

Plant species first recognised as naturalised for New South Wales in 2002 and 2003, with additional comments on species recognised as naturalised in 2000–2001

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Abstract: Information is provided on the taxonomy and distribution of 71 taxa of naturalised or naturalising plants newly recorded for the state of New South Wales during the period 1 January 2002 to 31 December 2003. Of these taxa, 32 are new records for Australia (prefaced with a †). These species are: *Abutilon pictum*, *Acanthus mollis*, †*Aesculus indica* (naturalising), *Agapanthus praecox* subsp. *orientalis*, *Ajuga reptans*, †*Anigozanthos flavidus*, *Aquilegia vulgaris*, *Arbutus unedo*, †*Athertonia diversifolia* (naturalising), †*Bergenia* x *schmidtii* (naturalising), *Bromus catharticus* subsp. *stamineus*, *Bryophyllum daigremontianum*, *Bryophyllum fedtschenkoi*, *Calyptocarpus vialis*, †*Ceiba speciosa* (naturalising), *Cereus uruguayanus*, †*Cestrum* x *cultum*, †*Chamaecyparis lawsoniana*, *Cistus salviifolius*, †*Clematis montana*, †*Coprosma* x *cunninghamii*, *Coprosma robusta*, *Cornus capitata*, *Cotoneaster simonsii*, *Cotoneaster* x *watereri* group, *Crinum moorei*, *Cupressus lusitanica*, †*Cylindropuntia fulgida* var. *mamillata* forma *monstrosa*, †*Cylindropuntia prolifera*, *Cylindropuntia tunicata*, *Desmanthus virgatus*, *Drosanthemum candens*, †*Elaeagnus umbellata* (naturalising), †*Eragrostis trichophora*, †*Eupatorium lindleyanum*, †*Gibasis pellucida*, *Glechoma hederacea*, †*Hesperis matronalis*, *Hieracium aurantiacum* subsp. *carpathicola*, †*Inga edulis* (naturalising), †*Juniperus conferta* (naturalising), †*Justicia caudata*, *Lamium galeobdolon*, *Lathyrus tingitanus*, †*Lysimachia fortunei*, †*Maackia amurensis*, †*Monstera deliciosa*, †*Murdannia keisak*, *Odontonema tubaeforme*, *Oxalis vallicola*, *Phoenix canariensis*, †*Physostegia virginiana*, *Pinus patula*, *Pittosporum eugenioides*, †*Pittosporum ralphii*, *Pittosporum tenuifolium*, *Plectranthus ecklonii*, †*Potentilla vesca*, †*Prunus campanulata*, †*Rhododendron ponticum*, *Rosa luciae*, *Rubus rugosus*, *Ruellia squarrosa*, †*Senna multijuga*, *Stapelia gigantea*, *Stephanophysum longifolium*, *Strobilanthes anisophylla*, †*Tabebuia chrysotricha*, †*Tabebuia impetiginosa*, †*Tradescantia pallida* and *Ulmus* x *hollandica*.

Additional notes and name changes are recorded for plants first recognised as naturalised for New South Wales over the period 2000–2001. The identification of several naturalised taxa occurring in New South Wales has been corrected. Plants formerly identified as *Pinus nigra* var. *corsicana* are now considered to be *Pinus halepensis*; *Cylindropuntia arbuscula* is *Cylindropuntia kleiniae*, *Cylindropuntia tunicata* is *Cylindropuntia rosea*, *Abrus precatorius* subsp. *precatorius* is now *Abrus precatorius* subsp. *africanus* and *Cotoneaster ?horizontalis* is *Cotoneaster microphyllum*. Further field studies have revealed that *Cylindropuntia leptocaulis*, *Cylindropuntia spinosior*, *Hypericum kouytchense* and *Chamaesyce ophthalmica* are more widespread than previously thought.

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Introduction

This paper is part of a series covering species recognised as naturalised or naturalising by the National Herbarium of New South Wales (standard code for this herbarium, NSW, is used throughout this paper). An earlier paper covered the period 2000–2001 (Hosking et al. 2003). This paper draws attention to a number of new naturalisations recorded for the state of New South Wales (N.S.W.) and the Australian

Capital Territory (A.C.T.) over the period 2002–2003, and follows the format of Hosking et al. (2003). Only taxa considered to be spreading from initial plantings or other naturalisations (e.g. from discarded garden refuse) are covered. ‘Naturalised’ in this paper refers to non-native taxa that have been reproducing (sexually or vegetatively) in the wild for at least one generation. ‘Naturalising’ covers taxa that are growing in the wild that have not yet reproduced, or are not spreading vegetatively.

Methods

All taxa treated are represented by vouchers lodged at NSW or the Australian National Herbarium, Canberra (CANB). A number of taxa listed were first collected prior to 2002 but are included here as these records were overlooked for *Flora of New South Wales* accounts and were subsequently noted during 2002 or 2003. Following recent collections a few old herbarium specimens stored at the end of genera and families in the NSW collection were able to be determined to species. There are also likely to be other records of recently naturalised species collected in the area during 2002 and 2003 that are housed at other Australian herbaria; we urge all collectors to lodge material collected from the Australian Capital Territory or New South Wales at either CANB or NSW.

The *Germplasm Resources Information Network database* (USDA) (URL <http://www.ars-grin.gov/cgi-bin/npgs/html/taxgenform.pl>) and the International Plant Name Index (<http://www.us.ipni.org/index.html>) were extensively consulted to determine currently accepted names, authorities and native range of taxa covered in this paper. The *PlantNET* website (NSW) (<http://plantnet.rbgsyd.nsw.gov.au>) was used to determine the current status of knowledge of introduced plants in N.S.W. The *NSW Collections* (NSW) and *Australian National Herbarium Specimen Information Records* (CANB) databases, together with the *Australia's Virtual Herbarium* website (<http://www.chah.gov.au/avh/>) were extensively used to determine the known records of introduced taxa.

Taxon names used are those currently adopted by NSW and can be viewed in the Flora Online module of *PlantNET* (<http://plantnet.rbgsyd.nsw.gov.au>). Herbarium codes follow Holmgren et al. (1990).

Information on means of dispersal of various taxa treated in this paper is given under 'Notes' for each taxon where this is known. Where the dispersal mechanism is not listed, the taxon concerned is presumed to spread by seed. However, the actual means of dispersal is not known for a number of taxa treated.

Discussion

The definition of the term 'naturalised' as used in this paper is outlined above. However, given that there is a degree of disagreement as to how this term should be applied (see Richardson et al. 2000, Pyšek et al. 2004), we have provided additional information on numbers of plants present, area covered and reproductive status of all taxa treated in this paper to allow for these differences in interpretation.

There are many ways of detecting new plant naturalisations (Hosking et al. 2001). The records listed below are the result of (i) collections made by experts who have a reasonable knowledge of local floras, including local government weeds officers, environmental consultants, bush regenerators,

professional botanists and staff from Landcare and Greening Australia, and (ii) specimens retained by herbaria who provide plant identifications for the general public.

More species (71 species) were first recorded as naturalised in N.S.W. during 2002 and 2003 compared with 40 for 2000 and 2001 (see Hosking et al. 2003), mainly due to increased effort to record naturalised plants in the Blue Mountains near Sydney, an area with a long history of ornamental horticulture. Records from Bellingen Hospital grounds, Bellingen, on the N.S.W. North Coast, cover species naturalising in an old arboretum (with management now limited primarily to path maintenance).

It is hoped that publication of new records of plant species naturalised in N.S.W. will prompt further collections of introduced species. In the long term, this approach will focus attention on potential problem species, and hopefully lead to their eradication before they have the opportunity to spread and become serious weeds.

Plant species first recognised as naturalised in New South Wales during 2002 and 2003

Taxa are listed alphabetically by family, genus and species under Conifers and allies, Monocotyledons and Dicotyledons. Vernacular names (where known), references to published descriptions (including illustrations and photographs), region of origin, distribution within N.S.W. according to botanical regions, habitat preferences, first known and additional herbarium records and miscellaneous notes (including relative abundance, invasiveness and whether naturalised in other states or overseas) are also provided. Authorities for species are those currently recognised at NSW.

Conifers and allies

CUPRESSACEAE

Chamaecyparis lawsoniana (A.Murray) Parl.

Lawson's Cypress, Port Orford Cedar

Description: Tree to 50 m high. See Wright (1984), Sykes in Webb et al. (1988), Michener in Morin (1993), Krüssmann (1985) and Bartel in Hickman (1993).

Region of Origin: Native of the USA (northern California, south western Oregon).

New South Wales Distribution / Habitats: Central Tablelands. Naturalised in disturbed shrubby *Eucalyptus piperita*, *E. sieberi* and *E. mannifera* woodland near planting of *Chamaecyparis lawsoniana*.

First Record: Wellington Road end of Burrawang Road, south of Wellington Road, Katoomba, *C.H. Barker 16 & J.R. Hosking*, 3 Dec 2003 (CANB, MEL, NE, NSW).

Notes: At the Katoomba site there were seven naturalised trees 1–6 m high, up to 40 m from an 18 m high parent planted tree. Two naturalised trees had cones. Spread appears to be by wind-dispersed seed. Seedlings have since been noted around other plantings in the Katoomba area. Many cultivars have been developed from *C. lawsoniana* (Krüssmann 1985). This species is not known to be naturalised in other Australian states but is naturalised in New Zealand and Europe (Sykes in Webb et al. 1988, Tutin in Tutin et al. 1964).

***Cupressus lusitanica* Mill.**

Arizona Cypress, Mexican Cypress

Description: Tree to 20 m high. See Krüssmann (1985) and Dallimore (1936).

Region of Origin: Native of Mexico, El Salvador, Guatemala and Honduras.

New South Wales Distribution / Habitats: Central Tablelands. Naturalised near plantings of this species. Growing on the edge of *Eucalyptus piperita* woodland with a shrubby understorey dominated by *Hakea dactyloides* and *Acacia terminalis* on sandstone-derived yellow-brown sand at Blackheath; at Katoomba it was collected from *Eucalyptus sieberi*, *E. piperita* and *E. blaxlandii* open forest with an understorey of mostly native species and *Cotoneaster franchetii*.

First Record: Roadside, Mt Wilson, *K. Hill 3827*, 9 Feb 1991.

Additional Records: Area of native vegetation alongside Blackheath Golf Course below end of Jubilee Avenue, Blackheath, *J.R. Hosking 2247 & C.H. Barker, 27 Nov 2002* (CANB, MEL, NE, NSW); Eastern side of Katoomba Cemetery, *J.R. Hosking 2440 & C.H. Barker, 7 Feb 2004* (CANB, MEL, NE, NSW).

Notes: At the Blackheath site there were many hundreds of naturalised young plants ranging in age from juveniles to cone-bearing trees to 5 m high, growing alongside a line of planted trees to 20 m high. At Katoomba there were about 20 plants up to 3 m high, but none of the naturalising plants were cone-bearing. Wildings have also been observed at other locations in the upper Blue Mountains; all collections have been from near cultivated trees. Spread appears to be by wind-dispersed seed. This species is doubtfully naturalised at Mt Glorious, west of Brisbane in Queensland (*Phillips 159* – BRI). There are no herbarium records of naturalised *C. lusitanica* elsewhere in Australia. *Cupressus lusitanica* is naturalised in Europe and on plantation margins in New Zealand (Franco in Tutin et al. 1964, Webb et al. 1995). It is considered invasive in Malawi (Cronk & Fuller 1995).

***Juniperus conferta* Parl.**

Shore Juniper

Description: Groundcover to 70 cm high. See Makino (1964), Ohwi (1965) and Krüssmann (1985).

Region of Origin: Native to Japan (western Hokkaido, coastal Honshu, Kyushu) and the Russian Federation (Sakhalin).

New South Wales Distribution / Habitats: Central Tablelands. Growing in shrubby woodland alongside and amongst *Leptospermum polygalifolium*, *Hakea dactyloides*, *Eucalyptus sieberi* and *E. piperita*, on sandstone-derived yellow sand mixed with humus to form a brown humic loam.

First Record: Roadside native vegetation between Katoomba Golf Course and Narrow Neck Road, over road from end of Essendene Road, Katoomba, *J.R. Hosking 2241 & C.H. Barker, 25 Nov 2002* (CANB, MEL, NE, NSW).

Notes: There appears to be only one plant (with male cones) at the collection site occupying a circular area about 2 m diameter. This plant appears to have originated from dumped garden waste. There are scattered *Juniperus* plants elsewhere in the Blue Mountains but it is not certain if they are the same species. *Juniperus conferta* is not known to be naturalised elsewhere in Australia.

PINACEAE

***Pinus patula* Schiede ex Schltdl. & Cham.**

Patula Pine, Mexican Weeping Pine

Description: Pine tree to 45 m high. See Sykes in Webb et al. (1988) and Henderson (2001).

Region of Origin: Native from Mexico to Nicaragua.

New South Wales Distribution / Habitats: Central Coast, Northern Tablelands and Central Tablelands. Naturalised alongside plantings.

First Record: South of lower dam, Ponderosa Picnic Area, Hanging Rock State Forest, *J.R. Hosking 2220*, 15 Jun 2002 (CANB, MEL, NE, NSW).

Additional Records: opposite 10 Angel Street, Wentworth Falls, *C.H. Barker 59*, 8 May 2004 (CANB, MEL, NE, NSW); Bell's Line of Road, Bilpin, 2.2 km east of Powell's Road, *C.H. Barker 61*, 11 May 2004 (CANB, MEL, NE, NSW).

Notes: There are over 100 trees of all ages naturalised at the *Hosking 2220* collection site where some naturalised plants were found over 100 m from cone-bearing plants. Recent specimens from the Blue Mountains are from smaller populations containing cone-bearing naturalised plants. This pine is spread by wind-dispersed seed, with minor spread associated with Yellow-tailed Black Cockatoos moving seed-bearing cones. Young trees with drooping needles are easily distinguished from most other naturalised pines in Australia. *Pinus patula* is one of the five most invasive *Pinus* species according to Rejmánek and Richardson (1996). It is naturalised in Victoria (Ross & Walsh 2003) and Queensland (BRI specimens), and is considered to be a problem in New Zealand, South Africa, Malawi and Hawaii (Sykes in Webb et al. 1988, Henderson 2001, Cronk & Fuller 1995).

Monocotyledons

ALLIACEAE

Agapanthus praecox Willd. subsp. *orientalis* (F.M.Leight.) F.M.Leight.

Agapanthus

Description: Herb with inflorescence spikes to 1.5 m high. See Conran in Walsh & Entwisle (1994), Healy & Edgar (1980) and Sims (1800, as *Agapanthus umbellatus* Ait.).

Region of Origin: Native of South Africa (Cape Province, Natal).

New South Wales Distribution / Habitats: Central Tablelands. Growing on sandstone-derived sandy soils in forests, woodlands, ditches and cliff ledges in areas near plantings or where garden refuse has been dumped. This species is also naturalised in the lower Blue Mountains and Sydney.

First Record: Roadside native vegetation between Katoomba Golf Course and Narrow Neck Road, over road from end of Essendene Road, Katoomba, *J.R. Hosking* 2209, 23 Apr 2002 (CANB, MEL, NE, NSW).

Notes: There are many hundreds of plants at the collection site and the species is also abundant on cliff face ledges below Echo Point Lookout, the main viewing point for the Three Sisters at Katoomba, where seed appears to have been washed over the cliff edge from plantings. *Agapanthus praecox* subsp. *orientalis* is naturalised at other locations in the Blue Mountains as a result of seed dispersal and dumping of rhizomes in garden waste or movement of rhizomes in water. The species is naturalised in Victoria, Tasmania and Western Australia (Conran in Walsh & Entwisle 1994, Blood 2001, Hussey et al. 1997) and in New Zealand, Britain (Isles of Scilly), Madeira and the Canary Islands (Healy & Edgar 1980, Webb in Tutin et al. 1980, Hansen & Sunding 1993).

AMARYLLIDACEAE

Crinum moorei Hook.f.

Description: Herb to 1.4 m high. See Wood (1912), Gibson (1975) and Hooker (1874).

Region of Origin: Native of South Africa (Cape Province, Natal).

New South Wales Distribution / Habitats: Central Coast. Only known to be naturalised at Valley Heights (lower Blue Mountains) where it is growing with *Eucalyptus punctata*, *Allocasuarina torulosa*, *Angophora costata*, *Ligustrum sinense*, *Syncarpia glomulifera* subsp. *glomulifera*, *Corymbia gummifera*, *Lomandra longifolia* and native grasses and sedges. In this area plants were growing on sandstone.

First Record: Area of mostly native vegetation in break between two sections of Taylor Road, Valley Heights, *J.R. Hosking* 2286 & *C.H. Barker*, 26 Mar 2003 (CANB, MEL, NE, NSW).

Notes: At Valley Heights there were 12 naturalised plants below a garden where there were many cultivated plants. Means of spread is unknown but naturalised plants are downslope from existing plantings. This species is listed as possibly naturalised in Western Australia (Hussey et al. 1997).

ARACEAE

Monstera deliciosa Liebm.

Fruit-salad Plant, Monstera

Description: Woody vine or herb mostly to 1.5 m high. See Mason & Mason (1987).

Region of Origin: Native of Costa Rica, Guatemala, Mexico (Chiapas, Oaxaca, Veracruz) and Panama.

New South Wales Distribution / Habitats: North Coast, Central Coast. Grows in many coastal areas where garden refuse had been dumped.

First Record: Area of mostly native vegetation in break between two sections of Taylor Road, Valley Heights, *J.R. Hosking* 2287 & *C.H. Barker*, 26 Mar 2003 (CANB, MEL, NE, NSW).

Notes: The specimen was collected from a single plant occupying an area 5 m x 5 m. Naturalised plants are scattered over the lower to mid Blue Mountains City Council area. Plants have large leaves and fruit. They are readily recognised and this may explain why this species has not been collected previously. The authors know of naturalised plants in a number of coastal locations throughout N.S.W. but there are no herbarium specimens from these locations. In most cases plants appear to occur singly and have probably arisen from dumped garden waste. This also seems to be the case in Queensland (Batianoff pers. comm., Nov 2005) where the species is recorded as doubtfully naturalised (*Batianoff* 0308267, *Phillips* 1123 – BRI). The species appears to have naturalised in Victoria where plants were recorded growing in a drain in suburban Melbourne (*Lepschi* 6092 and *Connors* – CANB, MEL). The species has naturalised in Florida (Wunderlin & Hansen 2004).

ARECACEAE

Phoenix canariensis hort. ex Chabaud

Canary Island Palm

Description: Palm to 15 (rarely to 20) m high. See Conn & Walsh in Walsh & Entwisle (1994), Healy & Edgar (1980), Barrow (1998) and Riffle & Craft (2003).

Region of Origin: Native of Canary Islands.

New South Wales Distribution / Habitats: Central Coast, North Western Slopes, Central Western Slopes and South Western Slopes. Growing in a damp gully in Oxley Park, Tamworth, with mostly exotic species such as *Ligustrum lucidum*, *Schinus molle* var. *areira*, *Pyracantha crenulata* and *Photinia serratifolia*. Growing in a disturbed roadside

remnant of shrubby *Eucalyptus microcarpa* / *E. sideroxylon* subsp. *sideroxylon* woodland near Koorawatha, and with *Eucalyptus camaldulensis* and *Schinus molle* var. *areira* along a creek at Bimbi. Naturalised amongst *Eucalyptus camaldulensis* forest alongside the Murrumbidgee River at Wagga Wagga and Narrandera.

First Record: Oxley Park, Tamworth, *J.R. Hosking s.n.*, 26 Sep 1987 (NE, NSW).

Additional Records: 1.5 km W of Godfreys Creek Road on Sutherland Road (= Koorawatha Road), c. 11.5 km E of Koorawatha, *B.J. Lepschi 4863*, *R.C. Godfree & D.J. Mallinson*, 16 Oct 2002 (CANB, NSW), Burrangong Creek, c. 300 m E of bridge on Grenfell – Quandialla road, Bimbi settlement, *B.J. Lepschi 5538 & R.C. Godfree*, 28 Mar 2006 (CANB, MO, NSW).

Notes: *Phoenix canariensis* is probably widely naturalised in disturbed areas close to where it has been planted, but is readily recognised and rarely submitted as herbarium specimens for identification. Large fronds of this species may also discourage collectors. It is abundant alongside the Murrumbidgee River at Wagga Wagga and Narrandera although no collections have been made from the area. It has also been observed (but not collected) along gullies in the lower Blue Mountains, through much of western Sydney, and on roadsides on the South West and Central West Slopes. Spread appears to be via movement of fruit, possibly by bats. Naturalised in Victoria and South Australia (Conn & Walsh in Walsh & Entwisle 1994, Smyth in Barker et al. 2005) and in New Zealand and the USA (Healy & Edgar 1980, McClintock in Hickman 1993).

COMMELINACEAE

Gibasis pellucida (M.Martens & Galeotti) D.R.Hunt

Tahitian Bridal Veil

Description: Trailing herb to 10 cm high, rooting at nodes. See Hunt (1986) and Faden in Morin (2000).

Region of Origin: Native of Mexico.

New South Wales Distribution / Habitats: Central Coast. Known from sclerophyll forest in higher rainfall areas where it is spreading from plantings and dumped garden refuse.

First Record: Albatross Avenue Road Reserve, north of Singles Ridge Road, Winmalee, *C.H. Barker 30 & J.R. Hosking*, 5 Dec 2003 (CANB, MEL, NE, NSW).

Notes: Probably spreads locally via stems that root at nodes and over greater distance via movement of vegetative material and possibly seed. Known from the collection site in Winmalee and also seen spreading into sclerophyll forest behind houses at Yellow Rock. From the literature this species could potentially establish along watercourses in rainforest areas. Not recorded as naturalised elsewhere in Australia. This species is recorded as weedy in citrus groves and waste places in Florida (Faden in Morin 2000).

Murdannia keisak (Hassk.) Hand.-Mazz.

Marsh Dewflower

Description: Prostrate herb with flowering parts ascending to 25 cm high, rooting at nodes. See Kuo-Shih in Li et al. (1978b) and Faden in Morin (2000) under *M. keisak* and Makino (1964) and Ohwi (1965) under the name *Aneilema keisak* Hassk.

Region of Origin: Native of Japan, Korea, China, Vietnam, Laos, Cambodia and Nepal.

New South Wales Distribution / Habitats: Central Coast. Recorded from Lane Cove where plants grow at the edge of wet sclerophyll forest near gardens amongst other exotic plants.

First Record: 'The Run' at 'Susan Park', Mangrove Creek, *D.F. Blaxell 1284*, 6 Mar 1974 (NSW)

Additional Records: The Comenarra Parkway, near Jordan Road, Turrumurra, *V. Klaphake 83*, 8 Mar 1987 (BRI, CANB, NSW); Near Innes Road entrance, Bushland Park, Lane Cove, *V. Klaphake 945*, 15 Dec 1993 (K, NSW).

Notes: This species is locally common in a number of parks in the Lane Cove municipality according to *Klaphake 945*. Probably spreads locally via spreading stems that root at nodes and over greater distance via movement of vegetative material and possibly seed. Not recorded as naturalised elsewhere in Australia. In Japan the species is common in wet places (Ohwi 1965). This species is still expanding its range in the USA since its introduction early in the 1900s (Faden in Morin 2000).

Tradescantia pallida (Rose) D.R.Hunt

Purple Queen, Purple Heart

Description: Trailing herb to 50 cm high, rooting at nodes. See Hunt (1975) and Faden in Morin (2000) under *T. pallida* and Graf (1968) under *Setcreasea pallida* Rose.

Region of Origin: Native of Mexico (Tamaulipas, Veracruz, Yucatan).

New South Wales Distribution / Habitats: North Western Slopes, Central Coast. Gullies in sclerophyll forest.

First Record: Oxley Park, Tamworth, *J.R. Hosking s.n.*, 13 Nov 1985 (NE, NSW).

Additional Records: below road to lookout, Oxley Park, Tamworth, *J.R. Hosking 727*, 31 Mar 1993 (CANB, MEL, NE, NSW); drainage reserve above junction of Dawes Place and Hume Road, Lapstone, *J.R. Hosking 2330 & C.H. Barker*, 21 Aug 2003 (CANB, MEL, NE, NSW).

Notes: This species appears to spread via stems that root at nodes. At Tamworth there is only one small clump of plants at the end of a drainage pipe below a road but this clump does not seem to have changed much in size since the initial collection in 1985, possibly because of restricted water

availability. At Lapstone, plants are spreading downslope in a disturbed gully, possibly originating from a garden above. Also naturalised in a disturbed riparian area at Greystanes in western Sydney. This species has not been recorded as naturalised elsewhere in Australia, but has been recorded on landfill and old home sites in Florida and Louisiana (Faden in Morin 2000).

HAEMORODORACEAE

Anigozanthos flavidus DC.

Yellow Kangaroo-paw

Description: Herb with scape to 3 m high. See Hopper in George (1987).

Region of Origin: Native of south western Western Australia.

New South Wales Distribution / Habitats: South Coast. Grows on sand in coastal woodland of *Banksia serrata*, *Corymbia gummifera* and *Syncarpia glomulifera*.

First Record: Near Lake McKenzie, Booderee Botanic Gardens, c. 3 km SW of Jervis Bay Settlement, *B.J. Lepschi 5047 & D.N. Brown*, 20 Nov 2003 (CANB, K, MO, NSW).

Notes: This species is a problem weed in and around Booderee Botanic Gardens, with many thousands of plants within the Garden grounds and adjacent Booderee National Park. The source of the introduction was via cultivated plants in the Botanic Garden, over a period of years since the 1960s. Intentional cultivation of this species at Booderee Botanic Garden ceased in the early 1990s when plantings were removed. It is spread via seed and rhizomes (through slashing and grounds maintenance). A control program for this species has been in place since 1997 with limited success. Not known to be naturalised elsewhere.

POACEAE

Bromus catharticus Vahl subsp. *stamineus* (E.Desv.) Massa

[syn. *Bromus catharticus* var. *elata* (E.Desv.) Planchuelo, *Bromus cebadilla* Steud., *Bromus fonkii* Phil., *Bromus lithobious* Trin., *Bromus stamineus* E.Desv.]

Chilean Brome

Description: Grass to 90 cm high. See Morris in Curtis & Morris (1994), Walsh in Walsh & Entwisle (1994), Sharp & Simon (2002), Massa et al. (2004) and Planchuelo (2006).

Region of Origin: Native of South America (Argentina, Chile).

New South Wales Distribution / Habitats: Southern Tablelands, Central Tablelands. Common in disturbed areas in the Blue Mountains.

First Record: Leura township, *E.J. McBarron 20633*, 17 Jan 1973 (NSW).

Additional Record: South side of Gates Avenue at bottom of hill, Katoomba, *C.H. Barker 21 & J.R. Hosking*, 3 Dec 2003 (CANB, MEL, NE, NSW).

Notes: We have followed Massa et al. (2004) in treating *B. catharticus* as a taxon comprising two subspecies *B. catharticus* subsp. *catharticus* and *B. catharticus* subsp. *stamineus*. This is not necessarily the approach that will be taken at NSW when taxonomic limits are further evaluated. Previous Australian treatments of this group (Sharp & Simon 2002, Wheeler et al. 2002) treat *Bromus catharticus* subsp. *stamineus* at specific rank, either as *B. lithobius* or as *B. cedabilla* (synonym *B. stamineus*). *Bromus catharticus* subsp. *stamineus* has previously been confused with *B. catharticus* subsp. *catharticus* but the former taxon has glabrous (rarely with a few scattered hairs) spikelets and awns to 3 mm long, whereas *B. catharticus* subsp. *stamineus* has hairy spikelets and awns 3–7 mm long. *Bromus catharticus* subsp. *stamineus* is locally common in a number of areas in the Blue Mountains. It is spread by seed movement. *Bromus catharticus* subsp. *stamineus* is also naturalised in Victoria, Tasmania and South Australia (Walsh in Walsh & Entwisle 1994, as *B. lithobius* and *B. cedabilla*; Morris in Curtis & Morris 1994, as *B. fonkii*; Jessop in Barker et al. 2005, as *B. lithobius*).

Eragrostis trichophora Coss & Durieu

Hairy Love Grass

Description: Tufted perennial grass to 0.6 m high. See van Oudtshoorn (1992).

Region of Origin: Native of Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.

New South Wales Distribution / Habitats: North Western Slopes, North Western Plains. In South Africa this species prefers sandy to sandy loam soils and is often common in disturbed areas such as roadsides (van Oudtshoorn 1992). These are the habitats occupied by this grass around Narrabri, Gravesend and Walgett.

First Record: Roadside – Newell Highway, 13 km SW of Narrabri, *A. Storrie 03/01*, 14 Apr 2003 (NSW).

Additional Records: Roadside – Collarenebri Road, 10 km W of Moree, *A. Storrie 03/02*, 16 Apr 2003 (CANB, MEL, NSW); rail crossing, Narrabri, *A. Storrie 04/03*, 10 Jul 2003 (CANB, BRI); Roadside – Newell Highway, 6 km SW of Narrabri, *A. Storrie 02/04 & T. Farrell*, 10 Feb 2004 (MEL, NSW, PRE); Roadside – Gwydir Highway, 1 km E of the village of Gravesend, *A. Storrie 09/04*, 3 Mar 2004 (CANB, NSW, PRE); roadside 20 m north of the junction of Kopi and Gem Streets, Lightning Ridge, *J.R. Hosking 2640*, 3 Nov 2005 (CANB, MEL, NE, NSW, PRE); other specimens from nearby locations are not listed.

Notes: This grass is spread by seed movement and sometimes locally by stolons. It was not collected until 2003 but was abundant by this time. This grass is similar in appearance

to *Eragrostis curvula* and is likely to be mistaken for that species. *Eragrostis trichophora* is considered to be a grass of average grazing value, as is *E. curvula*, in South Africa (van Oudtshoorn 1992). In *Flora Zambesiaca* this species is included in *Eragrostis cylindriflora* Hochst. by Cope in Pope (1999): 'In the Flora Zambesiaca area, however, the distinctions [between species] break down with all elements completely intergrading'. This species is also naturalised in the Northern Territory (*Albrecht 10568* – CANB) and in Maryland, USA (Peterson in Morin 2003).

Dicotyledons

ACANTHACEAE

Acanthus mollis L.

Bear's Breech

Description: Herb with inflorescence to 2 m high. See Barker in Jessop & Toelken (1986).

Region of Origin: Native of southern Europe (Spain east to the former Yugoslavia), Mediterranean islands, northern Africa (Morocco, Algeria, Tunisia), Asia (Turkey, Syria) and the Canary Islands.

New South Wales Distribution / Habitats: Central Tablelands and Central Coast. Only collected from disturbed *Eucalyptus piperita* and *Corymbia gummifera* sclerophyll forest where it was found growing with *Genista monspessulana*. Also observed growing as a garden escape in North Rocks, Sydney.

First Record: Southern side of Great Western Highway, 1.4 km south east of junction with Tableland Road, between Bullaburra and Wentworth Falls, *J.R. Hosking 2239*, 25 Feb 2002 (AD, CANB, MEL, NE, NSW).

Notes: Barker (1986) suggests the species that is cultivated and naturalised in Australia may be intermediate between *A. mollis* and *A. spinosus* L. Most plants grow near existing plants or where garden waste has been dumped. Spread is likely to be vegetative. In the collection area there were more than 100 plants over an area of c. 30 m x 4 m. This species is also naturalised in Queensland, Victoria, Tasmania, South Australia and possibly in Western Australia (Bean in Henderson 2002, Ross & Walsh 2003, Rozefelds et al. 1999, Barker 1986, Hussey et al. 1997). It is also naturalised in New Zealand (Sykes in Webb et al. 1988).

Justicia caudata A.Gray

Description: Rhizomatous shrub to 1.1 m high. See Gibson (1974) and Curtis (1796, as *Justicia peruviana* L.).

Region of Origin: Native of America (Mexico to South America) and to Caribbean islands.

New South Wales Distribution / Habitats: North Coast. Grows in coastal sandy areas where garden refuse has been

dumped. According to Gibson (1974), this species grows in damp thickets in Guatemala.

First Record: Alongside southern end of Owen Street in Macquarie Nature Reserve, Port Macquarie, *J.R. Hosking 2224*, 1 Oct 2002 (AD, CANB, MEL, NE, NSW).

Notes: Also known to be naturalised at Nambucca Heads between Captain Cook Lookout and the town on the southern side of the road (also from dumped garden waste) in weed-infested native vegetation. In horticulture, this species is often referred to *Justicia peruviana* Lam. sensu Curtis (Curtis 1796). According to T. Daniels (CAS; pers. comm.), there is confusion regarding the name that should be applied to *J. peruviana* Lam. sensu Curtis. At present, he uses the name *J. caudata* for this species but recognises that there are likely to be earlier valid names. This species appears to be spreading by rhizomes from dumped garden waste. *Justicia caudata* is not known to be naturalised elsewhere in Australia.

Odontonema tubaeforme (Bertol.) Kuntze [syn. *Odontonema strictum* (Nees) Kuntze]

Fire Spike

Description: Rhizomatous shrub with erect stems to 2 m high. See Barker (1996) and Hooker (1848, as *Thyrsacanthus strictus* Nees).

Region of Origin: Native of Panama, Nicaragua, Honduras, Costa Rica, Belize and Mexico.

New South Wales Distribution / Habitats: North Coast, Central Coast and Lord Howe Island. Locations where the species has been collected are where garden waste had been dumped. These areas are on the edge of disturbed tall open forest. In the first collection area *O. tubaeforme* was growing with *Delairea odorata*, *Monstera deliciosa*, *Lantana camara*, *Cinnamomum camphora* and native trees and shrubs.

First Record: Native vegetation opposite 109 Pacific Drive, Port Macquarie, *J.R. Hosking 2195*, 25 Feb 2002 (AD, CANB, MEL, NE, NSW).

Additional Record: Gully in front of 32 Mitchells Pass Road, Blaxland, *C.H. Barker 55* & *L. Thomas*, 30 May 2004 (CANB, MEL, NE, NSW).

Notes: This species is commonly known in horticulture as *Justicia coccinea* but this name refers to what is now known as *Pachystachys coccinea* (Aubl.) Nees. Many publications refer to *O. tubaeforme* as *O. strictum* but *O. tubaeforme* is believed to be the name that should be applied to this species (Barker 1996). There is an earlier specimen of *O. tubaeforme* held at NSW (*E. McBarron s.n.*, 27 August 1969), but there is no indication that the specimen was from naturalised plants. Apart from four clumps growing in native woodland where *J.R. Hosking 2195* was collected, there were many hundreds of stems recorded within Macquarie Nature Reserve at Port Macquarie (information recorded on label for *J.R. Hosking 2195*). This species appears to be spreading vegetatively, initially reaching areas via dumped garden waste. Vegetative

spread is reported as the main means of spread on Pacific islands (Meyer & Lavergne 2004). *Odontonema tubaeforme* has also been observed in Hunt's Creek Reserve at North Rocks and remnant bushland at Pennant Hills, Sydney and is recorded as naturalised in Queensland (Cook and Moreton pastoral districts) (Bean in Henderson 2002) with the first naturalised specimen (*Sharpe 4302 & Batianoff* – BRI) collected from Noosa National Park, Noosa in March 1986 (Barker 1996). This species is naturalised on Lord Howe Island (*Batianoff 200311, Le Cussan 1128* – both BRI) and is widely naturalised in French Polynesia, Hawaii and Samoa where it forms dense monospecific stands (between 100 and 500 m² in area) in wet forests (Meyer & Lavergne 2004).

Ruellia squarrosa (Fenzl) Cufod.

Creeping Ruellia

Description: Shrub to 40 (rarely to 100) cm high. See Barker (1996) and Walker (1970).

Region of Origin: Native of southern Mexico.

New South Wales Distribution / Habitats: Central Coast. Only collected from a gully in *Syncarpia glomulifera*, *Allocasuarina torulosa* and *Angophora costata* forest. Observed in Hunt's Creek Reserve in North Rocks, Sydney, growing in shaded creekside areas. Also recorded from shady situations in Queensland (Barker 1996).

First Record: Bushland Park off Ronald Avenue, Lane Cove, *V. Klaphake 936*, 7 Dec 1993 (NSW).

Additional Record: Alongside Maraket Avenue, Blaxland, *J.R. Hosking 2218 & C.H. Barker*, 24 Apr 2002 (AD, CANB, MEL, NE, NSW).

Notes: There were a few plants seen at each location. According to Meyer & Lavergne (2004) this species spreads by seed and vegetatively. The species is also recorded as naturalised in south eastern Queensland (Moreton pastoral district) (Bean in Henderson 2002) with the first naturalised specimen (*Pedley 5307* – BRI) collected at Indooroopilly in November 1984 (Barker 1996). *Ruellia squarrosa* is also naturalised in Okinawa and La Réunion (Walker 1976, Meyer & Lavergne 2004).

Stephanophysum longifolium Pohl [syn. *Ruellia brevifolia* (Pohl) C.Ezcurra, *Ruellia graecizans* Backer]

Tropical Wild Petunia

Description: Herb to 1 m high. See Barker (1986) & Everett (1982).

Region of Origin: Native of Brazil.

New South Wales Distribution / Habitats: North Coast. At Bellingen this species is abundant in shaded areas, but also occurs in exposed areas.

First Record: Naturalised in Bellingen Hospital grounds, Bellingen, *J.R. Hosking 2267 & I. Turnbull*, 13 Mar 2003 (AD, CANB, MEL, NE, NSW).

Notes: In the Bellingen Hospital grounds this species grows as the dominant understorey plant over an area of 110 m by 20–50 m. It disperses by seed. The species was also scattered over neighbouring properties, including in a pine plantation across Kalang Road from Bellingen Hospital. Since this species is an attractive ornamental, it is likely to be widely planted. It is also recorded as naturalised in Queensland (Cook and Moreton pastoral districts) (Bean in Henderson 2002) with the first naturalised specimen (*Lanham 590* – BRI) collected from 3.2 km north of Nambour in January 1973 (Barker 1986). This species is also naturalised in disturbed areas in Hawaii, Fiji, La Réunion and Mauritius (Meyer & Lavergne 2004). In La Réunion it is estimated to have invaded 3000 ha of wet forests (Meyer and Lavergne 2004).

Strobilanthes anisophylla (G.Lodd.) T.Anderson

Goldfussia

Description: Shrub to 1.3 m high. See Hooker (1885), Everett (1982) and Spencer (2002).

Region of Origin: Native of India (Meghalaya, West Bengal) and Bhutan.

New South Wales Distribution / Habitats: Central Coast. Only known from Lapstone where it grows in sandy soil in the bed of an intermittent stream in a gully forest with *Ligustrum sinense*, *Lantana camara*, *Lomandra* sp., *Morinda jasminoides*, *Ochna serrulata*, *Allocasuarina torulosa*, *Cinnamomum camphora* and *Corymbia gummifera*.

First Record: Gully north of northern part of Hume Road, Lapstone, *J.R. Hosking 2331 & C.H. Barker*, 21 Aug 2003 (AD, CANB, MEL, NE, NSW).

Additional Record: Gully north of northern part of Hume Road, Lapstone, *J.R. Hosking 2412*, 6 Dec 2003 (AD, CANB, MEL, NE, NSW).

Notes: Only recorded from four plants (all flowering in August 2003) occurring in a gully in Lapstone; a later collection (in December 2003) from the same location had the remains of flowers but no fruit. Although this species may have reached the site via movement of vegetative material down the gully, it has been observed to naturalise freely near garden plantings in nearby Glenbrook. The species is an attractive ornamental and is likely to be widely planted. *Strobilanthes anisophylla* was at one time referred to *Goldfussia* but Bremekamp's division of *Strobilanthes* into many segregate genera is no longer accepted (Wood 1994). This species is regarded as doubtfully naturalised in Queensland based on collections from Eagle Heights, Mount Tambourine in September 2000 (*Bean 16817* – AD, BRI, NSW) where a group of less than 10 plants that did not appear to have been cultivated was growing with native rainforest shrubs near the edge of the road (A. Bean pers. comm., Nov 2004) and from Montville, inland from the Sunshine Coast, in June 2005 where about 30 plants were growing in a gully of regrowth rainforest (*Batianoff 0506006* – BRI & G. Batianoff pers. comm., Nov 2005). *Strobilanthes anisophylla* is not known to be

naturalised elsewhere in Australia. The species is recorded as naturalised in native bush, gardens and among other weeds in North Auckland, New Zealand (Heenan et al. 2004).

AIZOACEAE

Drosanthemum candens (Haw.) Schwantes [*Drosanthemum floribundum* (Haw.) Schwantes misapplied]

Redondo Creeper

Description: Succulent, prostrate to weakly erect, shrub. See Jessop in Jessop & Toelken (1986), Walsh in Walsh & Entwisle (1996) and Hartmann (2002).

Region of Origin: Native of South Africa (Cape Province).

New South Wales Distribution / Habitats: South Coast. Only known in N.S.W. from Bowen Island, Jervis Bay.

First Record: Bowen Island, Jervis Bay, *R.J. Rudd 165*, 22 Jan 1992 (CANB).

Notes: This species is grown as an ornamental and is spread by seed. It is also naturalised in Victoria, South Australia and Western Australia (Walsh in Walsh & Entwisle 1996, Jessop in Jessop & Toelken 1986, Hussey et al. 1997).

ASCLEPIADACEAE

Stapelia gigantea N.E.Br.

Dead Horse Plant

Description: Mat-forming herb to 50 cm high. See Wagner et al. (1999), Spencer (2002) and Fabian & Germishuizen (1999).

Region of Origin: Native of southern Africa.

New South Wales Distribution / Habitats: North Western Plains. Known from a number of locations in and around Lightning Ridge where it is found growing below trees and shrubs, often as the dominant species.



Fig. 1. *Stapelia gigantea* has large flowers that attract blowflies for pollination. This succulent is spreading via wind-dispersed seed in the Lightning Ridge area.

First Record: East of a point 3.2 km along 3 Mile Road from Lightning Ridge end, *J.R. Hosking 2338* & *W. Schofield*, 3 Sep 2003 (AD, BRI, CANB, MEL, NE, NSW).

Additional Record: East of a point 3.2 km along 3 Mile Road from Lightning Ridge end, *J.R. Hosking 2404* & *W.A. Cherry*, 26 Nov 2003 (AD, BRI, CANB, MEL, NE, NSW).

Notes: This is a locally dominant naturalised herb. The species tolerates hot and dry conditions and is used as an ornamental on the opal fields around Lightning Ridge. The plant is pollinated by blowflies that are attracted to the foul-smelling flowers (hence the common name). Seeds of this species are wind-dispersed. It is reported as naturalised in Queensland, South Australia and Hawaii (Forster in Henderson 2002, AD specimen, Wagner et al. 1999).

ASTERACEAE

Calypocarpus vialis Less.

Creeping Cinderella Weed

Description: Herb with erect to trailing stems. See Stanley & Ross (1986) and Rickett (1973).

Region of Origin: Native to Mexico, El Salvador and Honduras.

New South Wales Distribution / Habitats: North Western Plains. Only known from a lawn in Moree. Also likely to be a weed of lawns in the North Coast region of N.S.W.

First Record: 134 Heber Street, Moree, *T. Holmes s.n.*, 13 Aug 2002 (NSW).

Notes: Awns on the fruit aid in dispersal of this species. It was collected from a lawn where over 100 plants were present. This species is listed as a weed of gardens, footpaths and other areas in south eastern Queensland (Stanley & Ross 1986). It is now common in lawns in Brisbane. The first herbarium specimen for Queensland (*Everist 2582* – BRI) was collected at Toowong, Brisbane, in April 1946. *Calypocarpus vialis* is spreading to central coastal Queensland (Rockhampton, Heron Island and the Whitsunday region) and is considered to be invasive in the understorey of riparian forests in central Queensland (G. Batianoff pers. comm., Nov 2005). It is likely to be a weed of disturbed areas in N.S.W. and is probably present on the N.S.W. north coast. However, so far it has not been collected from this area. This species is also naturalised in south eastern USA and Hawaii (Rickett 1973, Wagner & Herbst 1999).

Eupatorium lindleyanum DC.

Joe Pye Weed, Boneset

Description: Herb to 1 m high. See Makino (1964), Ohwi (1965) and Li in Li et al. (1978a).

Region of Origin: Native of China, Japan, Taiwan and the Philippines.

New South Wales Distribution / Habitats: North Coast, Northern Tablelands. In Cunnawarra National Park it is

recorded from a sphagnum/sedge community on peat. In Japan and Taiwan, this species grows in wet grassy places and on low mountains (Ohwi 1965, Li in Li et al. 1978a).

First Record: In swamps near the Tweed River, *Carron & Moore s.n.* (collector not listed on specimen, specimen not dated but pre-1865 – MEL) (Auld 1977)).

Additional Records: Timbarra, *Stuart s.n.*, no date (pre-1896 – MEL); Petroi Plateau, south of New England National Park, *J.B. Williams s.n.*, 5 Feb 1974 (NE, NSW); 'Petroi', on west-flowing creek, 350–400 m upstream from bridge crossing near old dwelling, Cunnawarra National Park, *W. Cherry 479 & 480 & A.J. Perkins*, 12 Apr 2003 (K, L, MO, NSW).

Notes: Early specimens of this species are held in the National Herbarium of Victoria (MEL) and information regarding these is covered in Auld (1977). He suggests that the species may have been introduced by Chinese labourers to the gold mining area of Timbarra. This species is dispersed by seed. According to recent collections (*Cherry 479, 480 & Perkins – NSW*) there were about six plants in the collection area in Cunnawarra National Park.

Hieracium aurantiacum L. subsp. *carpathicola* Nägeli & Peter

Orange Hawkweed

Description: Herb to 15 (rarely to 40) cm high. See Garnock-Jones in Webb et al. (1988), Espie (2001), Royer & Dickinson (1999) and Whitson et al. (1991).

Region of Origin: Native of Europe.

New South Wales Distribution / Habitats: Southern Tablelands. Occurs in a sub-alpine area in Kosciuszko National Park.

First Record: Kosciuszko National Park, Round Mountain Fire Trail, c. 4 km by road from Tooma Road, c. 2 m west of track margin, *N. Walsh 5931, K. McDougall & G. Wright*, 17 Dec 2003 (CANB, MEL, NSW).

Notes: This species is dispersed by seed and spreads locally via rhizomes and stolons. The initial collection was from a patch of about one metre square. Later surveys showed that this species occurred over more than 1 ha and seem to indicate that the species had been present for some time. *Hieracium aurantiacum* subsp. *carpathicola* is also naturalised in Tasmania, particularly on roadsides (Curtis 1963, as *Hieracium brunneocroceum* Pugsley) and in Victoria in and around Falls Creek, Mt Hotham and Mt Buller. Attempts are being made to eradicate the species in N.S.W. and Victoria. It is also a weed in New Zealand, Canada and the USA (Espie 2001, Royer & Dickinson 1999, Whitson et al. 1991). For more information on this species refer to Garnock-Jones in Webb et al. (1988), Espie (2001) and Royer & Dickinson (1999).

BIGNONIACEAE

Tabebuia chrysotricha (Mart. ex DC.) Standl.

Description: Tree to 15 m high. See Sandwith & Hunt (1974) and Lorenzi (1992).

Region of Origin: Native of north eastern Argentina and Brazil.

New South Wales Distribution / Habitats: North Coast. On well-drained red earth soils in a high rainfall area at Bellingen.

First Record: Naturalised in Bellingen Hospital grounds, Bellingen, *J.R. Hosking 2268 & I. Turnbull*, 13 Mar 2003 (CANB, MEL, NE, NSW).

Notes: Spread by wind-dispersed seed. Only known to have naturalised at Bellingen, not known to be naturalised elsewhere in Australia or overseas.

Tabebuia impetiginosa (Mart. ex DC.) Standl.

Description: Shrub or small tree to 6 m high. See Gentry in Steyermark et al. (1997) and Lorenzi (1992).

Region of Origin: Native of America (Mexico to Peru, north western Argentina, Paraguay and Brazil).

New South Wales Distribution / Habitats: North Coast. On well-drained red earth soils in a high rainfall area at Bellingen.

First Record: Naturalised in Bellingen Hospital grounds, Bellingen, *J.R. Hosking 2273 & I. Turnbull*, 14 Mar 2003 (CANB, MEL, NE, NSW).

Notes: This species is spread by wind-dispersed seed. Only known to have naturalised at Bellingen, Not known to be naturalised elsewhere in Australia or overseas.

BOMBACEAE

Ceiba speciosa (A.St.-Hil., A.Juss. & Cambess.) P.Ravenna [syn. *Chorisia speciosa* A.St.-Hil.]

Chorisia

Description: Tree to over 20 m high. See Santos (1967), Little et al. (1974) and Lorenzi (1992).

Region of Origin: Native of Argentina, Brazil and Paraguay.

New South Wales Distribution / Habitats: North Coast. On well-drained red earth soils in a high rainfall area at Bellingen.

First Record: Naturalised in Bellingen Hospital grounds, Bellingen, *J.R. Hosking 2272, I. Turnbull & T. Scanlon*, 14 Mar 2003 (CANB, MEL, NE, NSW).

Notes: Although we have included this species in the family Bombaceae, recent molecular evidence suggests that this family is part of the Malvaceae, as the subfamily Bombacoideae (Stephens 2005). At Bellingen, there were

more than 30 small plants growing to 2 m high. These plants arose via seed from trees that were planted in 1965 and 1970. Therefore it appears that these plants will take time to reach the reproductive stage. *Ceiba speciosa* is not known to be naturalising elsewhere in Australia or overseas.

BRASSICACEAE

Hesperis matronalis L.

Dame's Violet

Description: Herb to 1 (rarely to 1.5) m high. See Rich (1991), Garnock-Jones in Webb et al. (1988), Stubbendieck et al. (1995) and Royer & Dickinson (1999).

Region of Origin: Native from southern Europe to western Siberia.

New South Wales Distribution / Habitats: Central Tablelands. Collected from woodland alongside the Jenolan River below Jenolan Caves and scattered plants observed in woodland above Jenolan Caves House.

First Record: Campsite Jenolan Caves, *G.R. Sainty s.n.*, 17 Jan 1989 (NSW).

Additional Record: Alongside Jenolan River downstream of sewage works, below Jenolan Caves, *J.R. Hosking 2212*, 23 Apr 2002 (CANB, MEL, NE, NSW).

Notes: This species is dispersed by seed. It has attractive purple flowers and it is surprising that it has not been collected a number of times from this well-collected locality. Hundreds of naturalised plants are scattered over more than 1 km of river frontage including through a camping area. This species is naturalised in a number of other countries but appears to mainly occur on waste ground (Garnock-Jones in Webb et al. 1988, Rich 1991, Stubbendieck et al. 1995, Royer & Dickinson 1999).

CACTACEAE

Cereus uruguayanus R.Kiesling

[basonym for *Cereus hildmannianus* K.Schum. var. *uruguayanus* (R.Kiesling) N.P.Taylor]

Peruvian-apple

Description: Columnar cactus to 10 m high. See Anderson (2001, as *C. hildmannianus* var. *uruguayanus*).

Region of Origin: Native of Argentina, Brazil and Uruguay.

New South Wales Distribution / Habitats: North Western Slopes and North Western Plains. Naturalised in woodland in areas near original plantings.

First Record: Near cattle grid where road to Glen Garry leaves the Grawin road at right angle, *J.R. Hosking 2400* & *W.A. Cherry*, 25 Nov 2003 (B, BRI, CANB, MEL, NE, NSW, SI).

Additional Record: Alongside Wandobah Road, south west of Gunnedah, *J.R. Hosking 2528* & *G.W. Carr*, 12 Nov 2004 (CANB, MEL, NE, NSW).

Notes: This cactus was common in the initial collection area with hundreds of plants of all ages occurring for many square kilometres in and around the opal mining town of Grawin. Near Gunnedah only six plants from seedlings to adult plants to 4 m high were seen but others are likely to be present. This species is spread by seed. It is also naturalised in Queensland in the Darling Downs, Leichhardt and Maranoa pastoral districts (Forster in Henderson 2002, *Batianoff 2112298GNB*, *2112318GNB* – BRI) and in the Northern Territory (DNA, MEL, NT specimens). This cactus is naturalised in Hawaii and South Africa (Wagner et al. 1999, Bromilow 1995 as *Cereus peruvianus* Mill. misappl.).

Cylindropuntia fulgida (Engl.) F.M.Knuth var. *mamillata* (A.Schott ex Engl.) Backeb. forma *monstrosa* (J.M.Coult.) P.V.Heath

Boxing Glove Cactus, Coral Cactus

Description: Cactus to 75 cm high. See Earle (1980).

Region of Origin: Native of the USA (Arizona).

New South Wales Distribution / Habitats: North Western Plains and North Far Western Plains. In woodland in areas near original plantings and where segments have spread and then grown.

First Record: Cumborah behind abandoned garage, W of Grawin – Walgett and Lightning Ridge road junction, *J.R. Hosking 1888*, *J.P., T.L. & G.R. Hosking*, 18 Sep 2000 (CANB, MEL, NE, NSW).

Additional Records: Alongside Grawin golf course, *J.R. Hosking 2406* & *W.A. Cherry*, 27 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD); Purnamoota Station, the Springs Paddock, c. 25 km NE of Broken Hill, *M. Fletcher s.n.*, 5 Jan 2004 (NSW).

Notes: Locally common cactus with hundreds of plants of all ages occurring for many square kilometres in and around Broken Hill, Cumborah, Grawin and Lightning Ridge. This form of *C. fulgida* var. *mamillata* occurs naturally in Pinal and Pima Counties in Arizona and in this area flowers and fruit have never been observed (Earle 1980). This also appears to be the case in Australia where spread seems to be via movement of segments, particularly by water. As with a number of other *Cylindropuntia* species, this cactus is likely to be damaged by the cochineal insect *Dactylopius tomentosus* (Lamarck). This cactus is also naturalised in Queensland, South Australia and Western Australia (BRI, AD, PERTH and NSW specimens).

Cylindropuntia prolifera (Engl.) F.M.Knuth

Description: Cactus to 1.5 m high. See Benson (1982) and Anderson (2001).

Region of Origin: Native of the USA (California) and Mexico (Baja California).

New South Wales Distribution / Habitats: North Western Plains. Naturalised in woodland in areas near original plantings around Lightning Ridge.

First Record: approximately 9 km north of Broken Hill alongside Nine Mile Road on Nine Mile Station, *S. Lewer, s.n.*, 24 April 1993 (NSW).

Additional Records: Start of road to 9 Mile Opal Field, Lightning Ridge, *J.R. Hosking 2402 & W.A. Cherry*, 25 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD).

Notes: This cactus is scattered in a number of locations in and around Lightning Ridge and to the north of Broken Hill. It appears to be spread by movement of segments. According to Pinkava in Morin (2004) this cactus is of hybrid origin. As with a number of other *Cylindropuntia* species, this cactus is likely to be damaged by the cochineal insect *Dactylopius tomentosus*. *Cylindropuntia prolifera* has also been recorded from the town common at Longreach, Queensland in August 2006 (*B. Carlson s.n.* –BRI). It is not known to have naturalised in other countries.

Cylindropuntia tunicata (Lehm.) F.M.Knuth

Description: Small shrub cactus to 60 cm high. See Swinbourne in Jessop & Toelken (1986), Stajsic & Carr in Walsh & Entwisle (1996), Benson (1982) and Anderson (2001). In the first three references this species is under the name *Opuntia tunicata* (Lehm.) Link & Otto.

Region of Origin: Native of Mexico, the USA (Texas) and Cuba.

New South Wales Distribution / Habitats: North Western Plains. Naturalised in woodland in areas near original plantings in and around Grawin.

First Record: Western end of Grawin, near Museum site, *J.R. Hosking 2398 & W.A. Cherry*, 25 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD).

Notes: This cactus is scattered over a number of hectares in and around Grawin. It is not known to be naturalised elsewhere in N.S.W. This species was reported in Hosking et al. (2003) but material referred to that species has since been determined to represent *Cylindropuntia rosea* (see later in this paper). *Cylindropuntia tunicata* appears to be spread by the movement of its segments. Seed is produced, but this does not appear to be a source of dispersal as fruit does not appear to be eaten by Australian animals and seed does not separate from fruit. As with a number of *Cylindropuntia* species this cactus is damaged by the cochineal insect *Dactylopius tomentosus*. *Cylindropuntia tunicata* as circumscribed here is the same species as the one recorded under this name in

Victoria (Stajsic & Carr in Walsh & Entwisle 1996) and is probably the same as the one under this name in South Australia (Swinbourne in Jessop & Toelken 1986). In Victoria the first specimen was collected from Natya (between Swan Hill and Robinvale), *A. Carter s.n.*, 18 Aug 1994 (MEL) and in South Australia the first specimen was collected from the Barmera region, *C. Schrank s.n.*, Aug 1980 (AD). This species is also naturalised in Chile and Ecuador (Anderson 2001, Pinkava in Morin 2004).

CISTACEAE

Cistus salvifolius L.

Sage-leaf Rock Rose, Sage-leaved Cistus

Description: Shrub to 1 m high. See Coode in Davis (1965), Polunin (1969), Spencer (1997) and Clarke (2005).

Region of Origin: Native of Africa (Algeria, Libya, Morocco, Tunisia), Asia (Turkey) and southern Europe (from Greece to Portugal).

New South Wales Distribution / Habitats: Southern Tablelands. Plants at the Black Mountain site are growing in a disturbed site adjacent to an abandoned road bordering disturbed woodland of *Eucalyptus dives*, *E. mannifera* and *E. melliodora*. Plants at the Lake Burley Griffin site were recorded growing in a *Quercus suber* plantation.

First Record: Black Mountain Reserve: SW margin, near Caswell Drive, *L.G. Adams 4080*, 2 Nov 1988 (CANB).

Additional Records: Canberra, Stromlo Forest, N bank of Lake Burley Griffin near Scrivener Dam, *I.R. Telford 11511*, Nov 1991 (CANB); end of Rani road, SW slope of Black Mountain, Canberra, *B.J. Lepschi 4236, T.R. Lally & B.R. Murray*, 11 Nov 1999 (CANB, AD, K, MEL, MO, NSW); end of Rani road, SW slope of Black Mountain, Canberra, *B.J. Lepschi 5060*, 11 Jan 2004 (CANB, AD, MEL, NSW).

Notes: This species is spread by seed. There were approximately 50 plants covering an area about 5 m x 20 m at the Black Mountain site in 2004. The population at the Lake Burley Griffin site (*Telford 11511*) is described by the collector as 'rare – two small patches observed'. The origin of plants is unknown, but they may have originated from discarded garden refuse. This species is also naturalised in Victoria (Clarke 2005) and California (McClintock in Hickman 1993).

CORNACEAE

Cornus capitata Wall. [*Dendrobenthamia capitata* (Wall.) Hutch.]

Himalayan Strawberry-tree, Evergreen Dogwood

Description: Tree to 15 m high. See Jeanes in Walsh & Entwisle (1999), Blood (2001) and Webb in Webb et al. (1988, as *Dendrobenthamia capitata* (Wall.) Hutch.).

Region of Origin: Native of China, Bhutan, India (Assam, Punjab) and Myanmar.

New South Wales Distribution / Habitats: Central Tablelands. Becoming widespread in disturbed native vegetation in the upper Blue Mountains.

First Record: Narrow remnant of native vegetation between Glenwattle Close and Carlton Street, north of Wellington Road, Katoomba, *C.H. Barker 17 & J.R. Hosking*, 3 Dec 2003 (CANB, MEL, NE, NSW).

Notes: Collection notes indicate that the specimen came from a single naturalised flowering and fruiting plant 4 m high, and that there are many more non-reproductive plants growing amongst native vegetation in Gordon Falls Reserve, and scattered plants elsewhere in remnant native vegetation throughout higher parts of the Blue Mountains. This species is spread by bird-dispersed seed. *Cornus capitata* is also recorded as naturalised in Victoria with the first naturalised specimen (*Walsh 3503* – CANB, MEL) collected in Sherbrooke Forest in the Dandenong Ranges in May 1993. The species is now present in large numbers in native vegetation in the Dandenong Ranges. This tree is not recorded as naturalised in other Australian states but is naturalised in New Zealand (Webb in Webb et al. 1988).

CRASSULACEAE

Bryophyllum daigremontianum (Raym.-Hamet & H.Perrier) A.Berger

Mother-of-millions

Description: Herb to 45 cm high. See Stanley & Ross (1983) and Spencer (2002).

Region of Origin: Native of Madagascar.

New South Wales Distribution / Habitats: North Western Plains. Naturalised in woodland near plantings of this species.

First Record: West of road 3.0 km along 3 Mile Road from Lightning Ridge end, *J.R. Hosking 2343*, 4 Sep 2003 (BRI, CANB, MEL, NE, NSW).

Notes: In the Lightning Ridge area this species is naturalised in a number of locations but is not as common as either *Bryophyllum delagoense* or *B. daigremontianum* x *B. delagoense*. *Bryophyllum daigremontianum* spreads via movement of plantlets and seed (Hannan-Jones & Playford 2002). As with other *Bryophyllum* species this species is toxic to stock (Hannan-Jones & Playford 2002). It has not been collected from elsewhere in N.S.W. It has also been recorded as naturalised in Queensland from the Moreton, North Kennedy and South Kennedy pastoral districts (Forster in Henderson 2002, there is no specimen from Cook pastoral district – G. Batiannoff pers. comm., Dec 2005). This *Bryophyllum* is naturalised in Hawaii and Florida (Lorence et al. 1995, Wunderlin & Hansen 2004). *Bryophyllum* spp. are the subject of a biological control program (Hannan-Jones & Playford 2002). For more information on *Bryophyllum* spp. see Hannan-Jones & Playford (2002).

Bryophyllum fedtschenkoi (Raym.-Hamet & H.Perrier) Lauz.-March.

Description: Herb to 60 cm high. See Spencer (2002).

Region of Origin: Native of Madagascar.

New South Wales Distribution / Habitats: North Western Slopes. Naturalised in *Callitris glaucophylla* woodland that is also infested with *Bryophyllum daigremontianum* x *B. delagoense*.

First Record: Warialda, *C. McLeod s.n.*, 8 Jul 2002 (NSW).

Notes: In 2004, the site was revisited with C. McLeod. At this time there were large numbers of plants spread around the collection area although the area infested was only a few hundred square metres. *Bryophyllum fedtschenkoi* spreads via movement of plantlets and seed (Hannan-Jones & Playford 2002). As with other species of *Bryophyllum*, this species is likely to be toxic to stock. *Bryophyllum fedtschenkoi* has not been recorded as naturalised elsewhere in N.S.W., but it is naturalised in Queensland and South Australia (Forster in Henderson 2002, Toelken in Barker et al. 2005). This species is also naturalised in Hawaii (Lorence et al. 1995). Species of *Bryophyllum* are the subject of a biological control program in Australia (Hannan-Jones & Playford 2002).

ELAEAGNACEAE

Elaeagnus umbellata Thunb.

Autumn Olive

Description: Shrub to 7 m high. See Makino (1964), Ohwi (1965) and Ohba in Iwatsuki et al. (1999).

Region of Origin: Native from Afghanistan to China, Korea and Japan.

New South Wales Distribution / Habitats: Central Tablelands. Naturalising at Lawson where it is growing with native and other exotic species.



Fig. 2. *Cylindropuntia prolifera* is one of the many *Cylindropuntia* species naturalised in opal field areas of northern N.S.W.

First Record: Wilson Park, near Lawson Pool, Lawson, *C.H. Barker* 31, 27 Sep 2003 (CANB, MEL, NE, NSW).

Additional Records: Wilson Park, near Lawson Pool, Lawson, *C.H. Barker* 24 & *J.R. Hosking*, 4 Dec 2003 (CANB, MEL, NE, NSW).

Notes: Known from three plants at Lawson and one of these may have been planted. Spread by bird-dispersed seed. The species is not recorded as naturalised elsewhere in Australia. This species is considered to be a weed, forming impenetrable thickets in a number of areas in mainland USA and is naturalised and spreading in Hawaii (Sternberg in Randall & Marinelli 1996, Wagner et al. 1999).

ERICACEAE

Arbutus unedo L.

Strawberry Tree

Description: Tree to 8 (rarely to 12) m high. See Jessop in Jessop & Toelken (1986), Walsh in Walsh & Entwisle (1996) and Blood (2001).

Region of Origin: Native of southern Europe, Ireland, Turkey and northern Africa.

NEW SOUTH WALES DISTRIBUTION / HABITATS: Central Tablelands. Collected from Blackheath where it is growing in disturbed dry sclerophyll forest with many exotic species on sandstone-derived sandy soil.

First Record: Gully between two sections of Thirroul Street, Blackheath, *J.R. Hosking* 2295 & *C.H. Barker*, 27 Mar 2003 (CANB, MEL, NE, NSW).

Notes: Three naturalised plants were visible at the collection site but the species is widely naturalised in low numbers in upper parts of the Blue Mountains. There is also a record of a single, apparently naturalised, plant growing in the Australian Capital Territory (O'Connor Hill, 100 m N of bike track, *M. Mulvaney ANU* 30022, 8 January 1986 – CANB). This species is dispersed by birds and foxes that consume fruit and deposit seed in droppings and scats (Blood 2001). This tree is naturalised in Victoria and South Australia (Walsh in Walsh & Entwisle 1996, Jessop in Jessop & Toelken 1986) and doubtfully naturalised in Queensland (*Sharpe s.n.* – BRI). It is naturalised in New Zealand and the British Isles (Sykes in Webb et al. 1988, Stace 1997). *Arbutus unedo* produces lignotubers that enable plants to survive destruction of above-ground parts, for example by fire (Blood 2001).

Rhododendron ponticum L.

Rhododendron

Description: Large shrub to 8 m high. See Sykes in Webb et al. (1988) and Cronk & Fuller (1995).

Region of Origin: The species occurs as disjunct populations in south western Europe (Portugal, Spain), south eastern Europe (south eastern Bulgaria, Turkey) and western Asia (Georgia, Lebanon, Krasnodor, Turkey).

New South Wales Distribution / Habitats: Central Tablelands. Collected from *Eucalyptus oreades* and *E. mannifera* wet sclerophyll forest with an understorey of *Gahnia* sp., *Gleichenia* sp., *Acacia longifolia* subsp. *longifolia*, *Cyathea leichhardtiana*, *Polyscias sambucifolia*, *Ilex aquifolium* and *Arbutus unedo* on sandstone-derived sandy soil with high levels of organic matter.

First Record: 193 Hat Hill Road, Blackheath, *C.H. Barker* 3 & *J.R. Hosking*, 25 Nov 2002 (CANB, MEL, NE, NSW).

Notes: Two flowering naturalised plants were present at the collection site but the species is naturalised in low numbers throughout the upper Blue Mountains. The largest known naturalised population in North Katoomba consists of several hundred plants. *Rhododendron ponticum* is naturalised in the Queenstown and Strahan areas of Tasmania (M. Baker pers. comm., Mar 2006). It is considered to be a significant weed in the British Isles and Ireland and is also naturalised in New Zealand, Belgium and France (Sykes in Webb et al. 1988, Cronk & Fuller 1995). This species spreads by seed and vegetatively by layering, and cut stems are reported to resprout (Cronk & Fuller 1995). *Rhododendron ponticum* produces an andromedo-toxin and the leaves are unpalatable to herbivores (Cronk & Fuller 1995).

FABACEAE (CAESALPINIOIDEAE)

Senna multijuga (Rich.) H.S. Irwin & Barneby

November Shower

Description: Tree to 40 m high. See Barneby in Steyermark et al. (1998), Lorenzi (1992) and Martius (1870).

Region of Origin: Native of South America, occurring from Colombia to Peru, Bolivia and Brazil.

New South Wales Distribution / Habitats: North Coast. At Bellingen, this species is most common in a wide unmanaged strip between a road and a pine plantation, but it is also naturalised alongside roads elsewhere in Bellingen and at Thora.

First Record: Alongside Kalang Road on southern edge of Bellingen, *J.R. Hosking* 2271, 14 Mar 2003 (AD, CANB, MEL, NE, NSW).

Notes: Many thousands of trees in native forest, a pine plantation and disturbed areas near Bellingen Hospital, some as tall as mature pines in the pine plantation. Collections of flowering plants were sent as herbarium specimens to NSW in 1965 and records of plantings in the Bellingen Hospital grounds show that this species was self-sown in the area in 1975. Plants are spread by movement of seed. The species is an attractive ornamental and is grown in many areas as a result. This species is not recorded as naturalised elsewhere in Australia. The only other known record of this species becoming a problem is from Puerto Rico, where it is a garden escape (Liogier 2000). It has also been recorded as naturalised in Hawaii, continental North America, West Indies and the Old World tropics (Wagner & Herbst 1999, Barneby in Steyermark et al. 1998).

FABACEAE (FABOIDEAE)

***Desmanthus virgatus* L.**

Desmanthus

Description: Erect to sprawling shrub to 2 m high. See Cowan in Orchard (1998a).

Region of Origin: Native to the Americas, from Texas to Argentina and Uruguay.

New South Wales Distribution / Habitats: North Western Plains. Found in pasture in woodland where it was growing with shrubs and small trees of *Vachellia farnesiana*, *Capparis mitchellii*, *Citrus glauca*, *Geijera parviflora* and *Ventilago viminalis* with an understorey where the most common species are *Sclerolaena birchii*, *Chloris virgata*, *Setaria parviflora* and *Solanum esuriale*.

First Record: Site bsw041 located 30 km N (351 degrees) of Pallamallawa, on freehold property "Morven Downs", E of Gil Gil Creek, *B.S. Wannan 95*, May 2002 (NSW).

Notes: Spread by seed. A weedy species in disturbed coastal habitats from the Darwin region to Queensland (Dunlop *et al.* 1995). It is used as a pasture species and considered to be a long-lived perennial that provides high-quality stockfeed and withstands heavy grazing (Geesink *et al.* in Wagner *et al.* 1999, Crocker and Moylan 2004, Armstrong *et al.* 1997). This species is also naturalised in Florida, Chile, South Africa, Mauritius and on Pacific islands (Holm *et al.* 1979, Wunderlin and Hansen 2004, Arroyo *et al.* in Mooney and Hobbs 2000, Germishuizen in Arnold and de Wet 1993, Smith 1985). For more information on this species see Dunlop *et al.* (1995).

***Lathyrus tingitanus* L.**

Tangier Pea

Description: Climbing herb to 3 m high on supporting vegetation. See Weber in Jessop & Toelken (1986), Jeanes in Walsh & Entwisle (1996), Hussey *et al.* (1997) and Muyt (2001).

Region of Origin: Native of Africa (northern Algeria, Morocco), Europe (Spain, Portugal), Mediterranean islands (Sardinia), Azores, Madeira and the Canary Islands.

New South Wales Distribution / Habitats: Central Tablelands, Central Coast, South Coast. Recorded from shrubby *Eucalyptus* spp. woodland on granite-derived sandy soil in the Central Tablelands.

First Record: Casula near Liverpool, *E. McBarron 14499*, 21 Oct 1967 (NSW).

Additional Records: Casula near Liverpool, *E. McBarron 14561*, 4 Nov 1967 (NSW); Eden, *C. Evans s.n.*, 24 Oct 1978 (NSW), 1.7 km along Jenolan Caves Road, south of Wicketty War Road, near Hampton, *J.R. Hosking 2416*, 10 Dec 2003 (CANB, MEL, NE, NSW).

Notes: This species has been previously confused with *Lathyrus latifolius* in N.S.W. Field notes by *McBarron 14499* & *14561* describe the species as bushy herbs to 5 ft wide and 3 ft high, growing as tangled masses along railway line and over recent earthworks. Field notes of *Evans s.n.* list *L. tingitanus* as growing on roadsides in several locations in the Eden district. *Hosking 2416* records the species as growing over more than 1 km of roadside and on a steep east facing slope in the collection area. This species is also recorded as naturalised in all Australian states except the Northern Territory. Hussey *et al.* (1997) indicate that the species is increasing rapidly on roadsides and other disturbed ground in the Darling Range near Perth. It is likely to become a more widespread environmental weed in N.S.W. *Lathyrus tingitanus* is widely naturalised and locally common to abundant in New Zealand and is naturalised in the western USA (Webb in Webb *et al.* 1988, Isely in Hickman 1993). For more information on this species see Muyt (2001).

***Maackia amurensis* Rupr. & Maxim.**

Description: Deciduous tree to 14 m high. See Makino (1964), Ohwi (1965), Iwatsuki *et al.* (2001) and Hooker (1881, as *Cladrastis amurensis*).

Region of Origin: Native of China, Japan, Korea and far eastern Russia.

New South Wales Distribution / Habitats: Central Tablelands. Only known from a disturbed area between a garden and wet sclerophyll forest where it is growing on basalt-derived red-brown clay loam soil.

First Record: 'Joalah', Skyline Road, Mt Tomah, *J.R. Hosking 2292*, *C.H. Barker & N.W. Rodd*, 27 Mar 2003 (CANB, MEL, NE, NSW).

Notes: This species is spread by movement of seed, with naturalised plants appearing to be downwind from the parent tree. In the collection area there were over 20 plants arising from a garden tree growing nearby. Four of these 20 plants had pods. This species is not known to be naturalised elsewhere in Australia or overseas.

FABACEAE (MIMOSOIDEAE)

***Inga edulis* Mart.**

Ice Cream Bean

Description: Tree to 30 m high. See Cárdenas & Berry in Steyermark *et al.* (2001).

Region of Origin: Native of South America (Bolivia and Brazil to Colombia, Suriname and Venezuela).

New South Wales Distribution / Habitats: North Coast. Only known from overgrown area of a garden where a tree of this species was removed. Growing on basalt-derived red clay loam soil.

First Record: 6 Dianella Road off Shelly Beach Road, Port Macquarie, *J.R. Hosking 2194*, *R. Pullen*, *D. Smith & G. Taylor*, 25 Feb 2002 (CANB, MEL, NE, NSW).

Additional Record: Woolgoolga Creek, near Woolgoolga, *J. Berrigan s.n.*, 7 Oct 2003 (NSW).

Notes: The species is spread by seed. In the Port Macquarie collection area, there were over 30 seedlings emerging in long grass around a stump of this species. Conditions were particularly moist over the previous winter and this appears to have led to germination. At the Woolgoolga site, there was a single naturalised juvenile plant 1 m high. Although no plants have reached reproductive age at either site, the number of young plants indicate that this species has the potential to naturalise on the north coast of N.S.W. *Inga edulis* is cultivated for the edible pulp surrounding the seeds (Cárdenas & Berry in Steyermark et al. 2001). This species appears to be naturalising in the Cairns – Daintree region of far north Queensland (B. Waterhouse pers. comm., Oct 2004, *Jago 6275* – BRI) and is naturalised in low numbers in the Galapagos Islands (Tye in Groves et al. 2001).

HIPPOCASTANACEAE

Aesculus indica Colebr.

Indian Horse Chestnut

Description: Tree to 15 m high. See Hooker (1859) and Spencer (2002).

Region of Origin: Native of eastern Afghanistan, India (Himachal Pradesh, Jammu, Kashmir, northern Uttar Pradesh), Nepal and northern Pakistan.

New South Wales Distribution / Habitats: Central Tablelands. Naturalising on basalt-derived red-brown clay-loam soils in warm temperate rainforest dominated by *Doryphora sassafras*, *Dicksonia antarctica*, *Acmena smithii*, *Hymenanthera dentata* and *Acacia melanoxylon*.

First Record: Slope below garden, 'Lindfield Park', Mt Irvine, *J.R. Hosking 2277* & *C.H. Barker*, 24 Mar 2003 (CANB, MEL, NE, NSW).

Notes: There are many hundreds of plants growing over an area 18 m x 10 m down a steep slope from planted trees. These trees were up to 5 m high and still non-reproductive at the time of collection. The spread of this species is by movement of fruit. This species is not recorded as naturalised in other states. Occasional adventive saplings of *A. indica* have been collected near Poverty Bay in New Zealand and are believed to have resulted from seeds washed down into a forest from cultivated plants in an arboretum above this area (Webb et al. 1995).

LAMIACEAE

Ajuga reptans L.

Common Bugle, Bugle

Description: Stoloniferous herb to 25 cm high. See Sykes in Webb et al. 1988.

Region of Origin: Native of Europe, Asia (northern Turkey to northern Iran, Dagestan and Ciscaucasia) and northern Africa (northern Algeria, Tunisia).

New South Wales Distribution / Habitats: Central Tablelands. On damp areas in the upper Blue Mountains on sandstone-derived sandy soils.

First Record: Simpson Avenue road reserve, Blackheath, *C.H. Barker 1* & *J.R. Hosking*, 25 Nov 2002 (CANB, MEL, NE, NSW).

Notes: In the collection area, plants grow as a groundcover over an area of about 7 m x 2 m. Naturalised plants are also known from Katoomba and Lyrebird Dell, South Leura. *Ajuga reptans* appears to be spreading by stolons from existing plantings and by movement of stem sections along watercourses. This species is naturalised and listed as 'weedy on roadsides and creeks' in Tasmania (Rozefelds et al. 1999). It is also naturalised in New Zealand, Canada and the USA (Sykes in Webb et al. 1988, Gleason & Cronquist 1991).

Glechoma hederacea L.

Ground Ivy

Description: Rhizomatous herb to 30 cm high. See Sykes in Webb et al. (1988), Roy et al. (1998), Uva et al. (1997) and Stubbendieck et al. (1995).

Region of Origin: Native of Europe and Asia.

New South Wales Distribution / Habitats: Northern Tablelands. Naturalised in disturbed grassy woodland.

First Record: New England National Park, 1.2 km WNW of Point Lookout, adjacent to fence surrounding Navigation Towers, *L.M. Copeland 2168*, 14 Nov 1999 (CANB, NE, NSW).

Notes: Field notes of *Copeland 2168* record this species as an occasional plant in the collection area. This species is spread by seed and locally by rhizomes. In north eastern USA it is commonly found in damp shady areas but will grow in full sunlight (Uva et al. 1997). The species is listed as possibly naturalised in the Southern Lofty region of South Australia (Barker et al. 2005) and in the Mt Glorious area, west of Brisbane, in Queensland (*Phillips 803, 916* – BRI). It is recorded as naturalised on the north and south islands of New Zealand and in North America (Sykes in Webb et al. 1988, Roy et al. 1998, Scoggan 1979, Alex & Switzer 1976, Uva et al. 1997). In Canada and the USA it is a weed of turfgrass, gardens, roadsides, waste areas, pasture, open woods and perennial fruit crops (Scoggan 1979, Alex & Switzer 1976, Uva et al. 1997).

Lamium galeobdolon (L.) L.

Aluminium Plant, Yellow Archangel

Description: Trailing perennial herb to 25 (rarely to 40) cm high. See Conn in Walsh & Entwisle (1999).

Region of Origin: Native of Europe and Asia (Turkey, Azerbaijan, Georgia, northern Iran).

New South Wales Distribution / Habitats: Central Tablelands. Wet sclerophyll forest.

First Record: Below Wells Street, Catalina Park, Katoomba, C.H. Barker 14 & J.R. Hosking, 26 Nov 2003 (CANB, MEL, NE, NSW).

Notes: Commonly planted as an ornamental and appears to spread via trailing stems that root from nodes, and via seed. Naturalised in a number of locations around Katoomba and Wentworth Falls, and in the Dandenong Ranges (Victoria). The first naturalised specimen (*Clarke 2291 & Albrecht* – MEL) was collected near Yarragon in south eastern Victoria in May 1993. The species is also naturalised in Tasmania (HO specimen). *Lamium galeobdolon* is naturalised in New Zealand and the USA (Sykes in Webb et al. 1988, as *Galeobdolon luteum* Huds., USDA, NRCS 2006, as *Lamiastrum galeobdolon* (L.) Ehrend. & Polatschek).

***Physostegia virginiana* (L.) Benth.**

Dragonhead, Obedient Plant

Description: Rhizomatous herb with erect stems to 95 cm high. See Steyermark (1963).

Region of Origin: Native of Canada, USA and northern Mexico.

New South Wales Distribution / Habitats: North Coast and Central Coast. Naturalised on roadsides in a number of areas.

First Record: Lane Cove Road, about 0.3 km from junction with Mona Vale Road, Church Point, J.T. Waterhouse UNSW 3480, 14 Mar 1975 (NSW).

Additional Records: Maitland, East, B. Auld 120037, 11 Mar 1982 (NSW); roadside drain alongside Waukivory Road, about 50 m from The Bucketts Way East, Gloucester, J.R. Hosking 2201 & M.W. Tull, 1 Mar 2002 (CANB, MEL, NE, NSW).

Notes: An attractive ornamental, naturalised on roadsides at Church Point in 1975, in East Maitland in 1982 and growing over 70 m of a roadside ditch alongside pasture at Gloucester in 2002. The species appears to spread via rhizomes and possibly by seed. This species is not recorded as naturalised in other states. The species is considered to have naturalised in Florida, but is considered native elsewhere in the USA (USDA, NRCS 2006, Wunderlin & Hansen 2004).

***Plectranthus ecklonii* Benth.**

Blue Spurflower

Description: Shrub to 3 m high. See Conn in Walsh & Entwisle (1999).

Region of Origin: Native of South Africa.

New South Wales Distribution / Habitats: Central Coast. Recorded from *Syncarpia glomulifera* and *Allocasuarina torulosa* forest mostly on edge where it is growing with *Plectranthus verticillatus*, *Ehrharta erecta* and *Sida rhombifolia*.

First Record: Alongside Maraket Avenue, Blaxland, J.R.

Hosking 2215 & C.H. Barker, 24 Apr 2002 (CANB, MEL, NE, NSW).

Notes: In the collection area the species was growing in four clumps, the largest occupying an area of about 3 m x 2 m and one clump was about 50 m down-slope from the roadway and in native forest. It appears to have originated from dumped garden waste, with plants present in a garden across the road at the time of collection. *Plectranthus ecklonii* appears to spread vegetatively and possibly by seed. This species is recorded as naturalised in *Eucalyptus regnans* tall open-forest in Victoria (Conn in Walsh & Entwisle 1999) and in New Zealand (Sykes in Webb et al. 1988).

MALVACEAE (MALVOIDEAE)

***Abutilon pictum* (Gillies ex Hook. & Arn.) Walp. [syn. *Abutilon striatum* Dicks. ex Lindl., *Sida picta* Gill.]**

Chinese Lantern

Description: Shrub to 5.5 m high. See Standley & Steyermark (1949), Spencer (1997) and Hooker (1840).

Region of Origin: Native of South America occurring in Ecuador, Peru, Brazil, northern Argentina, Paraguay and Uruguay.

New South Wales Distribution / Habitats: Central Coast. Naturalised near plantings of this species.

First Record: Creekline north of Burfitt Parade, north west of Glenbrook Railway Station platform, Glenbrook, C.H. Barker 11, 17 Sep 2003 (CANB, MEL, NE, NSW).

Notes: At Glenbrook, this species was spreading by layering of stems that root where in contact with the ground. In this area, there were about 400 erect stems of this *Abutilon* growing along an urban creekline over an area of about 6 m x 40 m. Although we regard *A. striatum* to be a synonym of *A. pictum*, there is some debate as to whether these two should be considered separate species (Standley and Steyermark 1949). If these two taxa were to be regarded as distinct species, then the naturalised taxon occurring at Glenbrook represents *A. striatum* (sensu stricto). *Abutilon pictum* is listed as naturalised in Victoria (MEL specimen) and *A. striatum* is listed as naturalised in Guatemala (Standley and Steyermark 1949).

OXALIDACEAE

***Oxalis vallicola* (Rose) R. Knuth**

Description: Herb with inflorescence to 30 cm high. See Sykes in Webb et al. (1988).

Region of Origin: Native of Mexico.

New South Wales Distribution / Habitats: Central Tablelands. This species appears to be naturalised where garden waste has been discarded.

First Record: Edge of park behind vacant house block off Selby Street, Katoomba, C.H. Barker 20 & J.R. Hosking, 3 Dec 2003 (CANB, MEL, NE, NSW).

Additional Records: Albury (weed in garden), *E.J. McBarron* 4282, 17 Dec 1949 (NSW); Albury (in home garden), *H.J. Milvain s.n.*, 19 Mar 1974 (NSW).

Notes: Grows in dense clumps, with plants producing large numbers of bulbils within a brown tunic around the main bulb. This species appears to be spreading by bulbils and possibly also by seed. At Katoomba, the species is growing over an area of about a third of a vacant house block and into the edge of a neighbouring park. There are earlier records from gardens in Albury and the species is likely to be naturalised in and around Albury. This species is naturalised in the Dandenong Ranges, Victoria (Ross & Walsh 2003). In New Zealand, the species is recorded from 'waste and cultivated ground' and is listed as widespread (Sykes in Webb et al. 1988). *Oxalis vallicola* is regarded as a synonym of *Oxalis latifolia* in North America (Denton 1973), but that species has bulbs on stolons, whereas *O. vallicola* does not.

PITTOSPORACEAE

Pittosporum eugenioides A.Cunn.

Lemonwood, Tarata

Description: Tree to 15 m high. See Allan (1961) and Poole & Adams (1990).

Region of Origin: Native of the north and south islands of New Zealand.

New South Wales Distribution / Habitats: Central Tablelands. Naturalised in the upper Blue Mountains near plantings of this species.

First Record: Gully between current ends of Thirroul Street, Blackheath, *J.R. Hosking 2294* & *C.H. Barker*, 27 Mar 2003 (CANB, MEL, NE, NSW).

Notes: Collected in 2003 from Blackheath where it is growing in disturbed dry sclerophyll forest with many exotic species on sandstone-derived sandy soils. Four plants in the collection area, with more than 20 plants nearby. The species has bird-dispersed seed. A variegated form of the species is commonly used as a hedge plant but naturalised plants are mostly not variegated. *Pittosporum eugenioides* is naturalised in Victoria with the first naturalised specimen (*Clarke 2289* & *Albrecht* – CANB, MEL) collected near Yarragon in May 1993. The species is not recorded as naturalised in other Australian states.

Pittosporum ralphii Kirk

Karo, Ralph's Kohuhu

Description: Shrub to 7 m high. See Allan (1961) and Poole & Adams (1990).

Region of Origin: Native of the north island of New Zealand.

New South Wales Distribution / Habitats: Central Tablelands. Recorded from *Eucalyptus piperita* and *E. oreades* wet sclerophyll forest invaded by exotics such as *Cotoneaster franchetii*, *Hedera helix* and this species.

First Record: Alongside Cliff Drive between Katoomba Falls Kiosk and Kedumba River, Katoomba, *J.R. Hosking 2242* & *C.H. Barker*, 25 Nov 2002 (CANB, MEL, NE, NSW).

Notes: Over 50 naturalised plants scattered near the 2002 collection point and other plants scattered elsewhere in this catchment. Subsequent visits to the area revealed that the species is more widespread and is naturalised over about four square kilometres on the southern side of Katoomba. The species is grown as an ornamental. It has bird-dispersed seed and appears likely to become a common understorey species in this area. Although not recorded as naturalised elsewhere in Australia, *P. ralphii* is naturalised outside its native range in New Zealand (P. Heenan pers. comm., Mar 2003).

Pittosporum tenuifolium Gaertn.

Kohuhu

Description: Shrub or small tree to 10 m high. See Allan (1961) and Poole & Adams (1990).

Region of Origin: Native of the north and south islands of New Zealand.

New South Wales Distribution / Habitats: Central Tablelands. Recorded from disturbed margin of *Eucalyptus piperita* shrubby woodland where it is growing with *Banksia spinulosa*, *Leptospermum trinervium*, *Hakea laevipes* and *Lambertia formosa*.

First Record: Alongside and below firebreak behind houses on Jersey Avenue, Leura Park, Leura, *C.H. Barker 23* & *J.R. Hosking*, 3 Dec 2003 (CANB, MEL, NE, NSW).

Notes: Twenty-one shrubs were counted up to 20 m into native vegetation in the collection area. Only one shrub was in fruit; another large naturalised non-fruiting shrub was seen in native vegetation near Echo Point, Katoomba. This species occurs as scattered young shrubs elsewhere in upper Blue Mountains. The species has bird-dispersed seed. *Pittosporum tenuifolium* is naturalised in Victoria with the first naturalised specimen (*Jobson 393* – A, MEL, NSW) collected 21 km N of Cressy in 1988 and in Tasmania where the first naturalised specimen (*Cayzer 894* – CANB) was collected from Port Arthur in 2000. The species is also naturalised in California (McClintock in Hickman 1993).

PRIMULACEAE

Lysimachia fortunei Maxim.

Description: Erect to decumbent herb to 70 cm high. See Ohwi (1965) and DeVol in Li et al. (1978a).

Region of Origin: Native of Vietnam, China, Korea and Japan.

New South Wales Distribution / Habitats: Northern Tablelands. Recorded from a swamp where it was growing in a herbfield with *Carex gaudichaudii*, *Geum urbanum*, *Juncus* sp. and *Lysimachia* sp. on basalt-derived black peaty loam soils.

First Record: Werrikimbe National Park, SW side of Racecourse Swamp, 100 m E of track crossing of Hastings River, *L.M. Copeland 3557, I.R. Telford & J. Hodgon*, 13 Feb 2002 (BRI, CANB, MEL, NE, NSW).

Notes: The species was abundant in the collection area but it is not clear how it reached this area (I. Telford pers. comm., May 2003). This species is spread by rhizomes, stolons and seed. It is not recorded as naturalised in other Australian states. In Japan the species is considered to be a common weed (Holm et al. 1979).

PROTEACEAE

Athertonia diversifolia (C.T.White) L.A.S.Johnson & B.G.Briggs

Atherton Oak

Description: Tree to 30 m high. See Weston in Orchard (1995).

Region of Origin: Native of the Atherton Tablelands in Queensland, Australia.

New South Wales Distribution / Habitats: North Coast. Recorded from alongside existing plantings of this species in a high rainfall area on well-drained structured red earth soils.

First Record: Naturalising in Bellingen Hospital grounds, Bellingen, *J.R. Hosking 2274 & I. Turnbull*, 14 Mar 2003 (CANB, MEL, NE, NSW).

Notes: Naturalising in the collection area where there were two juvenile plants 1 m and 2 m high. The source trees were planted in the area in 1965 from material collected by J. King from Atherton (unpublished document on plantings in Bellingen Hospital grounds). This species is spread by seed. It has not previously been recorded as naturalising outside its natural range.

RANUNCULACEAE

Aquilegia vulgaris L.

Columbine, Granny Bonnets

Description: Herb to 1.6 m high. See Walsh in Walsh & Entwisle (1996).

Region of Origin: Native to Europe and northern Africa (Algeria, Morocco).

New South Wales Distribution / Habitats: Central Tablelands. Recorded from wet sclerophyll forest.

First Record: Below Wells Street, Catalina Park, Katoomba, *C.H. Barker 15*, 21 Nov 2003 (CANB, MEL, NE, NSW).

Notes: There were only four plants seen in the collection area but the species is also scattered elsewhere in disturbed areas at Katoomba. It spreads by seed. This species is also naturalised in Victoria (first naturalised specimen (*Rogers s.n.* – MEL) from Boundary Creek near the Snowy River, November 1961). It also appears to be naturalising in

Tasmania, although most collections are near houses or where garden waste has been dumped (A. Buchanan pers. comm., Mar 2004). The species has not been recorded as naturalised in other Australian states. It is naturalised in the USA, Canada and outside its native range in Europe (Gleason & Cronquist 1991, Cullen & Heywood in Tutin et al. 1964).

Clematis montana DC.

Description: Climber to 4 m high on supporting vegetation. See Garnock-Jones in Webb et al. (1988).

Region of Origin: Native of Afghanistan, India, Bhutan and China.

New South Wales Distribution / Habitats: Central Tablelands. Recorded from *Eucalyptus piperita*, *E. sieberi*, *Banksia cunninghamii* subsp. *cunninghamii* and *Pittosporum undulatum* forest on sandstone-derived sandy soils.

First Record: Gordon Falls Reserve, alongside toilet block, over road from 13 Lone Pine Avenue, Leura, *J.R. Hosking 2245*, 26 Nov 2002 (AD, CANB, MEL, NE, NSW).

Notes: Known from several localities in the upper Blue Mountains. In March 2003, in Gordon Falls Reserve, there were a number of new plants growing in native forest near the toilet block. It appears to have reached this area via wind-dispersed seed as the species is visible in a garden across the road from naturalised plants. *Clematis montana* has not been recorded as naturalised in any other Australian state. It is naturalised in New Zealand (Garnock-Jones in Webb et al. 1988).

ROSACEAE (AMYGDALOIDAE)

Prunus campanulata Maxim. [syn. *Prunus cerasoides* D. Don var. *campanulata* (Maxim.) Koidz., *Cerasus campanulata* (Maxim.) A.N.Vassiljeva]

Taiwan Cherry

Description: Shrub or small tree to 8 m high. See Sykes & Given in Webb et al. (1988), Su in Li et al. (1977) and Sealy (1939).

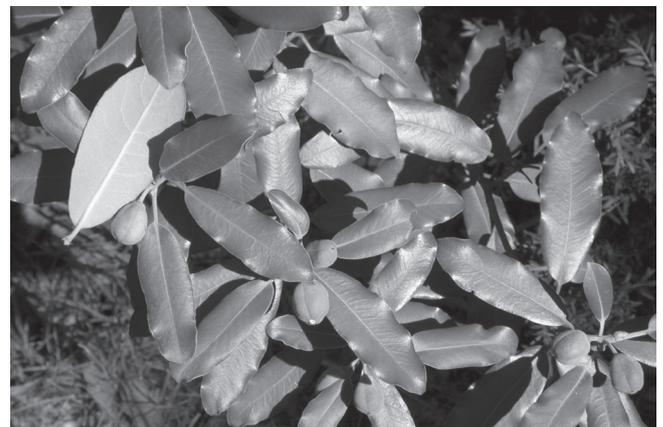


Fig. 3. *Pittosporum ralphii* is only known to be naturalised in Australia in higher areas of the Blue Mountains.

Region of Origin: Native of China (Fujian, Guangdong, Guangxi, Zhejiang), Japan (Ryukyu Islands) and Taiwan.

New South Wales Distribution / Habitats: Central Coast. In a gully forest with *Ligustrum sinense*, *Lantana camara*, *Lomandra* sp., *Morinda jasminoides*, *Ochna serrulata*, *Allocasuarina torulosa*, *Cinnamomum camphora* and *Corymbia gummifera*.

First Record: Gully N of northern part of Hume Road, Lapstone, *J.R. Hosking 2332* & *C.H. Barker*, 21 Aug 2003 (AD, CANB, MEL, NE, NSW).

Additional Record: Gully N of northern part of Hume Road, Lapstone, *J.R. Hosking 2411*, 6 Dec 2003 (AD, CANB, MEL, NE, NSW).

Notes: More than ten naturalised flowering and fruiting trees were scattered over an area of about 100 m of gully and a single naturalised plant was seen in an adjacent gully north of the collection site. A planted tree was also noted on the nature strip of Darwin Drive (immediately to the north of the collection site). This species appears to be spreading via bird-dispersed seed. *Prunus campanulata* has not been recorded as naturalised in any other Australian state. It is naturalised in New Zealand (Sykes & Given in Webb et al. 1988).

ROSACEAE (MALACOIDEAE)

Cotoneaster simonsii Baker

Himalayan Cotoneaster

Description: Shrub to 2 m high. See Symon in Jessop & Toelken (1986).

Region of Origin: Native of India (Sikkim), Bhutan and Nepal.

New South Wales Distribution / Habitats: Central Tablelands. Scattered in disturbed areas throughout the upper Blue Mountains. Recorded from edge of *Pinus radiata* plantation with *Cotoneaster franchetii*, *Ilex aquifolium*, *Prunus laurocerasus* and *Pterideum esculentum*.

First Record: Alongside Prince Edward Street, 45 m N of junction with Belvedere Avenue, Blackheath, *J.R. Hosking 2252* & *P.T. Gorham*, 28 Nov 2002 (CANB, MEL, NE, NSW, SA).

Additional Records: Alongside Prince Edward Street, 45 m N of junction with Belvedere Avenue, Blackheath, *J.R. Hosking 2280*, 25 Mar 2003 (AD, CANB, MEL, NE, NSW); Alongside Bureau Park, Katoomba, *J.R. Hosking 2436* & *C.H. Barker*, 7 Feb 2004 (AD, CANB, MEL, NE, NSW).

Notes: *Hosking 2280* records four naturalised mature shrubs in the collection area and five fruiting naturalised shrubs on neighbouring vacant land. The same label mentions that other naturalised plants of this species were seen elsewhere in Blackheath (many plants) and Katoomba (a few plants). Field information provided by *Hosking 2436* & *Barker* records about 20 plants in the collection area. This species is often growing with *C. franchetii*, a species that is much

more common and likely to be confused with *C. simonsii*. *Cotoneaster simonsii* spreads via bird-dispersed seed. This *Cotoneaster* is recorded as naturalised in Victoria, Tasmania and South Australia (Ross & Walsh 2003, Baker 2005, Symon in Jessop & Toelken 1986). It is also naturalised on the north and south islands of New Zealand (where it is locally abundant), throughout the British Isles and in France, Ireland, Norway and the USA (Sykes & Given in Webb et al. 1988, Clement & Foster 1994, Browicz in Tutin et al. 1968, USDA, NRCS 2006).

Cotoneaster x watereri Excell group

Cotoneaster

Description: Only known naturalised shrub was 3.5 m high. See Stace (1997).

Region of Origin: Hybrid developed in cultivation.

New South Wales Distribution / Habitats: Central Tablelands. Recorded from edge of *Eucalyptus piperita*, *E. sieberi*, *Banksia cunninghamii* subsp. *cunninghamii* and *Pittosporum undulatum* dry sclerophyll forest.

First Record: Gordon Falls Reserve, c. 4 m from road edge, over road from 9 Lone Pine Avenue, Leura, *J.R. Hosking 2246*, 26 Nov 2002 (CANB, MEL, NE, NSW, SA).

Additional Record: Gordon Falls Reserve, c. 4 m from road edge, over road from 9 Lone Pine Avenue, Leura, *J.R. Hosking 2275*, 24 Mar 2003 (AD, CANB, MEL, NE, NSW).

Notes: *Hosking 2275* states the plant is unlikely to have been planted in this area, and cultivated plants are present in a garden immediately opposite the collection site. Dispersal to this site is likely to have been via dumped garden refuse or bird-dispersed seed. Another plant of this group has been identified from the Dandenong Ranges in Victoria (Ross & Walsh 2003). The *C. x watereri* group is reported to be a complex of hybrids between *C. frigidus* Wall. ex Lindl., *C. henryanus* (C.K.Schneid.) Rehder & E.H.Wilson, *C. salicifolius* Franch. and possibly other species (Clement & Foster 1994). *Cotoneaster x watereri* is naturalised in many parts of Britain and Ireland (Stace 1997).

ROSACEAE (ROSOIDEAE)

Potentilla vesca (L.) Scop. [syn. *Fragaria vesca* L.]

Alpine Strawberry, Woodland Strawberry

Description: Herb to 30 cm high. See Given & Webb in Webb et al. (1988, as *F. vesca*) and Ross-Craig (1955).

Region of Origin: Native of northern hemisphere.

New South Wales Distribution / Habitats: Central Tablelands. Growing below *Pinus radiata*, *Eucalyptus radiata* and *E. piperita* with native and exotic shrubs and herbs.

First Record: Bushland alongside southern end of Cascade Street, Katoomba, *C.H. Barker 28*, 26 Nov 2003 (CANB, MEL, NE, NSW).

Notes: The generic name *Potentilla* is here adopted in preference to *Fragaria* for reasons given in Mabberley (2002). *Potentilla vesca* has only been collected from the above location where it was abundant over an area of 3 m x 2.5 m and scattered elsewhere at this location. It has also been observed as a roadside weed in three other locations in Katoomba. This species appears to be spreading via rhizomes and stolons and possibly by seed. *Potentilla vesca* is not recorded as naturalised in other Australian states. It is recorded as naturalised on the north and south islands of New Zealand and in Hawaii (Given & Webb in Webb et al. 1988, Wagner et al. 1999).

Rosa luciae Franch. & Rochebr. ex Crép. **hybrids** [syn. *Rosa wichuriana* Crép. or *Rosa wichurana* Crép. hybrids]

Rambler Rose

Description: Scrambling shrub to 6 m high on supporting vegetation. See as *R. wichuriana* in Sykes & Given in Webb et al. (1988) and Phillips & Rix (1988).

Region of Origin: Native to China, Korea and Japan.

New South Wales Distribution / Habitats: Central Coast, Central Tablelands and North Western Slopes. Spreading alongside areas where the species was planted or where it has been discarded as garden waste.

First Record: Harbord, Oliver Street, near intersection with Pittwater Road, *M.J. Taylor 156*, 1 Dec 1983 ('Dorothy Perkins' group, flowers double – NSW).

Additional Records: Alongside road to Oxley Lookout, Oxley Park, Tamworth, *J.R. Hosking 618 & R.H. Holtkamp*, 19 Nov 1992 (single flower – CANB, MEL, NE, NSW); Alongside road to Oxley Lookout, Oxley Park, Tamworth, *J.R. Hosking 726*, 31 Mar 1993 (single flower – CANB, MEL, NE, NSW); About 200 m west of Olympic Pool and north of Farnells Road, Katoomba, *J.R. Hosking 2244*, 26 Nov 2002 ('Dorothy Perkins' group, flowers double – AD, CANB, MEL, NE, NSW).

Notes: This taxon appears to be spreading from existing plants and from where garden waste has been dumped. It is a common roadside weed in the mid to upper Blue Mountains. Both double and single flowered forms are naturalised. *Rosa luciae* is also naturalised in Victoria (Ross & Walsh 2003) and on the north and south islands of New Zealand (Sykes & Given in Webb et al. 1988) and in the USA (USDA, NRCS 2006).

Rubus rugosus Sm. [syn. *R. rugosus* var. *thwaitesii* Focke]

Keriberry

Description: Scrambling shrub. See Webb & Given in Webb et al. (1988). The species has previously been referred to as *R. rugosus* var. *thwaitesii*.

Region of Origin: Native of Asia (India, Nepal and Sri Lanka to Malay Peninsula and Vietnam).

New South Wales Distribution / Habitats: North Coast. Recorded from alongside house at Comboyne. Likely to grow below perching sites for birds near areas where plants have been cultivated.

First Record: Property of Hartmut Kiehn, 'Yallaban', Comboyne, *J.R. Hosking 2196*, *H. Kiehn*, *T. Schmitzer*, *P. Leddy*, *D. Smith & G. Taylor*, 26 February 2002 (AD, CANB, MEL, NE, NSW).

Notes: According to Kiehn (pers. comm., Feb 2002), cultivated plants were removed from his property in 1999, but naturalised plants are still being found. The species was promoted as a source of edible fruit in the late 1900s and is likely to be naturalised in areas near original plantings as the species is attractive to birds and seed is animal-dispersed. *Rubus rugosus* is recorded as naturalised in Victoria (first naturalised specimen (*Stajsic s.n.*, *Sago & Crosbie* – BRI, CANB, MEL) collected in Selby Conservation Park in May 1999). The species is also recorded as naturalised in Western Australia and Tasmania (PERTH and HO specimens).

RUBIACEAE

Coprosma x cunninghamii Hook.f. (*Coprosma propinqua* A.Cunn. x *Coprosma robusta* Raoul)

Description: Shrub to 7 m high. See Taylor (1961).

Region of Origin: A natural hybrid found widely in New Zealand.

New South Wales Distribution / Habitats: Central Tablelands. Mount Tomah, recorded from tall open forest of *Eucalyptus fastigata*, *E. blaxlandii*, *Angophora costata* and *Hedycarya angustifolia* with a shrub and grass understorey.

First Record: Bells Line of Road, alongside Mt Tomah Botanic Gardens, Mt Tomah, *C.H. Barker 12*, 30 Sep 2003 (AD, CANB, MEL, NE, NSW).

Additional Record: Bells Line of Road, alongside Mt Tomah Botanic Gardens, Mt Tomah, *C.H. Barker 29 & J.R. Hosking*, 5 Dec 2003 (CANB, MEL, NE, NSW).

Notes: Only known in the wild in Australia from a single naturalised plant, the parents of this hybrid being grown in Mt Tomah Botanic Gardens and probably the source of this naturalised plant. The single plant was producing large amounts of fruit at the time of collection and, as with other *Coprosma* species, this hybrid is likely to be spread by bird-dispersed seed. This hybrid is not recorded as naturalised in other Australian states. According to Poole and Adams (1990), *C. propinqua* often hybridises with *C. robusta* and can form extensive hybrid swarms.

Coprosma robusta Raoul

Karamu

Description: Shrub or small tree to 6 m high. See Jeanes in Walsh & Entwisle (1999), Allan (1961) and Poole & Adams (1990).

Region of Origin: Native of the north and south islands of New Zealand.

New South Wales Distribution / Habitats: Central Tablelands. Mount Tomah, growing in tall open forest on basalt derived soils.

First Record: On north-western side of Bells Line of Road, near Mount Tomah Botanic Gardens, Mt Tomah, *J.R. Hosking 2278 & C.H. Barker*, 30 Sep 2003 (CANB, MEL, NE, NSW).

Notes: This species is known from locations around Mount Tomah Botanic Gardens, where the species is in cultivation. Spread is via bird-dispersed seed. *Coprosma robusta* is recorded as naturalised in Victoria and Tasmania (Jeanes in Walsh & Entwisle 1999, Rozefelds et al. 1999). In Victoria, this species is becoming increasingly common in the Dandenong Ranges. The first collection of this species (*Opie s.n. & Wellington* – MEL) was made in May 1977 from Doongalla Estate in Victoria and was probably collected from naturalised plants, although this was not stated by the collectors.

SAXIFRAGACEAE

Bergenia x schmidtii (Regel) Silva Tar.

Description: Herb to 65 cm high. According to Yeo (1961) this taxon is likely to be a hybrid between *B. crassifolia* (L.) Fritsch and *B. ciliata* (Haw.) Sternb.

Region of Origin: Species of horticultural origin.

New South Wales Distribution / Habitats: Central Coast and Central Tablelands. Growing downslope from waste disposal area.

First Record: About 100 m below South Lawson tip site at end of Ridge Street, South Lawson, *J.R. Hosking 2324 & C.H. Barker*, 20 Aug 2003 (NSW).

Notes: *Hosking 2324 & Barker* noted only a single plant. However, this hybrid is also naturalised elsewhere in the Blue Mountains, occurring in small groups. In these cases, it would seem to be growing from discarded garden waste or plant material washed down from existing plantings. This hybrid, or a similar unknown *Bergenia* sp., occurs at a cool creekside location in Carlingford, Sydney. *Bergenia x schmidtii* is naturalised in the British Isles (Clement & Forster 1994).

SOLANACEAE

Cestrum x cultum Francey

Description: Shrub to 2 m high. See Huxley (1992) and Francey (1935). This hybrid is regarded as a cross between *C. elegans* and *C. parqui* (Huxley 1992).

Region of Origin: Species of horticultural origin.

New South Wales Distribution / Habitats: Central Coast. Lapstone, recorded from a drainage reserve where growing

with *Lantana camara*, *Jasminum polyanthum*, *Ageratina adenophora* and *Bougainvillea glabra*.

First Record: Drainage reserve above junction of Dawes Place and Hume Road, Lapstone, *J.R. Hosking 2329 & C.H. Barker*, 21 Aug 2003 (AD, CANB, MEL, NE, NSW).

Notes: There are two clumps present at the collection site, possibly originally planted, but apparently spreading by suckering. Plants do not appear to be forming seed.

ULMACEAE

Ulmus x hollandica Mill.

Dutch Elm

Description: Tree to 40 m high. See Webb in Webb et al. (1988) and Hewson in George (1989). This taxon is said to be a hybrid between *U. glabra* Hudson and *U. minor* Mill. or a triple hybrid between *U. glabra*, *U. minor* and *U. plottii* Druce (Stace 1997).

Region of Origin: Native of Europe and Asia.

New South Wales Distribution / Habitats: Southern and Central Tablelands. Only recorded as growing on a steep slope with *Eucalyptus macrorhyncha*, *E. goniocalyx*, *Exocarpos cupressiformis*, *Acacia dealbata* and *Rubus* sp. (thought to be *R. discolor*, a name misapplied to *R. anglocandicans*).

First Record: ‘Lanyon’ homestead, A.C.T., *J. Olsen 1380*, Jan 1973 (NSW).

Additional Record: ‘The Rocks’, property W of Bathurst, *L.R. Cole s.n.*, 26 Aug 2003 (NSW).

Notes: *Ulmus x hollandica* spreads by suckering and possibly by movement of root material. The *Flora of Australia* treatment (Hewson in George 1989) suggested that *U. x hollandica* was naturalised in N.S.W. but this was not accepted by Harden (1990) or Harden and Murray (2000) presumably as the plant was locally suckering, rather being truly naturalised by their definition. Field information provided by *Olsen 1380* (cited by Hewson) states that there was a ‘Tree c. 6 m tall, surrounded by dense thicket of suckers.’ At the Bathurst site, according to *Cole s.n.* there were 28 trees at varying stages of growth and plants were not growing close to any habitation, past or present.

Ulmus x hollandica is recorded as naturalised in Victoria, Tasmania and South Australia (Ross & Walsh 2003, Rozefelds et al. 1999, Barker et al. 2005). The record of this plant being naturalised in Queensland (Jessup in Henderson 2002) is erroneous, based on a cultivated specimen (G. Batianoff pers. comm., Nov 2005). There is an earlier undated collection (*Curtis s.n.* – HO) from Taroona, a suburb of Hobart, probably in the 1950s. This taxon is recorded as naturalised in New Zealand (Webb in Webb et al. 1988).

Name changes and additional notes for some species recognised as naturalised in 2000–2001 (Hosking et al. 2003)

A number of species listed in Hosking et al. (2003) have been found to be incorrectly identified, and are listed below under the correct name, with the name used in Hosking et al. (2003) listed under Notes. The species order follows that used previously i.e. Conifers and allies, Monocotyledons, Dicotyledons. Entries are reduced if the names are correct and only additional notes on weediness are provided.

Conifers and allies

PINACEAE

Pinus halepensis Mill. [*Pinus nigra* J.F. Arnold var. *corsicana* (Loudon) Hyl., *pro parte* Hill in Orchard (1998b) see notes below; *sensu* Hosking et al. (2003)]

Aleppo Pine

Description: Tree to 30 m high. See Sykes in Webb et al. (1988), Hill in Orchard (1998b) and Henderson (2001).

Region of Origin: Native of southern Europe, Mediterranean islands, western Asia and northern Africa.

NSW Distribution / Habitats: Southern Tablelands, South Western Slopes. Naturalised near planted trees.

First Record: Stirling Ridge, near top of slope, 100 m W of mosque [ACT], *M.J. Mulvaney ANU 30060*, 14 Jan 1986 (CANB).

Additional Records: Yass River, c. 1 km NE of Yass Post Office, *B.J. Lepschi 1062*, 29 Aug 1993 (CANB, NSW); Northern outskirts of Griffith – southern edge of Kalinda Rd, 2.2 km E of the intersection with Wyangan Avenue, *D.J. Mallinson 642*, 30 Aug 2002 (CANB); Native shrubby woodland above the Wagga Wagga Botanic Gardens, Wagga Wagga, *J.R. Hosking 2507*, 10 Sep 2004 (CANB, MEL, NE, NSW).

Notes: Hill in Orchard (1998b) and Hosking et al. (2003) incorrectly recorded the occurrence of *P. nigra* var. *corsicana* in N.S.W. on the basis of *Lepschi 1062*. *Pinus halepensis* had not previously been recorded as naturalised in N.S.W. Naturalised occurrences range from a few scattered plants at the Yass River site, to over 100 young trees at the Wagga Wagga site (including plants from 2 m high bearing female cones). No details of population size are recorded for the Mulvaney collection. Dispersal of *P. halepensis* is via wind-dispersed seed. This pine is naturalised in Victoria, South Australia and Western Australia (Hill in Orchard 1998b). *Pinus halepensis* is one of the five most invasive *Pinus* species according to Rejmánek and Richardson (1996). *Pinus halepensis* is also naturalised in New Zealand, South Africa and Pakistan (Sykes in Webb et al. 1988, Henderson 2001). In Israel this pine is native to some areas but it has

been widely planted for reforestation and is now invading native vegetation alongside plantations (Lavi et al. 2005).

Dicotyledons

CACTACEAE

Cylindropuntia kleiniae (DC.) F.M.Knuth [*Cylindropuntia arbuscula* (Engelm. & J.M. Bigelow) F.M. Knuth *sensu* Hosking et al. (2003)]

Description: Shrub cactus to 2 m high. See Benson (1982, *Opuntia kleiniae* DC.) and Anderson (2001).

Region of Origin: Native of the USA (southern New Mexico, south western Texas) and Mexico (Chihuahua, Coahuila, Durango, Nuevo Leon).

NSW Distribution / Habitats: North Western Plains. Recorded from *Eucalyptus populnea* subsp. *bimil* woodland.

First Record: Northern side of Grawin, *J.R. Hosking 1889*, 19 Sep 2000 (BRI, CANB, MEL, NE, NSW).

Additional Record: North western side of Lightning Ridge, *J.R. Hosking 2405 & W.A. Cherry*, 26 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD).

Notes: This species was incorrectly identified as *Cylindropuntia arbuscula* in Hosking et al. (2003). That identification was based on non-flowering material. However, once flowering material was available, this species was readily identified as *C. kleiniae*. These plants had pink flowers, whereas *C. arbuscula* has greenish yellow flowers. *Cylindropuntia kleiniae* is scattered elsewhere over the Lightning Ridge, Grawin and Glen Garry opal fields. It is damaged by the cochineal insect, *Dactylopius tomentosus*. This cactus is not known to be naturalised elsewhere in Australia.

Cylindropuntia leptocaulis (DC.) F.M.Knuth

Pencil Cactus

Additional Record: Northern side of Grawin, *J.R. Hosking 2399 & W.A. Cherry*, 25 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD); Alongside road parallel to railway line and on opposite side of railway line to Kamilaroi Highway, Curlewis, *J.R. Hosking 2427*, 1 Feb 2004 (CANB, MEL, NE, NSW).

Notes: The infestation near Curlewis is large, covering an area of about five hectares. In one location at Curlewis this cactus was the dominant species, covering an area of 90 m x 30 m.

Cylindropuntia rosea (DC.) Backeb. [*Cylindropuntia tunicata* (Lehm.) F.M.Knuth *sensu* Hosking et al. (2003).]

Hudson Pear

Description: Shrub cactus to 1.5 m high, although often mat-forming. See Anderson (2001).

Region of Origin: Native of Mexico.

NSW Distribution / Habitats: North Western Slopes, North Western Plains. Recorded from mixed *Eucalyptus* woodland.

First Record: Cumborah, growing behind abandoned garage, near turnoff to Lightning Ridge, *J.R. Hosking 1887, J.P., T.L. & G.R. Hosking*, 18 Sep 2000 (BRI, CANB, MEL, NE, NSW).

Additional Record: 1.1 km north east of Glen Garry, *J.R. Hosking 2395, W.A. Cherry & M.P. Goodwin*, 24 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD).

Notes: This species was incorrectly identified as *Cylindropuntia tunicata* in Hosking et al. (2003). Once flowering material was available, these plants were obviously *C. rosea*. This species has pink-purple flowers, whereas *C. tunicata* has pinkish-yellow flowers. *Cylindropuntia tunicata* was collected at Grawin in November 2003 and its presence is reported earlier in this paper. *Cylindropuntia rosea* has become established as a weed in the Lightning Ridge, Grawin and Glen Garry area. This cactus is not known to produce seeds but its segments are readily spread by floodwaters. Currently this cactus is present over around 100 square kms, with infestations varying from scattered plants to large clumps of plants. Although most plants are low growing, some reach 1.5 m high. This cactus has long thorns with detachable sheaths that discourage grazing close to plants and are a hazard to animals and vehicle tyres. The form of *Dactylopius tomentosus* present in N.S.W. does not appear to cause much damage to this species of *Cylindropuntia*. This plant is also naturalised near Menzies, Western Australia (*S. Januskiewicz s.n.* – PERTH, NSW) and at a number of locations in South Australia (R. Chinnock pers. comm., Nov 2005). It is also reported to be naturalised in South Africa (Zimmerman pers. comm., Feb 2003).

Cylindropuntia spinosior (Engelm.) F.M.Knuth

Additional Record: Alongside and around old rubbish dump, Nebia Hill, west of Lightning Ridge, *J.R. Hosking 2403 & W.A. Cherry*, 25 Nov 2003 (ASU, BRI, CANB, MEL, NE, NSW, SD).

Notes: This cactus is also naturalised at Lightning Ridge where there were three large clumps and about 20 small clumps of plants in the area, with other plants scattered elsewhere over the Lightning Ridge opal fields. *Cylindropuntia spinosior* was also recorded from a property 50 km north of Longreach in Queensland in September 2006 (*B. Carlson s.n.* BRI).

CLUSIACEAE

Hypericum kouytchense H.Lév.

Notes: *Hypericum kouytchense* is more widespread in damp areas in the upper Blue Mountains than is indicated in Hosking et al. (2003). There is now a colour plate and more information available for this species in Robson (2004).

EUPHORBIACEAE

Chamaesyce ophthalmica (Pers.) D.G.Burch

Additional Record: Alongside New England Highway, between Uralla and Bendemeer, *J.R. Hosking 2708*, 8 Apr 2006 (BRI, CANB, MEL, NE, NSW).

Notes: This herb is now also found on the Northern Tablelands in N.S.W. Over 50 plants were found in gravel and soil on the edge and alongside the New England Highway at the above locality.

FABACEAE (FABOIDEAE)

Abrus precatorius L. subsp. *africanus* Verdc. [*Abrus precatorius* L. subsp. *precatorius sensu* Hosking et al. (2003).]

Crabs Eye

Description: Climber growing to 10 m high on supporting vegetation at Chinderah Golf Range. See Verdcourt (1970), and Stanley in Stanley & Ross (1983) as *A. precatorius*.

Region of Origin: Native of tropical Africa, Seychelles, Madagascar and Mauritius.

NSW Distribution / Habitats: North Coast. Coastal areas in various types of *Banksia* spp. and *Eucalyptus* spp. forest. Likely to naturalise in other high rainfall areas of coastal north-eastern New South Wales.

First Record: Chinderah Golf Range, 11 km south of Tweed Heads, *J.R. Hosking 2024 & R.L. Watson*, 14 Mar 2001 (CANB, MEL, NE, NSW).

Additional Records: Crabbes Creek, near Murwillumbah (NSW), *A.J. Beck s.n.*, 29 Jun 1981; roadside S of nursery, Hulls Road, S of Mooball, *N. Nicholson & A. McKinley*, Dec 1996 (NSW).

Notes: This species was incorrectly identified as subspecies *precatorius* in Hosking et al. (2003). Both subspecies have hairy pods but those of subspecies *africanus* are covered with low tubercles whereas those of subspecies *precatorius* are smooth. Subspecies *africanus* is also naturalised in south eastern Queensland (A. Bean pers. comm., January 2006) and in the Americas (Verdcourt 1970). Further information on this subspecies in northern N.S.W. and south eastern Queensland can be found in Hosking et al. (2003).

ROSACEAE (MALACOIDEAE)

Cotoneaster microphyllus Wall. [*Cotoneaster ?horizontalis sensu* Hosking et al. (2003).]

Small-leaf Cotoneaster

Description: Prostrate shrub. See Lu & Brach in Wu & Raven (2003).

Region of Origin: Native of China, Bhutan, India and Nepal.

NSW Distribution / Habitats: Central Tablelands. Known from a number of disturbed locations on sandstone-derived soils in mixed *Eucalyptus* woodland.

First Record: Alongside drainage line in Harold Hodgson Park, Katoomba, J.R. Hosking 1840, 23 Feb 2000 (AD, CANB, MEL, NE, NSW).

Additional Record: Amongst ruins of old building near corner of Narrow Neck Road and Farnells Road, Katoomba, J.R. Hosking 2208, 22 Apr 2002 (AD, CANB, MEL, NE, NSW).

Notes: This species was misidentified as *Cotoneaster ?horizontalis* in Hosking et al. (2003). The redetermination is based on Lu & Brach in Wu & Raven (2003). *Cotoneaster microphyllus* is actually a new record for N.S.W. as plants previously identified under this name (at NSW) are *Cotoneaster rotundifolius*. *Cotoneaster microphyllus* is also naturalised in New Zealand, the USA and the British Isles (Sykes and Given in Webb et al. 1988, Sigg in Bossard et al. 2000, Clement and Foster 1994).

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