Local Land Services

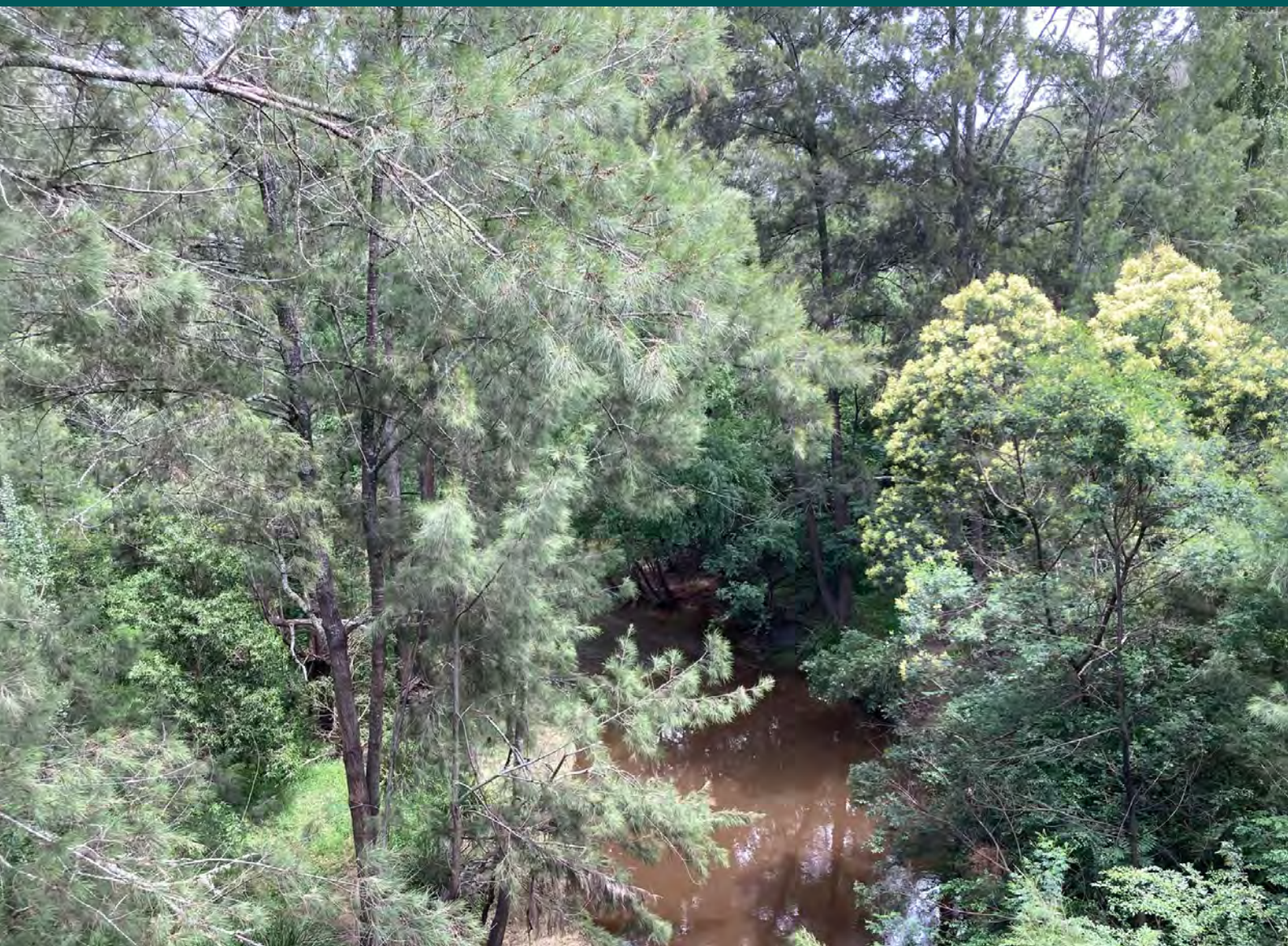
NSW GOVERNMENT

Wollombi Brook Catchment Riparian Revegetation Guide

Information in this guide will help landholders re-establish native vegetation along the banks of Wollombi Brook and its tributaries. It includes advice on how to put the right plant in the right place to help restore or re-establish healthy riparian vegetation and protect and enhance our waterways.

February 2022

lls.nsw.gov.au/regions/hunter



WHY RESTORE CREEK BANKS IN WOLLOMBI CATCHMENT?

Image: Stockyard Creek bank planting with cardboard tree guards.

Native vegetation plays a vital role in creek bank stabilisation. The Wollombi Brook and its tributaries are impacted by floods as well as human and animal activities. Its waterways need active assistance and management to maintain and improve their stability and resistance to erosion. Local native trees, shrubs and groundcovers are best suited to protect and rehabilitate creek banks. Some of their benefits include:

- reducing and stabilising erosion by holding soil in place
- reducing impacts of floods
- providing and linking habitat for native plants and animals
- reducing nutrient run-off into waterways, algal blooms and aquatic weeds
- regulating water temperature and providing shade for fish, platypus and other wildlife through over-hanging foliage
- enhancing aquatic habitat through fallen trees which provide for future creek bank protection.

Local native vegetation is preferable over exotic species, such as willows and poplars, as it provides biodiversity benefits and better habitat for native plants and animals.

Erosion and deposition of sediment are natural river processes. However, rates of erosion have been accelerated through the historical removal of native vegetation, over-grazing, mowing and other pressures preventing regeneration of native vegetation, leading to:

- loss of productive land
- loss of habitat and diversity
- reduced water quality.

Where creek banks are disturbed and weeds are prevalent there is limited ability of creek banks to repair themselves through natural regeneration of native vegetation between flood events.

Historical clearing in the Wollombi reaches has led to mass transport of sandy sediment downstream through to the Hunter River after floods. Fortunately, various parts of the Wollombi Brook are recovering through natural regeneration. Long term recovery is assisted by increasing native riparian vegetation, ground cover and woody debris to help catch and hold sediment in the upper reaches.

Image: Revegetation at Laguna, weeds were treated before planting and grass will continue to be mowed until the plants grow large enough to shade out the grass.

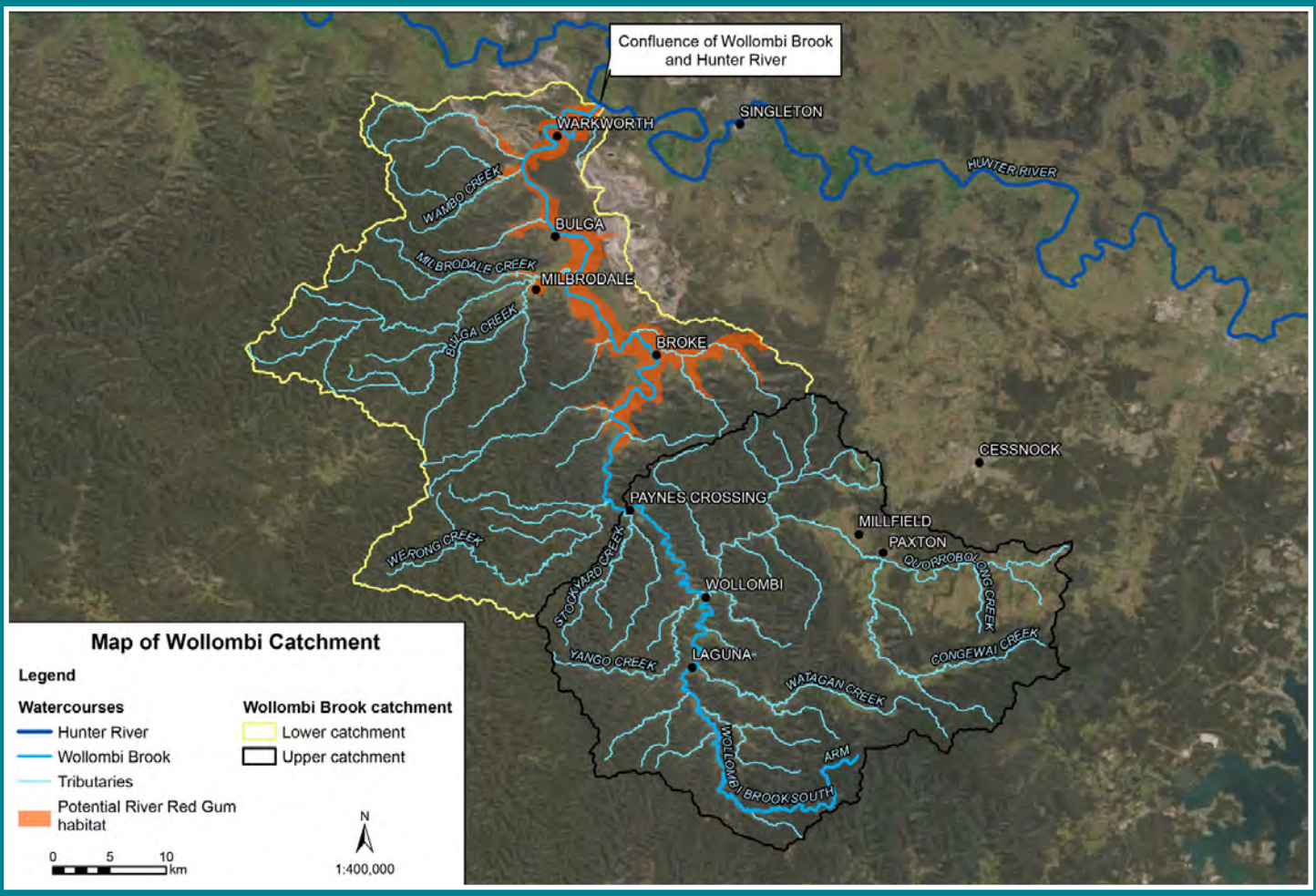
SPECIES BY LOCATION ON CREEK BANK

Select from the short-list of species from the table below:

Toe & lower banks:		**Upper banks:**	
Common name	**Species**	**Common name**	**Species**
Spiny-headed mat rush	*Lomandra longifolia*	Brush kurrajong	*Commersonia fraseri*
Tall sedge	*Carex appressa*	Tea tree	*Leptospermum polyanthum*
★ River oak	*Casuarina cunninghamiana*	Bottlebrush	*Callistemon salignus*
Sandpaper fig	*Ficus coronata*	Coffee bush	*Breynia oblongifolia*
○ Water gum	*Tristaniopsis laurina*	Muttonwood	*Myrsine variabilis*
Bottlebrush	*Callistemon salignus*	Sydney green wattle	*Acacia parramattensis*
		Silver-stemmed wattle	*Acacia parvipinnula*
		Yellow fruited pittosporum	*Pittosporum revolutum*
		□♦ River red gum – see note	*Eucalyptus camaldulensis*
		♦★ Forest red gum	*Eucalyptus tereticornis*
		○★ Thin-leaved stringybark	*Eucalyptus eugenioides*
		♦ Cabbage gum	*Eucalyptus amplifolia*
		○♦★ Grey gum	*Eucalyptus punctata*
		Cheese tree	*Glochidion ferdinandi*
		Prickly-leaved paperbark	*Melaleuca styphelioides*
		Narrow-leaved paperbark	*Melaleuca linariifolia*
		○ Grey myrtle	*Backhousia myrtifolia*
		○ Lilly pilly	*Acmena smithii*
		Red ash	*Alphitonia excelsa*
		Rough-barked apple	*Angophora floribunda*

○ Upper catchment areas
□ Lower catchment areas
♦ feed trees for Koala (endangered species)
★ feed tree or nesting habitat for Regent Honeyeater (critically endangered species)

River Red Gums: The Hunter Valley population of River Red Gum (*Eucalyptus camaldulensis*) is listed as an endangered population under *the NSW Biodiversity Conservation Act 2016*. Planting of "non-local provenance" is identified as a "potential threat to the genetic integrity of the Hunter catchment population". Contact the Broke/Bulga Landcare Group for further advice.



PLANTING METHODS

- Most native seedlings are sold in trays of 40 tubes. These small pots are designed to be an optimal size for planting considering low cost, speed of plant growth and development of roots.
- Using a mattock, spade, post-hole digger or auger (eg. cordless drill attachment), dig a hole big enough to comfortably fit the root ball of the plant. In hard packed soils prior-ripping may be required.
- Gently remove the plant from the plastic tube and place the plant in the hole. Make sure all the roots are beneath the surface of the ground. Back fill the hole with topsoil and press down firmly around the plant.
- Build a water basin around the outside of the planted tree, especially if planting on a slope or in fast draining soils (figure 1). Give the plant plenty of water.
- Tree guards can be used to protect the plant from wind, sun, frost, and browsing herbivores (wallabies and wombats,) and pest animals (rabbits and hares). Tree guards are available for purchase from plant nurseries and we recommend biodegradable cardboard (better near creeks) or reusable plastic 'sleeves' (on high banks above flood flows). All guards must be staked straight and tight to prevent them from collapsing, leaning on tree seedlings or blowing away. Check guards regularly and weed around seedlings. Retrieve plastic guards when plant is about waist high. Rushes and sedges don't need tree guards.
- Consider 'long-stem planting' (figure 2) deeper planting of tubestock that has been custom-grown at nurseries, ready to plant in the ground with up to ¾ of stem underground. Long-stem planting is especially suited to riparian revegetation projects in sandy soils as plants quickly grow strong root systems in damp subsoils and can better withstand flood waters. Other benefits include reduced watering requirements, improved frost tolerance and better ability to outcompete weeds. The long stem tube stock method was successfully developed in the Wollombi catchment by Bill Hicks.

Figure 1: form a basin around plants to catch and retain water

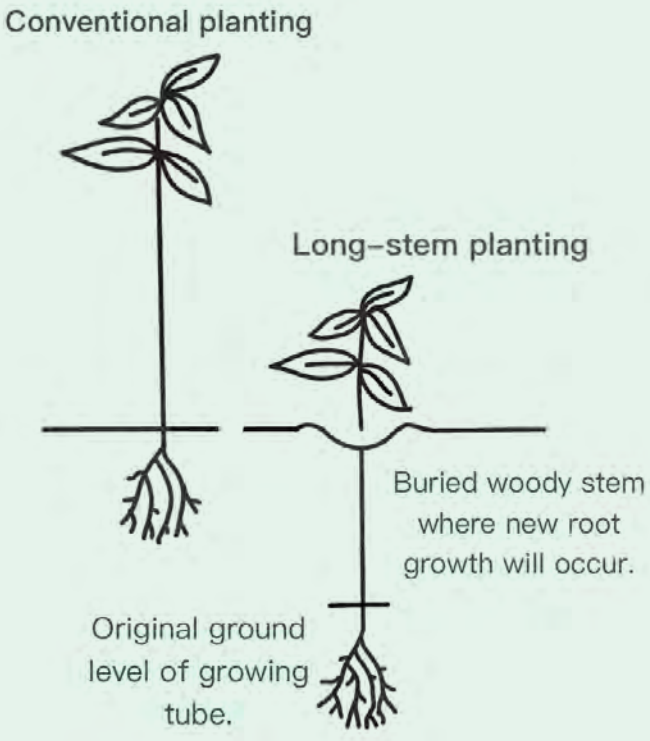


Figure 2: Source: Long-Stem Planting Guide

HOW TO PLAN YOUR REVEGETATION PROJECT

1. Prepare a site plan showing priority areas for revegetation, current property infrastructure and features, on an aerial photo or property map.
2. Remove livestock from planting site and install fencing if required, allowing one or more gateways as access for maintenance.
3. Consider whether your site will naturally regenerate on its own using the native seed bank in the soil. In this case all you need to do is observe, control weeds, allow natives to establish and supplementary plant as required. Other sites that have been extensively cleared and/or grazed for a long time are unlikely to have retained a native seed bank in the soil and will need planting.
4. Use the diagram below to plan your site layout and calculate how many plants you'll need to plant. When planting a large number of plants, planting in stages over multiple years may make maintenance more manageable.
5. Identify which native species are already growing well in your local area.
6. Choose native species from the table on page 3, including shrub and tree canopy species
7. Place your order with a local native plant nursery 3-6 months in advance for autumn and spring time planting. Where available, local provenance seeds or seedlings are strongly recommended to conserve local biodiversity and genetic integrity.
8. Prepare the site by slashing, weeding, or applying herbicide according to label instructions. Allow two weeks after herbicide treatment before planting, consider using a non-residual herbicide and avoid spray getting in to the water.
9. Arrange to collect or have plants delivered as close as possible to your planting day. Nursery plants need to be stored in a protected area and watered twice daily until planted.
10. Plant, water and protect from herbivores, wind, and extreme elements using tree guards and stakes. See planting methods below for detail.
11. Maintain planting: water plants immediately after planting, then weekly for the first few months as needed depending on weather and site; reduce competition by regular weeding and/or mulching, checking every month.
12. Replace any seedlings which do not survive due to adverse conditions.

Reeds, Rushes & Sedges: Plants like Lomandra and Carex form clumps and their matted roots and stems help anchor soils on the 'toe' or creek edge. Reeds and other aquatic vegetation often establish by themselves if the conditions are right. Where necessary, plant densely among tree seedlings at 0.5-1m centres).

Trees & Shrubs: Dense plantings provide greater protection from sun, wind and cold, help shade out weeds and rapidly reinforce creek bank soils. On middle and upper bank plant trees 2-3m apart (or greater distance 5m for large tree species) in a random zig-zag pattern, and mark well with a stake or tree guard. Distribute fast growing species throughout the planting, including Eucalypts, Wattles and Casuarinas. Plant trees and shrubs alternately to achieve a mix of species.

HOW CAN YOU HELP RESTORE CREEK BANKS?

Healthy waterways rely on good riparian land management throughout the Wollombi catchment.

Recommended management practices include:

- revegetate creek banks with a generous buffer of native vegetation
- identify and control weeds
- minimise the impacts of vehicle crossings
- avoid clearing and mowing near creek bank
- remove stock access to waterways
- provide off-stream water and shade for stock
- avoid ground disturbance on creek banks and instream
- leave logs and rocks for habitat

Image: Volunteers assisting with revegetation and fencing for erosion control on Congewai Creek

Vegetation along waterways is protected: Seek advice before clearing vegetation near waterways. Contact Local Land Services for advice on Allowable Activities including for environmental protection works under the *Local Land Services Act 2013.*

Controlled activities on waterfront land: Do you need approval? Approval may be required to conduct earthworks or install crossings, pumps and infrastructure on waterfront land. For advice on the legalities of working around river banks contact:
Natural Resources Access Regulator (NRAR) Ph. 1800 633 362 or visit **www.dpie.nsw.gov.au/nrar.**

References for further details:

www.stockandwaterways.com.au

Planting Your Patch booklet available for download from Hunter LLS website: **www.lls.nsw.gov.au**

Long-stem planting guide: **www.environment.nsw.gov.au/resources/grants/longstemguide.pdf**

Schneider, G (2007) Where land meets water resource kit: a guide to riparian management in the Hunter Valley. Hunter-Central Rivers Catchment Management Authority, Tocal NSW.

Living and Working on a Riverbank guide: **www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/633920/living-on-our-land-inland.pdf**

Allowable Activities – Environmental Protection Works: **www.lls.nsw.gov.au/__data/assets/pdf_file/0007/1208608/Environmental-protection-works.pdf**

Peake, T (2003) Hunter bushland resource kit: a guide to managing vegetation on private land in the Hunter catchment. Hunter Catchment Management Trust, Tocal NSW.

Need more information?

Contact Hunter Local Land Services for more information and advice on species selection, project planning, grants and other assistance available to individuals and community groups

Ph: 1300 795 299

Email: admin.hunter@lls.nsw.gov.au

Acknowledgements :

Thanks to Dr Stephen Bell, Hunter Indigenous Plants, Broke Bulga Landcare and Wollombi Landcare for their contributions. Concept for this fact sheet was based on the *Bellinger River Estuary Revegetation Guide* initiated by Bellinger Landcare Inc. This guide has been produced through funding from Hunter Catchment Contributions.