

8.8 Monitoring

8.8.1 Monitoring procedure

A regional plan is required by sections 35(2)(b) and 67(1)(i) of the RMA to state the procedures to be used to monitor the efficiency and effectiveness of policies, rules, or other methods. A regional plan has to be reviewed not more than 10 years after it has been made operative. For a review to be successful it is necessary to know how efficient and effective the policies and methods have been in contributing to achieving the plan's objectives and environmental results anticipated. In particular it is necessary to know whether each individual policy, and the methods to implement it, are contributing positively, neutrally or negatively.

Linked to this is the need to monitor the state of the environment and understand the causes of any changes, and the extent to which provisions in this chapter may have brought about those changes.

Chapter 1.3 of the Proposed NRRP outlines the general procedures to be used to monitor the overall effectiveness of the Proposed NRRP. 8.8 of this chapter is additional to that. This section sets out the general procedures to be used in Chapter 8 to monitor the:

- (a) achievement of the anticipated environmental results; and
- (b) efficiency and effectiveness of the chapter's policies and methods.

From time to time Council may need to deviate from the specific programmes listed if it is shown that the monitoring identified is no longer appropriate, or there is a more effective way of undertaking the monitoring.

8.8.2 Monitoring achievement of environmental results anticipated

Monitoring of soil quality indicators will be a key tool for assessing changes and trends in the health of the soil. Use will be made of information collected by other agencies, such as the Ministry of Agriculture and Forestry (MAF) chemical residue monitoring programme and Ministry of Health dietary surveys. Surveys will be undertaken to assess the awareness and uptake of effective management practices by farmers. The council will support the monitoring of Ministry for the Environment environmental performance indicators relevant to the arable soil environment.

Environment Canterbury will assess the achievement of environmental results through the use of a range of mechanisms as set out in Table SCN2, or other more effective methods if they are available. Should the methods not provide the necessary level of detail, then they will need to be reviewed.

Table SCN2: Monitoring of environmental results anticipated for soil conservation

Environmental results anticipated	Indicator	Location of monitoring	Method of monitoring	Frequency of monitoring	Method of reporting
SCN1(a)	% Bare ground	Hill & high country (& inland basins)/ <i>Hieracium</i>	Remote sensing	5-10 years	Annual performance report
			Vegetation transects	5-10 years	Annual performance report
	Erosion - events	Non-arable land	Aerial photos	10 years	Annual performance report
			Onsite measurements	5 years	Annual performance report
	Species composition & stature	Non arable land	Vegetation transects (ECan, Knight Frank, ISPD modelling)	5-10 years	Annual performance report
Vegetation vigour	Undeveloped and semi-developed non-arable land	Satellite imagery (Ecosat)	5 years	Annual performance report	
SCN 1(b)	% Bare ground	Hill & high country (& inland basins)/ <i>Hieracium</i>	Remote sensing	5 years	Annual performance report
			Vegetation transects	5-10 years	Annual performance report
	Management practices - grazing levels	Hill & high country (& inland basins)	Landholder survey	10 years	Annual performance report
	Vegetation vigour	Hill & high country (& inland basins)	Satellite imagery (Ecosat) <i>Hieracium</i> extent	5 years	Annual performance report
SCN 2	Soil Fertility: % base saturation; Olsen P; organic C; %N, AMN; vegetation vigour	Hill & high country & inland basins	Vegetation and soil sampling at vegetation transects; 500 soils surveys; ISPD site monitoring; nutrient budgets	Ongoing with each site monitored every 5-10 years	Annual performance report
SCN 4	Conditions of LIA	Whole region	Compliance monitoring		Annual monitoring reports
SCN 5	% Deep rooted cover	Soft rock hills, Kaikoura, Banks Peninsula ecosystem groups; loess-mantled hill slopes	Aerial photos – Mapping change in vegetation cover from shallow to deep-rooted species	10 years for any one site	Annual performance report
SCN 6	Erosion features associated with EW&VC activities; evidence of off-site effects of erosion	High to moderate erosion risk non-arable land	Aerial photos	5-10 years	Annual performance report
			Complaints and observations	As reported	Annual performance report
SCN 7	% C ; total organic matter content	Arable land	C & N analysis of soil samples	Ongoing with each site monitored every 5-10 years	Annual performance report

Environmental results anticipated	Indicator	Location of monitoring	Method of monitoring	Frequency of monitoring	Method of reporting
	Soil aggregate size distribution	Arable land	Collection and analysis of soil samples	5 years	Annual performance report
	Soil aggregate stability	Arable land	Collection and analysis of soil samples	5 years	Annual performance report
	Soil organic matter quality	Land with arable use	AMN of soil samples	5 years	Annual performance report
	Climatic triggers for induced soil erosion - NW winds, rainfall	Arable land	Climate data	Annually, or after significant weather events	Annual performance report
SCN 8	% Bare ground	Arable soils	Remote sensing	5-10 years	Annual performance report
	Management practices - Area cultivated; crop residue management; cultivation and rotation practices	All arable land	Arable farmer surveys; monitoring a representative range of arable soil types	10 years	Annual performance report
				5 years	
	Erosion - events; Changes in soil depth	Arable land	Caesium monitoring	10 years, or after significant erosion event	Annual performance report
	Management practices shelter	Arable land monitor a representative range of arable soil types	Field survey of land effectively sheltered by trees	5 years	Annual performance report
Remote sensing			5-10 years	Annual performance report	
SCN 9	Soil Cd	Land receiving P fertiliser	Cd analysis of soil samples	5-10 years	Annual performance report
		Land with arable use	Cd analysis of soil samples	5-10 years	Annual performance report
	Level of Cd in phosphate fertiliser		Industry review - compliance with Voluntary Agreement for Cd concentration in phosphate fertilisers	Ongoing	Annual performance report
SCN 10	New potential contaminants	Land receiving applications of chemicals (fertilisers, herbicides, pesticides) containing potential contaminants	Regular reviews of industry, agencies, CRI's and overseas for information on potential contaminants, levels of application etc	Ongoing	Annual performance report

8.8.3 Monitoring plan effectiveness

A review of the plan's policies and methods must be undertaken, and be made publicly available at least every five years. The review will consider effectiveness and efficiency of policies and methods, and include such matters as practicality, cost-effectiveness, and the extent to which they address impacts on soils and soil ecosystems.

Environment Canterbury will assess the achievement of environmental results through the use of a range of mechanisms as set out in Table SCN3, or other more effective methods if they are available. Should the methods not provide the necessary level of detail, then they will need to be reviewed.

Table SCN3: Monitoring effectiveness and efficiency of policies and methods

Plan provision	Assessment criteria	Method of assessment	Method of reporting
Policies	Extent to which policies have contributed to the achievement of objective, or achievement of targets set in objective	On an annual basis, record change in environmental indicators that measure achievement of targets in objectives. Feedback from Environment Canterbury staff.	An internal report every three years
Information, promotion and advocacy	Production and distribution of information/fact sheets for topics identified in chapter Number of field days Establishment of demonstration farms	Survey on five-yearly basis increased awareness of risks of soil erosion, and loss of soil quality factors; 1. usefulness of information supplied by ECan; and 2. increase in adoption of good management practices	Internal report every three years Survey reports as completed
Investigations	Initiation and completion of investigations identified in chapter	Review of progress with projects in Environment Canterbury Annual Plan. Publication of technical reports.	Annual progress reports Technical/consultant reports on completed projects
Economic incentives	Uptake of incentives to achieve soil conservation outcomes identified in Chapter 8	Applications for Environment Enhancement Fund (EEF) funding for soil conservation related projects Monitor number of requests for assistance for available plant materials	Annual reporting of applications and funding allocations for EEF. Internal report.
Territorial authorities	Recognition of soil conservation issues in district plans	Monitoring plan reviews	Annual report at time when plans undergoing review