

Managing high country landscapes into the future



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Presentation overview

- What are our goals for High Country landscapes?
- What are the drivers of change in the High Country?
- How can we manage High Country landscapes in the face of change?

- Landscape = natural environment (biotic and abiotic) plus the cultural overlay of human inputs (especially farming)
- Indigenous biodiversity = plants and animals that occur in New Zealand naturally (but exclude introduced species like hawkweeds and rabbits)
- Change is a key feature of the High Country – these are dynamic landscapes that we are managing
- Objective is to manage High Country landscapes in a manner that results in resilient ecosystems within which indigenous biodiversity is sustained
- Resilience = ability of system to return to recover after an external perturbation
- Comments apply to all High Country land tenures

What are our goals for High Country landscapes?

- 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
- This presents many problems, perhaps most importantly because 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.”

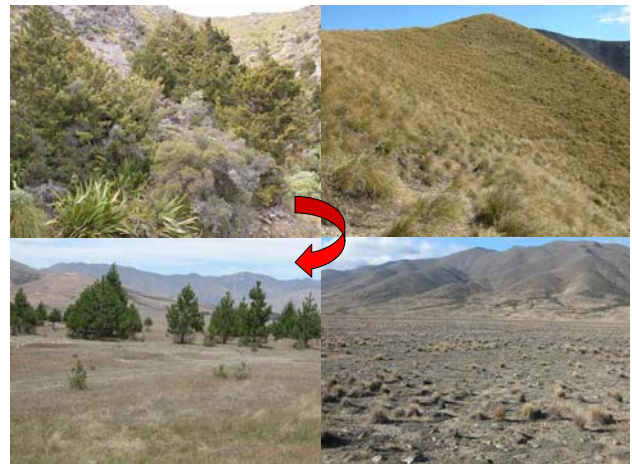
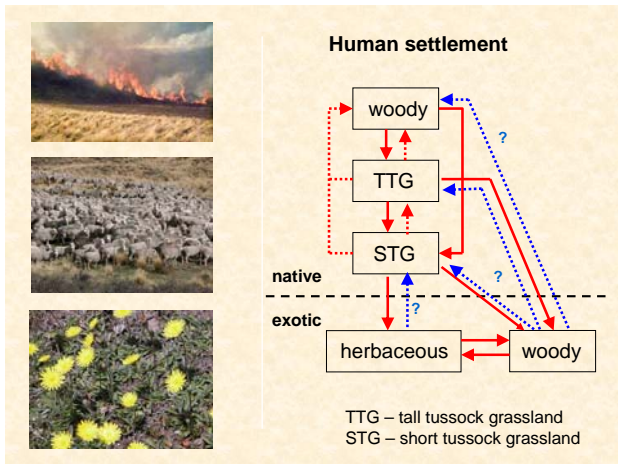
Ian Atkinson 1990

Goal setting & monitoring success

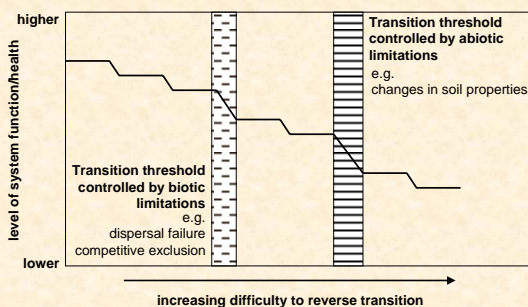
- Essential in setting goals to link these with a measure of success
- If the success of achieving a goal is not measured, then little point in setting the goal
- This is important for two main reasons:
 - Provides an auditable assessment of management
 - Enables the success of the methods used to be 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

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 other 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



Conceptual model of transitions between undegraded and degraded states in High Country tussock grasslands



Goals for the High Country

- Presently unclear what specific goals are for indigenous biodiversity in the high country at either a national level or a local level
- Absence of national level goals (beyond general statements) makes it difficult to justify current tenure review programme
- Absence of local level goals makes it difficult to implement management actions that will actually assist in sustaining indigenous biodiversity

National biodiversity goals relevant to the High Country

- Legislation and national strategies (sets broad context)
- Crown Pastoral Land Act (1998)
 - Promote the management of the Crown's high country land in a way that is ecologically sustainable.
 - Protected significant inherent values of reviewable land by the creation of protective measures, or preferably, by restoration of the land concerned to full Crown ownership and control.
 - Ensure that conservation outcomes for the high country are consistent with the New Zealand Biodiversity Strategy.
- Biodiversity Strategy (2000)
 - 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 what else is required to
 - Maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity.
- But provides no guidance for actual management of indigenous biodiversity or performance measures to assess success in meeting goals

Department of Conservation goals relevant to the High Country

- 2005-2008 Statement of Intent
 - Provides more specific outcomes
 - "Managed species have a lower risk of extinction"
 - Identifies indicators
 - Change in the threat classification status of managed "acutely threatened" species or subspecies"
 - But only applies at a national level – does not guide High Country management
- Conservation Management Strategies
 - Focus on regional priorities
 - Identify objectives
 - "to protect and enhance the viability of priority threatened species' populations and their habitat(s) in the Waitaki unit" (Canterbury CMS)
 - Outline specific management actions, but no measures of success
 - Also difficult to use to guide site based management

District Plans goals relevant to the High Country

- All District Plans have objectives and policies relating to native biodiversity
- Example of an objective & policy (from Mackenzie District Plan)
 - "To safeguard indigenous biodiversity and ecosystem functioning through bthe protection and enhancement of significant indigenous vegetation and habitats, riparian margins and the maintenance of natural biological and physical processes"
 - "To identify in the District Plan sites of significant indigenous vegetation or habitat, and significant geological or geomorphological features, and to prevent development which reduces the values of these sites or features"
- But no specific outcomes identified and again does not guide on-the-ground management

Problems with existing goals/objectives

- High level and general
- Often lack performance indicators
- Don't identify specific goals for indigenous biodiversity in High Country beyond general statements about "protecting and enhancing"
- Don't provide any guidance on what we are trying to achieve with biodiversity conservation in High Country
- Therefore provide no guidance on what management approaches might be required beyond a general wish for more "protection"
- Provides no justification for tenure change in itself as a management tool to meet national goals

How can we address this problem?

- Need to clearly define our goals for High Country indigenous biodiversity
- Need to address these goals at different levels – nationally, regionally and locally – and to develop them for all land tenures
- Goals need to be specific and relevant to the realities of High Country ecosystems
- Goals need to be developed in partnership between different interest groups including local communities
- National goals for indigenous biodiversity are well defined by Biodiversity Strategy, but are not translated well down to local levels
- Goals at local levels need to include consideration of the aspirations of the local communities

What are we trying to achieve in the High Country?

- Maintaining/enhancing the full range of indigenous biodiversity
 - Of species and/or 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 local-level goals and hence implement appropriate management

What are the drivers of change in the High Country?

- 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 & 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

- Global recession & oil price increases
- Changing consumer preferences/demands
- Availability of substitutes for product or producer
- Initial consequences
 - increased trading costs (lack of profitability)
 - alternative product sources (e.g., China for velvet)
 - 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/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 reestablish
 - Abiotic thresholds crossed and difficult to reverse

Summary on drivers of change

- Six key drivers of change in the High Country:
 - Invasive species (climate change)
 - Species interactions (climate change)
 - Intensification (climate change, international economic factors and domestic policy)
 - Attitudinal changes (international economic factors and domestic policy)
 - Resource availability (international economic factors and domestic policy)
 - Recruitment failure (historical legacies)
- 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

How can we manage for resilient high country landscapes?

Changing tenure doesn't = management

"it is essential that we do not view reservation as the end of the conservation effort, but rather as the beginning"

David Norton, Forest & Bird magazine 1988

Management is essential for sustaining indigenous biodiversity values

- Need management that reflects goals and hence reflects:
 - realities of High Country today
 - threats to indigenous biodiversity
 - community aspirations
- Most High Country ecosystems are induced and all are strongly influenced by external drivers of change, therefore management is needed to sustain indigenous biodiversity
- Management for indigenous biodiversity is required across all land tenures
- No-input management is unlikely to sustain indigenous biodiversity in the High Country

- No one goal for High Country therefore no one "correct" management approach, even for biodiversity conservation
- Need to utilise a range of management tools that reflect the range of goals for the High Country
- Goals & management approaches will vary across High Country and even within one part of the High Country (e.g., within one area)
- Key is to be adaptive, flexible etc and not tied into the "one-model" fits all approach
- The challenge is to apply the correct management to achieve the desired goals

What management?

- Management can involve a range of activities including:
 - Monitoring
 - 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 and/or fire exclusion
 - Amenity and shelterbelt plantings
- 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
 - Consider one example

Native brooms (*Carmichaelia*) appear particularly vulnerable to grazing and usually do best in the absence of grazing (by stock or animal pests)

Left: *Carmichaelia crassicaule* – Gradual Decline

Right: *Carmichaelia vexillata* – Serious Decline



In contrast several native herb, appear to suffer through competition in the absence of grazing.

Left: *Lepidium sysimbrioides* – Gradual Decline
Right: *Convolvulus verecundus* - Sparse



- Biodiversity conservation too important to limit its management to only one group
- Need to use all available options to achieve desired outcomes
- Need to work with pastoral management to achieve High Country biodiversity goals
 - Many High Country ecosystems induced and indigenous biodiversity benefits from ongoing pastoral management
 - Widespread and ongoing impact of invasive species
 - Willingness to undertake monitoring
 - Land manager always on property
- Treat pastoral farms as one component of over-all High Country biodiversity management strategy and work in partnerships

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 as well)
- Potential role for interested parties 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 tenure review 2-way split
- Reinforce the existing ethic of stewardship that farmers have for their land
- Provide feedback on effects of management activities

What will FMPs involve?

- Clearly defining goals for property over different time frames
- 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, 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 XXXX 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 biodiversity goals:

- Representative examples of the full range of natural ecosystems on the property are being managed for their indigenous biodiversity values.
- The current extent and condition of tall tussock grasslands has been maintained.
- Animal and plant pest species have been managed to a level that does not threaten either economic or biodiversity values
- Management has successfully reduced the cover of mouse-ear hawkweed within the YYYY block.
- Stream health is the same or exceeds levels present in 2005.
- At least two wetland restoration projects have been commenced

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
- Complete an assessment of the wilding spread potential and removal options for the established conifers around XXX 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.

How FMPs might work

- Initial assessment of property (including good mapping)
 - environmental patterns
 - social values (e.g., recreation)
 - farm management practices
- Production of FMP
 - vision and goals
 - constraints to management
 - management tools
 - monitoring
- 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

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 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 (e.g., photo monitoring)

The role of covenants

- Key tool to assist with meeting management goals
- Can provide long-term certainty over management of an area (both for future farmers and for outside agencies)
- Require clear goals for area and can include pastoral management as well as biodiversity goals
- Could be applied to whole property, or parts of a property reflecting particular values present, with different covenants on same property having different goals and management
- Can focus on landscape or biodiversity values
- Landscape covenant (potentially extensive) might restrict earthworks and AOSTD but permit ongoing grazing
- Biodiversity covenant (localised to extensive) might limit stock type or density, or might restrict grazing totally
- Needs to be room for flexibility with covenants (within prescribed bounds) as difficult to predict future conditions

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

- Need to clearly define goals for High Country indigenous biodiversity at both national/regional and local scales
- Need to include performance measures with goals to enable success of management interventions to be determined (essential feedback)
- Goals need to be realistic with regard to the factors that are causing change in High Country landscapes
- Management essential as High Country biodiversity values unlikely to be sustained otherwise
- 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