

NATIVE PLANT REGENERATION

STUDY GROUP

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Welcome to the first Newsletter of the Native Plant Regeneration Study Group. In this first edition I would like to set the scene for the work that I envisage that the study group will be working in the following areas associated with environmental management. These types of projects are:

- \* Monitoring effects of fire to both plants and fauna both in prescribed burns and bush fires.
- \* Monitoring growth rates of plants using direct seeding with the purpose of seeing which methods and types of plants are best suited to direct seeding.
- \* Monitoring growth rates of plants using tube stock with the purpose of seeing which methods and types of plants are best suited to tube stock usage.
- \* Assessing bush land regeneration in qualities of both habitat and restoration methods.

The above projects are seen as what is currently being used by the Landcare movement of Australia. If you have any suggestion or any other projects that you would like to be seen done by the group. Could you please submit a project brief so that I can include it in the next newsletter.

#### ENVIRONMENTAL POLICY

I would like to set a few ground rules to the type of work that we are involved with. In each of your states there is legislation that involves the usage of a permit to collect seed and trap fauna. I would like to point out that you must check with your local National Parks and Wildlife Service (NPWS) office. If you are going to collect seed from a remnant area of bush land if your going to carry out direct seeding trials or trapping fauna after a bush fire or assessing a piece of scrub.

The following are guide-line that I have copied from the Society For Growing Australian Plants South Australian Region Inc August 1994 Vol. 12 No. 3 pp. 296-298

## SOCIETY FOR GROWING AUSTRALIAN PLANTS POLICY ON REVEGETATION

In response to a request from the Natural Resources Council of South Australia in May 1993 to advise them of SGAP policy, Council appointed President Malcolm Vandepuer, Vice-President Tony Hill, and Councillor Brenton Tucker to prepare a policy statement. The statement adopted by Council at its February meeting is presented below. Council invites comments particularly from its country Groups.

Whilst this policy is not part of the Society for Growing Australian Plants (SGAP) Constitution, its implementation is closely allied to the objects of the Society, and is a guide to members of SAGP when they undertake revegetation projects.

### Clarification of terms

- Indigenous species are those which are known to occur naturally within a specific locality and also may occur in other localities.
- Endemic species are those which are native to a defined area/locality only.
- Rare: taxa with small populations that are not at present "Endangered" or "Vulnerable", but are at risk on account of their rarity.
- Vulnerable: taxa believed likely to move into the "Endangered" category in the near future if the causal factors continue to operate. Included are species of which most or all of the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; species with populations that have been seriously depleted and whose ultimate security has not yet been assured; and taxa with populations that are still abundant but are under threat from severe adverse factors throughout their range. Also included are taxa with low or localised populations or dependent on limited habitat that would be vulnerable to new threatening processes.
- Endangered: taxa in danger of extinction and those whose survival is unlikely if the causal factors continue to operate. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.
- The term Local in respect to seed and cutting collection means within a 5km radius.

### General guidelines

- SGAP suggests that in all cases appropriate local Australian native flora should be used.
- SGAP supports bio-diversity and therefore attention should be given to maintaining genetic diversity by collecting seeds and/or cuttings as close as possible to the areas to be revegetated.
- The establishment and/or enhancement of vegetation corridors/linkages should be priority.

- An holistic approach is preferred, addressing more than trees, including an understorey and habitat for native fauna. Landscape character and plant associations relative to a particular area should be replicated.
- The species chosen for revegetation should be those which are compatible with existing vegetation, with the soil type and rainfall of the area.
- Consideration should be given to water conservation, erosion control and future requirements including growth habit of the species intended for revegetation.
- In all revegetation preparation of the area and its surrounds may require removal of invasive plants, weeds, and non-native grasses.
- SGAP believes that any revegetation requires ongoing care for at least the first season after planting (eg, weed control, watering, rabbits, kangaroos and goats).

### Revegetation in privately-owned gardens

In home gardens SGAP accepts that any Australian flora may be grown. The provision of specialised soil beds and micro-climates may be appropriate, even if uneconomic. Rare, vulnerable and endangered species may be grown in order to fulfil SGAP aims to preserve these species and to further distribute them via seed and cutting material.

### Revegetation in metropolitan reserves

When revegetation is undertaken in these areas, SGAP requires the use of indigenous plants, except where the site has been significantly altered. The use of local seed is preferred.

### Revegetation on roadsides

When revegetating roadsides, SGAP requires the use of species indigenous to that area. Local seed should be used unless the area has been significantly altered.

### Revegetation adjacent to areas of natural vegetation

Where these areas are privately-owned, SGAP recommends indigenous species.

Where these areas are publicly-owned, SGAP requires that indigenous species are used. Local seed should be used.

### Revegetation in natural or relatively undisturbed areas

Unless there is a highly degraded area within or adjacent to these areas, preference should be given to weeding and controlling predators rather than planting. If planting is to proceed SGAP requires indigenous species be planted. It is essential in these cases that the plants be grown from seed and/or material obtained from the same area.

### Seed and cutting collection principles

SGAP has adopted the Greening Australia Code of Practice for seed collections and requires that seed collected, as mentioned above, should be in accordance with that Code. This Code of Practice may also be used for cutting collection.

I would Like to further add to these guide-lines by mentioning the following bio-ethics theses are:

- That No animal should be put under any undue stress that may inflict injury or death on to the organism
- That no animal be should killed unnecessary for the purpose of carrying out fauna trials unless it is for the identification of the organism only if there is state approval ie NPWS.

One way which you can get around this point is to use insects as your methods of assessing habitat value using miniature pit fall traps. Or if this is not your cup of tea then how about spot lighting at night and recording what you have seen. As a last resort why not try bird watching as a means of caring out the habitat assessment work.

#### NEXT NEWSLETTER

In the next newsletter I would like to hear some feed back from you on your opinions on what projects that should occur and what your opinion on the use of Willows as a habitat instead of recreating a natural habitat from native plants.

The new postal address is P.O BOX 2089  
NORMANVILLE  
SA 5204

Deadline for the next Newsletter is the 1/8/95 and hopefully you should have it in the post box by early September

\* If any one in the Adelaide area wants to give a hand to the in helping to co-ordinate the study group then they are most welcome.

Bye for Now

Matt Pearson

# Natural regeneration

Prepared by the State Tree Centre, Department of Primary Industries SA

## Why not take advantage of what nature has always quietly been doing

The cycle of replacement of old and ageing trees by the germination of self-sown seedlings and saplings is the nature's way of growing trees. You can take advantage of this to replace old trees on your property with a minimum of effort.

Natural regeneration is a cheap, relatively easy method of getting those trees back on your property to improve your crop and livestock production.

There is a place for native vegetation on every farm property. Native vegetation is an integral part of sound land management for agricultural productivity. It is an essential part of keeping our wildlife and the balance of nature.

## Proof of the potential exists

Many roadsides have had a prolific regeneration of young trees since the change from droving to vehicle transport of stock. Yet, often just across the fenceline in the adjacent paddocks, there are only a few old trees. The potential to grow trees where stock can be controlled is very high, especially in the higher rainfall areas of the lower Eyre Peninsula, the Adelaide Hills, Kangaroo Island and the South East.

## Some simple ways to get trees naturally

Trees, shrubs and understorey plants on your property will be forming new seeds in each normal season. Many of these seeds are released that year when they are mature. Under ideal conditions, each of these thousands

of seeds could germinate and grow into a new mature plant.

## Here are some hints on how to give those seeds an even break!

### 1. Fence off groups of trees and shrubs still on your property

A fence will allow the seedlings to get established. Stock has a liking for young trees and shrubs, especially sheoaks and eucalypts, and will graze the tops off the young plants. New trees and stock are usually incompatible. No fence, no saplings.

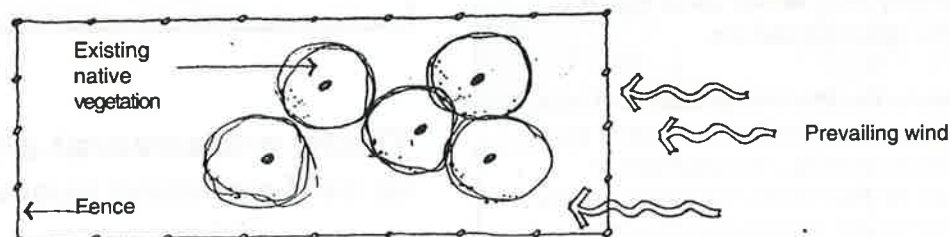
The fence will need to be maintained in good condition for at least five years to allow the seedlings to reach a decent size and height, able to withstand grazing pressure. Permanent fences will be needed to keep understorey intact.

### 2. Place the fence far enough out from the adult trees

Mature trees will compete with any new seedlings for sunlight, for soil moisture and for nutrients. Most new plants will grow outside the area shaded and dominated by the mature tree. The fenceline should be placed with this in mind. (see diagram)

Seeds from many Australian native species mature and fall in summer. Seeds from native plants such as eucalypts and tea-trees are small and light, like salt and pepper. Other native plants such as sheoaks and native pines have papery wings. The hot summer prevailing wind will tend to blow them out from the base of the parent tree. Extend the fenceline out to the lee side of the trees so that the seeds fall inside the fenced area.

PLAN VIEW



ELEVATION

x represents distance  $1\frac{1}{2}$  times height of tree



For further information phone on (08) 207 8767, or call at any office of Primary Industries SA.

Information may be reproduced with permission.

**3. Give new seedlings enough soil moisture by reducing weeds**

Prior to closing the fence, prepare the seed bed to reduce the fight for survival between the seedlings and weeds.

Observations of both self-seeding regeneration and direct seeding have shown that without any seed bed preparation, the native seedlings compete with pasture grasses and other weeds for available soil moisture. As many weeds are aggressive in occupying an area, most of the native species will die soon after germination.

If the paddock has been cultivated regularly, you may wish to cultivate as if you were cropping. Prepare the area in late spring or early summer. Then leave it untouched during seedfall and through the break of season.

An alternative method is to burn the stubble in early autumn. This may be particularly successful where you have wattles (Acacias) on your site.

If you wish to minimise disturbance to your soil, you can spray with a non-residual knock down herbicide such as glyphosate in autumn and late winter.

Natural regeneration can, and does occur, without weed control providing the soil moisture is high. This relies on above average rainfall.

**Check whether you have an understorey of native plants**

*If you are fencing an area that has never been cultivated or topped dressed, such as a rocky rise, a group of trees or a creek bank, make sure that you check whether native grasses and shrubs still form some of your ground cover. Ask your local native plant expert or revegetation officer for advice.*

*Grazed sites in the Mid-North have had over 40 different species of understorey plants such as native lilies, orchids, peas and native grasses come up from rootstock or long-lived seeds in a three year period after the fence was erected.*

*Do not spray these areas. The understorey plants are the building blocks for a stable eco-system and are very difficult to replace. Spot or strip spraying may be necessary but otherwise let nature take its course.*

**4. Control the grazing pressure of rabbits and hares**

Most fences are not rabbit or hare proof. Small numbers of rabbits and/or hares can destroy all your seedlings. Put into place a rabbit control program of poison, fumigation and ripping of warrens. Animal and plant control officers can provide advice.

**5. Manage the insect attacks on the young plants**

Check your young seedlings at germination for red-legged earth mite, and regularly for aphids and other insects. Seek expert advice on chemical and biological control.

**6. Take advantage of stock rotations**

If your farming practices allow for the removal of stock from a paddock for several months, say from mid winter to summer, you can watch for germinating seedlings and then fence off the best areas before letting stock back into the paddock. This has worked well in the South-East of South Australia where red gum and blue gum paddocks are spelled during the winter.

**Time is of the essence!**

*Many paddock trees are at least two hundred years old. They will not live for ever. It takes time and effort to replace them. Start before your trees are too old to produce lots of viable seed.*

*Please leave your old trees standing when they finally die! Many of our native birds, native bats, native lizards and small native mammals must use the hollows of old trees for nesting and raising their young.*

**There are several advantages to self-seeding regeneration**

**Cost effective**

The amount of work you need to do and the cost of the work is lower than other methods used such as planting tube stock or direct seeding.

**Environment friendly**

Because the parent trees are there and supplying the seed, the new trees will be well adapted to the local environment, soil and rainfall conditions.

***Farm product producing***

The saplings and young trees, especially clumps of blue gums and red gums, often grow straight and vigorously, and have the potential to provide good products such as firewood and posts for your farm.

***Retains the local character***

The local trees retain the local visual character of an area and provides suitable habitat for native animals.

***Is important for our wildlife***

Local trees on farms acts as stepping stones and feeding stations for native birds. Many small birds such as honeyeaters migrate throughout a district following the seasonal food.

## **There are some drawbacks to self-seeding regeneration**

***Sometimes a limited range of species recover***

The plants that grow by the natural regeneration method must have a seed source still on site. These are often only the large trees and shrubs left after clearing. The original understorey plants may have been removed or grazed out.

***Salinity changes the growing conditions***

If your property has a dryland salinity problem, the original trees may not tolerate the changed environment.

***Patience is required***

The method requires a great deal of patience in low rainfall areas. Research has shown that in high rainfall areas, the right temperatures and enough rainfall at the right time for excellent germination can be expected every two to four years. In low rainfalls, this combination of high soil moisture and temperature will occur (on average) once every twenty years.

***Limited choice for location***

The new trees will be in the same location as your mature trees and this may not suit all your farm planning needs.

***Random placement of trees***

Because you are leaving it almost all up to nature, the placement of the trees will be random. This may cause some inconvenience for farm work using machinery.

## **Further information**

The State Tree Centre is a rural revegetation resource centre and further fact sheets are available at the centre.

For advice, contact your nearest Department of Primary Industries Revegetation officer:

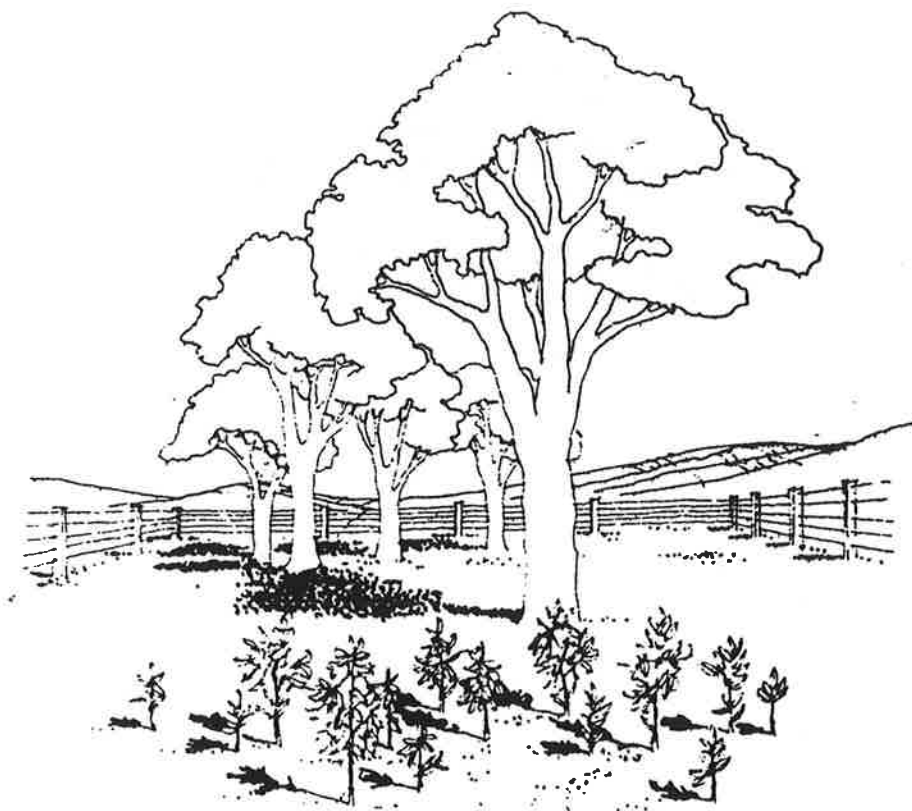
Wayne Brown  
Catchment Resource Centre, Mt. Barker  
Phone: (08) 391 7500

Zita Stokes  
South East Regional Headquarters, Struan  
Phone: (087) 64 7419

Steve Lamey  
Lameroo District Office  
Phone: (085) 76 3345

Helen Lamont  
Cleve District Office  
Phone: (086) 28 2091

Hugh Longbottom  
Kadina District Office  
(088) 21 1555



## WHAT'S WHAT ABOUT

# WILLOWS AND THE RIVER MURRAY

Wetlands and Murray-Darling Basin Branch

In conjunction with the South Australian River Murray Wetlands Management Committee and the CARE program

fact sheet 2

**What do you do** when willows protect the levee banks of the River Murray in South Australia against erosion, but crowd out other wildlife because they are alien to the way most native plants and animals live?

**do you know . . .**

Some species of willow have adapted so well to the River Murray environment that they are now 'naturalised', that is, they grow like natives. In Australia, six willow species are naturalised.

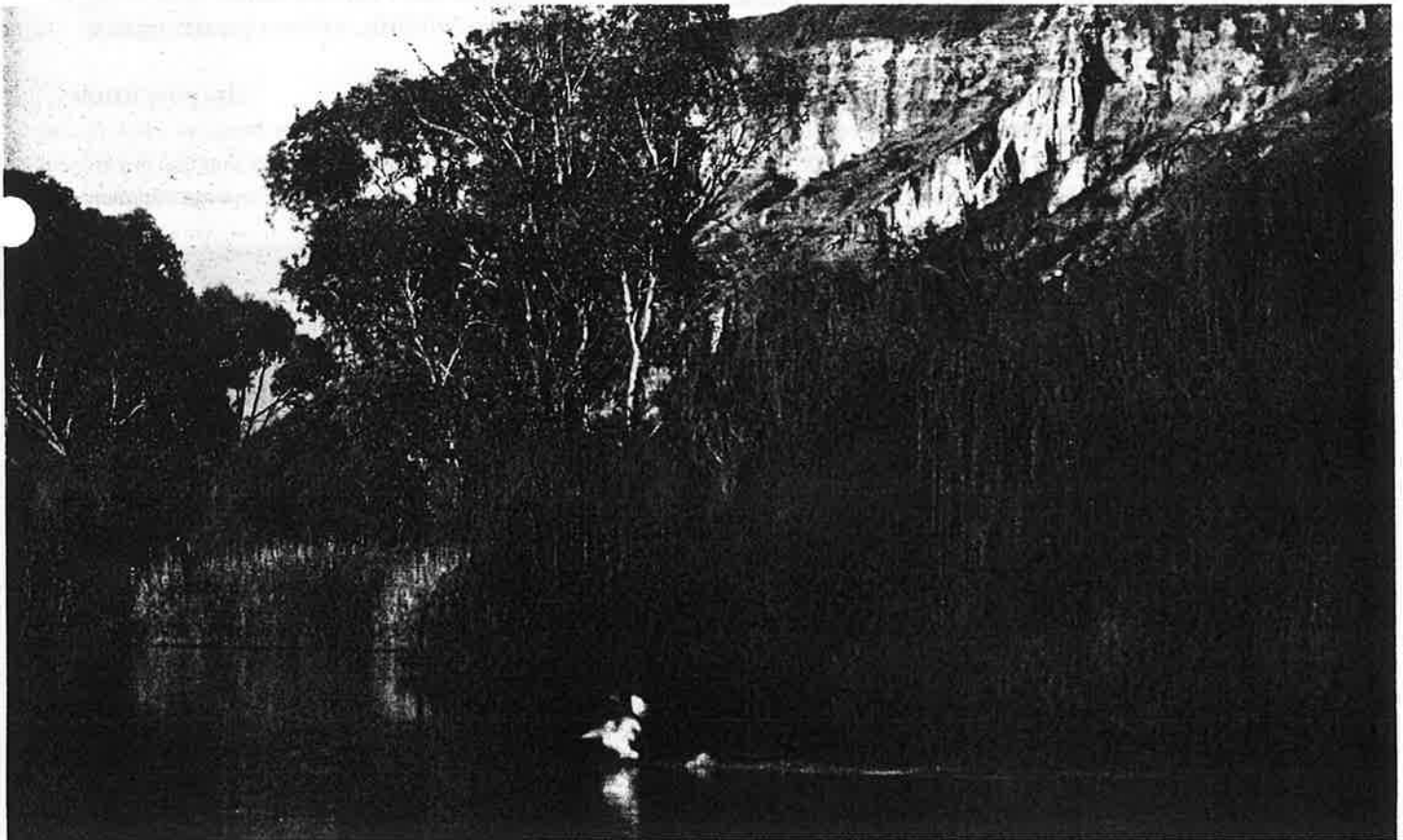
### WILLOW SPECIES IN AUSTRALIA

Willows are part of the genus *Salix*, which belongs to the family *Salicaceae*. There are some 300 species and varieties, none of which are native to Australia. A number of species are common in Australia:

- *Salix babylonica* (weeping willow)
- *Salix alba* (white willow)
- *Salix cinerea* (pussy willow)
- *Salix fragilis* (crack willow)
- *Salix viminalis* (osier willow)

- *Salix humboldtiana* (Chilean willow)
- *Salix purpurea* (purple osier)
- *Salix rubens* (basket or white crack willow).

Of all of these, only two species, *S. babylonica* and *S. rubens*, are common along the River Murray in South Australia. These species do not flower in South Australia as all the plants are male. They spread by striking from small pieces of broken stems.





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## WHY ARE THERE WILLOWS IN AUSTRALIA?

Like many non-native plants and animals in Australia, willows were brought in by European settlers. The settlers saw the Australian landscape as drab and uncivilised, and they believed that importing European plants would benefit the country. These species would add colour and recreate the familiarity of home.

### do you know . . .

*In the 1860s 'assimilation societies' were formed to import animals and plants into Australia to 'improve' the countryside.*

*Rabbits, foxes and many other pest species were brought into our continent this way and were encouraged to spread.*

The uses of these imported plants were well known, whereas the native species were alien to the newcomers. Believing that trade and industry would develop out of growing 'useful' plants, the settlers freely exchanged imported plant cuttings. They cleared the native scrub around their homes and established European trees and cottage gardens.

### do you know . . .

*The bark of white willow contains salicin — a glucoside that converts in the body to salicylic acid — which is the basis of modern aspirin.*

*Willow bark tea was a well-known herbal remedy used to relieve pain and fever.*

With the clearing of scrub for grazing and farming, soil erosion started to become a problem along the lower reaches of the River Murray. Levee banks were put in to enable irrigation of pastures on the floodplain. These bare banks soon became unstable. Because they were likely to break up in the annual flooding of the river, the banks posed a threat to agriculture. They also made docking difficult for the riverboats, which were vital to settlement and trade along the river. To solve this problem, willows were used to stabilise the bare banks, just as they did along European rivers and streams. Willows were well-adapted to wet soils. Their dense mats of roots bound the banks together, and roots growing out into the water trapped floating sediment and extended the banks.

## WHAT'S THE WILLOW CONTROVERSY?

The willows have been around for such a long time that we have become used to them. They are now part of river life. And because of this, because they do their job of bank support so well, because they are green and flourishing, we assume all's well with the riverbank environment. Green and growing means good and healthy, right?

Not necessarily. Willows are aggressive growers that reproduce asexually in South Australia. This means

they don't need female and male plants to reproduce. Broken-off branches and twigs take root and soon a whole new plant establishes itself. Since they take root so easily, they quickly colonise and spread. Other plants get crowded out. And the heavy shade a willow casts, so good to sit under on a hot summer's day, doesn't allow any light to get to other plants. Soon the banks under willows are bare, and there is no understorey to provide food and shelter for wildlife. That healthy looking green we see masks the slow death of other plant species and a decline in wildlife diversity.

### do you know . . .

*Anglers used willow forks stuck in the bank to prop up their rods. These forks took root and helped to spread willows along the River Murray.*

## WHY ARE WILLOWS A PROBLEM?

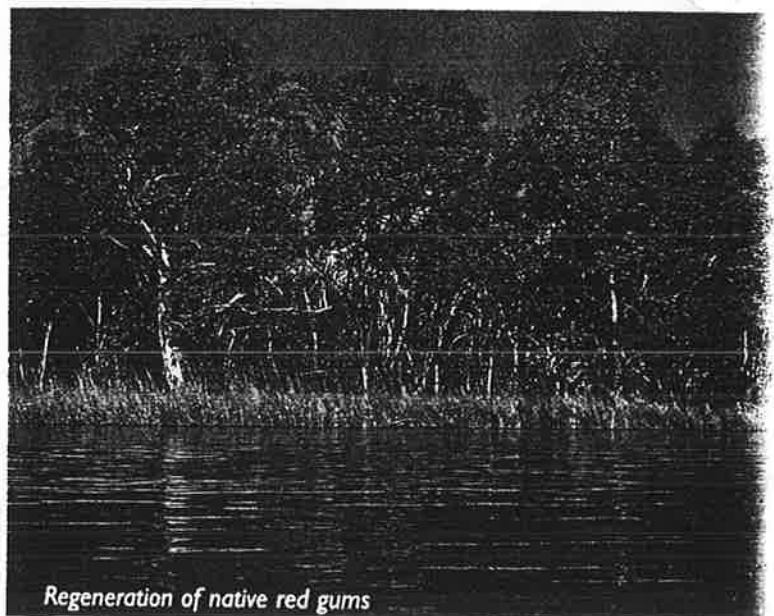
Despite their harmless appearance, willows are a problem chiefly because the Australian ecosystem has not evolved with them. They affect both the diversity of native species that can live alongside them and the numbers in these wildlife populations.

### Organic pollution

Willows are deciduous, which means they drop all their leaves in autumn. This adds a huge load of organic matter to the river over a short period of time. Because willow leaves are soft and break down quickly, they can't provide a sustained food source for water creatures. Besides this, they don't appeal to many types of native wildlife as food. Instead, nutrient levels increase in the water and oxygen levels decrease. These nutrients encourage the growth of types of algae that other creatures can't eat. So, rather than living in balance with other wildlife, willows create organic pollution.

### do you know . . .

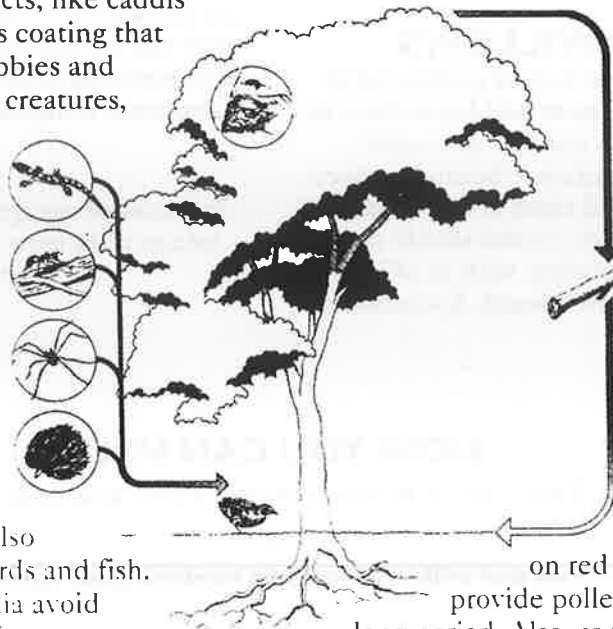
*Studies show that the only small water creatures which flourish in this organic pollution under willows are those that also live in the runoff of sewage treatment works.*



By contrast, native river red gums have evolved with other wildlife and play an important part in the river ecosystem. Red gums shed their leaves lightly and constantly during the year. The leaves break down slowly in the water. This provides a year-long supply of food for the whole wildlife chain. The decaying leaves release nutrients that nourish aquatic plants. Bacteria and fungi invade the leaves as they break down. This softens the leaves for shredding insects, like caddis flies, as well as providing a nutritious coating that is eaten by other small creatures. Yabbies and fish then eat these insects and small creatures, and may themselves be eaten by larger animals. So the continual shedding of gum leaves is part of a cycle that sustains the river environment.

### Wildlife habitat

Willow trees do not provide many native animals, birds and insects with either shelter or food. Willow bark is too dense to create hiding places for insects. And, as few insects feed on the leaves, there is also less food around for insect-eating birds and fish. Nectar-eating birds in South Australia avoid using the willows along the River Murray as habitat.



Willows also crowd out understorey plants. The deep shade of willows prevents the understorey from getting light in summer and early autumn, which means that other plants can't establish themselves among the willows' dense roots. As a result the banks of the river underneath willow trees quickly become bare. Animals that use the understorey for food and shelter relocate if they can. However, their movement is restricted as they

don't like crossing these bare areas without shelter for safety, and they can't feed as they go.

By contrast, red gums provide food and shelter for a wide range of animals, birds and insects. Their loose bark provides shelter for insects and spiders, which feed on the leaves and flowers or other insects. These insects and spiders are themselves food for insect-eating birds and animals. Other animals feed

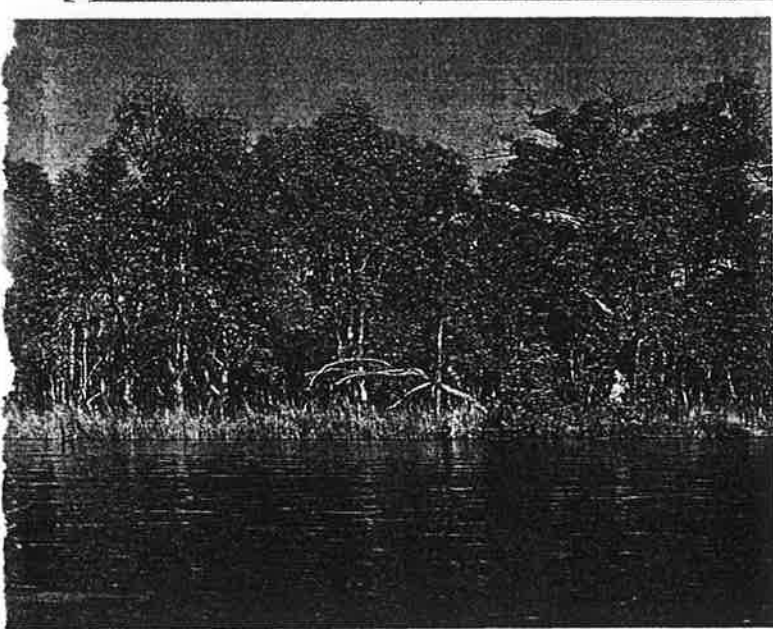
on red gum leaves, and the flowers provide pollen and nectar for birds over a long period. Also, as they age, red gums form hollows which are used as nesting sites and shelter by both animals and birds.

### do you know . . .

*Those parts of the River Murray dominated by willows contain less than half the number of tiny insects, beetles and crustaceans that exist in areas dominated by red gums.*

Willows do not shed branches in the river often, but when they do, the branches decay rapidly. As well as adding to the nutrient load in the water, the speed of this decay makes willow branches useless as fish habitat or as perches for water birds.

Red gums cast light shade that allows other plants to form an understorey in which many creatures shelter, feed and move. Another feature of red gums is that they frequently shed their branches. These take a long time to break down, creating snags in the river and hollow logs on land, which in turn provide shelter and breeding places for fish and animals as well as perches for birds.



## HOW CAN WE MANAGE WILLOWS SO THAT EVERYONE IS HAPPY?

Willow removal is a tricky issue. Willows are part of the culture of river life now, and some people prefer them to native species. Getting rid of willows might also seem to go against all the messages about the need to conserve vegetation. The sheer cost and effort involved in removing willows means that it is not practical to take more than a few of them out. Some trees are simply inaccessible, having taken root on sand bars in the main river channel. It is almost impossible to get equipment out to such areas. In such cases, control of spread is the best approach to managing this pest. Most willows will remain, with some strict control measures to prevent them from spreading.

Willow removal will focus on particular areas along the River Murray, like national parks. These are areas that have a high conservation value because of the natural quality of their native wildlife. Such areas need to be protected from pest species like willows in order to preserve their unique assets. Willow removal may also take place in areas where these trees are blocking channels, affecting the river's flow or the water supply to wetlands, or creating a hazard to navigation.

## HOW TO CONTROL WILLOWS

The cheapest and most effective way of getting rid of problem willows is to spray the trees and leave them to rot, which they do quickly. This method of control creates less environmental disturbance because it does not require heavy machinery and there is less chance of willow litter being spread. Willow control should be carried out only by licensed operators, such as officers from the Animal and Plant Control Board. A solution of

1:100 Roundup™ sprayed directly on to willow trees will kill them, although a large tree may need spraying two or three times. Access to willows from the banks is often difficult. Spraying from a boat gets around this problem.

This method of control is relatively safe for the environment. Roundup™ droplets bind to clay particles and become inactive when the spray hits the soil. And since the water in the River Murray has high levels of clay particles in suspension, any spray reaching the water will be deactivated as the Roundup™ binds with these particles. It also gets diluted to such a degree that its presence is almost impossible to trace.

### do you know . . .

*The estimated average cost to root out one willow is \$5000. This is because of the heavy machinery needed, the difficulty of getting to the tree, and the disturbance to the environment.*

## HOW YOU CAN HELP

There are a number of ways you can help:

•  
**Pull out willow shoots to control their spread.**

•  
**Be careful of spreading twig litter from willows — it can reshoot.**

•  
**Don't plant willows near the River Murray — use local native species like native willow or river coobah (*Acacia stenophylla*), bottlebrush (*Callistemon* spp), bulrushes (*Typha* spp), reeds (*Phragmites australis*), or sedges (eg *Cyperus gymnocaulus* or *Scirpus nodosus*).**

•  
**Read up so you know the facts about willows.**

•  
**Show your support for willow control by spreading the facts about willows.**

## FURTHER INFORMATION

For more information for school projects or on other titles in this series, telephone the Murray Network Officer in the Department of Environment and Natural Resources on (08) 207 2277. A good general reference for this series is *The Murray*, edited by N Mackay and D Eastburn, and published in 1990 by the Murray-Darling Basin Commission, Canberra. A useful local reference containing information on willows is *Managing wetlands of the River Murray in South Australia*:

*A guide for Communities of Common Concern*, prepared by Jason Carter and Clare Nicolson, and published in 1992 by the South Australian Department of Environment and Planning (now Environment and Natural Resources), Adelaide.

For more information on publications about willows and the River Murray write to the Murray-Darling Freshwater Research Centre, PO Box 921, Albury, NSW, 2640; or telephone (060) 43 1002.



## ACKNOWLEDGMENTS

This fact sheet is produced by officers of the Wetlands and Murray-Darling Basin Branch of the South Australian Department of Environment and Natural Resources. It is produced in conjunction with the South Australian River Murray Wetlands Management Committee and the CARE program.

