

Australian Native Plants Society (Australia) Inc



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GSG Vic Programme 2013

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Contact Neil for queries about program for the year. Any members who would like to visit the official collection, obtain cutting material or seed, assist in its maintenance, and stay in our cottage for a few days are invited to contact Neil.

GSG SE Qld Programme 2013

Morning tea at 9.30am, meetings commence at 10.00am. For more information contact **Bryson Easton** on (07) 3121 4480 or 0402242180.

Sunday, 24 November

VENUE: Home of Fran & Jim Standing
Mount Clunie Road, Woodenbong,
NSW 2476

PHONE: (07) 4666 5118.

SUBJECT: TBA

GSG NSW Programme 2013

For details contact **Peter Olde** 02 4659 6598.

Special thanks to the NSW chapter for this edition of the newsletter. Victorian members, please note deadlines on back page for the following newsletter.

Field trip in the Snowy

Melbourne November long weekend (Fri November 1 – Tues November 5 inclusive)

The itinerary is never firmly planned but will go roughly according to the localities on page 2. There are numerous campsites along the way and some motels. Meet at Bywong Nursery 159 Millynn Road Bywong NSW at 10am filled with petrol and ready to go. There is some accommodation at Bywong Nursery for people travelling up from Victoria – phone Peter & Jenny Ollerenshaw on 02 6236 9280.

Book your place with Peter on 02 46596598 if you intend to be accommodated at the lodge at Yarrangobilly for at least one night. Costs or availability are not known as yet. You can also camp out there for a low fee.

Inside this issue:

- Flame spider-flower (*Grevillea kennedyana*) recovery plan
- The search for *Grevillea lanigera* on the Monaro
- Flood damage to *Grevillea wilkinsonii*
- *Grevillea lanigera* at Green Cape and Nadgee Nature Reserve, New South Wales
- Seed germination in the rare shrub *Grevillea kennedyana* (*Proteaceae*)
- Propagation experiment

Direct deposits can be made into the Grevillea Study Group account

BSB 112-879

Account Number 016526630
(St George Bank).

Please notify the Treasurer
of transfer
by email

(bruce.moffatt@tpg.com.au)

or by post to
Grevillea Study Group,
32 Blanche St Oatley, NSW 2223

Just a short editorial after a long fulfilling trip to Western Australia where I spent around 5 weeks during August and September researching *Grevillea* species. Two weeks were spent in the herbarium where I worked on a number of species I am researching at present. I will be writing this up for another newsletter.

One of the most interesting programmes being undertaken at Kings Park by their Senior Plant Breeder Digby Growns is the breeding of *Grevillea* hybrids for export and local consumption. A huge range of cultivars are being developed for the American market, using a range of species and therefore genes, not previously combined in breeding. The first of these are due for release in 2015/16 and are presently unnamed.

G. banksii prostrate x (*G. treueriana* x *G. asparagoides*)
G. nivea x *G. ilicifolia*
G. treueriana x *G. arenaria*
G. 'Allyn Radiance' x *G. alpina*
G. nivea x (*G. 'Misty Pink'* x *G. formosa*) scarlet flowers
G. fastigiata x *G. 'Kay Williams'*

Following these it is likely that there will be some releases from their (*G. fastigiata* x *G. bipinnatifida*) x *G. banksii* crosses as well as some featuring *G. armigera* in their background. And a few others too!! If you are in Perth check Kings Park again. It has been transformed into a wildflower wonderland with beautiful display gardens that seem to go on forever. The gardens feature excellent interpretive plant labelling and a wide range of horticulturally important plants and many very rare plants.

Some may be interested in attending the Australian Systematic Botany Conference to be held at the University of Sydney from December 1 to December 6. Cost for students and retirees is \$250.

http://www.systematics2013.org/wp-content/uploads/2012/11/First-Circular_draftv2.pdf

There will be a range of interesting speakers and an interesting session is planned on Proteaceae. There will be at least 6 speakers which include Greg Jordan, Ray Carpenter Marcel Cardilho Emma Lewis and Renska Onstein who is studying leaf traits in Proteaceae. Dr Peter Weston will be talking about *Grevillea/Hakea*. Google the speakers' names for more information on their scientific interests and research.

Two websites that I would like to recommend for hours of enjoyable looking and learning.

http://www.flickr.com/photos/jean_hort/9846618284/

This site is run by Fred and Jean Hort and has many excellent high-quality *Grevillea* pics and named entomological pics, useful for identifying that fly or spider on your flowers.

A second site is run by Malcolm Archer from Norseman and deals with natural history up to 160 km from Esperance. The site contains numerous flowers and treats all the local grevilleas.

<http://esperancewildflowers.blogspot.com/>

<http://esperancewildlife.blogspot.com/>

<http://natureitems.blogspot.com/>

Guide to localities and *Grevilleas* planned for the field trip in the Snowy

- **Bywong**
- **Gunning** – *Grevillea lanigera*
- **Murrumbidgee River** – 6.5km south of the ACT border, W bank, 'Mirrunga', the closest locality to Cunningham's Type form of *G. lanigera*
- **Warri Bridge**, Kings Highway – *G. arenaria* ssp. *arenaria*
- **Corang River**, 50 km N of Braidwood – *G. juniperina* ssp. *fortis*
- **Mount Franklin** – *G. australis*, *G. diminuta*, *G. lanigera*, *G. oxyantha* ssp. *oxyantha*
- **Wee Jasper** – *G. iaspicula*,
- **Tumut**, Lacmalac, Goobarragandra River – *G. wilkinsonii*, *G. lanigera* (see page 13)
- **Batlow** – *G. oxyantha* ssp. *ecarinata*
- **Tumbarumba to Lobs Hole**, Sue City, Kiandra, Tumut River Gorge near River Camp, 3 miles S of Sue City – recorded localities for *G. 'rosmarinifolia'*
- **Tumut Pond**, Round Mountain S of bridge over dam (S of Cabramurra) – *G. victoriae* ssp. *nivalis*
- **Yarrangobilly** – *G. rosmarinifolia* subalpine form, *G. arenaria* ssp. *canescens*
- **Bemboka** – *G. bemboka*
- **Yambulla SF Newtons Picnic Area** off Imlay Rd – *G. parvula*, *G. neurophylla*, *G. lanigera*
- **Broulee**, N Mossy Point turn-off – *G. mucronulata*
- **Bournda Nature Reserve**, c. 1 km from turnoff to Tura Beach, between Tathra and Merimbula – *G. mucronulata*

Flame spider-flower (*Grevillea kennedyana*) recovery plan

May 2000

This is a summary of the Recovery Plan.
For full details go to the website:

<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/g-kennedyana/pubs/g-kennedyana.pdf>

1 Current conservation status

Grevillea kennedyana (Flame Spider-flower) is a shrub of restricted distribution occurring naturally in the extreme north-west of New South Wales and adjacent areas of Queensland. At present *Grevillea kennedyana* is known from six separate locations. The total number of plants is estimated to exceed 13,000, most of which occur within Sturt National Park. The species is listed as 'vulnerable' under Schedule 2 of the NSW Threatened Species Conservation Act 1995. It is also listed nationally as 'vulnerable' under Schedule 1 part 2 of the Commonwealth Endangered Species Protection Act 1992. In addition, the species has recently been added to Schedule 3 ('vulnerable taxas') of Queensland's Nature Conservation Act 1992. The current conservation status of *G. kennedyana*, as defined by ROTAP (Rare or Threatened Australian Plants), is 2VCa (Briggs and Leigh 1996). This classification denotes that the species is 'vulnerable' (i.e. not presently endangered but at risk of disappearing from its habitat within 20-50 years) with a known geographic range of less than 100 km and is considered to be adequately reserved.

While the distribution of the species is highly restricted and populations are somewhat fragmented, no direct threats to extant populations or individuals have been documented. Absolute numbers of individuals and the area of occupancy appear to be stable since detailed survey of the species was initiated in 1992. Whilst recent surveys have located several new populations (Enke & Mills 1997, Johnston & Dollary 1998), the continued lack of knowledge of the species' biology is of concern in the event that active management is deemed necessary for its in situ and ex situ conservation (Cropper 1993). The conservation status of the species is to be reviewed following the implementation of the actions outlined in this plan.

2 Description

Grevillea kennedyana F. Muell. (Family Proteaceae) is an erect, multi-branched shrub, typically 1 to 1.5m in height (occasional individuals reaching 2m) with silver-grey foliage. The leaves are linear or rarely narrow lanceolate, rigid, pungent (sharply pointed) and are 5–33mm long. Leaf margins are entire and revolute, partially concealing the lower surface. Inflorescences (clusters of individual flowers) are erect, 2.5–3.5cm long. The flowers are a conspicuous rich red colour and are 14–21mm long.



Grevillea kennedyana

The fruit is a glabrous obovoid-ellipsoidal follicle, 12–17mm long and tapered to a style base (Figure 2). The seed is 7.5–10.5mm long, 2.7–3.1mm wide, linear to narrowly ellipsoidal with a short, apical wing. Flowering occurs late winter-spring, and can be sporadic under drought conditions. For a complete botanical description refer to McGillivray & Makinson (1993) or Olde & Mariott (1995).



Immature *Grevillea kennedyana* fruit consisting of a small capsule opening in two valves – Photo D Ayers (1996).

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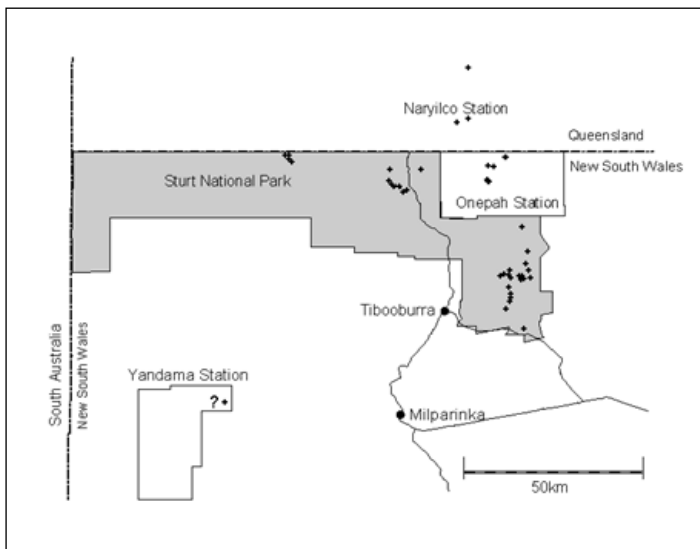
This species does not appear closely related to any other Australian *Grevillea* species (B. Makinson pers. comm.). Based on morphological features *G. kennedyana* has apparent phylogenetic affinities with other *Grevillea* species of temperate arid and semi-arid south western Australia, including *G. acuaria*, *G. sparsiflora*, *G. oligantha*, *G. decipiens* – all Western Australia taxa, and *G. pauciflora* which occurs in both South Australia and Western Australia (B. Makinson pers. comm.). The highly disjunct distribution of these related *Grevillea* species is of particular biogeographic interest. *G. kennedyana* is potentially a relict species being poorly adapted to deep sandy soils and 'stranded' on isolated rocky uplands by successive contractions and expansions of the arid interior of the continent.

Until 1977 no precise information on the exact distribution of *G. kennedyana* was available. It was first collected in 1886 by W. Baeuerlen at Olive Downs in the Grey Range. This material became the 'type' specimen on which the species' formal description was based by Mueller in 1888. Subsequent collections were made from Yandama Station in 1910 and 1960 and on Mount Woods in 1969 (McGillivray & Makinson 1993). In 1977, two additional locations were recorded for the species on Olive Downs Station and also Onepah Station by W.E. Mulham.

G. kennedyana has now been recorded from four general locations in the far northwest of New South Wales (Olive Downs escarpment, McDonalds Peak, Mt Wood Hills and Onepah Station) and two in south-west Queensland (Naryilco Station). All the populations are located at the southern end of the Grey Range and associated outlying hills and scarps. The linear geographic range of the species is less than 100 km (Figure 3 and Table 1).

At each of these localities, the arrangement of individuals in the landscape is highly fragmented and discontinuous. Each location comprises several populations or relatively discrete 'clumps'. The abundance of individuals varies considerably within the populations, from scattered shrubs spaced 100–200m apart, up to concentrations of 3 plants/10 m² (Duncan 1992a). The most recent estimate of the total population is 13,000+ (Table 1) (Enke and Mills 1997, B. Johnston pers. comm.). Large proportions of these individuals occur within Sturt National Park (Table 1). Population estimates attempted to take into account 'clumps' formed by connecting horizontal roots and 'clumps' formed by seedling establishment, however, the group was often treated as an individual (Duncan 1992a and b). Distribution of *Grevillea kennedyana* (denoted by small crosses) in north-western New South Wales and south-western Queensland. Vague records from "Yandama Station" which have not been relocated are denoted by "?".

Therefore, total population numbers are probably underestimates and so the data was presented as the minimum number. The populations previously recorded from 'Yandama Station' in 1910 and 1960 have not been relocated despite exhaustive searches in 1992 and 1997 (Duncan 1992b, Enke and Mills 1997). Imprecise location descriptions such as the names of large pastoral leases, the size and extent of which can change over the years, make it difficult to verify the possible local extinction at Yandama.



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Table 1: *Grevillea kennedyana* population census figures

Locality	Minimum number	Number of individuals in localised groups
Mount Wood*	2,300	30–400
Mount Wood Hills east of Mt Wood*	770	1–200
Mount Wood Hills* north of Mt Wood	1,700	1–250
Mount Wood Hills* north of Mt Wood Gorge	160	
Mount Wood Hills* SE of Mt Wood Peak	1,500	1–100
McDonalds Peak*	90	
West of McDonalds Peak*	2,900	47–400
Olive Downs Escarpment*	460	10–300
Onepah	1,650	
Three Sisters Hills Naryilco – Grey Range Queensland	2,000	
TOTAL	1,3530	

* Denotes populations within Sturt National Park

Source: Duncan 1992a and Enke and Mills 1997

3 Tenure

It is estimated that 70% of the recorded number of individuals are located within Sturt National Park. Remaining individuals, comprising 3 to 4 populations, are on leasehold land in NSW and Queensland.

4 Ecology

There is limited information on the biology and ecology of *G. kennedyana*. It is not known how long individual plants live. However, a relatively long life is a commonly observed adaptation in arid zone perennial plants as a response to the infrequent germination opportunities provided by limited rainfall. *G. kennedyana* is capable of recruitment via rhizomes (modified subterranean shoots). Investigations of clumps of plants at Onepah Station found that individual shrubs were connected by rhizomes. It is likely that many apparent individuals are clones (ramets of a limited number of genets). In addition, Duncan (1992b) observed that the species has the ability to resprout from adventitious buds at the base of stems. A wildfire partially burnt the Naryilco population in 1975. When observed in 1992 these plants had resprouted (Duncan 1992b). Flowering appears to be induced by

cool season rainfall and has been observed throughout winter and spring (unpublished data NSW NPWS). Preliminary observations suggest that substantial flowering episodes occur 2-4 months after a significant rainfall event. Threshold levels of effective rainfall are unknown. Flowering is irregular in dry seasons (Duncan 1992b). *G. kennedyana*, like most *Grevillea* species, does not appear to retain the fruit in the canopy after fruit set. Fruit probably matures 6-8 weeks after fertilisation and seed would be dispersed shortly afterwards. Mechanisms for seed dispersal are unknown, however, dispersal over short distances may be aided by the wings on seeds. Establishment of seedlings has not been observed in the wild. Little is known about seed dormancy in *G. kennedyana* but several other *Grevillea* species exhibit dormancy, possibly up to three or four years (B. Makinson pers. comm.). Recruitment via seed and subsequent establishment (as with other arid zone perennials) may be 'event driven'. Germination and growth may be reliant on exceptional rainfall events in the appropriate season or above average rainfall over successive years.

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5 Habitat

Grevillea kennedyana is found on rocky sites, typically the colluvial slopes of mesas and jump-ups, and occasionally in dry rocky watercourses. These habitats consist of the weathered moderately coarse fragments of silcrete duricrust overlying brown, loamy lithosols (Geological Survey of New South Wales 1967). The species appears absent from the upper, less stony slopes and the gently undulating plains which fringe the ranges. Denser concentrations of plants occur on lower slopes where the colluvium is deeper and water retention is comparatively good. Altitude range of *G. kennedyana* is from 140 m at Mount Wood to 200 m at Olive Downs. Slopes range from almost level (about 10°) to steep (about 75°) while aspect varies through 360°. The climate across the species range is arid and rainfall is extremely variable and unreliable (Figure 5). Extended dry periods without effective rainfall are common. *G. kennedyana* is associated with low, sparse arid shrublands dominated by Rock Fuchsia (*Eremophila freelingii*), Dead Finish (*Acacia tetragonophylla*) and Spiny Fan Flower (*Scaevola spinescens*). *G. kennedyana* is typically in the tallest stratum. The plant community or communities that are associated with *G. kennedyana* have not been adequately described. Plants are often scattered in loose groups across both the rocky upper slopes and the lower colluvial slopes. The highly variable nature of rainfall in the Tibooburra area is typical of the Australian arid zone.

6 Relevant legislation

- 6.1 Threatened Species Conservation Act 1995
- 6.2 Commonwealth Endangered Species Protection Act 1992
- 6.3 National Parks and Wildlife Act 1974
- 6.4 Environmental Planning and Assessment Act 1979
- 6.5 Native Vegetation Conservation Act 1998

7 Management issues

7.1 Threats and possible reasons for decline

Grevillea kennedyana is not threatened by overt habitat destruction. The arid climate and shallow soils which typify the habitat of *G. kennedyana* are unsuitable for intensive agricultural activities. However, subtle habitat degradation, through changes to pre-European fire regimes and browsing by herbivores, may have adversely affected the species.

7.1.1 Fire

While it is likely that pre-European fire intensities and frequencies have been altered in the last 100-150 years following the decline of Aboriginal burning practices and the introduction of stock and artificial watering points, the nature and consequences of these changes for *G. kennedyana* are unknown. Fire is not required to trigger the release of seed (B. Makinson pers. comm.) but may be implicated in the breaking of seed dormancy.

7.1.2 Grazing

It is likely that *G. kennedyana* can withstand browsing pressure. Plants respond well to heavy pruning in cultivation (*G. Fensom* pers. comm.) and much of the range of the species has been subject to prolonged and intensive grazing and browsing pressures by domestic stock, rabbits and macropods in the 1890's and the first half of this 20th century. However, grazing/browsing may be implicated in the in the lack of observed seedling recruitment.

7.2 Social and economic consequences

The habitat of *G. kennedyana* is remote, arid and rocky. Changes to existing land uses, principally nature conservation and extensive beef production, are not anticipated. Approximately 70% of the area occupied by *G. kennedyana* is publicly owned and managed for nature conservation.

7.2.1 Social considerations

G. kennedyana provides aesthetic appeal for those who visit the Park. For the broader community, exposure to interpretive materials relating to *G. kennedyana* and its habitat has the potential to increase the awareness of threatened plant species and the management of threatened species generally.

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7.2.2 Scientific and taxonomic value

The events and processes which have resulted in the current distribution and relative “rarity” of *Grevillea kennedyana* remain unknown. Investigations into the genetic diversity inherent within and between remaining populations and related taxa may contribute to a better understanding of speciation processes. Investigations into the biology of the species will further our knowledge of breeding systems and plant adaptations to arid environments.

8 Previous actions undertaken

8.1 Survey and recovery actions

A survey of all known populations and areas of suitable habitat was conducted in 1992 and ecological notes were collated by Duncan (1992b). Subsequently, a Recovery Plan was prepared for the then Australian National Parks and Wildlife Service (Duncan 1992a). Further survey and census of potential habitat was carried out in NSW and Qld during 1997 and 1998 and additional populations have been located in Queensland (Enke and Mills 1997, Johnston and Dollary 1998).

8.2 Current ex-situ programs

Propagative material was collected in 1980, 1989 and 1992 from various populations. The species is growing in cultivation at the Australian National Botanic Gardens (Canberra) and at Mount Annan annex, Royal Botanic Gardens (Sydney). Several clonal lines are now maintained in perpetuity via grafts and cuttings. Mount Annan maintains clones from four separate locations (Olive Downs, McDonnell Peak, Mt Woods and the gorge below Mt Wood). Some material is maintained in tissue culture and *G. kennedyana* has been successfully grafted onto *Grevillea robusta*. The Australian National Botanic Gardens (Canberra) maintains a single clone from Olive Downs Jump-up. Vegetative material is maintained by grafting onto *Hakea salicifolia* and *Grevillea* ‘Poorinda Royal Mantle’ and is also grown on from cuttings.

9 Species ability to recover

It is likely that *G. kennedyana* is restricted and rare as a result of largely ‘natural’ ecological and evolutionary processes. Known populations of the species appear to be stable over the last six years of field monitoring, without conservation

management. Currently there is no evidence to suggest that the species is in significant decline and no threatening processes have been documented. In addition, the discontinuous and disjunct nature of the species’ distribution renders it less susceptible to unforeseen localised catastrophe. Given that the species has persisted despite sustained intensive grazing and the cessation of prehistoric fire regimes and most of the population is within Sturt National Park, the prognosis for remaining wild populations in the medium to long term (the next 50 to 100 years) would appear to be reasonable. However, the lack of observed recruitment is of concern for the long-term survival of the species and needs to be monitored.

10 Recovery objectives and performance criteria

10.1 Objectives of the Recovery Plan

The long-term objective of this recovery plan is the conservation of the species in the wild in the long term. In the medium term (next 10 years) the objective is for the conservation status of *G. kennedyana* to be downgraded from ‘Vulnerable’ to ‘Conservation dependant’ or ‘Rare’ (IUCN criteria).

Specific objectives of the *G. kennedyana* recovery plan are to:

1. Monitor and protect all known populations,
2. Identify and manage threats to the species’ survival and recruitment, and
3. Improve the management of any identified threats by involving the community in the conservation of the species and through liaison with relevant landholders/managers.

10.2 Recovery performance criteria

Recovery criteria for *G. kennedyana* are that:

1. Any trend or pattern of continuing decline in known wild populations is prevented where possible,
2. Impacts of browsing and grazing animals on wild populations are understood, and
3. Relevant landholders/managers and interested stakeholders are aware of the species and its conservation through their involvement in recovery actions and the regular dissemination of information.

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11 Recovery Actions

11.1 Action 1 - Monitoring of wild populations and evaluation of browsing impacts

Monitor the distribution, abundance and overall health of *G. kennedyana* in the wild.

11.2 Action 2 - Germination requirements

Undertake research to determine the viability and germination requirements of *G. kennedyana* seeds. Collect seed from across the extant distribution of the species. Conduct greenhouse germination trials using smoked water, and various temperature and watering regimes. The results of this research will be used to evaluate the best conditions for germination of this species in the wild.

11.3 Action 3 - Community liaison and awareness

Maintain regular personal representations to relevant land managers and lessees.

12 Alternative Management Strategies

This section considers a series of options for the recovery of *G. kennedyana*.

12.1 Option 1. **No management action taken**

This alternative approach is not considered appropriate as threats to the species may be operating over extended periods of time.

12.2 Option 2. **Research on fire response**

Research into the response of *Grevillea kennedyana* to fire is not considered appropriate at this time. Notwithstanding the possible loss of individuals as a consequence of the application of fire, conducting burning trials on existing wild populations would be difficult given the general lack of fuels which typifies the habitat of the species.

12.3 Option 3. **Other research**

Determining the genetic variability within and between populations would provide insights into the gross number of clones that make up the population, and by inference, the nature of reproduction. This option will not be pursued as the outcomes, while potentially very interesting, are not anticipated to significantly modify the management of the remaining populations.

13 Community involvement

At this stage only two property owners are involved with the recovery of *Grevillea kennedyana* (Onepah, New South Wales and Naryilco, Queensland). During the writing of this recovery plan, contact was maintained with landholders. A colour brochure was produced and sent to all properties concerned (Onepah, Yandama, Naryilco).

14 Implementation

NPWS is responsible for the implementation of recovery actions specified in this plan for the period 2000–2005.

References

- Briggs** JD & Leigh JH (1996) Rare or Threatened Australian Plants. (CSIRO: Victoria)
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- Enke** R and Mills E (1997) *Grevillea kennedyana* (Flame Spider-flower) - distribution and abundance survey. Unpublished report to the NSW National Parks and Wildlife Service.
- Geological Survey of New South Wales** (1967) 1:250 000, Milparinka SH 54-7. Division of Regional Geography. (Government Printer: Sydney).
- Johnston** B & Dollary C (1998) Survey Report - *Grevillea kennedyana*. (Unpublished report to the NSW National Parks and Wildlife Service).
- McGillivray** DJ & Makinson RO (1993) *Grevillea* Proteaceae. (Melbourne University Press)
- Olde** P & Marriott N (1995) The *Grevillea* Book. Vol. 2. (Kangaroo Press: Kenthurst, Sydney).

The search for *Grevillea lanigera* on the Monaro

I (P.O.) am currently engaged in a search for where Allan Cunningham made his type collection of *Grevillea lanigera* which was made in April 1824. This will form part of a proposed visit on our field trip in November 2013. Attached to the type sheet in the British Museum (BM 000939204) is a piece of paper with the words, in Cunningham's script, "Rocky bed of the Murrumbidgee or Lachlan, south west from Lake George, A. Cunningham 42, Apr. 1824". Very little is known about this trip which was treated by Robert Heward (1842), Cunningham's biographer, in the following manner.

Excursion to the Monaro Country March 1824

At the latter end of March, Mr Cunningham started with his people on a tour to the southward of the colony, through the counties of Camden and Argyle; he also visited Lakes George and Bathurst, the head waters of the Murrumbidgee, Brisbane Downs (the Monaroo of the aborigines), Marley's Plains and the Shoalhaven gullies. The tract of country through which they travelled being of a generally good grazing character, did not afford so much botanical novelty as had been anticipated, but still some of the discoveries were interesting, from the curious identity of vegetation in many parts with that of the country in the vicinity, and to the northward of Bathurst on the western side of the great mountain range. A plant also of the south coast, discovered at Port Philip in 1802, by Mr Brown, (*Lomatia ilicifolia*), was also found in great profusion in the district of Argyle. [p292]

The singular limestone caverns, at the Shoalhaven gullies, appear from the short visit Mr Cunningham paid them, as one of the most interesting points of his excursion; and he much regretted, that time and proper facilities alone prevented his bestowing a more lengthened investigation of those apparently very extensive natural excavations. The distance travelled over in this journey was about four hundred and twenty miles. They returned the first week in May to Parramatta.

The full text of Robert Heward's biography can be read online at http://artuccino.com/Allan_Cunningham_Botanist_1839/

More information about Cunningham and his journal is given in an article 'Early Explorers in Australia' by Ida Lee (1925) which can also be read online at <http://gutenberg.net.au/plusfifty-a-m.html#lee>

However, the trip to the Monaro in early 1824 is not contained in any detail there. Recently, **Cathy Hook** delved a little deeper.

'Paul [Carmen] passed your email re the type location of *G. lanigera* on to me, as he thought I would be interested.

No part of the Lachlan River system is SW of Lake George, but Cunningham may have visited its upper reaches on the way to Lake George if he went west of Goulburn. The closest river to the SW of Lake George is actually the Yass River.

However, I had a look at the entry for Cunningham's '1824 Excursion to the Monaro Country' in the Flora of Australia Supplementary Series publication (No 13) on A. Cunningham's 'Australian Collecting Localities' (p.80), which says:

22 Mar. 1824. Commenced an excursion to the southern limits of the contemporary knowledge of N.S.W. (The Monaro country had been discovered the previous year by John Ovens and Captain Mark J. Currie.)

8 Apr. 1824. Reached the Bungendore area via Moss Vale, Lakes Bathurst and George, and Goulburn. Continued south from Bungendore. Did not reach the Monaro plains but visited the headwaters of the Murrumbidgee River to the west of Captain's Flat.

4 May 1824. Arrived back at Parramatta via the Shoalhaven gullies and Razorback Ridge.

To the west of Captains Flat is the Queanbeyan River; and the Murrumbidgee River is west of that again. I have looked at some maps and I see that there is a 'Cunningham Hill' which is pretty well due west of Captain's Flat, near the Murrumbidgee R. (about 2.5 km south of Williamsdale on the Monaro Highway) – I have no knowledge of the origin of the name, but it could indicate that it was part of Cunningham's route in 1824. What do you think?

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There is a ford at Angle Crossing a few kilometres away from Cunningham Hill, on the ACT/NSW border, which may allow some limited access to the river. Paul and I will try to go and have a look around sometime soon - it isn't an area with which we are familiar.'

The only detailed reference to the Cunningham excursion is in a small 20-page booklet by WL Havard (1956) which details the text of Cunningham's unpublished journal. It was part of an address to the Canberra Historical Society in September 1956. It is held by very few libraries, one of which though is the CSIRO library in Canberra. The original documents (Cunningham's Journal itself) on which it was based are no longer held even in Mitchell Library. They have been archived in the Archives of New South Wales, Kingswood (Reel 46).

Cathy Hook has photocopied the Havard document and forwarded a copy to me.

Havard [1956] 'Alan (sic!) Cunningham's journal of a tour into Argyle March-April 1824' was compiled from Cunningham's unpublished journal and edited so as to read in the third person. It will not be known whether further editing was done until the original document is consulted in the Archives at Kingswood. This work involves deciphering some often very poor handwriting.

More from Cathy:

Hi Peter,

It turns out that there is a copy of the document in the ANBG library! Paul has made a copy which I will post to you tomorrow (after reading it tonight).

Paul and I went to Angle Crossing yesterday afternoon, on the NSW-ACT border, but unfortunately, after last week's rain, the river was right up and the crossing closed. We walked about 1.5kms along the west bank of the river, downstream of the crossing (ie. ACT side) but found nothing. In general the river banks are very weedy, with large amounts of blackberry. However, there is some good news - we have discovered that the river corridor from just south of Tharwa to Angle Crossing (and much of the land on either side) is now part of the ACT public reserve system, so access permission is not required. We hope to go back and do some more extensive searching when the river has dropped.

In the meantime, Paul is making enquiries with ACT contacts to see if a plant list has ever been compiled for the area. Upstream of the crossing, in NSW, the river flows through private land, so access is a bit of a problem.

With regard to herbarium collections of *G. lanigera* from the Murrumbidgee R, there was one made by Isobel Crawford (3187) on 13 October 1995, from 6.5km south of the ACT border, W bank, 'Mirrunga'. The notes say "Dense shrub to 60cm. Rare.", and the habitat information is given as "River terrace, E. aspect. Alluvial sand over fine metasediments. Shrubland (*Callistemon palludosus*, *Kunzea ericoides*) dominant with dense patches of *Pomaderris* spp." There is a duplicate held at NSW.

Best wishes,
Cathy

'It seems clear that *G. lanigera* was collected on the Murrumbidgee River not the Lachlan River though the geography would have been somewhat obscure at the time. Cunningham does not mention the collection of *G. lanigera* in his journal but his diary for April 14 mentions the Lachlan River.

From Havard (1956: 12-13)

[April 14] '...Having made preparations for a week's absence from his encampment in a west and south-west direction by packhorse, he quitted the tents on this spot [below Foxlow] on Marley's Plains (= Molonglo Plains), taking with him two men, a saddle and pack-horse... His course was due west over a hilly country of poor soil and stunted timber when they reached the eastern boundary of an extensive and important tract of country without visible limit at west-north-west. Descending to the forest lands they went on about two miles and intersected a river whose winding channel they had previously seen from the ridge, when they halted, secured the horses, and kindled a large fire for the night. This river, which received the reed creek of Marley's Plains, was evidently an inland water and probably one of the branches of their old Lachlan. It was, where intersected, twenty yards wide, two fathoms deep, and ran with a brisk stream.'

continued >

Thursday 15th [April] Quitting their resting place they crossed the slightly rising grazing lands, forded the river 3/4 of a mile from their fire and took a westerly course to the open downs before them on the edge of which they arrived in an hour....At about 12 miles [in a SSW direction] they reached the opposite margin of these downs and went on through level but barren forest land with useless timber and indifferently watered. This wooded country became at length irregular and broken induced him to change his course to pass round some stony ranges. He descended under the main chain of mountains to the bed of a rapid stony river running to the northward. With some difficulty and danger they forded this river which we learnt from the stranger who accompanied them [probably the ex-convict Joseph Wild ?1773–1847] was called the Murrumbidgee, the lofty mountain range above them also taking that name, as given it by the aborigines.'

More from Cathy:

'This would explain the use of the two river names in the type information – he thought the Murrumbidgee was part of the Lachlan.

He reached the Murrumbidgee on the 15th April (p. 13) and camped about 1.5 miles from "Mt. Currie" (Mt Tennent according to Havard). This would put him somewhere in the vicinity of Tharwa. He then travelled upstream for a day before turning back to the north. On this basis, we should continue to look upstream from Tharwa (where we were last weekend) first.

*Best wishes,
Cathy'*

And thank you Cathy.

References

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Peter Olde

Grevillea lanigera at Green Cape and Nadgee Nature Reserve, New South Wales

Two vastly different horticultural clones of *Grevillea lanigera* in cultivation are claimed to have originated in Green Cape, in the southern portion of Ben Boyd National Park. The two forms in question are sold as *Grevillea lanigera* 'Green Cape' and *Grevillea lanigera* 'Kangarutha'. The former is a low, green-foliage, almost glabrous shrub that was selected for horticulture in the 1990s by Dave Theobald, proprietor of Bournda Native Nursery, no longer operating. The latter is a prostrate to decumbent grey-foliage plant which was selected in the 1980s by Bruce & Chris Hamilton of Kangarutha Nursery, via Tathra, New South Wales from a wild population growing near the high water mark at Green Cape lighthouse. According to Michael Wood, proprietor of Tarawood Native Nursery, this form acquired the promotional name of 'Drummer Boy' and was sold in New Zealand and parts of Australia under this label. The green-foliage form known as 'Green Cape' or 'Green-Cape Dwarf' closely

resembles a specimen in the New South Wales Herbarium collected by Bill Molyneux. Its location was given as near Bittangabee, a coastal campsite at the northern end of the National Park. This form was reported as rhizomatous in the Flora of Australia treatment, although cultivated plants are seed-obligate. A third form, the 'small-leaf form' or the 'fine-leaf form' with crowded small grey leaves and a low-growing habit, sometimes sold as 'Miniature', is also said by some nurserymen to have originated at Green Cape but its origin is more obscure. The correctness of these origins needed investigation.

On August 5 & 6, 2013 John Knight, former curator of the Eurobodalla Botanic Garden, and I, aimed to investigate polymorphism of *Grevillea lanigera* at Green Cape and in Nadgee Nature Reserve, now a wilderness area to the south from where additional collections have been made.

continued >

According to Wikipedia, **Nadgee Nature Reserve** is a protected area on the far south coast of New South Wales, to the immediate south of Ben Boyd National Park. It is about 8 hours from Sydney. Its southern border is the Victorian state border where it abuts Croajingalong National Park. Of its total area of 20,671 hectares (51,100 acres), 18,800 hectares (46,000 acres) or the southern part is declared wilderness. The area was inhabited by the Bidawal people. The first Europeans to visit the area were the survivors of the *Sydney Cove*, who encountered members of the Bidawal tribe on 29 March 1797, en route to Sydney. Since then, the region was impacted little by European settlement, with only two farms and surrounding acreage cultivated. Following a proposal in 1954, the New South Wales Government gazetted the Nadgee Faunal Reserve in 1957. The reserve was enlarged with the addition of the (recently logged) upper catchment of the Nadgee River in the 1970s. Vegetation types within the park include dry eucalypt forest, heath and saltwater wetlands. Much of the vegetation was burnt in bushfires in 1972 (from a lightning strike) and 1980 (from a logging burn-off). The varied habitats support a wide variety of bird species, 34 of which occur in the heathland areas alone, including the endangered Eastern Bristlebird.

Our investigation showed that *Grevillea lanigera* has three morphs in the limited accessible area around Green Cape where the species is confined to the coastal heath. None of the forms appear to be root-suckering, either in the wild or in cultivation. We first searched the heath north of Saltwater Creek towards Mowarry Point but despite intense examination and several hours walking along the coast and in the heath we did not find a single plant of *G. lanigera*.

The first small population of a few scattered individual plants was encountered after lunch at the junction of Green Cape Rd and the Pulpit Rock track. There, it is a small-leaved spare, low-growing grey shrub, albeit with lovely red and cream flowers on short upright stems. The thought that some of these plants might possibly be lignotuberous was conceived by observing that some of the plants had branches emerging from the sand. This was dismissed by the realisation that wind-blown sand had piled up around the plant and had begun to bury it. Without digging the whole plant up it was clear that this could not be investigated here with certainty. These plants closely resemble the fine-leaved grey foliage form mentioned earlier.



Population 1 – Photo P. Olde

The second form was encountered further along the Pulpit Rock Track at the junction of the walking track to Bittangabee Camping Area which leads from the lighthouse. Plants here had green almost glabrous leaves and were in all ways similar to the cultivated plants known as 'Green Cape Dwarf'. Apart from the almost glabrous leaves, they strongly resembled the first collection in every aspect including habit, habitat and associated species. All plants were in flower and grow in sandstone-derived sand with small rocks. Associated species included *Hakea decurrens*, prostrate forms of *Acacia suaveolens*, *Banksia paludosa* and *B. serrata*. A form of *B. serrata* was originally selected from here as a low-growing to prostrate plant and sold as *B. 'Pygmy Possum'*. This form, both in cultivation and in the wild, some 30 years after its introduction, has achieved a height of over 2.5 m, still small relatively but much larger than anticipated.

We then proceeded to the lighthouse and to a picnic table sitting above the high-water mark. The form of *G. lanigera* here was quite different. It had gnarled twiggy branches that were divaricately twisted and short, having been browsed regularly by a resident wombat, who also deposited its square scats all over the plants. The grey leaves of these plants were much wider and the plants much humped up into a dense shrub to 0.6 m high and 1 m wide. Some extended branches on the ground had died, possibly due to over-browsing or drought. Judging from its location this must be the 'Kangarutha' form. What remarkable variety in such a small area!

continued >



Near the high tide mark at the lighthouse – Photo P. Olde

We spent the first night in Bittangabee camp area, rough but well provided with fresh water, pit toilets and gas BBQs.

We had some additional locations to check further to the south in the wilderness zone of Nadgee Nature Reserve, serviced by a rather degraded 4WD track. We gained permission from ranger Lyn Evans at Merimbula NPWS to enter. We first investigated an area of heath behind Jane Spiers Beach that had been burnt in March. *G. lanigera* had been previously collected here.

What an incredible experience to be in such untouched wilderness! We took all morning to locate the area, but around 11 am we proceeded to search through the regenerating heath bordered by *Melaleuca armillaris* woodland. We were looking at the fire response for *G. lanigera* and to determine whether it suckered or was growing from lignotuber. We could not find any plants at all. While some ephemerals, grasses and

herbaceous species were regenerating from seed, none of the other seed-obligate species were rousing themselves, including *Hakea decurrens* which appeared to dominate large areas of the heath. Only the species capable of epicormic or lignotuberous regrowth were emerging, among them *Banksia serrata*, *Casuarina paludosa* and *Persoonia levis*. Failure to find *G. lanigera* was taken as prima facie proof that it was neither lignotuberous nor rhizomatous. Of course, there could be many reasons for its lack of presence, one of which could be that we just didn't see it!

We determined to investigate the unburnt heaths further south, at Black Head, Nadgee Moor, and Impressa Moor but were deterred by the late hour and the state of the road which caused us to pull the pin around 4 PM, still miles from our objective. Nadgee Wilderness adjoins Croajingalong National Park in Victoria. It was from coastal heaths in northern coastal Victoria that the forms of *G. lanigera* sold as 'Coastal Gem' and 'Woolly Bear Hero' originated. (Bill Molyneux pers. comm.) Neither of these two forms are rhizomatous. In fact, to my knowledge, all the coastal species are characterised by small leaves, small inflorescences and low-growing, seed-obligate habit. These character states extend to the plants at Wilsons Promontory in Victoria where the falsely named 'Mount Tamboretha' form occurs. The glabrous-leaved variant at Nadgee appears to be just that, a variant, but begins to blur the distinction between *G. lanigera* and *G. baueri*, though the former has rough leaves and the latter, in its typical form, smooth. This is why including subsp. *asperula* with rough leaves in *G. baueri* is such a poor concept.

Matt Hurst

Flood damage to *Grevillea wilkinsonii*

A recent trip to the Tumut area (June 2013) showed the devastation of the floods there twelve months before. The Goobagandra and Peak Rivers had a six and a half metre wall of water strip all vegetation from the banks of both up to twenty metres or more wide in places down to the confluence with the Tumut River. Naturally the damage to *Grevillea wilkinsonii* looked to be severe, however some plants close to the road could still be seen.

Re and damage to the Lacmalac population, most plants are fairly high on the bank on one side of the river. Damage is probably minimal but there will be some loss. The opportunities for reclaiming areas closer to the river are good as most seed will fall onto a now well cleared area. Other positives are that all willows and blackberry for the length of the river down the confluence with the Tumut river appear to have been destroyed.

Seed germination in the rare shrub *Grevillea kennedyana* (Proteaceae)

Lotte von Richter, Anthony Azzopardi, Richard Johnston & Cathy Offord. *Cunninghamia* 7: 205–212.

In 2001, seed germination trials were conducted as part of the Recovery Plan for *Grevillea kennedyana* by von Richter et al. at Mount Annan Botanic Garden (now the Australian Botanic Garden). In Sturt National Park propagation and spread of *G. kennedyana* plants within populations is by rhizomes, rather than by seed germination. No seedlings have been observed though seed is produced on the plants. The aim of this study was to investigate the viability of fresh and short-term, stored seed, and the optimal temperature and light requirements for germination of the species under controlled environmental conditions. From this it was hoped to understand whether the species is capable of sexual reproduction and if so, what environmental cues are required for seed germination. Most seed-propagated species have specific requirements that allow establishment in the field at the optimal time of year (Mott & Groves 1981). Successful seed germination requires several factors or environmental conditions such as temperature, moisture and light to be met simultaneously or sequentially. *G. kennedyana* occurs in the arid region of Australia where rainfall is low and unreliable. Many desert shrubs exhibit physical and physiological seed dormancies to ensure survival under these conditions (Baskin & Baskin 1998).

Seed was obtained from three populations of *G. kennedyana* in Sturt National Park. There were no detectable differences in germination rate and final germination values between the three populations. The study found that germination of fresh seeds is most successful at 10°C with light, and 15°C with or without light. The seeds were non-dormant and did not require further germination enhancing substances, such as smoke or fire to achieve > 80% success. These results do not support the role of fire in the management strategies suggested in the Recovery Plan for this species. *G. kennedyana* seeds are orthodox and can be dried at 15°C and 15% RH and stored at 4 and -18°C for a short period. In relating the results of this trial to the germination requirements of *G. kennedyana* in the field, it appears that successful germination will require low temperatures (i.e. < 15°C in winter) at the time of seasonal rainfall. Further studies are required to determine the cause of the poor seedling recruitment observed in the field.

Initially, many of the seedlings exhibited chlorotic cotyledons when placed in the greenhouse. In most cases the seedlings outgrew this chlorosis, producing healthy green leaves. Where chlorosis was severe, the seedlings often died. This phenomenon requires further investigation.

Forty-day-old seeds of *G. kennedyana* exhibited a very high level of viability when incubated at the optimum temperature (15°C) indicating a species with non-dormant seeds, at least while they are 'fresh'. This suggests that the conditions for germination in the wild may not be optimal at the time of seed fall, in summer, when minimum mean temperatures are in excess of 15°C, and remain so until the next autumn. However some seed germination might be expected, especially if soil moisture is adequate, as seeds can germinate at higher temperatures. For large-scale regeneration seeds would need to persist in the soil seedbank for some months. The longevity of seeds in the soil seedbank also needs to be investigated.

Germination may require a given amount of rainfall at a suitable temperature but seedling survival may require more significant rainfall. This combination of factors is particularly important in arid environments (Baskin & Baskin 1998). The germination results documented here were carried out with an adequate water supply — further work would need to be done to determine the limiting volume of water necessary for germination.

The absence of seedlings in the field may be due to grazing. *G. kennedyana* seedlings may be vulnerable to grazing, particularly by rabbits (Duncan 1992) but though rabbit numbers have decreased significantly since the spread of the calici virus, there is still no evidence of seedling establishment (NSW NPWS 2000). Site monitoring may help to determine if seedlings are emerging and being grazed, or whether there are other causes for the lack of seedling recruitment.

Seedlings attempting to establish in summer may be hampered by lack of soil moisture or extreme high temperatures. The severe chlorosis on the cotyledons of some of the cultivated seedlings may be a factor in seedling survival in the field. Seedling survival per se through to adulthood requires further investigation. Edaphic factors such as soil pH, moisture as well as climate and predatory behaviour should be considered along with soil seedbank persistence. The seedlings appear quite variable in leaf form; studies into the genetic variability of this species within and between populations may also be worthwhile to determine the amount of variability within and between populations. This could provide information on the extent of clonality in this species and whether recruitment of seedlings is taking place.

The full text and references can be accessed online at http://www.rbgsyd.nsw.gov.au/data/assets/pdf_file/0007/58525/Cun7Von205.pdf

Propagation experiment

I am experimenting with soaking seed, sowing it and covering it with a deep layer of pumice.

The hope is that I replicate the ant nest phenomenon and the seed erupt en mass as in nature. The other experiment is one used to germinate Hakea seed. This method may be useful for thin seed such as *Grevillea robusta*.

The old margarine container with sphagnum moss method has worked on some species but I think the moss should be killed by dunking in boiling water. I have seed germinate then damp off soon after.

Seed bank

Matt Hurst

37 Heydon Ave, Wagga Wagga 2650 NSW
Phone (02) 6925 1273

Please include a stamped self addressed envelope.

\$1.50 + s.a.e.

<i>Grevillea aurea</i>	<i>Grevillea nana</i>
<i>Grevillea baileyana</i>	ssp <i>abbreviata</i>
<i>Grevillea banksii alba</i>	<i>Grevillea newbeyi</i>
prostrate	<i>Grevillea nudiflora</i>
<i>Grevillea biternata</i>	<i>Grevillea occidentalis</i>
<i>Grevillea</i>	<i>Grevillea paniculata</i>
<i>candelabroides</i>	<i>Grevillea paradoxa</i> (ltd)
<i>Grevillea crithmifolia</i>	<i>Grevillea pilulifera</i>
<i>Grevillea decora</i>	<i>Grevillea polybotrya</i>
<i>Grevillea decurrens</i>	<i>Grevillea preissii</i>
<i>Grevillea eriobotrya</i>	<i>Grevillea pteridifolia</i>
<i>Grevillea eriostachya</i>	<i>Grevillea pulchella</i>
<i>Grevillea excelsior</i>	<i>Grevillea refracta</i>
<i>Grevillea floribunda</i>	<i>Grevillea ramosissima</i>
ex Coonabarabran	<i>Grevillea stenobotrya</i>
<i>Grevillea glauca</i>	<i>Grevillea striata</i> (ltd)
<i>Grevillea johnsonii</i> (ltd)	<i>Grevillea superba</i>
<i>Grevillea juncifolia</i>	<i>Grevillea synapheae</i>
<i>Grevillea leucopteris</i>	<i>Grevillea teretifolia</i>
<i>Grevillea longistyla</i>	<i>Grevillea tetragonoloba</i>
<i>Grevillea magnifica</i>	<i>Grevillea triloba</i>
<i>Grevillea magnifica</i>	<i>Grevillea triternata</i>
ssp <i>magnifica</i>	<i>Grevillea vestita</i>
<i>Grevillea manglesii</i>	<i>Grevillea wickamii</i>
ssp <i>manglesii</i> (ltd)	ssp <i>aprica</i>
<i>Grevillea monticola</i>	<i>Grevillea wilsonii</i>

Free + s.a.e.

<i>Grevillea nana</i> ssp <i>abbreviata</i>	<i>Grevillea leucopteris</i>
<i>Grevillea banksii alba</i>	<i>Grevillea longistyla</i>
<i>Grevillea banksii</i> – grey leaf form	<i>Grevillea mimosoides</i>
<i>Grevillea banksii</i> – red tree form	<i>Grevillea</i> ‘Moonlight’
<i>Grevillea banksii</i> – red prostrate	<i>Grevillea</i> ‘Moonlight x
<i>Grevillea Bon Accord</i>	Ivanhoe’?
<i>Grevillea caleyi</i>	<i>Grevillea occidentalis</i>
<i>Grevillea crithmifolia</i>	<i>Grevillea plurijuga</i>
<i>Grevillea decora</i>	<i>Grevillea pteridifolia</i>
<i>Grevillea didymobotrya</i>	<i>Grevillea robusta</i>
<i>Grevillea diversifolia</i>	<i>Grevillea</i> ‘Sandra Gordon’
ssp <i>subtersericata</i>	<i>Grevillea superba</i>
<i>Grevillea eriostachya</i>	<i>Grevillea synapheae</i>
<i>Grevillea floribunda</i>	<i>Grevillea tripartita</i> ssp
<i>Grevillea goodii</i>	<i>macrostylis</i>
<i>Grevillea johnsonii</i>	<i>Grevillea vestita</i>
<i>Grevillea johnsonii</i> ‘Orange’	<i>Grevillea wilkinsonii</i>

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

Fresh stocks of garden seed are desperately needed as most species are almost out of seed. Can members asking for seed please give an alternative list in case some species are no longer in stock. It is preferred if requests are sent with a small padded post pack. It costs less to send at approx \$1.50 per letter than padding an envelope at \$2.00 each or more so the seed will survive the trip down the sorting rollers. It's a good idea to send extra stamps with requests as extra postage is usually needed to be paid with almost every request. Leftover stamps would be sent back with your seed.

Financial report – October 2013**Income**

Subscriptions	\$335.00
Donations	30.00
Seed sales	5.00
Interest	2.13
Transfer from Term Deposit	1,000.00
	<hr/>
	\$1,372.13

Expenditure

Newsletter publishing	\$240.00
Printing	95.55
Postage	51.60
Bank fees	2.50
	<hr/>
	\$389.65

Amount in interest bearing deposit till 21/10/2013
\$27,786.18

Balance in current account 30/9/2013
\$1,806.32

Balance in business cheque account 30/9/2013
\$859.68

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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.

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<http://asgap.org.au/grevSG/index.html>

Deadline for articles for the next newsletter is 31 January 2014, please send your articles to peter.olde@exemail.com.au before this date.

If a cross appears in the box, your subscription is due.

Please send to the Treasurer, Christine Guthrie, 32 Blanche Street, Oatley 2223.

Please make all cheques payable to the Grevillea Study Group.

2012 2013
 If a cross appears in both boxes this will be your last newsletter.

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