

# Sustainable drainage management

## Best management practice

By Henry R Hudson



## 1 Bank reshaping

Complexity			Environmental value			Cost		
[Progress bar: Moderate to High]			[Progress bar: Moderate to High]			[Progress bar: Moderate to High]		
Low	Moderate	High	Low	Moderate	High	Low	Moderate	High

### Definition & purpose

Banks are excavated to remove steep drops and unstable materials, and to lower the bank to allow roots to extend through potential failure planes and into the lower bank where there is potential for scour. Channel capacity may be increased by bank reshaping and marginal vegetation may filter contaminants and reduce flow velocities.

### Location

Steep or unstable streambanks.

### Work window

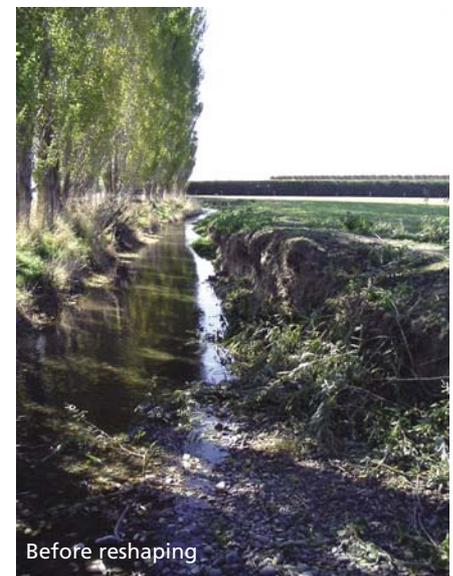
- Arrange access in consultation with landowners to avoid disruption of farming operations.
- Do not disturb the channel margins if there is whitebait (inanga) spawning or birds nesting. Inanga lay their eggs in late summer or early autumn in streamside vegetation in areas flooded by high tides.

### Treatment objectives

1. Increased bank stability.
2. Banks are re-shaped to a suitable grade and condition for streamside planting.
3. Increase channel capacity.
4. Rehabilitate disturbed land.

### Before you start

- Consult with District/Regional Council staff and landowners about habitat value, and the requirements for avoiding sensitive times and places.
- Obtain necessary approvals from the local authority.



Before reshaping



After reshaping

Photo: Michael Chivers, Environment Canterbury.

## Procedures

- Excavate unstable banks to a stable form (gentle side slopes) as per Figure 1.

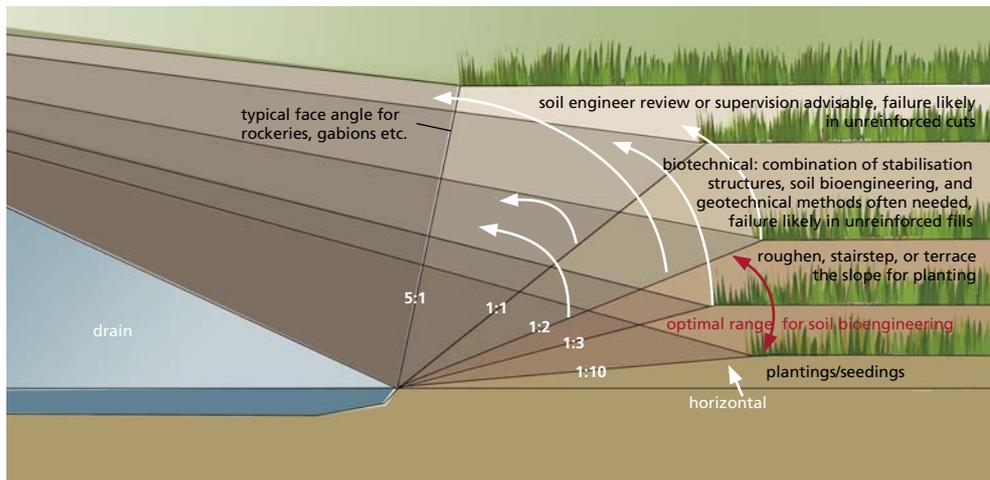


Fig.1. Slope (rise/run), and bank height relative to rooting depth, are important factors in determining appropriate bank protection measures (adapted from FISRWG 1998).

- Requirements for reshaping are largely related to the bank height relative to the rooting depth of stabilising vegetation. If the rooting depth is less than the bank height the streamside vegetation will provide little protection from bank scour.
- Some broad guidelines for root system protection are shown below in Figure 2.
- Establish bank vegetation (See Streamside planting guide, [www.nzwerf.org.nz](http://www.nzwerf.org.nz); Rehabilitating disturbed land BMP).

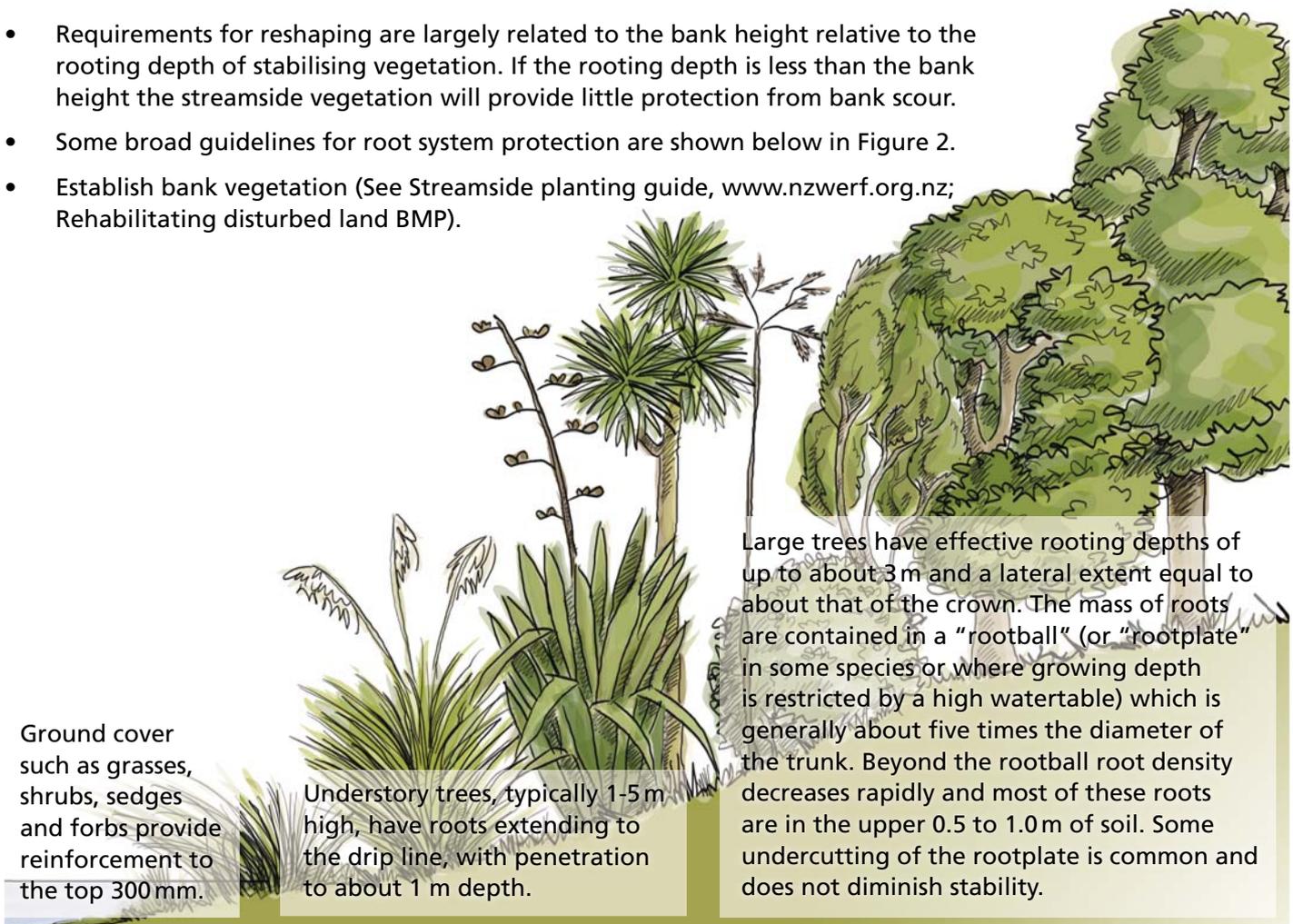


Fig.2. Guidelines for root system protection. Illustration: Greater Wellington.

## Additional reading

Lovett, S.; Price, P. 1999. *Riparian land management technical guidelines*. Volumes 1 & 2. Lands and Water Resources Research and Development Corporation, Canberra.