



Steepland Soil Protection

Introduction

Steep slopes without tree cover can be vulnerable to soil losses through erosion. Vast quantities of soil can be lost through slipping and other erosion during intense rainfall events. Recent reminders of this are Cyclone Bola, and the February 2004 Manawatu/Wanganui storms.

In catchments such as the Waikanae and Pauatahanui Basin, this soil loss not only results in a major loss of production on site, it discharges sediment into downstream waterways and impacts on flood channels.



How can soils be protected?

Tree root systems and other benefits of woody vegetation cover can make steepland soils relatively resistant to surface erosion and slipping. This results from:

- Tree roots reinforcing the soil as the roots penetrate through the upper soil layers and bond them to more stable subsoils.
- The root mass that is created by trees covers the erodable soil and helps to hold the soil layer in place.
- Trees reduce soil moisture through interception and evaporation on vegetation surfaces and through transpiration, where water is taken up and used in the plants growing process.
- Trees provide a permeable forest floor that can aid water adsorption and storage. The litter and leaf matter on and around trees helps prevent the impact from water droplets hitting open soil and limits the effect of water washing away the surface soil particles as it passes over.

The impact is most significant with well spaced larger vegetation and extensive vegetation cover.

Some Key Approaches

There are different approaches to stabilising soils with vegetation – the approach you take will depend on your property and particular approach to farming. Three general approaches are identified below. Where to go for support and information about these types of works is identified in “help is available” and “extra information”.

Soil Conservation Pole Planting

This is most commonly undertaken using open planted poplar or willow poles. It provides the opportunity to maintain ongoing grazing, while stabilising the site.

There are many benefits of planting poplar or willow poles.

- Erosion prone hillsides can be stabilised and sustained as farmland, because the extensive root systems of these trees bind and hold the soil in place.
- Poles can protect farm assets like fences and tracks prone to slip damage. They work as wind shelterbelts, reduce damage to watercourses, provide shade and shelter for stock, and can sometimes be cropped as timber.
- Poplars and willows produce useful stock feed, which can be an extra reserve during droughts. For example, about 1.4 kg of fresh poplar leaves maintains a ewe for a day.



Afforestation for timber production

Establishment of plantation forests on steep slopes utilises the beneficial effects of trees on slope stability, while also giving the opportunity to obtain a commercial timber harvest from the land. Soil stability is reduced for a period after harvest as the second crop or "rotation" establishes, but does not drop to the original level without tree cover.

Key points such as species, area, location and access need to be carefully considered to ensure that small timber plantations or "woodlots" will be practical to manage and provide good returns.

If you want to keep steep land in production and not lose it to possible soil erosion in the future then forest plantings are a good solution.

Reversion to native forest cover

Encouraging reversion of some areas of a property to native forest cover may be the best option where values such as wildlife and landscape are important to you. It is a good option where steep areas in

need of protection don't provide significant grazing and aren't practical for afforestation.

Early stages of native regeneration may already be occurring, and it may be just a matter of fencing to exclude stock to speed up reversion to forest. Where regeneration is not occurring and seed sources are not present close to or on the site, planting will be required (see "Restoration Planting..." publication below).

Getting involved on your property

A range of support, services and information are available to assist you on your property. These are summarised in the table below.

As a first point of contact to discuss your project, find out about services and advice etc, contact the Catchment Coordinator:

Catchment Coordinator
Ph 0508 000 062
www.waikanaecatchment.org or
www.pauatahanuicatchment.org

Steepland Soil Protection - Help is Available

Direct Support & Funding

Services	Who	Contact	Criteria	Notes
Support for soil conservation planting	GWRC	David Cameron, GWRC Masterton ph (06) 378 2484	<ul style="list-style-type: none"> Erosion prone land defined by Land Use Capability map. Various subsidy rates apply (25-45%) 	<ul style="list-style-type: none"> Limits on budget and staff resources
Support for native forest restoration & covenanting. <ul style="list-style-type: none"> Fencing survey 	GWRC & QE2	Tim Porteous GWRC, Wellington Ph (04) 384 5708 Robyn Smith QE2 Ph 04 472 6626	<ul style="list-style-type: none"> Owner wants to covenant area Area is accepted for covenanting by QE2 	<ul style="list-style-type: none"> 70k annual fund
Incentives for native forest restoration on steep slopes	KCDC	Braden Rowson, KCDC Ph (04) 904 5700	<ul style="list-style-type: none"> Currently investigating incentive options 	<ul style="list-style-type: none"> Under consideration

Free advice

Services	Who	Contact	Criteria	Notes
Soil Conservation Advice <ul style="list-style-type: none"> Planting Soil health Land management 	GWRC	David Cameron, GWRC Masterton ph (06) 378 2484	<ul style="list-style-type: none"> Available to all ratepayers 	<ul style="list-style-type: none"> Not limited
Forestry advice and service delivery	GWRC	David Cameron, GWRC Masterton ph (06) 378 2484	<ul style="list-style-type: none"> Consultation service provided for regional ratepayers. 	<ul style="list-style-type: none"> Limits on budget and staff resources
Native forest restoration & biodiversity advice	GWRC	Tim Porteous GWRC, Wellington Ph (04) 384 5708	<ul style="list-style-type: none"> Available to all ratepayers 	<ul style="list-style-type: none"> Not limited
	KCDC	Braden Rowson, KCDC Ph (04) 904 5700	<ul style="list-style-type: none"> Advice from biodiversity coordinator available to all Kapiti ratepayers 	

Paid Services

Services	Who	Contact	Criteria	Notes
Sale of planting material	GWRC	Akura Conservation Centre, Masterton (06) 370 5614	<ul style="list-style-type: none"> Sourced through Akura Conservation Centre 	<ul style="list-style-type: none"> Some limits on poplar and willow poles

Steepland Soil Protection - Extra information

Pole Planting

Title	Publishing	Notes
<i>Poplar and willow varieties and their attributes</i>	<i>Greater Wellington Regional Council – Land Management, Masterton</i>	Two page guide on pole species and planting guidelines. In print June 2006
<i>Poplar & Willow Management</i>	<i>Greater Wellington Regional Council</i>	
<i>Taranaki Regional Council Sustainable Land Management Info Sheets</i>	<i>Taranaki Regional Council, Land Management Section.</i> No 20: Poplars & willows for fodder No 31: Poles – why plant them? No 32: Pole planting – what are the benefits?	Brief 2-3 page information sheets. Can be downloaded from website.

Title	Publishing	Notes
Afforestation	No 33: Pole planting – general principles & practices No 34: Pole planting – maintenance No 35: Poplar & Willow varieties available from the Taranaki Regional Council No 36: Poplars for timber production. http://www.trc.govt.nz/ACTIVITIES/LANDMAN/DEFAULTACT.HTM	
Radiata Growers Manual Native Trees – Planting & Early Management for Wood Production	Piers McLaren, Forest Research, Bulletin No 184, 1993. David Bergin & Luis Gea Forest Research, Rotorua, 1995 NZ Indigenous Tree Bulletin No3	
Trees for the NZ Countryside – a planters guide.	John & Bunny Mortimer Silverfish 1984	
TRC Sustainable Land Management Info Sheets	<i>Taranaki Regional Council, Land Management Section.</i> No 6: Radiata Pine No 8: Douglas Fir No 13: Eucalyptus http://www.trc.govt.nz/ACTIVITIES/LANDMAN/DEFAULTACT.HTM	
Blackwood: A Handbook for Growers & Users	Ian Nicholas & Ian Brown, Forest Research Bulletin No 225, 2002	
Native forest restoration		
Managing your Bush Block: A guide to looking after indigenous forest remnants in the Wellington region	Greater Wellington Regional Council	
Restoration Planting: A guide to planning restoration planting projects in the Wellington region	Greater Wellington Regional Council	
Restoring our natural heritage: A guide to Greater Wellington's biodiversity assistance for private landowners	Greater Wellington Regional Council	
Native Forest Restoration: A practical Guide for Landowners	Tim Porteous, Queen Elizabeth the Second National Trust, Wellington, 1993	Currently being revised
Other Information		
TRC Sustainable Land Management Info Sheets	<i>Taranaki Regional Council, Land Management Section.</i> No 7: Land Resource Inventory Mapping http://www.trc.govt.nz/ACTIVITIES/LANDMAN/DEFAULTACT.HTM	Brief 2-3 page information sheets. Can be downloaded from website
NZ Land Resource Inventory (NZLRI) sheets & Key	Landcare Research, Palmerston North.	
Soil Conservation Technical Handbook	Ministry for the Environment 2001	