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The Grose Vale flora and the value of documenting botanically interesting sites

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***Abstract*:** Particular botanical sites have always been attractive to botanists, and the recording of such sites even in an *ad hoc* way, adds to our long-term documentation of ecological change. Here we look at records from an unusual dry rainforest site in western Sydney, first recognised in 1910, and re-recorded on several occasions more recently. Though the site has little formal conservation protection, the records indicate that many of the original species still survive at the site, while the periodic recording draws attention to the scientific value of the site, particularly at a local level, and has increased its value as an ecological reference site.

Much of the vegetation of the Cumberland Plain has been subject to major clearing and disturbance over the past 200 years, and almost all vegetation is recovering in some way. Repeated visits are valuable for getting a complete picture of the flora; repeated visits by the same botanist over the shorter term (e.g. within a few years) may also be valuable, especially as the revisiting botanist may be more likely to notice changes. By documenting sites now, and continuing this over future years; we can enhance the value of many existing sites.

Key words: long-term monitoring, conservation management, Western Sydney Dry Rainforest

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Introduction

Particular sites are always attractive to botanists. Such sites include those with locally different or relict floras, sites that stand out in the landscape for their particular geomorphology, geology etc, or sites where plants are part of the historical and cultural connections. In Australia such sites frequently include isolated mountain tops, hidden or sheltered valleys or gorges, and sites associated with botanical history such as Kurnell (visited by Banks and Solander in 1770). Sites along the routes of individual explorer-botanists, and often described or illustrated in their journals (e.g. Ludwig Leichhardt, Edmund Kennedy), are also likely to be revisited. Localised sites of particular interest may include hilltops, swamps, unusual geological outcrops, cave areas, cliffs and cultural sites (e.g. old cemeteries, mines, industrial sites). Serial visits to such sites often result in descriptive documentation or specimen collecting. For example the Mt Wilson – Mount Tomah basalt caps in the Blue Mountains west of Sydney, have provided plant collections (including those of Allan Cunningham, Jesse Gregson and Keith Ingram) and a series of scientific papers (Brough et al. 1924; Petrie 1925; McLuckie & Petrie 1926), while the dramatic Bulli escarpment inspired descriptions by Allan Cunningham (in Lee 1925) and Consett Davis (Davis 1936, 1941a,b). Other Sydney area examples are provided in Table 1. Because

of their scenic, scientific, cultural or tourist interest, and/or intrinsic attributes (often steep topography or relative inaccessibility), these sites often survive local development pressures relatively intact or at least partially protected. Given the rate of landscape change in Australia over the last 200 years, and the paucity of long term studies, sites with some historic botanical documentation may play a key role in future long term studies. Depending on the individual site and its vegetation history, such sites may reveal details of how vegetation has changed over time (e.g. responses to disturbance, plant lifespans, vegetation resilience, rates of weed invasion etc), and how it is likely to respond to future change.

Western Sydney has been subject to grazing and agriculture for two centuries, and increasing areas of urban development for the last century, leaving native vegetation as remnants with increasing weed and management issues. A number of sites do have some historical botanical documentation, including Bents Basin where plant collections were made by the botanist-explorer George Caley in 1804, Joseph Maiden in the early 20th century, and more recently described as part of a rare species study (Benson et al. 1990). Unfortunately, at most sites, botanical material from the pre-1950 period is restricted to sporadic herbarium collections (Table 1).

Two sites are exceptions, the *Native Vineyard* at Cobbitty, and the *Limestone flora* site at Grose Vale. These sites were recognised over a century ago for their unusual botanical significance, and good contemporary descriptions of their vegetation were compiled. Both sites are clearly different from the surrounding country and were evidently different in the pre-European landscape. The *Native Vineyard* at Cobbitty was described by clergyman-botanist William Woolls in 1867 (Woolls 1867). Its dry rainforest/vineforest vegetation was clearly different from the surrounding Cumberland Plain Woodland, and Woolls listed many species that were unusual for the area (unfortunately no specimens collected by him appear to have survived). Woolls' interesting account drew several botanical collectors to the area in the 20th century including LAS Johnson and AE (Tony) Rodd in 1968; Robert Coveny and Doug Benson in 1976; Marie Kennedy in 1992; and Anders Bofeldt in 1996. A species list from 1976 was included in Benson (1992) and indicated that weed invasion by African Olive (*Olea europaea* subsp. *cuspidata*) was having a severe impact on the native vine and shrub species; it is understood that this unfortunate situation continues (P Cuneo pers. comm. 2011).

An interesting area of vegetation at Grose Vale

In 1910 an interesting area of vegetation on limestone near Kurrajong drew the attention of W Mervyn Carne, at that time assistant botanist and assistant science master at Hawkesbury Agricultural College at Richmond (now part of the University of Western Sydney). Carne was interested in the impact of geology on the distribution of species and plant communities, and described the site (Carne 1910): *The present note deals with an interesting, though small, patch of vegetation occurring on an outcrop of a limestone at Grose Vale, Hawkesbury District. The deposit is to be found below Box Hill, and is followed by the Horseshoe Bend Road, which, running N.E. and S.W., joins the main Kurrajong and Grose Vale Roads. It is on the eastern slope of the hill, which curves to form a natural amphitheatre sheltering orchards and other cultivated areas. At about 100 yards from the Grose Vale end, and following the road for about half a mile, nearly to what is known as Lookout Hill, is the outcrop, with its vegetation, which is so distinct as to be noticeable against the hillside from several miles away. Another small deposit, denuded of timber, occurs near the church, about half a mile from Kurrajong Road. The deposit is about 800 feet above sea-level, and about 8 miles by road from Richmond. The dense growth of trees, entangled with many creepers, and the absence of Eucalypts, resembles that of the luxuriant gully– brushes of the eastern slopes of Kurrajong Range; or, perhaps, more nearly, those on volcanic soils, such as at Mountain Lagoon, Mount Wilson, or even of the Illawarra slopes. Above the road, this vegetation extends nowhere more than 20 yards, while, on the steep slope below, its width has been much greater, probably owing to the soil having been washed down from the outcrop.*

The site is now more or less located between Grose Vale Road and Westbury Road, Grose Vale (lat 33° 34' S; long 150° 38' E, c. 230 m elevation).

The botanist's published word is often able to survive the years better than native vegetation, and botanical interest can be passed down to succeeding generations. Carne's paper was picked up by Bill May who visited the site in 1984 and recorded the species present there at that time.

In 1996 as part of the National Parks and Wildlife Service Urban Bushland Biodiversity Survey (James 1997), Anders Bofeldt, a rainforest and rare species expert made some herbarium collections from Grose Vale. A summary list in the UBBS (Volume 2) is based on James' and Bofeldt's records – These records were from the steep slopes and a narrow zone on the lower side of Grose Vale Road (T. James pers. comm. 2011). In 2009 a list was made by Peter Lister (with Steve Clarke) who visited the site (see Figures 1, 2) as research for his biography of WM Carne (Lister 2009), and recorded species accessible from the road. Local resident Robin Woods has also prepared a list for the area based on recollection and observations (R.Woods pers. comm. Nov 2011), as part of a submission on listing Western Sydney Dry Rainforest (WSDRF) as an endangered ecological community under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 .

Species lists often remain unpublished and inaccessible, but Bill May's 1984 list and the original 1910 list, were published in Benson (1992) as Table 8. Unfortunately I incorrectly and inadvertently cited Joseph E Carne's (WM Carne's father) 1908 paper on the Western coalfields as the source of the 1910 list; I take this opportunity to apologise for misleading

Table 1 Some interesting Sydney area botanical sites with sequences of historical botanical data (references grouped broadly as 19th or 20th century) and any recent updates and current status.

EEC= Endangered Ecological Community; NR= Nature Reserve; NP= National Park, SCA= State Conservation Area

	Pre-1900	1901-2000	Recent updates	Current status
Umina sand ridges		Soil–vegetation studies Burgess & Drover 1952	Payne et al. 2010	EEC, private
Mt Wilson- Mount Tomah basalt caps	1820s description by A.Cunningham; specimens Jesse Gregson	Brough etal 1924; McLuckie & Petrie 1926; Petrie 1925; specimens Keith Ingram		Part NP
Grose Vale *limestone*		Species list and descrip. Carne 1910; Benson 1992	This paper	EEC, private
Agnes Banks sand deposit		Maze 1942, Simonett 1950, Benson 1981		Part NR,
Bents Basin	19th C specimens G. Caley, JH Maiden	Specimens JH Maiden, LAS Johnson; Benson et al. 1990		NR, SCA
Kurnell-Meeting place	1770 specimens, description Banks & Solander	Specimens JH Maiden	Benson & Eldershaw 2007	Part NP
Native Vineyard at Cobbitty	1867 spp list and descrip. Woolls 1867	Benson 1992		EEC, private
Bulli escarpment	1820s descrip. A Cunningham	1930s ecological descrip. Davis 1936, 1941a,b		Part NP, SCA
Five Islands, Illawarra		Davis et al 1938, Mills 1990		NR

Fig. 1. Junction of Bowen Mountain and Grose Vale Roads in 2009 showing roadside vegetation remnants. (photo Peter Lister)

readers. JE Carne's (1908) paper is itself interesting for its descriptions of the vegetation of some of the volcanic necks and caps in the western Blue Mountains, and in passing indicates the considerable rural activity at that time in an area that is now regarded as largely natural. His name has been applied to Carne Creek, an upper tributary of the Wolgan River with a series of botanically important Newnes Plateau Shrub Swamps. The contributions to NSW botany of both Carnes, father and son, were recognised in the naming of *Acacia carneorum* (= 'of the Carnes') by Joseph Maiden.

WM Carne's Grose Vale specimens remained at Hawkesbury Agricultural College in the Musson Herbarium until they were transferred to the National Herbarium of NSW in 1979, and after being databased during the last decade, became available for study. I have revisited the lists compiled in 1910 for updated naming, and though there are no specimens to accompany the 1984 and 2009 lists, there are other collections from recent times (mainly Anders Bofeldt's 1996 collections) to confirm botanical identity (Appendix 1). Of Carne's published lists we can confirm that of the 36 species listed for the limestone outcrop, 78% have supporting specimens; of the 11 intermediate habitat species, 55% have specimens; and of the 67 shale soil species, 51% have specimens (Table 2).

In 1910 Carne expressed concern that the pace of clearing and weed invasion was clearly going to destroy the interesting vegetation: *There is no doubt that, even up to recent years, this flora covered an area much larger than it does to-day. Many roadside plants, both native and introduced, have established themselves. Clearing is still going on. The conditions for luxuriant growth are no longer so favourable, and in a few years this interesting, patch of vegetation will probably disappear.* Similar fears are expressed for many sites today. Carne's response was to record the site by collecting specimens and describing it in the scientific media.

Whether Carne's work provided any protection in the early part of the 20th century is unknown, but drawing attention to the peculiarities of the local site has led to botanical responses in the last couple of decades, and some limited on-ground habitat rehabilitation. Robin Woods (pers. comm. Nov 2011) suspects that Carne only had access to roadside sites and never knew about some species. She found for example, some of the biggest and oldest *Croton insularis* with very diverse understorey in one property further west of the site,

Fig. 2. Grose Vale site in 2009 showing rainforest remnants along roadside. (photo Peter Lister)

Table 2 Specimen confirmation of Carne's 1910 Grose Vale list. Soil categories follow Carne (1910).

	Limestone	intermediate	Shale
Carne's 1910 list	36	11	67
Carne specimens	28	6	34
Incorrect taxa	4		
Confirmed by later specimen or listing	4		
Percentage of Carne's list with confirmed specimen	78%	55%	51%

Table 3 Number of species recorded in surveys at Grose Vale (1910, 1984, 1996, 2009, 2011) and percentage of flora surviving (2009-2011). Only limited collections were made in 1996.

	Limestone soil	intermediate soil	Shale soil
1910	32 plus 4 incorrect taxa	11	67
1984	18	10	23
1996	9	2	3
2009	19	5	16
2011	23 plus 5 possibles	10	34
2009, 2011 combined	24 plus 5 possibles	10	36
Percentage of 1910 flora surviving	75%	91%	54%

which resulted in $20 000 in funding for regeneration from the NSW Dept of Environment & Conservation.

Today, while the patch is much reduced in area, it is still possible to see many of the species recorded by Carne 100 years ago. Comparisons with the historic data (Table 3) confirm that a significant part of the flora is still present in the site area: 75% of the listed limestone flora (2009 and 2011 combined), and 91% and 54% of the intermediate and shale flora respectively. These last two statistics are artificially low as searches have targeted the unusual limestone flora. The shale flora is more widespread in the area. The site is freehold land and as far as is known there is no particular protection for this site at local government level. It is likely that the relative steepness of the site, and its situation at the junction of several roads, may all have helped survival, but the persistent nature and longevity of many native plant species has also been important. The resilience of many native species in response to adverse conditions was not recognised in 1910, though there are limits particularly in the face of the extensive shading from the exotic woody weed African Olive, *Olea europaea* subsp. *cuspidata*, that has developed over the last two decades. At Cobbitty where *Olea* was well established in the 1970s its severe competition had already lead to loss of natives by 1990.

At Grose Vale some form of formal protection (on nearby properties goats appear to be underscrubbing the forests), as well as further careful recording, a management plan, and weed control, are needed now if this important vegetation remnant is to survive beyond 2110.

Discussion

Can this attractiveness of particular sites to botanists and fellow scientists be used to advantage? Repeated visitation and supporting documentation is an important way to gather scientific information on changes longer than lifespans of individual researchers. Most of our primary 18th and 19th century historical botanical information is limited to plant specimens, generally with very little in the way of annotation except for locality data. There are very few descriptions of the native vegetation for specific sites; the few descriptions that exist are therefore important and especially so when the actual sites still remain. A list of such sites in western Sydney is small, probably restricted to the Native Vineyard at Cobbitty, Grose Vale limestone, Bents Basin, the Agnes Banks sand deposit and possibly Nortons Basin. But there may still be historical data to be found in unpublished letters, diaries or journals. For example it would be exciting to find a 19th century list of native plants from Prospect Hill, Parramatta Park, Penrith Weir, Yarramundi, or somewhere on the Georges River.

Where historically-documented sites exist, they need to be protected in local legislation and if private land, then should at least be accessible to scientific study, although not necessarily open to the public. Where conservation zoning is appropriate some funding could be provided. Interestingly both the Native Vineyard and Grose Vale limestone sites are part of the Western Sydney Dry Rainforest Endangered Ecological Community (WSDRF), now listed under the NSW *Threatened Species Conservation* (TSC) Act, and proposed for listing under the Commonwealth *EPBC* Act.

There are no similarly historically-documented sites in the adjacent and more extensive Cumberland Plain woodland vegetation, presumably because its vegetation appeared commonplace and widespread in the 19th century landscape. However much of the vegetation of the Cumberland Plain and greater Sydney area has been subject to major clearing and disturbance over the past 200 years, and almost all vegetation (apart from that growing on the low-fertility sandstones) is recovering in some way from past disturbance. The degree of disturbance seems to be somewhat discounted in much of our thinking however, perhaps because none of us have seen an undisturbed example. This is important. In the absence of the 1867 list for the Native Vineyard at Cobbitty it would be impossible to believe such a site existed, so unexpected is

the composition of the flora and its particular location. The uniqueness of the site was evidently special enough to draw Woolls' attention to it at a time when one would expect that there were still many other equally anomalous sites surviving. His documentation provided an impetus for revisiting the site and now provides a knowledge base for its future rehabilitation. Documentation in 1937 drew subsequent attention to the sand deposit at Agnes Banks, and ultimately to some vegetation being protected as Agnes Banks Nature Reserve in 1982, though without survival of this remnant it would be similarly hard to believe that such a site existed amongst the grassy woodland of western Sydney. A smaller sand deposit was once reported at Wilberforce (Maze 1942) and I remember seeing some remnant Banksias there in the 1970s, but sandmining had by then almost obliterated all physical evidence, and the literature record was very scant. Better recording and specimen collection would at least have provided an idea of its extent, and possibly provided a basis for future restoration. This was done for a remnant at Elderslie, which is now listed as Elderslie Banksia Scrub Forest Endangered Ecological Community under the TSC Act.

This history of disturbance is likely to have had differential impact on different flora species, (for example stringybarks may have been preferentially selected for timber above other species such as ironbarks, resulting in an artificial change in relative dominance Jon Sanders, pers. comm. 2012). This disturbance also means that the vegetation is very much still changing – e.g. areas that we see and accept as woodland may gradually transform into forest as trees regenerate and mature to sizes that we do not currently see. As a result of these changes, 'new' species may turn up in unexpected places as recovery occurs. It is also the case that there is increasing demand for the regeneration and even restoration of the native vegetation communities, a demand that we should be meeting and encouraging. Checking of historic botanical records, and revisiting these 'historic' sites may provide important information and reference points to aid restoration, such as which species have 'gone missing' at other sites, or are at unnaturally low abundance as a result of disturbance.

In my experience those involved in plant recording are almost invariably driven by a passion for finding or refinding plant species (this applies to those I have acknowledged below). For example Anders Bofeldt's passion for revisiting old botanical sites led to his re-discovery of the rare rainforest vine *Cynanchum elegans*, (then thought to be extinct in the Sydney region) at sites in western Sydney and the Illawarra, an action that has helped ensure that this species survives in western Sydney and the Illawarra.

Ongoing change and repeated recording

Long term monitoring plots at the Australian Botanic Garden, Mount Annan (Benson & Howell 2002), and work elsewhere (e.g.Watson et al. 2009) demonstrate that the flora species visible at sites in western Sydney may change quite markedly from time to time, with many species being either relatively short term or occasional in their presence (e.g. after fire, following rains etc). Whilst it would be expected that this temporal change would be less marked at a dry rainforest site, it is unlikely that all the flora will be seen on one visit. Repeated visits are therefore valuable in terms of getting a complete picture of the flora, and repeated visits by the same botanist over the shorter term (e.g. within a few years) may therefore also be valuable. Visits can be timed to sample under different climatic or environmental conditions; the important factor here is to record at each visit, allowing real comparison of information to detect any change.

To conclude, there is value in documenting sites, and continuing this over many years. Though we have only limited records from the 19th and 20th centuries, what we do have provides critical evidence for our view of the ecological world at that time, and an important time-frame for understanding the rate of subsequent changes. We cannot revisit the 19th or 20th century landscapes, but we can enhance the value of existing sites by beginning their documentation now.

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Appendix 1

Species listed for Grose Vale compiled by Carne in 1910 for his limestone, intermediate and shale substrates, with subsequent occurrence noted by later recorders, either from their lists or specimen collections.

Additional species not originally noted by Carne have generally not been included, as the exact locations of records are not known. Plant names follow PlantNet.

Family	Species	Carne 1910 list	Carne 1910 species	Bill May 1984 list	Bofeldt 1996 species	Lister & Clarke 2009 list	Robin Woods 2011 list
LIMESTONE SOIL							
Myrtaceae	*Acmena smithii*	limest.	1910			2009	2011
Adiantaceae	*Adiantum formosum*	limest.	1910			2009	2011
Adiantaceae	*Adiantum silvaticum*	limest.				2009	2011
Sapindaceae	*Alectryon subcinereus*	limest.	1910	1984		2009	2011
Rhamnaceae	*Alphitonia excelsa*	limest.	1910	1984		2009	2011
Celastraceae	*Elaeodendron australis*	limest.	1910	1984		2009	2011
Vitaceae	*Cayratia clematidea*	limest.	1910	1984			2011
Poaceae	*Cenchrus caliculatus*	limest.	1910				
Vitaceae	*Cissus antarctica*	limest.	1910	1984		2009	2011
Vitaceae	*Cissus hypoglauca*	limest.	1910	1984		2009	2011

Family	Species	Carne 1910 list	Carne 1910 species	Bill May 1984 list	Bofeldt 1996 species	Lister & Clarke 2009 list	Robin Woods 2011 list
Ebenaceae	*Diospyros australis*	limest.	1910		1996		possible
Blechnaceae	*Doodia aspera*	limest.	1910				2011
Boraginaceae	*Ehretia acuminata* var. *acuminata*	limest.	1910	1984			2011
Eupomatiaceae	*Eupomatia laurina*	limest.	1910				possible
Moraceae	*Ficus coronata*	limest.	1910	1984			2011
Sapindaceae	*Guioa semiglauca*	limest.	1910	1984		2009	2011
Malvaceae	*Hibiscus heterophyllus*	limest.	1910	1984		2009	2011
Pittosporaceae	*Hymenosporum flavum*	limest.	1910	1984	1996	2009	2011
Menispermaceae	*Legnephora moorei*	limest.	1910	1984		2009	2011
Apocynaceae	*Marsdenia rostrata*	limest.	1910	1984			
Meliaceae	*Melia azedarach*	limest.	1910	1984		2009	2011
Lauraceae	*Neolitsea dealbata*	limest.					possible
Passifloraceae	*Passiflora herbertiana*	limest.		1984		2009	2011
Pteridaceae	*Pellaea falcata*	limest.				2009	2011
Pittosporaceae	*Pittosporum multiflorum*	limest.	1910	1984			2011
Myrtaceae	*Rhodamnia rubescens*	limest.	1910	1984		2009	2011
Rosaceae	*Rubus moluccanus* var. *trilobus*	limest.	1910				possible
Santalaceae	*Santalum obtusifolium*	limest.	1910		1996		possible
Rutaceae	*Sarcomelicope simplicifolia*	limest.	1910		1996	2009	
Menispermaceae	*Sarcopetalum harveyanum*	limest.	1910	1984		2009	2011
Winteraceae	*Tasmannia insipida*	limest.	1910				
Meliaceae	*Toona ciliata*	limest.	1910	1984	1996	2009	2011
NO HERB RECORDS FOR Grose Vale							
Rousseaceae	*Cuttsia viburnea* No, only NC North from Landsdowne R	limest.					
Lauraceae	*Endiandra*	limest.					
Iridaceae	*Libertia paniculata*	limest.					possible
Adoxaceae	*Sambucus australasica*	limest.					
ADDITIONAL SPECIES NOT ORIGINALLY LISTED							
Euphorbiaceae	*Croton insularis*			1984	1996		2011
Lauraceae	*Cryptocarya microneura*				1996		
Moraceae	*Maclura cochinchinensis*		1910	1984			2011
Apocynaceae	*Marsdenia flavescens*				1996		
INTERMEDIATE SOIL							
Aphanopetalaceae	*Aphanopetalum resinosum*	interm.		1984			
Sterculiaceae	*Brachychiton populneus*	interm.	1910	1984		2009	2011
Adoxaceae	*Breynia oblongifolia*	interm.		1984			2011
Lamiaceae	*Clerodendrum tomentosum*	interm.		1984		2009	2011
Euphorbiaceae	*Croton verrauxii*	interm.		1984	1996		2011
Phyllanthaceae	*Glochidion ferdinandi* var *ferdinandi*	interm.		1984		2009	2011
Rutaceae	*Melicope micrococca (=Euodia)*	interm.	1910	1984	1996		2011

Family	Species	Carne 1910 list	Carne 1910 species	Bill May 1984 list	Bofeldt 1996 species	Lister & Clarke 2009 list	Robin Woods 2011 list
Bignoniaceae	*Pandorea pandorana*	interm.	1910	1984		2009	2011
Phyllanthaceae	*Phyllanthus gunnii (=gasstroemii)*	interm.	1910			2009	2011
Myrsinaceae	*Myrsine variabilis*	interm.	1910	1984			2011
Ulmaceae	*Trema tomentosa* var. *aspera*	interm.	1910	1984			2011
SHALE SOIL							
Malvaceae	*Abutilon oxycarpum*	shale	1910	1984	1996		
Fabaceae	*Acacia parramattensis (=A. decurrens)*	shale		1984		2009	2011
Fabaceae	*Acacia longifolia*	shale		1984			
Rosaceae	*Acaena novae-zelandiae*	shale	1910				
Rosaceae	*Acaena ovina*	shale					
Poaceae	*Aristida vagans*	shale					
Poaceae	*? Austrostipa rudis*	shale					
Poaceae	*Austrodanthona pilosa*	shale					
Poaceae	*Bothriochoa decipiens*	shale					
Pittosporaceae	*Bursaria spinosa*	shale	1910	1984		2009	2011
Myrtaceae	*Callistemon salignus*	shale		1984			2011
Asteraceae	*Calotis lappulacea*	shale	1910				
Cyperaceae	*Carex appressa*	shale	1910				
Cyperaceae	*Carex longebrachiata*	shale	1910				2011
Ranunculaceae	*Clematis aristata*	shale	1910			2009	2011
Ranunculaceae	*Clematis glycinoides*	shale	1910			2009?	
Commelinaceae	*Commelina cyanea*	shale				2009	2011
Poaceae	*Cymbopogon refractus*	shale					
Apiaceae	*Daucus glochidiatus*	shale					
Fabaceae	*Desmodium brachypodum*	shale	1910				
Phormiaceae	*Dianella longifolia* var. *longifolia*	shale	1910	1984			
Poaceae	*Dichantheum sericeum*	shale					
Poaceae	*Dichelachne sciurea*	shale					
Convolvulaceae	*Dichondra repens*	shale					2011
Sapindaceae	*Dodonaea viscosa*	shale	1910	1984			2011
Poaceae	*Echinopogon ovatus*	shale					2011
Chenopodiaceae	*Einadia trigonos*	shale		1984			
Onagraceae	*Epilobium billardierianum*	shale					
Poaceae	*Eragrostis leptostachya*	shale					
Myoporaceae	*Eremophila debilis*	shale	1910				
Myrtaceae	*Eucalyptus moluccana*	shale		1984		2009	2011
Myrtaceae	*Eucalyptus tereticornis*	shale		1984			2011
Luzuriagaceae	*Eustrephus latifolius*	shale	1910	1984		2009	2011
Santalaceae	*Exocarpos cupressifomis*	shale	1910				
Cyperaceae	*Gahnia aspera*	shale	1910				2011
Cyperaceae	*Gahnia melanocarpa*	shale	1910				
Luzuriagaceae	*Geitonoplesium cymosum*	shale		1984			2011

Family	Species	Carne 1910 list	Carne 1910 species	Bill May 1984 list	Bofeldt 1996 species	Lister & Clarke 2009 list	Robin Woods 2011 list
Geraniaceae	*Geranium solanderi*	shale		1984		2009	
Fabaceae	*Glycine cIandestina*	shale	1910	1984		2009	2011
Fabaceae	*Indigofera australis*	shale	1910	1984		2009	2011
Juncaceae	*Juncus usitatus*	shale	1910			2009	2011
Poaceae	*Leptochloa decipiens*	shale					
Ericaceae	*Leucopogon juniperinus*	shale	1910	1984			2011
Lomandraceae	*Lomandra longifolia*	shale					2011
Myrtaceae	*Melaleuca styphelioides*	shale		1984		2009	2011
Lamiaceae	*Mentha diemenica* (as *saturioides*)	shale	1910				
Poaceae	*Microlaena stipoides*	shale					2011
Solanaceae	*Nicotiana forsteri*	shale	1910				
Oleaceae	*Notelaea longifolia*	shale				2009	2011
Amaranthaceae	*Nyssanthes diffusa* (as *erecta*)	shale	1910		1996		2011
Poaceae	*Oplismenus imbecillis*	shale				2009	2011
Asteraceae	*Ozothamnus diosmifolius*	shale					2011
Poaceae	*Panicum pygmaeum*	shale	1910		1996		
Plantaginaceae	*Plantago debilis*	shale					2011
Lamiaceae	*Plectranthus parviflorus*	shale	1910	1984		2009	2011
Lobeliaceae	*Pratia purpurascens*	shale	1910				2011
Acanthaceae	*Pseuderanthemum variabile*	shale	1910	1984			2011
Rosaceae	*Rubus parvifolius*	shale	1910	1984			2011
Polygonaceae	*Rumex brownii*	shale					
Asteraceae	*Senecio glomeratus*	shale					
Asteraceae	*Sigesbeckia orientalis*	shale	1912			2009	2011
Smilacaceae	*Smilax australis*	shale		1984			
Solanaceae	*Solanum prinophyllum*	shale	1910				2011
Solanaceae	*Solanum stelligerum*	shale	1910	1984			2011
Urticaceae	*Urtica incisa*	shale	1910				2011
Asteraceae	*Vittadinia tenuissima*	shale	1910				
Campanulaceae	*Wahlenbergia gracilis*	shale		1984			2011