of evidence, is the assessment of landscape and landscape perception by local residents and visitors. Perception of landscape by those who use and live in it is well reflected in the First Queenstown Landscape Decision and the Pigeon Bay criteria, but the focus of discussion in the cases is still in the visual component of landscape." p.76

With reference to assessment of landscape and landscape perception by different groups of people, Barton notes the important work of Swaffield and Fairweather[22]. What this work above all shows is that there is social significance in landscape apart from arguing its qualities and significance in court. Earlier work by these authors has demonstrated that there are marked differences in our perception, valuing and caring about landscape and landscape change that seem to depend somehow on our values. This bundle of principles or standards that gives us our personal frames of reference by which we evaluate our own lives and environments may also vary with our socio-economic occupation and origin.

Among rural dwellers, farmers (high country farmers included) tend to express their values through implementing a range of farming goals, as Parminter and Perkins[23] demonstrate and as Allan Kane[24] has described it for a high country farmer. Others who choose to live in the countryside, including rural areas in the high country, such as this Wakatipu district, generally have well developed landscape values. As research by Frank Boffa and his associates and other continuing research by Harvey Perkins both indicate, their goals of countryside living may not always be satisfied by the kind of development in the countryside that has been advanced to enlist their support. Better understanding of different people's values and goals in such landscapes as these in the high country might greatly enlighten the practical planning paths to enhance and protect landscapes. This was a major feature of Frank Boffa's "*State of the New Zealand Environment Review"* a few days ago.

I make these comments in the full awareness, as most people here must share, that we are at this stage in history set to have much greater mischief wrought on high country landscapes by peri-urban subdivision and development, second-homing, recreational and touristic developments of one kind and another than was ever likely to come from merino wethers. What it means is that rather than use landscape protection as an instrument of land use change engendered by tenure review, we

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[22] S Swaffield and J Fairweather, 2003, "Contemporary Public Attitudes to Landscape" in *Reclaiming our Heritage: Proceedings of the NZ Landscape Conference 2003.*

[23] T G Parminter and A M L Perkins 1997, Applying an understanding of farmers' values and goals to their farming styles. *Proceedings of the New Zealand Grassland Association 59:* 107-111.

[24] A Kane, 1991, *"Landscape Perceptions – A landholder's point of view"* pp. 22-27 in Bishop and Findlay *op. cit.*

should be using land resource and landscape evaluation and social study of landscape perception and valuation as instruments enabling rural communities of earlier origin along with new arrivals to promote the development of landships for the care of their own landscapes.

The Three-way Split: is this the Outcome of Environmental Law?

Professor Barton drew attention to the Environment Court in Queenstown case to its interpretation

> "that the RMA seems to indicate a tripartite division of rural landscapes:
>
> (1) the outstanding natural landscapes under s 6(b);
>
> (2) the 'visual amenity' landscapes deserving particular regard under s 7, paragraphs (b), (c), (d), (f), and (g) – and also s 5 (2); and
>
> (3) landscapes in respect of which there are no significant resource management issues."

I have not time or capacity to examine properly the implications of this sort-out. I acknowledge the importance of the first but I am not clear in the relevance locally or nationally of the second. What I am not happy about is the sorting out of a third-class landscape. I take it that this is to become a class that the planners, bureaucrats or state protectors do not have to worry about. This is where I find myself rebelling not just against the comfortable three-way sort, you know like potatoes, table, seed and pig. What I find sad is that care and enhancement of landscape seems no longer to be a significant concern for this third class of landscape.

I wonder how that division is expected to affect the attitudes of those who live there, who may be tempted to do what they feel they always wanted, plough or grub it up and put in a crop of turnips; or those who may be motivated to develop it for new purposes, like housing for the workers, or even new holiday accommodation for the not-so-wealthy kiwi family. Is it a case of anything goes? at least so far as landscape is concerned? Somehow this presents the image of a vacuum of care. I believe it is a vacuum that a local community might abhor and should in consequence develop its own shared landship vision of landcare. It will be a good test of the significance of our expanding concepts of landscape.

Landcare of the Integrity, Beauty and Stability of the Biotic Community

Regardless of which category in resource management law a particular landscape is classed to fall into, sustaining the management of that landscape will call for the practice of a land ethic such as Aldo Leopold conceived:

> "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."

A few thoughts may be added as implementation of or corollary to this central principle enunciated by Leopold. The scale of the landscape will determine its homogeneity as a biotic community. It may not be all of the one level of naturalness. Few if any landscapes will be pristine throughout. Those that are totally or principally pristine may very well warrant their management with strict protected natural area status. For those landscapes which include the pristine or near-pristine and substantial components of modified-natural or mainly cultural character, maintenance of stability and beauty and above all, of integrity will be key essentials, regardless of what arrangements of tenure or protection may be entered into for the sake of the pristine or near-pristine. The peril of the current tenure review is violation of landscape integrity from the partition of the landscape into Crown-controlled land and unfettered freehold. The need for landcare in the management of freeholded segments of a landscape may seem a special imperative on the farmer. All parties in the tenure review should be considering whether the landscape can tolerate the primary partition, with its expected fence-line boundary between pastoral and non-pastoral use.

This is not the only application of the principle of promoting and respecting stability, beauty and integrity. At the lived-in landscape level, each of these attributes has a need for our comprehension and respect. We do well to reflect on Thaddeus McCarthy's lines that I quoted earlier. We should recall that there is more than one expression of ecological stability, that resilience or even oscillation may better suit some situations than constancy. We might note from Judge Jackson that he has not yet closed the book on aesthetics, recalling that beauty as a transcendental property of being, like truth and goodness, can be expressed in different ways, not everywhere found in the eye of every beholder. Above all our own creative ingenuity as humans, coupled

with our own membership of the biotic community, can have us enlarge the diversity of life in our landscape at the same time as we respect the vision of its integrity held by the larger landship. I keep thinking of Leonard Cockayne in terms of his own image of himself in his autobiographical fragment to which Andy Thomson[25] introduced us as 'The Little Boy in an English Wood'. The founder of high country conservation, the founder too of high country agronomy and of the pastoral ecology of animals has shared with us a glimpse of the continuing vision of diversity in integrity, from a wild wood to a garden.

Renewing a Shared Vision of Sustainable Management for the Landship

Reworking Landcare Groups as Landships

Landcare groups have become a common feature in high country circles in recent years. They have had a great range of success and failure. I have a hunch that their greatest risk is the lack of common shared physical and social focus. For this reason in my own idealism I recommend that the landcare group should work on itself in genuine formation of a landship. Their common task will be to articulate and share their own vision of the lived-in landscape to which they aspire for themselves, their neighbours and the larger community, including those who visit them.

If all inhabitants of a landscape are encouraged and welcomed into the landship, regardless of their gender, occupation or shape, it will almost certainly take longer and be more difficult to develop and share a common landcare focus. If regular visitors to the landscape are welcomed with special visitor status into the community of the landship, again the sharing will take longer, the finding and sharing of common focus will be more difficult. These outreaches will require more conscious sharing of ideas and ideals and will allow much less taking of matters for granted. The landship, its vision and its spirit will almost certainly be richer in the long run.

The Need for Shared Vision and Transitional Goals

We need progress points and vision markers along the way. At the 1991 Hawkes Bay International Conference on Sustainable Land Management, Simon Swaffield introduced[26] the notion of "transitional innovations in land use practice – innovations that are at least partially compatible with existing infrastructures, but that also contain within them the potential to become part of a more sustainable system in the future". He visualised that such "transitional archetypes" could contribute to the creation of a "shared vision giving substance to the intent of the Act – that of individual action within a broader framework of common interest". There is a place for this kind of vision-sharing in the Otago high country, especially on common kinds of degraded tussock grasslands.

Anybody who looks seriously at the condition of much of the Otago high country, especially the drier rabbit-prone country, but much of the thyme-ridden, hawkweed-ridden, briar-ridden, over-ridden terrain, knows in their heart that such country is a long way from sustainable management. It is unusual for such terrain to constitute landscapes of outstanding character, or even of significant visual amenity value. Such terrain is seldom sought after by DOC in tenure reviews, except perhaps as pleasuring grounds for mountain-bikers, little good though that may do for their landscape quality. Above all it is seldom sought after for agricultural or horticultural development, mostly for reasons of harsh economics. Yet Leonard Cockayne decades ago, Barry Wills and his colleagues more recently and maverick land conservators like Mike Brosnan have each in their turn shown how such land could be converted to a sustainable condition. Now they are joined by Susan Walker and her devotees of ecological restoration on the likes of Flat Top Hill.

Is there an opportunity, or even a responsibility under the Local Government Act for District Councils, guided if need be by Regional Councils, to encourage and facilitate the development by local landships of visions of the future? Can they relate and aspire to them for their children and their children's children? Whenever I see or hear that phrase, I think of the Burke's Pass Monument, now set more

[25] A D Thomson, 1983, "The Life and Correspondence of Leonard Cockayne", Paper presented to the History of Science in New Zealand Conference, Wellington,12-14 February 1983, published by the author through Caxton Press, Christchurch 55p.

[26] S R Swaffield, 1992, "Transitional Design" pp. 318-322 in P R Henriques (Ed) Sustainable Land Management: the proceedings of the international conference on sustainable land management, Napier, November 1991

discretely back from the road so that fewer read its message and learn from T D Burnett, "child of the misty gorges" just why we should find a place for trees in this forest-forsaken landscape. The fact that T D Burnett's own conifer plantings, like the Snowy River colt from Old Regret, had got away seems to me even more cogent reason for finding a landscape solution!

Lest we think of wilding pines solely as a McKenzie country problem, I think of the visionary potential of Jolyon Manning's arboretum at Earnscleugh Road, and I try to estimate my future powers of reading the time from the face of the mountain above Alexandra, matching my failing vision against the obscuring possibilities of rampantly spreading Pinus radiata and P. ponderosa in the driest terrain that New Zealand has to offer. How in the name of John Holloway, father and son, are we able to think for a moment that we can settle the place of forestry in the high country simply by focusing on quelling the waves of wilding pines?

This is another area where Simon Swaffield has done some serious research, on the perception of landscape change involved in successful establishment of trees. I know that twenty years of inaction will ensure that the McKenzie Basin floor is a pine forest in another 100 years, with enclaves of improved pasture for good farming behaviour. I know that decisions have to be made about the future landscapes of this high country and that these decisions should become the basis of the land use change that is introduced whether it is afforestation or tree eradication, pasture development or pastoral use with minimal development, both with and without compatible recreation, strict nature conservation, or nature protection with compatible recreation. The decisions are not exhausted, but the fair way of debating them and examining them in the interest of sustainable landscapes has not even started.

Simon Swaffield as a good landscape scholar noted that our emphasis in the RMA on effects carried into the formulation of performance standards would require a vision of what sustainable management might mean. We need to have performance standards for each of the major uses in the high country, for each landscape where the landship feels it is relevant. Whether it is nature conservation in various forms, or forestry, or recreation, or pasture development, or seasonal use of largely unimproved grasslands, or ecological restoration or alternative revegetation of degraded lands, each such use that is conceived as relevant to any landscape should be envisioned for that landscape as a way of opening our community minds to possible futures. When it comes to effectuating the planning of selected options, Swaffield would recommend that for sustainable management of land, we should have an over-riding rule:

> "Every individual change in land use or new development must contribute materially and demonstrably to an improvement in the sustainability of the region's resources"

Forsaking Tenure Review in favour of Reforming Land Use

At the present time, a series of adversaries are locked in a costly struggle that tokenises landscape and invites the contest of sectional interest to resolve the fate of the land by deciding tenure, surely one of the weakest instruments for the guidance of land use that the world has ever known. When Simon Swaffield wrote about performance standards and vision for the sake of employing transitional design towards sustainable management, Tenure Review was not a matter of public debate. Now it has become a national obsession. My invitation to the parties involved in the Tenure Review process would be to declare it a stalemate and start a different game.

I make it clear I don't mean start the old game afresh, perhaps with some new rules, or different umpires or something. No, I mean start up a new game of planning high country land use, a game played at the level of landscapes, with all the members of the landship taking part, assisted and facilitated by their district councils, guided by the resource policies of their Regional Councils and any National Policy Statement that central government could find the inter-departmental temper to generate. As I suggest above, District Councils have a responsibility for sharing the development of land use visions with the landships they serve.

Being Wary of Venture Capitalism

I would like to see District Councils engaged in this activity rather than washing their hands of this legitimate, laudable and necessary local government while continuing to dip them in the bloodbath for the land that venture capitalism will bring to subdivision and development. We know from history that venture capitalism in New Zealand was first in the oil industry when we gained oil for the lamps of Europe from offshore whales rather than offshore wells. We know how venture capitalism came ashore on the Otago and Canterbury coast with the likes of Johnny Jones and the Weller Brothers in the beginnings

of pastoralism. We know how the Godley-blest venture capitalism of Canterbury filled their land with sheep runs and spilled over into Otago so that even the stern constraints of William Cargill, Captain of their Souls, could no longer stem the tide of sheep.

The story of pastoralism is a story of dwindling capitalism, overshadowed early by the glistering of gold, steadily superseded in town by the new oligarchies of High Street and Hereford Street, supplanted on the rural lowlands by the spread of husbandry and the new venture of refrigeration, gnawed at in the wake of mining decay by irrigation for small-holdings and orchards, eventually over-whelmed by the incursions of roads, electrical engineers, and a growing tumult of ideas of soil conservation, pasture improvement, farm forestry, holidays in the sunshine and rain in the mountains, and a new spurt of venture capitalism in tourism. Peri-urban subdivision and development in the high country has become the new tormenting scourge of landscape, driven by venture capitalism.

Like most of you I find I soon have to make an electoral decision. It is a long time since I made one in terms of my own best interests. At this time of my life I feel very strongly inclined to make a choice in terms of the best interests of the high country. It is after all my first land love, perhaps my only lasting one. Yet I am torn between a party that has spawned a jolly green giant that represents the last remnant of state-can-do-it-best socialism, and that in the high country, and another party that seems to think piously that venture capitalism is good for the high country and that local government through its planning processes and hearings can be well exercised in moderating its excesses, without neglecting its ratepayers or the good of the land in any way! *"Laissez-faire"* seemed to have sunk into the history books when Muldoon was intervening his way about the countryside. I regret to find that it has had a naïve re-birth in this beloved country of mine. I am saddened that many of the high country folk that I know well may have been driven into its arms, or even learned to sup with the new venture capitalists themselves. The only hope for high country landscapes that I can see is abandonment of Tenure Review in favour of renewed community planning of high country land use, and vigorous eruption and courageous persistence of landships. Tomorrow would not be too soon.

As for the observed and noted recourse to landscape considerations in the courts, I am taking a rain check on the outcome of the spirited espousal of landscape that Environment Court judges have demonstrated in the last few years. I do not deny the significance of many landscape components as matters to be assessed in deciding resource consents. I think that many arguments, submissions and considered pieces of evidence are more about such matters than they are about landscape itself. Similarly, I have formed the opinion that the use of landscape as an "inherent value" in Tenure Review assessments is essentially spurious, but then the validity of assessment of significance is logically questionable anyway. I have a hunch that attempted emphasis on the connective and integrative roles of landscape in courts of law may be counter-productive to the more genuine community concern with landscape out in the real world. That community concern would preserve landscape quality while fostering landships in all their authentic variety. If we had a vital and effective landship in every lived-in landscape, we would have much easier district planning, much less work for the lawyers and a different kind of work, perhaps with greater work-satisfaction for the landscape professionals. I believe they would be able to help focus the land-caring landships on their needs-to-know, the areas of environmental science in which they have needs that can be met only by professional scientists. That could lead to the early re-birth of science in the high country, an event likely to have all sorts of unforeseen benefits. Both groups of profession-als would, of course, have to mind their language, taking care to avoid obscurities, because they will have to win the understanding and support of some very varied but real people. It is a future devoutly to be wished.

FIFTY YEARS OF SNOW TUSSOCK GRASSLAND RESEARCH APPLIED TO HIGH COUNTRY LANDSCAPE MANAGEMENT

Alan Mark – Hellaby Indigenous Grasslands Research Trust
and Emeritus Professor, Botany Department, University of Otago

My talk will be based on the more than fifty years researching various aspects of the ecology and sustainable management of snow tussock grasslands among other New Zealand ecosystems. Four 3-year terms as an elected member on the Otago Catchment Board back in the mid-70's to late- 80's, plus the last three years of the Land Settlement Board and the full 7-year term of the Mountain Lands Committee of Lincoln University, inevitably added some political appreciation of high country issues.

The Issues

I'm going to restrict most of what I say to the snow tussock grasslands since that's where I've conducted most of my research. This has been based mainly on my involvement with the Hellaby Indigenous Grasslands Research (IGR) Trust, as their first fellow in 1959, then subsequently as their research advisor, and currently as the Chair of their Board of Governors. My initial involvement was a few years after the Tussock Grassland Research Committee published a very salutary paper in 1954, in the N.Z. Journal of Science & Technology. A very influential group of senior government scientists/ecologists, including Jack Holloway of the Forest Service, Jim Raeside of DSIR's Soil Bureau, Lucy Moore and Henry Connor of its Botany Division, and Tom Sewell of the Department of Agriculture, presented their thoughts on the serious problems associated with the upland high country snow tussock grasslands. They stressed there were many uncertainties but reported extensive degradation to the point where they thought they might be dealing with a relict system, out of phase with the prevailing environment, where pastoralism was merely hastening the demise of that system. They recommended urgent intensive research, particularly into the ecology of the dominant snow tussock species as well as their systematics or taxonomy. That was the challenge I took up for the Hellaby IGR Trust in late 1959, after I had completed two years employment with the Otago Catchment Board on a range of high country issues.

My understanding of what is commonly meant by the 'high country' refers to the extensively farmed pastoral leasehold land to the east of the Southern Alps. This would be referred to by the American term 'rangeland'; signifying extensively grazed indigenous grasslands.

Figure 1: View west up the Matukituki Valley to Mt Aspiring National Park from the snow tussock slopes of Mt Alta. Feb., 1973

A fairly typical view of western Otago high country is seen in Figure 1, looking west, up the Matukituki Valley to the junction of the East and West Branches and beyond, Aspiring National Park, close to the main divide. The braided river on the Matukituki Valley floor, as with many others through the high country, is an integral and very important part of the high country landscape. The remnant forest stands are also typical of many such landscapes.

Figure 2: The old and new road to Treble Cone Ski Field. Aug., 1977.

Two attempts at roading onto Treble Cone, and a burn-off beyond, nearer Wanaka, are shown in Figure 2, as an example that could have been seen in many parts of the high country up to the 70s. There wasn't much sympathy or appreciation of landscape and ecological

values, or sustainable management, in terms of treatment of the high country, up to this time. The small road shown was first cut to assess a ski field prospect and the main road was put in later to develop it, with little attention given to landscape values. We learnt from that, so when The Remarkables Ski Field was developed, a much higher standard of road construction was demanded and this degree of damage did not occur.

Figure 3: View south from 1700m on the Garvie Mountains, across degraded alpine cushionfield (foreground), with intact slim snow tussock grassland beyond, to 1800m. Dec., 1963

If we look closer at some of our higher country, as in Figure 3 looking south on the Garvie Mountains in southern Central Otago, we see the more accessible foreground vegetation tends to be a mixture of sparse snow tussock and non-tussock cover; but further away, towards the more remote Rocky Mount, close to 2000m, is dominant snow tussock grassland.

Such contrasts in plant cover and high country landscape are not uncommon today, as a reflection of historical land use. I suggest in this case, the anomalous pattern of vegetation probably dates back to the late 1800s, soon after pastoralism began in the South Island high country.

On the much more accessible Old Man Range, little snow tussock remains along the crest and here at 1600m altitude, we see a graveyard of some 200 sheep skeletons (Figure 4), probably resulting from a severe summer storm in the late 1800's (decay rates are very slow here). This was part of the cost of farming in such severe environments. The nutrient residue from the carcasses has promoted blue tussock as an alternative to the cushionfield and herbfield that generally dominate here now - almost all induced from the original cover of alpine slim snow tussock grassland.

Figure 4: Sheep graveyard at 1600m on crest of the Old Man Range. Blue tussock dominates locally among the cushionfield. March, 1959.

At lower altitudes on the schistose Central Otago mountains, the snow tussock cover had been replaced in many areas by a much less palatable cover of golden spaniard and alpine fescue tussock or blue tussock by the early 1960s, as seen on parts of the Dunstan Mountains (Figure 5).

Figure 5: Golden spaniard and alpine fescue tussock which has replaced snow tussock grassland with pastoral farming. South Dunstan Mountains, 1160m. Dec., 1958.

And if we go north to the much more erodible greywacke mountains of the Hawkduns and nearby ranges in North Otago, I saw some very degraded landscapes when working there for

Figure 6: Severe erosion in upper Long Gully (Sth Br.), Hawkdun Range; Mt Ida behind. Jan., 1960

the Catchment Board in the early 1960s (Figure 6). And why was it so degraded? Well, it was still being burnt (and grazed), with escapes from permit fires and with no penalties for those responsible. Closer inspection showed there wasn't much tussock cover anywhere.

Further, where only small patches were burnt, for example due to a fire extending a small distance beyond a fenceline, the concentrated grazing could kill tussocks within just one season (Figure 7).

Figure 7: Differential grazing of recently burnt snow tussock grassland associated with the area available for grazing. Severe erosion is general. South slope, Hawkdun Range, 900m. Nov., 1957.

Even where most of a block was burnt and the grazing was therefore lighter, as to the left of the fence shown, the vegetation between the tussocks had virtually gone, but the tussocks were somewhat healthier.

Further up on the crest of the range, at almost 2000m, by contrast, the slim snow tussock in many areas remained in remarkably good condition, probably saved by snow cover at the time of burning on the lower slopes. Grazing was always less severe without fire.

Figure 8: Severe natural and induced erosion, 2100m, Craigieburn Range, mid Canterbury. Mar., 1959.

The greywacke mountains of Canterbury suffered much the same fate as those in North Otago. On the Craigeburn Range (Figure 8), the Forest Research Institute was investigating the ecological degradation and associated erosion, typical of the greywacke mountains of the South Island high country.

There were some natural plant communities on these mountains, such as fellfield on the more stable areas and scree on the natural debris slopes (Figure 9), with a very distinctive flora of some 25 native species.

Figure 9: Typical greywacke alpine cover at 1680m: stable fellfield with vegetable sheep (foreground) and mobile scree beyond. Dec., 1967.

So not all scree slopes were induced, though extensive areas of moving rock debris which lacked the distinctive features of a natural scree, presumably were.

Figure 10: View northwest across Lake Heron and surrounding tussock grassland and wetland, upper Ashburton catchment. Aug.,1985.

Further north in the Lake Heron basin of the upper Ashburton catchment (Figure 10), the tussock grasslands (and wetlands) surrounding the lake have been sustained and are part of an area which has been recently protected through a mixture of tenure review, a whole-property purchase (Clent Hills Station) and co-operation from three pastoral lessees. This was a very successful outcome in terms of protecting a valuable high country landscape with its plant

cover, and also satisfying the aspirations of the local farming community.

Figure 11: View northeast across Island Pass (1500m) and Molesworth Station. Degraded snow tussock grassland with exposed yellow-brown subsoils indicating induced erosion; the darker patches beyond are lichen-covered naturally bare areas. Jan., 1971.

In inland Marlborough, across Island Pass in the upper Clarence and Wairau Valleys is Molesworth Station. Figure 11 shows areas of accelerated erosion induced by early pastoral farming (yellow-brown areas in the foreground, typical of high country sub-soils), which contrasts with the dark grey colour of bare areas in the background, mostly at higher altitude, which are natural scree and fellfield. The dark colour here is associated with stable, lichen-covered rocks.

So, among this range of situations, I selected some issues to address through targeted research projects, which I will discuss in more detail.

General ecology of snow tussocks

Following my earlier MSc study on Maungatua, west of the Taieri Plain, the research I began for the Hellaby IGR Trust in 1959 was aimed at understanding the ecology of the upland snow tussocks, specifically to answer at least some of the questions posed by the Tussock Grassland Research Committee in 1954. I selected a coastal range (Maungatua), a Central Otago range (the Old Man) and a more western high country mountain (Coronet Peak), all with reasonable year-round access, as my main study sites.

Figure 12 shows the centre of the Old Man Range from about 800m to the crest at *c.* 1600m, with mixed fescue - narrow-leaved snow tussocks in the foreground. At higher altitudes (*c*. 900m), the snow tussock displaces the fescue tussock and dominates alone. From about this altitude upwards, is the 80% of the land which the South Island High Country Review of 1994 (the Martin Report) identified as generally receiving no inputs. This situation arises because the economic returns from these higher altitude areas are not adequate to justify the investment of over-sowing and topdressing. The mid slopes are dominated by narrow-leaved snow tussock (*Chionochloa rigida*), a more robust species than what we now know as slim snow tussock (*C. macra*), which replaces it above about 1300m throughout Central Otago and South and mid-Canterbury.

Figure 12: View up eastern slope of Old Man Range (1650m) from 750m on Obelisk Station. Mixed fescue–snow tussock (foreground) gives way to pure snow tussock grassland above 900m. Snow-lie areas above 1300m on the upper slopes have remnant slim snow tussock, blue tussock, herbfield and cushionfield. May, 2005.

In a transplant study of snow tussocks, I included plants from Maungatua and three sites (910m, 1220m, 1590m) up the slopes of Obelisk Station on the Old Man Range shown in Figure 12. Twenty tussocks from these four sites were each split up so the same plant could be grown at this range of sites, plus one at an even lower altitude.

The 1590m 'garden' is shown in Figure 13. The results indicated that these populations of snow tussock are genetically different in ways that adapt them to their local environment. The high-altitude population (above about 1300m) was so different it was described as a separate species (slim snow tussock). Plants of slim snow tussock have different growth patterns from those of narrow-leaved snow tussock from lower altitudes: a 5-month rather than an 8-month growing season, and slower growth rates so that there's a marked difference in the amount of growth achieved in a season.

Snow tussocks only flower irregularly; they have flowering and non-flowering seasons and,

in a flowering season, most tussocks flower. The transplant study showed that each population of snow tussock responds to a different temperature in terms of flowering.

Figure 13: Snow tussock transplant 'garden' at 1590m, Old Man Range with (r. to l.) plants from Maungatua (870m) and Old Man Range (910m; 1220m; 1590m), with some local plants on the far left. May, 1961.

Transplants replanted to their 'home' site behaved like the other local plants there (so transplanting *per se* didn't affect their behaviour), whereas those shifted to a higher altitude never flowered, and those moved to a lower altitude flowered every year. In the low-altitude garden at the University in Dunedin, there was a mass flowering every year (Figure 14). This (and other studies) showed that snow tussocks respond to a warmer than usual summer by flowering the next summer, but the critical temperature varies with the altitude of the tussock population.

Figure 14: Snow tussock transplants at the Botany Garden, Dunedin, with plants (l. to r.) from Maungatua (870m) and Old Man Range (910m; 1220m; 1590m), all flowering prolifically. Dec., 1965.

Growth patterns of the transplanted tussocks also showed genetic differences between the populations, with clear adaptations to their 'home' sites, even though they all look much the same. So, despite what the Tussock Grassland Research Committee had said earlier, these snow tussocks clearly are not relict – rather, they are well adapted to suit their own particular environment on a mountain slope. And the environments can be very different up a mountainside, as I showed on the Old Man Range, where mean annual precipitation increases from about 400 mm on the lower slopes to >1800 mm near the crest (maps at the time indicated a 30in. [750mm] value here), accompanied by a decrease in mean annual air temperature from about 10°C on the lower slopes to near zero on the crest.

Figure 15: View downslope to the 1220m study site on the Old Man Range, showing snow tussocks unburnt since 1940 (centre rear; fenced area at rear) and those burnt in 1961 and 1992 (foreground). May, 2003.

The Tussock Grassland Research Committee had stressed the need to better understand the burning and grazing aspects of pastoral farming on the dominant snow tussocks and, for this, I chose the mid-altitude site on the Old Man Range. Runholder John McCambridge was most co-operative and assisted me with a variety of burning and non-burning treatments here (one site has remained unburnt since about 1940: see Figure 15).

Results showed that snow tussocks grow significantly faster than unburnt plants in the same area, over the first year or two after burning, but then growth declines for several years and, by about year-14, growth in the burnt tussocks has about caught up (Figure 16A). There is also a strong flowering response to burning. Tussocks never flower in the year of a fire (any flower buds are killed by the heat), but one year later, all of the tussocks will flower with about 200 flower stems per tussock (Figure 16B). Then follows a rapid decline in flowering, to values significantly below that of unburnt plants in the area, and it takes at least 14-15 years for them to recover (Figure 16B). Being the longest record of post-burning effects on snow tussocks, I was asked by the Mountain Lands Committee and other organisations to continue this study. But by this time the lease had been sold and I was no longer permitted on

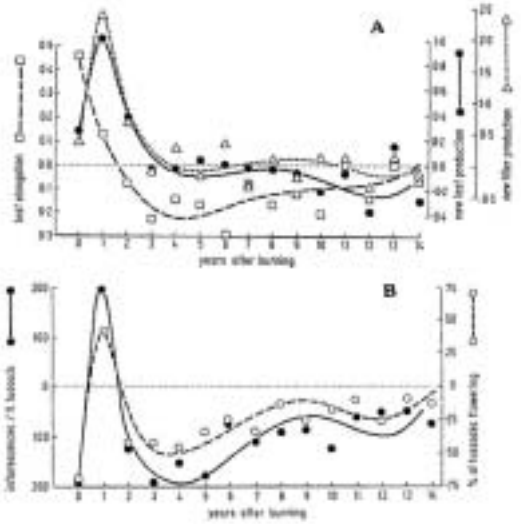

Figure 16: Effects of spring burning on growth (A, above) and flowering (B, below) of narrow-leaved snow tussock over 14 years at 1220m, Old Man Range. Growth is shown as leaf elongation, new leaf and new tiller production; flowering as % of plants flowering and no. of flower heads per tussock. All values are shown relative to those of unburnt plants in the area (dashed lines).

to the property. This was despite requests from the Otago Regional Council, LandCorp, and Federated Farmers. So this research project had to be terminated. Another aspect of this research was looking at the major nutrient (N, P, K) content of the tussocks in response to burning. We found the regrowth leaves almost doubled their nutrient concentrations compared with unburnt tussocks, but at the expense of nutrients in the roots, and it took several years for these tussocks to match the unburnt control plants. Neither roots nor stems were back to normal after 14 years (Figure 17) and neither had the tussock biomass recovered by then. Our advice to the managers and runholders was that, following burning, grazing should be deferred for a full year, preferably two, to allow adequate recovery of the nutrient balance (stock relish the new foliage and will also take the young flower stems). Otherwise, grazing will seriously deplete the limited nutrient capital of the grassland system. This information was later rejected publicly, by one prominent runholder (who is in the audience) at a Regional Council hearing on burning permit applications, on the basis that it was 'site specific' and thus not generally relevant to high country management. So now we have Landcare Research along with AgResearch, Department of Conservation and Forest Research involved in a very expensive, comprehensive study of the effects of both spring and summer-autumn burning on snow tussock grassland ecosystems at two sites (Lammerlaw Range and Mt Benger). At this stage, five years after initiation of this project, one treatment is yet to be applied, so results remain incomplete. In relation to the management of burning, however, I note with concern that the Regional Council's 'Code of Practice for the Management of Burning in the Otago High Country' was quite severely criticised by Judge Bollard in his recent (Sept. 2004) decision on aspects of the Central Otago District scheme (consistent with concerns raised by several ecologists in submissions on the draft code). The Council should review its code, as the judge recommended, to make it more significant and responsible in terms of Council's management oversight of burning in the upland tussock grasslands.

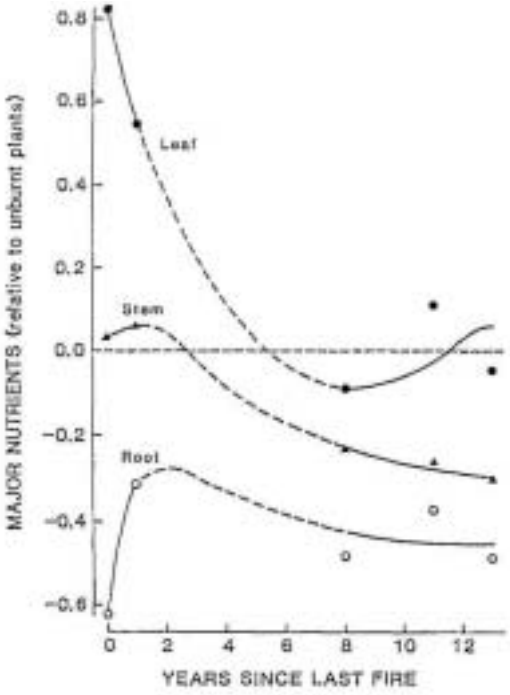

Figure 17: Effects of spring burning on the macronutrient (N, P, K) concentration in leaves, stems and roots of narrow-leaved snow tussocks over 14 years at 1220m, Old Man Range. All values are shown relative to those of unburnt plants in the area (dashed line).

Water yield

One of the most valuable aspects of the upland snow tussock grasslands in the high country, is water production. From my studies on the climate of several Otago mountain ranges (Maungatua, Old Man, Coronet Peak, Rock & Pillar), it became clear that the uplands receive much more precipitation and also experience much colder temperatures than the lower slopes, so it stands to reason they will provide

most of the runoff water. We began a study on water yield in relation to plant cover at 1000m altitude on the Rock and Pillar Range in 1966, and later extended it to six other sites, two at higher altitudes on the Rock & Pillars and four on the Lammerlaw/Lammermoor Ranges. We used tanks (lysimeters) of *c*. 0.3 m^2 surface area to represent one unit area of snow tussock grassland. Water yield from these lysimeters was compared using a range of cover types: burned, clipped and normal snow tussocks, blue tussock, *Celmisia viscosa* herbfield, exotic pasture and bare soil (Figure 18). These were run for up to five years and, right from the beginning, what we found surprised us as well as many others: significantly more water was yielded from the large snow tussocks (those burnt or clipped produced less water but their yields increased as the tussocks recovered).

Figure 18: Water yield site in snow tussock grassland, Ailsa Craig, 800m, Lammerlaw Range, showing tussocks clipped in a 100 sq m area around a lysimeter, with bare soil (foreground) and some of the instrumentation at the site. Aug., 1977.

From a 1348 mm mean annual rainfall on the Rock & Pillar Range, 63% of it was returned as water yield, surplus to local evaporation losses. Even bare soil yielded significantly less water here (56%) than the snow tussock grassland. On the very foggy uplands of the southern Lammerlaws**,** we got 80% of our measured rainfall as water yield from a snow tussock cover, and over the summer 6-months the yield was up to 86%. These water yields (as a percentage of inputs) from snow tussock grassland are close to, if not, world records.

Our conclusion, based on considerable additional research, was that the high yields from snow tussock grassland are associated partly with the tussocks very conservative use of water but largely with their gains of water from the interception of fog, which is not infrequent on these uplands. We showed that a single snow tussock could capture up to half a litre of water an hour from a dense fog when there wasn't any measurable rain falling. Hydrologists in the Forest Service and Ministry of Works were intrigued by our results, and forestry kept one of the catchments at Glendhu on the Lammerlaw Range in snow tussock rather than planting it up in pines. They established a paired catchment study at 460-650m there, to compare the water yield from the original snow tussock cover with that from the *Pinus radiata* they were planting. Water yield from the 218 ha snow tussock catchment was virtually the same as ours from the lysimeters at the low-altitude (1000m) site on the Rock & Pillar Range; a 64% water yield from 1305 mm of annual rainfall. By contrast, the 310 ha catchment planted in pines showed a steady reduction in water yield over time, associated with the pine plantation after year-6. By year-21 there was a 37% reduction in water yield compared with that from the snow tussock catchment (Figure 19). We now know, from this and several other studies, that any change in land use on the Otago uplands will result in a reduced water yield compared with that from a snow tussock grassland cover.

In another paired catchment study, initiated by Ministry of Works on Rocklands Station, three quarters of the 152 ha Deep Creek catchment, which was burnt in 1988, showed a significant reduction in water yield in the following three years compared with the nearby unburnt 152 ha Elbow Creek catchment.

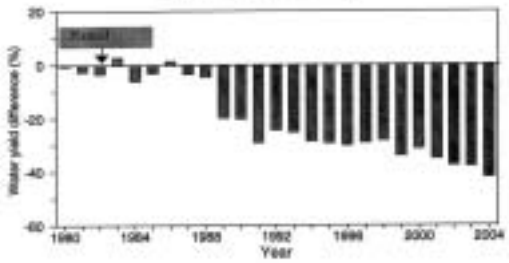

Figure 19: Water yield from the Glendhu paired catchment study; 1980-2004. Yield from the catchment planted in pines is expressed as a percentage of that from the snow tussock grassland catchment.

There was a 32% reduction in year-2 and 19% in year-3. Water yield then gradually picked up as the tussocks recovered, just as we had found earlier at our 1000m site on the Rock & Pillar Range.

In response to the debate over our water yield results, I tried another approach in collaboration with geo-chemist Neil Ingraham, from Auckland University, using stable isotopes of oxygen and hydrogen. At three upland sites in Otago (Rock & Pillars, Lammerlaws, Flagstaff), we caught

fog with a nylon mesh screen under a large metal umbrella, while rain was caught with a simple funnel (Figure 20). It was already known that when saturated air condenses, the first product is fog, which has a high proportion of the heavy isotopes of oxygen and hydrogen.

Figure 20: Devices for catching fog (nylon mesh mounted under large metal umbrella: left) and rain (red funnel: right) at 1140m, Rock & Pillar Range. Nov., 1996.

The rain which comes later has a lower proportion of these isotopes. So we needed to catch rain separately from fog and analyse these, plus the local ground water, for the two isotopes. The isotope analyses showed we had a sub-equal mix of fog and rain in the ground water. These results clinched for us, the importance of fog in supplementing water yield in these upland snow tussock grasslands.

Exotic forestry

Exotic forestry is a major issue in the South Island high country, particularly the wildings that come from much of it, which can impair landscape and indigenous biodiversity values, as well as water yield. These issues are now more generally appreciated than even a decade ago, and are being addressed in many (but not yet all) areas.

There seem to be too many permissive consents for exotic forestry in the high country, particularly in areas that are likely to be threatened by uncontrolled wildings. There are several examples in the Otago high country: the recent extensive planting of Douglas fir near Lake Onslow (that Grahame Sydney criticised earlier) and others near Bannockburn and Arrowtown. In Southland, the District Council's recent approval of several Douglas fir plantings in the upper Mataura Valley, some on obvious 'take off' sites, have caused widespread concern. These and other plantings are likely to create major problems in the future, because the wind-borne seeds can establish wildings quite remote from the source, as with *Pinus contorta* on the Lammerlaw Range from seed sourced 40km upwind, on the Blue Mountains. A commercial forestry company and our volunteer Forest & Bird group (which recently celebrated their 100,000th victim) removed these. If such wildings aren't removed they can multiply rapidly, even from *Pinus radiata* stands.

Our volunteer group removed *radiata* wildings from the Cromwell Gorge a few years ago but those across the Clutha River at Alexandra are now exploding and affecting distinctive Central Otago landscape values. Other serious wilding infestations are present in part of the Shag Valley catchment in Waitaki District. So wilding trees remain an important issue for most District Councils with responsibilities for high country landscapes since, as has been said, 'the price of procrastination is enormous'.

High country protection

Regarding the need for formal protection of high country tussock grasslands and associated vegetation for their scientific baseline, biodiversity conservation, and landscape values, this seems now to be generally appreciated after several decades of promotion and justification. Many people are aware of the Lindis Pass Scenic Reserve with its spectacular landscape. This 403 ha reserve was established in 1976, but without constraints on pastoral farming, so that its values are primarily for landscape. The first genuine reserve of tussock grassland in the high country was established in 1969. A 553 ha scientific reserve was created on Maungatua following my discussions with, and strong support from, two lessees, Archie Reid of Alandale Station and his brother Ken of Horsehoof Station. Each donated significant contiguous portions of their upper leasehold blocks to complement the adjacent lease, which was relinquished as an uneconomic unit by Allan Weatherall. The 144 ha Black Rock Scientific Reserve (note, all of the early snow tussock grassland reserves were classified as 'scientific') came out of the Lands and Survey Department's Black Rock development on the Lammerlaw Range, in 1972. This followed protracted negotiation and a prediction by the Department's reserves advisor that the area would soon revert to a shrubland of mostly boxwood Hebe, under non-intervention conservation management.

Our 30 years of monitoring here, conditional on the reserve being established, has recorded increased dominance of snow tussock on all but a few permanently waterlogged sites (Figure 21). The Nardoo Reserve of about 600 ha was established in the mid 1980s, being excised from Waipori land development following submissions on an environmental impact assessment and subsequent protracted debate between the Land Settlement Board and nine local scientists.

Figure 21: Black Rock Scientific Reserve, showing general dominance of snow tussock apart from Dracophyllum shrubland in the seepage area and on a poorly drained knoll (right). Oct., 1987.

Despite gaining support of The Ombudsman, we achieved protection for only the upper half of the Nardoo catchment. In 2003 this reserve contributed to the 21,000 ha snow tussockland Te Papanui Conservation Park on the Lammerlaw/Lammermoor Ranges. The Bain Conservation Area on the southern Old Man Range was purchased from the lessee by the Lands and Survey Department in the mid 1980s, following its identification as a 'Recommended Area for Protection' in the PNA survey of Umbrella Ecological District. Significantly, it was the first whole-lease purchase in the high country for conservation purposes. Within a few years the improved condition of the slim snow tussock grassland here, compared with the adjoining pastoral land, became obvious even in the absence of recent burning or aggressive pastoral management (Figure 22).

The Rock and Pillar Scenic Reserve (note 'scenic' reserve) was established from an area retired from grazing as part of a Catchment Board conservation run plan, following establishment of the Department of Conservation in the late 1980s. The upper part of this reserve is now being invaded by native shrubs, as the cessation of pastoral farming practices is allowing re-establishment of a zone of subalpine shrubland on the upper slopes of the range.

From the late 1990s several other areas of tussock grassland and associated ecosystems have been formally protected throughout the South Island high country, largely as an adjunct to the government's recent review of pastoral leasehold tenure, but also through some whole property purchases. Notable here have been Camberleigh on the Rock & Pillar Range, Birchwood in the Ahuriri catchment, southern Mackenzie basin, and Clent Hills in the upper Ashburton catchment. All three purchases have achieved valuable protection of continuous altitudinal sequences of high country ecosystems and their biota.

Figure 22: Fenceline on eastern edge of the Bain Conservation Area at 1500m, southern Old Man Range, showing increased height and cover of tussock in the reserve (left). Jan., 1991.

Tenure review, to date, has achieved conservation of generally much smaller areas, mostly on the least productive upper slopes. Few low-to-mid altitude areas have been protected through tenure review. A notable exception is a valuable remnant stand of silver beech forest with scattered Hall's totara, in upper Luggate Creek, on the dry northern slopes of the Pisa Range. This range is noted for its several remnant stands of Hall's totara and also its numerous scattered surface logs of totara. I'd like to acknowledge the support of the Lochar Burn owner, Geoffrey Brown, in agreeing to a no burning covenant (to protect the best remaining area of totara logs in Central Otago), which I recommended on his area privatised through tenure review.

Wetlands are another significant feature of high country ecosystems and landscapes. Campbell's Creek in the upper Waikaia catchment on the southern Old Man Range, is a good example, but the much more remote patterned mires in the upper Roaring Lion and Dome Burn on Nokomai Station in the southern Garvie Mountains are of international significance. I am pleased to acknowledge the assistance of the

lessee Brian Hore, for his help with our studies here, particularly use of his helicopter to get an aerial view of these distinctive wetlands (Figure 23), transporting heavy coring equipment and, not least, rescuing us from a snow storm. While not formally protected, access to these wetlands on pastoral leasehold land has been readily available to us.

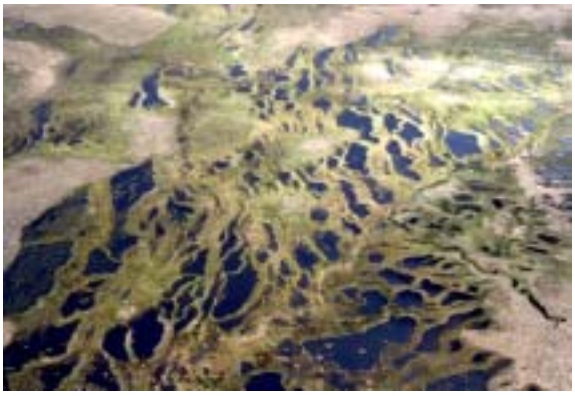

Figure 23: Aerial view of Nokomai patterned mire at 1300m on the Roaring Lion-Dome Burn saddle, Nokomai Station. Dec., 1986.

This contrasts with some other lessees, even to accessing some covenanted areas, as was the case with the conservation covenant on Little Valley Station. The sign on the boundary states that if one wants to access the covenant they must first ring the owner (Figure 24). When the Conservation Department sought permission for the Conservation Board to visit this covenant in 1997, soon after it was established, I was denied even though I was chair of the Board at the time.

Figure 24: Boundary sign on the QE II Covenant of red tussock grassland, Little Valley Station, Manorburn District, Central Otago. Feb., 1997.

So, while such covenants may serve a purpose in conservation, access is at the discretion of the occupier, and in another case, the occupier has stated in the press (even though I had never made a request) that I would be denied access to his extensive covenant.

Conclusions

Despite the statement of the influential Tussock Grassland Research Committee back in 1954, that the upland snow tussock grasslands of the South Island high country are 'mostly observed from a distance' and that 'at least on the mountains surrounding the inland basins, [are] no longer in equilibrium with its environment, and [are] in fact relict grassland', subsequent detailed studies by myself and others, have shown that this is not the case. Rather, the dominant snow tussocks here are clearly well adapted to their variable and generally severe environments. Indeed, the tussocks are even genetically differentiated between populations in ways that adapt them to the local conditions. Moreover, the snow tussocks have been shown to be quite tolerant, in some aspects even adapted, to fire, virtually at any season, but they are much less tolerant of mammalian grazing, particularly during the first few years following fire. This is perhaps not surprising since such grazing is a very recent phenomenon whereas fires have occurred irregularly on the high country over the last several thousand years.

Figure 25: View south along the crest of the Old Man Range at 1600m, showing an area (20m x 40m) with 800 narrow-leaved snow tussocks (sourced at 1220m), planted early in 1975, following the 'blading' of a 20m-wide strip alongside the road constructed to Obelisk in late 1974 for a TV translator. Feb., 1982.

Restoration of a depleted snow tussock cover is possible, either through transplanting mature tussocks (even outside their natural range: see Figure 25), or using nursery-raised seedlings or mature single tillers (as AgResearch showed on an area of the Lammerlaw Range purchased by Dunedin City Council for water production). However, this is clearly impracticable on a large scale. As distinguished botanist Lucy Moore indicated back in 1955, snow tussocks are much easier to retain than to replace; to quote her:

> 'as long as snow tussock is to be retained it must be remembered that, because its dominants are perennials with very long lives, it has many of

> the characteristics of a forest and few of those of a short rotation pasture. Like a forest, it is the product of a long slow development, and like a forest it is much easier to destroy than to rebuild.'

Based on my own research, I entirely concur with these comments. Unfortunately, snow tussocks cannot be aged but, clearly, they are very slow growing: seedlings in the field probably take at least 50 years to reach flowering, and mature tussocks have relatively slow growth rates. Although some ecologists have indicated snow tussocks can be classified as juvenile, mature and decadent, I believe that their intriguing method of self-perpetuation means that individual tussocks are potentially immortal. Snow tussocks are a veritable perpetual motion machine in that new stems (tillers) are continually produced, they take up to 15 years to reach a flowering age (and even then, flowering depends on favourable summer temperatures) and, an individual flowering stem produces at least one, usually 2-3 new stems while flowering. Moreover, dead snow tussocks are extremely rare in intact grasslands.

Although generally resilient, snow tussocks like most organisms, have their limits, so that in most situations they should be nurtured for the many ecosystem services (or benefits) they provide for human societies. Not only is a dense cover of snow tussocks valuable for soil conservation on mountain slopes but it appears to produce the maximum quantity and quality of runoff water, while also regulating its discharge more effectively than most alternative types of plant cover. A snow tussock cover also complements a wide range of landforms to provide impressive landscapes, the more so when the tussock canopy is waving in the wind.

Suggestions that a steady build-up of litter in unburnt snow tussock grassland inevitably increases the fire hazard, eventually to unacceptable levels are, I believe, misguided.

Figure 26: 4WD track at 1100m, Rock & Pillar Range, showing snow tussock leaf litter accumulated on the sheltered inner verge following a 'big blow'. Dec., 1996.

The occasional severe gales are known to remove at least some of the loose leaf litter, attested by its accumulation against netting fences or road verges (Figure 26).

Intact snow tussock grasslands are usually associated with a high diversity of indigenous biota, both plant and animal, and a dense cover of tussocks has also been found to constrain some potentially aggressive weeds, as with mouse ear hawkweed in the Black Rock Reserve. With non-intervention conservation management, snow tussock appears capable of sustaining itself in most situations, sometimes pure, or mixed with shrubs as part of a mosaic with stands of indigenous shrubland or woodland, or below the climatic treeline, perhaps even forest, as was probably the situation in many high country areas in pre-human times.

LANDSCAPES IN TRANSITION

Peter Espie - High Country Scientist, Agscience Limited

When we look at Figure 1, we see an iconic view of the tussock grasslands as we know them. This is from the top of Omarama Station looking out towards the Ahuriri and Longslip. We look at that and we think 'as it has been so it shall always be'. I'd like to suggest to you that these are landscapes in transition and what we see may not remain.

Figure 1: View from Omarama Station towards the Ahuriri River

I'd like to start with a thought: *'it's not so much where we stand, as in what direction we are moving'* (Oliver Wendell Holmes). That could be a theme talk for this seminar; it's also a mantra for the management of our high country. It's not so much where we stand; it is in what direction we are moving. To understand the direction of the high country, you need to understand global impacts and how they affect local impacts.

The global change of over 100,000 years of temperature variation in the Greenland ice cap (Figure 2) is very similar to what's happened in the southern hemisphere. The point that this graph shows us is that things aren't static and they change, and you will notice towards the right hand side of that graph the rapid increase in temperature in the last 20,000 years is associated with the last major glaciations. Figure 3 looks at this variation in more detail over the last 1,000 years. The most striking thing is the rising global temperature and the rise in global carbon dioxide and the graph shows that the cause is human intervention and the burning of fossil fuels.

These massive global changes are having an impact on the high country and affecting all of New Zealand. We all know the effects of El Niño, La Niña, hurricanes, increased energy use, increased rainfall and one in one hundred year rainfalls occurring twice in the last ten years. The impacts on the global systems on New Zealand are not something we can do very much about, except in our voting, but they do have enormous impacts. On our climate, our biology, our economy and our social well-being. In this talk, I want us to think ecologically and to think ecological systems. In the pyramid shown in Figure 4, the bottom layer depicts the producers: these are the things that fix energy from the sun, mainly plants,

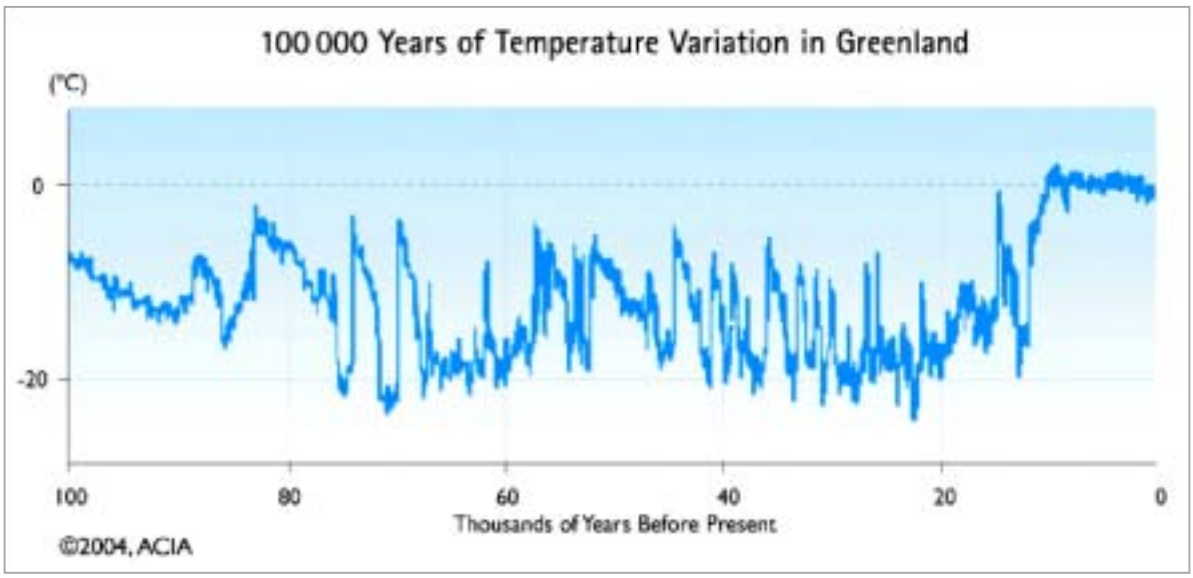

Figure 2: 100,000 years temperature variation

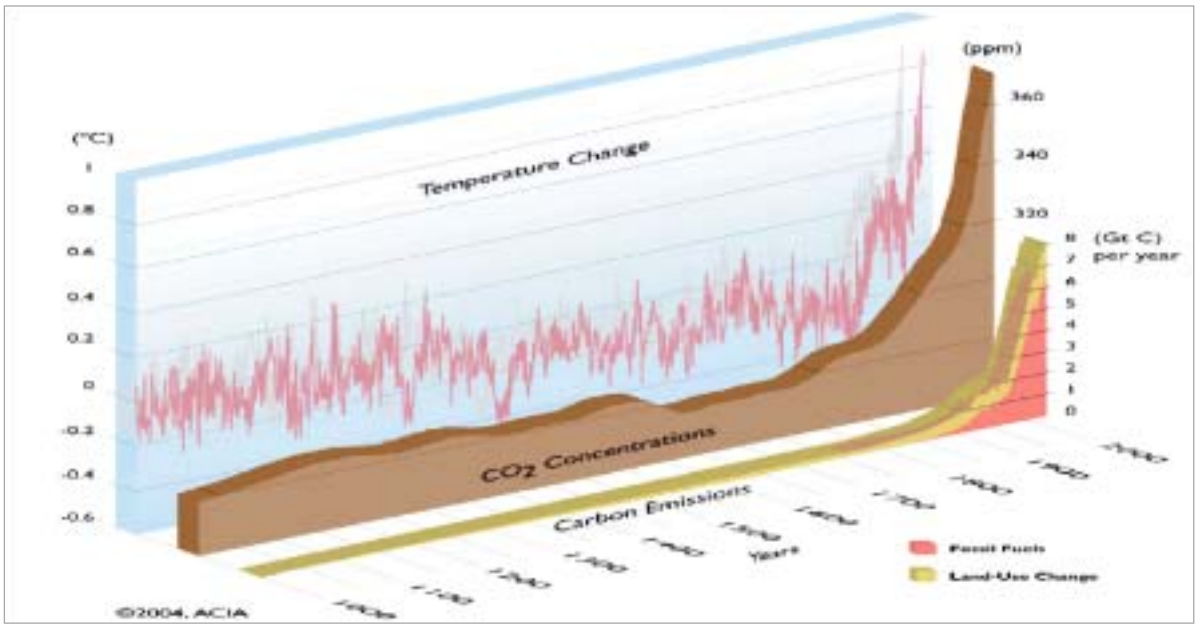

Figure 3: 1,000 years of temperature variation in Greenland

also some lichens and algae. Above them are the primary consumers, the herbivores, sheep, and rabbits. Above those, are the secondary consumers, carnivores, including humans.

The whole of this comprises what we call biodiversity, and in this talk I'm not only going to talk in the lower level concerning plants and vegetation because I'd like you to remember that what happens at the base of the pyramid affects what happens at the top. Change is not unnatural to the high country; 1,000 years ago what we see as tussock grasslands were once forests. By 1840 the area of forest had been significantly reduced by Polynesian intervention and forest clearance. The arrival of pastoralism from about 1840 saw another major change in these grasslands. Pastoralists introduced new animals and new plants. They had extensive grazing systems characterised by low inputs and these resulted in modification to the landscapes to suit pastoral enterprise. The tall tussock grasslands that had replaced the former forests in the montane zone were burned which, coupled with close grazing by animals, resulted in transformation on a massive scale into short tussock grasslands. These landscapes and the plants and vegetation on them can be influenced dramatically by human actions, as both

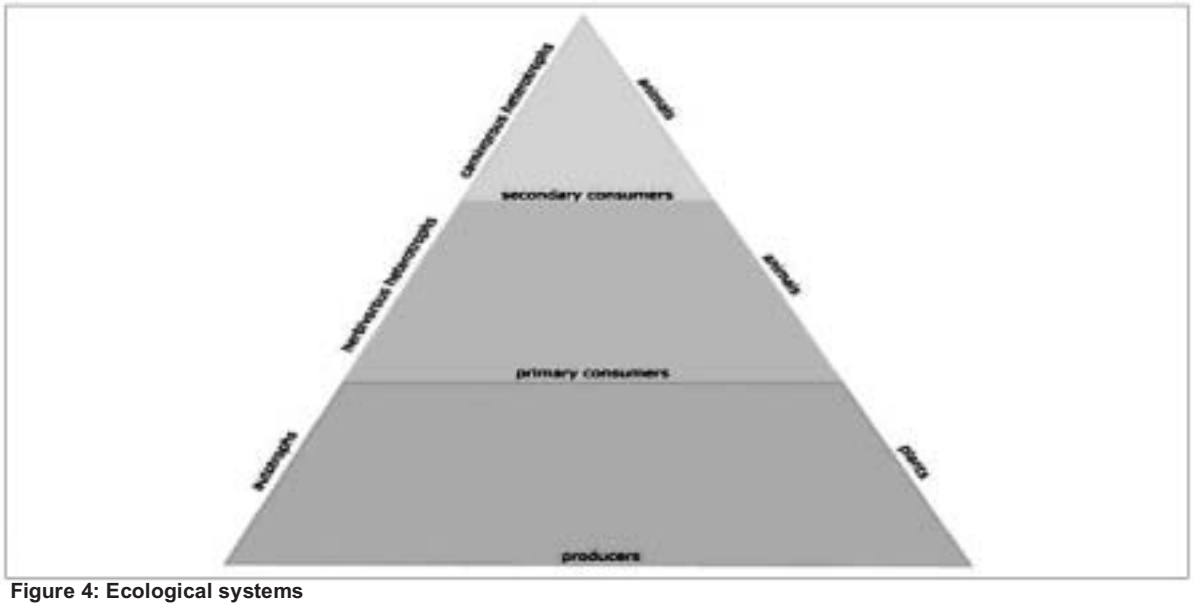

Figure 4: Ecological systems

Polynesian and European intervention has shown. The current tussock grasslands are largely induced grasslands; they are not the natural vegetation over much of the high country. As such, they are increasingly open to modification. I'd like to focus on two things that are currently having a dramatic impact on landscapes: these are two introduced plants - pines and *Hieracium*. The two photos in Figures 5 & 6, taken 20 years apart, show the potential for wilding trees to modify landscapes. Many similar examples exist as induced grasslands on formerly forested landscapes undergo a new transition to become forested landscapes.

Figure 5: Wilding pine spread at Mt Aurum 1983

At this scale, the economic resources are simply not there to reverse the change; the only feasible policy is one of containment. One tool of limited ability for controlling the spread of wildings is grazing.

Figure 6: Wilding pine spread at Mt Aurum from 2003

When the pine seedlings are very small (less than one year old) animals can remove them and can significantly limit their invasion; after this grazing does not kill the trees.

We know we can control trees; we've got the technology to do it if we have the resources to apply them. When it comes to the hawkweeds (*Hieracium* sp.*)* it's a different story.

Figure 7: *Hieracium* at Sawdon Station 1976

Hieracium pilosella has a low growing mat form, evolved under grazing in Europe, so it is admirably suited to the conditions it found when it arrived in the high country over 130 years ago. Brian Molloy's famous photographs in greywacke country, McKenzie Basin (Figures 7 & 8), show the transformation from fescue tussock grassland, in 1976, predominantly to *H. pilosella* by 2000.

Figure 8: *Hieracium* at Sawdon Station 2000

The study by Colin Meurke, from Landcare Research, looked at the dynamics of *Hieracium* invasions at ten sites in the McKenzie Basin, running from the high rainfall zone at the top of the lake down to the dry country just above the Benmore Dam and the Lindis Pass through to Burkes Pass.

Across these sites, the percentage of *Hieracium* cover more than doubled to more than 30 percent over 10 years - since 1990. That is the measured rate of increase of *Hieracium* across roughly half a million hectares of New Zealand high country.

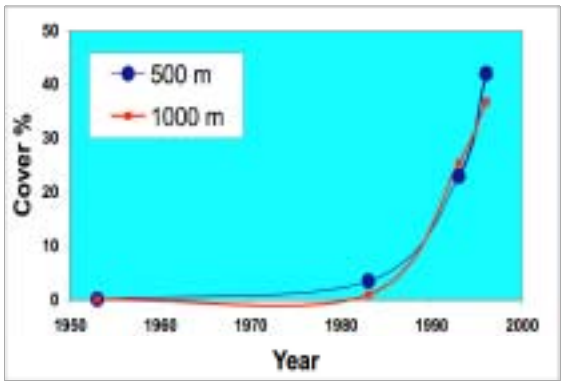

Figure 9: Tara Hills – change in *H. pilosella* cover at 2 sites

It is the same story at Tara Hills and this shows the importance of long term monitoring records to detect the processes that underlie landscape change. In the 1950's, the plant was present at Tara Hills, in very low numbers. *Hieracium* cover was about 2 percent when I first measured it in 1983. When I came back ten years later and measured the same plots I thought I'd made a mistake and got the wrong plot sheets, but it was real (Figure 9); that exponential trend has continued.

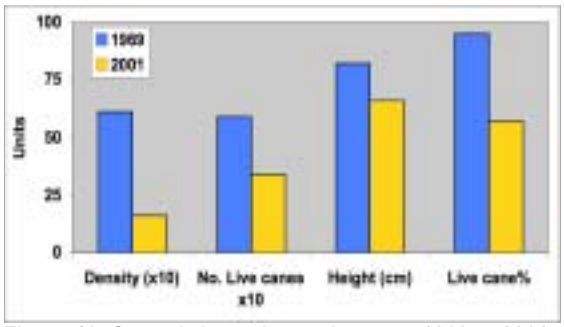

Figure 10: Sweet briar – change between 1969 to 2001

Barry Becker thinks *Hieracium* can take out tall tussocks. I think they have the capability of taking out shrubs. The changes in density, population, height and live cane percentage of sweet briar at Molesworth and Acheron are shown in Figure 10 (the density and number of live canes have been multiplied by 10 to enable them to be shown on the same scale as this graph). Brian Molloy first measured this in 1969. In 2001, briar density had decreased and there had been a decrease in the number of live canes per bush, a decrease in briar height and a decrease in the percentage of live canes - even though the total number of live canes had decreased. At the same sites, there was a marked reduction in ground cover of native tussocks, elimination of native and exotic herbs and native grasses but a marked increase in exotic grasses and of *H. pilosella* (Figure 11).

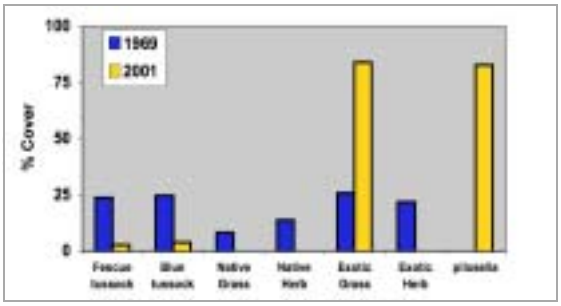

Figure 11: Changes in ground cover

Measurement of species diversity showed a similar number of tussocks in 2001, but the elimination of native grasses and herbs, and a reduction in the number of exotic grasses and exotic herbs (Figure 12).

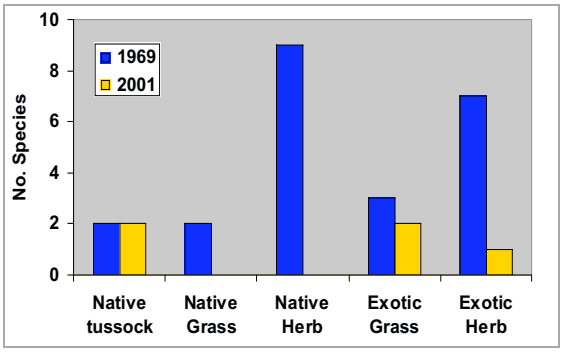

Figure 12: Changes in species diversity

This is the first evidence of elimination of biodiversity by *Hieracium* sp. in New Zealand. It updates some earlier papers that have been published that have shown different trends.

Measurement of an old rabbit-proof holding pen - ungrazed for probably 80 years - near the site of a former musterer's hut at Ben More Station, showed about 25% bare ground and nearly 60% *Hieracium* cover, both inside and outside the pen. Within the pen, *H. praealtum* dominated but, outside the pen, only *H. pilosella* was found.

Why isn't *H. pilosella* present in the exclosure? Any possible animal nutrient effects from the very small numbers of animals that were there in the 1880's will long since have gone; I leave the question hanging. Although I haven't got the statistics, species diversity appeared to be much

higher on the grazed land outside the pen - almost certainly a management effect. I might add that the plot at Benmore is identical to what's in another 90-year high country exclosure plot. So, grazing may not necessarily be bad for maintaining species biodiversity in modified short tussock grasses.

In 2001, I was awarded a Stapledon Fellowship to study at the Institute for Environmental Grassland Research in the United Kingdom, so I used the opportunity to investigate the question that underlay the Ben More plot, using a sand culture experiment with exudates from *H. pilosella* to try to understand why one species of *Hieracium* could so completely exclude another. Allellopathy had not yet been demonstrated in *Hieracium* but, on the basis of this experiment, I think it has now.

Coming back to the big debate about *Hieracium*: does it simply occupy degraded land or, as David Scott suggests, does it have superb competitive abilities which explain its success? We know that it is highly efficient at competing for nutrients and soil moisture. We know it lowers the soil ph beneath it to a level where solid aluminium becomes soluble. We know it is highly tolerant to soil acidity. Its characteristics, in terms of its vegetative and seed spread and wide environmental tolerances, add up to it being a supremely effective competitor. The importance of this for land management and how we manage our high country is that we are dealing with an invasive plant that has not yet reached its full expansion. If these facts are correct and if the results from those plots can be extrapolated, even in part, throughout the high country, it suggests that our biodiversity is under enormous threat. Today, the only control measures for land that can't be treated agriculturally are biological controls. They are new and their effectiveness is unproven.

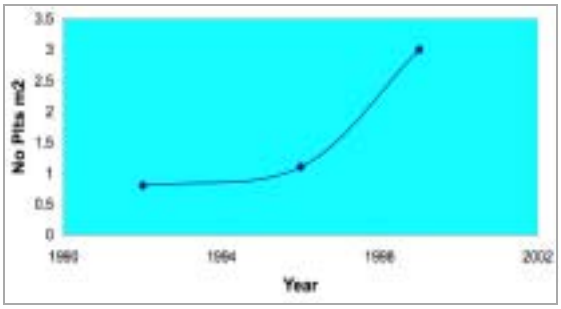

Figure 13: Expansion of *H. lepidulum* in 2 ungrazed Canterbury plots

H. lepidulum is characteristic of the tall upright-growing Hawkweed species. It is so different from *H. pilosella* that it has been classified in a different genus by some taxonomists. It doesn't spread by stolons and only reproduces by seed. Figure 13 shows the expansion of *H. lepidulum* at two ungrazed plots in Canterbury – a similar pattern to *H. pilosella*. The other thing that will influence landscapes is tenure review. Other people have covered that so I'll only touch on this topic very briefly. But, of the 2.2 million hectares in tenure review, about 50% of formerly grazed grasslands may end up in conservation parks: how should these grasses be managed?

One of the interesting things about grazing is that sheep like *Hieracium* flower heads and we now know that seed spread in wet years from all species of *Hieracium*, the flat and the tall, is a significant mechanism by which they invade.

Exclosure studies at Flock Hill from 1978 to 1999 show that, with grazing, cover of the flat *H. pilosella* increased to a level of about three times that of the ungrazed plots. Where it was ungrazed, it faced more competition and its rate of increase was far slower. The reverse applied to the upright species *H. praealtum* and *H. lepidulum*, which increased rapidly when protected from grazing and increased only very slowly under grazing; grazing is a possible management tool for *H. lepidulum*. It is a balancing act for *Hieracium* and it is not easy – grazing will increase the *H. pilosella* but lax grazing will increase the tall hawkweeds.

Conclusions

- Hieracium pilosella and pines out-compete other plants in grazed environments. I think they're the greatest biological threats to New Zealand's indigenous grassland biodiversity. Tall Hieracium species will invade ungrazed tall tussock grasslands. I think the reason they're not more prevalent is simply that they haven't got there.
- Strategic grazing is an important tool for limiting the upright Hieracium species and could possible assist in managing conservation values. I acknowledge that this is a difficult issue and it's a catch-22 - if you graze you damage, if you don't graze you damage. Grazing will not affect the flat species once established.
- For conservation land, and also for pastoral land, active management will be needed to maintain the landscape for both conservation and pastoral values in montane grasslands.

SOME IMPRESSIONS OF HIGH COUNTRY LANDSCAPES 1950 – 2005

Brian Molloy - High Country Representative, QEII National Trust; Research Associate, Landcare Research

Introduction

Exactly one month ago, my family and I celebrated my 75th birthday. Looking back, I reckon I have spent the last 55 of those years, off and on, amongst high country landscapes from Marlborough to Southland. My introduction to the high country began in the summer of 1949-50 when, as a student of Massey College, I worked on Mt Nicholas Station just across the lake from this venue. It was a time when the rabbit reigned supreme, and the high country landscapes that I travelled through and encountered on Mt Nicholas were devastated from low to mid altitudes by rabbits in excess. It was a time too when my passionate interest in the high country was aroused and remains to this day.

Shortly afterwards, I shifted permanently to Christchurch to continue my university studies while working for the Research Division of the Department of Agriculture. My MSc thesis on high country vegetation and soils was carried out on the Torlesse Range, Canterbury, now part of the new Korowai/Torlesse Tussocklands Park, which I supported. This work and companion studies in other parts of eastern South Island, were defining moments uncovering for the first time the history of high country vegetation, soils and erosion cycles. Following this, I completed my PhD thesis on the ecology of sweet brier, an exotic woody shrub which had sprung into prominence in our eastern tussocklands after the dramatic demise of the rabbit in the early 1950s. This study took me to most parts of the high country and broadened my experience and appreciation of the two floras of New Zealand; the native or indigenous, and the exotic or naturalised.

Along the way I was involved in several projects within the Department's tussock grasslands research programme, including burning surveys, soil sequence studies, grazing management, and oversowing and topdressing field experiments. This was a time when the aerial application of seed and fertiliser was becoming widely practiced, and oversowing and topdressing tussocklands was claimed to be the cheapest form of land development in New Zealand. In 1970 I transferred to Botany Division, DSIR (later Landcare Research) to focus more on native plants, including threatened species, with emphasis on their taxonomy, ecology, and management. This move also enabled me to continue my involvement in the promotion of protected natural areas and their management, especially in the high country. This was a time when emphasis on nature conservation was gathering momentum, beginning with the Protected Natural Areas Programme, which I helped to develop, and later assisted as a map co-ordinator and scientific advisor.

Since my retirement from Landcare Research in 1995, I have spent a good deal of my time as an independent consultant helping landholders and local authorities with RMA issues at District Council and Environmental Court hearings. And, like some of you in this audience, I have spent time in the past on a Catchment Board, a lands settlement committee, parks and reserves boards, and numerous other advisory bodies. I have also had the privilege of serving on the board of directors of the QEII National Trust, which I currently represent in the South Island high country. I trust this brief summary of my life and times in the high country will help you to understand where I am coming from in the rest of my presentation.

Some Impressions of High Country Landscapes

I now wish to share with you some impressions I have gained as an ecologist and botanist during my working life in the pastoral high country, bearing in mind the objectives of this forum. Our high country landscapes are extraordinarily diverse and defy adequate description. This is highlighted for me every time I put together a proposal for a new QEII covenant in the high country, or inspect and monitor existing ones. While the physical attributes such as landforms, rocks, soils, and climates have been fashioned essentially by nature, the present vegetation over large areas of the high country up to and beyond the climatic tree limit is anything but natural.

Vegetation History

We now know that the Polynesian settlers in particular, and the European setters who followed, brought about significant changes in the distribution of vegetation and plant species in the high country over the last 800-1,000 years. We know the broad facts, but the details in certain areas still need to be fleshed out.

In brief, the main trends in Polynesian times were the destruction of forest and other woody vegetation, the massed migration of native plants across the landscape, the expansion of tussocklands to a level unprecedented in our history, and significant faunal extinctions.

In European times the main trends have been the modification of post-Polynesian secondary native vegetation, and the introduction and spread of exotic plants and animals. At present, the vegetation of the pastoral high country is a mix of modified primary alpine vegetation and forest remnants, modified secondary forest, scrub and tussockland, improved and unimproved grasslands, and a range of plant communities that have crossed several thresholds and are best described as tertiary vegetation. Overall, this vegetation is dynamic and constantly changing to a greater or lesser extent, and is floristically diverse. Thus, the high country landscape we view today is an outstanding example of our bi-cultural heritage with as much claim to be respected and sustained as, for example, the goldfields and rail trails of Otago.

Soil History

High country soils too have undergone significant changes as a result of cultural destruction and modification of the natural vegetation. Most are now polygenetic in origin, of varied fertility, with or without the added complication of surface erosion, and composite soil profiles are not infrequent.

Of special interest, at least to me, is the strong influence of rock types in determining soil fertility, particularly natural phosphate levels, which in turn influence the kind of native and exotic plants I see in the high country. I have used this relationship repeatedly to account for the distribution of vegetation in general, and threatened species and their habitats in particular. In my view, the soil factor is a key element of high country landscapes and deserves more attention that it currently attracts.

The Native Flora

How have the native plants fared through this bi-cultural upheaval? Not badly in my opinion. After forest clearance, many of them achieved an unprecedented level of abundance and geographic distribution, although some may now be in various stages of decline or contraction, especially those found at lower altitudes.

Importantly, I am not aware of any native plant species confined to the high country that has become extinct during the European cultural period, including the small number of species currently classified nationally as Acutely Threatened (129).

In fact we are still describing new species found only in the high country. For example, I have just described with a colleague two new native grass species; one from the margin of kettle-holes, the other from subalpine grassland; both now protected by QEII covenants under continued pastoral use. And in a recent destocked QEII covenant in the Upper Clutha Valley I have only just discovered another new grass and a new shrub (heavily browsed by hares); both native species yet to be described. I know of several others awaiting formal description. This suggests to me that the native flora of the high country is not under siege. On the contrary, most native plants in this environment are surprisingly resilient given their low competitive ability and wide ecological amplitude, and the ecological poverty of the flora.

The native flora of New Zealand is not rich – 1,896 species at the last official count in the year 2000. This figure will increase as more new species are described, but not substantially. Perhaps the most spectacular example of the resilience of native plants is the recent expansion of grey scrub across high country landscapes generally. In part this expansion reflects the relatively high nutrient levels of preferred scrub habitats, and in part a response to aerial topdressing with artificial fertiliser. Dense patches and bands of the matagouri on the landscape are examples of the latter.

The Exotic Flora

Naturalised exotic plants on the other hand, which totalled 2,108 species in New Zealand in the year 2000, now exceed the number of native plants and continue to increase, principally by new introductions to the country. The expanding frontier of aggressive and highly competitive exotics has exposed serious deficiencies in the competitive ability of native plants, whether in disturbed or undisturbed vegetation up to and in places beyond the climatic tree limit.

Put simply, there are no native equivalents of willows, gorse, broom, and lupins in our riverbeds and adjoining terraces; gorse, broom, hawthorn, elderberry, sweet brier, thyme, and wilding conifers on our hillsides, and the widespread hawkweeds and exotic grasses. Hawkweeds and exotic grasses in particular have shown a remarkable rise to prominence in recent years posing an ever-increasing threat to

conservation values, especially with the complete withdrawal of grazing animals.

The New Flora

High country landscapes now have a new flora, which is an unstable mix of native and exotic species. It is still evolving as the exotic frontier continues to extend up valley and upslope. If the climate changes and becomes warmer and wetter, as some people predict, further migration of exotic plants will continue and may even accelerate.

While we have an obligation to safeguard our highly endemic native flora, our attitude towards exotic plants needs to change and become more realistic and accommodating. Despite attempts to control them, exotic species are now well established in the high country and are here to stay. Furthermore, the possibility of new introductions cannot be dismissed entirely.

I have suggested at a similar gathering to this one that we should acknowledge the virtues of exotic plants and the contribution some of them make to biodiversity and the protection and enhancement of our native flora, especially in semi-natural and modified areas. In Central Otago, for example, the QEII Trust has put in place two landscape covenants; one dominated by wild thyme, the other by my old friend sweet brier. In both cases remnants of Otago's small but distinctive semi–arid native flora are protected and sustained by these exotics.

In two other examples in this region we have placed QEII covenants over valuable species collections of exotic trees and shrubs, which protect and sustain an even greater range of the semi-arid native flora of Otago, including a naturally occurring and Nationally Endangered species.

Landscape Management

I believe the management of high country vegetation is essential for its future well being, irrespective of land tenure. The question is how can this be achieved.

Recently, I had the privilege of assisting a Hawkes Bay hill country farming trust with their future management plans. Central to this exercise was an excellent document covering the natural resources of the property and guidelines for their management, prepared by the Hawkes Bay Regional Council. What a refreshing document; a modern version of the high country run plans of yester-year, where every conceivable element, including nature conservation, was factored in for consideration and guidance. Perhaps this avenue could be revived and pursued by Regional and District Councils with respect to high country landscapes. Speaking for the QEII Trust, we would be very happy to work alongside councils and landholders should this happen.

Incompatibility of Rabbits

Before concluding, a word or two about rabbits as I still have vivid memories of them from my days on Mt Nicholas. I remember well spending about two weeks flying over Nicholas with the well-known World War 2 pilot 'Popeye' Lucas spreading foul-smelling phosphorised pollard to good effect. I have revisited Nicholas several times since then, the last time at the beginning of this year to inspect a QEII covenant covering the Mt Nicholas Lagoon, a valuable wildlife habitat. Not one rabbit to be seen, and a vegetative cover of mixed native and exotic species I would not have thought possible in 1949-50. This example, together with many other sites I have made repeated visits to, convince me that the removal of the rabbit was the single most important factor in the rehabilitation of former rabbit-infested land. To me the message is perfectly clear.

Concluding Remarks

In concluding, I would like to repeat the statement made by my esteemed friend and colleague Kevin O'Connor: 'Landscape management is not the monopoly of scientists or a professional elite. It is a human activity that has been participated in by practical men and women whose knowledge and experience we should be openly seeking not ignoring'.

In my experience, and that of my QEII Trust colleagues, landholders, be second or third generation, or new owners from within New Zealand, or from abroad, are committed guardians and on-site managers with a strong affinity, indeed a spiritual attachment to the land.

We of the QEII Trust regard our covenantors, the people of the land, as the lifeblood of the Trust family, and we work alongside them in an enduring partnership to the benefit of the land, its flora and fauna, heritage values, and its landscapes.

SUSTAINING ICON LANDSCAPES IN NZ: A LABYRINTH OF DESIRES

Dr Morgan Williams – Parliamentary Commissioner for the Environment

Today I would like to start by sharing with you how the PCE team and I think about sustainability matters – in this case, in the context of applying our thinking to the management of peri-urban and rural lands in New Zealand.

How do we approach an issue such as the one we are all focusing on today; how do we put it into context and shape our thinking? We start with us - communities, businesses, and organisations. It's all about people, and their relationships with landscape; people with great passion for what they're doing, where they're living, how they're extracting a living from and managing the land. People and passion are inevitably ingredients of power and influence. It's about the power of a community to think about, build on, and learn to manage a very complex system. It's also about power in terms of who is controlling the direction of thinking, action, planning and investment. In reality, there are many power relationships in any set of human relationships; whether a family, business, community or nation.

However, when there is great passion surrounding an issue, new thinking emerges and changes are needed in how we do things. Tensions will arise in a community about the thinking and needed action. We need to be pretty honest about these tensions and challenges when we're trying to get a desired outcome for landscapes or any other resource matters. It's no surprise that many of the tensions build up around our individual and collective aspirations to accumulate wealth. I want to focus on this important driver and shaper of landscape-based businesses because it has become central to how many of us create and accumulate wealth.

Underlying all these elements is the 21st century imperative of 'sustainability'; the need to maintain into a distant future our natural capitals, which include the things we call landscape values. Sustaining natural capital in turn depends on maintenance of our social, cultural and economic capitals; the societal platforms on which we craft our relationship with our habitats – the landscapes, the ecosystems we live in and depend on.

One, if not the most important, 'sea change' we must make is to shift our thinking from the 'mitigation-of-effects' model that has dominated thinking across the western world for the last 50 years. Instead, we must approach most of what we do from a sustainability perspective. Put simply, we need to move from a model where we simply clean up the messes we make in meeting society's needs and wants, and design systems in ways that don't make a mess in the first place. Such systems will be more efficient in their use of resources, and more efficient in terms of the demands they make on our 'receiving environment' - in other words, how we dump our wastes. Despite the RMA's 'sustainable management' focus, it remains primarily a mitigation model. The movement from a mitigation model to a sustainability model in New Zealand has to be an extremely positive one with enormous scope for innovation.

When discussing sustainability it is important to be clear about what we are sustaining because this pursuit has many dimensions - even though the ultimate sustainability 'bottom lines' are in the health of our natural world; our biodiversity, fresh waters, oceans and atmospheres. So, for me, sustainability includes:

- Natural capital – fresh waters, clean air, biodiversity, soils, seas …
- Landscape and cultural heritage – space and place
- Liveability – human habitat quality
- Wealth creation capacity
- Democratic capabilities
- Social capital

While we are trying to sustain or maintain all those things, clearly underpinning them is our 'natural capital'. And that is how we should think about it – as a 'capital stock'. This may help us focus on using the interest from natural capital rather than the capital stock itself.

So, why should we pursue sustainability? Ultimately, it is critical to the maintenance of our quality of life and that, according to the 2004 Growth and Innovation Advisory Board survey[1], is what New Zealanders value most. We ranked quality of life, environment, and education as

[1] Growth and Innovation Advisory Board, April 2004. *Research on Growth and Innovation*. Wellington: GIAB.

our top three priorities, well above most economic and employment matters.

The PCE has completed two landscape studies relevant to the focus of this conference. The first was in 2001 – *Managing Change In Paradise*[2] - which was prompted by concerns about subdivision in the Waitakere Ranges. It consisted of six case studies that looked at the pressures of peri-urban development, and included the Wakatipu Basin, Queenstown; Waiheke Island, Auckland City; the Waitakere Ranges, Waitakere City; Long Bay-Okura, North Shore City; Banks Peninsula, Canterbury; and the Pauatahanui Inlet, Porirua City. All had the common element of subdivision activity in landscapes that were cherished by local and more distant communities. As housing subdivision and other activities intensified, people increasingly felt that the values that attracted them in the first place were being eroded. While doing this study, we also looked at what was happening internationally and how communities and governments responded.

This resulted in a separate desktop study - *Superb or suburb? International case studies in management of icon landscapes*[3]. It examined how the communities of the Peak District in central England; Oak Ridges Moraine, Ontario; and Cape Peninsula in South Africa had been managing landscapes since the Second World War. We examined management and policies in these three very different cultures and places because communities worldwide are battling with how to 'people' (i.e. occupy) unique landscapes without degrading cherished features. Of the three studies, the most interesting is Oak Ridges Moraine because their legislative model was very similar to the RMA; it was a 'mitigation-of-effects' model. They found this was not sustaining many widely-valued aspects which led, via major community input, to new legislation that is more prescriptive.

Through a very robust process, the community has defined more precisely what they are trying to sustain in their landscapes. New legislation and institutional arrangements now ensure these values will be maintained long-term.

Not surprisingly, what all our studies reveal is that many very complex 'drivers' or 'shapers' are generating challenges for communities and councils trying to sustain desired landscapes.

These include:

- How the lure of landscapes and seascapes is increasing land prices.
- The perceived threats to property rights in any use restrictions.
- Current planning controls failing to provide certainty of outcome for communities.
- Strong ideological differences about land use controls.
- And, as detailed in Managing Change in Paradise, short electoral cycles making it difficult to maintain consistent political positions – and therefore policies - on landscape values.

We looked in depth at our current planning controls, and they don't provide a lot of certainty. We have very strong ideological differences in how we manage landscapes, particularly in relationship to ownership. In the Peak District National Park, the land is all privately owned; a totally accepted framework developed in the late 1940s. Here, we are predominantly locked into a model of protecting land by holding it as part of the Crown-owned estate. That is frequently not the model in other parts of the world. Our biggest challenges to maintaining our landscape values now lie on private lands. Clearly, these challenges will not be resolved by simply including the landscapes in the Crown estate. New mechanisms on private lands are required, particularly in areas where the demand for lifestyle living is intense.

So, in summary, what are my conclusions about our capacity to sustain desired landscape qualities in New Zealand?

- Are we losing qualities? Yes.
- Do we want to dramatically slow this? Yes. I believe we do.

One finding from our interviews with developers, land agents and long-standing residents in the Waitakere Ranges was that they all valued very similar attributes of the region – and that everybody was unhappy these cherished features were being slowly lost. I characterised it as 'death by a thousand cuts', a term that resonated with many.

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[2] PCE 2001. *Managing change in paradise: Sustainable development in peri-urban areas*. Wellington: PCE. http://www.pce.govt.nz/reports/allreports/1_877274_00_3.shtml

[3] PCE 2003. Superb or suburb? International case studies in management of icon landscapes. Wellington: PCE. http://www.pce.govt.nz/reports/allreports/1_877274_07_0.shtml

- Do our current legislation and policies, as used and implemented, sustain the landscape qualities many people cherish? No.
- Are we clear about the major drivers of land use changes and thus the loss of the landscape attributes many New Zealanders value? I don't think we are.

A common planning trend in many parts of the world is to intensify development around nodes such as existing villages or towns, and to markedly restrict green-fields developments. In contrast, in the Waitakere Ranges, development has been nibbling away at the core values (the 'death by 1000 cuts') and this led, in 2005, to the Waitakere Ranges Heritage Area Bill, which aims to provide greater landscape protection.

So far I have not defined 'landscape', but I have been talking essentially in terms of the landforms, textures, and cover characteristics of open pastoral, tussock or forest lands. However, we could include another dimension of 'landscape' in loss equations, and that is the loss of high quality soils to lifestyle blocks. The 6800 new lifestyle blocks developed in 2004 covered 37,600 hectares of mostly high-quality soils[4]. Not only are we losing our open spaces - which often fuel the aquifers that feed our urban and rural water supply systems - but we are also losing the engine room that's generating over 60% of our foreign exchange. Although this expansion of rural living may stimulate the local economy, it potentially reduces our capacity to pay New Zealand's bills through the production and export of high quality foods and fibres and all the associated adding of value. Other countries such as Germany and France are focusing on the same problem. In France, 600 square kilometres of farmland has been subdivided for non-farming uses over the last two years.

Earlier I alluded to what I consider one of the big issues that needs more focus. New Zealand's conservation and landscape protection mechanisms are primarily 'freeze frame'; they aim to preserve historic heritage, a species, open space, an ecosystem, in a limited 'use' framework. But protecting the bits will not sustain the whole! That has a place, but when we are talking about landscapes on a big canvas, we're talking about how we sustain the characteristics of the whole. This is why I believe we have to give much more serious consideration to how we maintain desired landscape values on a large scale on private lands. Over 70% of New Zealand is privately held and, yes, we are protecting increasing areas of special habitats there, but even under the RMA there are no effective mechanisms for protecting landscapes on a big scale.

One 'reality' that became apparent when delving into landscape futures is their cherished attributes will be sustained only if the uses and activities that degrade them are clearly identified and controlled. We must understand the full potential, and limitations, of RMA plans, processes and outcomes in a 2005 context. The RMA is becoming a more mature piece of legislation, but is it enough? If not, what else? The Waitakere City and Rodney District Councils and their communities have concluded additional legislation is required – hence the Waitakere Ranges Heritage Area Bill now being considered by Parliament.

The heart of the challenge is, however, having a full understanding of the deep drivers of landscape change; the things that are shaping land uses, shaping the desire to subdivide, shaping core wealth generation in land and property in New Zealand. New Zealanders believe that real wealth resides in land. We look for wealth from gains in land value, and we price land in the market according to expectations of use potentials or perceived or real scarcity value. We seek wealth in land as a superannuation fund, and we are not constrained by a capital gains tax. About 75% of the increase in dairy farmers' net wealth from 1998 to 2002 was in the capital appreciation of their plant and land. It was much higher than the actual returns from the product flow. In our quest to sustain desired landscapes we must therefore ask:

- Do any policy/legislative proposals to sustain any given landscape retain, enhance or erode its market value?
- If it is perceived that value is eroded, what are the probabilities of political success if uses are to be limited in the absence of compensation?

In summary, to make progress we need to ensure that:

- The value of land, and wealth generation capacity of land use activities, is understood, acknowledged and fairly accommodated.
- There are robust mechanisms to change land uses, when needed, for ecosystem and landscape protection reasons.

[4] MAF December 2004. *A Study of Smallholdings and their Owners.* Wellington: MAF Information Paper No: 53, prepared for MAF Policy by Robert Sanson, Andrew Cook and John Fairweather, and David Lillis.

- We have sufficient institutional capacity to develop appropriate mechanisms, regionally and nationally.
- There are institutions outside government such as trusts that can sustain the long view, provide societal cohesion, and fund initiatives.
- The strengths and weaknesses of current Regional and District Plans are well understood, as well as synergies with the new Local Government Act. Stronger plans and new legislation may be needed.

One thing that PCE studies have revealed is the great variability in local government capacity to resolve within our planning frameworks the issues we're talking about. We are also relatively weak at the central government level in facilitating planning matters that have national commonality. The lack of national policy statements under the RMA is stark. In the British and Canadian case studies discussed above we found much more effort by central UK government and provincial Canadian governments to empower and assist - and the operative word is 'assist' - local communities and local governments to deal with the sort of complexity inherent in large-scale landscape protection.

It was also evident a mechanism was needed to facilitate robust ongoing dialogues between all the 'players' in these complex matters. Such mechanisms seem to be most effective when they are institutions such as trusts or foundations that are outside local or central government. They are basically robust platforms that remain active over long periods – decades or more – sustaining dialogue and facilitating agreed actions.

In the Oak Ridges Moraine, Ontario, the Canadians created a legal entity to underpin the ongoing evolution of landscape protection, research and monitoring. The organisation was in the form of the Oak Ridges Foundation, a not-for-profit trust. The provincial government made a single investment of $15 million to underpin the foundation's work. It has the power to keep the dialogue going, invest in research, facilitate activities and build knowledge. Most importantly, it can maintain the long view independently of what happens in the electoral cycles of either the provincial or local governments.

New institutional models are also developing in New Zealand. The Greater Christchurch Urban Development Strategy Forum is an initiative of local government, business groups, universities, Ngai Tahu, Transit New Zealand and some central government ministries in the greater Christchurch region. The forum created a platform to develop a strategic approach to the region's development over the next 50 years. To date it has compiled a robust picture of the demography and expectations of the region's citizens. Development scenarios have been presented to a wide cross-section of citizens and a high degree of consensus reached on preferred options. Work on putting into operation the desired scenarios is now underway.

Another example is Banks Peninsula – a group convened by the Mayor of Banks Peninsula District Council and formed out of a common desire to sustain the Peninsula's many unique characteristics. If you reflect on the Canadian and British efforts to sustain the cherished features of Oak Ridges Moraine and the Peaks District, then Banks Peninsula is where we should be making a similar effort in New Zealand. It is important to focus on the things the community values in a place such as Banks Peninsula because some of those things will be sustained only by continuation of some current land uses. For example, the open hilltops and rock outcrops will not continue to be visual features unless we maintain pastoral farming. We won't maintain pastoral farming unless there is some recognition of its value in contributing to the now desired landscape. In part, recognising that value depends on how our planning regime shapes subdivision and overall settlement patterns. Currently, the Peninsula has many discrete settlements and it is vastly better to develop in and around these than spread lifestyle blocks across the farmed landscape. Maybe we need to think about pooling our energies and helping a community, such as the Banks Peninsula, to lead the way in New Zealand.

I'll conclude with a quote from Maurice Strong, a famous Canadian who was a major force in the development of the 1992 Earth Summit. In his 2002 submission to the US Senate and Environment Treaty Committee, he said: '*Most of the changes we must make are in our economic life. The system of taxes, subsidies, regulations and policies through which governments motivate the behaviour of individuals and corporations continues to incent unsustainable behaviours*'. In essence, he was saying that we have to look at how many of our economic instruments cause us to pursue unsustainable behaviours. In our efforts to better sustain New Zealand landscape values, in all their nuances, we too have to look hard at the many economic forces that incent us to cause 'deaths by a thousand cuts'.

A CONSERVATION MANAGEMENT PERSPECTIVE

Jeff Connell - Conservator, Department of Conservation, Otago

I'm going to start with a few preliminary conceptual comments about landscape; what is landscape and what isn't, and some terminology we can use when talking about different kinds of landscapes. I will move on to talk about influences on landscapes. I'd like to talk for a moment about landscape values on Crown pastoral land and I'll wind up with a few recent issues that we will all need to deal with in relation to landscape in the future.

What is landscape

Landscape of course involves considerations of scale: by way of illustration, Sutton Salt Lake (Figure 1) is a scenic feature sitting within the larger landscape which can be seen in the background. The immediate setting for Sutton Salt Lake is the Strath Taieri foothill tor landscape which has some protection in the Dunedin City Plan as rural amenity landscape, and behind on the slopes and crests of the Rock and Pillars is an area of outstanding natural landscape also protected in the District Plan. I make these distinctions to show that landscape is something that is larger in scale than a scenic feature.

Figure 1: Sutton Salt Lake

The 'Sarsen Stones' - quartz conglomerate stones on the eastern slopes of the Ida Valley - are a very interesting geological feature. Geologically unrelated to the surrounding range and basin topography, they probably originated from Canterbury. Landscape is larger and more complex than a geological feature.

Landscape and landform can't be separated; they are always interwoven. The striking Magdalen and Merton Hills of the lower Manuherikia Valley (Figure 2), large enough to be a landscape feature in their own right, illustrate how landscape and landform are interwoven.

Figure 2: Magdalen and Merton Hills

I want to make the point that landscapes and ecosystems are not necessarily the same thing, or rather that healthy ecosystems are not necessary for us to enjoy and appreciate the landscape in which they occur. On the road up to Duffers Saddle near Bannockburn is a sight that is not uncommon in Central Otago; where past land management has caused a monoculture of speargrass - not much use to man or beast. But when you stand back from it, it is still a natural landscape and it is still, in texture, colour and overall appearance, a part of the natural landscape of the area. Ecological health and landscape values are two different things. The other obvious place to make this point with is the Lindis Pass. We see the Lindis in so many calendars and so many coffee table books, but from an ecological health perspective it is not in good condition. The place is pretty much overrun with mouse-ear hawkweed and the tussock grassland is seriously depleted but, notwithstanding that, the Lindis unarguably still has outstanding landscape qualities.

Kinds of landscapes

You can still see landscapes representing original New Zealand (i.e. before humans arrived) in Mount Aspiring National Park and adjoining high country such as the Mount Alta Conservation Area (part of the South West New Zealand Te Wahi Pounamu World Heritage Area).

The Oceana Gold Mine (Figure 3), near Macraes, illustrates the opposite extreme in the range of landscapes that we have in our high country.

Figure 3: Oceana Gold Mine

In some parts of the high country we have historic features on a landscape scale. A good example is the Blue Lake at St Bathans together with its associated complex of water races, dams and tail races (Figure 4). We can better enjoy and appreciate and learn from that place when we can see how those elements in the landscape all once connected to each other.

Figure 4: Blue Lake at St Bathans

The point was made yesterday that we accept, appreciate and even enjoy the historic gold mining sites that are scattered through Otago. Some might ask if we can accept and enjoy historic gold mining sites, might not some future generation accept and enjoy the legacy of contemporary mining?

There is a difference, however. Modern technology and modern approaches mean that landscape change as a result of mining can happen on a vastly greater scale than was possible during the historic mining period and, in the case of Oceana Gold, with a vastly greater accumulation of deleterious materials. There are one or two toxic places among the historic reserves in Otago. Oceana recently helped us to clean one up and it took only two scoops of their digger. You couldn't do that with their big settling pond, which is now with us forever. My message is that, because we have bigger machines and bigger technology, what we do now can cause permanent and larger scale landscape change than anything the early miners ever dreamed of. We can't therefore assume that future generations will thank us for it.

It is useful to distinguish natural landscapes from working landscapes. A working landscape is one in which the native plants have effectively been displaced and an exotic managed plant community has been established and is being maintained for primary production or forestry purposes.

In the working landscapes and in our historic landscapes we have exotic trees and I certainly relish and welcome the colour and vibrancy they bring to those landscapes. I think that, in working landscapes and historic landscapes, deciduous exotic trees and exotic plants have a positive aesthetic role to play, that is if they're being managed and are not running rampant.

Natural landscapes are, however, the Department of Conservation's main interest. Natural landscape, in the high country anyway, is where native plants predominate. Te Papanui Conservation Park, on the Lammermoor Range, protects one of the best intact expanses of rolling tall tussock grassland in Otago, a landscape with a distinctive landform, colour and texture, appearing velvet in low sun angles. It is an uplifting place, there for the public to access and enjoy and, as Alan Mark has said, very good for water yield. Tall tussock grassland has been shown conclusively to be superior in terms of water yield, to exotic plantation forest and, particularly during summer low flows, it has superior yield compared to pasture.

The Upper Manuherikia Valley above Falls Dam is, in my view, another outstanding landscape, but it has no protection. This is a place which is underlain by a large lignite deposit. If one day some future generation is scraping the bottom of the barrel for fossil fuels, they might to decide to mine it.

Landscape influences

I want to run quickly through some of the other things that shape the high country landscape as we understand it. Obviously nature has a major part to play but it is the human influences I want to concentrate on. Fire begins a process of landscape change, but in the high country grasslands, which are to some extent able to survive infrequent fire, it is what is done after

the fire that can precipitate landscape change, rather than the fire itself. Stocking the area too soon can kill the remaining indigenous plants. Oversowing and topdressing can mean they are out-competed.

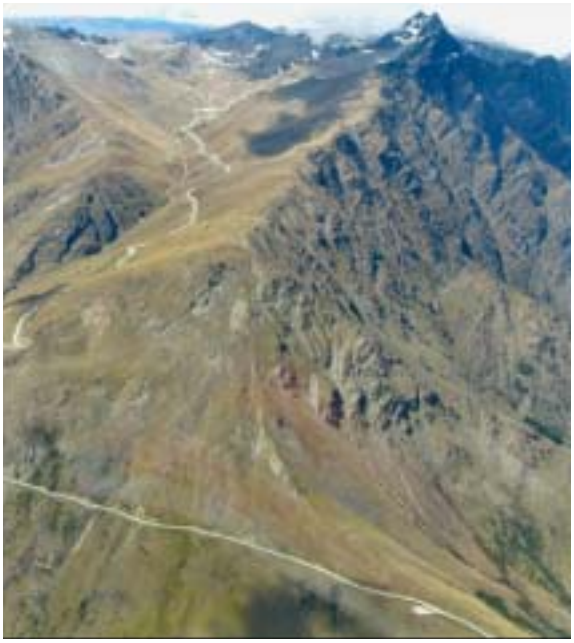

Figure 5: The Remarkables Ski Field access road

Adverse influences on vulnerable high country natural landscapes include roading. How many times have we seen the bulldozer driver make one cut then have to go back and do another one, compounding the adverse affects? When the Environmental Impact Assessment Report for the Remarkables Ski Field area was first published, the access road was predicted to be a 'pencil thin line' running across the landscape.

Against the vast backdrop of the Remarkables you might be able to argue that technically it is indeed pencil thin, but the eye is drawn inexorably to it (Figure 5). This particular road is maintained by the ski field company. It is on conservation land and the agreement we have with the ski field company is, not only will they maintain the road to keep it open so people can go freely up and down, but they will stabilise the uphill and downhill batters. As the uphill and downhill batters become progressively stabilised, the landscape impact of this road, particularly when viewed from the valley floor below, will become less. The environmental impact of this road is, in my opinion, much less than the impact of the road to the Cardrona Ski Field.

Forestry planting can not only replace indigenous ecosystems with something that has a completely different aesthetic character, but the formal shape of forestry plantings can introduce a new, some would say, discordant element into the landscape if the planting isn't particularly well designed. Wilding conifers are a significant actual and potential agent of landscape change in the high country and they also have a significant adverse effect on water yield.

Fences in the landscape contribute to landscape change because differential management on each side of a fence creates a straight line that can be seen for long distances (Figure 6). This kind of straight-line artificiality begins and accelerates the change from natural landscape to working landscape. Irresponsible four-wheel drive use can also have significant adverse effects on the landscape which persist for many years, especially in vulnerable high altitude environments such as the Old Man Range/Kopuwai. Even rows of wrapped baleage can introduce a discordant element into a natural landscape.

Crown pastoral lands

The lands of the Crown that are occupied for pastoral purposes by runholders are a significant component of the high country and it is important for us to be clear about how landscape values are managed by the Crown on that land. Pastoral lands are administered by Land Information New Zealand (LINZ). Holders have to get LINZ consent for the sorts of things that cause landscape change, such as burning, spraying herbicide onto indigenous shrublands, tracking and cultivation.

Figure 6: Fenceline effects

Under the Crown Pastoral Land Act 1998, LINZ looks at criteria relating to the protection of the inherent values (which can include landscape values) and making it easier to farm the land. The Act doesn't tell LINZ which one is most important; it's got to make a decision on a case-by-case basis. DOC's role is to give LINZ

advice and they don't always make a decision which is consistent with our advice.

In the tenure review process under the Crown Pastoral Lands Act, some attention must be paid to landscape values. But landscape isn't the only value and, where DOC advises LINZ in tenure review, we address biodiversity, historic, recreation, ecosystem services and landscape on any given property. It is usually difficult to achieve a result that protects everything. Ministers have explicitly acknowledged that not all significant inherent values will be protected and in any given deal there is no guarantee that landscape will be the winner. LINZ is the decision maker, DOC is the adviser. The kind of advice we give LINZ includes the basic policy position that, if a landscape value alone needs to be protected (with no requirement or expectation for public access or for active conservation management), then it may well be appropriate to protect the landscape value by covenant.

Some people have observed that, because tenure review can result in areas being returned to full Crown ownership and no longer grazed as part of the lease, an outcome of tenure review is to increase development pressure on the freehold part of the property. As a generalisation, this may appear to appeal to common sense. My observation around the high country generally is that only in a few cases has tenure review actually caused or resulted in development on the freehold lands that wasn't going to happen anyway. In more cases it has made development happen a bit faster. If indeed a tenure review does result in change of land use on the freehold lands or an acceleration of the conversion of natural landscape on the freehold lands to working landscape, then there has been an adverse landscape effect from that component of the tenure review. But the converse may also be true - that there has been a positive effect on landscape conservation in that some parts of the property have been explicitly designated for conservation. Tenure review has produced some positive landscape outcomes. For example, Te Papanui Conservation Park, which was largely formed as a result of a number of tenure review negotiations, has protected an entire landscape of rolling tussock grassland and has opened it up for public enjoyment. Much more of the Lindis Pass is now protected. There are many other examples.

There is, however, a tension, between tenure review and RMA advocacy processes. If DOC advises LINZ in a tenure review and the Crown makes a tenure review agreement with the holder, should DOC then try and achieve through the District Plan what it failed to achieve in the tenure review? DOC has decided not to advocate for protection of a site in District Plans if it has already gone through a review.

Tenure review is less effective at delivering landscape outcomes on valley floors and at lower altitudes. There are places in the high country where there are intact, natural landscapes from valley floor to skyline for which tenure review is not actually the best tool for protection. One possible approach for achieving landscape protection from the valley floor to the skyline is through whole property purchase by the Crown. However, the Crown is only going to do this in a handful of cases and it is not realistic for communities to expect the Crown to address landscape issues in this way on a district wide basis.

In summary, processes under the Crown Pastoral Lands Act do not guarantee good landscape outcomes. Much of the high country is a mix of freehold and Crown pastoral lands. Only RMA processes can address landscape values across the different tenures. It is primarily the communities themselves that will need to determine whether and how this is done.

DOC's internal landscape policy

Until recently, we didn't actually have a policy on landscape. We've now got a general policy that says '*Conservation management strategies and plans should identify landscapes, landforms, and geological features of international, national, or regional significance or of significance to tangata whenua.'… 'Activities which reduce the intrinsic values of landscape, landform and geological features on public conservation lands and waters should be located and managed so that their adverse effects are avoided or otherwise minimised.'* So we will engage with communities in the process of developing our conservation management strategies in identifying these significant landscapes. When it comes to landscape management on conservation land, our policy is to avoid or minimise the adverse landscape effects of management activities, as you would expect. For example, the recently built predator proof fence around Grand and Otago skink habitat, near MacRaes, had to go where it is, we had no choice, so we carefully chose our materials and sited the fence so that any adverse landscape effect would be minimised.

FARMING IN THE WETTER COUNTRY

Guy Mead – Dingleburn Station, Lake Hawea

It is my hope that these two days, following on from the original High Country Science day held in Cromwell two years ago and picking up on the Obelisk Field Day held last autumn, may be the start of a concerted effort to tackle the management of Hieracium lepidulum in our high country landscapes by all interested people.

I'm going to start by asking the question: could our perception be wrong of how we manage the landscape? Keep an open mind. Davida and I, with our family, have farmed Dingleburn for 17 years. Our grandchildren are the fifth generation of this family to have lived on the shores of Lake Hawea. I'm not a botanist or ecologist, I'm a stockman who was taught by my father at an early age to be keenly observant of what is going on in the environment around me. I've watched the devastating advance of *Hieracium* throughout our landscape; the change in the McKenzie Basin from golden tussocks waving in the afternoon breeze to the barren purple of today.

Dingleburn is a dynamic high country station which is in the final stages of completing tenure review. In a snapshot summary of this review: the Department of Conservation takes 16,800ha, we take 7000ha and there's a net loss of 4000 stock units made up of the entire wether flock and summer grazing for ewes. There is a grazing licence in the Hunter River Flats in the head of Timaru Creek, and public access is lavishly accommodated. We're going to take you on a tour of Dingleburn and demonstrate that grazing plays an important role in the containing of *H. lepidulum*. I would like you to remember that 60 – 70% of the area that is going to the Department of Conservation has grazing value as well as significant inherent value. The major significant inherent value is landscape value which, in most cases, can be protected without excluding grazing.

I first noticed *H. lepidulum* in the early 1970's. Ian Sargenson told us that he first noticed it in the Timaru Creek Basin area in the early 1970's. It rapidly increased through the 80's. There are other *Hieracium* species on Dingleburn, but they are in very small amounts. *H. lepidulum* is a major concern for the management of this property. It affects us from the low lake shore to the high basins. After the Obelisk Field Day, Peter Espie and I carried out a survey of the occurrence of *Hieracium* on Dingleburn. We covered the whole property and included the High Burn Valley (which is part of Hunter Valley Station on the western side at the head of the lake). We estimated the cover using a one metre² quadrat placed at random within the landscape in typical grassland situations. We covered three types of management: lightly grazed, undeveloped native grasslands; grazed, undeveloped native and agriculturally developed grasslands; and ungrazed native grasslands (except for being grazed by feral animals). With the advent of deer hunting by helicopters twenty-five years ago, the feral grazing has been very light.

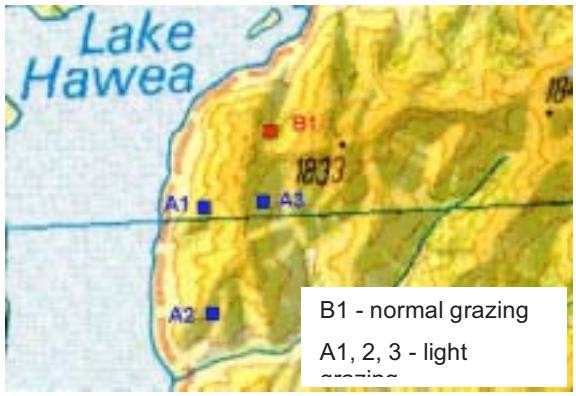

Figure 1: Extensive 7000ha block

The four sites in Figure 1 are part of an extensive 7000ha block which is only managed by the use of natural boundaries. This results in sheep choosing some country in preference to others.

H. lepidulum cover at these sites:

- A1: 70% (sunny aspect);
- A2: 60% (dark aspect);
- A3: 10 – 40% (dark aspect);
- B1: < 1% (sunny aspect)

It is so severe at Site A2 that matagouri and native shrubs are being completely smothered out. Sites A1, A2 and A3 are all lightly grazed. B1 is on a northerly facing sunny aspect - sweet warm country with a good diverse cover of plant species. Sheep love to graze in this area and are very easy to keep within these basins. This is typical of the basins on the sunny side of the ridge. This demonstrates how we can control *H. lepidulum* with grazing. The grasslands here have less than 1% *H. lepidulum*.

Figure 2: Grazed, developed low altitude pasture

The next category of country is sunny, grazed, low altitude developed pasture (405m) beside the lake (Figure 2). It was recently developed from bracken fern, sprayed two years ago, burned and oversown last spring. It has a good underlying cover of clovers. There was 10% *H. lepidulum* left at the end of the last growing season. We would expect by the end of this following grazing and growing season it would have completely disappeared.

Figure 3: Nil grazing

The country in Figure 3 has only been grazed by feral animals. The fan in the foreground goes to full Crown ownership. To our knowledge it has never been burnt or grazed for 35 – 40 years. Typical cover on this fan is tall manuka, matagouri with an underlying cover of bracken fern. When you open up the bracken fern, there is a 15% residual of *H. lepidulum*. There was no *H. lepidulum* present on this site 17 years ago.

Further up valley towards the head of the lake, there are some small patches of *H. lepidulum* establishing on ungrazed inaccessible dark sides. In this situation, the boundary with the Department of Conservation will be 560m on average - below the fern line. The area between 560m and 1000m has the potential to become invaded with *H. lepidulum*. We are concerned and worried that, when grazing ceases in this area within the next 12 months when the Department of Conservation take ownership, *H. lepidulum* will get away. This is a major concern for the wellbeing of our landscapes.

Figure 4: The High Burn Valley - steep, inaccessible and not grazed by domestic stock

We now cross to the High Burn Valley (Figure 4) that joins the Hunter from the west and I'd like to show you why we are so worried.

Figure 5: High Burn Valley dark aspect site at 1050m not grazed by domestic stock - 40% of the cover was dead H. lepidulum

The High Burn is a good example of what may be the eventual outcome of management that excludes grazing from our landscapes. *H. lepidulum* has been highly visible here ever since we came to the Dingle. It is steep, inaccessible and has not been grazed by domestic stock. At the dark aspect site at 1050m measured in this area, 40% of the cover was dead *H. lepidulum* (Figure 5).

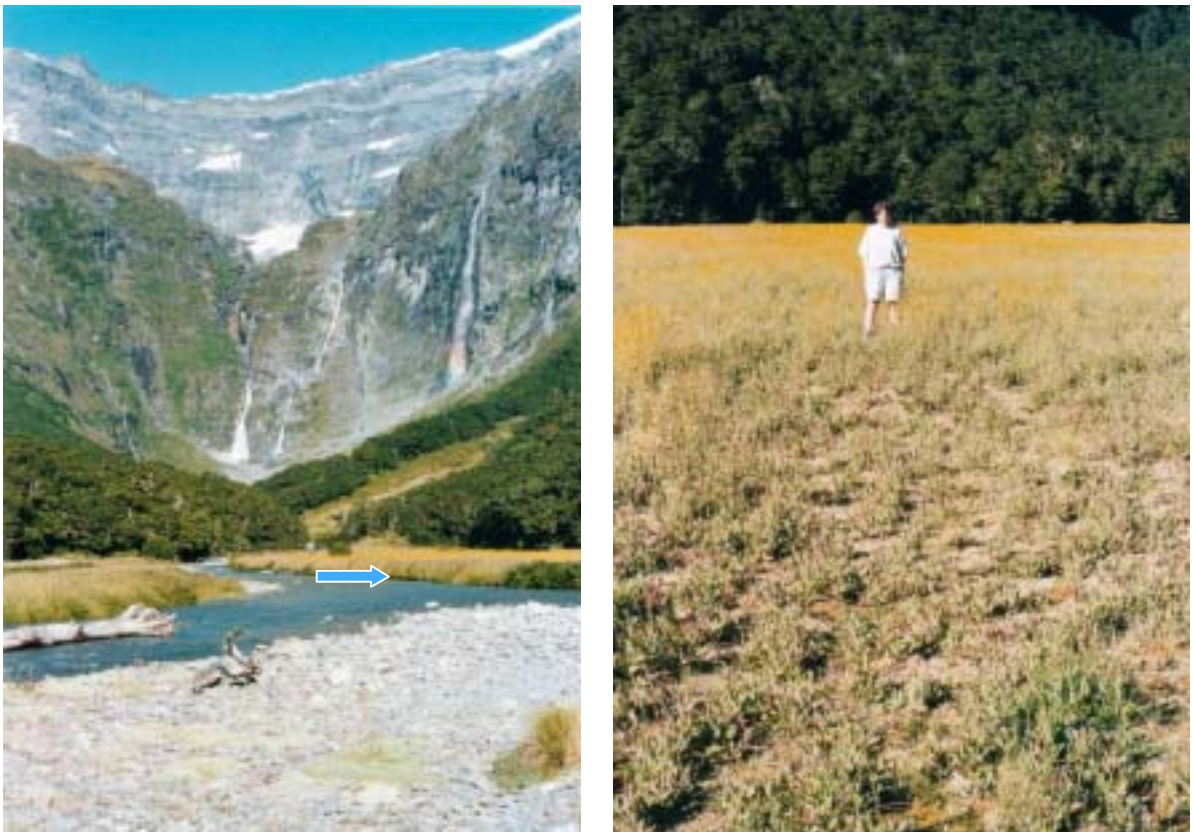

Figure 6: Rob Roy Valley - the arrow in the left hand photo is pointing to the river flat on the right.

In the Rob Roy Valley in the Aspiring National Park (Figures 6 and 7), *H. lepidulum* was not noticeable in the 1960's. It was getting quite bad by the mid 1980's. The arrow in the left hand photo is pointing to the river flat on the right. It is dominated by *H. lepidulum* and *H. praealtum* and bare ground. On the valley shoulder, *H. lepidulum* is rampant within small shrubs (Figure 7).

In summary, our survey found that *H. lepidulum* cover in native or developed grasslands that are effectively grazed was 0 - 10%. In lightly grazed grasslands, which almost certainly include grasslands of almost nil grazing, it is 25 - 70%. In ungrazed and feral grazed grasslands, it is 40 - 100%.

We have a major threat to our landscapes by *H. lepidulum*. There are large areas that are changing from a very diverse plant system to a monoculture of *H. lepidulum* with a high proportion of bare ground. The removal of grazing will be an open invitation to this weed to take over ever increasing areas of our landscape. There is a desperate need for all land managers, people with a genuine interest in our high country, to put our differences on a high shelf and pool our resources for the good of the landscape.

Figure 7: *H. Lepidulum* rampant within small shrubs on the shoulder of the Rob Roy Valley

MANAGING OBELISK, A SEMI-ARID HIGH COUNTRY RUN

Nicky Mead and Burt Elstob – Obelisk Station, Central Otago

Obelisk is a 3000ha property rising from Lake Roxburgh to the top of the Old Man Range. We are very passionate about the high country, not just Obelisk, but all the high country. We feel very privileged to have the opportunity to be the guardians of a piece of high country; a responsibility we both take very seriously. Obelisk Station is more than just a home to us. This is where we spend all of our time. For us, going away for the day isn't necessarily going to the beach or the park, or going into town to the pictures. We may go up to the top block and do some skiing or tobogganing, maybe go hunting for quail or duck, looking for yabbies down at the creek or horse riding on Flat Top. Maybe just box-sliding down Bald Hill. This is where we work, sweat and bleed. This is where we play, learn and grow. This is where we learned to love and be loved. Our property is more than stock units per hectare. It's more than wool weights and calving percentages. It's our life.

We take a holistic approach to our lives and our business: as we look towards the future, we take a long-term view. We think about how the land will look at the end of our time here. We know that many of the decisions we make will have a great effect on how this piece of high country looks in another hundred years or ten years. We deliberately monitor the effects of our decisions every single day we're living here.

We're very concerned about the sustainability of the high country and the land when grazing is taken off. We've been monitoring Obelisk and have data showing that invasive weeds such as *Hieracium* are more prominent in ungrazed country; the same for broom and other less desirable plants. It seems that we then need to use a chemical or poison on these plants when they could have been controlled in a natural way with grazing.

We think that the view that all grazing is all bad overlooks the good that animal impact can do. It helps stop the capping of the soil and promotes a good water and mineral cycle. Science has shown some plants need grazing to flourish and grow. It is the classic soil - plants - animal interaction. There cannot be plants without soil. Soil cannot be maintained without plants. Animals cannot survive without plants. We have now found a diversity of plants cannot survive without properly managed animals.

Our property, like all the high country, needs biodiversity. We have a direct and profound influence with our grazing management. We think that protecting high country biodiversity is also about diverse management techniques. It worries us deeply that huge tracts of land are being retired under one management policy using the tool of rest. By taking animals off it's not biodiversity and it's dangerous. Burt is not a scientist and has no fancy letters behind his name. What he does have is experience in the high country. He has worked with and learnt from about twenty-seven high country run-holders who are professors in their own right. They have shared their own life experiences with him: the culmination of about six hundred and forty years experience (and that's a wealth of knowledge). Within our own family there are four generations of high country farmers. A business and its resource base doesn't last four generations without doing most things right.

There's a huge variation in rainfall both between the years and the altitude. John Miller, a neighbouring farmer, has collected rainfall data for the past 40 years which shows that we average 50mm per month. We can have 150mm in any given month. Also, with altitude, we can have a variation of 350mm to 1000mm. These variations need unique management for the plants and landscapes to survive. These variations are found from paddock to paddock, block to block, catchment to catchment, county to county, province to province and country to country.

We know that any one of our blocks is unique and has an influence not only on Obelisk, but the big picture. We need to realise that there is change and our landscape is always changing. Be it from global warming or a political party, we need to be ready for change and we need to be able to change.

We're monitoring on Obelisk because we want the best information possible to secure our family's future in the high country. We have three different monitoring sites but here we will present only one - using fenced plots that have not been grazed for 45 years - to look at the effect of long-term retirement from grazing. These exclosures range from 910m to 1590m up the Old Man Range/Kopuwai (Figure 1).

We didn't use the top plot to compare grazing as this fence was down due to snow damage. The time since these plots were last burnt ranges from 13 to 65 years.

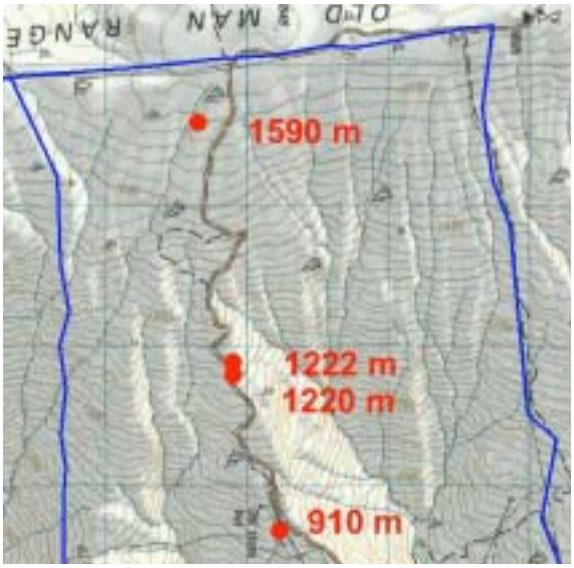

Figure 1: Location of exclosures

In our study we used height frequency transects and quadrats to record the effect on vegetation structure, plant biodiversity and weed invasion in snow tussock grasslands. Thirteen years after burning, there was very little difference between the frequency of the maximum height of the vegetation in the grazed and the ungrazed grasslands, and no difference after forty-four years.

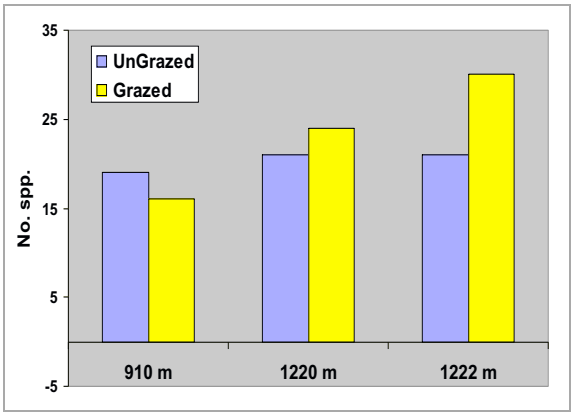

Figure 2: Biodiversity

Under the dense tall tussock at 910m (Figure 2), biodiversity was highest in the grazed grasslands. There were other species present but in such low frequencies that they weren't recorded on our transects. This same pattern holds for native species.

We have three problem weeds at Obelisk, *Hieracium*, wilding pines and broom. We can control the last two but the real threat to the property is *Hieracium*.

The frequency of *H. lepidulum* on the transects is shown in Figure 3 and you don't need a PhD to see it increases where it is not grazed. Because *H. lepidulum* is just beginning to invade these grasslands and the numbers are still quite low, we counted and scored as cover in the entire exclosures and then in a similar area of nearby grazed grasslands. Frosting made these plants difficult to identify at two sites (we are going to repeat the counts in summer) but the trends are exactly the same as with the frequency transects. *H. lepidulum* is unquestionably higher in the ungrazed grasslands.

In conclusion, our monitoring results prove that *H. lepidulum* is a major threat. It smothers nature and it reduces biodiversity. We can see that grazing controls *H. lepidulum*, minimises wilding pines and can enhance biodiversity.

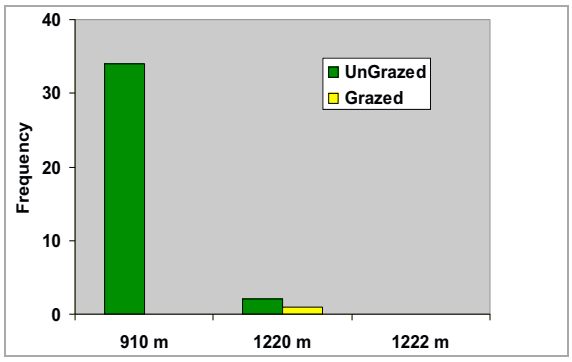

Figure 3: Grazing and *H. lepidulum* occurrence

We are going to leave you with a thought about how high country farmers regard the land. This is a quote from the late Arthur Borrell - *'Why would you steal from your own bank.'*

The old guard is changing and needs to change. It also needs recognition of its hard work in a sometimes hostile environment such as the high country can be. The change in our high country and landscape is happening very fast. There is no room for cheap shots and personal attacks; these are boring and unproductive and will only stand in our way.

We need to step up to the mark and effect the change. We all need to assume we could be wrong and make further change – together.

ALTERNATIVE PROTECTION OF LANDSCAPES AND SIGNIFICANT INHERENT VALUES

Andrew Simpson – Balmoral Station, Mackenzie Country

It is pleasing to see the proactive and positive approach that the Otago Regional Council has taken to organize this seminar. It is proactive because in doing so they recognize that the current system is not working and they are searching, through this seminar, for a pathway to achieve better outcomes.

If we're really serious about conservation and our landscapes, then we firstly need to recognise there is a problem and secondly recognise where that problem stems from. I propose to spend the time allocated to me in exploring these issues and proposing potential solutions. I would also like to outline how we are dealing with these issues on our own property - Balmoral Station.

The current philosophy is that all landscapes and significant inherent values should be protected. Under the Resource Management Act 1991 (RMA) this means that an area has to be identified on a map, with rules then applying to these areas. These rules, depending on how they are interpreted and enforced, can be very restrictive and may result in areas being removed from the property entirely (as is happening in the tenure review process at present) thus impinging on the viability of the property.

This in turn means identification of significant inherent values on a property becomes an impediment and a liability to your business. It is quite ironic that those embracing and protecting their conservation values are those that are most likely to be put under pressure to relinquish them. This clearly does not promote good conservation practices.

I believe that this should be turned on its head and the complete reverse should apply, and that landscapes and significant inherent values should be seen as an asset and therefore be valued by those that manage these lands. Making more rules will not secure conservation, biodiversity or landscape values. If we continue with this approach, we will continue to alienate people who manage these lands from these conservation values. Whilst this philosophy remains, biodiversity and conservation values will continue to be threatened. How do we achieve such a philosophical shift? We have to get away from the rules-based prosecution mentality that is currently dominating our government and bureaucratic structures at the moment.

The RMA was originally put in place as an enabling piece of legislation where if you complied with certain standards and mitigated the effects then you should be allowed to do certain things. It was supposed to be pro-active and positive. Unfortunately the way it is being administered at the moment it is very reactive and negative.

The solution, as I see it, is for our regulatory bodies to take on more of a role of facilitation, not legislation. Facilitating and understanding with land managers will create an environment that fosters partnerships and allows for opportunities that need not affect viability or ownership. Simply removing land managers from managing the landscapes and significant inherent values that they've already been managing for the last 150 years will not necessarily protect them. We need to build an understanding of what we are trying to protect and how best to accomplish this. If, on some occasions, the management of the values is going to detrimentally affect the viability of the property, it may be necessary to facilitate and assist with other potential and profitable alternatives that the property has. What needs to happen is for these landscapes and significant inherent values to be recognized as the valuable assets that they are and not seen as a threat to your business.

Putting lines on maps, as we currently have in our District Plans, or shrinking one's property by setting aside and removing areas from production, may in turn have an adverse affect on the remainder of the property or on the landscape that people are trying to protect. To keep the property viable, the land managers may have to intensify the remaining area of the property. This would be the case on our own property, Balmoral Station, which is already a marginal property where to lose any land or potential opportunity would put our business at risk.

Like most land managers, we are very passionate about the biodiversity and the significant inherent values on our property and believe that we are in the best position to

manage them. We propose to manage and secure these values by the formation of a charitable trust known as the Balmoral Biodiversity Benchmarking Trust.

This trust will have full responsibility for the management of the significant inherent values and will also act in an advisory capacity on the buffers surrounding these areas (Figure 1).

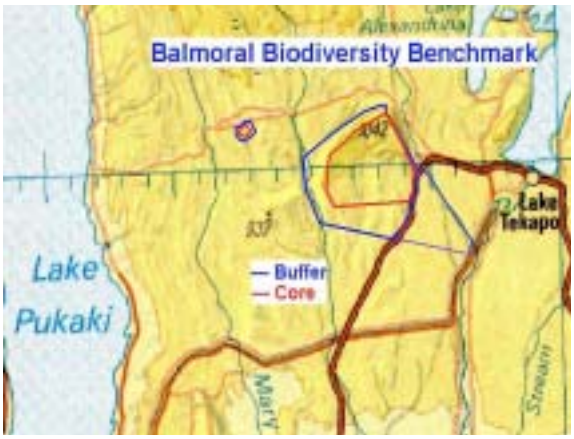

Figure 1: Balmoral Biodiversity Benchmark

These areas in turn will come under the protection of some form of conservation covenant. We would prefer to use the QEII Trust covenant but at the moment have been unsuccessful in convincing the Crown on this matter. The reason we would choose QEII is because it has the best track record in securing conservation values. It also has a philosophy of including land managers in its decisions on the management these areas. The areas on Balmoral have already been approved for protection by QEII, but the minister is refusing to allow these covenants to be registered whilst we're negotiating tenure review.

We see these areas as being a vital part of our business by creating future opportunities in the ecotourism industry, hence expanding our business and the biodiversity of Balmoral. The Crown alleges it needs full Crown ownership and control to secure these landscapes and significant inherent land values, and also to secure public access to these areas. We believe that uncontrolled access may threaten the very things that we are trying to protect.

Balmoral is situated between Lakes Pukaki and Tekapo. We are very fortunate to have the Forest Research Institute conducting research and monitoring in a trial area on the property (Figure 2). In our soil enhancement trial area there are monitors collecting soil, both inside and outside the forestry area, to determine the significance of the soil build up. We are also measuring the soil composition so we have a very accurate record of what was there before we started, and measuring the meteorology and the weather patterns within this area. When we change some landscapes and alter some habitats we actually create others, and the recording and counting of bird species is quite an important part of this trial. Vegetation biodiversity is measured and also the insects, which are captured using malaise traps. We are also recording the establishment of indigenous vegetation and monitoring its growth patterns. There is also research on exotic tree species, agri-forestry, silviculture trials and soil nutrient trials.

We're also fortunate to have, in another location on our property, a DSIR grasslands trial site. Whilst this site has been disabled and not funded by the Crown for a number of years, it has been carried on by David Scott acting in a private capacity.

I'd like to point out that we don't have to have all this science on our property but we choose to have it there and it is a vital part of our decision making for securing sustainability.

Figure 2: Landscape modification

The Balmoral Biodiversity Benchmarking Trust is currently adding to this knowledge by putting in place a management programme which incorporates the following:

- completing a whole property vegetation monitoring survey;
- compiling a historical bibliography for the property;
- fencing the benchmark area from outside influences to ensure its quality as a benchmark against which to measure sustainability.

Figure 3: Valued cultural heritage represented in high country landscapes

The photos in Figure 3 demonstrate the biodiversity in the cultural heritage of these landscapes. They can actually even enhance them. These are the things that we are very proud of on our property.

The advantages of using covenants to protect the significant inherent values in the landscapes are numerous: the production and property viability are not threatened; you have land managers embracing conservation values on their land; you have on-site managers who are actively managing significant inherent values in the landscapes; and there is no management cost to the nation.

If it is so simple, why are we not embracing covenants more often? The reason, I believe, is that significant inherent values are being used in order to secure access and parks and reserves. I also believe that it is not so much about conservation but about power and control and empire building.

In conclusion, the messages that I want you to take away are:

- The real need to identify what we are trying to protect then to put appropriate mechanisms in place to achieve this protection.
- Land managers should be an integral part of the conservation management as we have a long historical connection and are passionate about our biodiversity and conservation values on our properties.
- The need to use partial or whole property covenants to secure and protect significant inherent values and landscapes.
- Passive management that is currently being promoted by the Crown may not secure the significant inherent values or landscapes that they are trying to protect.
- The need to facilitate and communicate, rather than legislate, for positive and lasting outcomes.

LANDSCAPE MANAGEMENT – A REALITY CHECK

Edwin Pitts

I remember as a boy laying a strychnine line on our family farm in the Knobbies Range east of Roxburgh and next day picking up rabbits off the bare land and loading them into bags on the packsaddle to deposit in piles of several hundred not very far apart. The image of that moonscape has remained indelibly in my memory though it was many years ago. I thought for sure I would not have to see this sort of landscape again but there it was 30 years later after driving down through lush improved tussock grassland on Galloway Station - the same moving moonscape before us down the ridges.

A very similar view met me looking over a neighbour's property in the Upper Awatere Valley in Marlborough: was it only ten years ago? The rabbits provided the movement, but the bare grey-green scene was overwhelmingly attributable to *Hieracium pilosella*. I hasten to add that within a very short time the movement disappeared as RCD swept the area and new life was breathed into the landscape, far from the view of government observers. Visitors to the field day on this Middlehurst Station recently would have observed the green pastoral change between the recovering tussocks although the *Hieracium* still lies in wait for an opportunity to rule the roost again. No doubt circumstances will yet conspire to bring that about.

I note that this forum is about high country landscape management but this morning's session is focussed on land management. To me, 'landscape' has a rather distant though holistic feel to it – a scene to which one has become accustomed – whereas 'land' is very much feet on the ground stuff, and this is where I feel at home.

Landscape is the recipient of, and display for, every natural or man-made influence on the land, and nowhere is this more starkly contrasted than in the South Island high country. Land is the natural stuff with a myriad of ecological characteristics that people have, with their often conflicting aspirations, current knowledge and technical ability, sought to change and indeed control to meet their own agendas and objectives. It is because the land is finite, and the landscape is shared by all who see it, and because we all have differing views on what we would like to do with it, in it and on it, that management is an important adjunct to 'ownership' of land. The ecology of some environments such as our mountain and tussock land is less resilient than others, with land use changes having much longer-term effects. So careful management becomes an imperative with ownership.

So what do we mean by land management and why is best-practice land management so important in the high country? Management implies choosing options from those apparently available or creating new options for land use - be they for preservation, conservation, production, recreation or exploitation. Best practice management should consider all these options but work within boundaries learnt from experience and accumulated knowledge to create a natural balance that is sustainable through time. It is this balance that creates so much debate and discussion because, while most people with a genuine interest in our high country land and landscapes agree that this balance must be reached and maintained, there are so many opinions about what it is, depending often on self interest and back-ground. I guess that the objective in this forum is to strive toward that balance by setting aside, for as long as we dare, our self-interest and our background.

Let's face it, these are transitory factors for land alone endures and, unless we displace this land through earth movement or drowning, it is the ecological balance on this land that affects, and is affected by, human activity and endeavour. And yet this balance is constantly altered also by natural changes within our dynamic high country environment.

So we have a moving target to consider managing. We also have changing human expectations and increasing pressures coming to bear on high country land. In the 19th century, our high country was described officially as 'wasteland'; the few pioneers that drove stock into the hills and set up pastoral enterprises hardly warranted consideration by the govern-ment or the general public. These hardy souls had the best part of a century, before public pressure and legislation exerted influence, to accumulate knowledge and to learn from their mistakes how to work with nature in this harsh environment Some did not and both they and the land they occupied suffered degradation but

most ensured that knowledge was passed down through generations. The enduring rule was to balance production and conservation and to work closely with nature, never to abuse.

Then there followed in 1948 the enlightened pastoral lease period where the officers of the Crown quickly learnt to respect this knowledge borne of experience. However this was also accompanied by the soil conservation movement, based on the emotive premise that the mountains were falling into the sea: where as much land as possible was to be retired under hastily assembled Run Plans with incentives to improve pasture and raise stocking levels on the remaining easier land.

In hindsight this policy applied, in many cases, unsustainable pressure on that land while the retired land became a fire risk and a natural base for *Hieracium lepidulum* and *Hieracium caespitosum* and further encouraged the ingress of woody weeds and wilding trees. Unless the improved pastures on grazed land were well maintained, they became and are still becoming increasingly *Hieracium pilosella* based landscapes. I guess I can make these observations objectively, coming from a catchment area that was never brought under control or operated under Run Plans.

The present era of tenure review, with its resulting displacement of run identity and boundaries, and further land use change, is as much a product of social change, increased public pressure, and the need for economic stability and security of tenure, as it is in the interests of the land itself. Are we sure that the direction this is all heading is the best way to sustain the characteristics that we collectively value in the high country, in the landscape and on the land itself?

There are inherent dangers obvious to some of you, unheeded by others, that if there are no common beliefs and passions applied equally to sustain our high country, irrespective of ownership status, through active and prudent management, the scene to which we are accustomed will change irrevocably and not, I believe for the better.

Some years ago I was involved in a publication called ‘Spirit of the High Country: the search for wise land use’. The objective of this publication was to attempt to reduce the polarisation of attitudes towards land use in the high country, and we were pleasantly surprised by the unexpected reception of that objective by most parties. That goodwill extended soon to the advent of Landcare groups involving people with a wide range of skills and common interests on an informal basis who may never before have verbalised their commitment to sustainability in this environment. Communication at this level really works.

That wonderful enabling piece of legislation, the Resource Management Act 1991, which should have provided the ideal forums for establishing wise land and water use, got hijacked by bureaucratic processes to the extent that opportunities for frank discussion without prejudice and cost have all but disappeared. I am not sure in my own mind whether the right environment for land management policy development, that would get buy-in from all parties, can come from regional authorities, yet they are charged with that responsibility

Our precious high country landscape is a magnet drawing so many parties with their own agendas and attitudes into play. It is not right that land use decisions are made purely on perceived fiscal benefits – we are already having to work with the picking of inappropriate winners in the past (e.g. forestry leading to wilding trees, possums for fur) or, in the other extreme, that a total lock up of land occurs without appropriate management plans, as it did with run plan retirements.

Tenure review and the subsequent transfer of large areas of land to the conservation estate should be a cause for celebration as the culmination of a process entered into voluntarily by runholders. Why are there so many expressions of concern, mostly from runholders, about these transfers and indeed reticence about entering or continuing the process?

I believe this arises as a real concern for former pastoral land, however lightly stocked it may have been, moving directly into conservation and without an apparent management regime in place. There appears to be no place for meaningful dialogue between runholders and the Department of Conservation (DOC) about this transition. DOC officers can tend to professionally distance themselves from the former land managers when, if they were prepared to level with these farmers, there is so much to be gained and so many mistakes in ignorance to be avoided. Perhaps the Department lacks personnel who can bridge the communication gap and share the lessons to be learnt, and runholders have become prejudiced because they have not been respected for the

value of their opinions and advice, and have not therefore been prepared to understand where the Department is coming from.

Meanwhile DOC is being pressured by recreationists for unlimited access, concessionaires for increased business, entrepreneurs for all sorts of opportunities to make money from tourists, and having difficulty deciding where the pressure limits should be. After two terms on a Conservation Board I can appreciate the problems associated with juggling resources, priorities and accountabilities, and their determination to avoid ad hoc decisions through management planning under legislative constraint - a complex task becoming ever larger, in the context of this forum, as the boundary interfaces move downhill with tenure review.

Unfortunately, I foresee an extended period of inactive management and probably neglect occurring as the hands-on management and stewardship of farmers disappears. An idea to throw in here: DOC regularly convenes community forums where local issues are discussed and often conflict is resolved; regular DOC forums with local communities of interest, specifically high country, could be very beneficial to both groups of land managers.

The ability to diversify economic activities on the land has obviously been a driver for farmers freeholding as they strive to prosper and to remain physically on the land they love. Providing these activities do not impact on the landscape or distract the land managers from their primary task on the land, they are most likely acceptable.

What makes me uncomfortable, and I guess there are plenty of local examples, are the residential development impacts, when they are not in sympathy with the environment, and the infrastructural services that chew up pastoral land and substantially change the nature and experience of the landscape and certainly the appearance. Who is deciding how far this should go, or is the developer's dollar all-important? Do we continue to let scenic slippage contaminate the characteristic values we originally held dear or is it becoming too hard for farmers in those situations to resist? Who then is the guardian of our high country landscape?

I am well aware it is easier to criticise than to find sustainable solutions, assuming we have recognised the problems, and I should tender a positive contribution in conclusion - so here goes.

As a listener to the profound pronouncements of yesterday's speakers, it occurred to me that, in any situation where there are a number of conflicting positions held, the solution that can be sustained comes not through the top-down control of legislation, but from a groundswell of opinion that involves all the players in the situation. There was a time when a group of high country farmers and recreational users of the high country came together and it was a very unusual event in those days. We developed something very simple, easily remembered and communicated: it was called the high country or the backcountry code. Now, to go with Kevin O'Connor's 'ship' words of yesterday, I've got some '-ity' suffixes that I believe people in the landscape (the 'landship') can employ to develop something that could lead us through the current difficulties, perhaps a platform for discussion.

It involves the personalities of the people involved. There are requirements for flexibility, a landscape that has accessibility; and with that comes personal responsibility. If that is taken seriously by all parties, then the solution can find acceptability. To sustain the solution, we need accountability both to ourselves and to society through our own action.

The one common denominator that makes all this possible is trust, along with honesty and integrity. The basis for reconciliation can be called the 'high country landscape code of practice' and maybe something as informal as that can be the answer.

As long as the perceived problems are man-made, and most of the ones I see are, effective communication and receptive communicators are the key. That is why forums such as this are so important. It has been said that if human influence was removed entirely from the New Zealand environment for say 200 years, a returning visitor would be greeted by a landscape of pine trees.

Please do not talk past each other and solidify arguments with entrenched positions and legislation. Neglecting landscape management while we argue is like burying heads in the sand and sooner or later maybe *Hieracium* or the pine trees will prevail. The solution is often as simple as meeting halfway.

LANDSCAPE MANAGEMENT AND LAND USE DIVERSIFICATION

John Darby – Darby Partners Ltd.

Thanks to the Otago Regional Council for inviting me along, I read with interest the outline of what this forum was about and I congratulate them on having a forward focus. The high country has been a much-debated subject and I think an approach that starts to look forward is exactly where all our eyes should be focused. I want to take you through a couple of examples of projects we've been involved with that illustrate some of the ways forward in dealing with this quite complex issue of landscape management in the high country.

We have been involved in the high country for many years and seen the changes and the resulting community stress. We don't want to go back through all the early tenure review issues; we are now entering another phase as tenure review moves forward. A number of properties have been freeholded. There are new land use challenges, options and opportunities. I would particularly like to focus on this next phase.

I'd like to talk about the diversification of land use as a tool to achieve sustainable landscape management and the opportunities for landscape management programmes. For these programmes to work, I see two very key requirements. First, they must be enduring and sustainable. Quite simply, they've got to work for everyone and really that requires an alignment of ecological, economic and social outcomes. By that I mean they've got to achieve solid conservation benefit, they've got to provide economic return sustainably for the landowner and ultimately the community as well, and deliver the social outcomes that the community are seeking. This may be in the form of increased access, recreation or simply straight landscape protection. Also, at a local landowner level, they must deliver social outcomes.

I'd like to touch on a couple of those issues, as we've been involved in planning for high country properties: the whole issue of succession, the next generation and how one provides for that without simply selling the farm.

Second, to be effective and binding, landscape management programmes need to be quite explicit. They can't just be a lot of woolly words or coloured plans that no one really understands or they sound good but fall down in their implementation. They really do need to follow quite an explicit process or methodology. They need to be clearly written, understood and measurable in the sense that they can be monitored.

Several landscape management options exist. Regulatory landscape management options are simply imposed by way of Regional or District Plan, not so much at a regional level, more indirectly through a water and soil programme, but at a District Plan level, and I'll discuss that further in context to the Queenstown Lakes District area, which is well advanced in terms of community aspiration or expectation in this whole area of landscape control.

The second and particularly important option is voluntary landscape management. Often this is simply good environmental stewardship from landowners and run-holders who understand the land, who inherently know how to manage it through their in-depth knowledge and experience. It is important to pause on this because, without that stewardship, that landscape that we're all vitally concerned about just simply wouldn't be there. I particularly want to touch on those options under landscape management.

Finally, covenanting is really a hybrid of voluntary and regulatory, and covenants are now becoming more and more commonplace. Under tenure review, covenants are being used as a tool to allow land to be freeholded with appropriate land use or landscape controls on it. Equally, going way back in time, I know that there was a great support from the high country community for open space landscape covenants implemented by the QEII National Trust. Protection of tussock lands, wetlands and other valued landscape features were being successfully achieved 25 years ago on a voluntary basis from the high country community.

Regulatory or imposed options under the district planning procedures, where land considered to have high landscape value is protected by way of classification, are not always popular or understandable. The 'Outstanding Natural Landscape' categories in the Wakatipu Basin, for example, are very restrictive in terms of the criteria applied to resource consents for land use options. The other category, 'Visual Amenity Landscape' (VAL), is less restrictive.

This classification is quite a blunt instrument for landscape management. What it really does is throw a ring round the special ONL landscapes and say 'these are special, we need to be aware of these, we need to manage these and more strict criteria need be applied'. In the 'Visual Amenity Landscape' criteria are still being applied but there's an acceptance that that land has been modified and is in the process of change. This sort of very simple two tier approach can lead to contradiction if it is not supported by more detailed resource studies.

The 'Outstanding Natural Landscape' and 'Visual Amenity Landscape' policies in the Queenstown Lakes District Plan fail in one area particularly, in that they penalise good stewardship. Farmers who didn't undertake piecemeal subdivision when the doors were open (and they have been open at different times over the years for as-of-right subdivision), farmers or land owners who applied high levels of good stewardship to land management, effectively have a landscape that the community now values highly - because of their good stewardship.

In turn, we have rewarded them with an 'Outstanding Natural Landscape' classification which effectively says 'well, you'll do that for ever', whereas other neighbours up the road may have chosen to not implement good management and undertaken piecemeal subdivision and we bestow on them the benefit of Visual Amenity Landscape whereby we say 'its pretty shagged anyway so you may as well keep going'. This is really being a bit glib, but it is an extension of the philosophy of that argument so that areas that were well-maintained and open space are effectively protected. I'm not saying that they shouldn't be protected either, but it is an irony. How do we overcome this? As I said, this is a coarse but blunt instrument for landscape management.

Tenure review provides another mechanism. At Wyuna Station (Glenorchy), an area of Outstanding Natural Landscape, various covenants are being applied as part of the tenure review process to achieve landscape protection. This approach is probably a little better than the Outstanding Natural Landscape approach but, combined with it, the tenure review classifications or outcomes, together with the District Plan, do provide a measure of landscape management, albeit fairly coarse.

There are some problems with this. For a start, they typically result in arbitrary hard lines. Quite often, just by their very nature, the covenant areas follow an altitude line or a bush edge and this doesn't create much opportunity for transition or soft edges or integration. The tool is not meant to achieve that necessarily: it is something everyone would expect would occur at another level down, at a sub-district planning level. However, as I said, ten years ago neither of these controls was in place in the high country. Equally, the pressure of developmental change was considerably less ten years ago.

The high country landscapes are very dynamic landscapes physically. However behind the physical landscapes there are equally strong economic and social dynamics going on. These also need to be well understood if landscape management as a tool is actually to work. Social dynamics are important, particularly the changing ownership patterns in the high country or the difficulty of one family passing the property through to the next generation while providing for retirement and other capital uses. The old tradition of stations remaining in family hands is under threat. How do we keep people living on the land, how do we keep generation after generation farming there? I believe this is at the core of some of the landscape management opportunities. Where there is a long history of high country farming within a family, how do they provide for the next generation? Some want to farm, some don't. Equally the parents need to be provided for, all the capital is tied up in a leasehold property. What are their options? Quite simply, increasingly, it means a sale, and when we look at sale, we then look at who are the buyers and where do they fit in this community (if we can refer to this collectively), both locally and as a community of interest, people sharing and valuing the high country. How does this all fit together? It raises a new set of issues. We need to be aware of these processes if we're to be effective in managing this landscape resource.

Currently, we're involved working with about five different high country property stations as resource planners working with this whole subject of land change. I'd like to use one project as an example of this process but firstly, I'd just like to run through some of the current issues.

There can be a loss of traditional high country station character and the heritage values that go with it. Increasingly, particularly on the properties in and around the Southern Lakes District that are under pressure, we're seeing an erosion of the traditional values that we all

identify with the high country. Often associated with the extensive pastoral systems, this land is retired, farming practices by necessity have to change, landscape patterns change with that and social patterns change. The economic equation also changes.

Just to divert, and I'm not being critical of the Department of Conservation at all, just critical of the process, I believe the heritage value of the high country and its pastoral use has not been fully recognised. Look at the Otago goldfields where the eroded landscape sluice or historic artefacts are valued and protected by DOC, but I've yet to see them look to protect the heritage of the high country - the musterer's huts, the old yards, the tracks, the history that goes with it, the history of the musters. If you ask the man in the street about the high country, these are the things that he holds near and dear to him. There is a very valid argument for some properties to be managed for these heritage values. In which case, by necessity, the farming regimes may be less than attractive in terms of economic return, from extensive pastoralism. Equally, the opportunities that go with heritage values are recreation and visitor accommodation and other purposes that blend with that wonderful sense of traditional high country value to create very meaningful tourist experiences.

Another very real issue is landscape change resulting from retirement of the high country, from land use changes, from more intensive farming (for example deer fencing, drainage etc.) All these changes are creating different landscapes and arguably landscapes of lower value than the extensive pastoral landscapes we are all most familiar with.

On one high country property at Glenorchy, probably something like $50,000 a year is being spent reclaiming land back from broom infestation. Noxious weeds control becomes a very real issue if the burden of the management costs is transferred to the Crown. There is also a very bad Spanish Heath infestation on this property and it is spreading significantly. The cost of Spanish Heath control is many times that of broom and it is a very difficult weed to get under control.

How can this really be achieved? Well, land use diversification is the only way economically you're going to be able to sustain that sort of control and restore the preferred native cover and landscape patterns that the community so values. This is particularly the case when large tracts of land now are going to be faced with this issue of increased management cost.

But by its very nature, tenure review is unique to each property and, in being unique, the difficulty of connectivity and linkage with other conservation and recreation areas is becoming a real issue. We are involved with three stations that are adjoining. All have gone through tenure review by different consultants and at different times.

This is not a criticism of the process or those involved, it's just that their brief didn't extend over the fence and, when that occurs over different times, you get different isolated pockets of conservation or recreation land that don't link. This is becoming increasingly obvious as we look over large land areas; these issues have been handed on to the landowner to resolve because they were not well resolved in tenure review. Nor are they resolved in the District Plan.

Figure 1: Planting for farm shelter can obscure views of the landscape

We all know the problems with the balance between farming activity and the protection of views. For example, the roadside shelter-belt planting in Figure 1 will provide essential shelter, but will also effectively remove the long views to Mt Aspiring. This isn't a criticism of the farmer, it's exactly what I'd be doing if I was farming as well, but the farmer increasingly in this case has been asked to balance economic land use, farming, with landscape management objectives. So how do we do that without conflict or economic loss? It's not easy but it can be done.

New land use can unlock economic value while also maintaining and enhancing landscape values; providing enhanced recreational opportunities and better connection for public access - land use that promotes soft edges, landscape transition and improved connectivity

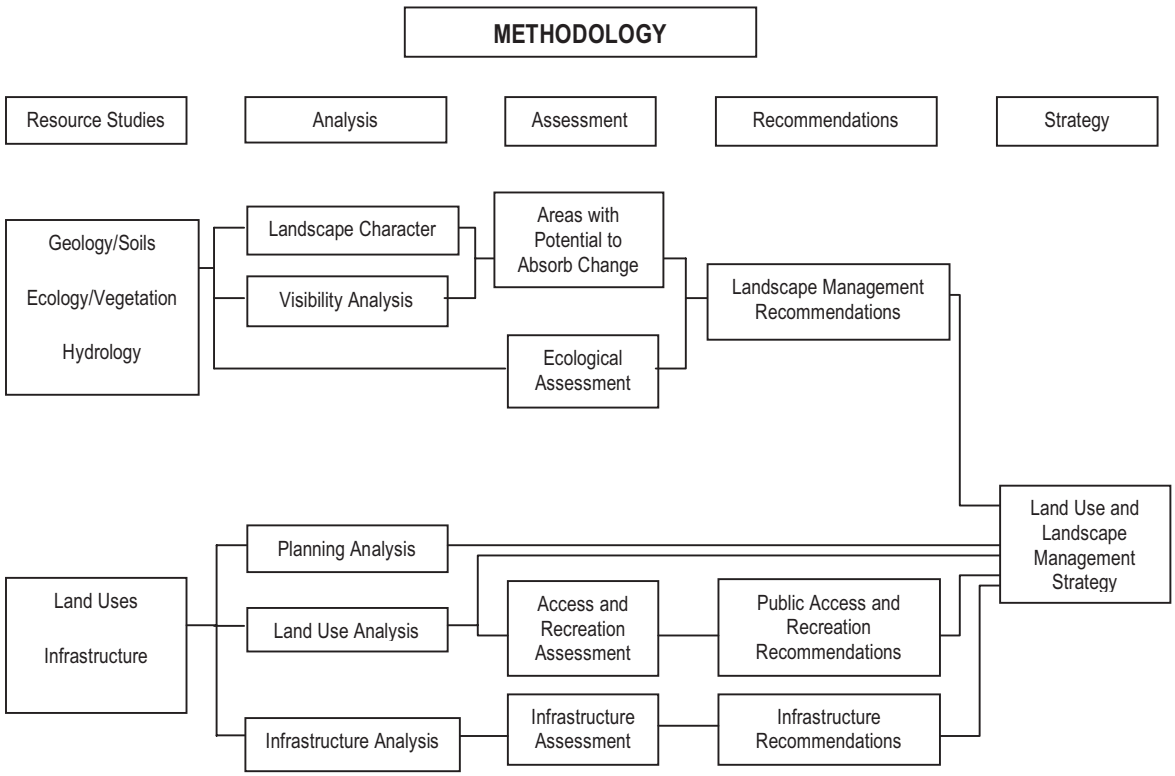

Figure 2: Methodology used to formulate land use/landscape management strategy

of recreation and ecological corridors particularly, also the expression of heritage values by maintaining multi-generation ownership. There's so much going to be lost from the high country in our next generation that we've got to think: what will our next generation thank us for? It is the stories, the history, the settlement and the connection that all evoke the image of the valued high country landscape.

So how do we keep that alive? The best way to keep it alive is to keep people on the land, keep them farming, keep them active, keep the memories alive, the history and the values there.

So, what's the process? For community support, it is essential that there be enduring and binding landscape controls. One useful tool is a stakeholder agreement, for example the Jacks Point stakeholder agreement at Remarkables Station. The methodology in Figure 2 was followed. It was explicit and measurable, but I won't go into great detail as it's fairly technical but it is the next level down from the District Plan (the landscape control level) and tenure review; it is sub-district landscape planning. The resource studies necessary to implement and complement this need understanding of geology, soils, ecology, hydrology, visual landscape, the land uses, the infrastructure, the tenure and the zoning. A useful description is landscape character; it is a good measure and 'definer' of landscape in the implementation of policy guidelines and strategies. Supporting landscape character is the visibility of the landscape: which areas have potential towards change? Which areas don't? Which have high ecological value?

All this enables a landscape management strategy to be formulated that is resource based, largely factual, explicit and reproducible. All are important criteria if these studies are to survive the rigour of debate. At another level, the more social and economic considerations - public access, infrastructure, tenure, and zoning - need to interface with the visual landscape policies, which cannot exist alone.

The Coneburn Area resource study (Figure 3) followed that exact methodology. This is an area which, as Remarkables Station, went through tenure review very early on. It didn't really get examined at the same level a property like this would today, however the landowners were very good stewards - they didn't undertake any subdivision. They managed the property as a model farm, it was a very clean farm, large areas of grey shrub land were retained (matagouri), wetland areas and buildings were always sited sensitively in, generally, a large tract of high value landscape.

Figure 3: Coneburn study area

Of course they were well rewarded but, in this case, the Council had the understanding and foresight to realise that, to retain this sort of high value landscape right on the edge of Queenstown (where it has unique pressures on it compared to other properties), another level of study was necessary: the Coneburn Resource Study was therefore undertaken - to provide a finer level of District Plan control on this particular important landscape.

Tenure was examined, the hydrology was well understood, soils were assessed in terms of the land use opportunities they provided and the ecology and the vegetation examined.

Particularly noticeable were the ephemeral stream corridors, the wetland and the grey shrub areas that were still currently on the property.

Slope was mapped (slope analysis often results in the identification of areas highly sensitive to tracking, cultivation, shoulder planting, fence lines or building visibility). A digital terrain model was used to examine the logic of the land from an ONL VAL perspective and there was very detailed computer mapping of the visibility of different areas from different public viewpoints.

A collation of this information through a GIS system (a mapping approach) was able to clearly define a defensible breakdown of the landscape into different character areas, and each different character area had its own unique set of opportunities, constraints, issues and options. Each area was examined for its potential to absorb change - anything from quarrying to farm activities, development, recreation, ecological restoration; it wasn't limited, it was wide ranging in terms of its examination of what the options were. Out of that, a broad scale landscape management strategy was promoted (see plan in Figure 4)

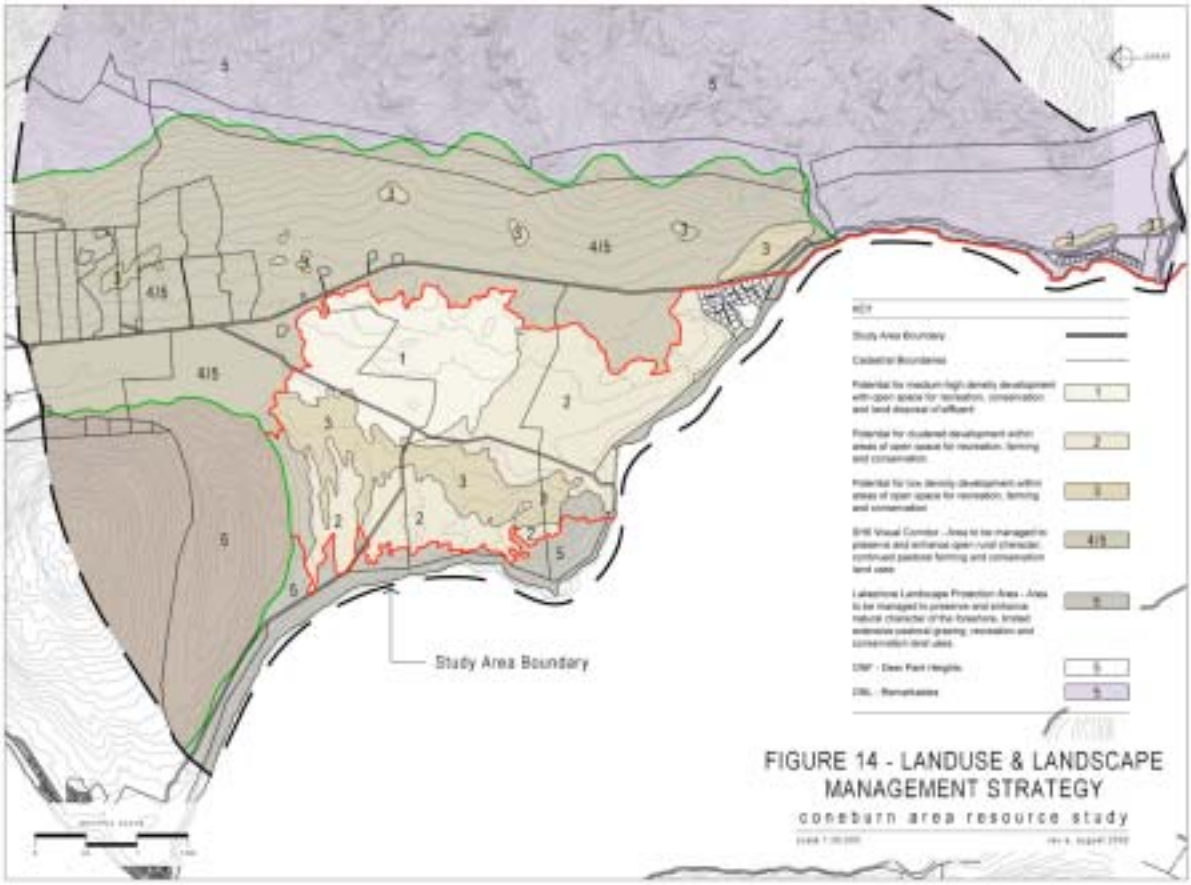

Figure 4: Coneburn landuse and landscape management strategy

Figure 5: Design review board and council interface

which formed the basis of a finer grain of District Plan policy.

The next step was to ensure that the ongoing programme would be measurable, explicit and enduring. To do this we really had to bring Council process and 'private landowner process' together in a meaningful way through a fine-grained approvals process. The flow chart in Figure 5 sets out the importance of the interaction between the resource consent process and the various resource studies that were undertaken on the property; it needed to be explicit. The Coneburn example gives a brief overview of one process that led to a significant development that also achieved some major landscape management outcomes:

- 95% of the area was reserved for open space, and public access was a fundamental part of the open space programme;
- the protection and restoration of the grey shrub land;
- the protection and restoration of the ephemeral stream corridors;
- the predominance of native plant in the use of the materials

- use of local materials; and
- a very tight set of design controls.

Another study under way, is the Glendhu Bay to Matukituki corridor study (Figure 6). It involves several properties which have completed tenure review and which have many different issues and options confronting them. This planning is resource driven, rather than being driven by questions of whether to subdivide, sell or develop. Again, it is fine grain planning which looks at the land and its ability to absorb change: what sort of landscape management programme should be implemented? How do we get them implemented and get landowner and community buy-in?

Figure 6: Landscape surrounding the Glendhu – Matukituki corridor

These studies provide a definite way forward and help to avoid the usual conflict of 'yes - no' resource management planning, and I see them as essential if we're to deal successfully with landscape management challenges. The important thing is that landscape change is going to occur whether we like it or not.

In the past, there tended to be a winners and losers outcome: sometimes development proposals that shouldn't have got approved did get approved and others, that perhaps were well thought through and debated at length, were declined. Unless we have a resource framework to provide some objectivity in this debate and some overriding goals in terms of landscape management, we're going to continue this process of conflict.

We (Darby Partners) are great fans of sub-district landscape management planning as a tool for determining the way forward in areas where values are very high and there is a need to go very carefully. It is also important that we allow the unlocking of economic value. If we don't, we are simply creating a vacuum in the high country. If we don't allow some appropriate development, to provide economic unlock, then we will never achieve the sort of outcomes that we might wish to. For example, the retention of native cover and protection of lake margins from buildings is a loss of economic opportunity, but it is protection of the landscape: how do we compensate for that loss of economic opportunity or loss of farming scope? There are ways and means because not all development is bad; in fact, some development will create a very high level of landscape protection.

A good example is the scarp at Glendhu Bluffs (Figure 7) - protected under tenure review. The opportunity of continuing native cover all the way around that landform is there, at high cost: the Government isn't going to pay for it, it's not part of tenure review, there's no public access, but it is possible as a sensible balanced trade-off (a freehold lake front, for example). The community and landowners together can look at the correct ultimate landscape management of these sensitive areas. For example, that area should be free of buildings: how do we achieve it? There are other uses: we are currently exploring the prospect of a golf course beside the Glendhu camping ground. That golf course could be open space, public and protected.

Equally, with the cost in a golf course, there's got to be some economic unlock, you can't deliver benefit without economic return, and there needs to be a balance struck. This is the challenge and this is the work we're involved in. Landscape management programmes that are a willing contract between community and landowner are the ones that will always have the greatest chance for enduring success, not the ones we impose, or for that matter, the ones we volunteer; there has to be a balance. We think this opportunity of community agreement or contract based on resource studies presents the greatest opportunity to achieve this.

Figure 7: Glendhu Bluffs

FROM MUSTERERING TO TOURISM

John Davies - Routeburn, Greenstone and Milford Guided Walks

When the Otago Regional Council executives asked me if I would speak to this forum, I thought back to the fact that, about every six weeks, a high country farmer or a backcountry farmer phones me and tells me how glorious part of the back of his property is and asks me if there an opportunity to put a guided walk there. So that's what I intend to talk about.

Just to give you some background of my interest in the high country: my first recollection was coming here as a thirteen year old in the school holidays and doing a lot of goat shooting out behind Coronet Peak and down through the Nevis Valley. I suppose I developed a real love for the high country at that point. It was no surprise that when I left college in Dunedin I followed a farming career as a cadet to National Mortgage - a stock and station firm. I was first sent to western Southland for eighteen months on a farm in Otautau, and then spent eighteen months in Omakau, a well-known rugby playing area, which I absolutely enjoyed. Then I came back to Glencoe Station, where I eventually became a high country musterer (half a dozen dogs owned by Lloyd Ewing) and I have some very fine memories.

I was talking to my three grandchildren the other day about experiences that are lost in the high country. They were asking me what I remember about Arrowtown when I first started work there. I have a memory: we used to muster down from Motatapu Station, down Billy Creek, poke the sheep up into Glencoe and then all the musterers would walk down to Arrowtown and ring Lloyd Ewing up at Glencoe to come and get us. He would eventually come down with his Landrover and trailer to take us all back, and he would pay for the dozen jugs that we had all drunk at that point. We thought it was pretty good because we hadn't had a beer for four days. I'll tell you what was better though: the dogs hadn't seen a lamppost for a year. They pissed on every lamppost in Arrowtown and drove every dog that was a residential dog out of the town!

I soon realised in that period of my life that I actually couldn't afford a farm. Although when I look at Glencoe now and see what it has been sold for, I think maybe I should have been able to! I left farming and purchased a 40 percent interest in a transport company called Wakatipu Transport - eight trucks, six of them went and two of them didn't. That company is now built into Northern Southland Transport and we run 150 vehicles, or thereabouts.

I was always a keen tramper and in 1989 the opportunity came to purchase the Greenstone Valley Guided Walk and the Routeburn Guided Walk. The Greenstone Walk had been developed by the two Americans who had Greenstone Valley Station - Earl Hagerman and Ralph Brown. They thought they would get into the walking business, so they built two lodges: one at Steele Creek and one at Lake McKellar in the National Park. They decided that they would concentrate on the cheap Australian market, with 19 and 20 year olds going through in what were known in the 1980s as 'Tearaway Tours'. They really only walked about 350 people a year at about $300 each.

These young people used to go through and have a glorious party: they weren't actually interested in the environment or in tramping, but they had a good time. Earl Hagerman and Ralph Brown had borrowed overseas money and spent about half a million putting in these two lodges and I thought, if I could get the Routeburn and the Greenstone and put them together, then we could run a walk called the Grand Traverse. We still run the Routeburn as a walk, and two or three days a week we run what's called a Grand Traverse in which they walk up the Greenstone and out over the Routeburn. This year the Routeburn and the Grand Traverse will together walk about 3000 people at about $1000 per head.

When I first got hold of the tracks, I went in and studied the visitor books back for fifteen years. I found out a lot of things - it's all about providing what the customer wants. The Routeburn Walk used to involve two parties walking from opposite directions to lodges on each side of the main divide. Then they would talk by radio and decide if the two parties would cross. In very bad weather they would wait there and cross the next day, but they both had to cross on the same day to free up the huts.

The first thing I discovered was that there is no guarantee if it rains one day in Fiordland that it's going to be anywhere near fine on the second day. The other thing that I discovered was that an American wrote that he was having his 'spare' day at Routeburn Falls. He said 'it's

been raining for twelve hours, an inch an hour' … 'this is like standing in the shower tearing up $20 bills'. So I decided thereupon that we would walk everybody straight through and that we would walk them in one direction.

The other interesting thing about it was - and at this stage of my life I had some interesting battles with DOC as I tried to lift the standard of the operation up - we had a six-berth bunkroom for ladies and a six-berth bunkroom for men. We would get a Japanese couple on their honeymoon and we would say to the guy 'you go in there with five people you can't speak to', and say to his wife 'you go in there with five ladies you can't speak to and have a good night'. So we went into four-berth bunkrooms, we mixed everybody up, we went multi-share and everybody at the time thought I was absolutely mad with the money we spent out there. We put in flush toilets, showers, improved the food, put in liquor, and it was really a success story because it very soon started to take on the Milford Track, which of course was a guided walk operated by the government.

In 1992 we had the opportunity to buy the government's Milford Track Guided Walk and, with Tourism Holdings, we purchased it. It had been going for 110 years and they walked 3000 people at $800 each. This year we'll walk 7000 at $1500. They'll drink somewhere in the vicinity of 8,000 bottles of wine and 16,000 cans of beer in five months. We run for 170 days, 50 per day maximum, and it's an enormous logistics problem. We give them meal options of rack of lamb, fish or chicken every night. They get the option of two meals and, in that 170 days, we turn over some $14 million. It's a large logistics operation because we have our own barge, our own helicopter and have to fly in everything and fly out everything, including sewage.

Ninety-two percent of the people are overseas tourists, 28% are Japanese, 20% from USA and 20% Australian. Four weeks ago, the biggest newspaper in America ('USA Today'), on a Saturday morning published a story from a couple that had just written a book. They reviewed the book and said there are ten things you should do before you die, and one of them was the Milford Track. In four hours we had 80,000 hits on our website. Routeburn Track Guided Walks (and they are both guided walks that are mentioned) has been rated by the National Geographic Magazine as one of the ten best treks in the world. Overseas tourists want showers, good beds, good food, good wine, good guiding and good interpretation. What's more, they're prepared to pay for it.

The majority of New Zealanders, when they go tramping, want to rough it. They don't want a shower, they don't want particularly good food and they certainly don't want to pay! As I said, hardly a month goes by without a high country person telling me that they've got a very good place out in the backcountry where they think they should start a walk. I invariably give them some advice about the Greenstone Walk, which today is a magnificent valley. You go round; you see all those signs 'Keep the Greenstone Free' of gondolas and all sorts of things, but the fact remains that, while it is an interesting valley, from a tourist point of view there is no alpine environment; there is no challenge to get across a pass like the Milford Track, where you go across the McKinnon Pass. We build the Milford up as a challenge. It certainly is. It is exposed, people can get hypothermia and they understand it is a challenge to get over McKinnon Pass. The same is true of the Routeburn - you go over the Harris Saddle; it is a challenge. People realise that and they realise they have achieved something when they've done it.

The Greenstone, on the other hand, is a valley walk. It just doesn't rate internationally, and it is very difficult to attract people to it as a walk on its own. That is the real problem for most properties where owners think they may have a good walk, a good product that people might be interested in doing. There are people that will pay - they are overseas people and it is very hard to get to them. If you are talking about New Zealanders, as I said, they're not interested in paying.

We have had a love-hate relationship with DOC: it is not easy operating in a National Park. But I think the department certainly understands our philosophy a lot better than ten years ago when we started a massive building programme. On the Milford Track, I would think we've spent $1 million a year for a decade in upgrading everything. When we took it over the lodges were rundown, the whole infrastructure was down, the generators were worn out, and so it has been a massive upgrade. It is very expensive to operate out there but it really has, in a lot of ways, been a success story.

MANAGING HIGH COUNTRY LANDSCAPES INTO THE FUTURE

David A. Norton – Associate Professor, School of Forestry, University of Canterbury

This paper covers three topics: What are our goals for high country landscapes? What are the drivers of change in the high country? How can we manage for resilient high country landscapes?

Goals

When we talk about the future of the high country, we need to be very clear about what our goals are for this environment. Goals are essential to guide management and without goals it is not possible to say if management has been successful. It is very important to distinguish between visions and goals. Visions are long-term objectives, usually outside the lifespan of most management projects or even a particular person. Goals are measurable targets over defined time intervals, usually short-term. In a sense, they are the stepping-stones towards reaching the vision. Goal setting is a fundamental but often overlooked component of management, especially for indigenous biodiversity conservation, and particularly at the scale of high country properties.

For goals to work they need to be realistic; goals that are unachievable are a waste of time. Goals need to reflect the realities of the modern high country landscapes. They need to be challenging but achievable: there is no point in setting a goal that cannot be achieved. In conservation, a common goal is to recreate some previous ecosystems state, but this is problematic, as the previous state would have changed irrespective of other impacts.

So what are the realities of high country landscapes? We have discussed some of these already at this forum. These are ecosystems that have resulted from nearly 1000 years of human influence. Several species are now extinct (e.g. moa). Seed sources are either absent or very sparse for many plant species including most of the dominant species in the pre-human landscape, the woody species (e.g. Halls totara, bog pine, celery pine). There is a new suite of species now dominant (such as Hawkweeds) and 'better' adapted to high country environments. Many of these high country systems have almost certainly crossed thresholds of change that will be very difficult to reverse: simply removing degrading factors alone will not lead to most of the high country regenerating back towards Halls totara forest for example - this is not going to happen. Finally, people are an integral part of high country landscapes.

Figure 1 summarises the changes that have taken place since human settlement of the high country: the shift from woody to tall tussock, then to short tussock vegetation, then across some quite fundamental ecological thresholds into systems dominated by exotic species - either herbaceous or woody. It is quite easy to move the systems in the directions of the red arrows in Figure 1, but moving them back in the directions of the blue arrows is going to require substantial management input and in some cases may not be possible. The high country has changed from predominately woody ecosystems through different types of grassland and on to exotic herbaceous dominated ecosystems with an increasing component of mainly exotic woody species. It is fundamentally important when we set a goal for management

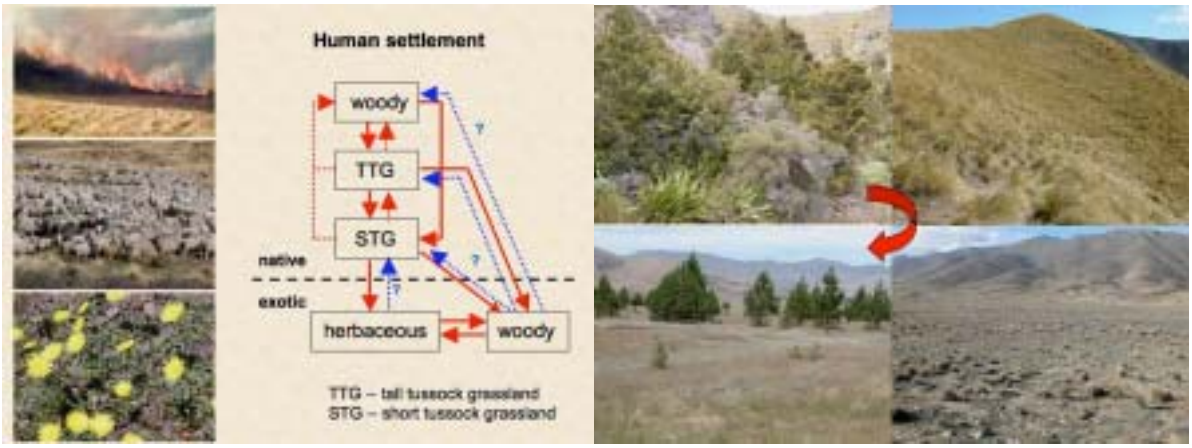

Figure 1: Ecosystem change in the high country since human settlement

that we also link it to a measure for success, for two reasons. First, the measure provides an auditable assessment of how well the management has been implemented: has the manager actually done what they said they were going to do? But also, perhaps more important ecologically, it enables the success of the methods used to be assessed and modified if necessary to adapt management to better meet the goal that has been set.

There are therefore three components to goal setting: the long-term vision, having clearly defined goals that are stepping stones towards reaching that vision, and then having performance indicators against which to assess success.

So what are the goals for the high country? Existing high country goals (e.g. in the Biodiversity Strategy, Crown Pastoral Land Act 1998 and Conservation Management Strategies) do not identify specific management outcomes for indigenous biodiversity beyond general statements about 'protecting and enhancing'. We have to ask ourselves what are we trying to achieve in the high country?

Are we trying to maintain or enhance the full range of indigenous biodiversity: of species and/or ecosystems?

- Of ecosystems that are present today or those that were present 500 years or 1000 years ago?
- Are we trying to sustain tussock grasslands, or are we trying to restore woody vegetation?
- And where in the landscape are we trying to do these things?
- We talk about restoring threatened species, are we talking about nationally threatened species, regionally threatened species, locally threatened species?

We need to be very clear about the answers to these questions before we can identify specific management goals for any particular place in the high country.

Drivers of change in the high country

We cannot achieve goals in the high country unless we understand what is causing change, especially what is causing change now and will cause change in the future. Some of the drivers of change are positive but many have unwanted outcomes. In a sense, these are threats to the achievement of goals for the high country. We need to consider both the realities of the high country today and the influence of these drivers of change on the future composition and structure of ecosystems in the high country.

Drivers of change have a number of underlying causes. For simplicity, these can be grouped into four broad groups:

- Global climate change.
- International economic factors.
- Domestic policy.
- Historical legacies - things from the past that are still influencing these landscapes and ecosystems today.

Global climate change and international economic factors are largely outside the control of high country land managers. Some of the initial consequences of global climate change are shifts in average rainfall and average temperature, and increases in the incidence of extreme events such as droughts or snowfalls.

Global climate change may affect biodiversity through intensification of farm management, as farmers seek to deal with changing conditions, and by altering species interactions (e.g. RHD and rabbits, hawkweeds in tussock grasslands, or trout and *Galaxias*). Species ranges will change, perhaps with contractions in drought intolerant species and warmth intolerant species, and some of the high altitude species will eventually disappear as temperatures rise. We will see the invasion of new species and, potentially, extinctions as well.

International economic factors, such as oil price increases, global recession, changing consumer preferences/demands and availability of substitutes, either for products or for producers, all influence what happens in the high country. They may have a whole range of initial consequences, such as reduced profitability from farming or tourism, which have direct impacts on high country land use. Any consequent reduction in the tax take may reduce the funds for conservation work on the public conservation estate. International animal welfare issues may require management changes associated with the use of chemicals such as 1080 for pest control.

Demand for natural fibres in preference to synthetic fibres could increase and 'green' certification, already important in the forestry

industry, may become an increasing requirement in agriculture and industry.

All of these factors affect biodiversity by changing the focus of agriculture (e.g. intensification) and they can reduce resource availability for 'low priority' activities by landowners, local authorities and central government. Changing attitudes towards indigenous biodiversity may increase or decrease interest in non-economic values: certification is going to lead to some positive changes in attitude; if farm profits decline, that will also cause changes in attitudes.

Domestic policy - regulatory requirements, land tenure review and land ownership, public access rights and national priorities – may increase the cost of doing business, change the focus of land use at the landscape scale and result in less community ownership of or interest in non-economic values. These things have biodiversity effects to the other drivers of change: changing agricultural focus, especially intensification; reduced resource availability for 'low priority' activities; and changing attitudes towards indigenous biodiversity.

Historical legacies - there have been many changes in the high country over the last thousand years. There has been a loss of seed sources (e.g. for woody species such as Halls totara and bog pine) and quite large areas of the high country are so different that many of the original species would not regenerate even if seed sources were available. Much of the native plant and animal biodiversity is in very small remnant populations and this limits the potential for recovery to large viable populations. Changes to soils have resulted from past management, especially soil loss through wind erosion exacerbated by high rabbit numbers in the past. Those influences will affect many generations to come of the plants and animals that live in the high country. These historical legacies, again, affect biodiversity: local extinction of remnant populations (remnant populations are very vulnerable); failure of native species to re-establish; and the crossing of abiotic thresholds, such as soil conditions, which are quite difficult to reverse.

To summarise, the key drivers that will directly effect indigenous biodiversity in the high country in the future are: invasive species, changing species interactions, recruitment failure, changing soil conditions, intensification, attitudinal changes and resource availability. Change is not bad in itself, in fact change is a normal feature of any ecosystem, and some of these changes can be quite positive, particularly changing farmer attitudes. But many of these drivers of change will also limit the outcomes that can be achieved for indigenous biodiversity in the high country, and these need to be acknowledged in management planning.

Managing for resilient high country landscapes

How can we manage for resilient high country landscapes? I don't believe that changing tenure in itself equals management; it is not actually a management action. For example, reservation of land (for conservation purposes) is not the end of the conservation effort; it is where conservation management begins. Most high country ecosystems are induced and all are strongly influenced by external drivers of change. For these reasons management is

Figure 2: Native brooms *C. crassicaule* (left) and *C. vexillata* (right) – vulnerable to grazing

essential to sustain indigenous biodiversity **across all land tenures.** The key is to be adaptive and flexible, and not tied into the 'one-model fits all' approach.

Two different groups of plants illustrate some of the challenges we face in managing biodiversity in the high country, and the role of different management tools. Native brooms (*Carmichaelia* - a group of plants with tremendous diversity) are unique to New Zealand and are very vulnerable to grazing whether by stock or animal pests.

Figure 2 shows two species: coral broom (*C. crassicaule*), normally a shrub up to 2 metres tall, severely browsed down to a few centimetres and in gradual decline; and *C. vexillata*, well browsed down, is in serious decline.

By contrast, *Lepidium sysimbrioides* (in gradual decline) and *Convolvulus verecundus* (sparse) are herbs found in dry areas such as the Waitaki Valley (Figure 3). These plants are not influenced so much by grazing animals but are very vulnerable to competition in the absence of grazing.

Where these two groups of plants are found together, conflicting issues arise in planning for their management. Excluding grazing will favour the native brooms but subject the vulnerable herbs to more competition, while using grazing as a management tool might result in the opposite outcome. These are some of the dilemmas we need to build into our management planning.

Whole property farm management plans

I believe whole property management plans are a key tool for positive biodiversity outcomes on high country farms irrespective of tenure (and similar plans should be implemented for public conservation land). They should cover **all** aspects of land management - biodiversity, farming and people, and there is a potential role for local community in plan development and annual review. These plans provide a unique opportunity for win-win economic, biodiversity and recreation outcomes.

Covenants can be part of the farm management planning approach, but are not in themselves the main way to manage indigenous biodiversity: they are an important tool that we can use to get there. The question then is why DOC and the environmental NGOs are not supporting this approach? Hopefully I can provide more insight into what's involved, and perhaps we can get some more support for it.

A farm management plan is a good way to formalise best management practice. It obviously will assist farmers in meeting their RMA requirements. It will underpin successful certification through green marketing schemes (e.g. eco-wool labelling) and I can't emphasise that enough - I think it's a very important tool. A farm management plan provides an alternative model to the current predominantly two-way tenure review split and reinforces the established ethic of stewardship that farmers have for their land. Importantly, it allows the feedback on the effects of management activities that is essential for adaptive management.

Figure 3: Native herbs *Lepidium sysimbrioides* (left) and *Convolvulus verecundus* (right) appear to suffer through competition in the absence of grazing

A farm management plan requires clearly defined goals for the property over different time frames and a good understanding of the environmental, social and farming attributes of the land itself. It will identify the key constraints to management for achieving these goals and subdivide the property into management units. It will formalise the tools that are to be used to meet those goals (stock management, weed control, recreation etc.). Targeted monitoring will be required to provide feedback on management actions.

The following examples of a vision and goals are from an evolving farm management plan for a particular high country property (with identifying details removed).

> **Vision**: The economic potential of XXX is being fully utilized while maintaining and, where appropriate, enhancing other values present (especially native biodiversity and recreation), in a manner that is resilient, dynamic and flexible.

Examples of 30-year goals (of the farming family):

- The property has been 'future proofed' as evidenced by not having to buy in feed and not having to sell capital stock during droughts.
- Average weaning percentage has increased to over 100% (given suitable weather conditions)
- Soil fertility is the same or exceeds levels present in 2005, at least within the areas used for economic production.
- The indigenous biodiversity values of representative examples of the full range of natural ecosystems on the property are being sustained.
- Animal and plant pest species have been managed to a level that does not threaten either economic or biodiversity values
- Stream health is the same or exceeds levels present in 2005.
- At least two wetland restoration projects have been implemented
- At least one new recreational opportunity has been developed

Examples of 5-year goals with performance indicators (PI):

- Identify and map representative examples of the full range of natural ecosystems on the property as a basis for subsequent management
- PI - Ecosystem pattern has been mapped for the property at the scale of 1:50,000
- Establish tall tussock grassland monitoring plots
- PI - At least 20 vegetation monitoring plots have been established in tall tussock grassland with at least one re-measurement undertaken
- Complete an assessment of the wilding spread potential and removal options for the established conifers around YYY huts.
- PI - The assessment has been completed and includes a staged proposal, with costings, to remove conifers from around these huts.
- Establish an aquatic monitoring system.
- PI - A survey of aquatic systems on the property has been completed and a monitoring system established covering the range of aquatic systems present, with at least one re-measurement having been undertaken.

The five year goals above are 'steps along the way'; you can't achieve everything overnight, it can take thirty years to get some of these things in place and up and going. They provide a practical way to move forwards within realistic economic and ecological time frames. The performance indicators are fundamentally important to measuring how successfully the goals have been met.

We need to know the environmental, the economic and the social context of the property for farm management planning: geology, landforms, soils and climate; vegetation, fauna (birds, lizards, aquatic etc.); farming history and farming opportunities; local economy (including location of main service centres used etc.); recreational uses and opportunities; and other uses of the property (e.g. forestry). This overview can be based on existing information and an initial property assessment.

Then the management constraints must be identified. These can be abiotic, biotic and socio-economic factors that limit our ability to reach our goals. The likely consequences of each factor should be identified and possible management actions for addressing them considered (economic, environmental and social). For example a constraint might be that unforeseen extreme weather such as a drought will impact on biodiversity conservation, maybe through killing some restoration plantings; it will also impact on farm production. The management response for biodiversity might be to make sure that all plantings are sourced from local material (because it will be better adapted), making sure that plantings are timed to minimise the impacts of drought, and reducing competition (e.g. with herbicide). For farming, the management response might be to invest in additional irrigation to enable more feed to be carried on property (future-proofing the property).

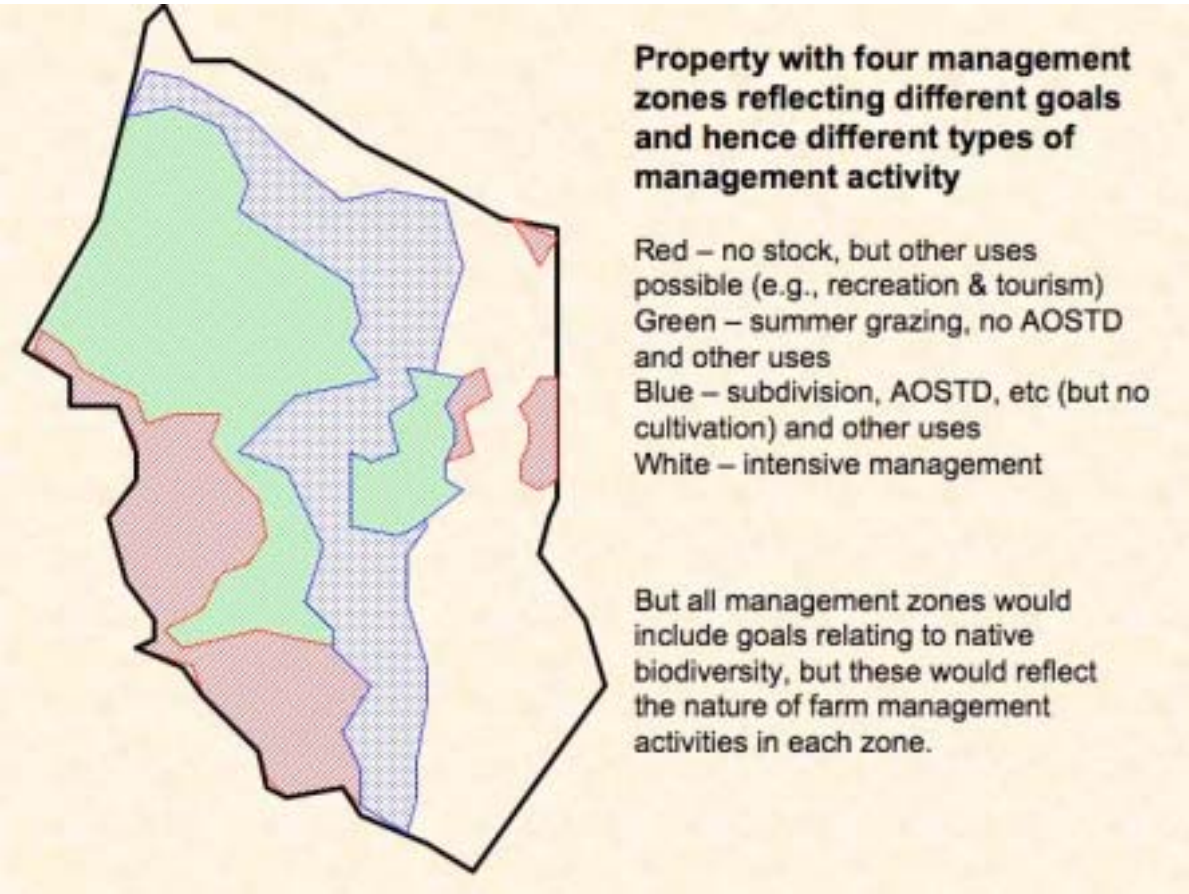

Figure 4: Subdivision of a property into management units

The core section of a management plan covers management tools and it will probably be divided into several subsections. It discusses in detail the range of tools available to meet the goals for the property. It includes approaches to stock management, pasture improvement, recreational use and biodiversity conservation. It is not possible to foresee all management approaches that might be used and it is therefore important to allow for regular revision and updating of these tools. They should be spelt out to a detail sufficient to guide management.

Possible subsections include stocking patterns (stock type, number and timing) subdivision; pasture improvement; weed control; animal pest control; retirement of areas from grazing; rehabilitation of particular ecosystems (e.g. forest or grassland); wetland management; covenants; and recreational management including public access, hut maintenance, recreation concessions etc.). Biodiversity management can involve a range of activities including plant and animal pest control, restoration plantings, waterway/wetland enhancement, reintroductions of locally extinct species, sympathetic grazing (stocking rate, stock type, timing of grazing), fertiliser application to degraded short tussock grassland, grazing exclusion, fire exclusion, amenity and shelterbelt plantings, and monitoring. Grazing is often seen as a key threat for native biodiversity, yet its removal can also lead to a loss in native biodiversity, especially when invasive exotic species are dominant.

Subdivision into management units is important because it provides us with a framework from which we can then go and apply management. No property is uniform, there is great variation which means that the goals and management tools will differ across the property. The number of management units will reflect the environmental diversity of the property and will be determined by a combination of management practicality and ecological patterns. They form the basis for implementing farm management and for assessing how sustainable the overall farming operation is. Figure 4 shows a hypothetical example of a property with a range of different management units.

Monitoring is the key part of farm management plans. It is critical for the whole plan and links to

the performance indicators associated with goals. It provides direct feedback to the farmer on success of different management actions. It is also a powerful advocacy tool (e.g. to show how management can meet government goals of ecological sustainability and protecting significant inherent values). It should include economic indicators (e.g. average animal body weight), recreational indicators (e.g. track or hut usage) and environmental indicators (e.g. tussock density).

Monitoring can be expensive, both in time and funds, and our thinking needs to be very focused on the goals. Some monitoring requires technical input (e.g. stream invertebrates), but most should be of a nature that is easy to undertake (and some will already be part of farm management). Possible monitoring variables include climate, soil fertility, vegetation condition (e.g. photopoints – photo monitoring is a valuable tool), animal pests (e.g. rabbit counts), standing crop, stock condition (lambing and fleece weight) and recreational use.

How do farm management plans work? The process begins with an initial assessment of the property (with good mapping) covering environmental patterns, social values (e.g. recreation) and farm management practices. The management plan is then produced and 'buy-in' sought from outside interest groups such as local government. The plan is then implemented with regular review (5 yearly). Without review, these plans are really a waste of time, and there is room for outside groups to be involved in reviews – there is a lot of skill out there that can be utilised very effectively. Reviews can be used as the basis for formulating annual work plans and should match any certification audit cycle. The key is to keep compliance costs low.

Possible cost to the farmer include base-line surveys, ongoing monitoring and review, changes in stocking patterns, costs of restoration plantings, additional fencing and lost areas of grazing. But there are funding sources: local government, central government, carbon credits, enhanced market access (through green certification) and alternative income sources as well (through intensification elsewhere on the property or ecotourism for example). There is a range of benefits to offset these costs. There is potential for a diverse range of economic uses, especially if the underlying tenure is freehold, and economic incentives for conservation management (e.g. weed control).

Whole property management planning can build on the established ethic of stewardship and capture a farmer's knowledge of the property. It ensures the presence of a 'manager' on the property all the time. Finally, there is potential to use sustainable management plans for 'environmental' marketing of products (e.g. an 'eco-wool' brand).

Conclusions

- I think we need to have clearly defined management goals in the high country, particularly for indigenous biodiversity. I don't believe we have those management goals here today. We have the high level goals and biodiversity strategies but not the management goals.
- We need to include performance measures with goals to enable the success of management interventions to be determined (essential feedback).
- The goals need to be realistic with regard to the factors that are causing change in high country landscapes.
- Management is essential; I don't believe biodiversity values will be sustained without some management. Changing tenure doesn't equal management.
- There is no one goal for high country and no one 'correct' management approach, even for biodiversity conservation.
- Whole property management plans provide a key tool to meet biodiversity conservation goals within an economic framework and at minimal cost to Government.
- It is time for Government and non-government land managers to work in partnership to ensure that we manage high country landscapes in a manner that results in resilient ecosystems within which indigenous biodiversity is sustained.

CULTURAL LANDSCAPES AND BIODIVERSITY CONSERVATION

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When we look at the high country, what are the landscape features we value, what do we want to protect and how do we limit undesirable change? Potentially, there are many things in landscapes that we might value – aesthetic, historical, economic, cultural, soils, biological, recreational – but here I will focus on indigenous biodiversity.

Do we actually manage landscapes or are they in fact just the result of what we all do in our own backyard locally? I am unsure of the answer but I think we need to question whether in fact, at a regional and local scale, we actually manage these systems. The second question is whether or not landscapes are an emerging feature with distinctive properties.

What are we aiming for in our landscapes? Richard Foreman[1] argues for a sustainable landscape: 'An area in which ecological integrity and basic human needs are concurrently maintained over generations'. But what is meant by ecological integrity? Clearly it allows for **adaptability,** for landscapes to change, but it also means that it can be a **working landscape** (perhaps with a slightly broader definition than given earlier in this forum, to include whatever people do, not just necessarily growing grass). Ecological integrity also implies stability but that stability would come from the juxtaposition of a number of different elements – **mosaic stability**.

The New Zealand Biodiversity Strategy sets out as a major goal to 'Halt the decline of indigenous biodiversity'. This means to 'Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments and do whatever else is necessary to maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity'. You may not like the Biodiversity Strategy and may feel it's an imposition, particularly on private landowners and with regard to the high country, but I think we need to remember that it was produced following widespread consultation and that those of us who live in towns also live under the Biosecurity Strategy, which was primarily set up to protect rural land activities.

Ecological integrity can be broken down to three basic components:

- Indigenous dominance - systems that are dominated by native species.
- Species occupancy - systems wherein we have a full complement of native species that are available (we are not talking about reconstructing the moa or bringing back all species that are now isolated on offshore islands, but as full a range as possible).
- Environmental representation – the full environmental range exhibited in New Zealand.

This perspective embraces plants and animals. If we deconstruct ecological information in this way we can use it as a sustainability indicator, a criteria for landscape assessments, or for eco-branding for agri-business and tourism.

Change has occurred in terrestrial systems in New Zealand throughout the Holocene period. What is interesting is that not only was there rapid change as the ice receded, there has also been rapid change with human settlement. For example, pollen sampling at Clarkes Junction reveals a pulse of bracken that resulted from burning and the expansion of the grassland. It also shows that the bio-climate is driving towards trees below the elevation of original tree line: the grasses and other non-woody species are there because of consumption, i.e. something is eating something else or stopping it from getting there (mainly the woody species), or fire is retarding succession.

Dynamic landscapes occur over all sorts of time periods. Figure 1 shows nearly 100 years of landscape change near Wanaka, with woodland expanding into the upland and more houses and more exotics introduced to the lowland. Even over a 100-year period, the dynamism is not necessarily always in one direction.

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[1] Forman, R. (1995). *Land Mosaics: the ecology of landscapes and regions*.

Figure 1: Dynamic landscapes – landscape change between 1909 (left) and 2000 (right)

What are we aiming for in biodiversity protection: pre-human, pre-European or 'pre-CBD' vegetation? There is no going back to what was here before human settlement; we have changed the system and modified New Zealand irrevocably. We are now looking at new environmental conditions and new assemblages of plants and animals, so all we can really hope for is to have systems dominated by indigenous species across representative environments.

The rate of landscape change in New Zealand is increasing. After the Polynesians settled, there were about eight hundred years for the landscape to adjust to their arrival (fire, kiore and hunting). Since European settlement, we have had about hundred and fifty years of mammalian grazing, predators and widespread habitat loss in the lowlands, and still the landscape is adjusting to that. More recently we have had recreation activities, eco-tourism and a whole range of other things that have been here for a shorter period. The level of adaptability in the landscape is often proportional to the duration of these phases: where the phases are recent, we should not expect necessarily to see great adaptations and we may need to watch out for what is happening. What is interesting now is that often what began as over-enthusiasm in the landscape is now turning to 'how do we function sustainably?' By over-enthusiasm I refer to the large sheep numbers that occupied the high country and parts of the low country in the eastern South Island, where initially there was over-burning, over-grazing and depletion of the grasses. All of us would not want to go back to that, but this over-enthusiasm often occurs and is a phase that lasts for different periods.

What drives landscape instability for biodiversity? The literature points to two major issues: land use change and increased intensity of land use. Those two things tend to trigger shifts in biodiversity. To get a more stable or more recovered landscape we have to focus on the regenerative capacities and abilities of the native biota, and concentrate on those elements that are going to give us some adaptive resilience. Post-settlement there was inevitably very low resilience and poor regeneration for many elements of biodiversity. We know when Polynesians arrived that, below the regional tree line in Central Otago, the forest quickly went in response to fire. We have now lost over 99% of that forest, but that was replaced with another native community - the tussocks and shrublands. Of those, 25% of the tussock remains and 12% of the shrubs. In this environment, it really was a landscape of birds. Some are now extinct, others survived, but birds were everywhere; they ruled instead of mammals.

It was also a landscape of lizards and we are only beginning to understand how lizards fitted into the different ecosystems present. We have as many lizard species in New Zealand as we do terrestrial bird species. In the high country we have some of the most amazing lizards on the planet: not just in terms of their coloration, we have geckos and skinks that are truly of international standing. If we look at the conservation status of the birds of the eastern high country, mainly in the Otago area, 90% have been lost regionally; some remain, but not many. There is less knowledge about the 14 known endemic reptiles but we know that two species have become extinct, a third of them are not threatened in any way and the rest are under some form of threat – 21% nationally critical and 29% in gradual decline.

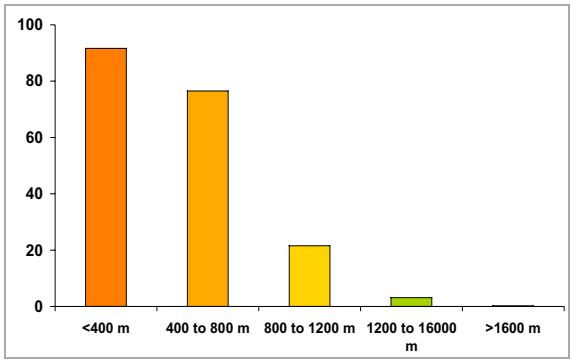

Figure 2: Percentage loss of indigenous cover since European settlement, by elevation zone in Central Otago.

The adaptive radiations that we have in the New Zealand flora and fauna are really spectacular by international standards; notable plant and animal groups have speciated widely. What's interesting is that many of those individual species have

local distributions. Radiations in the native weta, for example, have occurred because of mountain ranges being formed, cut off and joined again following successive glaciations; individual populations have been isolated and new species have developed. These are scattered across the landscape in ways that we are only just beginning to record.

Since European settlement, the loss of indigenous vegetation cover has been greatest in the low country (Figure 2). Most of our threatened plants are in the low country and we have very few in the subalpine and alpine high country. When we look at how we are protecting those environments, we can see that it's actually the opposite to where the threatened plants are distributed (Figure 3). We have protection in the alpine areas but not much in the lowlands. In the areas below about 1200 metres, protection is only going to be achieved through cooperation with private landowners. There is no way that public conservation land will enable the protection of those species.

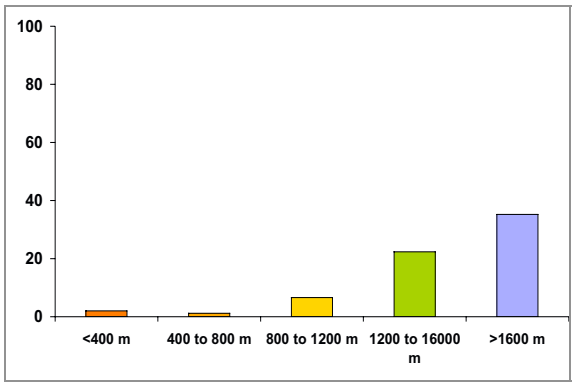

Figure 3: Percentage of elevation zone that is protected for natural heritage (in private covenants or DOC) in Central Otago.

Figure 4: Functional extinction – Lancewood (Pseudopanax crassifolius)

Connectivity is obviously important and we're only beginning to understand, with respect to lizards, that a fragmented tussock grassland landscape leads to decreases in genetic diversity, which limits the ability of those animals to respond to environmental change in the future.

Often in our landscape we are attracted by lone trees in a park-like landscape (Figure 4). For many of these trees, this is functional extinction: once they die they will not be replaced, they will disappear from our landscape. If we want to keep them in our landscape we have to ensure that they regenerate.

In terms of the activities we do, there are always some winners, and sometimes natives win. The tussocks obviously expanded following Polynesian burning but did not necessarily fare so well when mammalian grazers arrived. Kanuka and other less palatable shrub species are extending into some areas, especially following a drop in rabbit numbers. Other natives are spiny or very small and they also win.

Some native plant communities, such as our many turf communities, probably need grazers; it is possible that these developed under avian grazing systems. Rabbits and sheep may have acted as surrogate grazers for the birds who used to be there, limiting exotic species establishment and maintaining turfs. Introduced birds such as geese are also grazing and effectively assisting turf vegetation. As we lose habitat, so we lose biodiversity – we lose species (Figure 5). It is not a linear loss; it is curvilinear. Isolation effects can also result from loss of habitat, as individual remnants of indigenous habitat become further apart. These isolation effects become more significant when only about 20% or less of the original habitat remains.

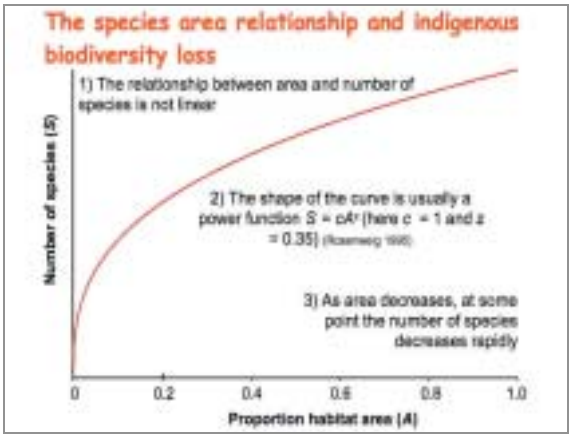

Figure 5: The species area relationship and indigenous biodiversity loss

Losing 10% of a largely intact habitat would lead to a loss of 4% of the remaining species. Whereas in a highly modified habitat where 80% of the original habitat has gone, a further 10% decline in habitat would lead to the loss of a quarter of the remaining species. The significance of habitat loss depends on where it sits on the curve. Central Otago habitats are aligned along this curve in terms of the proportion of habitat remaining according to elevation. Most of the original habitats still remain under indigenous dominance at high elevations but at low elevations further habitat loss would cause the loss of proportionately more species.

When we look at protection (Figure 6) we can see that at high elevations biodiversity is well up the curve. But the protection of lowland areas must be increased, and that is why what happens in many of the environments managed by farmers is significant. We are continuing to lose habitat - indigenous vegetation – and the greatest recent losses have been in Marlborough, the Far North, Tasman, Central Otago and Southland. Many of these areas involve high country, where we are still losing a lot of native vegetation cover.

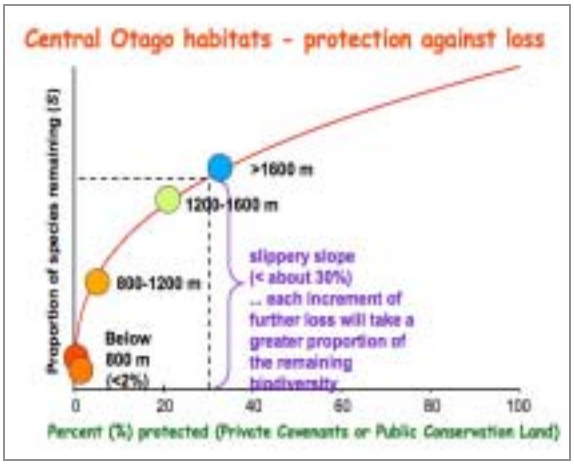

Figure 6: Central Otago habitats

Can we have our native vegetation and eat it too? I think the jury is still out on that; it is going to require more monitoring. It's pretty clear that in many of the landscape systems discussed at this forum there is a lack of regenerative capacity in the native vegetation. Whether that reflects weed invasion or grazing can be debated but in many systems it certainly reflects the fact that both feral and domestic grazers prefer juvenile components of the biota.

One of the problems we have is the inadequacy of the models that we use to manage vegetation. We have followed a range succession model (Figure 7) used widely last century, which assumes that if we graze we force the vegetation to occupy some position along a successional trajectory: if we want to move the vegetation one way we just put in more animals; if we want to move it in another way we just take the animals out.

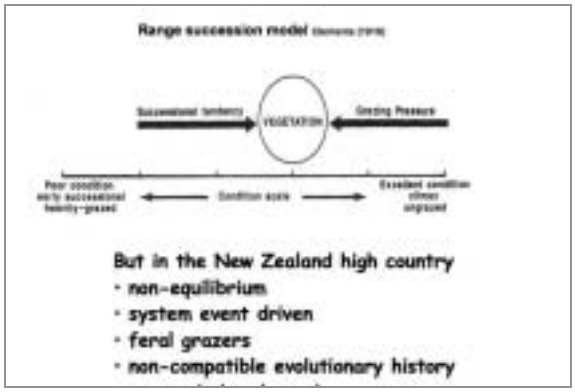

Figure 7: Range succession model

In New Zealand there are very few situations where this equilibrium between grazers and vegetation exists and works in this simple fashion. A lot of our systems are event driven: drought, hard winters, wet springs; it's those things that tend to drive the system, in interaction with the animals. Finally I think we have plants, in particular, that respond very poorly to grazing. There has been a period of intensification in the high country: the number of discretionary consents that have been granted on Crown pastoral leases (to clear, burn, spray, increase stock numbers etc.) has certainly doubled over the last few years, but there could be a number of reasons for that increase. Most of these consents essentially involve clearing indigenous biodiversity.

Figure 8: Fire – no credible role in modern environmentally sustainable agribusiness

Fire and vegetation management in the future will be a big issue (Figure 8). I suspect fire will actually eventually become socially and

environmentally unacceptable. Fire is also largely indiscriminate; it is a very coarse management tool for the landscape. It promotes, or certainly facilitates invasion, by opening up areas, and I suspect that in the long term it is unsustainable because of the nutrient capital lost in the process. Fire retards succession. That may be desirable, but I think that if we want to export our products internationally from modern environmentally sustainable agribusinesses, then the use of fire as a management tool will be unacceptable.

Grazing and weeds: is the cure worse than the disease? We had some presentations earlier on this and I think it is an area where the Regional Council should have an extended forum to work through some of the issues because I can only briefly respond here. Certainly, at landscape scales, I believe there is no evidence that grazing actually controls weeds in the systems that we are talking about: it consolidates weeds, increases the 'invasibility' of vegetation and reduces the regenerative capacity of native vegetation. At some local scales, we may see some slowing of the rate of expansion. Certainly many systems that have been grazed extensively for long periods of time still have a number of weeds in them. If we want to manage these systems, and focus on one weed which we think is the arch enemy, then we will reduce that system to the stature of that weed; in doing so the biodiversity losses will be enormous.

One of the things we see around the landscape is the proliferation of weeds, particularly in the lower elevations, which we know are going to cause problems in the future. But I want us to remember *Rumex acetosella* or sorrel, because in the 50's and 60's that was the bogey weed of the high country and there was a lot of research done on it. What happened to it? No one really knows. It seemed to decline and now, although it is present, you only see a few plants. I'm not suggesting we should all sit around and wait for *Hieracium* to decline, but I suspect in many cases that is what we are going to have to do.

Climate change will make the areas we are talking about wetter and warmer and this will undoubtedly favour shrub expansion. I would argue that at lower elevations and mid elevations it is really important that we encourage the persistence of native shrublands in the landscape.

Achieving national biodiversity conservation outcomes in the high country is not primarily an issue of land tenure and I don't think we can return to a past state. We are not aiming to go back to pre-Polynesian vegetation and it is not an issue of pristine versus modified. I would contend that it is not even about humans being in the landscape; we **are** in the landscape, we dominate the landscape. What it does require is explicit recognition of representative areas required for protection, improving ecological integrity at different scales by ensuring we have the relevant areas set aside for protection of biodiversity outcomes, and we certainly must prevent biodiversity loss.

David Norton talked about management plans in the high country and I would agree. I think we need biodiversity plans for high country farms, with explicit biodiversity outcomes agreed. Some of the discussion at this forum has centred around objectives or monitoring to see what happens with weeds etc. in the landscape and that is good. But what we need to manage for are agreed biodiversity outcomes that allow a particular farm to contribute to national biodiversity goals. Obviously there has to be some security for protection. I'm not saying these areas in all instances cannot be grazed. If they continue to be dominated by native plants, I for one would be more than happy for them to be continued to be managed in whatever way that will continue to facilitate that.

If land is set aside long-term for this then obviously the people that do it need access to publicly available funds for biodiversity protection; I think that will increase. What we require are proactive land users contributing to these national biodiversity goals. I suspect, and I think it is true of many groups, that more often we are reactive rather than proactive. If you recognise the biodiversity values of the area you manage, then the rural community needs to be a lot more proactive in saying 'yes we want to keep them' … 'yes we want to manage to keep them' so that these biodiversity outcomes are recognised. Obviously it will involve maintaining tussock grasslands across a representative range of environments and allowing woodlands and shrublands to expand in underrepresented environments. In the wetter areas of the high country, shrub expansion is occurring rapidly, which is really exciting from a native biodiversity perspective because it is a healing and restoring of the landscape. Finally, we must aim for working landscapes that contain a full range of indigenous biodiversity - a mixture of public conservation land and private protection, creating mosaics that demonstrate that what we do in the landscape is sustainable internationally.

WHERE TO NOW?

Iris Scott – Rees Valley Station

The Scott family has farmed at the head of Lake Wakatipu for a hundred years. My three kids are the fourth generation to work on the land. 'Where to now' for us will be based on the desire to continue the life we have chosen, and the challenge is to design our activities to allow us to 'render unto Caesar' without destroying what we value so highly.

Figure 1: Rees Valley - 'The life we have chosen'

The aim of each generation here has been to achieve **improvements in lifestyle** for the people, and domestic animals, while making sufficient income to educate succeeding generations in their chosen fields.

We are well aware that this is not the way to wealth. While we have an asset we can use to back overdraft facilities, if the farming income is insufficient to pay this off, eventually the land is forfeit. Our primary objective is to hold the land and be responsible stewards on behalf of the nation.

Our mountain landscapes have kept their unspoilt character because they have been extensively farmed. Extensive farming is the art of spreading people and domestic animals thinly over large areas and fits well with the native vegetation. It allows for the native habitats to remain essentially intact over large areas of land, while still permitting economic use. Farming, by definition, means controlling the actions of stock and replacing with fertiliser what is extracted from the land by the harvests.

Contrast this with the philosophy behind Fish and Game NZ, whose predecessors, the Acclimatisation Societies, released all sorts of species for sport with very little intention of managing them, other than ensuring their successful establishment. Degradation of land is much more likely from feral animals than domestic stock and any high country farmer whose stock are degrading their range is not going to gain much at shearing time.

The continuation of farming can be important for the maintenance of those mountain vistas we love. The alternative is an enormous bill to taxpayers for weed control. In the present affluent times, 'full Crown ownership' of all the tops may seem like a good idea, but will it be sustainable in less affluent times?

Figure 2: Unspoiled mountain landscapes

At the moment, wool farming is not producing a sustainable income. While we know people have farmed wool for thousands of years and it always goes up and down in value, we have been forced to look at alternatives. Throughout the time of this family's stewardship, Rees Valley Station has been farmed conservatively to protect the natural values while hosting many forms of recreation and scientific or educational endeavours. 'What now' for us is to find a way for these other activities to make a contribution to the maintenance costs and hopefully a bit more for improvements.

We have looked at other crops to diversify into and, as a general rule, would prefer to grow a healing herb like arnica over some of the less healthy popular ones. We have looked at tourism and tried some diversifications into horse trekking and snow sports. We soon found our strength is not as tourism business operators, but we see ourselves providing a venue for activities we consider suitable for Rees Valley to accommodate. Rees Valley has

a long history of multiple land use and it was with some excitement we read of the Department of Conservation's intention to operate their big high country farm (Molesworth) for multiple land use – farming, conservation and recreation combined - for the good of the nation. The Government would show us how to make multiple land use pay! Alas, step one is the injection of some millions of dollars over the next few years. It's like the old story: 'What do you need to make a little money from a ski field?' Answer – 'A lot of money.' Not an option for us at the moment.

Figure 3: A venue for tourism activities

We are very conscious that Otago's National Park, Mt Aspiring, shares a boundary with us. We recognise the significance of our bit of the landscape in this context. It is our intention that Rees Valley will be managed as a transition zone between the intensively developed head of the lake region and Mt Aspiring National Park. The property has a role to play as a buffer zone for weeds and pests and we take our responsibilities in this area as seriously as finances allow.

We know that a lot of the tourism and recreation activities in our region happen on the conservation estate and are therefore subject to government policy. We see ourselves as offering a venue for some forms of recreation not popular with DOC, such as llama packing and heli-accessed activities. We are a high rainfall area and wheels can cause problems so we prefer trail bikes, mountain bikes and 4WDs to keep off the hills. Other drier properties are more suitable for them and we believe that subtle improvements of the stock tracks to make them safer for horse traffic and walkers is more appropriate for our landscape.

We believe it is important for recreational activities to be controlled, both for the sake of the environment and for the safety and enjoyment of the participants. Some forms of recreation are compatible with the activities already happening. Others should go somewhere else. There is a very good case for some of the high country to remain in private control to provide alternatives to government policy. High country farmers have the ability to identify appropriate forms and levels of activity and can operate concessions as DOC does. We feel we have a well-established credit rating for managing our bit of the high country.

'Where to now' in a more general sense? As long as population growth continues, and affluence allows, people will want to escape to the country. The ones who can afford to realise the dream of a haven away from urban life will have no trouble finding real estate agents and developers ready to make their dreams come true. Luxury and even opulence is possible in almost any human habitat and with it comes the desire to sanitise the landscape to conform to whatever decoration of the land is fashionable.

Figure 4: Llama packing at Rees Valley

Beauty, including that of the landscape, is in the eye of the beholder, and the perception of a sweet life, sipping your own vintner's wine while you gaze across the vineyard at your feet towards the high country tops, is considered by some to be the ultimate. To a naturalist, that elegant development represents total destruction of an existing habitat and tough luck for any chafer beetle or dryland plant living there when the graders come in to rearrange the topsoil.

Where we go now must allow for both ends of the spectrum and as many variations as possible in between. Farming practices are under threat from people whose knowledge of theory is not matched by practical understanding of the 'big picture.' The prevailing view in the room where they keep the big spools of red tape is that regulating everything will save the planet. Hand over the care of the environment to a government department and no one has to worry about that side of life.

In reality, this leads to a giant government controlled monopoly. Nature, including landscape, is diverse. People are part of nature. Their perceptions of beauty ought not to be controlled by bureaucrats who have the power to levy them while imposing petty rules in the name of the environment. Are we so ashamed of our activities that we have to hide our buildings behind bushes and stones? A modern mansion in a prominent position on the landscape is expected to be disguised as a prison. Are we able to progress to a more holistic approach and remember that survival for ourselves and the other life forms is a more important goal than planning the colour palette that is acceptable? Planners should first consider the land use capabilities, and avoid the risk of increasing the erosion Morgan Williams described.

We are in an age where the expensive lawyer carries more weight than common courtesy. Perhaps this is why regulation is rampant. We are surrounded by examples of rural untidiness being converted to manicured lifestyle estates. Large personal fortunes have been created, with economic spin-offs for communities, in the course of this development. Should these opportunities be denied to high country communities just because some people, who mostly already have their patch or only want to drive through the country occasionally, say it shouldn't be changed?

Two previous speakers showed pictures of the Snow Farm. Many thousands of people get a lot of pleasure and/or income from this facility. A lot of snow sports people would welcome a new mountain facility with affordable accommodation. What are the chances? Why do so many people want to prevent buildings on a mountain yet condone total development on the flat? Building on the flat is easier and cheaper so perhaps we have become used to it. We have enormous areas of mountain lands protected, but have almost lost the natural lowlands.

Is something bad because it is highly visible? Our predecessors knew hilltops could be good building sites and that didn't interfere with the tuna habitat! Priorities change as people develop. What right have we to prevent someone building their dream home on land they have paid for? What right have we to destroy a living tree because it obstructs a view we could see if we took a few steps in another direction?

Landscape artists used to seek a point of interest such as an old wagon wheel or dying shed to enhance their picture! Now the fashion is for pristine scenes where human existence is minimised. Graeme Sydney's dislike of the green component reminds me that at least some of it is the result of Catchment Board Run Plans (the predecessor of Tenure Review) authority encouraging extensive farmers to intensify, fence lines similarly. Bureaucratic over-enthusiasm?

'Where to now' must take into account that perceptions are constantly changing; people are diverse and want different things from their environment. Some people want to roar around in noisy machines. Others want to listen to the insects. We must make room for both ends of the spectrum and aim to ensure the survival of our native flora and fauna without imposing a monopolistic control system that stifles initiative with red tape and compliance costs.

The QEII National Trust allows people to protect what they value without committing to a government-imposed policy they may not agree with. It is a fine example of official sanction for individual initiative. The concept of Open Space Covenants which allow some forms of economic use fits well with the high country. It allows opportunities for private control and allows some activities not considered suitable for the conservation estate. There is a point of view that DOC provides a vast playground for trampers and cuts out those who choose different forms of recreation.

Maintenance of the high country in private control, with open space covenants to preserve landscape and other natural values, can lead to exciting developments in recreation and economic areas. We have already seen how organised four-wheel-drive rallies can bring worthwhile benefits to deserving causes. Perhaps a privately run vehicle-testing track where hoons could have fun destroying their expensive off-road vehicles would save

Figure 5: One hundred years of farming – with little noticeable landscape change

conservation land from abuse and contribute to the property's rates bill? As we go forward, let us try to create opportunities, not stifle initiative with regulation. How can we make the RMA enabling as promised, rather than a cash cow for bureaucrats?

I'll finish with a pair of pictures of Rees Valley Station – one is a picture from 1905, the other is a photo we took recently. These show 100 years of farming has not changed the landscape noticeably; biodiversity is not compromised. Why not encourage us to continue, instead of threatening farmers with eviction?

We know we need to change with the times, but it doesn't help to have so much regulation and compliance costs and delays forced on us. It is becoming impossibly expensive to farm in a way that preserves traditional landscapes. A way must be found to allow existing uses, especially those with cultural significance to Pakeha, to continue.

LANDSCAPES RAISE POWERFUL EMOTIONS

Don Ross – CEO, NZ Landcare Trust

Thinking back, it is now 35 years since I initially worked professionally in Alexandra. The first property I went onto was Cairnhill, next door to Obelisk that we heard about yesterday. On to those magnificent rugged landscapes and it wasn't long before we came across an old jeep with a few dogs in the back and a man named Charlie Docherty, then well into his eighties. I learnt much about the high country over the next two hours, as we talked and viewed; I guess for me, it is the characters and the people that make the high country.

I was asked to give my overview on some of the feelings and themes that have come through over this two-day forum. Interesting really, as too often we forget about the people.

The high country for me is all about personal perspectives. This was really highlighted yesterday as I flew to Queenstown: we emerged out of the fog from Christchurch, flew down over the Mackenzie Basin tracking down over Burkes Pass and Grays Hills. On-board were about ten French-Canadians leaning over my shoulder looking out the portholes admiring the magnificence of the visual splendour - fresh snow, sparkling clean water, absolutely magnificent! I felt proud to be a New Zealander; that those people will go away from this country with a very strong feeling about the magnificence of our high country landscapes.

I asked myself, particularly on the background components: how much at risk are they? I think of all the times I've travelled through the Mackenzie Basin: there has only been one major chunk fallen off Mt Cook that I've seen, and the rest of it seems to be pretty safe. The French-Canadians got very excited when I pointed out Wanaka and then they were looking for Queenstown, they appreciate the built capital as much as the natural capital.

As I looked out the window, the canvas I viewed was changing rapidly. I am not sure if I am comfortable about what I saw, but this is my own personal perspective. In the foreground, a zone of traditional high country pastoral farming, I now saw huge circular irrigation rings, long rows of white wrapped baleage, and of course intensive subdivision. Subdivision is a magnificent economic opportunity for the landowners, but for me it is not really what has been my long-term perception of the high country; and everybody's perception is different, hence the emotions.

If there is one thing that has come through quite clearly over the last two days, it is that people are starting to become impatient. There is a desire to move forward; and while there has been the usual point scoring and some tension (which will always be there and is healthy in lots of ways), we have got to get smarter at moving past those positions and conflicts.

Yesterday we heard personal perspectives: from a painter who has deepened our perceptions of high country landscapes, from a photographer who has captured a 'Vision Splendid' and taken this to the world, poets and writers have been quoted. How significant in capturing the heritage!

Community and planning: we have been given the word 'Landship' – a community of people living in and at work on a particular definable landscape. Statutory rules can only go so far in protecting and enhancing the landscape – people shape landscapes through actions. How change is balanced will depend on community attitudes and how these are mediated by an evolving legislative/institutional framework. We have certainly heard quite a lot at this forum about how we evolve this legislative and institutional framework. A lot of people are advocating for the high country and I put a hypothesis to myself as I was coming here yesterday - 'I wonder whether I am going to see landscapes being used as a way to create a resistance to industrial modernisation'. I've probably got to dismiss my hypothesis now after being here for the two days.

The scientists were absolutely great and here are a few points from some of the very well constructed 'people messages' that came out of the four presentations yesterday afternoon:

- Safeguarding of landscapes demands the land care of landships.
- Special character – visual, cultural, ecological and economic.
- 'Immortality of older plants' – easier to retain than restore.
- 'What we see may not remain – it's not so much where we stand, it's the direction we are moving'.

- Value of long term monitoring – 'manage what we measure'.
- Present vegetation of high country is anything but natural.
- Native species are resilient and not under threat.
- Need to be more accommodating of exotics.

Of course there are differences of opinion among the science community. While not wanting to single anyone out, I was most taken by the comment from Brian Molloy that he is 'not aware of any native plant species confined to the high country that has become extinct during the European cultural period'. He talked about the resilience - while there are major issues about ground cover and the hawkweeds, the fact is there is still that opportunity there.

I really enjoyed the opportunity to listen to the scientists, but noted most are well into the grey power era, with little evidence of reinforcements; the institutional memory that we have in these research people is fast disappearing. Let me pay tribute to the handful of scientists who have been important in shaping my perceptions of biotic and social ecology. The high country will be the loser as Kevin and these magnificent men pass on. Congratulations to the Otago Regional Council for making the opportunity possible for us to hear their wisdom.

My experience tells me the room contains many of what I call 'big picture' thinkers. I am sure that the Parliamentary Commissioner for the Environment and his talk about sustaining iconic landscapes in New Zealand made us all re-think. He talked about people, passion, power, wealth and sustainability all within the context of sustainable development. It is interesting as time goes on as you note new words entering into vocabulary – currently the word 'drivers' is very much coming through. Are we clear about the major drivers of land use change and the loss of landscape attributes? 'Protecting bits will not sustain the future.' Uses and activities that degrade must be identified and controlled. The PCE's Growing for Good report is around the drivers of intensification and, as Morgan Williams said, intensification has gone on since we settled - it's just a process. However, while there is a real need to understand these drivers, as we are too quick to point the finger at a particular group, in this case farmers, as driving this intensification. Morgan also raised concerns about insufficient community/institutional capacity to develop appropriate mechanisms: a lack of knowledge in developing plans; a lack of funding for science; complexity and difficulties in changing direction in the policy/legislative framework; and insufficient robust open dialogue. He called for new organisations that sit outside government, capable of developing the long-term view, building social cohesion and building knowledge and capacity – 'been sitting down too long!'

This morning we moved more to the land management perspectives and I thought back to some of the comments from yesterday: 'the present vegetation is anything but natural' (Brian Molloy) … 'what we see may not remain' (Peter Espie) … 'deep drivers of landscape change are shaping land uses, as a process to wealth creation' (Morgan Williams). Humans change landscapes by changing land use and land management practices, a balance shaped by technological advances, commodity and other price changes, evolving individual and community attitudes (i.e. the 'drivers').

The reality is, since settlement, we have focused on exploiting the landscape and we have made some spectacular historical misjudgements on:

- Long term stock carrying capacity
- The impact of feral animals e.g. deer, rabbits
- The effects of introduced plants e.g. hawkweeds
- The unforeseen consequences of clearing
- The susceptibility of bare soils to water and wind erosion
- The risks and consequences of fires

I remember at a high country conference the after dinner speaker (Brian Coman from Australia) said that, when he was once talking about rabbits as an expert, he had been told by an old chap *'Don't worry sonny, they'll be dancing and peeing on your grave*'. We need to think about this as we move into the future.

Another theme is the irreversibility of the processes of land use change. That is why there has been so much focus on the need to protect, the need to conserve as people become more and more concerned about the loss of values that they see in the high country, be it perceived or be it real. The one thing that always fascinates me about high country events is how farmers who live in remote valleys, and

probably don't communicate that often, can get up in forums like this and speak so very clearly and passionately about their special places. Some of the feelings and themes I captured were:

- Could our perception be wrong? We need to keep an open mind.
- Concerned with what is happening in the high country, and the need for a holistic long-term view.
- Concern about the lack of monitoring.
- Research – 'vital part of decision making'.
- Value of local knowledge.
- Stress and strain of keeping people in the landscape, generation to generation.
- How to work with nature – 'Spirit of the high country'.
- Tenure Review – why has the knowledge not been captured in stewardship management arrangements.
- High Country Landscape Code of Practice – Forums.
- Emotional, spiritual attachment.

What really came through were the passion, the spiritual attachment and the values that those people have. The interesting thing was nobody talked about production. Instead we heard about monitoring because we are concerned with where things are going. This was the sort of thing that people were focusing on.

Ways forward

I refer to a book by Jules Pretty entitled Regenerating Agriculture. He talks of three key things that we need to focus on: resource conserving tools; the way institutions operate, and the value of organisations outside of government; and working as a collective.

We have heard over the last two days of a number of resource conserving tools - management plans, environmental stewardship, monitoring, research, programmes that endure and are sustainable, good resource information and integrated holistic approaches

We have heard about the way institutions operate, and the reality is that we need models in the future that are much more involved with local government and central government working alongside organisations and local people.

And we have heard of the value of working as a collective. We heard about several forums, the Greater Christchurch City planning group and the Fraser Basin Council in Canada. Some years back I spent time in Glenorchy working with the local rural and urban people who were working out their vision for the Glenorchy District, both the township and the rural landscape around it.

Sustainability is a movement towards new actions and behaviours, and I must put in a plug for Landcare groups. Through the 1990s, I saw the real value of getting people together to debate and talk about issues as we moved from the crisis of the huge rabbit numbers and people became more and more focused on where they were going in the future. Of course, right through that period, the innovation came through. It is here that this forum has confirmed for me that there are big opportunities to enhance landscapes.

THE WAY FORWARD: COMMUNITY AND PLANNING

Clive Geddes – Mayor of Queenstown Lakes District

I want to thank the Otago Regional Council for bringing us together. I think we will look back on this forum as some form of starting point for all of us to leave behind a lot of the baggage that we've been carrying and to find new mechanisms and new ways of doing things. I will briefly cover some of those that I think local government will be involved in.

Where to now? This is a very good question because it assumes that there is an agreement between us - that there is a need to, and a forum for, carrying the issues that we are addressing forward. If we can't agree on that simple thing, then we might as well just get back together on a regular basis for this sort of talkfest and leave any future actions out of the way. It also imposes on all of us I think, if we do agree that we do need to go forward together in a collective way, an obligation to understand and agree on the relevant and the relative roles that we have. I'm not too sure whether that is currently the case. In my view, this is one of the priorities that we need to establish next.

It is clear that there is a lot of overlapping and we need to untangle that. We need to make sure that each authority, constituent body or stakeholder (a word that I hate) clearly understands what their role is and, just as importantly, understands what their role is not. Then we will have an opportunity to collectively fill the gaps.

What does this process all apply to? It applies to information, it applies to micro-management and it applies to macro-management.

Information

We have a lot of information and a lot more is on the way. I think we are at risk of having so much information that we will be barely able to sift through it to find out what it means to us in our individual relevant and relative role, and what is the best use that we can make of it to achieve our specific goal.

There is a lot more information on the way: John Darby talked of a landscape assessment process that will soon become fundamental to the way development options in the Rural General Zone are assessed within the Lakes District. There is no point in having information unless it is collated and used in an intelligent way to meet whatever the collective goal is. The information we currently have is held by different parties for different purposes and is not necessarily available. It needs to be. Our Council (these are not Council views - they are my personal views) has just come through a tension-filled process, with the farmers who are our constituents, of establishing rules for the clearance of indigenous vegetation. It is a process that started off some years ago as part of the development of our $9 million District Plan and went through the Environment Court; I came along at the tail end of it to be involved in the mediation process. One of the first things that struck me was that all the information was there in order to enable the Council to accurately assess the indigenous vegetation and how it should develop rules for managing the clearance of it. But it existed in a series of discreet silos, some of which were available, some of which were not. The end result was that, on behalf of its community, the Council committed $100,000 of expenditure to undertake its own ecological assessment of each individual property in cooperation with the farmer **in order to produce resource consents** for the following five years. We just have to be a lot smarter about the way we do things.

I think we need to expand the growOTAGO database to include additional relevant information - agreed among the key stakeholders. It is a fantastic resource and seldom used.

Micro-management

I see this as management at local government level. The authorities that are involved in the consenting and management process for high country landscapes need to agree on the information sets that inform their processes. This comes back to the issue I have already mentioned - there are vast amounts of information on indigenous vegetation, threatened species and significant areas of natural vegetation. It is all out there and yet we (the authorities) keep stumbling over each other's processes in order to invent our own.

We have got to be a lot smarter about how we do that. It is my intent get in touch with all of the parties who are part of the process of consenting the clearance of indigenous vegetation so we can set an agenda for an agreed information set for that process and an agreed way of

managing it as a collective of six different consenting authorities.

As local authorities we must also be a lot smarter about our District Plans in Otago. We have learned the hard way, with our District Plan, about how you get robust landscape protection provisions inserted into it. It seems a huge waste of time, money and resources for that information to reside only in our District Plan and for it not to be picked up and used in other District Plans, amended as necessary for their local conditions. I intend to start some talks with our neighbours in Waitaki and Central Otago to see what progress we can make on that.

We have to commit to reducing the overlaps in the management and consenting processes. There are too many overlapping agencies and too many overlapping things that farmers must do to achieve the one management end.

Macro-management

Governance: here I am referring to governance by central government - and I don't mean the government bureaucracies; I mean the body politic. Quite simply, it is my view that we cannot look any longer to a system of MMP government for clarity. I repeat that: we cannot look to MMP government for clarity; what we will receive is compromise. The clarity has to come from us, and it has to be set in front of MMP central government as the imperative for them to put in place.

We need to link the Local Government Act and the Resource Management Act; if we don't, we will pass entirely on the 'landship' concept articulated by Kevin O'Connor yesterday. We have excellent community consultation processes in the Lakes District, in Central Otago and, I am sure, in many other constituent districts.

The community consultation processes in this district were developed on the basis of 'tell us what it is that you enjoy about living in your community today that you want to enjoy in 2025', so we do understand what our communities are saying to us and we do understand the range of views and what the various pressure groups are saying. What we have to do is reinforce with central government (through our local MP's and others) that those outcomes from community consultation must be linked to the consenting and management processes of the Resource Management Act.

The economy: I think that one of the things that blurred our thinking in the last eight years is an economy that has given every appearance of growth. I think in the next two years we are going to see a series of changes that will mean that the economy will not be in the position it has been for the last eight years, for possibly another generation. Remove the effects of immigration and the expansion of government services from the economic growth figures of New Zealand for the last ten years, and you find that net real economic growth has been slightly over one percent per annum. Centre the exchange rate back to where it is generally agreed it should be (between US53 cents and US58 cents) then add these two factors together and I think you will see a future that is not as optimistic and opportunist as the past.

Overseas ownership: my own view is 'if you can take it, take it'.

Tenure review: what should a Mayor of a District Council have to say about tenure review? I think the process has moved from a well-intended discussion between a lessee and a lessor to become something so complex that in my view the appropriate thing to do would be to set it to one side while the real stakeholders get around the table and redevelop the basis upon which it should be undertaken. It is absolutely incongruous in my view that the only agency that can affect land use, that is the local authority, is not a partner in the tenure review process. What we have done in our district is to try to encourage our farmers to come to us and talk about potential land uses prior to entering the tenure review process. It is too late when the deal is done and dusted. The other thing that we need to bear in mind is that tenure review is dealing with the high country on the basis on tenure and title, yet we are trying to understand it on the basis of landscape units. The two are mutually incompatible. I would like to think that a new tenure review process would have the courage to go back to the landscape unit as the unit of assessment and out of that would come robust long-term protection for it.

Last but not least, I want to reiterate what I said yesterday. At no point should any person or any agency ever forget that what we are dealing with in a high country landscape is someone's farm, someone's home, a place where the kids grow up, someone's culture, someone's history and someone's livelihood. In my view, we must commit to being participants in each other's processes, not objectors or submitters to them.

SUMMARY SESSION

Graeme Martin – Chief Executive, Otago Regional Council

Distance and detachment do wonderful things and give you an immense clarity of vision. Asked the question: 'Could the Swiss Alps exist without towering peaks, alpine chalets, ski runs, fir trees, cow bells, wild flowers and rich dark chocolate?' the answer is 'No, not the Swiss Alps'. Yes an alpine chain could, and this difference emphasises the linkages between people and landscape.

Kevin O'Connor gave us 'landship' as a good term to use, and I sincerely hope that it will be used a lot more. The following quotes bring out the richness and diversity of the thinking in the contributions that people have made to this very successful forum: 'We're at home in a landscape but cannot explain why'… 'People are finally shaped by the landscape they live in' …'Landscapes are very personal things for each of us'…'The landscape belongs, not only to those who create it, but also to those who live with it and behold it.'

Grahame Sydney talked about the 'crowding of the landscape', a nice concept, and of 'preserving the natural look and balance'. We need a 'good understanding of the location' and the 'integrity of the landscape', of the 'resonance and repetitiveness of the patterns in the landscape' but 'fences to restrain stock and tracks for access are required'.

On community plans: Clive Geddes said 'Our district's sole asset is its landscape' and asked 'How do you effect landscape protection in a way that respects the rights of the individual property owner?' Malcolm Macpherson commented on his district's approach and the fact that people tend to take a 'whole of view perspective' and Michael McEvedy said that they believe it is their own even though they don't own any of it. He also observed, very tellingly, on environment courts: 'You will never have the best of outcomes when you're not prepared to recognise that ten of something may be acceptable but twenty are not'.

There were different perspectives: Kevin O'Connor told us that we must behave with human awareness, competence and care when we live in and live with an ecosystem. He also reminded us that the term landscape is used in legislation and is interpreted, in a judicial context, without the culture of people.

Alan Mark reminded us that earlier researchers thought they were dealing with a relict landscape. Peter Espie talked of landscapes in transition. Brian Molloy said that the present vegetation is an outstanding example of our bicultural heritage with as much claim to be respected and sustained as the goldfields and rail trails of Otago. He also added that we have an unstable mix of exotic and native species and this must be accommodated.

Jolyon Manning commented on the major shift that is taking place with a new style of settlers now taking over the land, in the lifestyle blocks and others. Morgan Williams stressed that environmental management need to be shifted from the mitigation model to a sustainability model. He commented on clusters - building in clusters and nodes rather than scattering building developments - and added that the 'freeze frame' approach is not okay as a general mechanism to be used for managing whole landscapes.

Jeff Connell says we have to recognise natural, working and historic landscapes, and added that tenure review is not an assurance of landscape. The Mead family consider that grazing plays an important role in controlling *Hieracium lepidulum.* The younger generation commented that the old guard is changing and needs to be respected, but we do need to step up to the mark and make the change together. Andrew Simpson made a plea to invert the RMA rules approach and have landowners recognised and make the landscape their asset.

There were reminders: Edwin Pitts reminded us that, where conflicting positions are held, resolution comes from groundswell, not imposition. John Darby said that landscapes need to endure and work for everyone. John Davies reminded us that successful tourism is all about meeting expectations. David Norton sought for us to seek goals and to take into account the 'drivers for change'.

Tools for change were offered: David Norton suggested that tools that widely scoped farm management plans, with monitoring and review, are a valuable aid to farm viability and landscapes. Bill Lee added that biodiversity plans might be a necessary inclusion, or adjunct to, farm management plans.

Then we had the unthinkable optimism from one speaker (unattributed): 'The high country is just a fabulous place, and if we stuff it up we can just look at the sky'!

We have an opportunity to take a line of 'futures evasion'. We could choose to just be 'grumpy old men': seeking to relive yesterday's thoughts and lost opportunities, criticising the young generation for not sharing our perspectives and 'learning' as we did, extolling our biases as fundamental truths and doing a King Canute in seeking to stop the rising tide of unavoidable changes. Or we can look for future moves.

Should we dare to undertake a local multi-property landscape management trial based on council's adopted community outcomes? Should we adopt the farm management plans; with goals, monitoring and review; and with land use, biodiversity and landscape elements. Should we provide active council support and facilitation for agreed farm plans and their attainment of community outcomes?

The wisdom, the knowledge and the wealth of experience at this forum are greatly illustrated by the array of quotable comments that they have given us.

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