

Association of Societies for Growing Australian Plants

GREVILLEA STUDY GROUP

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Newsletter No. 76 – February 2007

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GSG NSW Programme 2007

For more details contact **Peter Olde** 02 4659 6598. Meet at 9.30am to commence at 10.00am for all meetings unless stated otherwise.

Saturday, 10 February

VENUE: Home of Christine Guthrie & Bruce Moffatt
32 Blanche St, Oatley

PHONE: (02) 9579 4093

SUBJECT: The Grevillea linearifolia Group

Saturday, 21 April – Sunday, 22 April

VENUE: 'Silky Oaks',
140 Russell Lane Oakdale 2570

TIME: 10am – 4pm both days

SUBJECT: On-farm plant sale and garden visit

SET-UP: Friday, 20 April

PULL-DOWN: Monday, 23 April

DIRECTIONS: From M5 take Picton exit. 10 km to Picton. Turn left at T intersection into Argyle St. Cross Historic bridge. First Right into Barker's Lodge Road. Travel 17km to Oakdale. Russell Lane runs off to the right just past the Oakdale sign.

Wednesday, 13 June

VENUE: Dot & Hessel Saunders
61 Franklin Ave Woonona

PHONE: (02) 4284 3911

SUBJECT: Growing Grevilleas in Containers

Saturday, 18 August

VENUE: Glenbrook Native Reserve

SUBJECT: Visit nursery and reserve, then convoy to Lithgow to visit *G. rosmarinifolia* in wild.

GSG S.E. QLD Programme 2007

Morning tea at 9.30am, meetings commence at 10.00am. For more information contact **Merv Hodge** on (07) 5546 3322 or mwhodge@bigpond.net.au

Sunday, 29 April

Sunday, 24 June

Sunday, 26 August

Sunday, 21st October

NOTE change of date due to SGAP Plant Sales, Mt. Gravatt on 28th.

All venues and subjects to be decided at February 25 meeting and will appear in next issue, contact Merv for details.

GSG VIC Programme 2007

For more details contact either **Neil Marriott** (Leader of GSG Vic), on (03) 5356 2404, 0408 177 989 or neilm@tfn.org.au (new email address), or

Max McDowell (convener) on (03) 9850 3411, 0414 319 048 or maxamcd@melbpc.org.au

Sunday, 20 May

VENUE: Geelong-Anglesea

DETAILS: Meet 9.30-10.00am at Geelong Botanic Gardens (Melway 452 F4) for morning tea and inspection of Australian Section.

11.00am depart for Anglesea area to see *Grevillea infecunda* and local flora including *Correa reflexa* and *Epacris impressa* which should be in flower. After tour and lunch return to Geelong area and visit local nurseries. A garden visit may be arranged. Geelong District Group members welcome to participate.

Saturday, 23 August – Sunday, 24 August

VENUE: Wangaratta-Chiltern area

DETAILS: Return visit to see *G. alpina*, *G. lanigera* and *G. rosmarinifolia* in localities not seen in 2004. Itinerary will include visit to Graytown State Forest en route to see *G. rosmarinifolia* (see article in this NL).

Details in June Newsletter.

Friday, 2 November – Tuesday, 6 November

VENUE: Melbourne Cup Weekend Combined Field Trip to south-western Victoria and far south SA.

Details later in the year.

Special thanks to Neil Marriott and Max McDowell for this splendid edition of the newsletter. The Queenslanders will produce the next newsletter. Please note deadlines on back page.

Inside this issue:

- Panrock Ridge Grevillea Collection Working Bee
- The response of Grevillea species to wildfire
- Recovery plan for *Grevillea bedggoodiana*
- Research into the Grevillea aquifolium Alliance/Group
- Conserving water in the home nursery and more....

Peter Olde

Welcome to the start of 2007.

Preparations are now in full swing for the annual plant sale. As indicated in the last issue the Sale will be conducted this year on-farm at Oakdale. This is a little out of the way and may not attract as many casual visitors. It must be said that last year our sale held at Mount Annan also attracted few visitors with lower numbers in attendance. Notwithstanding this our turnover maintained itself around \$50,000. Victorian plant sales are regularly situated on a large private property that provides an interesting landscape setting from which to sell the plants. These are well-attended. People will hopefully be interested in seeing how we have established our water-efficient gardens here at Oakdale and in seeing the landscapes being created. Nowadays there seems to be a dearth of native gardens to visit. Housing estates create smaller and smaller blocks. Worse they often already have a fixed landscape plan that prevents interaction from the owners, who quickly lose interest without the challenge of discovery and the opportunity to develop their own interest. We hope to encourage the use of native plants on larger blocks on the outer suburban fringe. Despite the grip of this dreadful drought which is being experienced country-wide and extending even to New Zealand and Indonesia, plant sales continue to be strong in some areas. This year we will again have some very interesting plants for sale with interested nurserymen showing their wares from as far as Brisbane and Geelong. Smaller plants are very popular and we cater to this in the catalogue of plants for sale. The main feature of the sale is the large number of plants that cannot be purchased from regular retail outlets.

We have received a request from Rosenberg Publishing (the Rosenberg's owned Kangaroo Press which published the Grevillea Books) to attend the plant sale to launch the long-awaited *Eremophila and allied genera* by Bob Chinnock which will be released in April. Final details are not resolved but it looks promising at this stage.

This year our garden will be entered in the Open Garden Scheme. We will let you know the date when we receive notice. We will also host a visit in October from the post-conference tourists associated with the Biennial Conference of the Associations of Societies for Growing Australian Plants being held in Newcastle.

We are currently developing a new website at <http://asgap.org.au/grevillea>. Bruce tells me he does not have enough time to develop the existing one and I have asked for assistance from Brian Walters, who has agreed to lend his expertise.

The Illawarra Grevillea Park continues to prosper despite the prospect of losing the front 10% to road development. Electricity has now been connected to the site and is on at the church and front gate. This will make life much easier. Ray is also talking about the installation of a second toilet. Several gardens have also been revamped and the Park is well worth another visit this year.

Our Christmas Party was well-attended. Many of the guests travelled long distances and some stayed over. Graham Nosworthy and Bryson Easton visited from Queensland. The Reids, Graeme and Elaine, and Colin Broadfoot came from near Coffs Harbour. Robert Pawley travelled down from Newcastle and six came from the Nowra area. The long-distance travellers far outnumbered the Sydney-siders. The support and encouragement from everyone was greatly appreciated.

This year we have a programme that will appeal to people wishing to visit species in the wild. Members are encouraged to attend any or all these events.

The newsletter can be sent electronically to save paper and postage.

If you'd prefer to receive the newsletter this way please send your current email address and phone number to grevilleanews@optusnet.com.au

Don't forget to also update your details when you send in your subscriptions.

Panrock Ridge Grevillea Collection Working Bee Nov 2006

After the extensive damage to the Grevillea Study Group's official Grevillea Collection caused by last summer's bushfires, it was decided to have a study group get together and clean up at Panrock Ridge in the Black Range, Stawell. We decided not to touch the burnt-out gardens until November to allow for any recovery and seedling germination. Unfortunately the ongoing drought severely impacted on the regeneration, although some positives did eventuate. The bushfire gave us the opportunity to witness just what happens to the majority of Grevillea species when they are burnt out by a bushfire –what species recover by re-shooting from lignotubers, epicormic buds, or by root-suckers, and what species rely solely on regeneration by seed alone.

Members began arriving on Friday afternoon, and by Saturday morning we had around 15 able and willing workers. After a full inspection and record taking, we got straight in to removing all dead plants, digging up and potting on seedlings and generally tidying up in preparation for new plantings. All surviving plants were clearly marked with fluoro tape as were areas of seedlings. Thelma and Malcolm Vanderpeer and Werner Kutch came all the way from Adelaide, while John Edmonds-Wilson came from Coonalpyn, also in SA. The rest of the workers came from far and wide across Victoria. GSG members of the Yarra Yarra APS Group from eastern Melbourne gave able support with at least 3 workers, while from Bendigo came Ian Evans with his wonderfully versatile backhoe. This machine single-handedly ripped out and bundled up all the hundreds of dead grevilleas and then stacked them onto a shuttle of trailers that removed them to a massive bonfire pile away from the gardens.



Ian Evans working in the Grevillea Garden

Neil Marriott

Teams of workers dug up and potted around 800 seedlings while other teams worked on the removal of the dead grevilleas and tidying up of the former gardens. Wendy was kept busy recording all the survivals, seedling regeneration etc and this data is provided in an accompanying article. It reveals some very interesting discoveries not previously recorded for the genus. This is particularly so for those species recorded recovering by root suckers. Species such as *Grevillea asparagoides*, *Grevillea annulifera*, *Grevillea dielsiana*, *Grevillea synapheae* ssp *synapheae* and *Grevillea hookeriana* (yellow-flowered form) have never before been recorded responding to fire by root suckers. It was also interesting to note that 2 species *Grevillea dielsiana* and *Grevillea synapheae* ssp *synapheae* regenerated from both root suckers and lignotubers. *Grevillea synapheae* ssp *synapheae* also regenerated by seed, so it is a species that has really adapted to survive!



Workers loading dead grevillea into the trailer

From a collection of around 350 species and subspecies we had very disappointing seedling recovery –only 17 species so far. However this is almost certainly being dictated by the severe drought and it is hoped that many more species will germinate following autumn-winter rains this year (if they ever come!!).



Grevillea seedlings dug up during working bee

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Following a hard day in the garden we all relaxed and had a great evening's BBQ, socialising and catching up with old and new friends. Feedback from previous Study Group meetings indicated a desire for workshops on propagation and using the Grevillea key, and these were incorporated into the weekend. The two sessions resulted in lively discussion and active participation, with most members taking home pots of freshly processed cuttings out of the gardens.

The workshop on using the key went extremely well and members took home several pages of notes kindly run off by Max McDowall. Sadly Max and Regina could not attend the campout due to the illness of their granddaughter Mia. However in typical McDowall fashion, Regina baked several tins of biscuits and Max ran off multiple copies of the Grevillea key and a quiz etc for all participants. We were sorry you could not attend Max and Regina, but thank you ever so much for all your help and support. I am pleased to say that Mia is now back to good health.

On Sunday afternoon we visited Steven Smart's graft nursery where members bought up the numerous rare grevilleas Steve specialises in growing. Then followed a tour of his wonderful collections of grevilleas, eucalypts and many other genera. A dense windbreak of the dwarf *Eucalyptus eximia* in full flower was admired by all. We then continued on to Craig and Sharon Beeching's garden at Pomonal. Members were amazed at the rapid growth of many of the plants in this garden. The specimen of *Grevillea 'Canning Classic'* was voted the most spectacular plant ever seen by all in attendance.



Following the tour of the Beeching garden we continued on to Halls Gap where we had booked in to a restaurant for tea – a fitting end to a wonderful weekend. In conclusion, I feel we had a most enjoyable and productive campout. Wendy and I could never have achieved what all the wonderful members did – you are true friends and we thank you ever so much. Particular thanks must go to Ian Evans – without the use of his fabulous backhoe, and his skill in its operation, we would not have got too far with the cleanup – Ian's machine saved us at least a weeks hard and dirty work!

We now have a largely bare valley, where the extensive Grevillea Gardens used to be – we now need to sit down and plan out how we will landscape the site. It will be different this time – no longer will it be an extensive species collection, with its associated high maintenance requirements. Instead we wish to create a series of attractive and relatively low maintenance and low moisture demanding garden beds, well landscaped, and concentrating on the smaller and rarer grevilleas and other gems from around Australia. We have learnt to never use organic mulches in high bushfire threat areas again and are already achieving great success using washed river sand as a thick mulch on the beds that survived the fire.



Part of the now almost bare Grevillea Garden

The response of Grevillea species to wildfire

Following the New Years Eve bushfire 2005 in the Black Range, Stawell the following records were made of grevillea recovery after a 9 month spell to allow for maximum recovery.

Species re-shooting from lignotuber

Grevillea alpina – type form (Grampians, Black Range, Mt Cole Range forms) – all other races of *G. alpina* apart from the suckering population from Myrrhee in NE Vic. have died.

G. aspera subsp. *nova* – Gawler Range (type form from Flinders Range dead).

G. bipinnatifida – both subsp. and all forms. Fastest of all grevilleas to recover, with some plants now almost as large as the original plants.

G. calliantha.

G. dielsiana

G. dryandrodes subsp. *hirsuta*.

G. globosa.

G. ilicifolia subsp. *lobata* – kite-leaf form from Big Desert.

G. johnsonii – orange flower race ONLY*.

G. longistyla – even grafted plants.

G. maxwellii.

G. nudiflora.

G. preissii subsp. *preissii* – all forms.

G. preissii subsp. *glabrilimba* – all forms.

G. pteridifolia – prostrate form.

All other forms dead.

G. ramosissima subsp. *hypargyrea*

Subsp. *ramosissima* all dead.

G. stenomera – even grafted plants.

G. synapheae subsp. *synapheae*.

G. treueriana.

Species re-shooting from epicormic buds along the main branches

Grevillea albiflora.

G. arenaria subsp. *canescens*.

(All forms of subsp. *arenaria* are dead).

G. argyrophylla.

G. banksii – all forms.

G. cagiana.

G. chrysophaea.

G. exul – only burnt lightly.

G. fililoba.

G. georgeana – only burnt lightly.

G. heliosperma.

G. helmsiae – only burnt lightly.

G. hodgei.

G. insignis subsp. *insignis* – subsp. *elliottii* all dead.

G. juncifolia subsp. *juncifolia* – subsp. *temulenta* all dead.

G. leucodendron.

G. nudiflora – Curly leaf form (Pt Anne).

G. pectinata subsp. *nova* – Nindibillup Rd. All other populations dead.

G. pilosa subsp. *pilosa* – large leaf form (red fls). All other popns dead.

G. polybractea – upright form (may have avoided intense heat due to height above ground).

G. robusta.

G. striata.

G. variifolia subsp. *variifolia*.

G. whiteana.

Ramets arising from underground roots (or rhizomes)

G. anethifolia.

G. annulifera.

G. aquifolium – Little Desert suckering form. All other populations are dead.

G. asparagoides.

G. dielsiana.

G. hookeriana – yellow flower form.

G. ilicifolia subsp. *lobata*.

All other forms and subspecies dead.

G. nudiflora – fine leaf form.

G. ramosissima subsp. *hypargyrea*.

G. spinosissima.

G. willisi.

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Species recovering by seedling regeneration

G. alpina – several races
G. aquifolium – local Black Range form only.
G. bipinnatifida subsp. *bipinnatifida*.
G. chrysophaea.
G. endlicheriana.
G. fastigiata.
G. flexuosa.
G. johnsonii – red and cream flowered race*.
G. lissopleura.
G. magnifica subsp. *magnifica*.

G. magnifica subsp. *remota*.
G. manglesii subsp. *dissecta*.
G. pectinata.
G. petrophloides.
G. phanerophlebia.
G. pilosa subsp. *pilosa*.
G. synapheae subsp. *synapheae*.
G. tetragonoloba.
G. wittweri.

* the observation that *G. johnsonii* – orange-flowered race recovered by lignotuber (3 plants), while the cream – and red-flowered race (5 plants), failed to re-shoot, but recruited by seedling establishment has considerable ramifications for the recognition of these two populations as distinct subspecies.

Neil Marriott

Grevillea 'Red Hooks' and its Response to Bushfires

During the devastating Grampians bushfires last January, long-time native plant grower and enthusiast Rodney Tonkin lost his extensive wholesale nursery, and all his wonderful stock gardens south of Pomonal. Included in these gardens were many grevillea species and cultivars including the cultivar *Grevillea 'Red Hooks'*. This cultivar has had a chequered history, being originally raised, to the best of our knowledge by the Royal Botanic Gardens Melbourne in the 1880's (?) as *Grevillea hookeriana*. Plants or more likely seed was sent to the Sydney Botanic Gardens, where it was raised and cultivated and eventually found its way into the nursery trade.

It was registered as *G. 'Red Hooks'* by the Grevillea Study Group to overcome the confusion in the nursery trade and with native plant enthusiasts alike.

It is a beautiful, hardy, mostly sterile cultivar, with showy red toothbrush flowers for much of the year. Foliage is dark green and pinnately divided, with leaf lobes broader and less hairy than *Grevillea tetragonoloba*. It has proven to be easy to grow and is generally a smaller and more compact shrub than *G. tetragonoloba* although it can still grow to around 3–4m x 3–5m.

In the 'Grevillea Book' Vol 2, p 201 we stated that we suspected it was in fact a seedling of *G. tetragonoloba*. However we do not know whether it was a hybrid or just a sport. Seedling regeneration around a large old plant on Rodney Tonkin's property confirms *G. tetragonoloba* as the real species, however the many dozens of seedlings dug up are all uniform, with no sign of hybrid separation as is the case with F2 hybrid seedlings. This tends to point to *G. 'Red Hooks'* being a sport rather than a hybrid with some other species.

A number of questions arise from this experience;

Does 'Red Hooks' have (viable) pollen?.

Could it have been back-pollinated with fertile *G. tetragonoloba* pollen?.

Are the seedlings mature enough to identify directly with *G. tetragonoloba* ?

Has anyone ever observed seed set on *Grevillea 'Red Hooks'*?

Max and Regina McDowall

Grevillea rosmarinifolia in the Graytown State Forest

In August 2000 en route to the A.P.S. Vic quarterly meeting at Shepparton, we explored some locations suggested to us by Ted and Cynthia Beasley in the Graytown and Rushworth State Forest for a possible field trip by the Grevillea Study Group to see forms of *Grevillea alpina* and *G. rosmarinifolia*. The forest is mainly box-ironbark with an understorey including *Acacia pycnantha*, *montana*, *acinacea*, *verniciflua*, *gunnii* and *flexifolia*, *Calytrix tetragona*, *Cassinia arcuata*, *Dillwynia sericea*, *Daviesia ulicina* and *leptophylla*. *Boronia anemonifolia*, *Phebalium obcordatum*, *Pultenaea largiflorens*, *Crowea exalata* and *Euromyrtus ramossissima* occur in more restricted locations in this and the adjacent Rushworth Forest. The terrain is mostly rather flat to undulating with shallow dry watercourses, but some hilly areas are found in the north around Whroo and approaching Rushworth and in the south-west around Mt Black Flora Reserve.

The Graytown-Rushworth Road runs north from Graytown, 21km west of Nagambie. Proceeding right (north-west) 1.3 – 2.3km along Darrochs (Dam) Road, 9.5km north of Graytown, we observed 20-30 scattered small, apparently young, open bushes 50–80 x 50–80cm on the north-east side of the road of *G. rosmarinifolia* growing in stony clay. Old, mature plants were not seen. Flower colour ranged from deep red through scarlet and orange to cream with green stigma. Mature foliage was bright to dull green, 18- 5 x 1–2mm, pungent, ascending; margins entire, hairy, 50–95% revolute on terete, hairy branchlets. A formal description will be prepared when the original pressings or fresh living flowering material from cultivated plants have been re-examined. From a preliminary examination of the original pressing, Peter Olde considers this to be typical *G. rosmarinifolia* – not a hybrid.

We explored north-east of the road as far as the creek line but the occurrence seemed to be confined to an area about 20–30m wide NE of the road and not at all on the south-west side. According to Ted, there were supposed to be *G.alpina* x *G. rosmarinifolia* hybrids along this road, but we did not see these, nor any *G. alpina* for several kilometres.

On a subsequent reconnoitre of the region in September 2005 to check out possible itineraries for a bus tour or self-guided tour (notes available on request) for the Acacia 2006 Fred Rogers Biennial Seminar, we revisited the location, but failed to find any of the original plants on the north-east side of the road. However, more plants were located mostly on the south-west side 2 – 2.5km from the junction. The bush was extremely dry and the understorey severely depleted.

Today (31/01/2007), I had a long discussion with Dr. David Cameron of DSE at the Arthur Rylah Institute, during which he guided me through the interactive map option on the DSE website, and the Australian Virtual Herbarium public version on the RBG website. We determined that there were no listings on either site for *G. rosmarinifolia* anywhere near the Graytown Forest, so this is evidently a new location for the herbarium, even though it has been known by local APS members for some decades.

Cultivation: Several of these forms have been in cultivation for several years. They grow and keep well in pots. Some specimens in pots at Bulleen were lost in a flood in 2003 and others in the ground at Panrock Ridge were lost in the 2006 fires. At Bulleen three garden plants are growing in a fairly dry situation in part sun, in well-drained soil consisting of sand, loam and clay-loam with some compost over a clay base. They are very upright in habit upwardly branching and up to 1.5m high after about 2 years in the pot and 2–4 years in the ground which tends to confirm the impression that the plants observed in the wild were still young. They flower from late winter to mid-spring and are quite attractive both in flower and foliage. Plants tolerate dry conditions, and have set some seed. They would be especially suitable as background plants in narrow garden beds against fences or walls in part to full sun.



Autumn On Farm Plant Sale & Native Garden Display 2007

**'Silky Oaks', Oakdale
140 Russell Lane, Oakdale**

Access M5 to Picton, turn left at Picton into Argyle St, first right into Barkers Lodge Road and Russell Lane is on the right at Oakdale (17 km from Picton)
Train to Macarthur, bus to Camden, change bus to Russell Lane, Oakdale



**Saturday, 21 April 10am to 4pm
Sunday, 22 April 10am to 4pm**



Guest speakers on both days are **Don Burke & Angus Stewart**

Visit the extensive native show gardens where native plants are grown to perfection in a timeless open parkland setting

* **Grevillea gardens * Rainforest Garden * Waratah Garden**

Workshops as well as expert garden and horticultural advice will be available from

* **Merv Hodge * Cas Liber * Neil Marriott * Ray Brown * David Shiells**

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Download our catalog and program from April 1 at
<http://asgap.org.au/grevillea>

Entry fee \$5 per person - seniors \$2.50 per person - accompanied children under age 18 are free

Sponsored by: **The Grevillea Study Group** of the Australian Plants Society,
P.O. Box 275 Penshurst N.S.W. 2222 Contact phone 02 4659 6598

Review by Neil R Marriott

Recovery plan for *Grevillea bedggoodiana*

(Enfield Grevillea) 2004 – 2008
Oberon Carter, Anna H. Murphy and Judy Downe

Conservation status

Grevillea bedggoodiana is listed as Vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, and is protected (but not listed) under the Victorian Flora and Fauna Guarantee Act 1988 (all Victorian Grevilleas are protected). There are approximately 37,228 plants remaining in approximately fifty-nine wild populations.

Distribution

Grevillea bedggoodiana is confined to the Enfield and Smythsdale areas, both shortly south-west of Ballarat in Victoria.

Habitat critical to the survival of the species

Given that this species is Vulnerable, all known habitat is currently considered critical. Actions include survey for critical, common and potential habitat to identify habitat critical to the survival of the species.

Populations of *Grevillea bedggoodiana* occur in eucalypt woodland on gravelly clay (Walsh & Entwistle 1996). Associated species may include *Eucalyptus dives*, *Eucalyptus baxteri* s.l., *Gahnia radula*, *Dianella revoluta* s.s., *Pultenaea gunnii*, *Epacris impressa* and *Lomandra filiformis*. (Those members who visited the area on a Study Group trip several years ago will remember the spectacular deep red flowered *Epacris impressa* amongst the grevilleas. NM)

Important populations

Important populations are listed in the plan as those populations with 1000 plants or more that occur in conservation reserves, as recorded in VROTPOP database records dating 1997 and 2001. This amounts to eleven populations incorporating greater than 19,335 individuals, or c. 52% of all known individuals, all of which occur in Enfield State Park. More thorough assessment of the relative importance of sites, and comparison with other sites, is warranted.



Known and Potential Threats

Biology and ecology relevant to threatening processes

There have been no targeted biological or ecological studies of *Grevillea bedggoodiana*. As a result, little is known of its germination requirements or other methods of persistence. Response to fire needs to be determined.

Reshoots vigorously from lignotubers as well as prolific regeneration by soil-borne seed (mostly stored in underground chambers by ants) N Marriott pers obs.

Identification of threats

Potential threats/perceived risk
Inappropriate biomass reduction/fire regimes
Moderate: The response of <i>Grevillea bedggoodiana</i> to fire is unknown. Following fire this species may resprout, or new individuals may recruit from seed. Some species in association with this <i>Grevillea bedggoodiana</i> respond well to fire (eg. <i>Platylobium obtusangulum</i> , <i>Eucalyptus baxteri</i>). Appropriate fire intervals are expected to be about 10-15 years.
Greatest threat to <i>G. bedggoodiana</i> is accidental introduction of <i>Phytophthora cinnamomi</i> to which it is extremely susceptible. This could be easily introduced on earth moving machinery used in logging operations etc, and as a result such activities warrant reassessment.

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Recovery actions and performance criteria

Specific Objective 1 – Acquire accurate information for conservation status assessments

Specific Objective 2 – Identify critical, common and potential habitat

Specific Objective 3 – Manage threats to populations

Specific Objective 4 – Identify key biological functions

Specific Objective 5 – Determine the growth rates and viability of populations

Specific Objective 6 – Build a network of government and non-government organisations and individuals

Specific Objective 7 – Co-operate in bioregional policy implementation and manage Recovery Plan implementation.

Management Practices

The philosophy of the strategy for recovery is habitat conservation, restoration and management combined with an understanding of the ecological and biological requirements of *Grevillea bedggoodiana*. The emphasis is on using knowledge to better implement in situ management techniques that protect populations and promote regeneration and recruitment. To achieve this, recovery actions are primarily structured to (i) acquire baseline data, (ii) assess habitat condition including ecological and biological function, (iii) protect populations to maintain or improve population growth and (iv) to engage the community in recovery actions.

On-ground site management will aim to mitigate threatening processes and thereby insure against extinction. Major threats requiring management include accidental destruction (eg. via timber harvesting practices or road maintenance works), and inappropriate fire regimes. A range of strategies will be necessary to alleviate these threats including fire management and negotiating Special Protection Zones in State Forest.

Broadscale protection measures applicable to all populations include legal protection of sites, habitat retention and liaison with land managers including private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations.

The Recovery Plan also advocates strategies to fill some of the major gaps in our knowledge to date. These include an understanding of the mechanisms underlying recruitment and regeneration. Successful in situ population management will be founded on understanding the relationships between *Grevillea bedggoodiana* and associated flora, and its response to environmental processes. These are directly linked to biological function and are thus vital to recovery. Demographic censusing will be necessary to gather life history information and to monitor the success of particular management actions.

In addition to the above, ex situ conservation measures will be required and will include seed storage and plant cultivation. Cultivating ex situ populations will also aim to increase the amount of seed available for reintroduction to sites. Cannot be grown anywhere within range of closely related taxa eg *G. aquifolium*, *G. dryophylla* etc or hybrid seed may result.

Community participation in recovery actions will be sought, particularly in regard to recovery team membership and implementation of on-ground works.

(From observations on our trip to the area as well as several subsequent visits, timber logging is still having an adverse impact on several populations. The frequency of wildfires over the last few years also poses an increasingly serious threat to the species. NM)

Direct deposits can be made into the Grevillea Study Group account but the Treasurer needs to be notified of the date of transfer by email preferably
(bruce.moffatt@tpg.com.au)

or by post to
**Grevillea Study Group,
PO Box 275 Penshurst NSW 2222**

Account details for direct deposit
BSB 112 879
Account Number 016526630
(St George Bank).

Morphological analysis of the *Grevillea ilicifolia* complex and recognition of taxa

Trisha Downing, Marco Duretto & Pauline Ladiges
Australian Systematic Botany, 17, 327-341 June 2004

In 'The Grevillea Book' Vol 2, pp 205-207 we treated *Grevillea ilicifolia* as a variable taxon with two varieties, var. *ilicifolia* and var. *angustiloba*. We further divided var. *ilicifolia* into Wedge-leaf form (kite-shaped), Kangaroo Island Form and Lobed-leaf Form. We always felt that the species needed a full investigation, and Trisha's research work is well overdue. The following is the abstract taken from the paper;

Abstract. A morphological study of herbarium and field-collected specimens, using phenetic techniques of agglomerative classification, ordination and minimum spanning trees, and covering the geographic range of the Holly *Grevillea*, *G. ilicifolia* (R.Br.) R.Br. *sensu lato*, has resulted in the recognition of three species and four subspecies. The taxa are based on leaf form, noted by previous authors to be highly variable between populations. The taxa recognised here are *G. ilicifolia*, *G. ilicifolia* subsp. *ilicifolia* (typical, kite-shaped leaf form), *G. ilicifolia* subsp.. *lobata* (F.Muell.) T.L.Downing comb. et stat. nov. (oak-shaped leaf form), *G. dilatata* (R.Br.) T.L.Downing comb. et stat. nov, (fan-shaped leaf form), *G. angustiloba* (EMuell.) T.L.Downing comb. et stat. nov., *G. angustiloba* subsp. *angustiloba* (narrow-lobed leaf form) and *G. angustiloba* subsp.. *wirregaensis* T.L.Downing subsp.. nov. (very narrow-lobed leaf form). The rank of subspecies is used where there are some intermediate plants between forms. *Grevillea ilicifolia* subsp. *ilicifolia* is the most widespread taxon and occurs in South Australia, western Victoria and in two localities in New South Wales. *Grevillea angustiloba* subsp. *wirregaensis* has the most restricted range, occurring in semi-arid regions near Wirrega in South Australia. *Grevillea dilatata* is largely endemic to Kangaroo Island, South Australia.

We therefore now have two subspecies of *Grevillea ilicifolia*, two subspecies of *Grevillea angustiloba*, and *G. dilatata*. Of concern to me is the fact that, as stated above, the "taxa are based on leaf form". Elsewhere in the paper it is noted that "Preliminary observations indicated that floral characters are invariant across the species' geographic range and were thus not

used in the analysis." To my knowledge this is therefore the first time species and subspecies of grevillea have been delimited purely on the morphology of their leaves.

Despite these misgivings I fully support the findings of Trisha's research. Peter Olde and I have always felt that the different forms of *Grevillea ilicifolia* were more than just leaf variations. We have observed *Grevillea ilicifolia* and *Grevillea angustiloba* growing almost sympatric on the southern edge of the Little Desert with no apparent signs of hybridisation. Elsewhere in South Australia I have observed *Grevillea ilicifolia* and *Grevillea angustiloba* growing close to each other and again, have never seen any signs of interbreeding. This actually implies that the species are in fact reproductively isolated. On the other hand, as noted by Trisha, there are occasional intermediate plants of *Grevillea ilicifolia* subsp. *ilicifolia* and *G. ilicifolia* subsp.. *lobata*, and as a result these two taxa are treated as subspecies.

Key to Taxa

- 1 Lobes of leaves < 4mm wide, narrowly linear to subulate, margins flat to recurved to revolute
G. angustiloba
- 2 Leaf-lobes 2–4mm in width, sometimes with secondary division.
G. angustiloba subsp. *angustiloba*
- 2: Leaf-lobes 1–1.5(-2)mm in width, usually with secondary or tertiary division
G. angustiloba subsp. *wirregaensis*
- 1: Lobes of leaves usually 4 mm wide, narrowly to broadly triangular or rounded-oblong, not linear to subulate, margins almost flat to slightly recurved
- 3 Leaves fan shaped, appearing more 'toothed' than lobed; triangular 'teeth' 3-13, crowded in the apical half of the leaf; lobes markedly pungent; hairs on the lower surface always subsericeous (straight, silky); upper surface glabrous or glabrescent or with a very sparse indumentum
G. dilatata

continued >

3: Leaves kite or oak-leaf' shaped, shallowly to deeply lobed, lobing distinct; lobes

3-15, lobes pungent but not overtly so; hairs on the lower surface either subsericeous (straight, silky) or occasionally curled or woolly; upper surface with a sparse to dense indumentum
G. ilicifolia

4 Leaves cuneate to kite – or diamond-shaped; lobes usually 3–7, indented less than half the distance from lobe tip to midrib when measured along the lobe vein (shallowly lobed) *G. ilicifolia* subsp. *ilicifolia*

4: Leaves oak-leaf-shaped or with herringbone division; lobes 3–15, indented for more than half the distance from lobe tip to midrib when measured along the lobe vein (deeply lobed) *G. ilicifolia* subsp. *lobata*

Summary

Instead of one species and two varieties we now have three species and four subspecies;

G. ilicifolia (R.Br.) R.Br. with two subspecies

G. ilicifolia subsp. *ilicifolia* (typical form, kite-shaped leaf form)

G. ilicifolia subsp. *lobata* (F.Muell.) T.L.Downing comb. et stat. nov. (oak-shaped leaf form)

G. dilatata (R.Br.) T.L.Downing comb. et stat. nov. (fan-shaped leaf form)

G. angustiloba (F.Muell.) T.L.Downing comb. et stat. nov. with two subspecies

G. angustiloba subsp. *angustiloba* (narrow-lobed leaf form)

G. angustiloba subsp. *wirregaensis* T.L.Downing subsp. nov. (very narrow-lobed leaf form)

G. angustiloba subsp. *wirregaensis* was visited by the Study Group during the 2005 Grevillea Crawl, and it clearly warrants the recognition as a subspecies of *G. angustiloba* given by Trisha. All other taxa have been inspected by me at most locations in the wild, and this revision, at long last brings some clarity to the *Grevillea ilicifolia* complex.

Grevillea rosmarinifolia 'Lara Dwarf'

Grevillea rosmarinifolia 'Lara Dwarf' is a distinct taxon, growing to around 0.4m with showy pink-red and cream spider flowers, and simple grey-green linear leaves slightly broader than similar dwarf forms of *Grevillea rosmarinifolia*. The original population occurred in basalt grassland on the Lara railway line, but unfortunately it is now extinct in the wild. It is also very rare in cultivation, with most specimens examined by me turning out to be incorrectly identified. Fortunately Ian Taylor of Western Plains Flora near Melbourne has been growing the plant for many years, and plants will soon be obtained from Ian so members of the study group can gradually build up the number of plants of this wonderful small shrub.

Kellee Reissinger informed me that it is also in cultivation at the Geelong Botanic Garden as well as at the nearby Werribee Zoo, which specialises in basalt plains flora. Kuranga Nursery also occasionally stocks the plant although I have not examined any of these sources to ascertain their correct identity.

"Grow What Where"

Gwenda McDonald, Natalie Peate & Alice Talbot

Bloomings Books, Richmond, Vic, 2006, Fourth edition. RRP \$49.95

This wonderful, fully revised edition contains listings including a large number of grevillea species and cultivars. It is an invaluable resource for helping you decide just what plants you should choose for every conceivable situation in your garden. There are lists for dry shade, wet shade, dry sunny, heavy soils, sandy soils, frost hardy, drought hardy, pink flowered, white flowered plus many many more! Then there is the free CD with this edition that has a further sixty lists, of which fourteen are "user-defined" – these can be custom-made to create your very own lists! Most highly recommended. If you cannot get a copy locally let me know and I will send you one for \$46.00 including postage.

Neil R Marriott

Research into the *Grevillea aquifolium* Alliance/Group

Trisha Downing, PhD student with the School of Botany at the University of Melbourne, is currently undertaking a research project into *Grevillea aquifolium* and its relatives, with fellow research student, Gareth Holmes. In a recent email from Tricia she says – “As part of my research project, I will be investigating the morphological and molecular variation of *G. aquifolium*, with the aim being to resolve the taxonomy as regarding forms; i.e., are there definable groups present within this species that require recognition? I will be aiming to document the morphological and geographic variation within *G. aquifolium*; to investigate the underlying genetic variation that leads to the morphological variation observed in this species, and to what extent this is influenced by local population size or gene flow between related taxa and finally to investigate the variation of leaf shape within plants at various developmental stages. My project will involve morphological analysis using both Light and Scanning Electron Microscopy (SEM), whilst genetic variation (DNA) will be investigated through the use of microsatellites.”

I provided Trisha with a list of those populations that warranted examination and inspection in the field, pointing out that there is considerable

variation within this species, covering many hundreds of populations. Indeed, a large task to resolve! In another email Trisha replied –“Thank you for sending those suggested field sites; they will come in handy when I finally get around to fieldwork. I have noticed that there are distinct leaf shapes and that these vary depending on where the specimen is from, but so far the variation is not as extreme or obvious as is was for *G. illicifolia*. At any rate, I feel that the morphology may not give the answers in this case and I hope that the molecular work will make up for it. My supervisors are Prof Pauline Ladiges and Dr Mike Bayly at the School of Botany; Liz James is my unofficial supervisor at MEL.”

Grevillea aquifolium certainly is a most variable species, with several populations at the very least that I consider to warrant recognition as distinct taxa, and I really look forward to the successful completion of Trisha’s research. Unfortunately Trisha has recently discovered that many of the wild populations have been burnt out in last summers bushfires! Trisha desperately needs seed for her research –if any members find any seed in wild populations please collect it and send to me (ideally with a small specimen and location). I will forward it on to Trisha.

A New location for *G. biformis* ssp *cymbiformis*?

Another interesting grevillea found by Werner Kutshe during his 2005 field trip to WA was what appears to be *Grevillea biformis* ssp *cymbiformis*. The unusual thing is that it was found nowhere near Eneabba, in fact the photo below was taken in Chiddarcooping Reserve. This may simply be a juvenile population of *Grevillea biformis*, the closely related *Grevillea ceratocarpa* or it may well be a new location or better still, yet another new taxa!! Well done Werner! It just shows that there is still much to be found in our big, poorly surveyed country. It also shows that by simply getting good photos, a pressed specimen and a GPS location as Werner has done, then these possible new sites can be revisited and substantiated.



Grevillea biformis ssp *cymbiformis*? – Photo Werner Kutshe

Max and Regina McDowall

Conserving water in the home nursery

When Stage III Watering restrictions were imposed on Melbourne with two weeks notice, just one week before Christmas, we wondered how we would manage to keep the nursery and stock plant collection of 30–35 sq. metres alive through the Summer heat on two watering days per week, without a rain-water tank. Fortunately, we were able to get an exemption, for the nursery only, on the two other days allocated for odd house numbers, to use the microsprays for 7 min/day, and we would have to manage manually with grey water from watering cans on the other three days.

However, before we knew whether we would get the exemption, we proceeded to put the entire nursery into styrofoam boxes lined with 20 micron polythene sheet to a depth of 2cm and 8 thicknesses of newspaper. We took the opportunity to weed the pots as we went, adding additional nutricote and topping with about 1 cm of small 5–7mm white pebbles to cut evaporation by reducing capillary action and reducing the surface temperature by reflection of sunlight. Now all water falling within the perimeter of the box is retained up to a depth of at least 1cm, and to remain available for the plants for at least one more day, except on very hot days. As a result, we have been able to cancel some scheduled watering periods on the cooler days and instead store about 100–120litres in buckets including some cleaner grey water for manual watering on hot off-days. As a result the plants are thriving.

Possible problems

1. We are concerned that continued accumulation of nutrients from the normal leaching of the nutricote will eventually result in excessive levels in the potting medium, especially for proteaceae species.
2. Some of the plants may not like extended periods of wet feet. In the absence of aerial root pruning, others may produce excessive root growth, out of the bottom of the pots.
3. The build-up of nutrients and potting medium in the boxes may encourage the growth of algae and other pathogens.

Accordingly we intend to rotate the nursery over a period of about 4–6 weeks during cooler or wetter weather through unlined polyboxes for 3–4 days in turn, to enable watering cycles to flush out the excess nutrients, and to enable the

lined polyboxes to be cleaned and checked for leaks. This will be require a lot of extra work, and we have yet to start the first cycle.

Note: We are getting sore arms and shoulders from hauling and holding buckets and watering cans of water, especially as we had pre-existing injuries, and now carry only half-full buckets. We now collect most of our dirtier grey water from the showers and laundry in a converted 240 litre recycle bin and pipe it onto garden beds or into buckets down the block. Water is bailed from any full buckets into the watering can using an old kitchen pot.

Any comments from other members would be appreciated (maxamcd@melbpc.org.au).

Illawarra Grevillea Park OPEN DAYS 2007

April, Sat 28 & April, Sun 29

May, Sat 5 & May, Sun 6

July, Sat 21 & July, Sun 22

July, Sat 28 & July, Sun 29

September, Sat 29 & September, Sun 30

October, Sat 6 & October, Sun 7

Each year the Park is open on the last full weekend in April, first weekend of May, last two full weekends in July, last weekend in September and first weekend in October. Opening hrs are 10am – 4pm.

Location

The Park is located at the rear of Bulli Showground, Princess Highway, Bulli. (Turn at the Woonona-Bulli Sports Club).

Admission

\$4 adults, children accompanied by adults are free.

Barbeque and picnic facilities available

Bring your lunch and make it a family day!

Special openings for groups

Special openings for tour groups (such as bus tours by Garden Clubs) can be arranged

The park is open from 10am to 4pm.
For more information email

grevil2@grevilleapark.org

Max A. McDowall

Biodiversity interactive maps and the australian virtual herbarium (public)

The Department of Sustainability and Environment (DSE) website <http://www.dse.vic.gov.au/dse/index> of Victoria has provided the public access to a powerful tool for the management and exploration of the natural resources of the State of Victoria with its Online Interactive Map Utility. Click on the Interactive Maps option under the heading Online Services at the right of the screen, then select Biodiversity Maps and use the options tools and layers and zoom buttons to display the data in the area you want. Species and subsp. names must be spelt accurately to get a valid search. Similar utilities may be available in some other states also – see their related websites.

From the Royal Botanic Gardens website visit the public section of the Australian Virtual Herbarium (AVH) at <http://www.rbg.vic.gov.au/avh/> and

search for locations of species of interest. This database is also more current than the DSE one for records of recently recorded flora locations.

I am indebted to Dr David Cameron of DSE for showing me how to use these great internet databases for discovering locations and habitats of our Australian Flora.

It is up to the user to learn the skills of exploiting the full versatility of these systems. When we have become more familiar with them we may find it useful to publish some instructive articles on their use for the benefit of study group members. With these tools comes the obligation to use the knowledge wisely and responsibly in the interest of conservation of our rare and threatened flora, including special local forms of otherwise more common species.

Seed Bank

Matt Hurst

13 Urana Street, Wagga Wagga 2650 NSW
Phone (02) 6925 1273

Please include a stamped self addressed envelope.

\$1.50 + s.a.e.

<i>Grevillea armigera</i>	<i>Grevillea magnifica</i> ssp <i>magnifica</i>
<i>Grevillea aurea</i>	<i>Grevillea monticola</i>
<i>Grevillea baileyanus</i>	<i>Grevillea nudiflora</i>
<i>Grevillea bipinnatifida</i>	<i>Grevillea paniculata</i>
<i>Grevillea candelabroides</i>	<i>Grevillea polybotrya</i>
<i>Grevillea drummondii</i>	<i>Grevillea pteridifolia</i>
<i>Grevillea excelsior</i>	<i>Grevillea pulchella</i>
<i>Grevillea decora</i>	<i>Grevillea refracta</i>
<i>Grevillea floribunda</i>	<i>Grevillea superba</i>
<i>Grevillea glauca</i>	<i>Grevillea teretifolia</i>
<i>Grevillea goodii</i>	<i>Grevillea tetragonaloba</i>
<i>Grevillea johnsonii</i>	<i>Grevillea triloba</i>
<i>Grevillea juncifolia</i>	<i>Grevillea wickamii</i> ssp <i>aprica</i>
<i>Grevillea leucoptera</i>	<i>Grevillea wilsonii</i>
<i>Grevillea longistyla</i>	

Free + s.a.e.

<i>Grevillea banksii</i>	<i>Grevillea 'Moonlight x Ivanhoe'</i>
– red tree form	
<i>Grevillea bipinnatifida</i>	<i>Grevillea paniculata</i>
<i>Grevillea candelabroides</i>	<i>Grevillea petrophilioides</i>
<i>Grevillea dryandri</i>	<i>Grevillea pterosperma</i> SA
<i>Grevillea endlicheriana</i>	<i>Grevillea robusta</i>
<i>Grevillea leucoptera</i>	<i>Grevillea 'Sandra Gordon'</i>
<i>Grevillea longistyla</i>	<i>Grevillea stenobotrya</i>
<i>Grevillea 'Moonlight'</i>	<i>Grevillea wilkinsonii</i>

Please note: seed from hybrid plants does not necessarily come true to type.

**Stocks of garden seed are running low and some more donations would be greatly appreciated.
Please make cheques for seed payable to Grevillea Study Group.**

Financial Report – February 2007

Income

Subscriptions	\$140.00
Plant Sale	1,898.18
Seeds	6.00
Interest	71.27
	<hr/>
	\$ 2,115.45

Expenditure

Newsletter Publishing	\$270.00
Postage	156.90
Printing	181.62
Stationery	35.98
Bank fees	8.50
	<hr/>
	\$653.00

Amount in Interest Bearing Deposit till 9/6/07

\$20,802.03

Balance in Current Account 31/1/07

\$15,004.14

Balance in Business Cheque Account 26/1/07

\$1,271.16

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Curator of Seed Bank

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13 Urana Street, Wagga Wagga NSW 2650
Phone (02) 6925 1273

Email Group

This email group was begun by John and Ruth Sparrow from Queensland. Free membership.

To subscribe, go to groups.yahoo.com and register, using the cyber-form provided. You must provide a user name and password as well as your email address to enable continuing access to the site which houses all emails and discussions to date.

You will receive a confirming email back and then you are able to access the site wherein you can select the groups to which you would like to subscribe. In this case search for 'grevilleas' and then subscribe.

Following this you will receive the latest emails regularly in your email to which you can respond. This is a good way to encourage new growers and those interested in the genus.

Postmessage: grevilleas@yahoogroups.com

Subscribe: grevilleas-subscribe@yahoo.com

Unsubscribe:grevilleas-unsubscribe@yahoo.com

List owner: grevilleas-owner@yahoo.com

URL to this page: <http://groups.yahoo.com/group/grevilleas>

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grevilleas@yahoogroups.com
3. URL for Grevillea Study Group website
<http://users.bigpond.net.au/macarthuraps/grevillea%20study%20group.html>

Deadline for articles for the next newsletter is 31 May 2007, please send your articles to peter.olde@exemail.com.au before this date.

If a cross appears in the box, your subscription of \$5.00 is due.

Please send to the Treasurer, Christine Guthrie, PO Box 275, Penshurst 2222.

Please make all cheques payable to the Grevillea Study Group.

2006



2007



If a cross appears in both boxes this will be your last newsletter.