

Guidelines for Preparing Whole Property Management Plans for High Country Farms



**High Country
Accord**

**merino
inc.**



Sustainable Farming Fund Project 04/063

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2 March 2008

“The discourse revolves around the rhetorical (and overly simplified) dichotomies of production versus conservation, which often are highlighted in the environmental regulatory arena. Conservative pastoralists who depend upon ecological stability for their livelihood and way of life could focus production and conservation in a form of active curatorship of a changing ecology that is informed by observation, skill and experience.”
Michèle Dominy (2001:39)



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Executive summary

These guidelines have been prepared to assist high country farmers prepare whole property management plans for their properties. Farmers can use an electronically available template (www.forestry.ac.nz/nortonlab/home) as the framework for preparing their management plan while these guidelines provide the guidance on how to fill in this framework. While the guidelines have been written for high country farmers, they should be equally relevant to hill country farmers, or to any land manager who wishes to plan for the full range of economic, environmental and social issues that farmers face today in managing rural land in New Zealand.

Three factors are increasingly making management planning a necessary part of farming in high country environments; (i) resource consent requirements, (ii) the need to be able to demonstrate sustainable land management as part of product marketing, and (iii) the desire of some high country farmers to continue managing significant inherent values on their properties after a Tenure Review.

The management plan has been divided into four main parts, with each of these further subdivided. The actual sections included in an individual plan will vary depending on the circumstances of an individual property, but the management plan template is based around this structure. These guidelines review each of these sections and include suggestions on the types of material that could be included within each section.

Introduction: This part includes sections on the management plan context, vision and goals for the property, summary of property management, and opportunities & constraints to achieving the vision and goals. The vision and goals are perhaps the most important section of the management plan as it describes the vision that the farmer has for their property and the goals that need to be met to achieve this vision. The other sections outline the context within which the vision and goals are founded.

Management units: This part provides both a division of the property into management units and the identification of management objectives for each unit. These management objectives outline the key approaches to the management of each unit and reflect the underlying economic and environmental (including social) values of the property.

Management approach: This is the biggest part of the management plan and includes sections on finances, infrastructure, pasture and soils, stock, plantations and woodlots, plant and animal pests, native biodiversity, recreation and historic resources, agrichemicals, energy & water efficiency/quality, and health and safety. These sections discuss the strategic approach to different aspects of property management required to meet the goals for the property. Each of the individual sections requires sufficient detail on the strategic approach to each issue in order to guide day-to-day management but should not be prescriptive in specifying the specific management actions that will be undertaken.

Implementation: The final part of the management plan includes sections on monitoring and plan implementation. The monitoring section outlines the methods that the farmer will use to monitor the consequences of management actions. Many of the management actions assessed in the monitoring section relate back to the specific performance targets set with the individual management goals and as such provide the quantification of the success of management at meeting these goals. Monitoring is an integral part of adaptive management, in that management actions should be modified (adapted) in response to the information that monitoring results provide. The implementation section discusses how the plan will be implemented, the way that farm operations will be reviewed, and the role of external stakeholders if any in this review. There are a number of different approaches that could be used for review, but what is important is that there is regular review to assess what has been done, and more importantly what hasn't been done and why. Obviously the approach to management plan review that is taken will depend on the circumstances of the property.

The final part of this report discusses the use of covenants as part of management planning, and the relationship between management plans and environmental and animal welfare certification and auditing. It is suggested that covenants and easements in themselves are only tools that can be used towards meeting broader objectives; it is the manner in which the land is managed that is most important. However, a covenant or easement can be used to ensure that the management plan goals relating to particular significant inherent values (SIVs) are being met through time and provide certainty to stakeholders on the long-term management of these SIVs.

Whole property management plans can assist high country farmers meet the increasing demands on them to show accountability in the way in which they manage their farms. Management plans do not provide any guarantees about how a property is managed, but do provide a framework to assist the farmer to plan properly for the different values present, and if used correctly, can provide an excellent framework for the auditing of farm management activities. In particular, the goals and performance indicators incorporated in the management plan can be tailored to meet the auditing requirements of a certification scheme that a farmer might choose to belong to.



1. Introduction

These guidelines are the final output from the Ministry of Agriculture and Forestry Sustainable Farming Fund project “*Can native biodiversity conservation and economic production be compatible activities in the high country?*” (SFF04/063). The objectives of the project were:

1. Determining the optimum way that a whole property farm management plan might be written to facilitate the management of a range of values (economic, native biodiversity, recreation, aesthetic) in an integrated and sustainable manner.
2. Assessing the role of covenants as a tool for achieving the desired environmental outcomes as part of a farm management plan.
3. Identifying the most cost-efficient manner for developing and implementing farm management plans.
4. Making a farm management plan template available to the high country farming community.

These guidelines have been prepared to assist high country farmers prepare whole property management plans for their properties. Whole property management plans as defined here incorporate environmental issues into the economic management of a property. The reasons why farmers might want to develop such management plans are initially discussed in Section 2, and then the process involved in preparing a management plan is outlined in Section 3. The main part of these guidelines (Sections 4-7) reviews the components of a whole property management plan. Finally in Section 8 the use of covenants as part of management planning, and the relationship between management plans and environmental and animal welfare certification and auditing is discussed.

These guidelines have been written to enable individual farmers to prepare a management plan to meet their own situation. Most farmers prepare business plans for their properties and many have plans for other parts of their farming operation (e.g., nutrient plans). The management planning process described here is designed to complement business and other management planning undertaken by the farmer by providing a broader perspective on the manner in which a property is managed to include a range of environmental considerations.

These guidelines are deliberately wide-ranging and farmers can choose the parts they wish to focus on and how comprehensive or detailed they wish to go with their own plans. A template that can be used as the basis for preparing a whole property management plan is available electronically on the web (www.forestry.ac.nz/nortonlab/home) and farmers are encouraged to use this as the basis for developing their own plans. The template provides the framework for the management plan with some examples, while these guidelines provide the guidance on how to fill in the template.

There has been and continues to be a strong emphasis on management planning in New Zealand agriculture. Many high country farmers had Water and Soil Conservation Plans prepared in the 1970s and 1980s, while many Regional Councils today either assist farmers in preparing management plans (e.g., Horizons and Hawke’s Bay Regional Councils) and/or require management plans for particular activities (e.g., as part of irrigation consents). Some farm industry groups and non-governmental organizations also provide assistance with farm management planning (e.g., Fonterra have guidelines for developing strategic plans for dairy farms, while New Zealand FarmSure assist farmers in developing land management plans). Many of these management planning systems include a component of environmental planning and the management planning approach outlined in the present document further develop this by integrating environmental issues into farm management planning.

While the guidelines presented here have been written for high country farmers, they should be equally relevant to hill country farmers, or to any land manager who wishes to plan for the full range of economic, environmental and social issues that farmers face today in managing rural land in New Zealand.

2. Why whole property management plans?

High country farms are perhaps unique within the New Zealand agricultural sector not only because of their size and demanding environmental conditions, but also because of the wide range of values present (e.g., native biodiversity, historic, recreation and landscape as well as economic). Most high country farmers chose to farm in these environments because of the presence of these multiple values; they provide both an opportunity and a challenge for farm management, while farmers themselves feel a strong sense of stewardship in terms of sustaining these diverse values for future generations. Three factors are increasingly making management planning a necessary part of farming in these environments; (i) resource consent requirements, (ii) the need to be able to demonstrate sustainable land management as part of product marketing, and (iii) the desire of some high country farmers to continue managing significant inherent values on their properties after a Tenure Review.

The public has also become increasingly involved in discussions on high country farm management through the implementation of the provisions of the Resource Management Act 1991 as well as the tenure review process (see below). Both the tenure review debate and the resource management process have focused on the way farmers manage their land and highlighted the broad range of groups that believe they have a stake in this management (local communities, NGOs, territorial local authorities, Government agencies). As a result, regional and local councils have increasingly been regulating through the planning process to ensure that many farm management activities are open to broader scrutiny through the use of rules in District and Regional Plans that require resource consents for activities as diverse as native vegetation clearance, burning, tree planting, irrigation and tracking.

The nature of the farming industry has also been changing, especially with respect to the marketing of farm products to off-shore customers. Supermarket chains in Europe and North America are increasingly asking questions about the way that animals and the land they are reared on is managed in the production of meat, while the clothing industry has also started to use environmental “clean green” images as a way to distinguish wool products from artificial fibres (e.g., Howies in the UK and Smart Wool in the USA; Figure 1). The New Zealand Merino Company has developed the “Zque” initiative to meet the demands of the international market with respect to both animal welfare and environmental management. The Zque accreditation programme¹ aims to ensure environmental, social and economic sustainability, animal welfare and traceability. Canterbury Meat Packers have developed their “On-Farm Quality Assurance Programme” to ensure that lamb, sheep and cattle meat products sourced from their producers meet the standards demanded by international supermarket chains such as Waitrose in the UK. It is likely that international schemes such as LEAF (Linking Environment and Farming²) will become a requirement for New Zealand producers who wish to sell into particular overseas markets. The focus of LEAF is on viable agriculture which is environmentally and socially responsible. All of these systems require farmers to meet particular standards in the way they manage their animals and land.

Management of high country farms has been and continues to be contentious³. Much of the recent debate has centered on the status and management of Crown pastoral leasehold land and especially the tenure review process, with both Central Government and Non-Government Organisations (NGOs) claiming that tenure review is resulting in a loss of perceived “public-good” values (referred to as Significant Inherent Values or SIVs in the Crown Pastoral Land Act 1998) through the freeholding of previously leasehold land. In particular it has been claimed⁴ that tenure review is failing to protect SIVs in areas that are freeholded while various NGOs claim that tenure review is opening up the high country to unsustainable housing development (e.g., around lakes). Notwithstanding this debate, some high country farmers wish to continue managing significant inherent values on their properties as part of their freehold title after tenure review.

¹ www.zque.co.nz

² www.leafuk.org

³ O’Connor 2003, Todhunter 2004, Norton 2004, Mark & Dickinson 2004, Brower 2007

⁴ Walker et al. 2007



Figure 1. “Clean green” marketing of products made from New Zealand merino wool by Howies in the United Kingdom.

Whole property management plans are important for high country farmers as they can assist them in addressing all of the above issues as well as other aspects of farm management. Specifically management plans can:

1. Provide a realistic alternative to the current two-way split tenure review model as they enable a property to be managed for the full range of values present rather than by partitioning values between public and freehold land with potentially significant losses in both sets of values⁵.
2. Assist farmers in the resource consent process through Regional and District Plans by showing how a particular management action (e.g., water extraction, burning or tree planting) fits within the overall goals for the property.
3. Provide documentation and guidance to assist farmers in meeting environmental and animal welfare certification and auditing requirements (e.g., through the Zqie programme).
4. Provide the management planning framework that those farmers who continue to farm SIVs freeholded through the tenure review process can utilise.
5. Enable farmers to set and record their goals and objectives for the property.
6. Through a formalised monitoring programme, assist farmers to identify developing problems before they become major issues and hence may still be readily manageable.

Whole property management plans are likely to be particularly important as part of the process of providing assurances to stakeholders, regulators and markets about the way in which a particular property, including its SIVs, is being managed. When linked to a set of standards and verifiers, management plans become the central component of the overall environmental and animal welfare certification and auditing process for a property. These linkages are discussed further at the end of this report. Management plans also provide an excellent tool to enable farmers to formalize their own best-

⁵ Norton 1991, 2004, 2006

management-practices, and as such can be an invaluable tool for guiding farm employees and contractors. However, in order to successfully meet the objectives outlined above, management plans needs to be implemented in a cost effective manner; management planning will only work if it adds value to the farming community.



3. Developing whole property management plans

In this section the process of developing a whole property management plan is reviewed. Two key challenges occur in developing management plans: (1) ensuring that the cost in both developing the plan and in implementing it is not an impediment to uptake, and (2) ensuring that the farmer retains full ownership of the plan. The latter point is critical as history shows that requiring land owners through regulation to adopt particular management actions aimed at protecting specific values usually fail to achieve their objectives.

Different approaches can be taken to plan development depending on the individual needs and circumstances of a property. However, it would seem likely that plans will either be developed by (1) an individual farmer⁶, or (2) a group of farmers (e.g., neighbors or members of a Landcare Group). In either case, management plan development may occur with or without external assistance (e.g., from a farm advisor or ecological consultant). In some situations (e.g., due to land tenure or market requirements), an external group (e.g., territorial local authority or central Government agency) may need to be directly involved in plan development. There are a number of advantages where a group of farmers work together on plan development, especially through sharing ideas about plan content (e.g., about what are realistic goals) and sharing the costs of any external assistance required in plan development, as well as collegial support.

Whatever approach is taken, a number of common steps will be involved in management plan development including:

- Deciding that a management plan is necessary for the property.
- Collating underlying information on the property – environmental, management, social.
- Defining goals for the property.
- Adapting the management plan template to fit the property.
- Implementation of management plan including monitoring and review.

Depending on the reasons why the management plan is being developed, there may be an additional step in plan development where the plan is provided to an external group (e.g., meat or wool marketing company, territorial local authority, or the Crown) for independent auditing prior to its implementation.

An important aspect in developing and implementing management plans is to ensure that the process is as simple and cost effective as possible. There are, however, likely to be costs in developing a management plan as there is almost certainly going to be a requirement to obtain some technical advice, especially in relation to what SIVs are present on a property, although most of these costs will occur initially and for properties that have been involved in tenure review detailed information is usually available through the Conservation Resources Report. By working together, it should be possible for farmers to share these costs as environmental patterns and associated SIVs are often similar on adjacent properties. Another area where cost may be involved is in establishing and undertaking monitoring, although this will depend on the monitoring method chosen (see later discussion on monitoring).

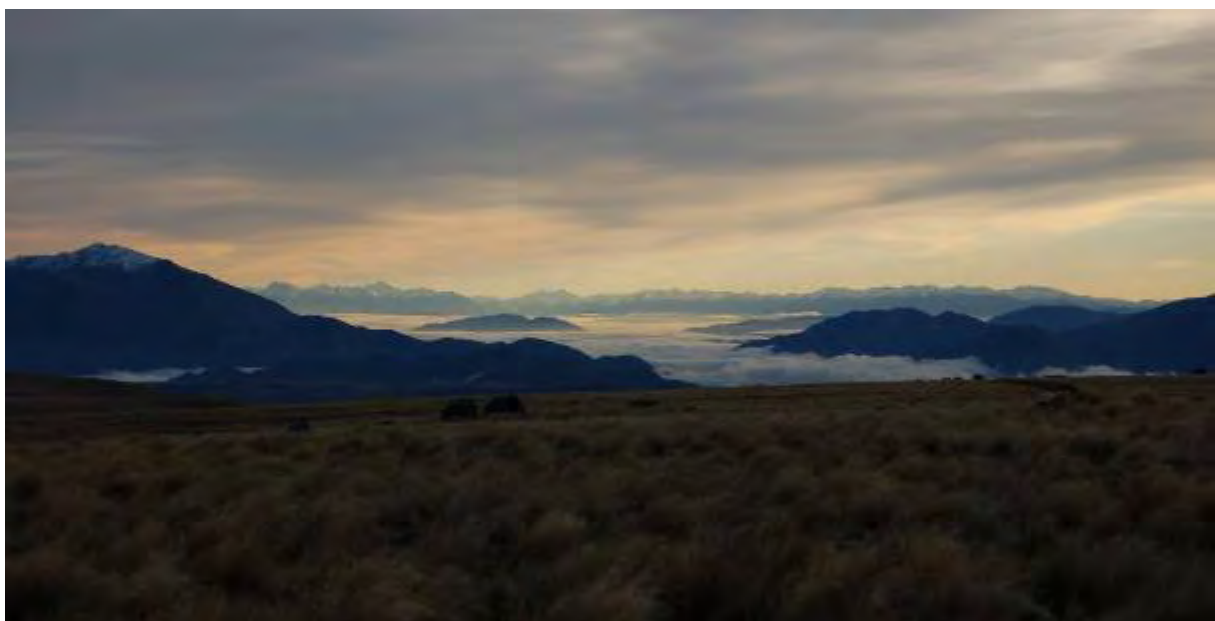
As a basis for assisting a farmer in estimating the possible costs of developing a management plan, an indication of the key steps that are likely to be involved and the time required for technical input to complete each step is presented. However, this estimate does not include any additional technical input a farmer may wish to include for non-environmental issues such as nutrient balances or pasture species selection. This estimate has been developed with a 5,000 ha sized property in mind.

⁶ The term farmer in the context of management plan development is used in this report in a general sense and may include the family as well as the individual farmer, and in some cases may refer to a corporate entity depending on the management structure.

- Collating baseline information on the property (both environmental and farm management) including a site visit and accessing published and unpublished information sources (soils, geology, biology etc)
 - Site visit (2-3 days)
 - Office review (2 days)
- Developing the management plan for the property
 - Meeting with farmer and writing a first draft of the plan (3 days)
- Finalising the management plan
 - Meeting with farmer and finalising management plan (2 days)
- Establishing land-cover monitoring
 - Establishing photo-monitoring across property (2-3 days)

These estimates are based on the assumption that the farmer is developing the management plan alone but using a consultant to do much of the work. This estimate is therefore likely to provide an upper limit for what is involved. No actual costing has been included as this will vary depending on the actual amount of input sourced from a consultant and the particular consultant used (and there will also be incidental costs for travel, accommodation, etc). Furthermore the actual amount of time involved will vary depending on the particular issues associated with the property, the amount of background information already available, and the knowledge the consultant might already have of the property. Some farmers may choose to complete the whole process themselves, while others may take a hybrid approach with varying amounts of external input.

One issue that should be considered in developing a whole property management plan is the potential response that a farmer would make to a sudden and/or major unexpected event such as a drastic market fluctuation or significant adverse climatic or other natural event. Such an event may make it impossible for the farmer to manage towards the vision and goals identified within the management plan and might require a dramatic change in farm management to ensure survival of the farming operation. While it is usually not possible to predict such events or the most probably response, the development of a fall-back position should such an event occur is an important part of risk management and could be included within the management plan. It may be that for some events (e.g., drought), there is a linkage developed in the management plan between stock and pasture management and monitoring to indicate the point at which a back-up contingency plan is implemented for the property (e.g., destocking areas to avoid overgrazing under drought conditions).



4. What a whole property management plan involves

The next few sections provide an overview of the different parts of a whole property management plan and are designed to guide writing the individual sections of the plan using the template. The key elements of a farm management plan are summarised below (Table 1). These will obviously vary between properties, but the management plan template is based around this structure.

Table 1. Whole property management plan structure.

<p>Part A – Introduction Introduction Management plan context Vision and goals Summary of property management Opportunities & constraints</p>
<p>Part B – Management units Management units</p>
<p>Part C – Management approach Finances Infrastructure Pasture & soils Stock Plantations & woodlots Plant & animal pests Native biodiversity Recreation and historic resources Agrichemicals Energy & water efficiency/quality Health & safety</p>
<p>Part D – Implementation Monitoring & data management Implementation</p>

The following sections of this report review the approach taken to each management plan section and outline the information that is likely to be included within this section. In the template, bullet point lists of content and examples, where appropriate, are provided from each section of the management plan. Not all management plans will necessarily include all the sections outlined there, or may include other sections depending on the local situation. The amount of detail that a farmer includes for each section of the management plan will vary depending on the local situation. There is no one “correct” approach to this and the key point is that the detail included is sufficient to meet the needs of the particular situation. The management plan structure presented here is likely to be relevant to most high country (and hill country) farms.



5. Part A – Introduction

The first part of the management plan provides the context for management of the property. It not only reviews the context within which the property is located, but also outlines the likely factors that will constrain the farmer's ability to meet their desired vision and goals for the property. This part of the management plan is divided into five sections.

5.1 Introduction

The introduction provides a brief background to the property including its location and some comments on the property's history. The introduction outlines the management structure for the property (e.g., family or company) and the approach or philosophy (e.g., holistic farm management) that is taken to property management. In particular, this section needs to clearly articulate the drivers for management plan development; in essence the reasons why the management plan has been developed (e.g., market driven).

Key assumptions that underlie the approach to farm management planning taken might include:

- A clear recognition that it is not possible to promote ecological sustainability without:
 - clearly identified management goals
 - financially sustainable farming operation
- Management actions need to be undertaken in a staged manner to ensure they are built on a solid base and to spread resource requirements over realistic time periods (the “Rome cannot be built in a day” principle).
- Management of SIVs is an integral part of farm management in itself through its value for marketing farm products.

The management plan acts as the guiding document for all aspects of farm management. It provides an overview of the approach that will be taken to farm management and covers farming as well as non-farming activities (e.g., native biodiversity and recreation management). While a management plan outlines the principles that underlie management, it should not be prescriptive (e.g., provide specific details on how a particular activity such as pasture development or weed control will be undertaken). The management plan focuses on the “big picture”, providing the framework and principals within which day-to-day activities are undertaken. It is strategic. Avoidance of prescription is important because it can be difficult to predict in advance changing circumstances that might occur in the future, or changing environmental factors that might influence management. Such prescriptive detail is the day to day work of the farmer and their staff, and is based on past experience combined with new developments in management techniques. The key to successful farm management is that the day-to-day management work should fit within the strategic framework of the management plan.

It is anticipated that the management plan will be revised at regular intervals (these guidelines assume a 5-year review period) in response to changing circumstances (e.g., market or environmental driven), experience derived from ongoing management (and monitoring feed back), and the results of external audits of farm management. It may well be that the specific management goals are revised annually as part of annual farm and budget planning.

5.2 Management plan context

It is not possible to develop a management plan for a high country property without first considering the legislative, market, environmental and socio-economic context within which the property is managed. Each of these issues shapes in some way the vision and goals that are appropriate and possible for the property. Preparation of this section is a useful reminder to the farmer of the diversity of issues that affect the management of the property. This section is similar but different to the Opportunities and Constraints section of the management plan (see below). The Context section

provides the broad parameters within which property management works (e.g., the provisions of a District Plan) while the Opportunities and Constraints section outlines the opportunities the property presents as well as the factors that are likely to limit the farmer's ability to achieve their goals for the property (e.g., soil type or presence of a particular weed species). While the context issues are largely beyond the control of the farmer, many of the constraints can be addressed by the farmer through active management.

Legislative context: Primarily dictated by the relevant District and Regional Plan which prescribe a set of rules that will directly affect the type of management that can be undertaken on the property (e.g., tracking or plantation establishment). National legislation (e.g., Health and Safety in the Workplace Act, Hazardous Substances and New Organisms Act, Wild Animal Control Act and Historic Places Act) also directly affect the way in which a farmer can manage their land. While it is not possible or necessary for a farmer to list all relevant legislation, the major issues relating to the property should be reviewed here. These are most likely to relate to District Plan rules relating to subdivision, native vegetation clearance, cultivation, tree establishment, and track and building location, and Regional Plan rules relating to water extraction and runoff, plant and animal pests, and to restrictions on management relating to soil and water conservation. For farmers with pastoral leases, the provisions of the Crown Pastoral Land Act and the specific lease agreement between the Crown and the farmer are also part of the legislative context for the property.

Market context: This is likely to be similar between properties and is influenced strongly by fluctuations in commodity prices and how these require a long-term perspective in farm management. Market context also includes consideration of the relative importance of different products (e.g., wool v lamb v cattle v velvet), and should also include reference to the growing influence of consumer preference for products that have been sourced from properties that meet particular environmental and animal welfare standards and how these requirements can be built into management planning.

Environmental context: This section should provide a brief summary of the broad climatic, landform, soil and biotic characteristics of the property which in turn dictate the different options that are available for property management. For many properties, environmental information is available from Protected Natural Areas Programme survey reports and more recently from tenure review Conservation Resources Reports. The amount of detail required will vary from property to property, but an awareness of the environmental context of the property, and of any SIVs present, is essential to ensure that informed decisions and tradeoffs in management are made to ensure that optimal outcomes for the property are achieved through environmentally appropriate farm management.

Socio-economic context: All high country properties sit within a local and regional socio-economic context which includes the economic base of the district, availability of services, infrastructure and recreational resources. Many parts of the high country (e.g., in Queenstown and Lakes District) are increasingly dominated by tourism which creates new pressures and demands on traditional high country properties. Changing service delivery and infrastructure also affect high country farm operations. Most high country properties provide some degree of recreational opportunities, while an increasing number of high country properties border public conservation land, with access to that land occurring along legal easements across properties.

5.3 Vision and goals

This is the most important section of the management plan as it describes the vision that the farmer has for their property and the goals that need to be met to achieve this vision. The vision is a generic statement about how the farmer would like to see the property in the future (perhaps when it is handed on to the next generation) and ideally should include a set of more specific outcomes that need to be met if the vision is to be achieved. The vision and especially management outcomes are likely to have a relatively long time-frame – perhaps 30 years. However, in order to meet this, short-term management goals need to be identified which outline the management steps that will be taken to meet the vision. Five-years is suggested as an appropriate time-frame for these goals because it is short

enough to be realistically achievable, but long-enough to see real progress made towards the long-term goals. As each 5-year period elapses, a new set of goals will need to be developed.

Both the vision and management goals may in part or even totally address specific issues associated with property management as required by an external stakeholder (e.g., a lessor or a market audit system). However, it is more likely that they will primarily reflect the farmers own vision and plans for the property.

Visions need to be challenging, but achievable. The following is an example of what a vision might look like:

“The economic potential of the property 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.”

This vision is necessarily general and a set of more specific outcomes that are important to achieve if the vision is to be realized should be included. Outcomes might include some or all of the following:

- The property is an economically viable farming unit
- The property provides for the family needs
- Farm management is a multifaceted and sustainable operation
- Animal welfare issues are a central consideration in farm management
- Significant Inherent Values on the property are being sustainably managed
- Appropriate public use of the property is facilitated
- Management activities are monitored

The vision and outcomes cannot, however, be achieved overnight both because of the resources that are required to invest in management and because ecological processes work on long time-frames. It is therefore essential that day-to-day management is based around a series of short-term achievable management goals. It might be possible with some management issues to meet a 30-year outcome in five years, but in most cases this will not be the case (e.g., wilding pine control), hence incremental steps in the desired direction are fundamentally important. The following illustrates an incremental approach to wilding conifer management:

- Years 1-5: Map the extent of wildings on the property, remove the main seed source trees, and remove outlier trees.
- Years 6-10: Remove remaining clusters of cone-bearing wilding trees originating from the original seed sources, and continue removal of outlier trees.
- Years 11-15: Control any regeneration at the sites where removal occurred in Years 1-10, and continue removal of outlier trees.
- Years 16 onwards: Maintain annual control of wildings across property on a 5-year rotational basis (covering whole property every 5-years).

Each 5-year management goal should have a performance indicator associated with it. This can be used to measure the success of management in achieving the goal against and can also be related to standards associated with environmental and animal welfare certification and auditing systems.

5.4 Summary of property management

This section expands on the management structure of the property. It should describe the basic approach towards farming (e.g., the mixture of income streams), the staff employed on the property and contractors used for particular tasks, the way the property is set up in terms of infrastructure, any reliance on external land (e.g., down-country leasehold or freehold land for finishing), and other general matters relating to property management. More specific details on stocking patterns, pasture types, fertiliser regimes are included in latter sections of the plan.

A key part of this section is the inclusion of a table summarizing the annual calendar of farm activities (e.g., shearing, fertiliser application, dipping, silage making, summer grazing, etc). This table should

include an indication of which events are fixed and which are more flexible, as this will provide the basis for planning other activities (e.g., fence maintenance). This table will draw on recent experience and be a summary of farm management activities over the last few years.

5.5 Opportunities and constraints

This section of the management plan outlines both the opportunities that the property offers for sustainable farm management, and the factors that are likely to limit the success in achieving the management goals for the property, and ultimately the long-term vision for the property. Some constraints can also be opportunities (e.g., the location of the property close to a major tourist centre, or the presence of particular environmental conditions).

Opportunities that a property offers might include some or all of:

- Scale of the property allows flexibility in management.
- Diversity of property allows diversity in potential income streams and hence buffering against downturns in individual commodity markets.
- Merinos suited to environmental conditions.
- Presence of extensive native grasslands for summer grazing.
- Presence of SIVs, including outstanding landscapes (the “X” factor) important for marketing of farm products.
- Substantial opportunities for additional income sources (e.g., through commercial recreation or eco-tourism).
- Proximity to major tourist routes.

Constraints to land management include:

- Physical factors such as climatic extremes (e.g., snow and drought) and fire.
- Biotic factors such as animal and plant pests, stock health, and ability to provide winter feed.
- Socio-economic factors such as market fluctuations (e.g., wool or fuel prices) and public interest in the property.

A clear recognition of these constraints is essential to ensure that management addresses them. For each constraint, both the reasons why it is an issue (e.g., drought limits what plants can be grown or the timing of grazing of particular blocks) and the proposed response to the issue (e.g., selection of drought tolerant pasture species or spelling of blocks at particular times of the year) need to be discussed. The responses identified here then form part of the management approach section of the management plan.



6. Part B – Management units

Most high country properties are diverse, and this diversity results in a diverse range of intrinsic values across the property and a diverse range of management actions that are required. This section provides both a division of the property into management units and the identification of management objectives for each unit. These management objectives outline the key approaches to the management of each unit and reflect the underlying economic and environmental (including social) values of the property. For example, some parts of the property might have as their primary management objective the production of high quality pasture for lamb finishing and/or silage production while other parts of the property might have as their primary management objective the provision of public access and conservation of particular native biodiversity values (e.g., snow tussock grasslands), with economic use restricted to a limited grazing period.

The division of a property up into management units needs to be based on a good understanding of both the economic values (current and future) and the distribution of other values across the property. The definition of management units is in most cases fairly self-evident, reflecting a combination of environmental units (e.g., terraces, hill slopes, ridges) and management (cultivated, over-sown and top-dressed, native). The resultant management units provide the basis for the management actions described in the plan. The features of each management unit need to be described and it is likely that as further information is collected on the natural and recreational resources of a property that the management unit framework will be revised (e.g., to take into account new recreational opportunities or SIVs).

The identification of management units can be undertaken simply using aerial photos and field observation, involving marking onto the aerial photo the major units present. However, the utilization of computer software such as Geographical Information Systems (GIS – see Section 8.1) enables the farmer to develop a much more detailed breakdown of the property and can feed into all aspects of farm management.

Management units for a typical high country property might include the following (Figure 2):

- Facilities – infrastructure such as roads, tracks, yards, airstrips, silage pits etc.
- Cultivated flats – small to medium sized areas of cultivated, and sometimes irrigated, flats with sown pastures or winter feed crops. Usually characterised by small paddocks more reminiscent of a down-country farm.
- Undeveloped flats – river flats and related sites that have not been developed. Often sparsely vegetated or with considerable matagouri shrubland, and generally used for cattle grazing. Wetlands can be locally important and can have high native biodiversity values.
- Fertilised and over-sown downs and hill country – extensive rolling downs and lower hill country that have been improved through over-sowing and top-dressing (OSTD). Usually with a strong exotic grass (browntop, sweet vernal, cocksfoot, annual bromes) and legume component, although native grassland species are also present. Native biodiversity values can be locally high, especially in gullies and wet areas (lakes, tarns, steams).
- Undeveloped downs and hill country – similar to the above but undeveloped and often with a strong mouse-ear hawkweed component. Both short and tall tussocks can be dominant depending on location and management history, and can have locally high native biodiversity values (e.g., associated with habitat types such as gullies, rocky areas or wetlands).
- High country – the summer grazing country comprising subalpine shrublands, extensive snow tussock grasslands, and often substantial areas of rock and scree. Usually subdivided by natural barriers such as alpine ridges or rivers.
- Lakes, tarns and rivers – not an actual management unit in terms of grazing, but often a key part of a property with respect to native biodiversity and recreational values and in terms of potential vulnerability to management inputs (this unit can be included within the above units or treated separately depending on the nature of the property).

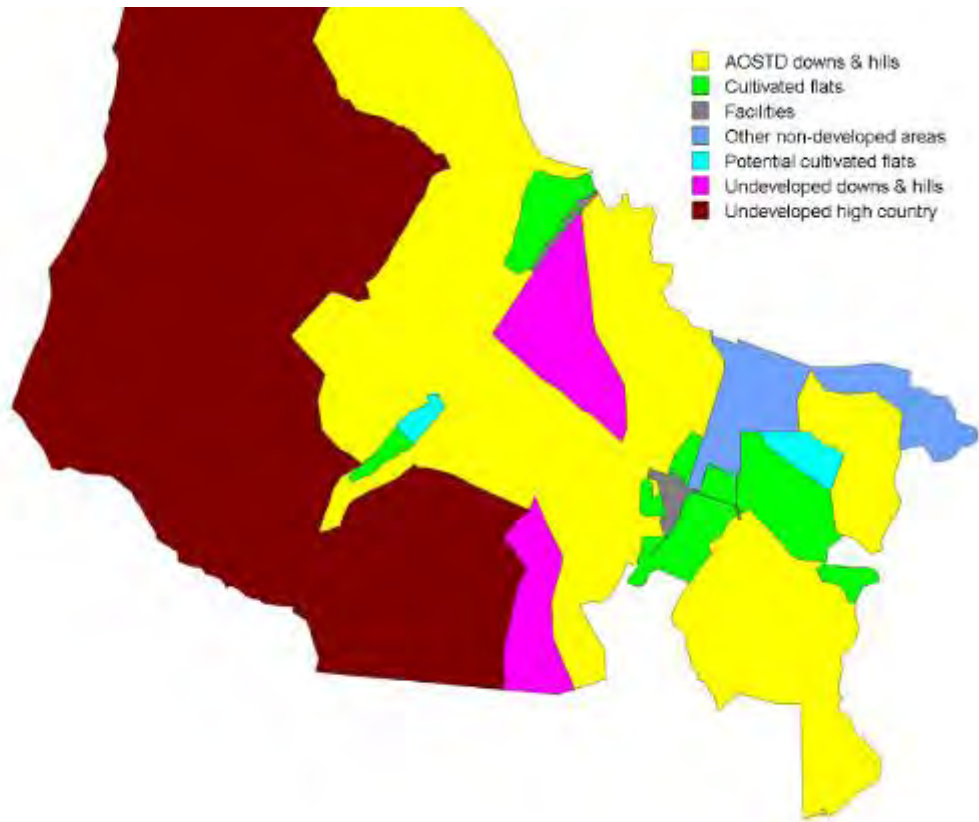


Figure 2. An example of the spatial distribution of management units for part of one high country property.

Identification of the management objectives for the different units is likely to be a more difficult task and will involve tradeoffs as it is usually not possible to maximize all values at any one place. For much of the property, one set of values is likely to take precedence over other value sets. However, in some areas there will be a greater overlap in values, and here a degree of subjectivity will be required in determining what the most appropriate approach is for the particular unit.



7. Part C – Management approaches

This part of the whole property management plan is likely to be substantial as it discusses the strategic approach to different aspects of property management in order to meet the goals for the property. While the management approach section is obviously critical to the overall plan, it is not possible to foresee all management approaches that might be used and it is important to allow for regular revision and updating of these. This part of the management plan should be divided up into the main components of management such as stocking, pasture improvement, animal and plant pest control, recreational management, native biodiversity management etc. Each of these sections will then require sufficient detail on the strategic approach to each issue in order to guide day-to-day management but should not be prescriptive in specifying the specific management actions that will be undertaken (e.g., the winter feed species grown or type of herbicide used).

An example of the difference between general and prescriptive relates to weed control. The management plan would outline the broad approach to weed control including the target species, the areas that are high priority and the types of management that are compatible with other aspects of farm management (e.g., aerial spraying would not be appropriate adjacent to a wetland). However, the determination of the actual species, sites and areas where control will be undertaken in a given year, and the chemicals used, would be part of annual operational planning. In addition, various management guidelines (e.g., for pesticide use or environmental management) also provide prescriptive detail on how to undertake particular activities (e.g., how to store and use pesticides).

The issue of landscape is not addressed separately in the management plan as virtually all aspects of farm management can affect landscape values. Landscape is, however, widely perceived as one of the key SIVs in the high country⁷ and inappropriate management whether due to cultivation, stocking rate, tree planting, tracking or plant and animal pests can impact on landscape and it is therefore essential to consider how management activities are impacting on the landscape and minimize any adverse effects.

The following sections provide an overview of the likely components to the management approaches part of the management plan, although there is likely to be some variation between properties reflecting the local situation. Each of these sections will be linked to other sections because of the interactions that occur between the different aspects of farm management (Figure 3).



⁷ Ashdown & Lucas 1987

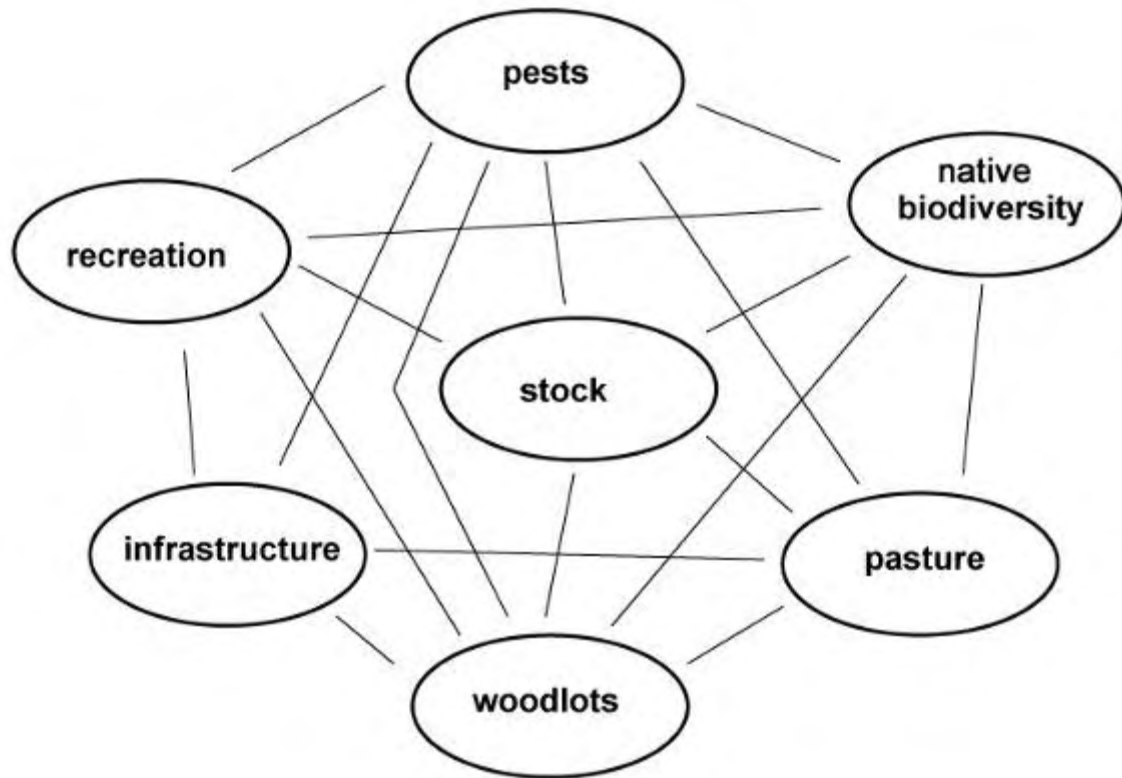


Figure 3. Interconnections between different aspects of high country farm management.

7.1 Finances

This part of the management plan will obviously be confidential to the farmer and covers the approach that is being taken to financing farm operations including mortgages and seasonal borrowing, as well as more general policies on how to structure new developments (e.g., new irrigation) and other activities which will require additional funding. Some comment on successional planning should also be included here where appropriate. All farmers have annual business plans, and these could be developed into 5-year business plans as part of farm management plan development and included here. Business planning provides the financial details on how farm management will meet the vision and goals for the property, so inclusion of a detailed 5-year business plan allows the close integration between the “big picture” planning for the property and the day-to-day management operations. It is likely that the 5-year business plan would be updated annually.

7.2 Infrastructure

This section covers the ongoing maintenance of buildings, yards, tracks and fences, as well as any new infrastructure development proposals (e.g., new woolshed or irrigation). New fencing is included under stock management. Shelterbelts are an essential part of farm infrastructure and both the maintenance of existing shelterbelts (which do require a regular replacement strategy) and the establishment of new shelterbelts should be discussed. Issues including landscape impacts and wilding spread need to be considered with respect to shelterbelts⁸.

⁸ e.g., Ledgard & Langer 1999

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Ongoing maintenance of existing infrastructure (painting, fence maintenance, track upgrades etc).
- Ensuring new developments meet district plan requirements (e.g., landscape issues) and comply with environmental guidelines (e.g., culverts).
- The need to spread both the time involved and costs of maintenance and new development across the five years of the management plan.
- Development of a long-term replacement policy for shelterbelts to ensure that they continue to provide benefits for the farm.

7.3 Pasture and soils

This section focuses on what is done under best practice farm management and doesn't require a large amount of detail on routine farming activities, but should include sufficient information to explain the basic approach that is taken, policies for particular issues, and future plans (e.g., for subdivision and new pasture development). The information included within this section while focusing on pasture management, should also be made within the context of other values that are present on the property (e.g., avoiding OSTD in ecologically sensitive areas).

Inclusion of an inventory of the different paddocks/blocks on the property at the start of this section would help summarise current management practices. This table could include information on area, landform, soil type and nutrient levels, pasture type, fertiliser application, cultivation, current use etc.

Issues to cover in detail are likely to be common to most properties and include some or all of:

- Emphasise the importance of good quality pasture to support the properties stock and also to provide the buffering against adverse weather events – include comment on the need to select pasture species that are adapted to local conditions (often dry and cold). Good pasture also helps balance the impacts that stock might have on native vegetation. Pasture development through OSTD can also be a tool for controlling hawkweed infestation. Again reference should be included to other values and the need to target OSTD operations to avoid impact on other values (e.g., wetlands).
- Summarise routine pasture maintenance including fertilizer application and pasture redevelopment.
- Outline plans for new fencing in the next 5-years and the need to ensure that such fencing doesn't conflict with native biodiversity values and allowance is made for recreational access.
- Plans renewing current irrigation systems or establishing new irrigation in the next 5-years should be discussed, with reference to broader issues relating to sustainability of water supplies and impacts on aquatic values (both in the extraction and run-off waterways).
- The policy for ensuring that there is sufficient feed on the property for both adverse winter (snow) and summer (drought) conditions needs to be discussed.

7.4 Stock

Stock management on any property is the product of many decades of farm management experience coupled with a desire to ensure the land remains in good condition. 'Balance' is the term used to describe the importance of both the lower altitude paddocks/downs and higher altitude hill/mountain country to the sustainable management of a property and is a distinctive feature of most high country farming operations; without the ability to put ewes and wethers into the higher altitude parts of a property during late summer and autumn, the lower country would not be given the essential rest it needs to ensure that it too remains in good order and can sustain grazing through the rest of the year. Most high country farmers are cautious about radical changes to stocking patterns as experience has usually shown what the optimal configuration is. However, new developments such as irrigation, as well as the recognition of other values (e.g., native biodiversity and recreation), can alter stocking patterns and these need to be indicated in this section.

A core part of this section is an overview of the seasonal grazing pattern utilised on the property (stock numbers, type, density, timing with reference to different parts of the property) as this forms the basis for the management of all other values. This could be undertaken in a tabular format (Figure 4), or could be a more general description of the approach taken. A tabular summary could be produced either by paddocks/blocks (as done in Figure 4) and/or by mob (e.g., hoggets, two-tooths, MA ewes) – information on both is a key part of farm management. This information is not intended as a restriction to future stocking options, but rather as a statement of the status quo as a basis for considering future options. This section would also include any plans for changes in stocking patterns, outlining both the nature of these changes and the manner in which they might be implemented. Changes in stocking pattern usually require other changes in property management (e.g., subdivision fencing or new irrigation) and links to these parts of the management plan should be identified. This section outlines the approach to stocking at a strategic level, but in discussing both current and future stocking patterns needs to cross-reference to other values on the property such as native biodiversity and public access.

Block	Area	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
A	185												
			350 ewes x 120 days						350 ewes x 35 days		500 ewes x 120 days		
			15 yearlings x 105 days										
B	148		70 ewes x 63 days										
			220 hinds x 147 days								220 hinds x 220 days		
C	505		350 ewes x 120 days						350 ewes x 35 days		500 ewes x 120 days		
			45 cows x 150 days								25 cows x 135 days		
D	53			100 ewes x 133 days									
			58 cows x 112 days										
E	348		300 ewes x 120 days		150 ewes x 80 days		500 wethers x 21 days						
			480 ewes x 63 days				1450 2" ewes x 120 days			25 cows x 70 days			
F	276		60 yearlings x 60 days		60 yearlings x 60 days					60 yearlings x 30 days			
G	211		380 ewes x 120 days				1500 hoggets x 77 days		1450 2" ewes x 90 days				
			60 yearlings x 50 days										
H	923		500 ewes x 120 days				1450 2" ewes x 60 days				65 cows x 35 days		
I	285		220 ewes x 120 days										
J	2089					500 ewes x 56 days					65 cows x 28 days		
K	1449					400 ewes x 56 days				65 cows x 21 days			
L	1146					750 ewes x 56 days			65 cows x 35 days				

Figure 4. Tabulation of grazing patterns across a subsample of blocks from one high country property (red sheep, blue cattle, grey deer).

Finally, this section should discuss the approaches that are taken to addressing animal welfare issues (e.g., mulesing, shelter and yarding stock) and disease management. Again, this plan should focus on the broad approach rather than the specific details. For example, with regards to mulesing, the management plan should outline the properties policy (e.g., no mulesing) and the alternatives management approaches that will be taken to dealing with fly strike⁹. With regard to diseases, an overview of the routine methods used to deal with diseases (e.g., frequency and timing of dipping) should be outlined, as well as contingency plans for dealing with new diseases or outbreaks of existing diseases.



7.5 Plantations and woodlots

Woodlots offer the potential to diversify the income stream for a high country property if properly located and managed, can offset greenhouse gas emissions through carbon sequestration, and can provide supplementary feed. This section outlines the approach that will be taken towards establishing new woodlots including location and species choice, as well as management of existing areas of plantation trees. The key issues that need to be considered here include the time to maturity, likely future economic value, ability to under-graze, landscape effects, and wilding spread. This section requires a strong link to the section on weed control because of the potential for wilding spread. District Plan rules may well restrict the areas where plantation establishment is possible.

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Undertake review of current woodlots as basis for maintenance and harvesting.
 - Species, age and condition of trees present.
 - Silvicultural requirements.
 - Marketing opportunities.
 - Wilding spread risk.
- Assess opportunities for establishment of new woodlots and plantations
 - Potential additional income sources.
 - Location and species choice need to minimise wilding spread issues but maximise economic returns.
 - New shelter.

⁹ The practice of mulesing is likely to be prohibited in New Zealand by 2010.

7.6 Plant and animal pests

Invasive plants and animals threaten the economic viability of farming both through competition (e.g., hawkweeds, sweet brier, broom, rabbits and hares) and the spread of bovine tuberculosis (e.g., mustelids, possums and pigs), and are also regarded as the single biggest threat to New Zealand's native biodiversity. Because of the importance of invasive species for both stock management and native biodiversity conservation this section provides an overview of how they will be managed. For both plant and animal pests, this section should discuss current distribution and threats, and the strategic approach to control. A number of species need to be considered in this section depending on the particular property (Table 2). However, specific details on plant and animal pest control do not need to be included here (e.g., on the particular chemical to be used or its application rate).

Table 2. Problem plant and animal pests in at least part of the South Island high country.

<p>Plant pests</p> <ul style="list-style-type: none"> European broom (and gorse) Hawkweeds (mouse ear, tussock and king devil hawkweeds) Lupin (tree and Russell) (but can be desired species in some situations) Manuka and kanuka (can be both pests and desired species) Matagouri (can be both a pest and a desired species) Sweet brier Wilding conifers Willow Other woody weeds (buddleia, hawthorn, etc)
<p>Animal pests</p> <ul style="list-style-type: none"> St Johns Wort Brush-tail possums Chamois and thar (also have recreational values) Feral deer (red and fallow – also have recreational values) Feral goats (also have economic values) Mustelids (ferrets, stoats and weasels) Pigs Rabbits and hares Wallabies Canadian geese

All plant and animal pest control needs to meet regional and national legislative requirements, especially any obligations imposed through the Regional Pest Management Strategy, and should also follow best-practice guidelines. Staff or contractors involved in plant and animal pest control works need to have appropriate certification for handling any chemicals involved.

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Prioritising plant and animal pest species for control.
 - Prioritises based on threats (to economic and native biodiversity values) plus control potential.
 - Can't control all species at once and need to ensure that control is sustainable within resources available.
- Liaison with other agencies (e.g., regional council and DOC).
 - Explore external funding sources and partnerships for pest control
- Removing key seed sources of plant pests where practicable.
 - Especially for wilding conifers, but needs to be staged.

- Controlling to levels where the pests do not impact on other values
 - Range of control techniques available
 - Consider minimising reliance on chemicals where appropriate
 - Consider use of grazing as a management tool for some species (e.g., wilding conifers, sweet brier and hawkweeds).
- Use of recreational concessions for management of some species (e.g., thar).

This section will have a range of linkages to other chapters including stock (through risks associated with bovine Tb and the use of stock for weed control), pasture and soil (pasture development can be used to control some weeds), native biodiversity, and historical, cultural and recreation (some animal pests are also an important recreational resource). This section will also link with the monitoring section in Part D of the management plan.



7.7 Native biodiversity

High country properties vary in the nature and value of native biodiversity present. The presence of native biodiversity alone does not equate to high value (much of our short tussock grassland has been induced by fire and grazing), and the presence of native biodiversity whatever its value, does not need to preclude economic use (e.g., sustainable grazing of tall tussock grasslands). Native biodiversity is often important economically (e.g., summer grazing grasslands and shrublands providing shelter during lambing) as well as having very high aesthetic values. Some properties contain extensive areas dominated by native biodiversity while others, because of their locations or because of past tenure review outcomes, have far less native biodiversity present. However, the amount of significant native biodiversity (SIVs discussed in tenure review reports) is not necessarily correlated with the amount of native biodiversity present; some properties may contain very little native biodiversity but what is present may be highly significant (e.g., saline areas), while others may have extensive native biodiversity (e.g., tussock grasslands), although relative little of this may be significant with respect to its rarity nationally. As a result the management approach towards native biodiversity will vary considerably from property to property.

This section of the management plan outlines the approach that will be taken to the management of native biodiversity values on the property and some of the following issues are likely to be important on most properties:

- Native biodiversity survey – good information may already be present (e.g., as a result of past surveys such as used to produce Conservation Resources Reports), but in some cases the specific values present may be poorly known and survey work can help identify what values are present. Development of a vegetation map for the property (Figure 5) can be important as a basis for quantifying the native biodiversity values present and for better planning of future farm development.
- Wetland management – wetlands often have high native biodiversity values but are also vulnerable to modification by farm management activities (e.g., trampling by cattle or drainage). Wetlands are also important as a source of stock water. Identification of priority wetlands and a combination of fencing, stock control and provision of alternative water sources can help address threats to the values present, although this needs to be undertaken within the context of the importance of wetland areas for stock (particularly cattle), especially during droughts.
- Threatened species management (native plant and animal) – again good information may already be from previous surveys and from DOC records and there may already be DOC Recovery Plans in place for some species (e.g., black stilt and cypress whipcord hebe). Consultation with appropriate experts may highlight simple management options that can be implemented to ensure that such species are sustained or even enhanced under pastoral management.
- Native vegetation clearance – most local authorities have either identified specific areas on a property where native vegetation clearance (cultivation, burning, draining, etc) is not permitted or have rules relating to vegetation clearance (e.g., area that can be cleared per year). Identification and appropriate management of these areas as part of farm management is therefore important, although identification of non-clearance areas doesn't necessarily restrict grazing.
- Ecological restoration – there are a range of options to restore particular values on a property whether they be associated with a severely depleted ecosystem type (e.g., bog pine shrubland) or removal of grazing from key shrubland or forest remnants.
- Grassland management – grazing is an important tool for the management of both short tussock and snow tussock grasslands. Both too-much and too-little grazing can result in unwanted changes in these tussock grasslands. Furthermore, tussock cover can be important for shelter, especially during lambing, so maintenance of tussock cover and shrubland has economic as well as native biodiversity benefits. Fertiliser can also be used as a tool to increase tussock vigour.

What is important with native biodiversity management is to clearly identify what the goals are and then target management towards these. If the goal is maintaining native biodiversity (e.g., tussock grasslands), then simply removing grazing will not always result in this outcome¹⁰ – controlled grazing can be better than no grazing.



¹⁰ Norton 2006, Rogers et al. 2007

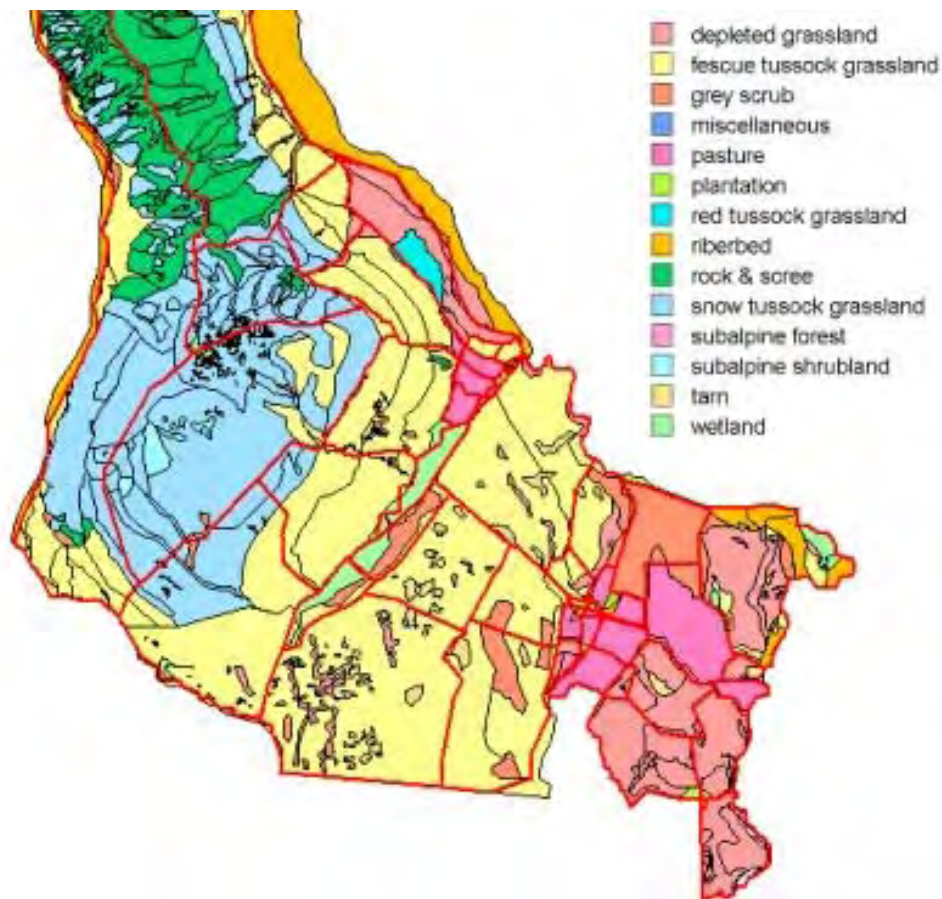


Figure 5. Vegetation map for part of a high country property showing main vegetation types present with management blocks superimposed.

For native biodiversity management, there is the potential to work in partnership with a variety of stakeholders (e.g., territorial local authorities, DOC, community groups) to obtain positive outcomes in the management of particular values. For those properties that are staying under a pastoral lease and the management plan is used as a basis to obtain some form of recompense from central Government for SIV management, this section will need to discuss how particular SIVs on the property are to managed. The details included here will depend on the values present and the agreement reached between the lessee and the Crown. There are also opportunities available to source external funding (e.g., from Regional Councils) to implement native biodiversity management work depending on the local situation.

7.8 Recreation and historic resources

High country properties often occur adjacent to public conservation land to which the public have an expectation of access. While some legal access might be available to these areas, much historical access has been across properties either with or without the permission of the farmer. High country properties often offer a diversity of recreational opportunities within the property itself, some of which might be currently utilised but others will not be utilised. Historic resources can also be important including evidence of old mining activities (e.g., water races) and early farming days (old huts). In some cases the management of historical resources is controlled by the provisions of the Historic Places Act 1993.

This section outlines the approaches that need to be taken to managing recreation and historic resources on the property:

- Farm policy for provision of public access both to and beyond the property.

- This may involve working with Fish and game, DOC, local authorities and the local community to clearly ascertain needs and the most appropriate access options.
- Development of recreational opportunities on the property (e.g., ecotourism or guided hunting).
- Identification and preservation of historical resources.

The management approach in the first five years of the plan may include the following actions:

- Clearly marking public access routes to adjacent public conservation land.
- Undertaking assessment of recreational opportunities on property

7.9 Agrichemicals

Farming uses a number of agrichemicals including pesticides for managing livestock diseases and controlling animal pests such as rabbits and possums, and herbicides for weed control. The use of these substances is covered by the NZS 8409:1999 Code of Practice for the Management of Agrichemicals and the Hazardous Substances and New Organisms Act 1996. Legislation requires that hazardous substances are stored in secure facilities and that only licensed or registered personnel can purchase and/or apply restricted agrichemicals.

This section of the management plan outlines that approach that is taken to both the safe use of agrichemicals and to their broader role in farm management. While the use of agrichemicals is not a limiting factor for environmental certification, unless part of an organic certification system, international systems such as LEAF have a strong emphasis on “appropriate” use (as opposed to “excessive” use) and especially on having systems to document use. This section of the management plan is most likely to include discussion on one or more of the following issues:

- Documentation of agrichemicals use.
- Storage and handling of agrichemicals, including the need for staff or contractors to have appropriate certification for their application.
- Procedures for the preparation (e.g., mixing with water), use (e.g., wind conditions and avoidance of sensitive areas and non-target species), and safe disposal of unwanted agrichemicals and their containers.
- Procedures to deal with an accidental agrichemical spill.

A key focus in this section is on ensuring that agrichemicals are used in a manner that does not have unwanted side effects on staff, the environment (including wetlands and non-target species) or through the development of resistance to the diseases being treated. However, specific detail on rates of chemical use and specific rules relating to application are covered in pesticide and environmental guidelines and need not be included here.

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Upgrading or building a secure agrichemical storage area.
- Ensuring that all staff have current certification for agrichemical use.
- Instigating a formal system for documenting agrichemical use, including information on purchases, use (animal groups or specific areas applied), and disposal.

7.10 Energy & water efficiency/quality

There are regulatory and market-driven incentives to increase energy and water use efficiency, and the quality of runoff water, on farms. Energy is a key cost area for farming while water use is regulated through resource consents for water extraction. With climate change potentially increasing the incidence of droughts in the eastern South Island, water management has become critical for high country farmers. Runoff from intensively grazed and fertilized pastures also poses down-stream risks through increased nutrient levels, although this is less of an issue in the high country than elsewhere.

There is also increasing pressure coming on farmers to account for their greenhouse gas emissions. High country farmers do, however, have the opportunity to establish/facilitate woody vegetation including plantations, restoration plantings and regenerating shrublands as a method to offset some of these emissions.

This section outlines the approaches that need to be taken to managing energy and water use on the property including general strategies for reducing reliance on external energy sources (e.g., using micro-hydro power generation to power irrigators) and for increasing the efficiency of water use (e.g., through upgrading or replacing irrigation systems). Furthermore this section should discuss methods to mitigate potential effects of run-off on down-stream aquatic values (e.g., through the use of riparian buffers). Because of recent central Government initiatives there is also a need to discuss the approach that the farm is taking to quantify and reduce the emissions of greenhouse gases.

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Development of a system to monitor energy use on the property.
- Development of a long-term (10-20 year) plan for irrigation redevelopment to ensure efficient water use and that the effects on water quality are “less than minor”.
- Initiation of a riparian fencing and planting programme to reduce nutrient run-off issues.
- Determination of the carbon footprint for the farm and development of an approach to offset greenhouse gas emissions.
- Develop a plan for reducing fertiliser use (as fertiliser is a major source of greenhouse gases).

7.11 Health & safety

Health and safety in the workplace is an important issue on farms, with a number of different farm management activities presenting potential hazards. Most farms either have or should have specific health and safety policies and guidelines and in this section the general approach to health and safety should be outlined without needing to repeat the details of specific guidelines. The legislative requirements for health and safety issues are covered by the Health and Safety in Employment Act 1992.

Issues to cover in this section are likely to include:

- Compliance with regulations.
- Hazard identification and isolation/minimisation.
- Procedures for working alone.
- Ensuring staff have appropriate health and safety certificates.
- Appropriate reporting and review of health and safety incidents.
- Health and safety issues associated with visitors on the property.
- Procedures in the case of a life-threatening accident.
- Procedures in case of a fire.

The management approach in the first five years of the plan is likely to include some or all of the following actions:

- Ensuring that staff have appropriate health and safety certificates.
- Development of a health and safety policy for the farm and ensuring that all staff and contractors are familiar with it.

8. Part D – Implementation

The final section of the management plan discusses the implementation of the plan. The approach that will be taken to monitoring is initially outlined followed by details on how the plan will be actually implemented. Finally, the use of covenants to provide some certainty on the future management of the property is discussed.

8.1 Monitoring and data management

This section outlines the methods that the farmer will use to monitor the consequences of management actions. Monitoring is important for several reasons:

- Providing direct feedback to the farmer on how successful different management actions have been in meeting their goals and vision for the property.
- Quantifying the outcomes of farm management in order to meet the goals of an environmental and animal welfare certification and auditing programme such as Zq̄ue or LEAF.
- Providing assurance to external stakeholders (e.g., territorial local authorities) that management actions are meeting regulatory or legislative requirements.
- As a more general advocacy tool for showing how high country farming is meeting local, regional and central Government goals in relationship to sustainable land management, native biodiversity conservation and public access.

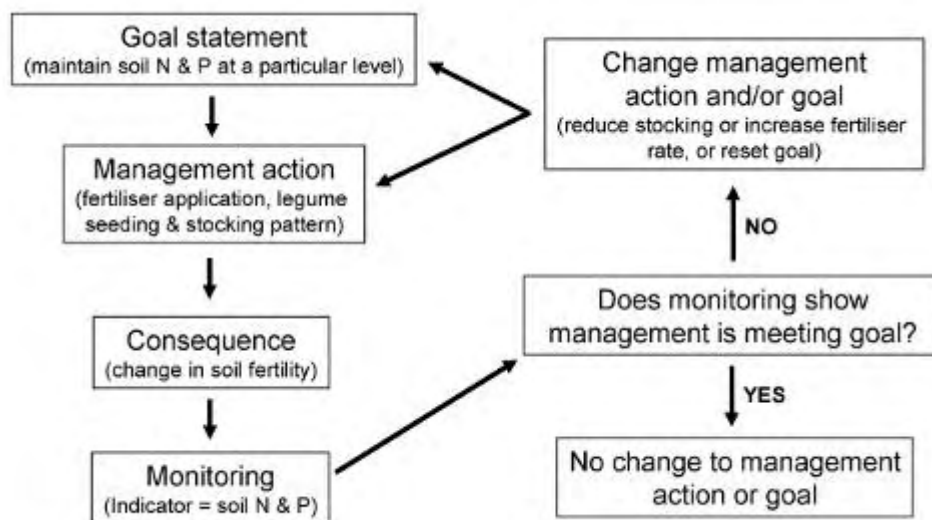


Figure 6. Relationship between management plan goals, management actions and monitoring (with an example in brackets).

Many of the management actions assessed in the monitoring section relate back to the specific performance targets set with the individual management goals and as such provide the quantification of the success of management at meeting these goals. Monitoring is an integral part of adaptive management, in that management actions should be modified (adapted) in response to the information that monitoring results provide (Figure 6). For example, monitoring may show that a particular stocking level is having unacceptable impacts on tussock cover and hence stocking patterns need to be altered.

The monitoring section should identify the different aspects of the property that will be monitored and introduce the methods that will be used for monitoring these. All high country properties already

measure a range of indicators of management actions (e.g., weaning percentages and soil fertility levels), but with an increasing focus on environmental and animal welfare certification as well as regulator requirements, additional management actions will need to be monitored. A diverse range of monitoring indicators are available, not all of which will be applicable on every property. Examples of monitoring indicators include:

- Economic indicators
 - numbers of animals
 - average animal body weight (kg/animal)
 - weaning percentages (% per ewe, cow or hind)
 - wool clip (kg/animal)
 - soil fertility levels (N, S, P, cations, pH etc)
 - agrichemical use (litres/animal/yr or litres/ha/yr)
 - fertiliser use (tonnes/ha/yr)
 - animal densities (e.g., number animals/ha)
 - carbon footprint (balance between emissions and sequestered CO₂)
- Environmental indicators
 - tussock density (numbers/ha)
 - bare ground (% cover)
 - weed abundance (% cover)
 - native animal numbers (e.g., counts of particular species)
 - pest animal densities (e.g., McLean scale for rabbits)
 - stream/lake health (e.g., nutrient levels, invertebrate community composition or water clarity)
- Recreation indicators
 - number of visitors to or through property
 - track or hut usage

Monitoring should be undertaken on a regular basis (e.g., every one – two years) and this section of the management plan should provide a guide to the frequency of remeasurement.

Some monitoring may require technical input (e.g., soil or water nutrient levels), however, most of the monitoring should be readily undertaken as part of routine farm management activities – monitoring that is too complex or expensive will not be repeated and will therefore not yield data for the farmer to utilise. Monitoring can absorb a large amount of resources (both in terms of time and funds) and needs to be focused on the goals for the property. A number of monitoring guidelines are available including the ‘Farmer Resource Monitoring Kit’ produced by the High Country Committee federated Farmers in 1994, and the ‘Land Condition Monitoring Reference Manual’ produced by the Rural Futures Trust in 1998. One form of monitoring that can provide considerable information for relatively little cost involves repeat photographs from the same site over time¹¹. Such photopoints provide an invaluable tool for monitoring overall property condition, as well as more detailed information on, for example, pasture condition, weed densities and tussock cover, and is something that is easy to undertake and to interpret (Figure 7).

As well as monitoring, this section should also outline the approach that will be taken to data management (storage and management). Data storage can take a number of forms, but most data is usually stored on computer using various spreadsheet or database packages (e.g., Microsoft Excel). Computer packages are particularly useful as they can be customised to suit a range of uses, and provide ready access to statistics and graphics, although farmers need to be aware that programs do need to be updated to ensure compatibility with other systems. Key issues with data storage include the need to ensure that all raw data collected is stored (preferably in a different location to ensure that it is not lost) and that information on the way the data has been stored is carefully documented for future reference. A range of options for data analysis are available and will depend on the particular circumstances, but usually simply graphing trends is sufficient to provide feedback on management activities.

¹¹ See photo monitoring guide appended to this report.



Figure 7. Photos taken in 1996 (left) and 2007 (right) showing increase in sweet brier density as a result of intensive rabbit control.

Many farmers utilise farm management programmes (e.g., Farm Keeper, Farm Site, Farm Worker P-Plus, Stockpol, Endeavour) as part of land management. With more technical GIS programs like MapInfo becoming more accessible (*ca.* \$4000 for a single-user licence), it is becoming easier to manage and manipulate a wider range of farm management data. GIS software coupled with Geographical Position System (GPS) data provides farmers with a very powerful tool for land management (Figure 8). These tools are widely used by the forestry industry who operate at similar spatial scales to high country farmers. MapInfo and similar GIS and farm management computer systems enable a farmer to:

- Record and easily display farm management data such as fence lines, tracks, water races, stock numbers, ecological patterns (soils, vegetation).
- Produce maps and plans for staff and contractors to use for particular jobs.
- Calculate areas and quantities for activities like fencing and OSTD.
- Record information on changing stock numbers, and plant and animal pests.
- Record information from contractors on where they were working (e.g., GPS printouts from an aircraft involved in weed spraying).

The development of GIS databases will, however, impose additional costs although underlying data on environmental attributes is freely available as it was funded through public good science funding and most territorial local authorities now have up-to-date digital aerial photography that can be used.

The management approach with respect to monitoring in the first five years of the plan is likely to include some or all of the following actions:

- Identification of key indicators that need to be monitored on the property with reference to management goals and any external certification or regulatory requirements.
- Implementation of a cost effective monitoring programme.
- Analysis of monitoring results.

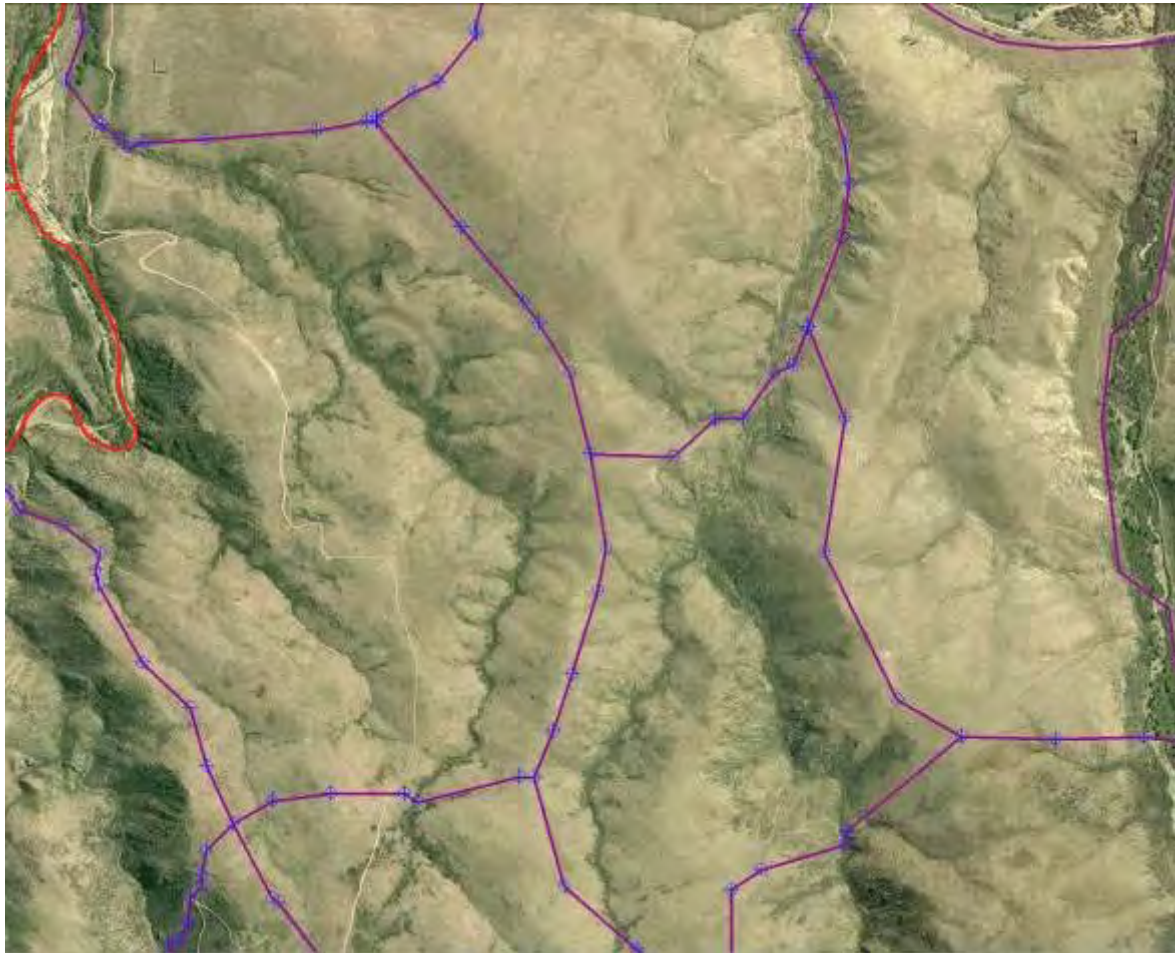


Figure 8. Fence line position determined by GPS fixes from a helicopter (± 1 m accuracy; blue crosses) overlain on a colour aerial photo. The red line marks the centre of a river, also determined by helicopter GPS measurements.

8.2 Implementation

This final section of the management plan discusses how the plan will be implemented, the way that farm operations will be reviewed, and the role of external stakeholders if any in this review. Most farmers have an annual business plan and may or may not have an annual work plan. An annual work plan that outlines the specific work programme in relation to the management plan goals is an important component of management planning and should be developed alongside the annual business plan. It does not need to be long, but should outline the key tasks that need to be done in the forthcoming year and should relate directly to the goals in the management plan. Routine farm management activities need not be included in detail, but an outline of seasonal farm tasks should be included (e.g., shearing dates).

This part of the management plan should also discuss the methods used to review the management plan and who might be involved in this. There are a number of different approaches that could be used for review, but what is important is that there is regular review to assess what has been done, and more importantly what hasn't been done and why. This review is important as it enables the farmer to determine what is limiting their ability to meet the goals they have set for the property. There are a number of approaches that could be taken to reviewing management progress including:

- Review undertaken by the farmer, with or without input from farm advisor or similar. However, having an independent person involved is useful as it helps focus on assessing why a particular action did or did not happen (thus making the process more formal).

- Collegial review by a group of farmers (neighbours or members of a Landcare Group), with or without input from an external advisor or facilitator. Collegial reviews allow the sharing of experiences and learning opportunities.
- Review undertaken by an external reference group including representatives from different interest groups (e.g., local community, covenanting body, local authority, scientific expert etc). This type of review is more likely to be used when there are key SIVs associated with the property and hence considerable external interest in the management of the property.
- External review as part of environmental and animal welfare certification system or through a regulatory requirement.

Obviously the approach to management plan review that is taken will depend on the circumstances of the property. Where an external reference group is used, clear terms of reference would need to be developed to ensure that the review provides focused advice to the farmer. Defining the role of external stakeholders is essential, although in some situations farmers may have little influence on this where the review is, for example, part of a regulatory requirement. Management plan reviews should occur annually, although the management plan itself need not be revised each year. However, it is likely that the management goals will be updated to reflect both changing farm management and the results of monitoring.



9. Other matters

9.1 Covenants and easements

Covenants and easements in themselves are only tools that can be used towards meeting broader objectives; it is the manner in which the land is managed that is most important. A covenant or easement can, however, be used to ensure that the management plan goals relating to particular SIVs are being met through time and provide certainty to stakeholders on the long-term management of these SIVs. Covenants can be structured in different ways and can be developed with a variety of organizations (QEII National Trust, District or Regional Council, DOC). The QEII National Trust has the track record and confidence of the rural community and is likely to be the preferred covenant option for most farmers. An easement is an entry on a Certificate of Title showing the land is subject to certain rights. In the case of public access this would be the right of access by a private individual across a property without having any right of possession of that property or anything on the property.

Covenants are likely to cover those parts of the property with significant inherent values (e.g., native biodiversity or landscape), but are less likely to be used to guarantee permanent public access. Easements are the more appropriate tool for guaranteeing public access. Covenants might focus on key native biodiversity values such as wetlands or shrublands, or on particular landscape features such as the backdrop to a tourist centre. In writing a covenant considerable care is required in the wording to ensure that the goals of the covenant are clearly stated in relationship to the key values present but that there is an ability to evolve/change the covenant within defined parameters in response to changing conditions through time (for example because of a new opportunity that arises which does not threaten the values present). A covenant might restrict the type, number and timing of grazing in order to maintain native biodiversity values, or might prevent earthworks or tree planting that would alter landscape values.

Whole property covenants are also a possibility, although these might be considered too restrictive and unnecessary for those parts of the property that are managed primarily for their economic values (e.g., cultivated and irrigated flats). But there may be some situations where a whole property covenant is considered desirable.

Covenants and easements are likely to be seen by stakeholders as an important method to provide guarantees that key parts of a property will be managed in particular ways and/or that public access will be provided. Conservation covenants (with the Crown) and easements have been used as part of tenure review settlements to achieve this outcome.

9.2 Relationship with environmental and animal welfare certification and audits

Whole property management plans provide a tool that can assist high country farmers meet the increasing demands on them to show accountability in the way in which they manage their farms. Management plans do not provide any guarantees about how a property is managed, but they do provide a framework to assist the farmer to plan properly for the different values present, and if used correctly, can also provide an excellent framework for the auditing of farm management activities. In particular, the goals and performance indicators incorporated in the management plan can be tailored to meet the auditing requirements of any certification scheme that a farmer might choose to belong to.

The Canterbury Meat Packers “On-Farm Quality Assurance Programme” has a number of requirements and recommendations that fit comfortably within a management plan framework. For example, in the lamb section, auditing requirements include:

- “Exposure to extreme climatic conditions must be minimized. Sufficient shelter and feed must be available to ensure ongoing live weight gain of growing livestock
- “Withholding periods for chemicals applied to grazed pastures must be adhered to”
- “All waste, including effluent, offal, chemicals and oils including their containers must be disposed of in accordance with Regional Council by-laws and regulations”

These requirements can be built into the goals and management tools sections of the management plan, with verification built into the monitoring section in order to meet the Canterbury Meat Packers requirements. Similar requirements are present within the Zq̄ue programme run by the New Zealand Merino Company and again the management plan can be used to ensure that the relevant standards are being met. The LEAF Marque standard from the UK has a tighter set of requirements for their audits, but again these can fit within a farm management plan framework.

The key components of an environmental and animal welfare certification system are likely to include the farm management plan (which provides the visions and goals and strategic approach to management), Environmental Guidelines (outlining best practice), and the auditing standards associated with the certification system (that ensure that the goals of the management plan and the environmental guidelines are being met in farm operations). The relationships between these different components are summarized in Figure 9 and are central to the whole concept of sustainable farm management that this report addresses.

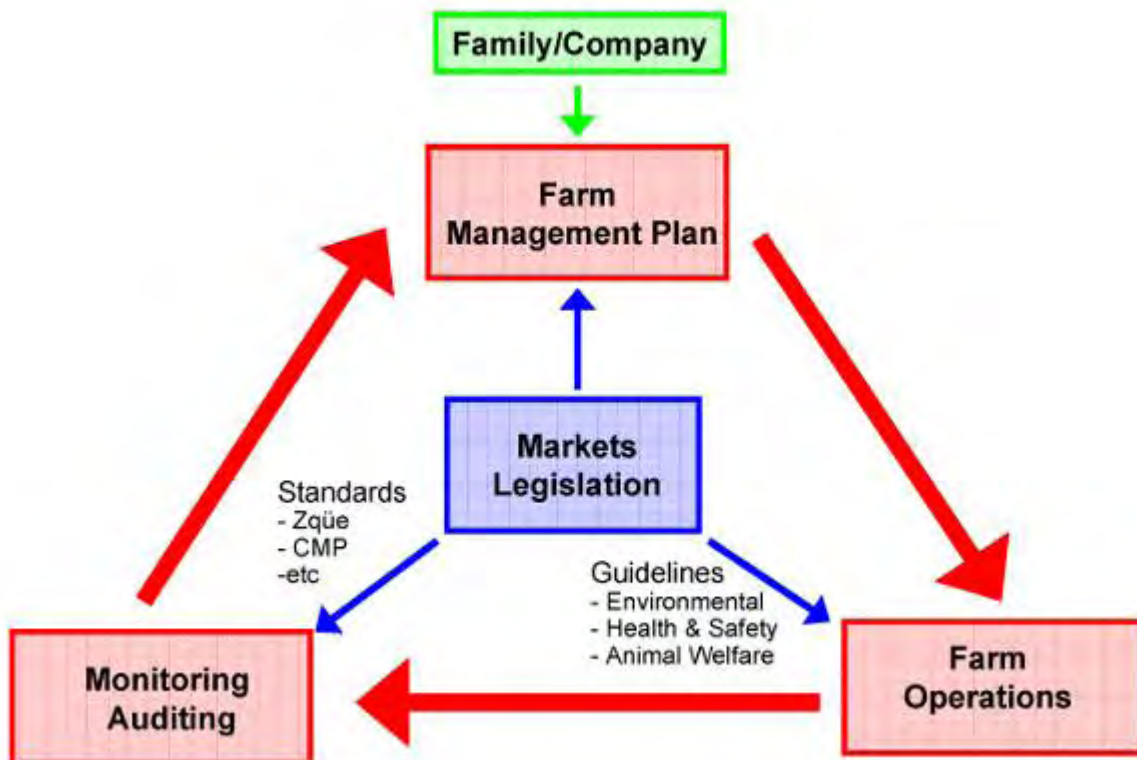


Figure 9. Relationships between the different elements of farm management planning.

10. Acknowledgements

I would like to acknowledge the invaluable support of the different groups that funded this project, especially the Sustainable Farming Fund (special thanks to Fiona Duncan for her patience), High Country Accord, Merino Inc and High Country Section of Federated Farmers. I am also very appreciative of the invaluable input from the farmers on my Research Advisory Group – thank you Richard Burdon, Andrew Simpson and Ben Todhunter, and especially the Murray and Cameron families (Jim, Anne, Will and Emily Murray, and Hugh and Mandy Cameron) for sharing their love and incredible knowledge of the high country with me, and for letting me spend so much time with them and on their farms. I would also like to acknowledge the support and/or helpful comments of John Aspinall, Bob Douglas, Peter Espie, Jon Manhire, Brian Molloy, David Scott and Mark Stevenson in developing the whole property management plan concept and these guidelines. Thanks to Yvette Dickinson for proof-reading the text prior to publication. Finally, I would like to dedicate this report to the memory of Rodney Patterson – Rodney instigated this project and provided much stimulation and inspiration until his untimely death.



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