

7.3 STREAM BANK ZONE MANAGEMENT

What is the stream bank zone ?

The stream bank zone refers to the area adjacent to waterways including the vegetation on both the banks and verges. The verge is the area of land up to 40 metres from the waterway channel.

Why is it important ?

In a natural stream environment, the bank and surrounding vegetation act as a buffer between the watercourse and surrounding land uses. This buffer can assist in:

- *Stabilising and maintaining stream bank*
- *Preventing excessive erosion*
- *Providing canopy shade.*
- *Protecting riparian condition*
- *Filtering and trapping soil particles*
- *Extracting nutrients from the water*

What causes stream bank degradation ?

The primary causes of stream bank degradation in the Yass catchment are: *lack of vegetation, stream bank erosion, willows and other weeds.*

Increased water flow, combined with a reduction in ground cover and soil disturbance, causes stream bank erosion. It is usually caused by the direct action of stream flow and can be exacerbated by erodible soil types. Other contributors to stream bank erosion include; damage by stock, flooding, carp, or channel blockages (by sand, gravel, vegetation etc).

The removal and degradation of stream bank vegetation in the Yass area has contributed to increased erosion, changed nutrient levels, water quality decline, and loss of aquatic habitat.

The decline of stream bank vegetation condition in the Yass area has allowed willow populations to spread. There is now a growing concern over willows, their impact on watercourses and their role in the landscape. Willows can have an increasingly large impact on a river system causing:

- *Flooding*
- *Erosion*
- *Water quality decline*
- *Disruption to water flow*
- *Changes to stream nutrients, aquatic habitat and food resources*
- *Potential threat to structures such as bridges and roads.*

More than 100 species or varieties of willows have been introduced to Australia, of which four major species are found in the Yass catchment (Cremer, 1995).

The four major species are:

- *Crack Willow (*Salix fragilis*)*
- *Black Willow (*Salix nigra*)*
- *Golden Upright Willow (*Salix alba* var. *vitellina*)*
- *Weeping Willow (*Salix babylonica*)*

What is the impact on the Yass catchment ?

Native stream bank vegetation in the upper Murrumbidgee area, which includes Yass Valley, is declining. The major threats to stream bank vegetation are rabbits, poor grazing management, weeds, willows and clearing.

The Yass Valley sub-catchment consists of 74 major drainage systems flowing into the Yass River. Land use mapping suggests 46% of the Yass river is dominated by exotic riparian vegetation, 27% is dominated by native stream bank vegetation, and the remaining 27% a mix

of native and exotic species (DLWC 2000b). For stream bank condition assessments for all streams in the Yass Valley sub-catchment see the Appendix section 7.3.

Aerial photographic mapping conducted by DLWC suggests 99.3kms of the Yass catchment is affected by stream bank erosion of which:

- 77% is less than 1.5 metres deep;
- 17% is 1.5 to 3 metres deep;
- 4% is 3 to 6 metres deep and;
- 2% greater than 6 metres.

Fish barriers, such as weirs, are having a detrimental effect on native fish movement and breeding. Gravel roads, saline areas and gullies are sending sediment and nutrients into the Yass River system (DLWC 2000b).

Fish species in the Yass area are dominated by carp. The greatest population of native fish occur in the Murrumbidgee River, but only constitute 8% of the total fish diversity.

According to the *Stressed Rivers Assessment Report* (DLWC 1999) the Yass River and tributaries are subject to high environmental stress, with the upper parts of Yass River displaying increased stress. The primary stress factors for the Yass River and tributaries **above** the Yass Weir include; high water extraction, salinity, dams and rural residential development. In the Yass River and tributaries **below** the Yass Weir, primary stress factors include sewerage, flow restrictions such as weirs, and salinity. Full development of this area below the weir could create a potential increase in hydrologic stress.

Stream bank vegetation has been assessed as poor in Yass River from Yass to Gundaroo (lower-mid), where poor indicates a dominance of exotic species. Stream bank condition has also been assessed as poor at Derringullen Creek

(mid), Cooks Creek (mid), Mantons Creek (lower-mid), Gundaroo Creek (lower) and Bungendore Creek (upper), where poor indicates little effective vegetation on unstable or dispersive soils, recent bank movement or erosion.

Priority

Stream bank vegetation condition was established as a high priority issue by all six landcare groups in the Yass Valley sub-catchment. This is largely due to the dependence of the townships of Yass, Bowning and Binalong on the Yass River for their water supply. This concern is echoed by the Burrinjuck sub-catchment landcare groups, and in the overarching Murrumbidgee Catchment Action Plan which lists stream bank zone management as a high priority issue.

The groups stated willow management should focus on controlling their spread and to control willows in areas of greatest impact on stream health and stability.

1. *Seeding willows*
2. *Vegetative spreading willows*
3. *Islands – Willows on mid-stream islands/silt beds, channel blockage and erosion.*

Local Actions to Date

2000/2001

- Yass Urban Landcare Stream bank rehabilitation project

1999/2000

- Taylors & Allianoyomyiga Creeks Remnant Vegetation Protection & Enhancement Project
- Riparian Zone Revegetation - Moura Creek Stage 2
- Stream Bank Restoration Demonstration Sites
- Narrangullen Creek Stream Bank Revegetation & Erosion Control Project
- Sawpit Creek gully works

1998/1999

- Jerrawa Creek Rivercare
- Sutton Yass River Management Plan & Works
- Cooma Cottage Riverbank Rehabilitation
- Yass River Fencing & Revegetation
- Jeir Creek Fencing, Revegetation & River Management
- Riparian Zone Revegetation Moura Creek
- Dicks Creek Stream Bank Revegetation
- Murrumbateman Missing Links

1997/1998

- Jerrawa Creek Rivercare
- Yass Urban Willow Removal & Revegetation

1996/1997

- Jerrawa Creek & Lachlan River Tributaries Riverine Corridor Stabilisation and Enhancement Project.

- Gundaroo - Yass River management plan and works.

See also in the Appendix:

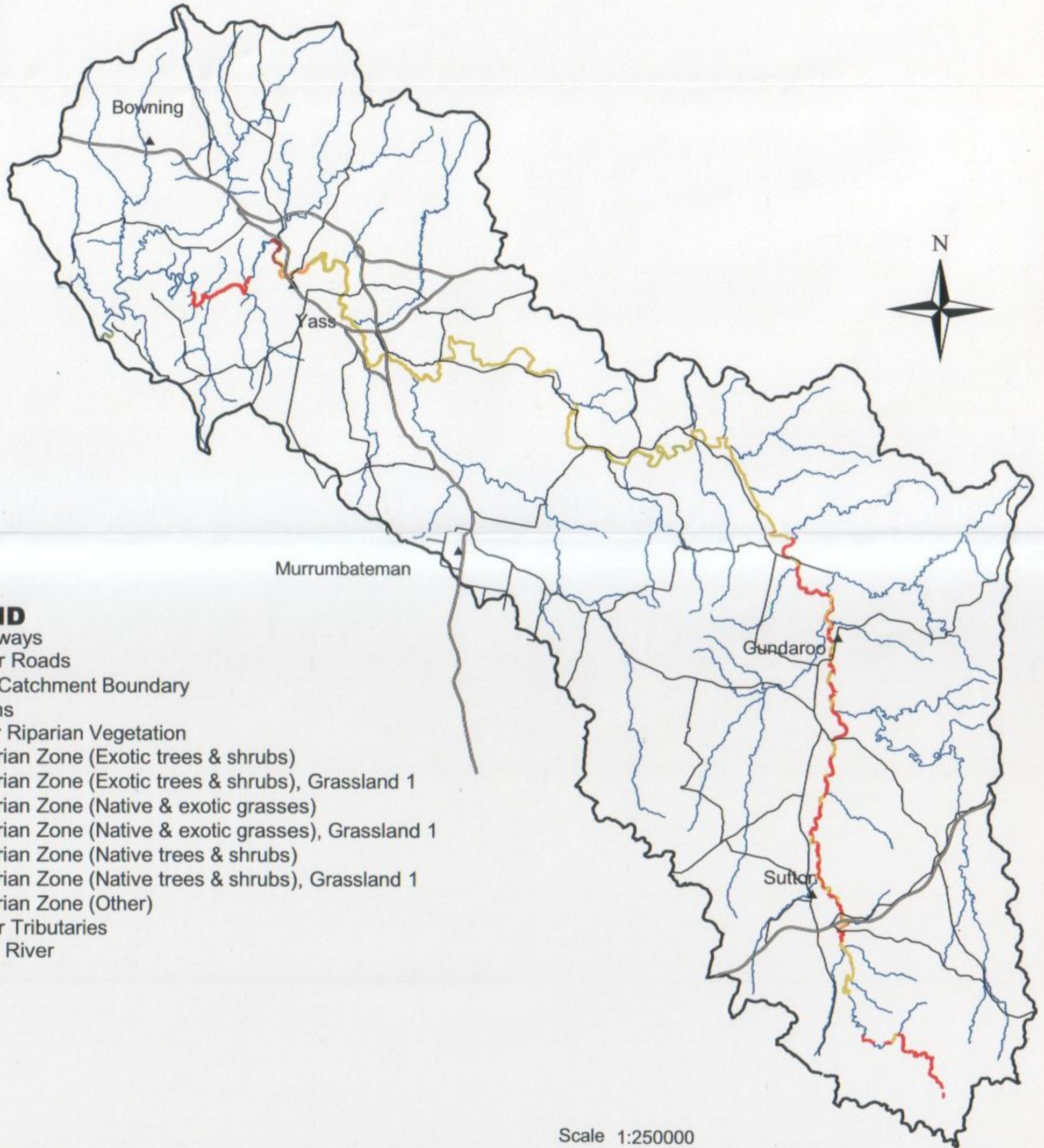
Section 7.3 *Stream Bank Zone*

Table 13 Dominant native riparian vegetation for the Yass area

Table 17 Riparian vegetation and stream bank condition: Yass Valley Sub-catchment

YASS VALLEY SUB-CATCHMENT

Map 11: Stream Bank Vegetation



LEGEND

- Highways
- Major Roads
- Sub-Catchment Boundary
- Towns
- Yass River Riparian Vegetation**
- Riparian Zone (Exotic trees & shrubs)
- Riparian Zone (Exotic trees & shrubs), Grassland 1
- Riparian Zone (Native & exotic grasses)
- Riparian Zone (Native & exotic grasses), Grassland 1
- Riparian Zone (Native trees & shrubs)
- Riparian Zone (Native trees & shrubs), Grassland 1
- Riparian Zone (Other)
- Major Tributaries
- Yass River

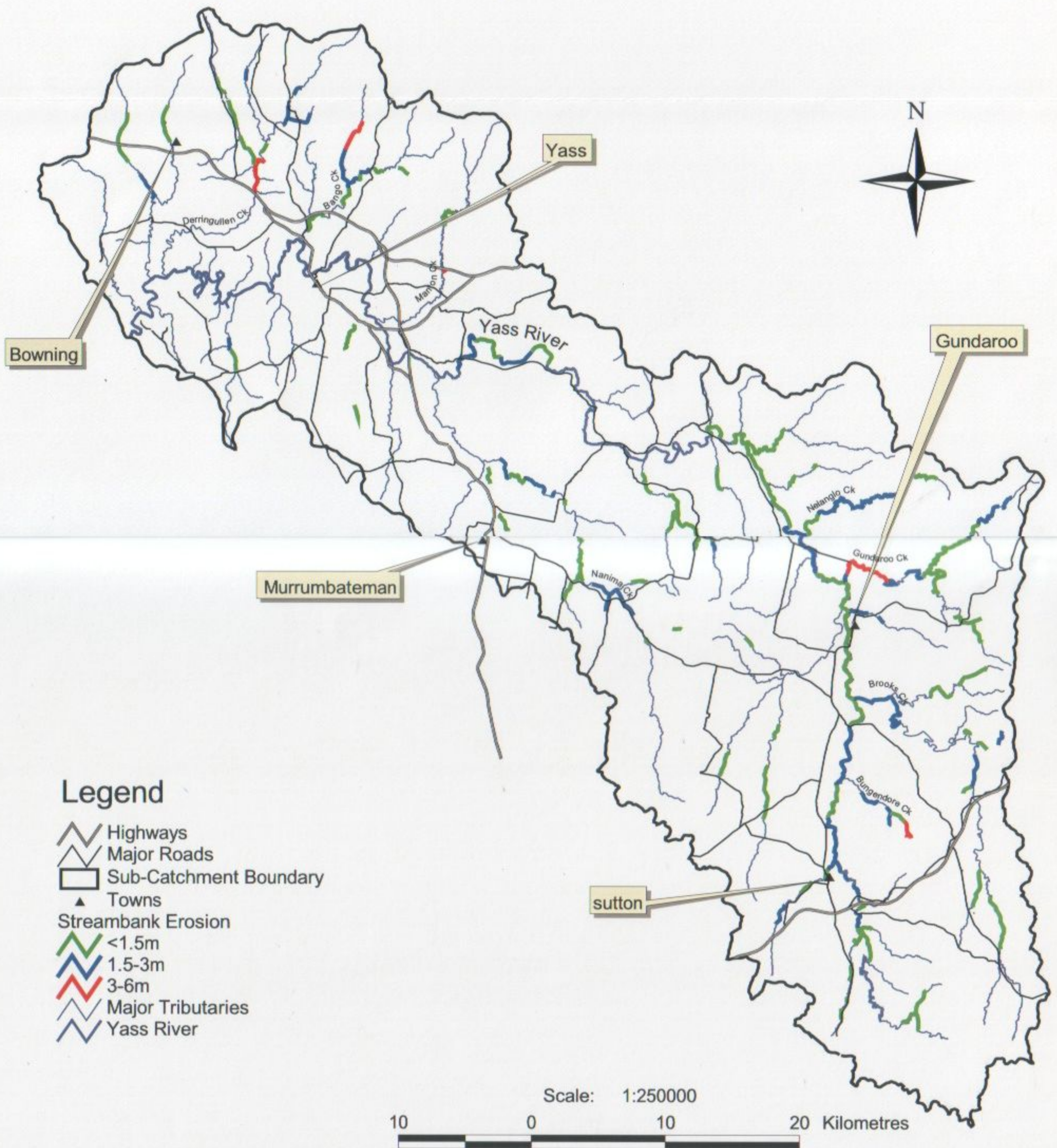
Scale 1:250000

10000 0 10000 20000 Metres

DISCLAIMER
 The Department of Land and Water Conservation and/or contributors accepts no responsibility for the result of action taken or decisions made on the basis of the information contained herein or for errors, omissions or inaccuracies presented here. Whilst all care is taken to ensure a high degree of accuracy, users are invited to notify of any map discrepancies.

YASS VALLEY SUB-CATCHMENT

Map 12: Stream Bank Erosion



Legend

- Highways
- Major Roads
- Sub-Catchment Boundary
- Towns
- Streambank Erosion**
- <1.5m
- 1.5-3m
- 3-6m
- Major Tributaries
- Yass River

Scale: 1:250000

10 0 10 20 Kilometres

DISCLAIMER

The Yass Area Network of Landcare Groups and/or contributors accepts no responsibility for the result of action taken or decisions made on the basis of the information contained herein or for errors, omissions or inaccuracies presented here. Whilst all care is taken to ensure a high degree of accuracy, users are invited to notify of any map discrepancies.

Source DLWC 1999

3. STREAM BANK ZONE ACTION PLAN

WHAT WILL WE DO ?

WHY ARE WE DOING IT ?

Manage creek and river corridors.	To prevent loss of productive farmland, minimise sediment & chemical content, and to maintain water quality.
-----------------------------------	--

HOW DOES IT CONTRIBUTE TO MURRUMBIDGEE CATCHMENT BLUEPRINT TARGETS ?

Water Quality ✓	Biodiversity ✓	Community Building ✓
-----------------	----------------	----------------------

HOW WILL WE DO IT ?

(codes in brackets indicate Matching Blueprint Actions)

Identify the problem

SZ1. Use the Riparian Catchment Assessment Sheets to identify and target high priority areas.

SZ2. Seek expert advice on the severity of the problem and possible local causes.

Implement management practices

SZ3. Manage stock access to protect areas of identified stream bank erosion, eg large mobs grazing for short periods to maximise ground cover. (WMA4, BMA2)

SZ4. Change practices to include buffer zones near stream banks.

SZ5. Encourage zoning of appropriate stream bank areas for public use, access and environmental benefit. (BMA2)

SZ6. Use 'environmentally-friendly' chemicals near waterways, and ensure other chemicals do not enter the stream bank zone.

On-ground works

SZ7. Where appropriate to individual farm plans, fence areas as necessary with the cooperation of land holders.

SZ8. Remove weeds such as Crack willows or Black willows. (WMA5)

SZ9. Improve stream bank vegetation cover and biodiversity. (BMA10)

SZ10. Undertake structural earthworks on severely eroding banks. (WMA6)

SZ11. Control carp populations through participation in regional actions. (WMA15)

Promote and educate

SZ12. Develop information kit/guidelines for landholders. (CBMA11)

SZ13. Develop demonstration and sponsor projects. (CBMA11)

SZ14. Encourage voluntary agreements such as land retirement, management agreements and covenants for stream bank areas.

Monitor

SZ15. Establish regular assessment and mapping of stream bank conditions (building on existing GIS data).

SZ16. Monitor change and the impacts of management practices (CBMA11)

SZ17. Monitor downstream sediment loads to test impact of actions taken.

BEST MANAGEMENT PRACTICES

STREAM BANK ZONE

What is the stream bank zone ?

The stream bank zone is the area adjoining a waterway including the vegetation on both the banks up to 40 metres from the waterway channel.

Why do we need to manage it ?

- to maintain good water quality
- to prevent erosion
- to maintain aquatic habitat
- to provide a wildlife corridor

What can I do ?

There are a number of things you can do to improve the sustainability and health of the stream bank. As a first step, the stream bank zone should be managed to allow controlled access of stock and to assist regeneration and weed control.

- willow control
- weed control
- revegetation, and
- structural works.

Facts sheets on each of these activities is attached.

Some general principles :

- don't build structures on, or close to a stream bank,
- leave a buffer zone
- don't remove trees, shrubs or grasses from the stream bank (unless noxious weeds)
- only allow stock watering points on gently sloping banks, and ensure erosion control measures are in place, eg paved ramp etc.
- don't allow excessive build-up of debris in the stream which can divert the stream flow
- access ramps to the stream should only be built on the inside of bends
- never excavate a stream without getting advice and permission !

!!! Remember: any works undertaken on a stream, creek or river may require a permit or permission from one or more agencies - ask for advice !!!

Who can help ?

Department of Land & Water Conservation, Yass Phone (02) 6226 1433

WILLOW CONTROL

Why should we control willows ?

Willows are familiar sight in the Australian rural landscape. And while they have some recognised values such as providing shade, shelter and bank stabilisation, they are a serious threat to the health of the waterways, native vegetation and stream banks.

Willows cause erosion by diverting the flow of water towards the banks. They also reproduce rapidly through a prolific production of seed, or by broken branches taking root.

How do I control willows ?

The most effective means of controlling willows is to completely remove them from the streambank. Removal should begin in the headwaters of the catchment, moving downstream. If possible, removal should be undertaken within a certain section, bounded by control points such as rock beds, culverts etc to minimise risk of erosion. Remove willows on straight sections first, then on the inside of bends, then on the outside bends.

- remove young willow seedlings **by hand**,
- **foliar spray**, Glyphosate (360 g/L) is registered for use as a foliar spray on trees up to two metres high at a rate of 1-1.3 L/100L water.
- **stem injection**, 1-2 mL of Glyphosate (360 g/L) injected into cuts around trunk spaced at 13 cm intervals
- **cut tree to a stump**, application of undiluted Glyphosate (360 g/L) immediately after cutting.

Any debris resulting from willow control should be removed immediately and the area revegetated with suitable plant species.

Where do I start ?

First priorities

- Willows growing in midstream that block or divert water should be removed first.
- Willows that divert water flows into banks.

Then

- Damaged, brittle or old willows that drop branches
- Species that produce viable seed (see below).

When is the best time to control willows ?

Chemical control should take place between December and March. The Department of Land and Water Conservation (DLWC) recommend that willow clearing should be carried out in as short a time as possible, to be finished within three (3) years of approval.

What are my legal obligations when removing willows ?

Approval must be obtained from DLWC before any vegetation is removed from within 20 metres of nominated waterways. DLWC's *Willow clearing guidelines for applicants* outlines the approval process and can be obtained from any DLWC office.

Approval must also be obtained for activity involving ground disturbance within 40 metres of a watercourse, (contact DLWC for more information).

Also seek advice about the restrictions on the use of weedicides near waterways of the *Clean Waters Act of NSW (1970)* from the DLWC.

Remember: Revegetate the sites with appropriate native vegetation and regularly check site for spread of any new willows.

Species contributing to seed production

Salix nigra

S. alba var *vitellina*

S. matsudana x *S. alba* and clones

S. matsudana 'Tortuosa'

S. rubens

S. cinerea

S. purpurea

S. glaucophylloides

S. viminalis

S. fragilis

Species for urgent control and management

S. alba var *vitellina* x *S. fragilis*

S. babylonica

S. caprea

S. matsudana 'Pendula'

Further reading

Willow Management Strategy for the Upper Murrumbidgee Catchment, June 1998; Willows Working Group of the ACT Environment Advisory Committee and Willow Working Group of the Upper Murrumbidgee Catchment Coordinating Committee.

Who can help ?

Department Land and Water Conservation, Yass.

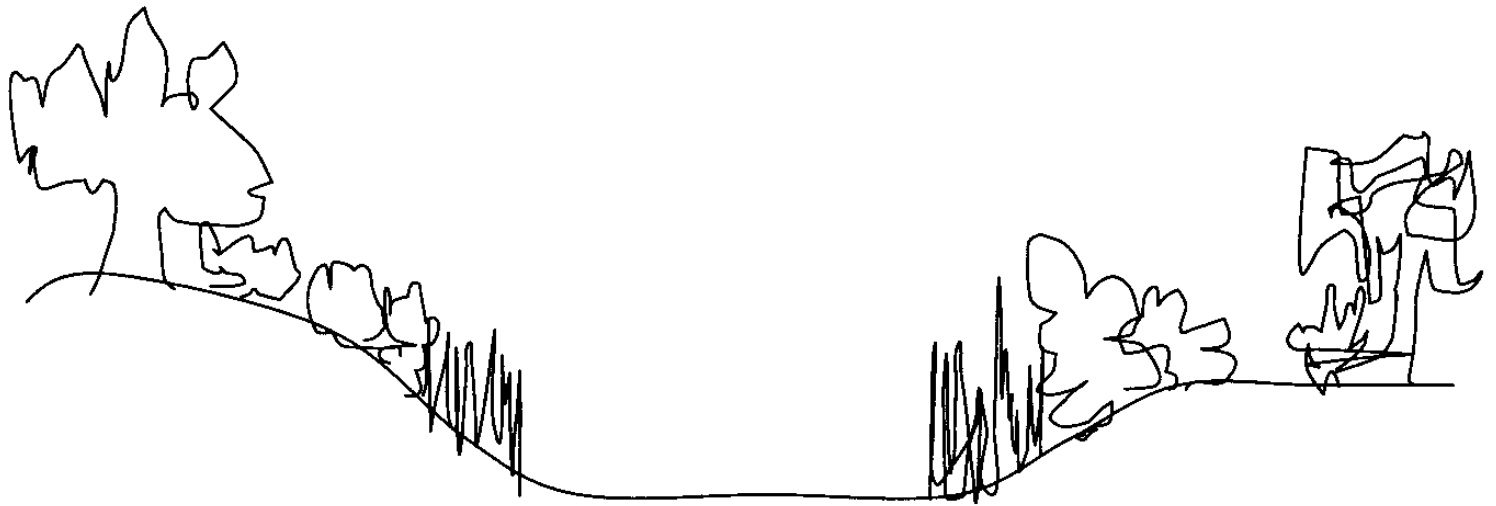
Ph: 6226 1433

Landcare Coordinator, Yass

Ph: 6226 1433

STREAM BANK REVEGETATION

When revegetating stream banks, a variety of trees, shrubs, groundcovers and grasses should be used.



Trees should be planted away from the banks, with shrubs and reeds closer to the stream.

The stream bank should be managed along best management practices (see BMP Stream Bank).

Greening Australia recommend a number of species for the stream bank zone including;

- Silver Wattle (*Acacia dealbata*)
- Red Stem Wattle (*Acacia rubida*)
- Tussock Grass (*Poa labillardieri*)
- River Tea-tree (*Leptospermum obovatum*)
- River Bottlebrush (*Callistemon sieberi*)
- Common Reed (*Phragmites australis*)
- Cumbungi (*Typha sp.*)

Further References

Greenotes Greening Australia ACT & SE. PO Box 538 Jamison Centre, ACT 2614 ph (02) 6253 3035
fax (02) 6253 3145 email gaact@netinfo.com.au

Who Can Help ?

Department Land and Water Conservation, Yass.
Greening Australia ACT & SE NSW

Ph:(02) 6226 1433
Ph:(02) 6253 3035

MANAGING STOCK ACCESS TO THE STREAM BANK ZONE

Why should stock access be managed ?

Unmanaged access of stock to the stream bank zone can destroy vegetation, compact the soil, push soil into the watercourse, create small gullies into the watercourse and endanger the stock themselves. This can lead to erosion of the stream bank and a decrease in water quality.

Stock should also be kept out of the watercourse. If allowed access, they damage water vegetation, add excess nutrients to the water, destroy native fish habitat and risk injuring themselves.

How can stock access the water without damaging the stream bank ?

Watercourses provide an important source of water for stock for many agricultural enterprises, and access to that water can be maintained without causing damage to the stream bank.

The best option is to fence off the stream bank zone and control stock access to that area. Options for managing access include installing a paved ramp down to the water, using a bore and tank in the paddock or a pump and a trough. Recommendations about the best places to set fences, access points and crossings are available (see Further References).

Before you install infrastructure to extract water from a stream or river, contact the Department of Land and Water Conservation for advice and to ensure you do not breach any legislation.

Can stock still access the vegetation for fodder?

Once the vegetation is established, stock can graze in the stream bank zone for short periods to eat the grass, but should be moved before they start to eat shrubs and trees.

How will I control weeds in the fenced area ?

Weed control should be undertaken. You should seek advice from the local Department of Land and Water Conservation as the *Clean Water Act* contains provisions regulating the use of chemicals near watercourses.

Further References

Livestock Control near Rivers: Ways of Keeping Livestock out of River Beds and Off the Banks, Riverwise Advisory Notes for Rural Landholders, DLWC, 1995.

Who can help ?

Department Land and Water Conservation, Yass.

Ph:(02) 6226 1433

HOW TO ASSESS THE CONDITION OF STREAM BANK VEGETATION

RATING	VEGETATION	STABILITY
LOW	<ul style="list-style-type: none"> • Vegetation on banks generally sound • Good species diversity 	<ul style="list-style-type: none"> • River channel is stable from erosion • No undermining of banks • No continuous damage to bank structure
MODERATE	<ul style="list-style-type: none"> • Vegetation on banks is sparse • OR vegetation is the wrong kind • OR there is excessive growth within the river channel 	<ul style="list-style-type: none"> • River channel is starting to enter a state of decline and physical instability • Banks held by discontinuous vegetation or erosion resistant soils • Some obvious damage to bank structure and vegetation • Generally stable toe
SEVERE	<ul style="list-style-type: none"> • Vegetation on banks is missing • Banks are bare or falling into channel 	<ul style="list-style-type: none"> • River channel is in an advanced stage of disintegration • Unstable or dispersive soils • Mostly undercut toe • May be recent bank movement or erosion

Further information and advice

Landcare, Yass Office C/- DLWC (02) 6226 1433

Department Land and Water Conservation, Yass. (02) 6226 1433

FACT SHEET

**USEFUL SPECIES FOR REVEGETATION OF RIPARIAN AREAS IN THE YASS AREA
CATCHMENT**

BOTANICAL NAME	COMMON NAME	CATCHMENT AREAS
<i>Acacia dealbata</i>	Silver Wattle	Yass River, Brooks Creek, Murrumbateman Creek, Murrumbidgee River, Ginninderra Creek, Tuggeranong Creek, Mountain Creek, Goodradigbee River, Micalong Creek
<i>Acacia rubida</i>	Red Stem wattle	
<i>Poa labillardieri</i>	Tussock grass	
<i>Phragmites australis</i>	Common Reed	
<i>Typha spp.</i>	Cumbungi	
<i>Casuarina cunninghamiana</i>	River She-Oak	Murrumbidgee River, Ginninderra Creek, Tuggeranong Creek, Mountain Creek, Goodradigbee River, Micalong Creek
<i>Eucalyptus camaldulensis</i>	River Red Gum	Yass River, Brooks Creek, Murrumbateman Creek
<i>Eucalyptus viminalis</i>	Ribbon Gum	Goodradigbee River, Micalong Creek

ADDITIONAL NATIVE SPECIES SUITABLE FOR RIPARIAN REVEGETATION

BOTANICAL NAME	COMMON NAME	HABIT
<i>Acacia pravissima</i>	Wedge-leaf Wattle	Shrub
<i>Acacia mearnsii</i>	Black Wattle	Small tree
<i>Bursaria lasiophylla</i>	Blackthorn	Shrub
<i>Callistemon sieberi</i>	River Bottlebrush	Shrub
<i>Calytrix tetragona</i>	Common Fringe Myrtle	Shrub
<i>Cassinia aculeata</i>	Common Cassinia	Shrub
<i>Cassinia longifolia</i>	Cauliflower Bush	Shrub
<i>Dodonaea viscosa</i>	Hopbush	Shrub
<i>Eucalyptus aggregata</i>	Black Gum	Medium/large tree
<i>Eucalyptus stellulata</i>	Black Sallee	Medium/large tree
<i>Eucalyptus pauciflora</i>	Snow Gum	Medium/large tree
<i>Eucalyptus rubida</i>	Candlebark	Medium/large tree
<i>Grevillea juniperina</i>	Prickly Grevillea	Shrub
<i>Grevillea lanigera</i>	Woolly Grevillea	Shrub
<i>Hakea microcarpa</i>	Small-fruit Hakea	Shrub
<i>Leptospermum brevipes</i>	Slender Tea Tree	Shrub
<i>Leptospermum lanigerum</i>	Woolly Tea Tree	Shrub
<i>Leptospermum obovatum</i>	River Tea-tree	Shrub
<i>Lomandra longifolia</i>	Long-Leaf Mat Rush	Rush
<i>Lomatia myricoides</i>	Long Leaf Lomatia	Shrub
<i>Lythrum salicaria</i>	Purple Loosestrife	Herb/groundcover
<i>Pomaderris angustifolia</i>	Pomaderris	shrub

RIVER CORRIDOR SPECIES

Planting of the following species should be undertaken a suitable distance from the banks to prevent collapse into the river. This distance will depend on the stability and soil type forming the bank. For larger trees a distance of three times the bank height is recommended.

COMMON NAME	SCIENTIFIC NAME	REVEGETATION INFORMATION
Apple Box	<i>Eucalyptus bridgesiana</i>	alluvial soil, medium sized tree to 20m
Black Sallee	<i>Eucalyptus stellulata</i>	loamy, alluvial soils, will propagate on very cold river flats, and also on poorly-drained sites, height to 12m
Black Wattle	<i>Acacia mearnsii</i>	dry, shallow soils, very frost and drought hardy, vigorous spreading and anchoring root system, 5-15m
Blue Gum	<i>Eucalyptus globulus</i> <i>bicostata</i>	moist conditions, preferring loams or shallow clay soils, tall tree 25-60m
Broad-leaf Peppermint	<i>Eucalyptus dives</i>	prefers poor, shallow soils, 8-25m
Candlebark	<i>Eucalyptus rubida</i>	dry, shallow soils, hardy, suitable for cold areas, 2-10m
Hickory Wattle	<i>Acacia falciformis</i>	shallow, rocky soils, 4-12m
Lightwood	<i>Acacia implexa</i>	shallow, dry soils, 4-15m
Ribbon Gum/Manna Gum	<i>Eucalyptus viminalis</i>	prefers well drained, alluvial soils, large tree, 25-50m
River Bottlebrush	<i>Callistemon paludosus</i>	wet sand or rocky soils, also suitable base of eroding stream banks, 2-7m
River Red Gum*	<i>Eucalyptus camaldulensis</i>	prefers deep, moist, clay soils along rivers and watercourses eg. Yass and Murrumbidgee rivers, 12-25m. Large tree, plant well back from eroding or collapsing banks
River She-oak	<i>Casuarina cunninghamiana</i>	roots good at binding banks, 12-30m
Silver Gum?	<i>Eucalyptus crenulata</i>	cool, poorly drained sites
Silver Wattle*	<i>Acacia dealbata</i>	is frost and drought resistant, and will grow along watercourses, vigorous spreading root system, regenerates easily by seed and suckering
Snow Gum	<i>Eucalyptus pauciflora</i>	wide range of soils, very hardy on cold, open sites and where soils too shallow for Ribbon Gum, height to 20m
Yellow Box	<i>Eucalyptus melliodora</i>	loamy soils on lower slopes, but higher than the River Red Gums on the alluvial soils

* Most Useful Revegetation Species for Yass River and Murrumbidgee River Sub-Catchments
(As described in *Upper Murrumbidgee Catchment Riparian Vegetation Survey - Greening Australia, 1996*)

STRUCTURAL WORKS IN THE STREAM BANK ZONE

What structural works can I undertake to control erosion?

- **Brush Groynes** are a series of low walls built out of logs and brush extending into the stream along the eroded bank. The groynes slow the flow, collect sediment and allow vegetation to establish. It is a low cost option, suitable for low to medium energy flow watercourses.
- **Fallen logs** in the watercourse can also be used to protect the bank from erosion by diverting the flow of water away from an eroding bank.
- **Log walls** can be constructed along the base of the bank which allows vegetation to establish.
- **Realignment of the water channel** can be carried out to direct flows away from the banks. Native vegetation is used to stabilise the new bank. Note that permits apply to this type of work. See local DLWC office for more information.
- **Gravel mesh sausages** are long mesh baskets filled with gravel that are used to slow the flow of the watercourse near the bank and guide it way, allowing sediment to deposit at the base of the bank.
- **Jacks** are a series of cross-shaped structures placed along the base of the eroded bank with vegetation planted in between to slow the flow near the bank, and allow vegetation to establish.
- **Timber weirs** provide bed erosion control, and restore shallow rapids and pools. They also provide for fish habitat and water supply.
- **Boulders** can be used to raise the bed level and direct flows away from banks. They also provide polls, riffles and holes for fish habitat.
- **Rock revetment** is the placing of rocks against the base of the bank to protect it and hold material in place.

It is important that you seek advice before planning any of the above works.

Work undertaken in or near stream banks is subject to local and state legislation and you should seek advice regarding your obligations or any permits that may be required.

Who can help?

Department of Land and Water Conservation, Yass Office (02) 6226 1433.

Further References

Works to control stream bank erosion: Treatment Options. Riverwise Advisory notes for rural landholders, DLWC, 1998

FURTHER REFERENCES

Cremer, K.W.

Willow identification for River Management in Australia

Technical Paper No 3 1995

CSIRO Division of Forestry, Canberra, Australia

Ive, J. Recommended Native Species for Planting in the Yass Valley. Yass River Valley Re-vegetation project. October 1990.

Natural Resource Management, Special Issue, December 1999

Australian Association of Natural Resource Management

Riverwise: Advisory notes for rural landholders. DLWC Sydney.