


Will high country tenure review sustain native biodiversity?



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Presentation overview

- Sustainable land management in New Zealand
- Tenure review and sustainable land management
- Whole property management planning as an additional approach for tenure review

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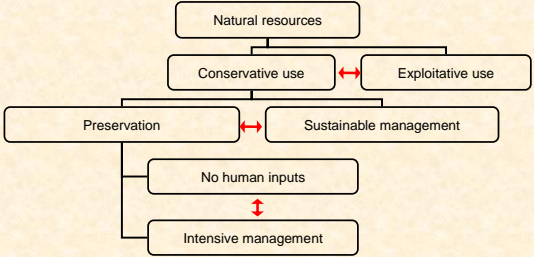
* Agricultural Research Group on Sustainability

Sustainable land management in New Zealand

- Theoretical context
 - Different ideologies about conservation
- Legislative context
 - Resource Management Act *versus* Conservation Act
- Land management in NZ today

Different views on what conservation is

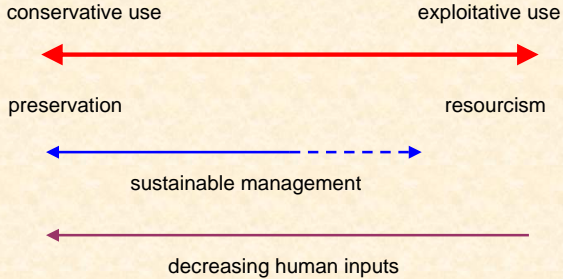
- Preservation *versus* Conservation
 - much confusion over what these concepts mean
- Common misconception that conservation = preservation
 - incorrect to dichotomize these different terms
- Hierarchies and continua



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graph TD
    NR[Natural resources] --> CU[Conservative use]
    NR --> EU[Exploitative use]
    CU <--> EU
    CU --> P[Preservation]
    CU --> SM[Sustainable management]
    EU --> SM
    P <--> SM
    P --> NI[No human inputs]
    SM --> NI
    SM --> IM[Intensive management]
    NI <--> IM
  
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Natural resource management as a continuum



conservative use ←→ exploitative use

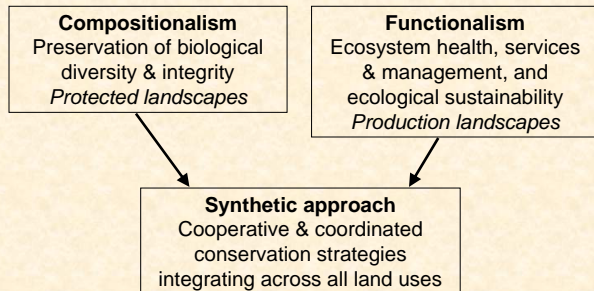
preservation ←→ resourcism

←→ sustainable management

←→ decreasing human inputs

Complementary and synthetic approaches to conservation

(after Callicott et al 1999, *Conservation Biology* 13)



Legislative context

- Legislation primarily for protecting biodiversity
 - Reserves Act 1977
 - National Park Act 1980
 - Conservation Act 1987
 - Crown Pastoral Land Act 1998
- Legislation with a broader mandate
 - Resource Management Act 1991
 - Forests Act (amended) 1996

- **Conservation Act** – “To **promote the conservation of New Zealand’s natural resources**,
- Conservation means “**preservation** & protection of natural resources for the purpose of maintaining their intrinsic values.....”
- **Reserves Act** – “(a) Providing, for the **preservation** & management for the benefit and enjoyment of the public, areas of New Zealand possessing (ii) Wildlife; or (iii) Indigenous flora or fauna; or (v) Natural, ..., biological, geological, scientific,, or other special features or value:
- (b) Ensuring, as far as possible, the survival of all indigenous species of flora & fauna, both rare & commonplace, in their natural communities & habitats, and the **preservation** of representative samples of all classes of natural ecosystems & landscape which in the aggregate originally gave New Zealand its own recognisable character”

Resource Management Act

- 1) The purpose of this Act is to **promote the sustainable management** of natural and physical resources.
- 2) In this Act, “sustainable management” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety **while—**
 - (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
 - (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

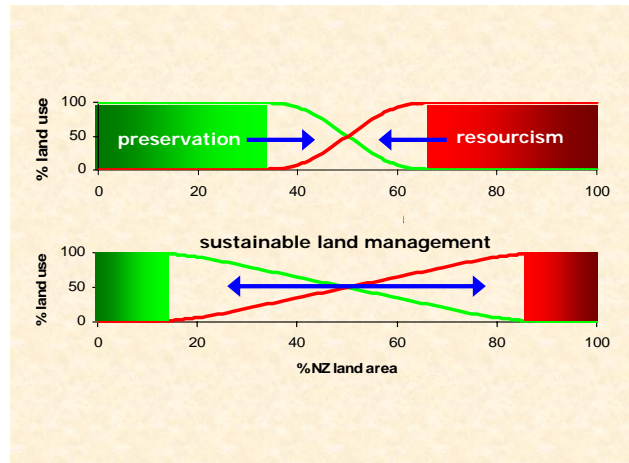
Amended Forests Act 1993

- Intention of Act re indigenous forests:
 - “..... **promote the sustainable forest management** of indigenous forest land” (Section 67B).
- Sustainable forest management is defined as:
 - “..... the management of an area of forest land in a way that maintains the ability of the forest growing on that land to continue to provide a full range of products and amenities in perpetuity **while** retaining the forest’s natural value” (Section 2).

Crown Pastoral Land Act

- Ten objectives, but two have primacy
 - **Promote ecologically sustainable land management**
 - **Protected significant inherent values** of reviewable land
 - Significant Inherent Values means “inherent value of such importance, nature, quality, or rarity that the land deserves the protection of management under the Reserves Act or the Conservation Act”
 - Inherent Value means “a value arising from— (a) A, ecological,, or scientific attribute or characteristic of a natural resource in, on, forming part of, or existing by virtue of the conformation of, the land”
- Act allows for review of land tenure with key objective being
 - To enable the protection of the significant inherent values of reviewable land— (i) By the creation of protective mechanisms; or (**preferably**)
 - (ii) By the restoration of the land concerned to full Crown ownership and control; and

- Two contrasting philosophical approaches in legislation
 - Preservation focus (CA, RA, NPA)
 - Sustainable management focus (RMA, FA)
 - But CPLA tries to have a bit of both, but really preservation focused
- Jurisdiction of Acts also spatially discrete
 - CA, RA & NPA focus primarily on public conservation land (but provide for advocacy mandate on all land tenures)
 - RMA and FA are not applicable to public conservation land
 - CPLA aims to shift land from leasehold tenure to public conservation land tenure
- But sustainable management focus of RMA is also being squeezed by a range of interest groups (e.g., current debates over water allocation)
- Prevailing political conservation paradigm in NZ today is essentially dualistic – its either preservation (usually called conservation) or its “open slather” resourcism



Tenure review and sustainable land management

- Focus of tenure review is on South Island high country
 - Rain-shadow mountains and basins of eastern SI
 - Predominantly grassland and shrubland ecosystems
 - Used for extensive pastoral farming (especially for merino wool)
 - Mixture of freehold (0.5 million ha), leasehold (2.2 million ha) & public conservation land (3.5 million ha)
- Review of tenure has been an option for leasehold farmers for 150 years, but since 1998 has become a far more contentious issue (CPLA)
- Approach being advocated by Government provides an interesting case study of the dualistic approach to conservation management currently in vogue in NZ

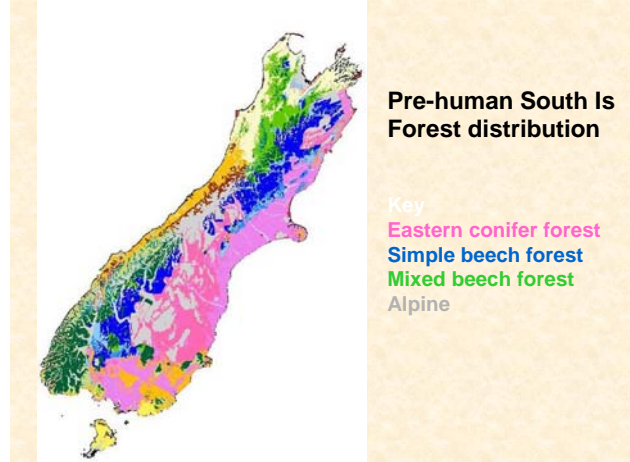


Tenure review under CPLA

- Land Information NZ (LINZ) lead agency (it manages the leases which have a 33-year term with perpetual right of renewal)
- Department of Conservation (DOC) provides advice to LINZ on Significant Inherent Values (SIVs)
- Predominant approach in tenure review is to split land between freehold and restoration to full Crown ownership (under DOC management)
- Splits so far have been c. 60% freehold & 40% Crown, but this is likely to change as additional properties enter the process (suggested final outcome will be 40% freehold & 60% Crown)
- Limited use of conservation covenants on freehold land
- This approach is entrenching the preservation – resourcism dualism to the detriment of environmental values
- Will explore these issues further now

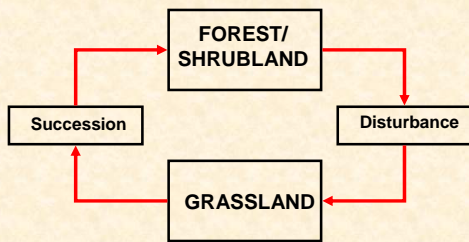
High country tussock grasslands as culturally induced ecosystems

- High country tussock grasslands have been largely induced by 700 years of human settlement
- Prior to Polynesian settlement (1200-1300 AD), most of the high country below alpine timberline carried woody vegetation
- Evidence comes from plant fossils (e.g., pollen), buried logs, surface dimples and forest soils
- Tall tussock grassland largely confined to alpine areas and disturbed sites, otherwise tussocks occurred as mixtures with trees and shrubs
- The present indigenous lowland and montane tussock grasslands are unparalleled in the historical record (not natural grasslands)



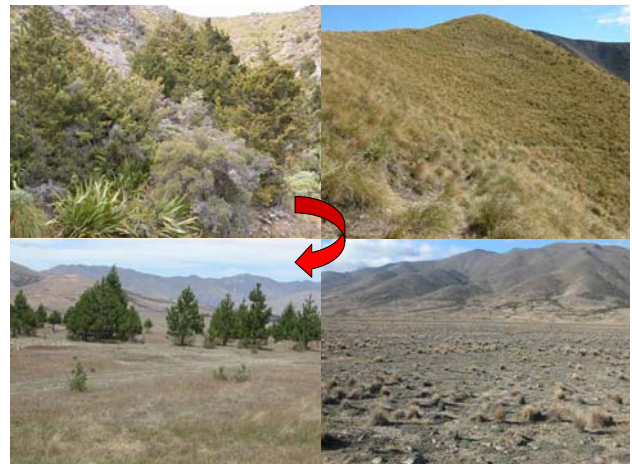
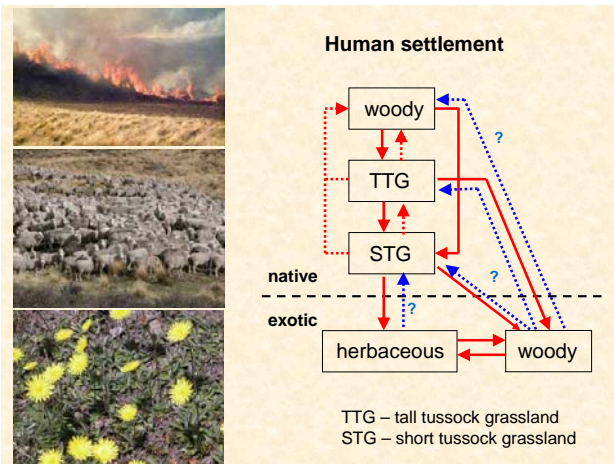
Pre human-settlement ecosystems

infrequent fire, river flooding and slips were main drivers of change



Post-human settlement ecosystem change

- **Maori settlement**
 - frequent fire
 - lead to replacement of woody vegetation by grassland and shrubland vegetation
- **Early European settlement (pre 1950)**
 - frequent fire and intensive grazing of re-growth
 - lead to replacement of tall tussock grasslands by short tussock grasslands
- **Later European settlement (post 1950)**
 - less frequent fire and less intensive grazing (but legacies from earlier pastoralism in terms of long-term ecosystem changes)
 - increasing abundance of invasive plants (herbaceous and woody)
 - possible crossing of thresholds that may not be reversible in foreseeable future



High country ecosystems today

- Induced ecosystems that have evolved under 6-700 years of burning and grazing & with ingress of exotic plants
- Highly valued environments for biodiversity, landscape, recreation and historical reasons
- But removal of pastoral farming will not necessarily sustain these values and may in fact result in a net-loss of biodiversity values across the whole high country (especially due to invasive species)
- Creates a dilemma for conservation in that for many of the tussock grasslands, protecting them from pastoralism is likely to result in the loss of the very values that protection aims to conserve

Benefits of current tenure review process

- Some economic benefits for landowners who now have greater flexibility in farm management (but potential negative biodiversity impacts)
- Difficult to see any clear benefits for the Crown except for being the owner and manager of a further 1-2 million ha of land

Limitations of current tenure review process

- Likely to result in biodiversity losses for several reasons including:
 - Impacts of invasive species on public conservation land
 - Loss of biodiversity on freehold land through intensification
 - Loss of landscape connections affecting overall biodiversity
- Other adverse impacts include:
 - Loss of farmer/community support and stewardship
 - Reduced income regionally and nationally
 - Increased demands on central Government funds
- Fails to consider other options for land management
 - Specifically the option to use protective mechanisms allowed in CPLA which might better achieve ecological sustainability
- Entrenches preservation – resourcism dualism

“New Zealand will have real difficulty breaking out of the partitioned landscape model: production on private lands with pasture predominating, and conservation on public lands. Conservationists do not trust landowners to manage indigenous species in a sustainable fashion while landowners do not trust conservationists who try and appropriate their private property rights”

Morgan Williams, Parliamentary Commissioner for the Environment
19th International Grasslands Congress 2001

Whole property management planning as an additional approach

- Whole property management planning addresses many of the weaknesses identified in the preservation – resourcism dualism that tenure review reinforces
- Three key components to whole property management planning
 - Clearly define goals for ecological sustainability in high country
 - Identify the drivers of change in the High Country
 - Management approaches for resilient high country ecosystems

Defining goals

- Whole property management planning needs to be based on sound goals
- Goals are essential to guide management
- Without goals it is not possible to say if management has been successful
- Important to distinguish between visions and goals
 - Visions are long-term objectives (usually outside the life-span of most management projects)
 - Goals are measurable targets over defined time intervals (usually short-term = stepping stones towards reaching the vision)
- Goal setting is a fundamental but often overlooked component of management, especially for indigenous biodiversity conservation

Goals need to be realistic

- Unachievable goals are a waste of time
- Goals need to reflect the realities of modern high country landscapes
- Goals need to be challenging but achievable – there is no point 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

“A common view of ecological restoration is that it is an attempt to reinstate biotic communities in their original pre-human pristine state. There is much to be said for this view as an idealistic model to work towards but it can seldom be seen as an achievable goal, unless one adopts a very loose definition of the pristine state.”

Ian Atkinson 1990

Realities of high country landscapes

- Current ecosystems are the result of nearly 1000 years of human influence
- Several species are extinct (e.g., moa)
- Seed sources are either absent or very sparse for many species (e.g., previously dominant trees and shrubs)
- A new suite of species is now dominant and “better” adapted to high country environments
- Many high country ecosystems have crossed thresholds that will be difficult to reverse
- People are an integral part of High Country landscapes

Goal setting & monitoring success

- Essential in setting goals to link these with a measure of success
- If the success of achieving a goal is not measured, then little point in setting the goal
- This is important for two main reasons:
 - Provides an auditable assessment of management
 - Enables the success of the methods used to be assessed and modified if necessary - adaptive management
- Therefore three components to goal setting
 - Long-term vision
 - Clearly defined goals
 - Performance indicators to assess success against

What are goals for the High Country?

- Existing High Country goals (e.g., in Biodiversity Strategy, CPLA & Conservation Management Strategies) do not identify specific management outcomes for indigenous biodiversity beyond general statements about "protecting and enhancing"
- What are we actually trying to achieve for biodiversity conservation in the High Country?
 - Maintaining/enhancing the full range of indigenous biodiversity
 - Of species and/or ecosystems?
 - Of ecosystems extant today or present previously?
 - Sustaining tussock grasslands and/or restoring woody ecosystems (and where)?
 - Restoring threatened species
 - Nationally threatened?
 - Regionally threatened?
 - Locally threatened?
- Need to be clear about the answers to these questions before we can identify specific management goals

Drivers of change

- Can't achieve goals unless we understand what is causing change
- Some drivers of change are positive, but many have unwanted outcomes (threats)
- Goals for the High Country need to consider both:
 - Realities of High Country today, and
 - The influence of these drivers of change on future ecosystem composition and structure

Underlying causes

- Provide framework for understanding future change
- Four broad groups of underlying causes of change in High Country ecosystems
 - Global climate change
 - International economic factors
 - Domestic policy
 - Historical legacies
- Two of these (global climate change and international economic factors) are largely outside the control of High Country land managers

Global climate change

- Initial consequences
 - Shifts in average rainfall and temperature
 - Increase in incidence of extreme event such as droughts or snowfalls
- Effects on biodiversity
 - Intensification of farm management
 - alteration to species interactions (e.g., RCD and rabbits, hawkweeds in tussock grasslands, or trout and galaxias)
 - changing species ranges (e.g., contraction of drought-intolerant and warmth-intolerant species)
 - invasion of new species (plants, animals and diseases)
 - potential extinctions

International economic factors

- Oil price increases & global recession
- Changing consumer preferences/demands
- Availability of substitutes for product or producer
- Initial consequences
 - Reduced profitability (e.g., through increased trading costs or alternative product sources)
 - reduced tourism
 - reduced tax take
 - management changes due to animal welfare issues (e.g., use of chemicals for pest control)
 - increased use of natural fibres over synthetics
 - green certification
- Effects on biodiversity
 - changing agricultural focus (e.g., intensification)
 - reduced resource availability for "low-priority" activities (by land owners, local authorities and central government)
 - changing attitudes towards indigenous biodiversity (could be either reduced or increased interest in non-economic values)

Domestic policy

- Regulatory requirements (RMA, HASNO, OSH etc)
- Land tenure review and land ownership
- Public access rights
- National priorities
- Initial consequences
 - increased costs of doing business (both on freehold and public land)
 - changing focus of land use at the landscape scale
 - less community ownership of or interest in non-economic values
- Effects on biodiversity
 - changing agricultural focus and especially intensification
 - reduced resource availability for "low priority" activities (by land owners, local authorities and central government)
 - changing attitudes towards indigenous biodiversity (especially as a result of regulatory pressures, land tenure changes & public access "rights")

Historical legacies

- Loss of seed sources (e.g., for native woody species like Halls totara and bog pine)
- Very small remnant populations
- Alterations to soil conditions as a result of past management (including wind erosion)
- Effects on biodiversity
 - Local extinction of remnant populations
 - Failure of native species to re-establish
 - Abiotic thresholds crossed and difficult to reverse

Summary on drivers of change

- Key drivers of change in High Country ecosystems:
 - Invasive species
 - Changing species interactions
 - Recruitment failure
 - Changing soil conditions
 - Intensification
 - Attitudinal changes
 - Resource availability
- Change isn't bad in itself, and some of these changes will be positive (e.g., changing farmer attitudes with green certification)
- However, many of the drivers of change will limit the outcomes that can be achieved for indigenous biodiversity in the High Country & these need to be acknowledged in management planning

Management approaches for resilient high country ecosystems

Changing tenure doesn't = management

Most High Country ecosystems are induced and all are strongly influenced by external drivers of change, therefore management is essential to sustain indigenous biodiversity across all land tenures

Key is to be adaptive and flexible, and not tied into the "one-model" fits all approach

Whole property farm management plans

- Key tool to ensure positive biodiversity conservation outcomes on High Country farms
- Should be implemented irrespective of tenure (and similar management plans should be implemented for public conservation land)
- Cover all aspects of farm management
- Potential role for local community in plan development and annual review
- Unique opportunity for win-win economic and biodiversity outcomes
- Covenants can be part of the farm management planning approach, but are not in themselves the main way to manage indigenous biodiversity

Question then is why this approach is not being supported by DOC and NGOs?

Why bother with FMPs?

- Formalise existing "best practice" management
- Assist in meeting RMA requirements (e.g., for gaining resource consents)
- Underpin successful certification through green marketing schemes (e.g., eco-wool labeling)
- Provide an alternative model to current 2-way tenure review split
- Reinforce the existing ethic of stewardship that farmers have for their land
- Provide feedback on effects of management activities (essential for adaptive management)

What will FMPs involve?

- Clearly defining goals for property over different time frames
- Overview of property attributes (environmental, social, farming)
- Identification of the key constraints to management achieving these goals
- Subdivision of property into management zones
- Formalising the tools that can be used to meet goals (stock management, weed control, recreation etc)
- Targeted monitoring to provide feedback on management actions

Examples of vision and biodiversity goals for a High Country property

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:

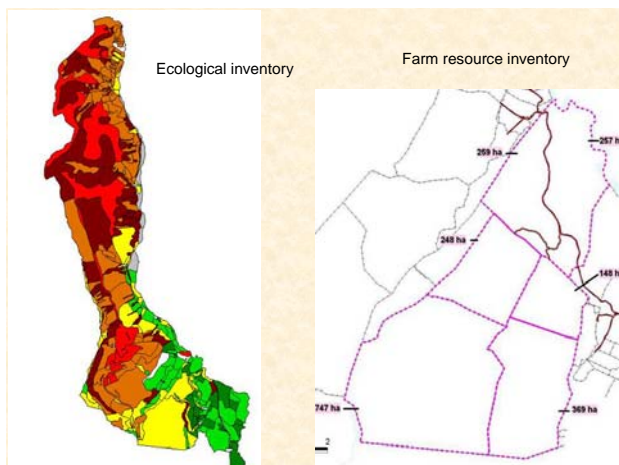
- The property has been "future proofed" as evidenced by not having to buy in feed and not having to sell capital stock during droughts.
- Average weaning percentage has increased to over 100% (given suitable weather conditions)
- Soil fertility is the same or exceeds levels present in 2005, at least 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:

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

Environmental, economic and social context

- Overview of the property including:
 - geology, landforms, soils & climate
 - vegetation
 - fauna (birds, lizards, aquatic etc)
 - farming history and farming opportunities
 - local economy (including location of main service centers used etc)
 - recreational uses and opportunities
 - other uses of the property (e.g., forestry)
- Based on existing information and initial property assessment



Management constraints

- Three broad groups of factors - abiotic, biotic and socio/economic environment
- Identify factors likely to limit farmers ability to meet the short- & long-term goals
- For each factor identify likely consequences and possible management responses (economic, environmental and social)
- Essential to ensure that appropriate management is implemented
- Already considered examples of the key drivers of change in High Country landscapes

Management constraint example

- **Constraint:** “unforeseen extreme weather events such as drought which could have impacts on both biodiversity conservation (e.g., through killing restoration plantings) and farm production (e.g., necessitating bringing in additional winter feed)”
- **Management response (biodiversity):** “sourcing all plant material locally (so that it is adapted to local conditions), timing planting to occur so that plants are well established before summer droughts, use of herbicide to kill the grass sward before planting”
- **Management response (farming):** “investing in additional irrigation to enable more feed to be carried on property (future-proofing the property)”

Management tools

- Major section (probably divided into several sections)
- Discusses in detail the range of tools available to meet the goals for the property
- Include approaches to stock management, pasture improvement, recreational use & biodiversity conservation
- Not possible to foresee all management approaches that might be used & therefore important to allow for regular revision and updating of tools

Possible sections

- 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
- recreational management (including public access, hut maintenance, recreation concessions etc)

What management for biodiversity?

- 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
 - 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

Management units

- Divide property into units that would form the basis of farm management
- Number of units would reflect the environmental diversity of the property
- Management units would be determined by a combination of management practicality and ecological patterns
- Management units will form the basis for implementing farm management and for assessing how sustainable the overall farming operation is

Monitoring – key part of FMPs

- Critical for the whole plan - links to performance indicators associated with goals
- Provides direct feedback to farmer on success of different management actions
- Also powerful advocacy tool (e.g., to show how management can meet Government goals of ecological sustainability and protecting SIVs)
- Monitoring should include:
 - economic indicators (e.g., average animal body weight)
 - recreational indicators (e.g., track or hut usage)
 - environmental indicators (e.g., tussock density).

- Monitoring can be expensive (time and funds) and needs to be focused on the goals
- Some monitoring may require technical input (e.g., stream invertebrates)
- But most should be of a nature that is easy to undertake (& some will already be part of farm management)
- Possible monitoring variables
 - climate
 - soil fertility
 - vegetation condition (e.g., photopoints)
 - animal pests (e.g., rabbit counts)
 - standing crop
 - stock condition (lambling & fleece weight)
 - recreational use



How FMPs might work

- Initial assessment of property (including good mapping)
 - environmental patterns
 - social values (e.g., recreation)
 - farm management practices
- Production of FMP
- Buy-in by outside interests
- Implementation of monitoring
- Regular review of FMP (5 yearly)
 - use as basis for formulating annual work plans
 - possible role for outside groups in review
 - reviews should match any certification audit cycle
 - key is to keep compliance costs low

Costs, funding & benefits of FMPs

- Possible costs to farmer
 - Base-line surveys & ongoing monitoring/review
 - Changes in stocking patterns
 - Restoration plantings
 - Additional fencing
 - Loss of areas to grazing
- Possible funding sources
 - Local government
 - Central government (e.g., biodiversity condition fund)
 - Carbon credits
 - Enhanced market access through green certification
 - Alternative income sources (e.g., through intensification elsewhere on property or ecotourism)

Benefits of whole property management planning

- potential for a diverse range of economic uses (especially if the underlying tenure is freehold)
- economic incentives for conservation management (e.g., weed control)
- building on established ethic of stewardship and capturing the farmers knowledge of the property
- presence of a “manager” on the property all the time
- potential to use sustainable management plans for “environmental” marketing of products (e.g., an “eco-wool” brand)

Conclusions

- Tenure review approach is not unique (e.g., Timberlands)
- But same approach occurs through RMA process where DOC and ENGOs see “protection” as preferred option for biodiversity conservation
- Systemic failure in DOC and ENGOs to support the role of other groups in sustaining native biodiversity
- Covenants still viewed largely as proxy reserves
- Strong antagonism towards any economic use as part of conservation management (e.g., timber or grazing)

- Current NZ land management policies reinforce preservation – resourcism dualism
- This is manifest at different scales
 - Land management decisions such as those with Crown owned native production forests & high country pastoral leases
 - Remnant focus of protection throughout lowland NZ
- This approach has several risks associated with it
 - No guarantee that sufficient funds will be available to properly manage public land (and hence the values there)
 - Potential loss of biodiversity values on private land
 - Overall loss of biodiversity through loss of landscape focus
 - Loss of income to NZ (including loss of potential income through private tourism)
 - Alienation of rural communities (& their input into land management)
 - Loss of culture of private land stewardship

- Management of high country ecosystems essential to “promote ecologically sustainable land management” and to “protect significant inherent values”
- Changing tenure doesn’t equal management
- No one goal for High Country therefore no one “correct” management approach, even for biodiversity conservation
- Farm management plans provide a key tool to meet biodiversity conservation goals within an economic framework and at minimal cost to Government
- 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