

River Red Gums of Southern Australia – age, size, oddities and history

Glenelg Hopkins CMA Field Day

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Introduction – the River Red Gum (RRG)

- RRGs widespread in Australia (except Tasmania & SW & NE mainland), usually along rivers
- some provenances highly salt-tolerant
- timber hard, durable and resistant to termites (bridges, fencing, house stumps, firewood, furniture)
- not greatly competitive with grass (recycle nutrients from depth)
- considered to counteract top-soil salinity by depressing the ground water table
- RRG ‘forests’ considered to be ‘shadeless’ by early travellers used to European species
- provide a home for many species of birds (e.g. owls, treecreepers & parrots) and mammals
- need for protection – the perils of settlement, fire, drought, insects and disease
- need for replacement – many are old and will soon vanish from the landscape
- prompts for my research – age (how old are they?) and size (which are the biggest Red Gums?)

Age (difficult to assess due to lack of annual growth rings)

- Erica Nathan (1998) studied RRGs on Dundas Tableland and concluded that trees milled from 1880 onwards had grown after 1840 (based on log sizes and an estimate of 14 mm diam. growth/year). Erica concluded that logs 60-90 cm diameter milled after 1920 were only 50-100 years old. She contended that the pastoral era was responsible for the ‘forest’ of Red Gums.
- Recent studies dispute that contention – annual diam. growth is probably closer to 3-7 mm: Roger Edwards data (Woolpoor) 3.5 mm; my data (Bryans Swamp) for 3 trees 4, 6 & 6.6 mm. Taking an average of 5.6 or 3.5 mm, Erica’s 60 cm diam. trees may have been 110-170 years old and her 90 cm trees 165-260 years old – all would have germinated pre-settlement.

Size (height, girth, canopy spread, or volume of millable timber?)

- By Height – Forest Lodge (51 m), Big Red at Mullinger Swamp (42 m), Charleston SA (41 m)
- By girth – Herbiggs SA 15.1 m, Mt Remarkable SA 14.5 m, Barmah 13.5 m, Dwyers Ck 12.7 m, Big Red 12.1 m, Barmah 11.5 m, Mirranatwa 9.9 m
- By spread – Edenhope 40 m, Wyperfeld 41 m
- By log volume – Big Red (73 m³), Forest lodge (45 m³), Bilston’s (40 m³)

Curiosities (layering, shield trees...)

- Mt Sturgeon Station – ancient trees rooting from branches resting on the ground
- Brimboal (100 m west of Bilston’s Tree) – re-directed growth, original stump dying.
- Gringegalonga (Mick Perns) – a ‘cutting’ – the top part of a tree cut down for sleepers regrew.
- Aborigine shield or canoe trees – widespread in Victoria

[“*River Red Gums at Bryans Swamp and other sites in SW Victoria and in South Australia: photographs & measurements of significant ancient trees*” (2011) by Rod Bird is available as a free download from hamilton-field-naturalists-club-victoria.org.au – go to ‘Publications/information’ page, Section (C)]

Hazards of Drought, Drainage, Fire, Cropping, stock camps & isolation

- Paddock RRGs suffer more insect defoliation, perhaps due to increased nutrient supply from stock – the annual loss is perhaps as high as 0.5% of trees.
- Paddock RRGs need to have fallen branches pulled away from the butt, in case of fire (and should never have the wood piled around the base in paddocks that are cropped)
- Drought & climate change or drainage can weaken RRGs, making them susceptible to insect attack and fire (e.g. Bryans Swamp trees – dieback was evident in 2002 and made worse by a fire in 2006)
- Drainage of wetlands will reduce groundwater recharge and weaken RRGs (e.g. Hattah Lakes and Bryans Swamp), where water levels remained low for over 10 years.
- Fire suppression – avoid knocking down RRGs damaged in a wildfire (see Bryans Swamp example where efforts were made by Geoff Evans of DSE to overturn past practice by DSE & CFA). 102 old trees were burned in Nov 2006, 30 severely. All except a dozen were left standing, although many have subsequently died. These still offer habitat to wildlife. Old, dead trees must be retained.

Revegetation Strategies on Farms – impacts on Woodland Birds

Research by Birds Australia, Deakin University, CSIRO and University of Adelaide has shown an alarming decrease in the number of woodland bird species with declining tree and shrub cover in the rural landscape.

David Freudenberger (CSIRO) conducted research in the Boorowa River area of NSW. He found:

- some species could live in an area regardless of habitat simplification ('common species')
- some species could not live in a small area, regardless of its complexity
- other species could not live in an area (regardless of size) if tussocks, shrubs or logs were absent
- patch size, not connectivity or structure, was the factor that most limited many species

From his work, and that of Birds Australia and others, Freudenberger's priority order of work was:

1. Retain the existing diversity – protect remnants from continuous grazing:
 - beginning with those >10 ha
 - smaller remnants that are within 1.5 km of other remnants of >10 ha size
 - those that have a structurally complex understorey.
2. Where regeneration of native understorey grasses and shrubs is poor within fenced remnants, try to establish local provenances of these vegetation types by planting or direct-seeding.
3. Enlarge existing remnants to at least 10 ha.
4. Create linkages between protected and enhanced remnants >1.5 km from other remnants that are >10 ha in size. The linkages should comprise planted or direct-sown strips at least 25 m wide (5-7 rows), or 'stepping-stones' of blocks at least 10 ha, or a combination of both.
5. Create linkages at least 25 m wide between protected remnants that are <1.5 km away from other remnants >10 ha in size.
6. Create linkages at least 25 m wide between unprotected remnants >10 ha in size.

Richard Loyn (DSE) – groups of patches larger than 10-25 ha support as many forest bird species as single patches of equivalent size (Loyn 1985). But small areas, and isolated or simplified woodlands, will not sustain large numbers of species (e.g. vulnerable Hooded Robins, Diamond Firetails or Stone-curlews).

Rohan Clarke *et al.* Deakin Univ – (2006-08) – research in our area indicated that revegetation of 10-15% of landscape increased species numbers by about 15 species when little remnant vegetation existed. For the total area of wooded cover (0-20%), a mix of revegetation and remnants was almost as good as the remnants alone but, on its own, inferior by up to 20 species. Below about 10% cover, many species are threatened.

Prof. David Paton, Univ. of Adelaide (see www.bior.org.au) – woodland birds Mount Lofty Ranges area.

1. Large areas (over 100 ha) are required for survival of woodland birds. The home range of Varied Sittella is ~250 ha, Restless Flycatcher ~ 185 ha and Brown-headed Honeyeater ~ 66 ha. The area that needed to be planted was about 30% if up to 50 species were not to become regionally extinct.
2. Woodland bird species have declined drastically now as a result of clearing before 1980.
3. The decline will continue unless the area of the remaining (and new) blocks is increased.
4. Structural features are vital in revegetation ("untidiness" – fallen logs, low bushes and grasses).
5. Agroforestry, shelter and landscape planting contained only common birds (species that can tolerate poor structure and other factors) – most revegetated sites did nothing for the declining species.
6. Corridors were almost useless because they were expensive, had large edge effects, poor structure and small patch size that prevented most species from staying or breeding.
7. Need to restore LARGE areas – whole farms (or blocks greater than 100 ha) must be retired.
8. A "Future Fund" – people could contribute e.g. as a way of off-setting Carbon production. This would be tax-deductible. The fund would only use income generated annually and not the capital.

In SW Vic (in 1996) the average amount of remnant vegetation on farms was only 8 ha! How are we to implement Freudenberger's proposals when we have so little? What landscape solution is there?

- *Focus first on a single large area* – one large, well-managed natural area on the farm is much better than many smaller blocks having the same total area. A narrow belt is NOT a good solution.
- *Work with neighbours and Landcare groups* – combining resources may enable a large patch (> 10 ha) of vegetation on mutual boundaries to be conserved.
- *Consider roadsides and other reserves in the plan* – a network of public land should add to a regional goal of 30% woodland cover. Ensure that Shires, Departments and fire brigades are aware of the need to maintain native vegetation on the reserves. Help them to do so. And widen the reserve by fencing an adjacent strip in your property. This could provide the additional width required to give a viable corridor of 25-50 m width (and > 10 ha in area).