

Ecology of Sydney plant species

Part 8 Dicotyledon families Rutaceae to Zygophyllaceae

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Benson, Doug and McDougall, Lyn (National Herbarium of New South Wales, Royal Botanic Gardens, Sydney, Australia 2001. Email: doug.benson@rbgsyd.nsw.gov.au) 2001 Ecology of Sydney plant species: Part 8 Dicotyledon families Rutaceae to Zygophyllaceae. Cunninghamia 7(2) 241–462. Ecological data in tabular form are provided on 325 plant species of the families Rutaceae to Zygophyllaceae, 236 native and 89 exotics, occurring in the Sydney region, defined by the Central Coast and Central Tablelands botanical subdivisions of New South Wales (approximately bounded by Lake Macquarie, Orange, Crookwell and Nowra). Relevant Local Government Areas are Auburn, Ashfield, Bankstown, Bathurst, Baulkham Hills, Blacktown, Blayney, Blue Mountains, Botany, Burwood, Cabonne, Camden, Campbelltown, Canterbury, Cessnock, Concord, Crookwell, Drummoyne, Evans, Fairfield, Greater Lithgow, Gosford, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kiama, Kogarah, Ku-Ring-Gai, Lake Macquarie, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, Mulwaree, North Sydney, Oberon, Orange, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Rylstone, Shellharbour, Shoalhaven, Singleton, South Sydney, Strathfield, Sutherland, Sydney City, Warringah, Waverley, Willoughby, Wingecarribee, Wollondilly, Wollongong, Woollahra and Wyong. The study area falls within the Sydney Basin IBRA Bioregion.

Families are: Rutaceae, Salicaceae, Sambucaceae, Santalaceae, Sapindaceae, Sapotaceae, Scrophulariaceae, Selaginaceae, Simaroubaceae, Solanaceae, Stackhousiaceae, Sterculiaceae, Stylidiaceae, Symplocaceae, Thymelaeaceae, Tremandraceae, Tropaeolaceae, Ulmaceae, Urticaceae, Valerianaceae, Verbenaceae, Viburnaceae, Violaceae, Viscaceae, Vitaceae, Winteraceae, Zygophyllaceae.

Data are derived from herbarium collections, literature and field observations. It is hoped that the many, often alarming gaps in the information available will stimulate much-needed research into the ecology of more of the species. Information is provided so far as available to us for each plant species in the following categories:

Life History: Growth form, vegetative spread, longevity, primary juvenile period (time from germination to fruiting), reproduction, flowering and fruiting times, fruit/seed type, dispersal, establishment and growth, fire response, interaction with other organisms.

Distribution: Status/origin (native/naturalised), botanical subregions, distribution in Sydney area, selected locations.

Habitat: Habitat, altitude, annual rainfall, typical local abundance, vegetation, substrate, exposure.

Conservation: Conservation status.

Introduction

The *Ecology of Sydney plant species* aims to provide ecological information on native and naturalised Sydney plants. Particular emphasis has been given to data that are relevant for ecologists and natural area managers, for people involved in bush regeneration, land rehabilitation and landscape design, for researchers in many fields and for a wide range of people who are interested in bushland and native plants. Species-specific information is also relevant to environmental impact assessment and to studies involving changes in drainage, water movement, wind exposure, nutrient conditions and fire regimes on plant species and plant communities. Information included covers growth form, flowering and fruiting times, longevity and maturation periods, pollination and seed dispersal data, distribution, habitat and plant community, as well as responses to fire and disturbance where available and is complementary to the descriptive texts in taxonomic handbooks such as the *Flora of New South Wales* (Harden 1990–93).

Part 8 of the *Ecology of Sydney plant species* covers the Dicotyledon families alphabetically from Rutaceae to Zygophyllaceae.

Part 9, Monocotyledon families Argavaceae to Juncaginaceae will be published in 2002. Part 10, Monocotyledon families Lemnaceae to Zosteraceae 2003, Part 11, Monocotyledon family Poaceae 2004.

Methods

Part 8 follows the format used in Parts 1–7b (Benson & McDougall 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000). The Sydney region is defined as the Central Coast and Central Tablelands botanical subdivisions (i.e. approximately bounded by Lake Macquarie, Orange, Crookwell and Nowra) (Fig. 1). This is the area broadly covered by *Flora of the Sydney Region* (Carolin & Tindale 1993), with the exception that the Hunter Valley is not included here since it lies within the North Coast and Central Western Slopes subdivisions. Relevant Local Government Areas are Auburn, Ashfield, Bankstown, Bathurst, Baulkham Hills, Blacktown, Blayney, Blue Mountains, Botany, Burwood, Cabonne, Camden, Campbelltown, Canterbury, Cessnock, Concord, Crookwell, Drummoyne, Evans, Fairfield, Greater Lithgow, Gosford, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kiama, Kogarah, Ku-ring-gai, Lake Macquarie, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, Mulwaree, North Sydney, Oberon, Orange, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Rylstone, Shellharbour, Shoalhaven, Singleton, South Sydney, Strathfield, Sutherland, Sydney City, Warringah, Waverley, Willoughby, Wingecarribee, Wollondilly, Wollongong, Woollahra and Wyong. The study area falls within the Sydney Basin IBRA bioregion.

The Sydney region, as defined here, includes approximately 3500 plant species, both native and naturalised. To deal effectively with this number, the work has been divided into parts each of approximately 350 species based on plant families beginning with ferns, Cycads and Gymnosperms, and then Dicotyledon and Monocotyledon families. Within these groups, families, genera and species are arranged alphabetically:

- Part 1: Ferns, Fern allies, Cycads and Conifers, Dicotyledon families Acanthaceae to Asclepiadaceae (*Cunninghamia* 3(2) 1993)
- Part 2: Dicotyledon families Asteraceae to Buddlejaceae (*Cunninghamia* 3(4) 1994)
- Part 3: Cabombaceae to Eupomatiaceae (*Cunninghamia* 4(2) 1995)
- Part 4: Fabaceae (*Cunninghamia* 4(4) 1996)
- Part 5: Flacourtiaceae to Myrsinaceae (*Cunninghamia* 5(2) 1997)
- Part 6: Myrtaceae (*Cunninghamia* 5(4) 1998)
- Part 7a: Nyctaginaceae to Primulaceae (*Cunninghamia* 6(2) 1999)
- Part 7b: Proteaceae to Rubiaceae (*Cunninghamia* 6(4) 2000)
- Part 8: Rutaceae to Zygophyllaceae** (*Cunninghamia* 7(2) 2001)
- Part 9: Monocotyledon families Agavaceae to Juncaginaceae
- Part 10: Monocotyledon families Lemnaceae to Zosteraceae
- Part 11: Monocotyledon family Poaceae

For each species (and generally for subspecies) a data sheet is prepared incorporating life history, distribution and habitat data from specimens in the National Herbarium of New South Wales; this information is entered in a database together with data from literature sources both published and unpublished. References have been cited where appropriate but for unreferenced data responsibility has been assumed by the authors. A provisional compilation sheet with the available information is then prepared and distributed to interested persons for comments and additions/alterations. This compilation is then published in parts in the summer issue of *Cunninghamia*, with the subsequent long-term aim of producing a book at the completion of the eleven parts. This will allow the incorporation of new and additional material.

Part 9, Monocotyledon families Agavaceae to Juncaginaceae, is planned for publication in 2002, and any information that readers would like included should be sent to the authors by 30 June 2002.

Ecological review papers may be appropriate for families in future issues, particularly the major families e.g. Cyperaceae, Poaceae, Orchidaceae, but papers would also be welcomed for smaller families. Authors interested in contributing such papers should contact the Scientific Editor.

Information categories

For each species or subspecies, information is presented under headings relating to different life-history aspects, each with further subdivisions. Emphasis has been given to understanding the species in its wild habitat. For this reason data on cultivation and artificial propagation, available in horticultural books, are generally not included. Likewise information on weed control is not given. Generally, the categories are broadly interpreted and since the project aims to stimulate further investigation, we welcome the addition of extra data on any other aspects of the plant's ecology.

A 'comments' section has been deliberately avoided — for all information retrieval purposes, all ecological material should be attributable to some life history aspect of the plant or its habitat although even with our broad categories there have been problems with 'Vegetation' and 'Substrate' sections for specialised lifeforms such as mistletoes. The main purpose of this information is to give a picture of the ecology of particular species as is currently known. It is not primarily for comparative purposes although it can be used in this way. One of our original aims was to demonstrate that closely related species may have different ecologies and that to generalise within genera for example rather than look at a particular species is an over simplification. We have also included reference to individualistic information resulting from specific research that will not necessarily be available for all species.

Similarly where we have observations on the effects of factors such as drought on particular species we have included these, though we have not included a category for 'drought' because of difficulties in definition. One of our aims is to be open-ended, to point out that there are many gaps in the ecological knowledge and to indicate areas and species where future work may be particularly useful.

Botanical nomenclature

Family/Genus/Species: Names currently recognised at the National Herbarium of NSW and mostly as used in *Flora of New South Wales*.

Common name: Names used in *Flora of New South Wales*.

Life history

Growth form: Brief description.

Source: *Flora of New South Wales*.

Vegetative spread: Indication of whether localised expansion or spread is possible from an individual by rhizome, stolon, rootsucker etc. Important in determining ability of species to colonise immediate local area. Does not include vegetative distance-dispersal which is included under 'Dispersal, establishment & growth' (diaspore).

Source: Flora descriptions, Herbarium specimens, field observations.

Longevity: Average potential life-span under natural conditions — range in years where possible, indefinite, where death is not a result of inherent growth e.g. continued rhizomatous growth. Longevity may be shorter in cultivation. There are very few references in the literature to the longevity of species or records of individual plants, particularly of the longer-lived species, yet this is an important factor in assessing importance of recruitment and changes in plant communities.

Most of the estimates given are based on the authors' judgement, based on the shape, size and growth rates of individuals, and the authors' experience in the field over 25 years, together with any historical data available. The figures given are conservative and represent minimal average ages. The authors would not be surprised if much greater ages are achieved in many cases.

Source: literature, authors' assessment from field observations.

Primary juvenile period: time taken from germination to produce first fruits or spores. Gill (1975) uses the term for the period from germination to flowering but the period to fruit maturity is more significant ecologically. Secondary juvenile period is time taken for an individual to recover to produce fruit after major damage e.g. from fire, but applicable only if species regularly resprouts. The time required to accumulate a seedbank sufficient to ensure reasonable recruitment in the event of mass mortality is also an important consideration. Primary and secondary juvenile periods should not be considered as absolute and they may vary spatially as a function of habitat factors (moisture availability, nutrients etc.) and temporally (e.g. climatic variation).

Source: literature, field observations.

Reproduction: for Angiosperms, reproduction is separated into:

Flowers: predominant flower colour, flowering period — range of months and, where possible, peak month based on frequency of herbarium collections. Pollination vectors.

Fruit: fruit shape and size, particularly with respect to potential dispersal agents. Maturation period. Seed size and number.

Source: Herbarium specimens, field observations, *Flora of New South Wales*, literature.

Dispersal, establishment and growth: diaspore type (including vegetative), dispersal agent. Germination requirements: seedbank presence, dormancy, growth rates, seasonality, deciduousness etc. [notes on propagation in cultivation may be given where these imply similar behaviour under natural field conditions e.g. insights into seed germination inhibition].

Source: literature, field observations.

Fire response: general response of mature plant to fire, in particular whether it generally resprouts or is killed (see also Gill 1981, Gill & Bradstock 1992). Seedling recruitment associated with fire is included under establishment and growth. Entries such as 'probably killed' mean that a species has no obvious morphological characteristics likely to assist in surviving and resprouting following fire. While species that resprout after fire may be readily noted, the death of individuals may not be observed unless the occurrence of the species in the area was well known prior to the fire.

For a given species some populations may be capable of resprouting while other populations may be killed. This may explain cases where contradictory evidence has been given though response to fire in some species may depend on fire intensity.

In view of the limited information available for many species, the categories of Gill and Bradstock (1992) have not been applied at this stage.

Source: field observations, literature.

Interaction with other organisms: symbiosis, predators, diseases etc.

Source: mainly literature.

Distribution

Status/origin: native or naturalised, region of origin, source and date of introduction/naturalisation. Naturalised species indicated by an asterisk following the botanical name.

Source: *Flora of New South Wales*, literature.

Botanical subregions: occurrence of species in botanical subdivisions of NSW, other states and countries.

Source: National Herbarium of New South Wales.

Distribution in Sydney region: main geographic regions occupied by species.

Source: Herbarium specimen records.

Selected locations: restricted to about 10 localities for each taxon reflecting natural geographical range of species in the Sydney area. Earliest collection dates are given for some species, particularly exotic species. Recent collection sites indicated where possible. Locality data must be interpreted carefully. The record may be based on an old specimen or observation record and the species may no longer be present at the site. However a knowledge of the original distribution may be important in showing up particular habitat requirements of the species.

Source: Herbarium specimen records.

Habitat

Specific data refer to Sydney area unless stated otherwise.

Habitat: brief generalised description.

Source: Herbarium specimen records, field observations.

Altitude: approximate altitudinal range (m +/- 100 m) occupied by the species,

Source: Herbarium specimen records.

Annual rainfall: approximate annual rainfall range (mm +/- 100 mm) for sites occupied by the species.

Source: Bureau of Meteorology (1979).

Typical local abundance: most frequent recordings (scale: dominant/frequent/occasional/rare)

Source: Herbarium specimen records.

Vegetation: main structural type with typical associated species where available.

Source: Herbarium specimen records, field observations, literature.

Substrate: geology, soil, moisture supply.

Soil nutrient rating scale: very fertile (high nutrient) (e.g. basalt soils)/ fertile (moderate nutrient)/ infertile (low nutrient)/ very infertile (very low nutrient) (e.g. sands).

Soil salinity scale: hypersaline/ saline/ brackish/ fresh.

Source: Herbarium specimen records, field observations, literature.

Exposure:

Exposure scale: exposed/ indifferent/ sheltered.

Shading scale: deep shade/ mid shade/ light shade/ no shade.

Source: Herbarium specimen records, field observations, literature.

Conservation

Conservation: listing as Endangered or Vulnerable, or as Endangered Population on schedules of the NSW *Threatened Species Conservation Act 1995*; national significance listing (Briggs & Leigh 1996), Rare or Threatened Australian Plants (ROTAP) database; comments on regional significance and adequacy of conservation within Sydney area are based on authors' knowledge of the abundance of species and their primary occurrence in major conservation areas. These comments apply to the Sydney region; a species may be common or rare elsewhere. 'Probably' is used in many cases as it is the authors' views that a definite categorisation of 'adequately conserved' needs to be based on a better knowledge of the species' biology and distribution than we have at present for most species.

Source: Herbarium records, field observations, literature.

General comments on part 8

Part 8 covers 325 plant species of the families Rutaceae to Zygophyllaceae, 236 native and 89 naturalised exotics.

Excluded from this work are a number of exotic species that do not appear to be truly naturalised in the Sydney region (*Kickxia commutata* subsp. *graeca*, *Nierembergia hippomanica*, *Petunia axillaris*, *Physalis virginiana*, *Solanum erianthum*, *Veronica hederifolia*, *Verbena aristigera*).

General aspects of the ecology of the Rutaceae family are covered in the accompanying paper by Auld (page 213). Other plant families in this part are Salicaceae, Sambucaceae, Santalaceae, Sapindaceae, Sapotaceae, Scrophulariaceae, Selaginaceae, Simaroubaceae, Solanaceae, Stackhousiaceae, Sterculiaceae, Stylidiaceae, Symplocaceae, Thymelaeaceae, Tremandraceae, Tropaeolaceae, Ulmaceae, Urticaceae, Valerianaceae, Verbenaceae, Viburnaceae, Violaceae, Viscaceae, Vitaceae, Winteraceae, Zygophyllaceae. Very little ecological work has been done on these groups.

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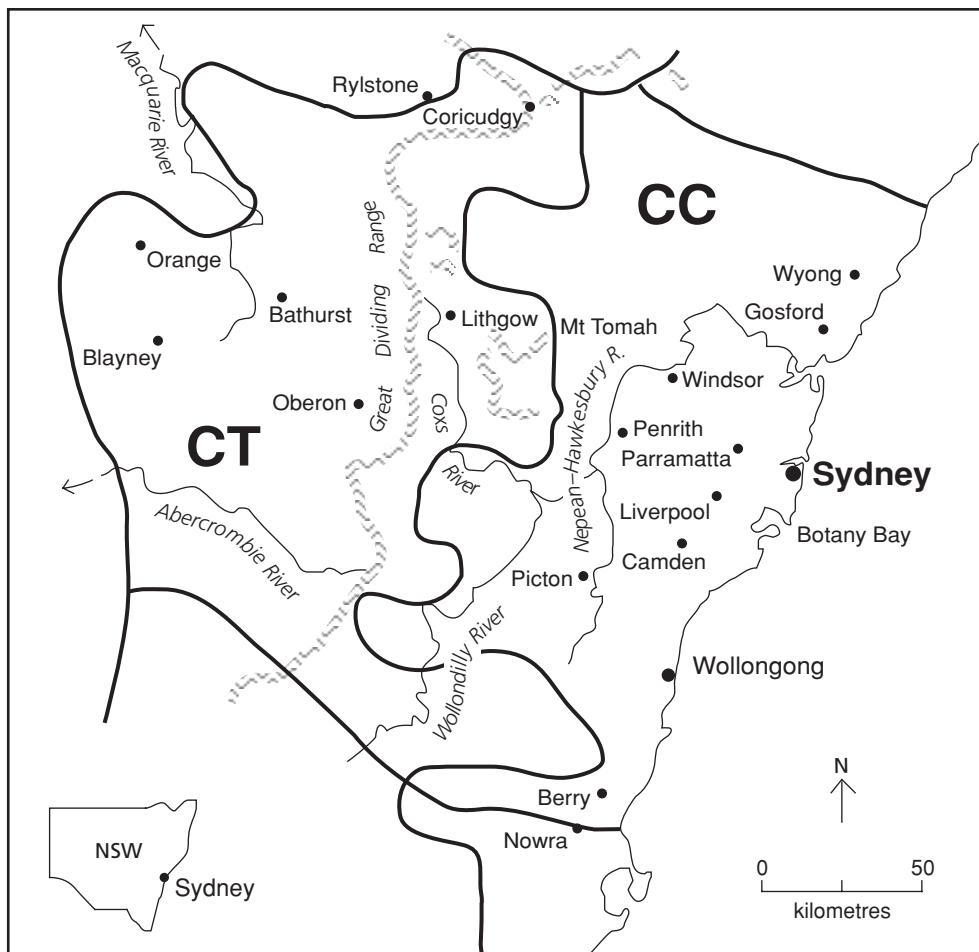
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Map of the Sydney region

For the Ecology of Sydney Plant Species the Sydney region is defined as the Central Coast and Central Tablelands botanical subdivisions.

Dicotyledon families Rutaceae to Zygophyllaceae

Acronychia oblongifolia

RUTACEAE

Common Acronychia

Life history

Growth form: Shrub or medium-sized tree to 27 m high; leaves 4–12 cm long, with a bump at base of leaf blade.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Creamy white, bisexual, February–March.

Fruit/seed: White, edible fleshy 4-lobed fruit, 13 mm diam., with a tuft of hairs, mature summer. Fruit 3 500 per kilogram, seeds 170 000 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Diaspore: fruit, both vertebrate and ant-adapted for dispersal (Westoby et al. 1990). Germination slow and difficult, with only 5% germination after 175 days (Floyd 1989).

Fire response: Resprouts from base (Adam & Williams 2001).

Interaction with other organisms: Fruit eaten by Green Catbird, Pied Currawong, Regent Bowerbird, Satin Bowerbird, Topknot Pigeon and Wompoo Fruit-dove (Floyd 1989).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CWS; Qld, Vic.

Distribution Sydney area: Coast and coastal ranges.

Select locations: CC: North Entrance, Yarramalong, Gosford, Newport, Kogarah, Razorback, Bola Creek, Otford, Mt Keira, Minnamurra Falls, Berry, Cambewarra Range.

Habitat

Habitat: Steep slopes, gullies, creeks.

Altitude: 0–300 m

Annual rainfall: 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Littoral rainforest e.g. with *Glochidion ferdinandi*, *Acmena smithii*, *Cupaniopsis anacardioides*, *Livistona australis*, *Dendrochne excelsa*; gully rainforest e.g. with *Glochidion ferdinandi*.

Substrate: Alluvial and clayey soils, medium nutrients, well-drained.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Dharug NP, Sydney Harbour NP.

Acronychia wilcoxiana

RUTACEAE

Silver Aspen

Life history**Growth form:** Small tree to 9 m high; leaves with scattered oil dots.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Whitish, January–May (Floyd 1989).**Fruit/seed:** White fleshy fruit 8–20 mm diam., with black seeds. Fruit mature March–May, 1 270 per kilogram, seeds 125 000 per kilogram (Floyd 1989).**Dispersal, establishment & growth:** Difficult to germinate (Floyd 1989).**Fire response:****Interaction with other organisms:** Fruit eaten by Wompoo Fruit-dove (Floyd 1989).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Gosford–Wyong area.**Select locations:** CC: Ourimbah, Strickland SF, Matcham, Gosford.**Habitat****Habitat:** Creek banks, gullies.**Altitude:** 0–200 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Rare.**Vegetation:** Gully rainforest (warm temperate) e.g. with *Ceratopetalum apetalum*, *Glochidion ferdinandi*, *Archontophoenix cunninghamiana*, *Ripogonum fawcettianum*, *Smilax australis*, *Cissus hypoglauca*.**Substrate:** Alluvium, brown clay over shale, high nutrients.**Exposure:** Sheltered.**Conservation****Conservation:** Gosford is southern geographical limit. Conservation status unknown.***Asterolasia asteriscophora***

RUTACEAE

Life history**Growth form:** Erect shrub 1–2 m high, with grey–brown hairy covering on young branches.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, August–November, peak October.**Fruit/seed:** Dry dehiscent, segmented fruit with dull black seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC NT CT ?ST; Vic.**Distribution Sydney area:** Tablelands, sporadic.**Select locations:** CC: Buxton, Kangaroo Valley. CT: Towac, Canobolas, Medway, Penrose.**Habitat****Habitat:** Rocky outcrops.**Altitude:** 300–1000 m **Annual rainfall:** 800–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Eucalypt open-forest e.g. with *Eucalyptus punctata*, *E. sclerophylla*.**Substrate:** Rock outcrops e.g. trachyte, sandstone, shallow sandy soil, low nutrients.**Exposure:****Conservation****Conservation:** Uncommon, conservation status unknown.

Asterolasia buxifolia

RUTACEAE

Life history**Growth form:** Erect shrub to 2 m high, similar to *Asterolasia asteriscophora*.**Vegetative spread:** No.**Longevity:** Probably about 20–40 years (B. Makinson pers. comm.).**Primary juvenile period:****Flowers:** Yellow, probably insect-pollinated, October.**Fruit/seed:****Dispersal, establishment & growth:****Fire response:** Probably killed.**Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** CT.**Distribution Sydney area:** Western Blue Mountains.**Select locations:** CT: River Lett, Hartley.

Habitat**Habitat:** Riverbanks.**Altitude:** 700–800 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Shrubland e.g. with *Acacia buxifolia*, *Calytrix tetragona*, *Hakea microcarpa*, *Lomatia myricoides*, *Callistemon*, *Leptospermum*.**Substrate:** Sandy soils on granite and alluvium within flood zone.**Exposure:**

Conservation**Conservation:** Rare, collected during 1830s and 1840s by Allan and Richard Cunningham (Wilson 1998a). Recently recorded by Bob Makinson (pers. comm. 10/2001). Conservation of the population will be critical.

Asterolasia correifolia

RUTACEAE

Life history

Growth form: Erect shrub 1–2 m high, with short, white to brown hairy covering on branches; leaves 3–9 cm long, with covering of star-like hairs on lower surface.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to cream, August–December, peak September–October.

Fruit/seed: Dehiscent, segmented fruit with dull black seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically. Seed has deciduous membranous flap that may function as an ant-attracting food body for dispersal (J. Howell pers. comm.).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT.

Distribution Sydney area: Widespread.

Select locations: CC: Martinsville, Glen Davis, Ourimbah, Wheeney Creek, Kincumber, Spencer, Mooney Mooney Creek, Cowan, Deep Creek (Narrabeen), Erskine Creek, Flemington (1898). CT: Burrawang.

Habitat

Habitat: Moist gullies.

Altitude: 0–600 m **Annual rainfall:** 600–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist eucalypt open-forest e.g. with *Eucalyptus deanei*, *E. saligna*, *Syncarpia glomulifera*, *Allocasuarina torulosa*, *Angophora costata*, *Eucalyptus piperita*.

Substrate: Sandy soils on Narrabeen shale, volcanic rocks, medium nutrients, well-drained.

Exposure: Light shade, sheltered.

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Dharug NP, Marramarra NP, Muogamarra NP, Ku-ring-gai Chase NP, Garigal NP.

Asterolasia elegans

RUTACEAE

Life history

Growth form: Slender, erect shrub 1–3 m high, with hairy covering on young branches; leaves 4–13 cm long with covering of rusty star-like hairs on both surfaces.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, July–September.

Fruit/seed: Dry dehiscent, segmented fruit, with dull black seeds, mature November–December.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically and has ant-attracting food body (J. Howell pers. comm.). Seed dormancy variable; seedbank is short-lived, with seedlings emerging regularly but probably not surviving in undisturbed community (Scott 1994). Germinates after 2 months of watering in the lab, with up to 80% success. Seed viability is 80–90% (Maria Matthes pers. comm.).

Fire response: Killed, with best seedling recruitment after fires of moderate to high intensity (Scott 1994).

Interaction with other organisms:

Status/origin: Native. Botanical subregions: CC. Distribution Sydney area: Lower Hawkesbury River. Select locations: CC: Leets Vale, Maroota.	Distribution
Habitat: Lower slopes above creek. Altitude: 0–100 m Annual rainfall: 900–1000 mm Typical local abundance: Frequent. Vegetation: Moist eucalypt open-forest e.g. with <i>Eucalytus piperita</i> , <i>Angophora costata</i> , <i>Syncarpia glomulifera</i> ; riparian forest e.g. with <i>Acmena smithii</i> , <i>Trochocarpa laurina</i> , <i>Ceratopetalum apetalum</i> . Substrate: Sandy to yellow clay soil on sandstone, low nutrients, well-drained. Exposure: Light shade, sheltered.	Habitat
Conservation: Restricted local endemic, listed as Endangered (Schedule 1) NSW <i>Threatened Species Conservation Act 1995</i> . Coded 2ECa on national rare species list (Briggs & Leigh 1996). May be threatened by too frequent fire, rubbish dumping, roadworks, nutrient run-off from changed landuse (Scott 1994). Reported in Marramarra NP.	Conservation

Asterolasia rivularis

RUTACEAE

Growth form: Erect shrub 1.5 m high (Wilson 1998a). Vegetative spread: Longevity: Primary juvenile period: Flowers: Yellow, rusty–stellate–hairy outside (Wilson 1998a), July–September. Fruit/seed: Not seen. Dispersal, establishment & growth: Fire response: Interaction with other organisms:	Life history
Status/origin: Native. Botanical subregions: CC. Distribution Sydney area: Avon Dam to Buxton. Select locations: CC: Avon Dam, Buxton.	Distribution
Habitat: Creek banks. Altitude: 300–500 m Annual rainfall: 900–1400 mm Typical local abundance: Vegetation: Substrate: Moist alluvial soil. Exposure:	Habitat
Conservation: Restricted local endemic, conservation status unknown.	Conservation

Boronia algida

RUTACEAE

Life history**Growth form:** Erect, much-branched shrub to 1 m high, young branchlets red.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pink or white, October–December.**Fruit/seed:** Dehiscent, 4-lobed fruit, with black seeds 2 mm long.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** SC NT CT ST SWS; Vic.**Distribution Sydney area:** Tablelands, sporadic.**Select locations:** CT: Winburndale, Katoomba, Mittagong, Penrose.**Habitat****Habitat:** Ridges.**Altitude:** 600–1000 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Heath, eucalypt open-forest.**Substrate:** Sandy soil over granite or sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Rare in the area, conservation status unknown.***Boronia anemonifolia* var. *anemonifolia***

RUTACEAE

Life history**Growth form:** Erect shrub to 2 m high, with glandular-warty leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale pink, August–January, peak September–October.**Fruit/seed:** Dehiscent, 4-lobed fruit, with black seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:** Resprouts from base.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST; Vic., Tas.**Distribution Sydney area:** Mainly Tablelands with restricted distribution at lower elevations.**Select locations:** CC: Piles Creek (Hawkesbury River), Maroota (L.McD.), Grose Vale, Five Dock. CT: Currant Mountain Gap, Kandos, Blackheath, Hampton, Yerranderie, Hill Top, Mittagong, Fitzroy Falls, Belmore Falls, Tallong.**Habitat****Habitat:** Among rocks.**Altitude:** 0–1000 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–rare.**Vegetation:** Open-forest e.g. with *Eucalyptus sieberi*; woodland e.g. with *Eucalyptus sparsifolia*, *E. rossii*; heath e.g. with *Banksia spinulosa*, *Hakea dactyloides*.**Substrate:** Shallow sandy soil over sandstone, low nutrients, well-drained.**Exposure:** Light shade.**Conservation****Conservation:** Conservation status unknown. Reported in Marramorra NP, Blue Mountains NP, Morton NP.

Boronia anethifolia

RUTACEAE

Life history**Growth form:** Shrub to 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale pink, June–September.**Fruit/seed:** Dehiscent, 4-lobed, with black seeds, November.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:** Probably killed.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS; Qld.**Distribution Sydney area:** Colo area, lower Blue Mountains.**Select locations:** CC: Central Colo, Maroota, Springwood, Tahmoor. CT: Glen Davis.**Habitat****Habitat:** Sandstone ridges, rocky slopes.**Altitude:** 0–600 m**Annual rainfall:** 600–1000 mm**Typical local abundance:** Rare.**Vegetation:** Eucalypt forest and woodland e.g. with *Angophora bakeri*, *Corymbia eximia*.**Substrate:** Low nutrient sandy soils on sandstone, well-drained.**Exposure:****Conservation****Conservation:** Uncommon, conservation status unknown.***Boronia barkeriana***

RUTACEAE

Life history**Growth form:** Shrub to 1 m high; branchlets often reddish.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Bright mauve to pink, August–December.**Fruit/seed:** Dehiscent, 4-lobed fruit, with black seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC NT CT ST; Qld.**Distribution Sydney area:** Upper Blue Mountains, Budderoo.**Select locations:** CC: Little Sirius Cove. CT: Blackheath, Carrington Falls.**Habitat****Habitat:** Heath, rock faces, moist places.**Altitude:** 0–1000 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Moist heath e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *Leptospermum trinervium*, *Banksia spinulosa*, *Allocasuarina nana*, rock faces with ferns.**Substrate:** Shallow peaty soil over sandstone, poorly-drained.**Exposure:****Conservation****Conservation:** Recorded for Little Sirius Cove (Mosman) in 1891 but now likely to be extinct there. Conservation status unknown. Reported in Budderoo NP.

Boronia deanei

RUTACEAE

Life history

Growth form: Erect, strong smelling shrub to 0.2 m–1.5 m high, with glandular-warty branchlets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to bright pink, September–December, peak October–November.

Fruit/seed: Dehiscent, 4-lobed fruit, with black seeds, December.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.

Fire response: Resprouts from base. Most conspicuous when flowering after fire.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT ST.

Distribution Sydney area: Newnes Plateau, Kanangra-Boyd, Southern Highlands.

Select locations: CT: Carne Creek, Newnes SF, Clarence, Farmers Creek, Whalania Heights, Carrington Falls, Fitzroy Falls.

Habitat

Habitat: Shrub swamps in valleys.

Altitude: 600–1200 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Rare.

Vegetation: Wet heath and sedge shrub swamp e.g. with *Gymnoschoenus sphaerocephalus*, *Grevillea acanthifolia*, *Lepidosperma limicola*, *Baeckea utilis*, *Leptospermum lanigerum*.

Substrate: Low nutrient peaty soils on sandstone, granite, poorly-drained.

Exposure:

Conservation

Conservation: Local endemic, listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Coded 3VCa on national rare species list (Briggs & Leigh 1996). Newnes Plateau is northern geographical limit. Reported in Kanangra-Boyd NP, Morton NP, Budderoo NP.

Boronia floribunda

RUTACEAE

Pale-pink *Boronia*

Life history

Growth form: Shrub generally 0.5 to 1 m high; leaves pinnate with 5–9 leaflets. ‘Nearly 10 feet high’ in Royal NP (Maiden & Campbell 1897).

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: White to pale pink, fragrant, September–January, peak October.

Fruit/seed: Dehiscent, 4-lobed fruit, with black seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.

Fire response: Resprouts from base (St Ives–Garigal NP 1995 L.McD.)

Interaction with other organisms: Reported by Maiden and Campbell (1897) that enormous quantities were sold in Sydney during spring, reputed to be ‘one of the most beautiful of our indigenous plants’, not as well known as *Boronia serrulata*.

Distribution

Status/origin: Native.

Botanical subregions: CC CT.

Distribution Sydney area: Widespread but uncommon, Hornsby Plateau, Blue Mountains.

Select locations: CC: St Ives, West Pennant Hills, Frenchs Forest, Bargo. CT: Mount Tomah, Wentworth Falls, Bonnum Pic, Bundanoon.

<p>Habitat: Ridgetops, rocky outcrops. Altitude: 0–1000 m Annual rainfall: 1200–1400 mm Typical local abundance: Frequent. Vegetation: Open-forest e.g. with <i>Eucalyptus piperita</i>, <i>Angophora costata</i>, <i>Corymbia gummifera</i>, <i>Eucalyptus sclerophylla</i>; heath e.g. with <i>Banksia ericifolia</i>, <i>Allocasuarina distyla</i>, <i>Hakea dactyloides</i>, <i>Eucalyptus stricta</i>. Substrate: Sandy loam soils on sandstone, low nutrient. Exposure:</p>	Habitat
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<p>Conservation: Now localised, conservation status unknown, small populations in Garigal NP, Ku-ring-gai Chase NP. Also reported in Blue Mountains NP, Nattai NP.</p>	Conservation

Boronia fraseri

RUTACEAE

<p>Growth form: Shrub to 2 m high, with stellate hairs on branchlets; leaves pinnate with 3–7 leaflets. Vegetative spread: Longevity: Primary juvenile period: Flowers: Usually bright pink, August–November, peak September–November. Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds. Mature October–November (Duretto 1999). Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically, also myrmecochorous (Rice & Westoby 1981). Fire response: Probably killed, only seedlings found in 2 year old burnt site at Jerusalem Bay (J. Thomas). Interaction with other organisms:</p>	Life history
<hr/>	
<p>Status/origin: Native. Botanical subregions: CC. Distribution Sydney area: Hornsby Plateau, lower Blue Mountains Select locations: CC: Somersby Falls, Wondabyne, Marramarra Creek (L.McD.), Jerusalem Bay, Cowan Creek, Bobbin Head, Oxford Falls, Lapstone Hill, Glenbrook Creek, Menangle.</p>	Distribution
<hr/>	
<p>Habitat: Gullies. Altitude: 0–500 m Annual rainfall: 1000–1200 mm Typical local abundance: Occasional–frequent. Vegetation: Moist eucalypt open-forest e.g. with <i>Acacia elata</i>; margins of gallery rainforest e.g. with <i>Ceratopetalum apetalum</i>, <i>Tristaniopsis laurina</i>. Substrate: Sandy soil on sandstone, low to medium nutrients. Exposure:</p>	Habitat
<hr/>	
<p>Conservation: Local endemic species, coded 2RCa on national rare species list (Briggs & Leigh 1996). Most known populations already within Conservation Reserves. Reported in Brisbane Water NP, Marramarra NP, Ku-ring-gai Chase NP, Blue Mountains NP.</p>	Conservation

Boronia ledifolia

RUTACEAE

Sydney Boronia, Ledum Boronia

Life history

Growth form: Erect, much branched shrub to 2.5 m high; leaves 1-foliolate or pinnate with 3–11 leaflets. Leaflet number per leaf increases along branches (Duretto 1999).

Vegetative spread: No.

Longevity: 10–15 years.

Primary juvenile period: 4–5 years (Benson 1985).

Flowers: Pale to bright pink, or rarely white, July–November, peak August–September. Probably pollinated by Honeybees, native bees, and flies (P. Kubiak pers. comm.).

Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds 4 mm long. Mature October–December (Duretto 1999).

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically; ant-adapted for dispersal (Westoby et al. 1990). Dormancy mechanism, needs leaching for 3 weeks, main recruitment after fire.

Fire response: Killed. Re-establish from soil-stored seed, in first year, generally with no subsequent recruitment.

Interaction with other organisms: Roots possibly eaten by rabbits, shoot damaged by rabbits but not eaten (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST CWS; Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Putty, Mangrove Mountain, Kulnura, Wondabyne, Glenorie, Arcadia, Berowra, Lindfield, Bents Basin, Glenbrook, Bundeena, Douglas Park, Bargo, Hill Top. CT: Bell, Mt Banks, Mt Victoria, Leura, Wanganderry Tableland, Bundanoon, Wingello.

Habitat

Habitat: Ridges, rocky outcrops.

Altitude: 0–1100 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Corymbia gunnifera*, *C. eximia*, *Angophora bakeri*, *A. costata*, *Eucalyptus piperita*, *E. punctata*.

Substrate: Sandy soil over Hawkesbury Sandstone, low nutrients, well-drained.

Exposure: Full sun to light shade.

Conservation

Conservation: Widespread and probably adequately conserved. Reported in Brisbane Water NP, Dharug NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP, Royal NP, Morton NP.

Boronia microphylla

RUTACEAE

Small-leaved Boronia

Life history

Growth form: Shrub 30–90 cm high; leaves pinnate with 5–15 small leaflets.

Vegetative spread: No.

Longevity: medium–long.

Primary juvenile period:

Flowers: Bright pink to rose purple, October–December, peak November.

Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.

Fire response: Stems killed, resprouts from base.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC SC NT CT CWS; Qld.

Distribution Sydney area: Upper Blue Mountains, Southern Highlands.

Select locations: CT: Kandos Weir, Newnes Plateau, Mt Wilson, Mount Tomah, Blackheath, Leura, Medway, Mittagong, Bullio.

	Habitat
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Habitat: Rocky ridges and slopes.	
Altitude: 600–1200 m	Annual rainfall: 800–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Woodland e.g. with <i>Eucalyptus sclerophylla</i> ; heath e.g. with <i>Eucalyptus stricta</i> .	
Substrate: Sandy soils on sandstone, low nutrient soils, well-drained.	
Exposure:	
	Conservation
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Conservation: Probably adequately, conserved. Reported in Blue Mountains NP, Wollemi NP.	

Boronia mollis

RUTACEAE

	Life history
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Growth form: Erect, much branched shrub to 2 m high; leaves pinnate with 3–9 hairy leaflets.	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: Pale to bright pink, August–November, peak September.	
Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds. Mature October–December (Duretto 1999).	
Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.	
Fire response:	
Interaction with other organisms:	
	Distribution
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Status/origin: Native.	
Botanical subregions: NC CC.	
Distribution Sydney area: Pittwater, Warragamba area.	
Select locations: CC: Palm Beach, Bayview, Terrey Hills, Narrabeen, Erskine Creek, Nortons Basin, Warragamba River.	
	Habitat
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Habitat: Moist gullies.	
Altitude: 0–200 m	Annual rainfall: 900–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Moist open-forest e.g. with <i>Syncarpia glomulifera</i> , <i>Backhousia myrtifolia</i> , <i>Elaeocarpus reticulatus</i> , <i>Livistona australis</i> .	
Substrate: Sandy alluvial soil, low nutrients.	
Exposure: Light to mid-shade.	
	Conservation
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Conservation: Warragamba is southern geographical limit. Conservation status 2R (Duretto 1999). Reported in Wollemi NP, Blue Mountains NP. Frequent in Katandra Bushland Sanctuary, which does not have NP or NR status (L.McD.).	

Boronia nana var. *hyssopifolia*

RUTACEAE

Life history**Growth form:** Dwarf shrub 8–25 cm high, with hairy branches; leaves 1-foliolate.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale pink, January.**Fruit/seed:** Dehiscent, 4-lobed, with black seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT ST SWS; Vic., Tas.**Distribution Sydney area:** Newnes Plateau.**Select locations:** CT: Newnes Plateau, Bungleboori picnic area.**Habitat****Habitat:** Upper slopes.**Altitude:** 1000–1200 m **Annual rainfall:** 1000–1100 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Eucalyptus pauciflora*, *E. dives*, *E. sieberi*.**Substrate:** Sandy soil, sometimes with shale influence, low nutrients.**Exposure:****Conservation****Conservation:** Newnes Plateau is northern geographical limit. Conservation status unknown.**Boronia parviflora**

RUTACEAE

Swamp Boronia

Life history**Growth form:** Herb or low shrub to 1 m high; leaves 1-foliolate.**Vegetative spread:****Longevity:** 25–60 years (D. Keith pers. comm.).**Primary juvenile period:** More than 5 years (Keith 1996).**Flowers:** Pale to bright pink, mainly August–March, peak March, September.**Fruit/seed:** Dry dehiscent, 4-lobed fruit, with black seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically and ant-adapted for dispersal (Rice & Westoby 1981). Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts, secondary juvenile period 1 year (Keith 1996).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Bateau Bay, Springwood, Gosford, Duffys Forest, Rose Bay, Maroubra, La Perouse, Kogarah, Bargo, Wollongong.**Habitat****Habitat:** Coastal swamp.**Altitude:** 0–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Peaty swamp and wet heath e.g. with *Viminaria juncea*, *Banksia robur*, *Goodenia stelligera*, *Callistemon citrinus*, *Drosera binata*.**Substrate:** Peaty soils and deep sandy swamps, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown though wetland habitats susceptible to disturbance. Reported in Brisbane Water NP.

Boronia pinnata

RUTACEAE

Life history

Growth form: Shrub 0.5–1.5 m high, with leaves and flowers strongly aromatic; leaves pinnate with 5–11 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bright to purplish pink, July–November, peak September–October. Probably pollinated mainly by Honeybees *Apis mellifera* and native bees, with flies playing a minor role (P. Kubiak pers. comm.).

Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds.

Dispersal, establishment & growth: Diaspore seed, dispersal both ballistic and ant-adapted (Westoby et al. 1990), also myrmecochore (Rice & Westoby 1981). Soil-stored seedbank (Fox 1988).

Fire response: Resprouts from base.

Interaction with other organisms: Larvae of fine longicorn beetle *Uracanthus triangularis* feeds on stem (Maiden & Campbell 1898). The first *Boronia* exported from Australia, grown in glasshouses in UK since 1830s (Johnson & Burchett 1996).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; ?Qld.

Distribution Sydney area: Mainly Hornsby Plateau and northern Sydney.

Select locations: CC: Somersby, Calga, Gosford, Cowan, Berowra, South Maroota, Arcadia, Terrey Hills, Hornsby, Thornleigh, Deep Creek, Frenchs Forest, Epping, Rose Bay, Waterfall, Helensburg. CT: Olinda, Mount Tomah.

Habitat

Habitat: Ridges and plateaus.

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent.

Vegetation: Eucalypt forest e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *Eucalyptus haemastoma*; heath e.g. with *Angophora hispida*, *Banksia ericifolia*.

Substrate: Deep earthy soils often with ironstone influence, on sandstone, low nutrients.

Exposure: Frost-tolerant, light shade (Johnson & Burchett 1996).

Conservation

Conservation: Probably adequately conserved. Reported in Wollemi NP, Dharug NP, Marramarra NP, Muogamarra NP, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP.

Boronia polygalifolia

RUTACEAE

Life history**Growth form:** Shrub or herb 8-60 cm high; leaves 1-foliolate.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale to bright pink, mainly October–June.**Fruit/seed:** Dry dehiscent, 4-lobed fruit, with black seeds.**Dispersal, establishment & growth:** Diaspore seed, dispersed ballistically.**Fire response:** May be apparent after fire, presumably from resprouts (D. Blaxell pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST; Qld.**Distribution Sydney area:** Cumberland Plain and Hornsby Plateau.**Select locations:** CC: Howes Valley, Morisset, Culoul Range, Maroota, Llandilo, St Marys, Glenbrook, Ryde, Duck River, Kogarah, Cronulla Beach, Thirlmere Lakes. CT: Barbers Creek.**Habitat****Habitat:** Periodically wet places.**Altitude:** 0–600 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Eucalyptus fibrosa*, *E. eugenioides*, *E. parramattensis*, *E. sideroxylon*, *Angophora bakeri*, *Melaleuca decora*; open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*.**Substrate:** Clay soils on shale e.g. Wianamatta Shale, or shale layers over sandstone, also sandy loam, medium nutrients, sometimes poorly drained.**Exposure:****Conservation****Conservation:** Rare, vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown, last reported from Barbers Creek in 1898. Reported in Wollemi NP.***Boronia rigens***

RUTACEAE

Life history**Growth form:** Shrub generally less than 40 cm high; leaves mostly 3-foliolate.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale pink, July–October.**Fruit/seed:** Dehiscent, 4-lobed, with black seeds, November.**Dispersal, establishment & growth:** Diaspore seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC CT ST SWS; Qld.**Distribution Sydney area:** Coast and Blue Mountains, sporadic.**Select locations:** CC: Kekeelbon Mountains, Maroota, Belrose (L.McD.), Maroubra, Botany, Bargo. CT: Newnes Plateau, Mt Wilson.**Habitat****Habitat:** Rocky ridges, creekbanks.**Altitude:** 0–1000 m**Annual rainfall:** 900–1200 mm**Typical local abundance:** Rare.**Vegetation:** Heath and eucalypt forest e.g. with *Eucalyptus sclerophylla*, *E. sieberi*.**Substrate:** Sandy soils on sandstone, low nutrients, sometimes periodically wet. Ironstone gravel over clay (at Belrose, L.McD.).**Exposure:** Full sun to light shade.**Conservation****Conservation:** Conservation status unknown. Reported in Blue Mountains NP, Muogamarra NR.

Boronia rubiginosa

RUTACEAE

Life history

Growth form: Shrub to 2 m high; branchlets with star-like hairs, leaves pinnate with 1–5 (–7) leaflets (Duretto 1999).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pink, July–November, peak September.

Fruit/seed: Dry dehiscent, 4-lobed fruit 4–6 mm long; seeds 3–4 mm long, October–December (Duretto 1999).

Dispersal, establishment & growth: Diaspore seed, dispersed ballistically.

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT CWS.

Distribution Sydney area: Colo area, western Blue Mountains, Southern Highlands.

Select locations: CC: Wisemans Ferry, Sackville, Kenthurst, East Kurrajong. CT: Dunns Swamp, Tayan Pic, Glen Davis, Genowlan Mountain, Berrima, Joadja.

Habitat

Habitat: Cliffs, rocky slopes, gully heads.

Altitude: 0–900 m **Annual rainfall:** 600–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Corymbia gummifera*, *C. eximia*.

Substrate: Sandy soil on sandstone, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Southern geographical limit is Berrima, conservation status 3RC- (Duretto 1999).

Boronia serrulata

RUTACEAE

Native Rose, Rose Boronia

Life history

Growth form: Shrub 0.5–1.5 m high; leaves strongly aromatic, broad, toothed, crowded and flattened over the stem.

Vegetative spread: No.

Longevity: Medium (15–20 years).

Primary juvenile period: Flowering maturity at 5 years (Benson 1985), bears an increasing number of flowers for another 5 years.

Flowers: Bright pink, August–October, peak September. Small diurnal moths may be pollinators (P. Kubiak pers. comm.).

Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds.

Dispersal, establishment & growth: Dispersal: both ballistic and ant-adapted (Westoby et al. 1990, Rice & Westoby, 1981). Soil-stored seedbank.

Fire response: Killed, re-established from soil-stored seed, germinating within 2 years of fire.

Interaction with other organisms: Larvae of fine longicorn beetle *Uracanthus triangularis* feeds on stem, egg-shaped pink galls on branches caused by wasp (Maiden & Campbell 1898).

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Wondabyne–Manly, Loftus–O'Hares Creek.

Select locations: CC: Scopas Peak (Wondabyne), Arcadia, Hornsby, Duffys Forest, Belrose, Frenchs Forest, Loftus, Bundeena, O'Hares Creek.

Habitat

Habitat: Rock outcrops and platforms.

Altitude: 0–200 m **Annual rainfall:** 1100–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist heath and low woodland e.g. with *Corymbia gummifera*, *Eucalyptus haemastoma*, *Banksia ericifolia*, *Leptospermum trinervium*, *Angophora hispida*, *Banksia serrata*.

Substrate: Sandy soil associated with rock outcrops and ironstone gravels on Hawkesbury Sandstone.

Exposure: Full sun to light shade.

Conservation

Conservation: Local endemic species, originally reasonably common on North Shore but now mostly destroyed by urban development. Main populations are now in Brisbane Water NP and Ku-ring-gai Chase NP. Survey work after 1994 fires indicate species abundant in localised populations (T. Auld pers. comm.). Also reported in Marramarra NP, Muogamarra NR. O'Hares Creek is southern limit (Keith 1994). Coded 2RC- on national rare species list (Briggs & Leigh 1996)

Boronia thujona

RUTACEAE

Life history

Growth form: Shrub or small tree 1–4 m high; leaves aromatic, pinnate with 3–15 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bright pink, August–November, peak October.

Fruit/seed: Dry dehiscent, 4-lobed fruit, with black seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.

Fire response: Killed after high intensity fire (at Katandra 1/1994), re-established from seedlings appearing within 5 months of fire (L.McD.).

Interaction with other organisms:

<p>Status/origin: Native.</p> <p>Botanical subregions: CC SC CT.</p> <p>Distribution Sydney area: Mainly coast and Southern Highlands.</p> <p>Select locations: CC: Coal and Candle Creek, Bayview, Mona Vale, Oxford Falls, Balgowlah, Flat Rock Creek (RNP), Wattamolla, Bulli Pass, Minnamurra Falls Reserve, Mount Jamberoo. CT: Wentworth Falls, Wildes Meadow, Carrington Falls, Bundanoon, Barrengarry Pass.</p>	Distribution
<p>Habitat: Gullies, creekbanks, cliffines, near waterfalls.</p> <p>Altitude: 0–1000 m Annual rainfall: 1200–1600 mm</p> <p>Typical local abundance: Occasional–frequent.</p> <p>Vegetation: Moist eucalypt open-forest e.g. <i>Eucalyptus sieberi</i>, <i>E. piperita</i>, <i>Tristaniopsis laurina</i>.</p> <p>Substrate: Moist sandy soils on sandstone, low nutrients.</p> <p>Exposure: Sheltered, medium shade.</p>	Habitat
<p>Conservation: Conservation status unknown. Reported in Garigal NP, Royal NP, Morton NP, Budderoo NP. Frequent in Katandra Bushland Sanctuary, which does not have NR or NP status (L.McD.).</p>	Conservation

Correa alba* var. *alba

RUTACEAE

White Correa

<p>Growth form: Erect shrub to 1.5 m high, with rusty-hairy stems.</p> <p>Vegetative spread:</p> <p>Longevity:</p> <p>Primary juvenile period:</p> <p>Flowers: White or rarely pale pink, cup-shaped, mainly April–June.</p> <p>Fruit/seed: Dehiscent, 1–4-lobed, with dull brown seeds.</p> <p>Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.</p> <p>Fire response:</p> <p>Interaction with other organisms: Leaves and roots eaten by wombat (Burns 1996).</p>	Life history
<p>Status/origin: Native.</p> <p>Botanical subregions: NC CC SC; Vic., Tas.</p> <p>Distribution Sydney area: Coastline.</p> <p>Select locations: CC: Swansea, Barrenjoey, Maroubra Bay, Lady Robinsons Beach, La Perouse, Kurnell, Cronulla, Port Kembla, Five Islands, Windang Island, Shellharbour.</p>	Distribution
<p>Habitat: Beaches and headlands, coastal islands.</p> <p>Altitude: 0–50 m Annual rainfall: 1200–1600 mm</p> <p>Typical local abundance: Frequent.</p> <p>Vegetation: Coastal heath e.g. with <i>Westringia fruticosa</i>, <i>Melaleuca armillaris</i>, <i>Aotus ericoides</i>; dune scrub e.g. with <i>Acacia longifolia</i>.</p> <p>Substrate: Sandy soil on dunes, sandstone, low nutrients.</p> <p>Exposure: Exposed to salt spray.</p>	Habitat
<p>Conservation: Conservation status unknown. Reported in Sydney Harbour NP.</p>	Conservation

Correa lawrenciana* var. *macrocalyx

RUTACEAE

Life history**Growth form:** Shrub or small tree 0.6–9 m high, with rusty-floccose stems.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish–yellow, tubular, May–December.**Fruit/seed:** Dehiscent, 1–4-lobed, to 9 mm long, with dull brown seeds, December.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Patonga (1929), Minnamurra Falls (1954).**Habitat****Habitat:****Altitude:** 0–200 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:** Moist forest?**Substrate:****Exposure:****Conservation****Conservation:** Rare and poorly known. Most recent collection Minnamurra (1954) is at southern geographical limit. Reported in Brisbane Water NP.***Correa reflexa* var. *reflexa***

RUTACEAE

Common Correa, Native Fuchsia

Life history**Growth form:** Decumbent or erect shrub 0.5–1.5 m high, with rusty-floccose stems.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Green or red and green, tubular, March–October, peak July–August.Pollen eaten by Red Wattlebird *Anthochaera carunculata*, Crescent Honeyeater *Phylidonyris pyrrhoptera*, New Holland Honeyeater *Phylidonyris novaehollandiae*, Tawny-crowned Honeyeater *Phylidonyris melanops*, Eastern Spinebill *Acanthorhynchus tenuirostris* (Barker & Vestjens 1989).**Fruit/seed:** Dehiscent, 1–4-lobed, 6–9 mm long, with dull brown seeds, October–November.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically, also ant-adapted for dispersal (Westoby et al. 1990). Soil-stored seedbank (Fox 1988).**Fire response:** Killed by fire (Fox 1988).**Interaction with other organisms:** Leaves and roots eaten by wombat (Burns 1996).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS SWS; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Widespread on coast, also Tablelands.**Select locations:** CC: Olney, Patonga Creek, Kurrajong Heights, Springwood, Turrumurra, Manly, Gladesville, Nortons Basin, Rookwood, Maroubra Bay, Oatley, Sutherland, Otford, Wedderburn, Douglas Park, Thirlmere Lakes, Hill Top. CT: Kandos Weir, Glen Davis, Katoomba Falls, Abercrombie Caves, Mt Jellore, Bundanoon.

	Habitat
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Habitat: Hillsides, gullies.	
Altitude: 0–800 m	Annual rainfall: 600–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Open-forest e.g. with <i>Corymbia eximia</i> , <i>Eucalyptus punctata</i> , <i>E. sparsifolia</i> , <i>E. pilularis</i> , <i>Angophora costata</i> , <i>Eucalyptus sieberi</i> , <i>E. muelleriana</i> .	
Substrate: Sandy soil on sandstone, clay soil on shale, occasionally basalt.	
Exposure:	
	Conservation
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Conservation: Probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.	

Crowea exalata

RUTACEAE

	Life history
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Growth form: Shrub to 1 m high.	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: Pink to pale mauve, sporadically, October–August.	
Fruit/seed: Dehiscent, 1–5-lobed fruit, with shiny brown seeds.	
Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically.	
Fire response:	
Interaction with other organisms:	
	Distribution
<hr/>	
Status/origin: Native.	
Botanical subregions: CC SC NT CT ST NWS SWS; Vic.	
Distribution Sydney area: Widespread.	
Select locations: CC: Glenorie, Grose Wold, Glenbrook, Woolwash, Woronora River, Tahmoor. CT: Mullion Creek, Blackheath, Hill Top.	
	Habitat
<hr/>	
Habitat: Rocky hillsides, ledges, cliffs.	
Altitude: 0–1000 m	Annual rainfall: 800–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Open-forest and woodland e.g. with <i>Corymbia eximia</i> .	
Substrate: Sandy soil on sandstone, low nutrients, well-drained.	
Exposure:	
	Conservation
<hr/>	
Conservation: Conservation status unknown.	

Crowea saligna

RUTACEAE

Life history**Growth form:** Slender shrub to 1.5 m high,**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pink to purple or rarely white. December–October, peaks February–April, July. Probably pollinated by native bees and small butterflies; the barricade of flower filaments may prevent nectar theft by small ants (P. Kubiak pers. comm.).**Fruit/seed:** Dry dehiscent fruit, 1–5-lobed, with shiny brown seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically and ant-adapted for dispersal (Westoby et al. 1990, Rice & Westoby 1981). Soil-stored seedbank.**Fire response:** Probably killed. Frequent seedlings within 5 months of high intensity fire (1/1994 at Katandra), in an area previously unburnt for more than 50 years (L.McD.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Coast, Gosford–Yerrinbool.**Select locations:** CC: Killcare, Kariong, Woy Woy, Bobbin Head, Hornsby, Oxford Falls, Frenchs Forest, Cremorne, Hunters Hill, Nielsen Park, La Perouse, Sutherland, Glenbrook, Yerrinbool, Springwood.**Habitat****Habitat:** Hillsides, often rocky.**Altitude:** 0–400 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Angophora costata*, *Eucalyptus piperita*, *Corymbia gunnifera*.**Substrate:** Sandy soil over sandstone, low nutrients, well-drained.**Exposure:** Sheltered.**Conservation****Conservation:** Local endemic species, conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP.***Eriostemon australasius***

RUTACEAE

Pink Wax Flower

Life history**Growth form:** Erect bushy shrub 1–2 m high.**Vegetative spread:** Limited root-suckering noted for some populations.**Longevity:** Medium, probably more than 30 years (Lion Island).**Primary juvenile period:** 4 years (Benson 1985).**Flowers:** Pink, June–December, peak August–October. Probably pollinated by honeybees, native bees; wasps, small butterflies and beetles may have a lesser role in pollination; large ants fed on nectar through a gap in the filaments, possibly created by chewing (P. Kubiak pers. comm.).**Fruit/seed:** Dehiscent, 1–5-lobed fruit, with dull–shiny, dark brown–black seeds.**Dispersal, establishment & growth:** Diaspore: seed, both ballistic and ant-adapted dispersal (Westoby et al. 1990, Rice & Westoby 1981). Soil-stored seedbank (Fox 1988). Requires rupturing of seed coat as well as leaching to induce germination (Langkamp 1987).**Fire response:** Variable. Populations on dune sand (e.g. at Eastflakes) can resprout or root sucker, possibly aided by sand movement; resprouted at Wheeny Creek (P. Hind specimen 1987). Probably killed in some situations on sandstone. Killed by fire at Myall Lakes (Fox 1988). Prolific seedling recruitment after high intensity fire (1/1994) at West Head and Muogamarra NR (L.McD.).**Interaction with other organisms:** Seeds eaten by Superb Lyrebird *Menura novaehollandiae* (Barker & Vestjens 1989,1990). Larvae of fine longicorn beetle *Uracanthus triangularis* feeds on stem (Maiden & Campbell 1898).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Qld.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Norah Head, Woy Woy, Maroota, Cowan, Terrey Hills, Pennant Hills, Rose Bay, La Perouse, Engadine, Kentlyn, Burragorang, Helensburgh, Appin, Maldon, Darkes Forest, Buxton, Bargo, Bulli, Hill Top. CT: Bell.

Habitat

Habitat: Well-drained rocky outcrops and stable dunes.

Altitude: 0–1000 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Corymbia gummifera*, *Angophora bakeri*, *Banksia serrata*, *Eucalyptus piperita*, *E. sieberi*, *E. sclerophylla*, *E. sparsifolia*, *E. punctata*; heath e.g. with *Angophora hispida*.

Substrate: Sandy soil on sandstone or sand, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Widespread on coast but only 1 record for Blue Mountains at Bell in 1909. Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Dharug NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Sydney Harbour NP, Georges River NR, Royal NP.

Geijera salicifolia* var. *latifolia* (*Geijera latifolia*)*RUTACEAE****Life history**

Growth form: Tree to 27 m high; leaves glossy green, paler undersurface, with raised midrib on both surfaces, more so below.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, November–April. Not automatically self-pollinated (Adam & Williams 2001).

Fruit/seed: Fruit globose 6 mm diam., with shiny blue-black seeds, held for a time after dehiscence of fruit. Seeds 6650 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Germination unpredictable (Floyd 1989).

Fire response:

Interaction with other organisms: Host to parasitic plant *Korthasella rubra* (Downey 1998).

Fruit eaten by Australian King Parrot, Brown Cuckoo-dove, Lewins Honeyeater and Scrub Turkey (Floyd 1989).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.G.

Distribution Sydney area: Illawarra, Camden area.

Select locations: CC: Cobbitty, Orchard Hills, Berkley, Calderwood, Albion Park, Minnamurra Falls, Whispering Gallery.

Habitat

Habitat: Gullies.

Altitude: 0–100 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Rare.

Vegetation: Dry rainforest e.g. with *Alectryon subcinereus*, *Planchonella australis*, *Streblus brunonianus*, *Citriobatus pauciflora*.

Substrate: Clay soils on shale, latite, alluvium, medium to high nutrients.

Exposure:

Conservation

Conservation: Minnamurra is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999) and probably now extinct at Cobbitty. Threatened by weed invasion and degradation of habitat.

Leionema dentatum (*Phebalium dentatum*)

RUTACEAE

Toothed Phebalium

Life history**Growth form:** Shrub or small tree to 6 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale yellow to white, August–October, peak September. Probably pollinated by honeybees, native bees and flies (P. Kubiak pers. comm.).**Fruit/seed:** Lobed fruit, segment 3.5 mm long; seeds 3 mm long, October–December.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:** White scale on stems, possibly *Gascardia destructor*, Coccidae, Hemiptera (P. Kubiak pers. comm.).

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT.**Distribution Sydney area:** Mainly coast.**Select locations:** CC: Boorai Creek, Mooney Mooney, Galston Gorge, Pennant Hills, Narrabeen, Frenchs Forest, Manly Dam, Woronora River, Kentlyn, Macquarie Fields, Campbelltown, Grose Vale, Springwood, Tahmoor, Shoalhaven Gorge. CT: Bowens Creek.

Habitat**Habitat:** Creekbanks, hillsides.**Altitude:** 0–500 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Riparian scrub e.g. with *Tristaniopsis laurina*, *Austromyrtus tenuifolia*, *Syncarpia glomulifera*, *Callicoma serratifolia*; open-forest e.g. with *Angophora costata*, *Bachousia myrtifolia*, *Eucalyptus piperita*, *E. pilularis*, *Ceratopetalum apetalum*, *Eucalyptus agglomerata*.**Substrate:** Rocky and sandy alluvium, sandy soil over sandstone, low nutrients.**Exposure:**

Conservation**Conservation:** Conservation status unknown. Reported in Wollemi NP, Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Georges River NR.***Leionema diosmeum*** (*Phebalium diosmeum*)

RUTACEAE

Life history**Growth form:** Shrub to 2 m high, with hairy stems and leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Creamy yellow, late June–October, peak September.**Fruit/seed:** Segmented fruit; single segment 4 mm long**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** CC SC CT ST.**Distribution Sydney area:** Coast south of Port Hacking, Southern Highlands.**Select locations:** CC: Sutherland, Waterfall, Mt Keira, Bulli, Maddens Plains, Barren Grounds. CT: Carrington Falls, Wingello.

<p>Habitat: Ridges, cliffs. Altitude: 0–700 m Annual rainfall: 1000–1800 mm Typical local abundance: Rare–occasional. Vegetation: Wet heath e.g. with <i>Hakea teretifolia</i>, <i>Aotus ericoides</i>, <i>Pultenaea elliptica</i>. Substrate: Shallow to deep sandy soil over sandstone. Exposure:</p>	Habitat
<p>Conservation: Sutherland is northern geographical limit (Harden 1991), conservation status unknown. Reported in Macquarie Pass NP.</p>	Conservation

Leonema lachnaeoides (*Phebalium lachnaeoides*)

RUTACEAE

<p>Growth form: Tall shrub, with whitish stem. Vegetative spread: No. Longevity: Primary juvenile period: Flowers: Pinkish to pale yellow, August–October, peak August. Flowering October–November (Cohn n.d.). Fruit/seed: August. Dispersal, establishment & growth: Diaspore: seed, released ballistically. Fire response: Interaction with other organisms:</p>	Life history
<p>Status/origin: Native. Botanical subregions: CT. Distribution Sydney area: Katoomba area. Select locations: CT: Nellies Glen, Bonnie Doon, Katoomba, Narrow Neck.</p>	Distribution

<p>Habitat: Cliff-top rocks and rock platforms. Altitude: 800–1000 m Annual rainfall: 1200–1400 mm Typical local abundance: Rare. Vegetation: Low shrubland e.g. with <i>Allocasuarina nana</i>, <i>Leptospermum trinervium</i>, <i>Baeckea ericifolia</i>; low woodland e.g. with <i>Eucalyptus stricta</i>, <i>Allocasuarina nana</i>, <i>Banksia marginata</i>. Substrate: Shallow sandy soil over sandstone, low nutrients, with moisture available, well-drained. Exposure:</p>	Habitat
<p>Conservation: Local endemic, listed as Endangered (Schedule 1) NSW <i>Threatened Species Conservation Act 1995</i>. Coded 2ECi on national rare species list (Briggs & Leigh 1996). Threatened by human interference, with potential for disturbance from run-off, sedimentation and erosion; reported in Blue Mountains NP at one site (Cohn, undated).</p>	Conservation

Leionema lamprophyllum* subsp. *orbiculare

RUTACEAE

*(Phebalium lamprophyllum)***Life history****Growth form:** Compact shrub to 2 m high; stems prominently warty.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White with pink tips, August–October.**Fruit/seed:** Segmented fruit; segments 3 mm long, October–December.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT ST; Vic.**Distribution Sydney area:** Western Blue Mountains, Rylstone–Lithgow.**Select locations:** CT: Mt Coricudgy, Kandos Weir, Wolgan Pinnacle, Newnes Plateau, Clarence.**Habitat****Habitat:** ‘Pagoda’ rock outcrops.**Altitude:** 600–1000 m **Annual rainfall:** 700–900 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath e.g. with *Banksia ericifolia*, *B. spinulosa*, *Calytrix tetragona*, *Brachyloma daphnoides*.**Substrate:** Skeletal sandy soil over sandstone outcrops, low nutrients.**Exposure:****Conservation****Conservation:** Rylstone district is northern geographical limit (Harden 1991), conservation status unknown. Reported in Wollemi NP.***Leionema* sp. *Hungryway Creek***

RUTACEAE

Life history**Growth form:** Shrub, with glandular-warty stems that are covered with star-like hairs.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellowish, May.**Fruit/seed:****Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Colo River.**Select locations:** CC: Hungryway Creek.**Habitat****Habitat:** Riparian zone.**Altitude:** 0–10 m **Annual rainfall:** 800–900 mm**Typical local abundance:** Dominant.**Vegetation:** Riparian scrub e.g. with *Tristaniopsis laurina*, *Stenocarpus salignus*, *Lomatia myricoides*, *Backhousia myrtifolia*.**Substrate:** Alluvial sand amongst sandstone boulders, low nutrients.**Exposure:****Conservation****Conservation:** Poorly known local endemic, conservation status unknown. Reported in Wollemi NP.

Leionema sympetalum (*Phebalium sympetalum*)

RUTACEAE

Rylstone Bell

Life history**Growth form:** Shrub 2–3 m high; stems covered with star-like hairs.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish yellow, June–December.**Fruit/seed:** Segmented fruit; single segment 4 mm long.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT.**Distribution Sydney area:** Coricudgy to Gospers Mountain.**Select locations:** CT: Currant Mountain Gap, Cooroogoba Creek, Gospers Mountain.**Habitat****Habitat:** Rocky outcrops.**Altitude:** 600–900 m **Annual rainfall:** 650–700 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Eucalyptus laophila*, *E. bensonii*; heath e.g. with *Allocasuarina distyla*, *Caustis pentandra*, *Acacia suaveolens*.**Substrate:** Sandy soil on sandstone, low nutrients, well-drained.**Exposure:** Exposed to wind.**Conservation****Conservation:** Local endemic, listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Coded 2VC- on national rare species list (Briggs & Leigh 1996).

Reported in Wollemi NP.

Melicope micrococca (*Euodia micrococca*)

RUTACEAE

Hairy-leaved Doughwood

Life history

Growth form: Shrub or slender tree to 27 m high, young growth often softly hairy; leaves divided with 3 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, summer–early autumn.

Fruit/seed: Grey to black segmented fruit, with shiny black seeds, March–May.

Dispersal, establishment & growth: Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990).

Fire response: Resprouts from base (Adam & Williams 2001).

Interaction with other organisms: Beetle *Trichaulax trichopyga* feeds on flowers January–February (Hawkeswood 1987).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area: Sporadic.

Select locations: CC: Hungryway Creek, Colo, Yarramalong, Lower Portland, Wheeny Creek, Eastwood, Menangle, Razorback, Albion Park, Gerringong, Minnamurra.

Habitat

Habitat: Sheltered gullies, creeks.

Altitude: 0–400 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional–rare.

Vegetation: Riverflat forest e.g. with *Eupomatia laurina*, *Streblus brunonianus*, *Ehretia acuminata*, *Tristaniopsis laurina*; rainforest e.g. with *Backhousia myrtifolia*, *Hymenanthera dentata*, *Melaleuca styphelioides*, *Streblus brunonianus*.

Substrate: Clay soils on shale, alluvium, medium nutrients.

Exposure: Mid-shade.

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status unknown. Reported in Wollemi NP.

Nematolepis squamea subsp. *squamea*

RUTACEAE

(Phebalium squameum subsp. *squameum*)

Satinwood

Life history

Growth form: Shrub or tree to 12 m high, with smooth stems and strongly aromatic leaves, with silvery undersurface.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, mainly September–October. September–December (Floyd 1989).

Fruit/seed: Segmented fruit; single segment 3 mm long, October–November. Fruit ripe December–February (Floyd 1989).

Dispersal, establishment & growth: Diaspore: seed, released ballistically. Easily raised from seed (Floyd 1989).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Qld, Vic., Tas.

Distribution Sydney area: Widespread.

Select locations: CC: Epping, Lane Cove River, Kurrajong Heights, Springwood, Thirlmere, Kangaroo Valley. CT: Currant Mountain Gap, Mt Wilson, Bowens Creek, Wentworth Falls, Carrington Falls, Robertson.

Habitat: Moist gullies. Altitude: 0–1000 m Annual rainfall: 900–1600 mm Typical local abundance: Frequent–occasional. Vegetation: Moist forest e.g. with <i>Angophora costata</i> , <i>Eucalyptus piperita</i> , <i>Ceratopetalum apetalum</i> , <i>Callicoma serratifolia</i> . Substrate: Sandy soils on alluvium, sandstone, also shale-influenced, low to medium nutrients. Exposure:	Habitat
Conservation: Conservation status unknown. Reported in Blue Mountains NP.	Conservation

Phebalium squamulosum* subsp. *argenteum

RUTACEAE

Scaly Phebalium

Growth form: Shrub to slender tree 1–7 m high, stems covered with rusty scales; leaves 3–10 mm wide, lower surface silvery, scaly. Vegetative spread: Longevity: Primary juvenile period: Flowers: Bright yellow inside, covered with rusty or silvery scales outside, August–October. Fruit/seed: Segmented fruit, individual segment 3.5 mm long, dehiscent at maturity. Dispersal, establishment & growth: Diaspore: seed, released ballistically. Fire response: Interaction with other organisms:	Life history
Status/origin: Native. Botanical subregions: NC CC SC CT; Vic. Distribution Sydney area: Sporadic. Select locations: CC: Wattamolla. CT: Bundanoon Creek.	Distribution
Habitat: Coastal headlands, creeks. Altitude: 0–600 m Annual rainfall: 1200–1400 mm Typical local abundance: Frequent–occasional. Vegetation: Coastal heath e.g. with <i>Westringia fruticosa</i> , <i>Melaleuca armillaris</i> . Substrate: Sandy soil on sandstone, low nutrients. Exposure:	Habitat
Conservation: Rare, only two records, conservation status unknown.	Conservation

Phebalium squamulosum* subsp. *ozothamnoides

RUTACEAE

Alpine Phebalium

Life history

Growth form: Shrub to slender tree 1–7 m high, stems covered with rusty scales; leaves 3–7 mm wide, roundish, lower surface smooth.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bright yellow inside, covered with rusty or silvery scales outside, September–December.

Fruit/seed: Segmented fruit, individual segment 3.5 mm long, dehiscent at maturity.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: ?CC NT CT ST; Vic.

Distribution Sydney area: Lithgow area.

Select locations: CT: Portland, Clandulla, Cullen Bullen, Lithgow, Mt York, Blackheath.

Habitat

Habitat: Exposed upper slopes.

Altitude: 600–1000 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Rare.

Vegetation: Heath e.g. with *Calytrix tetragona*, *Allocasuarina nana*, *Leptospermum parvifolium*.

Substrate: Sandy soils on sandstone, tuff, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. An unlikely CC record (Berowra to Peats Ferry, collected by J.H. Maiden, Oct 1895) needs field confirmation.

Phebalium squamulosum* subsp. *squamulosum

RUTACEAE

Scaly Phebalium

Life history

Growth form: Shrub to slender tree 1–7 m high, stems covered with rusty scales; leaves 2–10 mm wide, upper surface smooth, lower surface with rusty scales.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bright yellow inside, covered with rusty or silvery scales outside, August–October.

Fruit/seed: Segmented fruit, individual segment 3.5 mm long, dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990, Rice & Westoby 1981).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS; Qld, Vic.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Howes Valley, Mt White, Central Colo, East Kurrajong, Patonga, Oxford Falls, Frenchs Forest, Castlecrag, Manly, Cronulla, Waterfall, Bents Basin, Glenfield, Douglas Park, Buxton, Bomaderry. CT: Katoomba, Kings Tableland.

Habitat

Habitat: Ridges, hillsides.

Altitude: 0–1000 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Allocasuarina nana*, *Allocasuarina distyla*, *Banksia ericifolia*; low woodland e.g. with *Corymbia gummifera*, *C. eximia*, *Angophora hispida*; open-forest e.g. with *Eucalyptus deanei*, *Ceratopetalum apetalum*.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Mainly on coast, rare in Blue Mountains, conservation status unknown.

Reported in Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP.

Philotheca buxifolia* subsp. *buxifolia**RUTACEAE**

(*Eriostemon buxifolius* subsp. *buxifolius*)

Life history

Growth form: Small shrub to 1.3 m high; leaves roundish, thick, with lower surface keeled. Around Botany Bay and Port Hacking *P. buxifolia* subsp. *buxifolia* grades into *P. scaber* subsp. *scaber* (Harden 1991).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, pinkish in bud, August–October.

Fruit/seed: Segmented fruit, single segment 7 mm long, dehiscing at maturity, October–December.

Dispersal, establishment & growth: Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990).

Fire response: Killed and re-established from soil-stored seed.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC.

Distribution Sydney area: Coast and foreshores, mainly S of Port Jackson.

Select locations: CC: Mona Vale, North Head, Vaucluse, Balgowlah, Dobroyd Point, La Perouse, Cape Solander, Kurnell, Wattamolla.

Habitat

Habitat: Coast and adjacent plateaus.

Altitude: 0–200 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Coastal heath e.g. with *Westringia fruticosa*, *Melaleuca armillaris*; heath e.g. with *Calytrix tetragona*, *Banksia ericifolia*, *Allocasuarina distyla*.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Local endemic taxon restricted to coastline between Mona Vale and Wattamolla. Conservation status unknown.

Philotheca buxifolia* subsp. *obovata

RUTACEAE

(Eriostemon buxifolius subsp. *obovatus*)**Life history****Growth form:** Small shrub to 1.3 m high; leaves roundish, thick, with lower surface keeled.**Vegetative spread:****Longevity:****Primary juvenile period:** 5 years (Benson 1985).**Flowers:** White, pinkish in bud, mainly August–October. Honeybees *Apis mellifera* feed on nectar (P. Kubiak pers. comm.).**Fruit/seed:** Segmented fruit, single segment 7 mm long, dehiscing at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990).**Fire response:** Resprouted from base after high intensity fire 1/1994 at West Head (L.McD.)**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC.**Distribution Sydney area:** North of Port Jackson, Mangrove Mountain to Manly.**Select locations:** CC: Mangrove Mountain, Peats Ridge, Somersby, Calga, Wondabyne, Warrah, West Head, Frenchs Forest, Manly.**Habitat****Habitat:** Coast and adjacent plateaus.**Altitude:** 0–300 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Corymbia gummifera*, with shrubby understorey.**Substrate:** Sandy soil on sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** In the Sydney area *Philotheca buxifolia* subsp. *obovatus* occurs north of Port Jackson although it occurs on SC. Conservation status unknown. Reported in Brisbane Water NP, Lion Island NR, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP.***Philotheca hispidula* (*Eriostemon hispidulus*)**

RUTACEAE

Life history**Growth form:** Small shrub to about 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale pink, August–November, peak October. Honeybees *Apis mellifera* and flies (Diptera) feed on nectar (P. Kubiak pers. comm.).**Fruit/seed:** Segmented fruit, single segment 7 mm long, dehiscing at maturity, October–December.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:** Resprouts from base (Herb. specimen).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC CT.**Distribution Sydney area:** Blue Mountains, Colo area.**Select locations:** CC: Mellong Range, Wisemans Ferry, Loughtondale Gully, East Kurrajong, Kenthurst, Berowra, Yarramundi, Glenbrook, Springwood, Werombi, Thirlmere. CT: Mt Boonbourwa, Wentworth Falls, Woodford.

<p>Habitat: Ridges, hillsides. Altitude: 0–1000 m Annual rainfall: 900–1200 mm Typical local abundance: Frequent. Vegetation: Woodland e.g. with <i>Corymbia eximia</i>, <i>E. punctata</i>, <i>Corymbia gummifera</i>, <i>Angophora bakeri</i>; Open-forest e.g. with <i>Eucalyptus piperita</i>, <i>Syncarpia glomulifera</i>, <i>Angophora costata</i>; heath e.g. with <i>Eucalyptus stricta</i>, <i>Lambertia formosa</i>, <i>Banksia ericifolia</i>. Substrate: Sandy soil on sandstone, low nutrients, well-drained. Exposure:</p>	Habitat
<p>Conservation: Reported in Wollemi NP, Bouddi NP, Dharug NP, Marramarra NP, Muogamarra NR, Blue Mountains NP, Wollemi NP.</p>	Conservation

Philotheca myoporoides* subsp. *myoporoides

RUTACEAE

(*Eriostemon myoporoides*)

<p>Growth form: Shrub to 2 m high, stems moderately to faintly warty; leaves variable 6–22 mm wide. Vegetative spread: Longevity: Primary juvenile period: Flowers: White, August–November, peak September. Fruit/seed: Segmented fruit, single segment 7 mm long, dehiscing at maturity. Dispersal, establishment & growth: Diaspore: seed, released ballistically. Fire response: Interaction with other organisms: Food plant of butterfly larvae <i>Papilio aegesus aegesus</i> (Common & Waterhouse 1981).</p>	Life history
<p>Status/origin: Native. Botanical subregions: CC SC CT ST CWS; Qld, Vic. Distribution Sydney area: Widespread. Select locations: CC: Colo River, Grose Vale, Yarramundi, Agnes Banks, Glenbrook, Nortons Basin, Bents Basin, La Perouse, Menangle, Maldon, Tahmoor, Bargo River. CT: Genowlan Mountain, Lithgow, Mt Blaxland, Kanangra.</p>	Distribution

<p>Habitat: Rocky hillsides, creekbanks, waterfalls. Altitude: 0–1000 m Annual rainfall: 800–1200 mm Typical local abundance: Frequent. Vegetation: Riparian scrub e.g. with <i>Backhousia myrtifolia</i>, <i>Acacia floribunda</i>, <i>Ceratopetalum apetalum</i>, <i>Casuarina cunninghamiana</i>, <i>Tristaniopsis laurina</i>, <i>Acacia binervia</i>; woodland e.g. with <i>Corymbia eximia</i>, <i>Eucalyptus punctata</i>, <i>E. crebra</i>. Substrate: Shallow soils on sandy alluvium, sandy soil over sandstone, low nutrients. Exposure:</p>	Habitat
<p>Conservation: Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP, Kanangra Boyd NP, Morton NP.</p>	Conservation

Philothea obovalis (*Eriostemon obovalis*)

RUTACEAE

Life history**Growth form:** Small shrub to 1 m high, stems slightly hairy.**Vegetative spread:****Longevity:** Probably medium.**Primary juvenile period:****Flowers:** White, tinged with pink, September–March, peak November, January.**Fruit/seed:** Segmented fruit, single segment 4.5 mm long, dehiscing at maturity, February.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:** Resprouts from base.**Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** CT.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Mt Coricudgy, Pantoneys Crown, Wolgan Gap, Newnes Plateau, Clarence, Mt Wilson, Mt Victoria, Blackheath, Mt Hay, Katoomba.

Habitat**Habitat:** Rocky outcrops, ridges.**Altitude:** 900–1100 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Heath e.g. with *Allocasuarina nana*, *E. stricta*, *Banksia ericifolia*; open-forest e.g. with *Eucalyptus sclerophylla*, *E. sparsifolia*.**Substrate:** Shallow sandy soils on sandstone, low nutrient soils.**Exposure:**

Conservation**Conservation:** Local endemic, coded 3RCa on national rare species list (Briggs & Leigh 1996). Reported in Wollemi NP, Blue Mountains NP.***Philothea salsolifolia*** subsp. *salsolifolia*

RUTACEAE

Life history**Growth form:** Erect heath-like shrub to 2 m high, with thick, glabrous leaves, 1–2 mm wide.**Vegetative spread:** No.**Longevity:****Primary juvenile period:** 5 years (Benson 1985).**Flowers:** Pink to purple, August–February, peak September–October. Probably pollinated mainly by Honeybees *Apis mellifera* and native bees, with small butterflies may play a minor role; bugs (Hemiptera) may feed on nectar without pollinating (P. Kubiak pers. comm.).**Fruit/seed:** Segmented fruit, segment 5–6 mm long, with dull dark brown seed, fruit dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990, Rice & Westoby 1981).**Fire response:** Resprouts from base (at Agnes Banks, Benson 1981).**Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST NWS CWS NWP.**Distribution Sydney area:****Select locations:** CC: Brooklyn, West head, Agnes Banks, Oxford Falls, Nortons Basin, Coogee, La Perouse, Kurnell, Loftus, Bargo. CT: Mullions Range, Kanangra Walls, Blackheath, Berrima, Mittagong, Wombeyan Caves.

	Habitat
Habitat: Rocky or sandy sites.	
Altitude: 0–1000 m	Annual rainfall: 800–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Heath e.g. with <i>Allocasuarina distyla</i> , <i>Banksia ericifolia</i> , <i>Angophora hispida</i> , <i>Calytrix tetragona</i> ; woodland e.g. with <i>Corymbia eximia</i> , <i>Eucalyptus punctata</i> , <i>E. parramattensis</i> , <i>Angophora bakeri</i> ; open-forest e.g. with <i>Eucalyptus sieberi</i> , <i>E. globoidea</i> .	
Substrate: Sandy soil on sandstone, sometimes lateritic soil, low nutrients.	
Exposure:	
	Conservation
Conservation: Reported in Brisbane Water NP, Dharug NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal, Lane Cove NP, Sydney Harbour NP.	

Philotheca scabra* subsp. *latifolia

RUTACEAE

(Eriostemon scaber subsp. *latifolius)*

	Life history
Growth form: Small shrub to 0.6 m high, with markedly warty stems; leaves 1–5 mm wide, lower surface warty.	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: White to pink,	
Fruit/seed: Segmented fruit, segment 7 mm long, dehiscent at maturity.	
Dispersal, establishment & growth: Diaspore: seed, released ballistically.	
Fire response:	
Interaction with other organisms:	
	Distribution
Status/origin: Native.	
Botanical subregions: SC CT ST.	
Distribution Sydney area: Bundanoon.	
Select locations: CT: Bundanoon, Penrose.	
	Habitat
Habitat: Exposed rocky ridges.	
Altitude: 700–800 m	Annual rainfall: 1000–1200 mm
Typical local abundance:	
Vegetation: Open-forest; heath	
Substrate: Sandy soils on sandstone, low nutrients.	
Exposure:	
	Conservation
Conservation: Bundanoon is northern geographical limit, conservation status unknown.	

***Philotheca scabra* subsp. *scabra* (*Eriostemon scaber* subsp. *scaber*)**

RUTACEAE

Life history**Growth form:** Small shrub to 0.6 m high, with leaves 1–5 mm wide, lower surface warty.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pink, August–October.**Fruit/seed:** Segmented fruit, segment 7 mm long, dehiscent at maturity, September–December.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC.**Distribution Sydney area:** Sydney to Nowra.**Select locations:** CC: Manly, Oatley, Menai, Heathcote Creek, Campbelltown, O'Hares Creek, Bargo.**Habitat****Habitat:** Slopes above creeks.**Altitude:** 0–300 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus pilularis*, *Allocasuarina littoralis*; woodland e.g. with *Angophora bakeri*, *Eucalyptus haemastoma*.**Substrate:** Sandy soil on sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Manly is northern geographical limit. Conservation status unknown. Reported in Heathcote NP.***Philotheca trachyphylla* (*Eriostemon trachyphyllus*)**

RUTACEAE

Life history**Growth form:** Shrub or small tree 2–7 m high, with warty stems.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, January.**Fruit/seed:** Dehiscent, 1–5-lobed, with dull–shiny, dark brown–black seeds, October.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC CT ST CWS; Vic.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Darkey Creek, Botany Bay. CT: Tarana.**Habitat****Habitat:****Altitude:** 0–1000 m**Annual rainfall:** 800–1400 mm**Typical local abundance:****Vegetation:** Woodland e.g. with *Eucalyptus viminalis*, *Angophora floribunda* (at Tarana).**Substrate:** Granite soils, also probably sandy soils, low nutrients.**Exposure:****Conservation****Conservation:** Rare, recorded from three localities, Darkey Creek (Putty Creek) the northern geographical limit; Tarana (on 1/47 granite sites in Semple 1997) and Botany Bay (collected 1899 and probably extinct there). Conservation status unknown.

Sarcomelicope simplicifolia* subsp. *simplicifolia

RUTACEAE

*(Acronychia simplicifolia)***Life history****Growth form:** Shrub or small tree to 18 m high, with opposite leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male and female flowers on separate plants, autumn–winter.**Fruit/seed:** Yellowish to whitish fleshy fruit 10–15 mm diam., 1200 per kilogram (Floyd 1989). Fruit ripe mainly March–July.**Dispersal, establishment & growth:** Diaspore: fruit. Fresh seeds germinate after removal of the pulp, but germination is erratic (Floyd 1989).**Fire response:****Interaction with other organisms:** Fruit eaten by Green Catbird and White-headed Pigeon (Floyd 1989).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; LHI, Qld.**Distribution Sydney area:** Coast, mainly Illawarra.**Select locations:** CC: Belmont, Gooseberry Island, Bass Point, Albion Park, Kiama, Minnamurra Falls.**Habitat****Habitat:** Coastal rainforest.**Altitude:** 0–100 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:** Margins of warmer rainforest.**Substrate:** Sandy soils.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Zieria arborescens subsp. *arborescens* (*Z. arborescens* subsp. A)

RUTACEAE

Stinkwood

Life history**Growth form:** Tall robust shrub or small tree to 10 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, August–October.**Fruit/seed:** Segmented fruit dotted with oil glands, with dull black seed; fruit dehiscent at maturity, November–December.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically. Reported regrowing on cleared land (Herb. specimen).**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST; Qld.**Distribution Sydney area:****Select locations:** CC: Mogo Creek, Wyong, Bilpin, Kiama, Minnamurra Falls. CT: Mt Wilson, Mount Tomah, Blackheath, Woodford, Robertson.

Habitat**Habitat:** Gullies, sheltered sites.**Altitude:** 0–1000 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Moist open-forest e.g. with *Eucalyptus deanei*, *Syncarpia glomulifera*, *Dicksonia antarctica*; margins of rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*, *Acacia melanoxylon*.**Substrate:** Clay soils on shale, basalt, medium to high nutrients; occasionally on sandy soil on sandstone.**Exposure:**

Conservation**Conservation:** Conservation status unknown. Reported in Blue Mountains NP, Dharug NP.**Zieria aspalathoides**

RUTACEAE

Life history**Growth form:** Shrub to 1 m high, with leaves appearing simple, whorled, to 3 mm wide.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale to deep pink, hairy, September–October.**Fruit/seed:** Segmented fruit, with dull black seed; fruit dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NT CT NWS CWS SWS NWP SWP; Qld, Vic.**Distribution Sydney area:** Western Blue Mountains.**Select locations:** CT: Widdin Valley, Ben Bullen SF, Gardiners Gap, Glen Davis.

Habitat**Habitat:** Pagoda rock outcrops.**Altitude:** 600–1100 m**Annual rainfall:** 650–700 mm**Typical local abundance:** Occasional.**Vegetation:** Heath e.g. with *Calytrix tetragona*, *Callitris rhomboidea*; open-forest e.g. with *Eucalyptus piperita*, *Acacia terminalis*, *Isopogon dawsonii*.**Substrate:** Sandy soil on sandstone, low nutrients, well-drained.**Exposure:**

Conservation**Conservation:** Localised, conservation status unknown.

Zieria baeuerlenii (*Zieria* sp. *M*)**RUTACEAE****Life history**

Growth form: Small straggly, erect, ascending or decumbent shrub often more than 1 m high, with main stems often prostrate, and hairy, grey-green trifoliolate leaves; Stems of plants in area not burnt for 29 years may attain diameter 25 cm (Barratt 1997).

Vegetative spread: Layering reported by Mills (1996) but examination by Barratt (1997) failed to confirm this.

Longevity: ?indefinite.

Primary juvenile period:

Flowers: White to pink, July–November.

Fruit/seed: Fruit unknown, no seed production detected to date (Barratt 1997).

Dispersal, establishment & growth:

Fire response: Resprouts from base, possibly from rhizome (Barratt 1997).

Interaction with other organisms: Shoots probably eaten by rabbits (Barratt 1997).

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Nowra.

Select locations: CC: Bomaderry Creek.

Habitat

Habitat: Level to gently sloping sites often among rock outcrops.

Altitude: 0–10 m **Annual rainfall:** 1400 mm

Typical local abundance: Rare.

Vegetation: Open-forest–woodland e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *Corymbia maculata*, *Eucalyptus agglomerata*, *Syncarpia glomulifera*, *Eucalyptus imitans*; closed scrub e.g. with *Leptospermum sejunctum* (Barratt 1997).

Substrate: Shallow to moderately deep sandy soils over sandstone (Nowra Sandstone) with loose rocks, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Local endemic restricted to an area of about 0.5 km² at Bomaderry Creek near Nowra. Listed as Endangered (Schedule 1) under NSW *Threatened Species Conservation Act 1995*. Coded 2E on national rare species list (Briggs & Leigh 1996). Habitat in Bomaderry Creek Bushland threatened by road proposals and possible expansion of adjacent urban areas, as well as recreational use and vandalism (Barratt 1997).

Zieria caducibracteata

RUTACEAE

Life history

Growth form: Tall shrub or small tree to 6 m high; branches covered with star-like hairs and oil glands, leaves divided with 3 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White,

Fruit/seed: Segmented fruit, dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC ST.

Distribution Sydney area: Colo River.

Select locations: CC: Boorai Ridge.

Habitat

Habitat: Escarpment ranges.

Altitude: 400–500 m **Annual rainfall:** 900–1000 mm

Typical local abundance: Frequent.

Vegetation: Moist open-forest; rainforest margins.

Substrate: Sandy soils on sandstone, low to medium nutrients.

Exposure:

Conservation

Conservation: Colo River has localised disjunct population at northern geographical limit.

Conservation status unknown.

Zieria covenyi

RUTACEAE

Life history

Growth form: Erect shrub to 2 m high; leaves divided with 3 leaflets.

Vegetative spread: Root suckers.

Longevity: ?indefinite.

Primary juvenile period:

Flowers: White to pale pink, October–November.

Fruit/seed: Fruit not known.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Katoomba area.

Select locations: CT: Narrow Neck.

Habitat

Habitat: Ridgetops.

Altitude: 1000–1100 m **Annual rainfall:** 1000 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *Leptospermum trinervium*, *Banksia serrata*, *Telopea speciosissima*, *Brachyloma daphnoides*, *Lambertia formosa*, *Allocasuarina littoralis*, *Banksia cunninghamii*.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Local endemic known only from Narrow Neck Peninsula in the Blue Mountains. Coded 2VCi on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.

Zieria cytisoides

RUTACEAE

Downy Zieria

Life history

Growth form: Bushy shrub to 3 m high; branches velvety with star-like hairs; leaves aromatic, divided, with three leaflets. Multi-stemmed plants have been found in the Rylstone district.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep to pale pink or white, May–October, peak September.

Fruit/seed: Segmented fruit, with dull black seed; fruit dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Drews Creek, Colo Gorge, Nortons Basin, Leumeah, Menangle, Burragorang, Yerranderie, Bomaderry Creek. CT: Mt Coricudgy, Kandos Weir, Currant Mountain Gap, Gardiners Gap, Capertee, Wolgan Gap, Georges Plains, Mt Jellore, Tallong.

Habitat

Habitat: Rocky hillsides, pagoda rock formations, ridges.

Altitude: 0–1000 m **Annual rainfall:** 650–800 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*, *Allocasuarina torulosa*, *Backhousia myrtifolia*; woodland e.g. with *Corymbia eximia*, *E. punctata*.

Substrate: Sandy soil on sandstone, granite, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Yengo NP, Wollemi NP.

Zieria fraseri subsp. **compacta** (*Z. fraseri* subsp. *B*)

RUTACEAE

Life history

Growth form: Erect, bushy shrub to 1.5 m high; branches dotted with oil glands.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale pink, June–October, peak September.**Fruit/seed:** Segmented fruit, with dull black seed; fruit dehiscent at maturity, October–December.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:**

Distribution

Status/origin: Native.**Botanical subregions:** NC CC SC NT CT NWS CWS SWS; Qld.**Distribution Sydney area:****Select locations:** CC: Mountain Lagoon, Nortons Basin, Erskine Creek, Maldon Bridge, Thirlmere, Burragorang Lookout, Hill Top. CT: Currant Mountain Gap, Genowlan Mountain, Mt Gundangaroo, Glen Davis, Mt Canobla, Mt York, Church Creek, Mt Jellore, Berrima.

Habitat

Habitat: Steep rocky outcrops, ridges.**Altitude:** 0–1000 m**Annual rainfall:** 650–1000 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus punctata*, *Angophora costata*, *Eucalyptus pilularis*, *Corymbia eximia*, *Eucalyptus agglomerata*; riparian scrub e.g. with *Allocasuarina littoralis*, *Acacia longifolia*, *Daviesia corymbosa*.**Substrate:** Skeletal soils on granite, sandstone, slate, low nutrients.**Exposure:**

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP.**Zieria furfuracea**

RUTACEAE

Life history

Growth form: Medium to tall shrub, with warty, velvety branches; leaves divided with 3 leaflets.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, hairy, September.**Fruit/seed:** Segmented fruit, with dull black seed; fruit dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:**

Distribution

Status/origin: Native.**Botanical subregions:** NC CC NT.**Distribution Sydney area:****Select locations:** CC: Olney SF.

Habitat

Habitat:**Altitude:** 0–200 m**Annual rainfall:** 1400 mm**Typical local abundance:****Vegetation:** Open-forest; rainforest.**Substrate:****Exposure:** Exposed.

Conservation

Conservation: Olney SF near Wyong is southern geographical limit. Conservation status unknown.

Zieria granulata

RUTACEAE

Life history**Growth form:** Tall bushy shrub to 3 m high; leaves divided with 3 narrow leaflets.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, July–October, peak October.**Fruit/seed:** Segmented fruit, dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Illawarra area.**Select locations:** CC: Killalea SRA, Shellharbour, Whispering Gallery, Kiama, Saddleback Mountain Lookout, Jerrara Dam, Jamberoo, Fox Ground.**Habitat****Habitat:** Rocky outcrops, roadsides, near subtropical rainforest (Mills 1988).**Altitude:** 0–100 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest; rainforest margins e.g. with *Syncarpia glomulifera*, *Eucalyptus saligna*, *E. quadrangulata*.**Substrate:** Clay soils on basalt, latite, high nutrients, well-drained.**Exposure:****Conservation****Conservation:** Local endemic restricted to Illawarra region. Listed as Endangered (Schedule 1)NSW *Threatened Species Conservation Act 1995*. Rare, coded 2VCi on national rare species list (Briggs & Leigh 1996). Threatened by roadside mowing and clearing for hobby farms (Mills 1988).**Zieria involucreta**

RUTACEAE

Life history**Growth form:** Tall erect shrub covered with star-like hairs; leaves divided with 1–3 leaflets.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, mainly August–October.**Fruit/seed:** Segmented fruit, dehiscent at maturity, October–November.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC CT.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Womerah Range, Howes Range, Wheelbarrow Ridge, Leeds Vale, Lower Portland, Upper Marramorra Creek, Little Cattai Creek (L.McD.), Kurrajong, Spingwood, Valley Heights. CT: Katoomba.**Habitat****Habitat:** Steep sandy slopes, creeks, ridges.**Altitude:** 0–1000 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Moist open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus punctata*, *E. piperita*, *Allocasuarina torulosa*, *E. oreades*.**Substrate:** Sandy loam on sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*.

Coded 2VCa on national rare species list (Briggs & Leigh 1996). Reported in Wollemi NP, Parr NP, Marramorra NP.

Zieria laevigata

RUTACEAE

Life history**Growth form:** Glabrous shrub 30–100 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, July–October, peak August–September. Honeybees *Apis mellifera* and flies (Diptera) feed on nectar (P. Kubiak pers. comm.).**Fruit/seed:** Segmented fruit, dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically. Ant-adapted for dispersal (Rice & Westoby 1981, Westoby et al. 1990).**Fire response:** Probably killed.**Interaction with other organisms:** Food plant of butterfly larvae *Papilio aegaeus aegaeus* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Kulnura, Maroota, Belrose, Pennant Hills, Collaroy, North Head, Botany Bay, Como, Lucas Heights, Austinmer, Berambing. CT: Mt Coricudgy, Rylstone, Glen Davis, Mt Wilson, Mt Banks, Wentworth Falls, Kanangra, Wanganderry.**Habitat****Habitat:** Ridges, plateaus, cliffs.**Altitude:** 0–1000 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Heath e.g. with *Banksia ericifolia*, *Epacris microphylla*, *Angophora hispida*, *Boronia ledifolia*, *Grevillea buxifolia*; low forest e.g. with *Corymbia gummifera*, *Angophora costata*, *A. bakeri*, *Corymbia eximia*, *Eucalyptus haemastoma*, *E. racemosa*.**Substrate:** Skeletal soils on sandstone or granitic outcrops, low nutrients, well-drained.**Exposure:** Full sun.**Conservation****Conservation:** Probably adequately conserved, reported in Brisbane Water NP, Dharug NP, Marramarra NP, Muogamarra NP, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP, Blue Mountains NP.**Zieria laxiflora**

RUTACEAE

Life history**Growth form:** Erect shrub to 1.2 m high, with leaflets.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or pale pink, with a dense covering of hair, September.**Fruit/seed:** Fruit of 4 segments.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC.**Distribution Sydney area:** Swansea.**Select locations:** CC: Swansea.

Habitat: Sandy, swampy areas. Altitude: 0–100 m Annual rainfall: 1200–1400 mm Typical local abundance: Vegetation: Substrate: Sand dunes. Exposure:	Habitat
Conservation: Swansea is southern geographical limit. Conservation status unknown.	Conservation

Zieria murphyi

RUTACEAE

Growth form: Slender shrub 1–2 m high; divided leaves with 1–3 leaflets. Vegetative spread: No vegetative spread. Longevity: Primary juvenile period: Flowers: White–pale pink, September–October. Fruit/seed: Segmented capsule, with 1–4 segments, releasing seeds forcibly when dehiscing, seeds black. Dispersal, establishment & growth: Diaspore: seed, dispersed explosively. Fire response: Interaction with other organisms:	Life history
Status/origin: Native. Botanical subregions: CT. Distribution Sydney area: Mt Tomah, Bundanoon/Penrose. Select locations: CT: Mount Tomah, Bundanoon, Penrose.	Distribution
Habitat: Moist gullies. Altitude: 700–900 m Annual rainfall: 1100–1200 mm Typical local abundance: Occasional. Vegetation: Moist eucalypt forest Substrate: Sandy soil over sandstone, low nutrients. Exposure: Sheltered situations.	Habitat
Conservation: Local restricted endemic, listed as Vulnerable (Schedule 2) NSW <i>Threatened Species Conservation Act 1995</i> , coded 2VC- on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.	Conservation

Zieria obcordata

RUTACEAE

Life history

Growth form: Divaricate shrub to 0.5 m high, with warty, hairy branches; leaves divided, with 3 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or pale pink, September–October.

Fruit/seed: Segmented fruit, dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically.

Fire response:

Interaction with other organisms: Browsed by Wallabies (Herb. specimen).

Distribution

Status/origin: Native.

Botanical subregions: CT CWS.

Distribution Sydney area: Bathurst area.

Select locations: CT: Crackerjack Rock.

Habitat

Habitat: Rocky hillsides.

Altitude: 800 m

Annual rainfall: 600 mm

Typical local abundance: Rare.

Vegetation: Open-forest e.g. with *Callitris endlicheri*, *Eucalyptus macrorhyncha*, *E. goniocalyx*, *Acacia vestita*, *Stypandra glauca*.

Substrate: Skeletal gritty sand on granite.

Exposure:

Conservation

Conservation: Rare and localised, listed as Endangered (Schedule 1) NSW *Threatened Species Conservation Act 1995*. Coded 3E on national rare species list (Briggs & Leigh 1996).

Zieria pilosa

RUTACEAE

Life history

Growth form: Shrub to 1 m high, with hairy branches; leaves divided with 3 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to pale pink, May–November, peak September.

Fruit/seed: Segmented fruit, dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT.

Distribution Sydney area: Widespread.

Select locations: CC: Lughtondale, Cowan, Collaroy, Arncliffe, Woodford, Heathcote, Menai, Buxton, Dapto, Cambewarra, Shoalhaven River. CT: Mt Wilson, Bundanoon.

Habitat

Habitat: Hillsides.

Altitude: 0–800 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist open-forest e.g. with *Corymbia gummifera*, *Eucalyptus piperita*, *E. pilularis*, *Angophora costata*, *Syncarpia glomulifera*.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure: Full sun to mid-shade.

Conservation

Conservation: Conservation status unknown. Reported in Dharug NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP.

Zieria robusta

RUTACEAE

Life history

Growth form: Erect compact bushy shrub 2.5 m high; leaves divided with mostly 3 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to pink, September–December.

Fruit/seed: Segmented fruit, dehiscent at maturity.

Dispersal, establishment & growth: Diaspore: seed, released ballistically.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT NWS CWS; Vic.

Distribution Sydney area: Mainly Kanangra area.

Select locations: CT: Winburndale NR, Kanangra Walls, Kowmung River, Mt Werong.

Habitat

Habitat: Rocky outcrops, canyons, valleys.

Altitude: 800–1200 m **Annual rainfall:** 800–1000 mm

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus radiata*, *E. rossii*, *E. goniocalyx*, *E. viminalis*.

Substrate: Shallow soil on shale, conglomerate, granite, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Kanangra Boyd NP, Winburndale NR.

Zieria smithii

RUTACEAE

Sandfly Zieria, Stinkwood

Life history**Growth form:** Erect, robust shrub to 2 m high; leaves divided with 3 leaflets.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, July–March, peak August–October. Probably pollinated by native bees, flies (Diptera) and honeybees *Apis mellifera*, with small butterflies, wasps and bugs (Hemiptera) playing a lesser role (P. Kubiak pers. comm.).**Fruit/seed:** Segmented fruit, dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically. Ant-adapted for dispersal (Westoby et al. 1990).**Fire response:****Interaction with other organisms:** Food plant of butterfly larvae *Papilio aegaeus aegaeus* (Common & Waterhouse 1981). May be an important source of nectar for a variety insects in spring in Lane Cove River area; white wax scale may be *Gascardia destructor*, Coccidae, Hemiptera (P. Kubiak pers. comm.).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wyong, Mooney Mooney Creek, Sackville, Grose Vale, Glenbrook, Barrenjoey, Gordon, Lane Cove, Balls Head, Ashfield, Newington, Rookwood, Audley, Stanwell Park, Picton, Clifton, Macquarie Pass, Yerranderie, Minnamurra Falls, Shellharbour, Cambewarra. CT: Blackheath, Bundanoon.**Habitat****Habitat:** Gullies.**Altitude:** 0–600 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist open-forest e.g. with *Angophora costata*, *Eucalyptus pilularis*, *Syncarpia glomulifera*, *Eucalyptus deanei*, *Angophora floribunda*, *Eucalyptus piperita*, *E. oreades*; margins of rainforest e.g. with *Backhousia myrtifolia*, *Eleocarpus reticulatus*, *Tristaniopsis laurina*.**Substrate:** Loam on sandstone, sometimes with shale enrichment, medium nutrients.**Exposure:** Light to medium shade.**Conservation****Conservation:** Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Dharug NP, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP.**Zieria tuberculata** (*Zieria* sp. *C sensu*)

RUTACEAE

Life history**Growth form:** Bushy shrub to 3.5 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, November.**Fruit/seed:** Segmented fruit, dehiscent at maturity.**Dispersal, establishment & growth:** Diaspore: seed, released ballistically.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC.**Distribution Sydney area:** Cambewarra Range.**Select locations:** CC: Cambewarra Range.

Habitat: Edges of rainforest.
Altitude: 0–600 m **Annual rainfall:** 1400–1600 mm
Typical local abundance:
Vegetation:
Substrate:
Exposure:

Conservation

Conservation: Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act* 1995. Coded 2VCi on national rare species list (Briggs & Leigh 1996). Cambewarra Range is northern geographical limit (Mills 1988). Not conserved.

Populus alba* **SALICACEAE**

White Poplar

Life history

Growth form: Tree to 20 m with an erect habit; leaves lobed, toothed, deciduous.
Vegetative spread: Suckering from roots particularly in poorly drained ground (Harden 1990).
Longevity:
Primary juvenile period:
Flowers: Purplish, male and female flowers on separate plants.
Fruit/seed: Capsule 3 mm long packed with cotton-like hairs, with numerous seeds.
Dispersal, establishment & growth: Diaspore: seed.
Fire response:
Interaction with other organisms: Leaves of *Populus* sp. eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995).

Distribution

Status/origin: Exotic, native to temperate Eurasia and N Africa. Introduced as ornamental.

Botanical subregions: CC; Qld, Vic., W.A., N Afr.

Distribution Sydney area: Sydney suburbs.

Select locations: CC: Roseville (1951), Forestville, Manly (1950).

Habitat

Habitat: River edges, old plantings.
Altitude: 0–1000 m **Annual rainfall:** 1200–1400 mm
Typical local abundance:
Vegetation:
Substrate: Clayey soils.
Exposure:

Conservation

Conservation: Cultivated and occasionally locally naturalised by suckering from old plantings.

Populus nigra *

SALICACEAE

Lombardy Poplar

Life history**Growth form:** Tree to 30 m with a columnar habit; buds very sticky.**Vegetative spread:** Suckers from roots if parent tree is cut down.**Longevity:****Primary juvenile period:****Flowers:** Female flowers not known for this cultivar (Harden 1990).**Fruit/seed:****Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Leaves of *Populus* sp. eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Host to rust fungi *Melampsora medusae* and *M. larici-populina* (Harden 1990).**Distribution****Status/origin:** Exotic, native to Eurasia. Introduced as ornamental.**Botanical subregions:** CC; Vic.**Distribution Sydney area:****Select locations:** CC: Manly (1950).**Habitat****Habitat:** Old plantings.**Altitude:** 0–1000 m**Annual rainfall:** 800–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Cultivated and suckers freely, though probably not truly naturalised. Reported in Ku-ring-gai Chase NP.**Salix alba ***

SALICACEAE

White Willow

Life history**Growth form:** Tree to 12 m high with spreading crown; hybridizes freely with related species, especially with *S. fragilis* (Harden 1990). True *S. alba* is rare in Australia, most are probably *S. X rubens* (Cremer 1995).**Vegetative spread:****Longevity:****Primary juvenile period:** More than 4 years (Cremer et al. 1995).**Flowers:** Male and female flowers on separate plants, September–October. Pollination mainly by insects (Cremer et al. 1995).**Fruit/seed:** Seed 1 mm long, surrounded by loose hairy material; although not previously thought to regenerate from seed in Australia, abundant viable seed and seedlings have now been found (Cremer et al. 1995).**Dispersal, establishment & growth:** Diaspore: seed, viable for a few days only, germinating within one or two days on moist blotting paper in light (Cremer et al. 1995). Spreading by seed and rooted branches; seed collected more than 10 days after release is likely to be dead from old age (Cremer 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to temperate Eurasia.**Botanical subregions:** CC SC CT ST.**Distribution Sydney area:** Coast south of Sydney and Tablelands.**Select locations:** CC: Richmond. CT: Berrima.

Habitat: Riverbanks.
Altitude: 0–600 m **Annual rainfall:** 800–1000 mm
Typical local abundance:
Vegetation:
Substrate: Riverine alluvium.
Exposure:

Conservation

Conservation: Often abundant along rivers on the tablelands and coast south of Sydney but further north confined to tablelands (Harden 1991). To avoid spread by seed remove female plants (Cremer 1995).

Salix babylonica* **SALICACEAE**

Weeping Willow

Life history

Growth form: Tree to 20 m high with spreading crown and very weeping branches.

Vegetative spread: Occasional limited spread by rooting of detached branches.

Longevity:

Primary juvenile period:

Flowers: Only female plants in Australia, flowers appearing with leaves, September–October.

Fruit/seed: Seed rarely produced (Cremer 1995).

Dispersal, establishment & growth: Viable seed found, though no seedlings found so far; seed collected more than 10 days after release is likely to be dead from old age (Cremer 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to China. Introduced as ornamental.

Botanical subregions: NC CC ST CWS SWS; Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Glenfield, Cocks River, Carcoar.

Habitat

Habitat: Riverbanks, dams.

Altitude: 0–800 m **Annual rainfall:** 700–1000 mm

Typical local abundance: Occasional.

Vegetation:

Substrate: Riverine alluvium.

Exposure:

Conservation

Conservation: Probably the most widely planted and recognised willow in Australia; although there is no current evidence for spread by seed, the potential seems to exist (Cremer et al. 1995). Not truly naturalised. To avoid spread by seed, remove female plants; some 'weeping willows' are fertile hybrids of *S. babylonica* with *S. fragilis* or *S. alba* and do produce viable seed (Cremer 1995).

***Salix fragilis* ***

SALICACEAE

Crack Willow

Life history

Growth form: Spreading tree to 25 m high; mostly hybrids with *S. alba* (Harden 1990). Stem divides into major branches at ground level; base of branches breaks easily with an audible crack; never with weeping habit; breeds with *S. alba* var. *vitellina* (Cremer 1995).
Vegetative spread: Disperses and multiplies readily from broken branches (Cremer et al. 1995).

Longevity:**Primary juvenile period:****Flowers:** Male only, in Australia.**Fruit/seed:****Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Eurasia. Introduced as ornamental.**Botanical subregions:** NC CC SC CT ST SWS.**Distribution Sydney area:** Widespread on Tablelands.**Select locations:** CT: Meadow Flat, Oberon, Blayney, Bowenfels, Orange, Hartley, Sodwalls (1955).**Habitat****Habitat:** Low lying areas.**Altitude:** 800–1000 m**Annual rainfall:** 600–800 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Amongst the three most common willows in Australia and has spread aggressively in many rivers especially in Tasmania (Cremer et al. 1995).***Salix nigra* ***

SALICACEAE

Black Willow

Life history

Growth form: Spreading shrub or tree to 20 m high, usually with a single prominent trunk; male and female trees equally common. Hybrids *S. nigra* X *S. fragilis* uncommon (Harden 2000). May breed with *S. babylonica* (Cremer 1995).

Vegetative spread:**Longevity:****Primary juvenile period:** 3–8 years (Cremer et al. 1995).**Flowers:** Male and female catkins on separate plants. Pollination mainly by insects (Cremer et al. 1995).**Fruit/seed:** Capsule 5 mm long; seeds with silky hairs.**Dispersal, establishment & growth:** Diaspore: seed, water-dispersed; spread vegetatively by rooting branches (Harden 2000). Seed collected more than 10 days after release is likely to be dead from old age (Cremer 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N. America.**Botanical subregions:** NC CC ST SWS; Vic., S.A.**Distribution Sydney area:** Colo–Macdonald River area.**Select locations:** CC: Macdonald River, Colo River, Wrights Creek, Mogo Creek (H-NCMT 1996).

Habitat:
Altitude: 0–200 m **Annual rainfall:** 800–900 mm
Typical local abundance:
Vegetation:
Substrate:
Exposure:

Conservation

Conservation: Introduced as seed in 1960s and spreading aggressively by seed and rooted branches in rivers and roadside ditches; to avoid spread by seed remove female plants (Cremer 1995).

Sambucus australasica**SAMBUCACEAE**

Native Elderberry

Life history

Growth form: Evergreen shrub or small tree to 4 m high; leaves divided with 3 or 5 leaflets, one is terminal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, January–April.

Fruit/seed: Yellow, succulent, roundish fruit 5 mm diam., May.

Dispersal, establishment & growth: Diaspore: fruit

Fire response:

Interaction with other organisms: Sweet fleshy fruit eaten by Aboriginal people (Maiden 1889, Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Culoul Range, Gosford, Bulli Pass, Shellharbour, Minnamurra Falls, Cambewarra Range. CT: Mt Coricudgy, Mount Tomah, Burrawang, Moss Vale.

Habitat

Habitat: Rainforest.

Altitude: 0–1000 m **Annual rainfall:** 900–1800 mm

Typical local abundance: Occasional.

Vegetation: Cool temperate rainforest e.g. with *Doryphora sassafras*; warm temperate rainforest e.g. with *Dendrocnide excelsa*, *Cassine australe*, *Diospyros australis*, *Cryptocarya glaucescens*.

Substrate: Clay soils on shale, basalt, medium–high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP, Royal NP, Robertson NR.

Sambucus gaudichaudiana

SAMBUCACEAE

White Elderberry

Life history

Growth form: Evergreen shrub to 2 m high, with herbaceous stems from a perennial, tuberous rootstock.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, November–January.

Fruit/seed: Succulent, pale yellow or whitish, edible fruit (drupe), 5 mm long, weight 86 mg, with c. 3 seeds per fruit (extra data on seed & pulp characteristics in French 1991).

Dispersal, establishment & growth: Diaspore: fruit, probably animal-dispersed.

Fire response: Probably resprouts.

Interaction with other organisms: Sweet, fleshy fruit eaten by Aboriginal people (Maiden 1889, Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., Tas., S.A.

Distribution Sydney area:

Select locations: CC: Culoul Range, Lower Portland, Cobbitty, Kowmung River.

CT: Abercrombie Caves, Junction Reefs.

Habitat

Habitat: Locally moist sites in drier country, cliffs and footslopes.

Altitude: 0–800 m

Annual rainfall: above 700 mm

Typical local abundance: Frequent.

Vegetation: Moist forest e.g. with *Syncarpia glomulifera*, *Acacia parramattensis*; riverflat forest.

Substrate: Clay soils from basalt, slaty metamorphics, alluvium, medium nutrients.

Exposure: Sheltered, light shade.

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

***Sambucus nigra* ***

SAMBUCACEAE

Elderberry

Life history

Growth form: Deciduous shrub 2–5 m high; leaves divided with 3 or 5 leaflets, one is terminal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, October–December.

Fruit/seed: Black, succulent, roundish 5 mm long

Dispersal, establishment & growth: Diaspore: fruit, probably bird-dispersed.

Fire response:

Interaction with other organisms: Fruit edible but not palatable, used for making elderberry wine, wood used for skewers and in hand-made shoes; flowers eaten and used in fritters, drinks, and to give flavour to jam (Cribb & Cribb 1984).

Distribution

Status/origin: Exotic, native to Europe and W Asia. Introduced as ornamental.

Botanical subregions: NC SC CT ST; Vic., Tas., S.A.

Distribution Sydney area: Bathurst–Orange area.

Select locations: CT: Canobolas SF, Carcoar.

Habitat: Altitude: 700–1000 m Annual rainfall: 600–1000 mm Typical local abundance: Occasional–frequent. Vegetation: Woodland e.g. with <i>Eucalyptus dives</i> . Substrate: Exposure:	Habitat
Conservation: Cultivated as ornamental, occasionally locally naturalised in Bathurst–Orange area.	Conservation

Choretrum candollei

SANTALACEAE

White Sour Bush

Growth form: Erect shrub 1–5 m high, with very small leaves, usually on young branches. Hemi-parasite on roots of other plants. Probably hybridizes with <i>C. pauciflora</i> . Vegetative spread: Longevity: Primary juvenile period: Flowers: White or cream, very small, at any time of year, with peaks in August–November and May. Fruit/seed: Greenish, roundish fruit 3–6 mm diam., succulent at first then dry, with one seed, matures in summer. Dispersal, establishment & growth: Diaspore: fruit Fire response: Resprouts from base, reaching flowering maturity within 4 years of high intensity fire (Fox 1988). Interaction with other organisms: Foodplant of moth caterpillar <i>Chelepteryx chelepteryx</i> (Coupar & Coupar 1992).	Life history
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Status/origin: Native. Botanical subregions: NC CC SC NT CT ST NWS SWS; Qld. Distribution Sydney area: Coast and ranges. Select locations: CC: Morisset, Willoughby, Helensburgh, Springwood, Barren Grounds. CT: Nullo Mountain, Mt Coricudgy, Portland, Mt Wilson, Mount Banks, Blackheath, Wentworth Falls, Lawson, Hill Top, Carrington Falls.	Distribution
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Habitat: Sandstone ridges. Altitude: 0–1000 m Annual rainfall: 900–1400 mm Typical local abundance: Frequent–occasional. Vegetation: Open-forest e.g. with <i>Eucalyptus pilularis</i> , <i>Angophora costata</i> , <i>Allocasuarina littoralis</i> , <i>Syncarpia glomulifera</i> , <i>Eucalyptus piperita</i> , <i>E. sideroxylon</i> . Substrate: Sandy soil on sandstone, low nutrients. Exposure:	Habitat
Conservation: Conservation status unknown. Reported in Blue Mountains NP, Royal NP, Buderoo NP, Morton NP.	Conservation

Choretrum pauciflorum

SANTALACEAE

Dwarf Sour Bush

Life history

Growth form: Spreading to ascending shrub or undershrub to 2 m high, with very small leaves. Probably hybridizes with *C. candollei* (Harden 1992). Hemi-parasite on roots of other plants.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to cream, very small, June–January, peak October.

Fruit/seed: Roundish fruit 4–6 mm diam., with one seed, succulent at first then dry, November–January.

Dispersal, establishment & growth: Diaspore: fruit.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST; Vic.

Distribution Sydney area: Mainly Tablelands.

Select locations: CC: Appin. CT: Hill End, Portland, Sunny Corner, Clarence, Blackheath, Wentworth Falls, Kanangra Walls, Mt Werong, Wombeyan, Hill Top, Mittagong, Fitzroy Falls, Wingello.

Habitat

Habitat: Gullies.

Altitude: 0–1200 m

Annual rainfall: 750–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus dalrypleana*, *E. pauciflora*; woodland e.g. with *Eucalyptus sclerophylla*.

Substrate: Sandy soils on sandstone, quartzite, shale, granite, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Conservation status unknown.

***Choretrum* sp. A**

SANTALACEAE

Life history

Growth form: Erect, yellowish green shrub or small tree to 5 m high, with very small leaves on young stems and growing tips

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or cream, very small, April.

Fruit/seed: Succulent at first, roundish 3–7 mm diam.

Dispersal, establishment & growth: Diaspore: fruit

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC CT CWS; Qld.

Distribution Sydney area: Widespread but sporadic.

Select locations: CC: Drews Creek, Wollombi. CT: Newnes Plateau, Wentworth Falls.

Habitat

Habitat: Hillsides, ridges.

Altitude: 0–1000 m

Annual rainfall: 900–1200 mm

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *E. radiata*, *E. dives*.

Substrate: Sandy soils on sandstones.

Exposure:

Conservation

Conservation: Wentworth Falls is southern geographical limit, conservation status unknown. Reported in Yengo NP.

Exocarpos cupressiformis**SANTALACEAE**

Cherry Ballart, Native Cherry

Life history

Growth form: Shrub to small tree to 8 m high, with cypress-like appearance, branchlets often drooping and graceful; leaves very small, scale-like on new growth. Hemi-parasite upon roots of other plants, commonly eucalypts but also other species.

Vegetative spread: Limited root suckering.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Very small, in short spikes or clusters, July–March, peak March. Small fly (Diptera) apparently feeds on flowers (P. Kubiak pers. comm.).

Fruit/seed: Succulent, roundish fruit 4–6 mm long with one seed, resting on a yellow to red, edible, succulent pedicel. Fruit weight 282 mg (extra data on seed & pulp characteristics in French 1991). Berries eaten by Black-faced Cuckoo-shrike *Coracina novaehollandiae* (Barker & Vestjens 1989, 1990). Seed eaten by Australian King Parrot *Alisterus scapularis*, Crimson Rosella *Platycercus elegans* (Lepschi 1993). Mature August–January.

Dispersal, establishment & growth: Diaspore: fruit. Hard seed is difficult to germinate.

Fire response: Resprouts with numerous suckers from lateral roots and from rootstock, seedlings recorded less than 1 year after fire (Purdie 1977).

Interaction with other organisms: Host to parasitic shrub *Viscum articulatum* (Downey 1998). Foodplant of moth caterpillars *Chelepteryx chlepteryx*, *Genduara punctigera*, *Teia anartoides*, *Ctenomeristis almella* and *Digglesia australasiae*; *Xanthodule ombrophanes* feeds on lichens and algae often found on the branches (Common 1990). Foodplant of butterfly larvae *Delius aganippe* (Common & Waterhouse 1981). Host plant of Cerambycid beetle *Coptopterus cretifera* (Hawkeswood 1993).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Tuggerah, Wyong, Avalon, Epping, Castlereagh NR, Glenbrook, St Marys, Kurnell, Liverpool, Razorback, Berry CT: Blackheath, Oberon, Katoomba, Abercrombie Caves.

Habitat

Habitat: Flat areas to rocky hillsides.

Altitude: 0–1000 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. sclerophylla*; scrub e.g. with *Banksia integrifolia*, *Allocasuarina littoralis*.

Substrate: Various, dune sand, sandy soils on sandstone, shale–sandstone transition, slate, clay soils on shale, basalt, low to high nutrients, well-drained.

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Lion Island NR, Castlereagh NR, Dharug NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP.

Exocarpos strictus

SANTALACEAE

Pale-fruit Ballart, Dwarf Cherry

Life history

Growth form: Erect shrub to 3.5 m high, light green, bronzy, blue-green or greyish, may have many stems. Hemi-parasite on roots of other plants.

Vegetative spread: Often forming dense thickets, presumably from root suckers.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Very small, in short clusters, July–November, peak September.

Fruit/seed: Succulent, roundish, shiny, green to purplish black fruit, 4 mm long, with seed resting on succulent pedicel which is whitish or reddish at fruiting stage; one seed. Mature September–January.

Dispersal, establishment & growth:

Fire response: Resprouts from base.

Interaction with other organisms: Host to parasitic shrub *Viscum articulatum* (Downey 1998). Foodplant of butterfly larvae *Delius aganippe* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST CWS SWS SWP SFWP; Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Kindarun Mountain, Maroota, Glenbrook, Bents Basin, Ingleburn, Kentlyn, Helensburgh, Appin, Thirlmere. CT: Mt Coricudgy, Kandos, Mt Vincent, Clarence, Kanangra, Mt Werong, Hill Top, Bundanoon.

Habitat

Habitat: Ridges and rocky slopes.

Altitude: 0–1000 m

Annual rainfall: 800–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Corymbia eximia*, *Angophora costata*, *Eucalyptus blakelyi*.

Substrate: Variable, sandy soil on sandstone, clay soil on shale, basalt, low to high nutrients, well-drained.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Dharug NP.

Leptomeria acida

SANTALACEAE

Native Currant, Sour Currant Bush

Life history

Growth form: Erect shrub 1–3 m high, with very small leaves that are soon shed.

Hemi-parasite on roots of other plants.

Vegetative spread: No.

Longevity: 25–60 years (D. Keith pers. comm.).

Primary juvenile period: 7 years (R. Lembit pers. comm.).

Flowers: Very small greenish-brown, December–May, peak January.

Fruit/seed: Succulent, roundish, greenish sometimes purplish, acid, edible, 7 mm long, with one seed about 3 mm diam. Fruit mature May–November depending on aspect, altitude etc.

(R. Lembit pers. comm.). Seeds may be prone to predation by ants (French & Westoby 1996).

Dispersal, establishment & growth: Diaspore: fruit, possibly dispersed by birds, seed very difficult to germinate.

Fire response: Killed, recruitment mainly after fire (D. Keith pers. comm.). Seedlings not observed on one site previously inhabited by this species five years after fire; at another site (near Deep Pass), flowering and fruit set occurs 7 years after fire (R. Lembit pers. comm.). Reported to resprout from above ground at Myall Lakes (Fox 1988).

Interaction with other organisms: Host plant of Jewel Beetle *Cisseis vicina* (Webb 1993). Fruit contains moderate amount of vitamin C, 21 mg/100 gm, eaten by Aboriginal people and European settlers (Low 1988). Sour to taste (E.J. McBarron Herb. note).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Mount White, Bowen Mountain, Cheltenham, Hunters Hill, Rose Bay, Abbotsford, Kurnell, Loftus, Helensburgh, Bulli. CT: Mt Coricudgy, Glen Davis, Marrangaroo, Mount Wilson, Blackheath, Hill Top, Moss Vale, Carrington Falls, Sutton Forest, Wingello.

Habitat

Habitat: Sheltered situations.

Altitude: 0–1000 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *E. radiata*, *E. sieberi*, *E. haemastoma*, *Angophora costata*, *Eucalyptus mannifera*; shrubby understorey.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure: Sheltered.

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP, Brisbane Water NP, Dharug NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP, Blue Mountains NP, Budderoo NP, Nattai NP.

Leptomeria drupacea**SANTALACEAE****Life history**

Growth form: Erect, broom-like shrub to 3 m high, with very small leaves that are soon shed.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Very small, white, late spring–summer.

Fruit/seed: Fleshy, oval, 3–6 mm long, January.

Dispersal, establishment & growth: Diaspore: fruit.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC NT CT ST; Tas.

Distribution Sydney area: Orange area.

Select locations: CT: Ophir.

Habitat

Habitat:

Altitude: 800 m **Annual rainfall:** 800–900 mm

Typical local abundance: Rare.

Vegetation: Open-forest

Substrate: Shallow rocky soil

Exposure:

Conservation

Conservation: Rare, only one record for the area, on Orange–Ophir road in 1961. Conservation status unknown.

Omphacomeria acerba**SANTALACEAE****Life history**

Growth form: Erect to divaricate shrub about 1.3 m high, with very small scale-like leaves that are soon shed. Hemi-parasite on roots of other plants; *Eucalyptus piperita* is a possible host.

Vegetative spread: Strongly rhizomatous (M. Gray pers. comm.).

Longevity:

Primary juvenile period:

Flowers: Male flowers in short spikes, with yellowish, solitary female flowers on different plants. Local populations may include both male and female plants.

Fruit/seed: Succulent, green to purplish, acidic, edible 6–12 mm long, with one seed, June–November.

Dispersal, establishment & growth: Diaspore: fruit.

Fire response: Possibly resprouts. No seedlings recorded more than 1 year after fire (Purdie 1977).

Interaction with other organisms: Stems often infested with insect galls.

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT ST CWS; Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Marsden Park, Castlereagh NR, Cheltenham, Bankstown, Kogarah, Kurnell, Springwood, Campbelltown, Bargo. CT: Gospers Mountain, Mullion Creek, Sunny Corner, Yetholme, Clarence, Blackheath, Wentworth Falls, Mt Werong, Hill Top, Wingello.

Habitat

Habitat: Ridges, rocky outcrops of sandstone or flatter country.

Altitude: 0–1000 m **Annual rainfall:** 650–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Allocasuarina torulosa*, *Eucalyptus consideniana*, *E. sieberi*, *E. rossii*; Castlereagh Woodland e.g. with *Eucalyptus fibrosa*, *Melaleuca decora*, *Eucalyptus parramattensis*.

Substrate: Sandy soil on sandstone, granite, Tertiary alluvium, metamorphics, low to medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Santalum obtusifolium

SANTALACEAE

Santalwood

Life history

Growth form: Erect glaucous shrub to 2.5 m high, with leaves 2–6 cm long. Hemi-parasitic on roots of other plants.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Small, whitish, September–February.

Fruit/seed: Succulent, roundish, purple fruit 10 mm long, with one seed, November–February.

Dispersal, establishment & growth: Diaspore: fruit.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Kurrajong, Springwood, Wallacia, Casula, Ingleburn, Audley, Douglas Park, Albion Park, Bulli, Minnamurra. CT: Megalong Valley, Hill Top, Mt Jellore, Mittagong.

Habitat

Habitat: Riverbanks, gullies, hillsides.

Altitude: 0–700 m

Annual rainfall: 900–1200 mm

Typical local abundance: Rare–occasional.

Vegetation: Moist open-forest e.g. with *Eucalyptus quadrangulata*, *E. muelleriana*, *E. saligna*, *E. piperita*, *E. globoidea*, *Angophora floribunda*.

Substrate: Sandy soils on sandstone, granite, alluvium, also on basalt, low to high nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

Thesium australe**SANTALACEAE**

Australian Toadflax

Life history

Growth form: Erect herb to 40 cm high with slender wiry stems. Hemi-parasite on roots of other plants.

Vegetative spread: No (McIntyre et al. 1995).

Longevity: 2–3 years (Scarlett et al. 1994), less than 2 years (Griffith 1992).

Primary juvenile period: Less than 1 year (Archer 1987).

Flowers: Small, greenish-yellow, October–January.

Fruit/seed: Fleshy, dry, nut-like, roundish 2 mm diam., with one seed, summer.

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995). Seed can remain dormant for at least 12 months (Archer 1987). Exposure to heat of fire or hot summers may stimulate mass germination, with land use and weather conditions in following summer critical to survival; sub-zero temperature does not stimulate germination (Archer 1987).

Germination facilitated by immersion in 1 M HCl for 24 hours, cold treatment at 5°C for 2–3 months, then 20–25°C; germinates when planted with *Themeda australis* hosts in potting mix and natural soil (1:1) (Scarlett & Parsons 1992). Although *Thesium australe* has good reproductive vigour, germination is very erratic in the wild; on coastal headlands growth continues during coolest months (Griffith 1992). Variable growth rate possibly reflected health and vigor of host plant (Archer 1987).

Fire response: Probably killed. Germination stimulated by fire (Archer 1984), but may germinate in absence of fire (Scarlett et al. 1994). Favoured by medium-term absence of fire, depleted by late-season burning (Griffith 1992).

Interaction with other organisms: Parasitic on roots of other plants, not selective of hosts, attaches by cup-like appendages to the roots (Archer 1984), e.g. *Themeda australis* (in Victoria); severely grazed by cattle, horses, rabbits, kangaroos and wombats, as well as grasshoppers; eaten by slugs and possibly Common Garden Snails *Helix aspersa* (Scarlett et al. 1994), heavily grazed by sheep, trampling by pedestrians and motor vehicles (Griffith 1992), main threat to survival by grazing cattle (in Victoria, Archer 1987).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT ST NWS CWS; Qld, Vic., Tas., E Asia.

Distribution Sydney area: Originally western Sydney.

Select locations: CC: Camden 'Cow Pastures' (1803).

Habitat

Habitat: Often in damp sites.

Altitude: 0–300 m

Annual rainfall: 750 mm

Typical local abundance:

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. crebra*; grassland e.g. *Themeda australis*. Absent from areas of dense shrub or tree cover (in Victoria, Scarlett et al. 1994).

Substrate: Clay soils on Wianamatta Shale, medium nutrients. Salt-tolerant on coastal headlands (Griffith 1992).

Exposure: Full sun, grows under extreme conditions, high salt levels on coastal headlands, survives periodic drought on the tablelands and winter snow in subalpine areas (Griffith 1992).

Conservation

Conservation: Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Coded 3VCi+ on national rare species list (Briggs & Leigh 1996), species is apparently declining in New South Wales due to intensive grazing, cultivation and pasture improvement (Leigh, Boden & Briggs, 1984), declining in Victoria for similar reasons (Scarlett et al. 1994).

May be out-competed by Bitou Bush *Chrysanthemoides monilifera* subsp. *rotundata*, and introduced grasses e.g. *Axonopus affinis*, *Chloris gayana*, *Paspalum dilatatum*, *P. urvillei*, *Sporobolus indicus*, *Stenotaphrum secundatum* (Griffith 1992). Only Sydney record is 'Cow Pastures' at Camden (1803) and now regarded as extinct in Western Sydney probably due to grazing (James et al. 1999).

Alectryon subcinereus

SAPINDACEAE

Wild Quince

Life history

Growth form: Small tree or shrub, with branchlets and inflorescences finely hairy; leaves with 2–8 leaflets.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Minute, pink, December–January (Floyd 1989).

Fruit/seed: 2-lobed capsule 8–10 mm long; seed black with a red aril. Mature September–February. April–August or October, seeds 9600 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Diaspore: fruit, vertebrate-adapted for dispersal (Westoby et al. 1990). Germinates readily after removal of the aril (Floyd 1989).

Fire response:

Interaction with other organisms: Food plant of butterfly Eastern Flat *Netrocoryne repandra repandra* (Common & Waterhouse 1982). Fruit eaten by Green Catbird (Floyd 1989).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT CWS; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Mt Yengo, Wyong, Woy Woy, Kurrajong, Newport, Cobbitty, Razorback, Cambewarra, Mt Kembla. CT: Kanangra, Goodmans Ford, Robertson NR.

Habitat

Habitat: Warmer rainforest in gullies, gorges.

Altitude: 0–900 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Rainforest e.g. with *Doryphora sassafras*; dry rainforest e.g. with *Streblus brunonianus*, *Ehretia acuminata*, *Melaleuca styphelioides*, *Brachychiton populneum*, *Cassine australis*.

Substrate: Clay soil on shale, basalt, medium–high nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Reported in Yengo NP, Brisbane Water NP, Royal NP, Robertson NR.

***Cardiospermum grandiflorum* ***

SAPINDACEAE

Balloon Vine

Life history

Growth form: Herbaceous climber with hairy stems to c. 10 m long; leaves divided with toothed leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, March–May. Possibly pollinated by honeybees (P. Kubiak pers. comm.).

Fruit/seed: Papery, balloon-like capsule 5–6 cm long, seeds 7 mm diam., globose with basil aril, January–September.

Dispersal, establishment & growth: Diaspore: balloon-like capsule, gravity-dispersed, short-distance wind-dispersed and water-dispersed near waterways. Whole fruit can be blown across water surface. Heavy seed tends to fall within a few metres of plant (Buchanan 1989b). Seeds are buoyant on water; after flooding rain seeds are washed to the sea and on to beaches sometimes in large numbers but do not appear to retain viability for long; establishment on riverbanks after floatation is common (Smith 1999). Seeds readily germinate in moist ground (Harden 1992).

Fire response:

Interaction with other organisms: Shoots apparently eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Exotic, native to tropical America, Africa, W Indies.

Botanical subregions: NC CC NWS CWS; Qld.

Distribution Sydney area: Widespread at lower elevations.

Select locations: CC: Richmond, Wahroonga, Beecroft, Lane Cove, Northbridge, Bellevue Hill, Oatley, Glenfield, Fairfield, Liverpool, Campbelltown, Picton, Albion Park, Jamberoo.

Habitat

Habitat: Creekbanks, gullies, wetland.

Altitude: 0–100 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent.

Vegetation: Disturbed eucalypt woodland, riparian scrub.

Substrate: Sandy soil on sandstone, alluvium, low–medium nutrients.

Exposure:

Conservation

Conservation: Serious weed of disturbed bushland areas, with ability to occupy and dominate the canopy resulting in significant crown disturbance and individual tree mortality.

***Cardiospermum halicacabum* var. *halicacabum* ***

SAPINDACEAE

Small Balloon Vine

Life history

Growth form: Herbaceous climber with hairy stems to c. 10 m long, smaller in all its parts than *C. grandiflorum* and less hairy; leaves divided with toothed leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White,

Fruit/seed: Papery, balloon-like capsule 3–4 cm long, seeds 3–5 mm diam., globose with basil aril.

Dispersal, establishment & growth: Diaspore: fruit, gravity-dispersed, short-distance wind-dispersed and water-dispersed.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to tropical America, Africa, Asia.

Botanical subregions: CC NWP; Qld.

Distribution Sydney area:

Select locations: CC: Hornsby (1914).

Habitat:		Habitat
Altitude: 0–200 m	Annual rainfall: 1200 mm	
Typical local abundance:		
Vegetation:		
Substrate:		
Exposure:		
Conservation: Reported from one site at Hornsby in 1914.		Conservation

Cupaniopsis anacardioides**SAPINDACEAE**

Tuckeroo

Life history

Growth form: Small to medium-sized tree, with hairy new growth; compound leaves 15–25 cm long with 4–11 leaflets.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Yellowish, June–August. Separate male and female flowers on same plant or separate plants (Harden 1991). Insects attracted by nectar and prolific pollen, visited by small native bee *Trigona carbonaria* for nectar and pollen, probably effecting a high level of self-pollination and a low level of cross-pollination; flies *Stomorhina discolor*, *Baccha* sp., fruit fly *Dacus murrayi*, green bee *Palaeorhiza* sp. carried small amounts of pollen and probably play a lesser role in pollination (Hawkeswood 1983).

Fruit/seed: 3-lobed dehiscent capsule 15–30 mm long, with an reddish aril; seed black, November. Seeds 2 725 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Fresh seed begins to germinate after 14–25 days, with 71–84% germination after 20–48 days; seed is difficult to store either at room temperature or in cold storage (Floyd 1989), easily germinated after treatment with hot water (Carolin & Clarke 1991).

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Nacaduba berenice berenice* attended by small black ants, probably *Prolasius* sp. and *Prosotas felderi*, which feeds on buds and flowers (Common & Waterhouse 1981). Host to larvae of moth *Macadamia* Nutborer *Cryptophlebia ombrodelta* and moth *Peritornenta circulatella* in joined leaves (Common 1990). Fruit eaten by Figbird, Olive-backed Oriole and Pied Currawongs; seed often eaten by insect larvae (Floyd 1989). Orange-red tissue surrounding seeds eaten by Aboriginal people (Carolin & Clarke 1991).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Coast and foreshores.

Select locations: CC: Tuggerah, Botany Bay, Cronulla, Weeney Bay, Kurnell, Bundeena, Coalcliff.

Habitat

Habitat: Near the sea, along estuaries.

Altitude: 0–50 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Littoral rainforest; dune scrub e.g. with *Leptospermum laevis*, *Banksia integrifolia*, *Guioa semiglauc*; estuarine woodland e.g. with *Casuarina glauca*, *Banksia integrifolia*.

Substrate: Sandy to loamy soils on sands, medium–low nutrients.

Exposure: Can withstand average wind and heavy saltspray (Hawkeswood 1983).

Conservation

Conservation: Gerroa is southern geographical limit. Conservation status unknown. Reported in Sydney Harbour NP, Royal NP.

Diploglottis australis

SAPINDACEAE

Native Tamarind

Life history

Growth form: Tree to 30 m high, with rusty-hairy new growth; compound leaves 40–120 cm long, with 6–12 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Male, female and bisexual flowers on the same plant, creamy-brown, October.

Fruit/seed: 2–3-lobed, brown-hairy capsule 10–15 mm diam., with an orange-yellow aril, ripe November–December. Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Seed weight with aril 515 per kilogram, without aril 1660 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Fresh seed germinates rapidly (Floyd 1989).

Fire response:

Interaction with other organisms: Host to larvae of Ghost Moth/Swift Moth *Aenetus ramsayi* (Common 1990). Fruit eaten by birds and bats, Brown Cuckoo-dove, Crimson Rosella, Figbird, Green Catbird, Regent Bowerbird, Rose-crowned Fruit-dove, Topknot Pigeon and Wompoo Fruit-dove (Floyd 1989). The acidic fruits have been used for drinks and making jam (Harden 1991).

Distribution

Status/origin: Native. Occasionally planted as ornamental or shade trees (Harden 1991).

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area: Coastal ranges.

Select locations: CC: Gosford, Calga, Waterfall, Bulli Pass, Mt Kembla, West Dapto, Macquarie Pass, Cambewarra.

Habitat

Habitat: Gullies, slopes.

Altitude: 0–300 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Rainforest e.g. with *Toona ciliata*, *Dendrochmide excelsa*, *Elaeocarpus kirtonii*.

Substrate: Clay soil on basalt, or sandstone with basalt enrichment, high nutrients, well-drained.

Exposure:

Conservation

Conservation: Conservation status unknown.

Dodonaea boroniifolia

SAPINDACEAE

Life history

Growth form: Spreading or erect shrub to 2 m high, with divided leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Male, female or bisexual, May–October.

Fruit/seed: Capsule 10–18 mm wide, with 4 membranous wings, seeds 2 mm, black, mature October–January.

Dispersal, establishment & growth: Diaspore: capsule segment.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic.

Distribution Sydney area: Blue Mountains.

Select locations: CC: Culoul Range, East Kurrajong, Burralow Creek, Shellharbour. CT: Kandos Weir, Capertee, Ben Bullen, Katoomba, Tallong .

<p>Habitat: Lower slopes. Altitude: 0–1000 m Annual rainfall: 600–1400 mm Typical local abundance: Occasional–frequent. Vegetation: Dry sclerophyll forest e.g. with <i>Eucalyptus piperita</i>, <i>Angophora costata</i>; woodland e.g. with <i>Eucalyptus rossii</i>. Substrate: Sandy soils on sandstone, quartzite, low nutrients. Exposure:</p>	Habitat
<p>Conservation: Conservation status unknown, but many early coastal records e.g. Como (1899), Shellharbour (1899), Tallong (1811), Katoomba (1902), Bathurst (1822), have not been reconfirmed. Probably now restricted to Wollemi and Blue Mountains NP.</p>	Conservation

Dodonea camfieldii

SAPINDACEAE

<p>Growth form: Spreading, often prostrate shrub 0.2–0.5 m high, with simple leaves 1–3.5 cm long, sometimes toothed. Vegetative spread: Longevity: Primary juvenile period: Flowers: Male, female or bisexual, November–February. Fruit/seed: Capsule 12 mm wide, with 4 leathery wings, seeds 2 mm, dark brown or black, mature October–November. Dispersal, establishment & growth: Diaspore: segment of capsule. Colonising disturbed roadsides and forming dense soil-binding, multi-stemmed mats (West 1993). Fire response: Probably killed. Interaction with other organisms:</p>	Life history
<p>Status/origin: Native. Botanical subregions: CC SC. Distribution Sydney area: Mainly Hornsby Plateau. Select locations: CC: Kulnura, Mount White, Maroota, Glenbrook, Como, Waterfall, Cataract Dam.</p>	Distribution
<p>Habitat: Rocky sites, ridges. Altitude: 0–300 m Annual rainfall: 900–1200 mm Typical local abundance: Rare. Vegetation: Open-forest or woodland e.g. with <i>Corymbia eximia</i>, <i>C. gummifera</i>, <i>Eucalyptus sparsifolia</i>, <i>E. haemastoma</i>, <i>E. punctata</i>, <i>E. racemosa</i>. Substrate: Small pockets of soil on sandstone, low nutrients. Exposure: Exposed rocky sites</p>	Habitat
<p>Conservation: Rare, conservation status unknown. Kulnura is northern geographical limit. Reported in Popran NP, Brisbane Water NP.</p>	Conservation

Dodonea falcata

SAPINDACEAE

Life history**Growth form:** Erect shrub to 2 m high, with simple leaves 2.5–5 cm long.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Male, female or bisexual, early Spring.**Fruit/seed:** Capsule 11–14 mm wide, with 4 membranous wings, mature February –March.

Seeds 2 mm, black

Dispersal, establishment & growth: Diaspore: segment of capsule**Fire response:** Probably killed.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT NWS NWP; Qld.**Distribution Sydney area:** Western Sydney and Hornsby Plateau.**Select locations:** CC: Howes Valley, Putty, Cattai, Berkshire Park, Castlereagh, Bondi.**Habitat****Habitat:** Ridges, hillsides.**Altitude:** 0–300 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Castlereagh woodlands e.g. with *Eucalyptus fibrosa*, *E. sclerophylla*, *Angophora bakeri*, *Eucalyptus parramattensis*; sandstone woodland e.g. with *Corymbia gummifera*, *Angophora bakeri*, *Angophora hispida*.**Substrate:** Sandy soil on Tertiary gravels, red gravelly soil or sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Once found on 'low ground between Bondi and Rose Bay', now restricted to Castlereagh area and isolated occurrences further north. Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported from Castlereagh NP, Yengo NP.***Dodonea heteromorpha***

SAPINDACEAE

Life history**Growth form:** Erect shrub to 3 m high, with simple leaves 3–8 cm long, sometimes divided.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual,**Fruit/seed:** 4-winged capsule 15–25 mm wide.**Dispersal, establishment & growth:** Diaspore: segment of capsule**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT CWS NWP SWP; Qld, Vic.**Distribution Sydney area:** Orange area.**Select locations:** CT: Cudal.**Habitat****Habitat:****Altitude:** 600 m**Annual rainfall:** 900 mm**Typical local abundance:** Rare.**Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Rare, only one record for Sydney area, at Cudal in 1969. Conservation status unknown.

Dodonaea megazyga

SAPINDACEAE

Life history**Growth form:** Erect shrub or small tree to 5 m high, with divided leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, September–March.**Fruit/seed:** Capsule 13–22 mm wide, with 3 membranous wings. Take 10–12 months to mature and plants often bear flowers and fruits simultaneously, August.**Dispersal, establishment & growth:** Diaspore: segment of capsule.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Glen Davis, Olney SF.**Habitat****Habitat:** Slope below cliffs.**Altitude:** 0–700 m**Annual rainfall:** 600–1400 mm**Typical local abundance:** Rare.**Vegetation:** Dry sclerophyll forests or on margins of rainforest**Substrate:** Sandy soil on sandstone.**Exposure:****Conservation****Conservation:** Rare, known from only two locations in Sydney area. Locations are very different from each other. Conservation status unknown.***Dodonaea multijuga***

SAPINDACEAE

Life history**Growth form:** Erect shrub to 1.5 m high, with divided leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, January–April.**Fruit/seed:** Capsule 15–20 mm wide, with 3 leathery wings, seeds 3 mm black, mature October–December.**Dispersal, establishment & growth:** Diaspore: segment of capsule, possibly dispersed by water.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Centennial Park, Casula, Erskine Creek, Woronora River, Bargo River. CT: Kandos Weir, Capertee, Glen Davis, Newnes SF, Clarence, Mt Wilson, Hazelbrook, Berrima, Wingello.**Habitat****Habitat:** Creeks, riverbanks.**Altitude:** 0–1000 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus mannifera*, *E. ovata*, *E. cypellocarpa*, *E. piperita*, *Casuarina cunninghamiana*; woodland e.g. with *Eucalyptus punctata*, *E. rossii*.**Substrate:** Sandy soils on sandstone, conglomerate, alluvium, low nutrients.**Exposure:****Conservation****Conservation:** Widespread but uncommon. Vulnerable in Western Sydney (James et al. 1999), earlier this century it was common near the Georges River but has suffered from the urban sprawl. Conservation status elsewhere unknown. Reported in Wollemi NP, Blue Mountains NP.

Dodonaea pinnata

SAPINDACEAE

Life history**Growth form:** Shrub to 1.5 m high, with divided leaves.**Vegetative spread:****Longevity:****Primary juvenile period:** 5 years (at Dharug).**Flowers:** Red–brown, male, female, or bisexual, August–October.**Fruit/seed:** 4-winged capsule 15–18 mm wide, seeds 3 mm long, black, mature November–February.**Dispersal, establishment & growth:** Diaspore: segment of capsule**Fire response:** Probably killed, localised group of small plants, some flowering, recorded 3 years after fire at Ku-ring-gai.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Lower Blue Mountains, Colo River, lower Hawkesbury River.**Select locations:** CC: Colo Heights, Wisemans Ferry, Wilberforce, Glenorie, Patonga, Church Point, Bobbin Head, Narrabeen Lake, Mt Irvine, Springwood.**Habitat****Habitat:** Rocky outcrops, riverbanks.**Altitude:** 0–300 m **Annual rainfall:** 900–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest e.g. with *Corymbia eximia*, *Eucalyptus punctata*, *E. piperita*, *Angophora costata*, *Eucalyptus agglomerata*, *E. deanei*.**Substrate:** Sandy soil on sandstone (West 1993).**Exposure:****Conservation****Conservation:** Uncommon local endemic species. Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Brisbane Water NP, Dharug NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP.***Dodonaea triangularis***

SAPINDACEAE

Life history**Growth form:** Shrub to 3 m high, with simple leaves 1–3 cm long. Density of hairs and leaf shape quite variable — no evident correlation with geographical or ecological distribution (West 1984).**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual.**Fruit/seed:** 3–4-angled capsule, mature September–December. Seeds 2.5 mm, black.**Dispersal, establishment & growth:** Diaspore: segment of capsule.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT NWS CWS NWP; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Howes Mountain. CT: North of Bathurst (1823).**Habitat****Habitat:** Rocky hillside.**Altitude:** 300– **Annual rainfall:** 900 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus trachyphloia*, *Callitris* sp.**Substrate:** Sandy soils on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Rare in Sydney area, conservation status elsewhere unknown.

Dodonaea triquetra

SAPINDACEAE

Native Hop Bush

Life history**Growth form:** Erect shrub 1–3 m high, with simple leaves.**Vegetative spread:** No.**Longevity:** 30 years.**Primary juvenile period:****Flowers:** Separate male and female flowers, usually on different plants, January–March.**Fruit/seed:** Capsule 9–16 mm long, with 3 membranous wings, mature September–January. Seeds 3 mm long, black.**Dispersal, establishment & growth:** Diaspore: segment of capsule. Ant-adapted for dispersal (Rice & Westoby 1981), wind, water-dispersed. Seeds germinate without treatment. Abundant regrowth followed cessation of mowing and absence of fire (at Silverwater). Will germinate vigorously in absence of fire. Growth rate rapid (Floyd 1966). Coloniser.**Fire response:** Killed and re-establish from soil stored seed (Fox 1988). Following a hot burn and consequent high germination percentage, *D. triquetra* is likely to become a dominant species of the regenerating wet sclerophyll forest understorey (West, 1984). In laboratory studies 100% germination followed pretreatment at the optimum temperature of 90°C for 10–50 min. (Floyd 1966).In field observations (Floyd 1966) found that *D. triquetra* seeds can emerge from a maximum depth of approx. 5 cm. A high intensity fire, with increased soil temperatures penetrating to greater depths in the soil profile, could result in germination of a large proportion of the soil reservoir of stored seed which may be the product of several years successful fruiting.**Interaction with other organisms:** Seed eaten by Rosella *Platycercus eximius* (Barker & Vestjens 1989, 1990). Food plant of butterfly larvae *Hypochrypsops ignitus ignitus* (Common & Waterhouse 1981). Host to several species of vividly marked bugs (Hemiptera, including one species in family Scutelleridae); seedlings eaten by rabbits; white wax scale common on stems, possibly *Gascardia destructor*, heavy infestations appear to be detrimental (P. Kubiak pers. comm.).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT NWS; Qld, Vic.**Distribution Sydney area:** Mainly coast, Lower Blue Mountains.**Select locations:** CC: Ourimbah, Hornsby, Cheltenham, Manly, Waverly, Kurnell, Oatley, Duck River, Long Bay, Waterfall, Casula, Springwood, Glenbrook, Oakdale, Yerrinbool, Cambewarra, Bomaderry. CT: Mt Coricudgy, Blackheath, Hill Top, Bowral, Bundanoon.**Habitat****Habitat:** Hillsides and gullies.**Altitude:** 0–1000 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus botryoides*, *Corymbia gummifera*, shrubby understorey.**Substrate:** Clay soil, often on shale/sandstone transition, also on alluvium, medium nutrients. Also common on sandstone (T. Auld pers. comm.).**Exposure:****Conservation****Conservation:** Widespread and probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP.

Dodonaea truncatiales

SAPINDACEAE

Life history**Growth form:** Erect shrub to 3 m high, with simple leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, yellow-green, September–November.**Fruit/seed:** Capsule 17–25 mm wide, with 3–4 membranous wings, green–reddish, seeds 2.5 mm, black, September–December.**Dispersal, establishment & growth:** Diaspore: segment of capsule.**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC CT CWS; Vic.**Distribution Sydney area:** Widespread but scattered.**Select locations:** CC: Putty, Upper Colo, Mount Yengo, St Albans, Wilberforce, Nortons Basin, Douglas Park. CT: Mount Coricudgy, Newnes Plateau, Joadja.

Habitat**Habitat:** Hillslopes.**Altitude:** 0–1000 m**Annual rainfall:** 700–1000 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus crebra*, *E. siderophloia*, *E. cypellocarpa*, *Corymia gummifera*, *C. eximia*.**Substrate:** Sandy soils on sandstone often with local enrichment from basalt or shale.**Exposure:**

Conservation**Conservation:** Conservation status unknown.***Dodonaea viscosa* subsp. *angustifolia***

SAPINDACEAE

Life history**Growth form:** Compact shrub to 5 m high, with simple leaves 6–13 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, May–December.**Fruit/seed:** 3–4-winged capsule 10–30 mm wide, September–October.**Dispersal, establishment & growth:** Diaspore: segment of capsule**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS NWP; Qld, Vic., Amer., Afr., Asia, Pac.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Colo Heights, Calga, Lansdowne, Albion Park, Dapto. CT: Hargraves, Hill End, Kanangra Walls, Kowmung Valley.

Habitat**Habitat:** Rocky hillsides.**Altitude:** 0–1000 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus tereticornis*, *E. globoidea*, *E. bosistoana*, *E. moluccana*; occasional in remnant rainforest.**Substrate:** Clay soils on shale, basalt, metamorphics, limestone, medium nutrients, well-drained.**Exposure:**

Conservation**Conservation:** Conservation status unknown.

Dodonaea viscosa* subsp. *angustissima

SAPINDACEAE

Life history**Growth form:** Erect shrub to 4 m high, with simple narrow leaves 3–9.5 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, August–November.**Fruit/seed:** 3–4-winged capsule 10–30 mm wide, November–January.**Dispersal, establishment & growth:** Diaspore: segment of capsule**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NT CT ST NWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.**Distribution Sydney area:****Select locations:** CT: Olinda, Limekilns, Wattle Flat, Tarana, Coxs River, Bowral, Paddys River, Abercrombie Caves, Tuena, Wombeyan Caves.**Habitat****Habitat:** Rocky hillsides.**Altitude:** 700–1000 m **Annual rainfall:** 600–1000 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Clay soils on shale, basalt, limestone, low to medium nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown.***Dodonaea viscosa* subsp. *cuneata***

SAPINDACEAE

Life history**Growth form:** Compact spreading shrub to 3 m high, with simple leaves 1–3 cm long.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Male, female, or bisexual, spring–summer.**Fruit/seed:** 3–4-winged capsule 10–30 mm wide, brownish red, takes 10–11 months to mature and often present during flowering, September–November. Seed 2–3 mm, black.**Dispersal, establishment & growth:** Diaspore: segment of capsule**Fire response:** Probably killed.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC CT CWS SWS NWP SWP NFWP; Qld, Vic., S.A.**Distribution Sydney area:** Cumberland Plain, Capertee Valley.**Select locations:** CC: Wisemans Ferry, St Marys, Greystanes, Liverpool, Bents Basin, Bringelly, Mount Annan, Camden, Wedderburn. CT: Glen Alice, Capertee Valley.**Habitat****Habitat:** Hillslopes.**Altitude:** 0–800 m **Annual rainfall:** 700–900 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, with shrubby understorey.**Substrate:** Clay soils in Wianamatta Shale, medium nutrients, well-drained.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

Dodonaea viscosa* subsp. *spatulata

SAPINDACEAE

Life history

Growth form: Spreading to erect shrub 1.5–4 m high, with simple leaves 2.3–7.5 cm long. Leaf characters intergrade with *D. viscosa* subsp. *angustissima*, subsp. *cuneata*, and subsp. *mucronata*.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Male, female, or bisexual, January–February.

Fruit/seed: 3–4-winged capsule 10–30 mm wide, tawny brown, sticky, September–December.

Dispersal, establishment & growth: Diaspore: segment of capsule.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Tablelands, western Sydney.

Select locations: CC: St Marys, Wallacia. CT: Hargreaves, Winburndale, Yetholme, Clarence.

Habitat

Habitat: High rainfall areas.

Altitude: 0–1000 m **Annual rainfall:** 600–1200 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus rossii*.

Substrate: Clay soils on shale.

Exposure:

Conservation

Conservation: Conservation status unknown.

Guioa semiglauca

SAPINDACEAE

Life history

Growth form: Tree to 6 m high, with smooth, often spotted bark and hairy new growth; compound leaves 8–15 cm long, with 2–6 leaflets.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: White, separate male and female flowers on same plant, September–November. Pollination both automatic and open (Adam & Williams 2001). Pollination by honeybee *Apis mellifera*, and native bees *Leioproctus cristatus*, *Amphylaeus nubilosellus*, *Heterapoides* sp., *Homolictus flindersi* (Williams & Adam 1997). Pollen carried by Jewel Beetles *Castiarina acuminata*, *C. producta* and Flower Wasp *Dimorphothynnus dimidiatus* (Williams & Adam 1998).

Fruit/seed: Reddish capsule 10–14 mm diam., with 2–3 spreading lobes and a yellow aril enclosing the seed, ripe December–February. Seed weight 31 000 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Diaspore: vertebrate-adapted fleshy fruit (Westoby et al. 1990). Germinates from fresh seed (Floyd 1989).

Fire response: Resprouts from base (Adam & Williams 2001).

Interaction with other organisms: Eaten by Australian King Parrot, Eastern Rosella, Figbird, Lewins honeyeater, Olive-backed Oriole, Pied Currawong and Varied Triller (Floyd 1989).

Status/origin: Native. Botanical subregions: NC CC SC; Qld. Distribution Sydney area: Coastal ranges. Select locations: CC: Calga, Barrenjoey, Grose Vale, Eastwood, Nortons Basin, Razorback, Mount Keira, Bass Point, Saddleback Mountain, Minnamurra Falls.	Distribution
Habitat: Seacoast, rocky gullies. Altitude: 0–300 m Annual rainfall: 700–1400 mm Typical local abundance: Occurrence. Vegetation: Dry rainforest, littoral rainforest e.g. with <i>Cassine australis</i> , <i>Glochidion ferdinandii</i> , <i>Syzygium</i> , <i>Acmena smithii</i> , <i>Eucalyptus botryoides</i> ; warmer rainforest. Substrate: Clayey soils on sandstone, shale, medium nutrients. Exposure:	Habitat
Conservation: Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP.	Conservation

Planchonella australis

SAPOTACEAE

Black Apple

Growth form: Medium to tall tree, with milky latex sap; simple leaves 8–16 cm long, thick and leathery, with shiny upper surface. Vegetative spread: Longevity: Primary juvenile period: Flowers: White, December–January. Fruit/seed: Purplish or black berry 20–50 mm long; seeds 3–5 brown and shiny, with a long narrow whitish scar. Mature September–January, fresh seed 570 per kilogram, dried seed 780 per kilogram (Floyd 1989). Dispersal, establishment & growth: Diaspore: fruit, probably animal-dispersed. Fruit eaten by Grey-headed Flying Fox <i>Pteropus poliocephalus</i> (Eby 1995) and Green Catbird (Floyd 1989). Fresh seed may begin to germinate after 9–22 days, with germination of 80% after 16–70 days; seed cold-stored at 2°C gave 80% germination; scarification found not to accelerate germination (Floyd 1989). Fire response: Interaction with other organisms: Seeds were eaten by Aboriginal people in the Gosford area; the fruit is edible but often infested with maggots; suitable for jam (Floyd 1989).	Life history
Status/origin: Native. Botanical subregions: NC CC CWS; Qld. Distribution Sydney area: Coastal ranges. Select locations: CC: Ourimbah, Wamberal, Bass Point, Albion Park, Gerringong, Kiama, Jamberoo, Saddleback Mountain.	Distribution

Habitat: Rainforest. Altitude: 0–200 m Annual rainfall: 1200–1400 mm Typical local abundance: Vegetation: Warmer rainforest; widespread stunted coastal rainforest, littoral rainforest. Substrate: Clay soils on shales, basalt, medium nutrients. Exposure:	Habitat
Conservation: Conservation status unknown. Reported in Royal NP.	Conservation

Bacopa monnieri**SCROPHULARIACEAE****Life history**

Growth form: Prostrate perennial herb, with more or less succulent leaves.

Vegetative spread: Rooting at nodes and often forming dense mats.

Longevity: Indefinite.

Primary juvenile period:

Flowers: White or pale blue, November–January.

Fruit/seed: Capsule 4 mm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, cosmop.

Distribution Sydney area: Coast, north from Port Hacking.

Select locations: CC: Mona Vale, Narrabeen, Manly, Port Hacking, Royal NP.

Habitat

Habitat: Edge of freshwater or brackish pools, streams, sometimes submerged. Southern sites on wet flushes below sea cliffs (P. Adam pers. comm.).

Altitude: 0–100 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Rare.

Vegetation:

Substrate: Damp sandy soils, low nutrients. In poorly drained, brackish soils (P. Adam pers. comm.).

Exposure: Full sun.

Conservation

Conservation: Rare, Royal NP is southern geographical limit. Mostly old records with most recent record at Royal NP in 1975. Other sites probably destroyed by development. In 2000, observed at Coogee (Lurline Bay) and in some abundance at Long Bay (P. Adam pers. comm.).

Bartsia trixago* **SCROPHULARIACEAE**

Yellow Bartsia

Life history

Growth form: Erect, sticky herb 10–70 cm high, with narrow, opposite, coarsely-toothed leaves, hemi parasitic.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Purple to pink and whitish, summer.

Fruit/seed: Ribbed capsule 10–12 mm long, with numerous seeds.

Dispersal, establishment & growth: Diaspore; seed, possibly animal and wind-dispersed (Carr et al. 1992).

Fire response:

Interaction with other organisms: Partially parasitic, eaten by stock (Herb. note).

Distribution

Status/origin: Exotic, native to Mediterranean.

Botanical subregions: CT CWS SWS ; Vic., S.A., W.A., native of Medit region.

Distribution Sydney area:

Select locations: CT: Carcoar (1955).

Habitat

Habitat: Disturbed sites, in crops.

Altitude: 800 m

Annual rainfall: 700–800 mm

Typical local abundance:

Vegetation:

Substrate: Sandy soil

Exposure:

Conservation

Conservation: One record for Carcoar in 1955. Current extent in Sydney area unknown.

Calceolaria tripartita* **SCROPHULARIACEAE**

Lady's Slipper

Life history**Growth form:** Decumbent or erect hairy herb 20–40 cm high, with opposite, divided leaves.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Yellow, July–September.**Fruit/seed:** Hairy 4-valved capsule 6–9 mm long, with numerous tiny seeds.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to America from S Mexico to Bolivia. Introduced as ornamental.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Nowra.**Select locations:** CC: Meroo (1973).**Habitat****Habitat:****Altitude:** 0–100 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Often cultivated. Only naturalised record for Sydney area is Nowra in 1973, where reported to be confined to a small area for many years, remaining constant. Situation since 1973 unknown.***Cymbalaria muralis* *****SCROPHULARIACEAE**

Ivy-leaved Toadflax

Life history**Growth form:** Procumbent, often reddish perennial herb; leaves simple, roundish, ivy-shaped 5–35 mm wide.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Purple and white, September–April.**Fruit/seed:** Flattish capsule 4 mm wide, with many tuberculate-wrinkled seeds.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and NW Africa.**Botanical subregions:** CC SC CT CWS SWS; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: Hornsby, Paddington, Glebe point, Dundas, Georges River. CT: Abercrombie Caves.**Habitat****Habitat:** Crevices in walls, moist sites in gardens and glasshouses.**Altitude:** 0–800 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Rock walls, brick rubble, moist rock crevices on sandstone, limestone.**Exposure:****Conservation****Conservation:** Locally naturalised in gardens and suburban areas. Potential to invade bushland unknown.

Derwentia blakelyi**SCROPHULARIACEAE****Life history**

Growth form: Small glaucous, glabrous shrub or woody herb to 50 cm high, with simple, shallowly-toothed, opposite leaves 2.5–5.5 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bright blue-violet, October–December.

Fruit/seed: Capsule 4–6.5 mm long, December.

Dispersal, establishment & growth:

Fire response: Appears to resprout (D. Binns pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Western Blue Mountains.

Select locations: CT: Nullo Mountain, Mt Horrible, Limekilns, Peel, Lidsdale, Newnes SF, Wolgan Gap, Clarence.

Habitat

Habitat: Slopes with southerly aspect, edge of swamps.

Altitude: 900–1100 mm **Annual rainfall:** 800–1100 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest and woodland e.g. with *Eucalyptus dives*, *E. rossii*, *E. mannifera*, *E. dalrympleana*, *E. pauciflora*; heath e.g. with *Eucalyptus gregsoniana*.

Substrate: Sandy loam on shales, slates, sandstones, alluvium, low nutrients.

Exposure:

Conservation

Conservation: Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Coded 2K on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.

Derwentia derwentiana* subsp. *subglauca**SCROPHULARIACEAE****Life history**

Growth form: Woody herb to 140 cm high, with many stems from large woody rootstock; leaves simple, opposite, toothed, 5–20 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, pale lilac, or pale blue, November.

Fruit/seed: Capsule 3–6 mm long, November–March.

Dispersal, establishment & growth: Diaspore: seed, appears to colonise open areas (Herb. note).

Fire response: Resprouts (Herb. note).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Mt Canobolas to Taralga.

Select locations: CT: Mt Canobolas, Lithgow, Hassans Walls, Hampton, Oberon, Ginkin, Kanangra Plateau, Mt Werong, Wombeyan Caves, Taralga.

Habitat

Habitat: Rocky slopes, gullies.

Altitude: 780–1380 m **Annual rainfall:** 800–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist open-forest e.g. with *Eucalyptus fastigata*, *E. cypellocarpa*, *E. viminalis*; woodland e.g. with *Eucalyptus pauciflora*.

Substrate: Loams on granite, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Derwentia perfoliata**SCROPHULARIACEAE**

Digger's Speedwell

Life history

Growth form: Erect or decumbent woody, glaucous herb or shrub to 120 cm high, with several stems from woody rootstock; forms shortly rhizomatous clumps; roundish leaves opposite, toothed, 15–40 mm wide. Great variation in leaf shape with narrow-leaved plants in drier areas; broad-leaved plants in moister cooler sites (Harden 1992).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Blue or purplish blue, mostly summer.

Fruit/seed: Capsule 4–8 mm long.

Dispersal, establishment & growth: Diaspore: seed. Grows in drier sites than *Derwentia derwentiana*.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: SC CT ST NWS CWS SWS; Vic.

Distribution Sydney area: Widespread on Tablelands.

Select locations: CT: Browns Gap, Wolgan Gap, Mt Werong, Mittagong, Lidsdale, Mt Victoria, Katoomba, Edith, Wombeyan Caves, Taralga, Berrima, Ilford, Wingello.

Habitat

Habitat: Creekbanks.

Altitude: 800–1200 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist open-forest e.g. with *Eucalyptus fastigata*, *E. cypellocarpa*, *E. radiata*, *E. viminalis*, *Acacia falciformis*; woodland e.g. with *Eucalyptus dives*, *E. sieberi*.

Substrate: Sandy or gravelly clay soils on quartzite, sandstone.

Exposure:

Conservation

Conservation: Rylstone is northern geographical limit. Conservation status unknown.

Digitalis purpurea* **SCROPHULARIACEAE**

Foxglove

Life history

Growth form: Erect biennial or perennial, densely hairy herb 120–150 cm high, with simple, basal leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, purple or pink, late spring–early summer.

Fruit/seed: Hairy, egg-shaped capsule 10 mm long, with numerous seeds.

Dispersal, establishment & growth: Diaspore: seed

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to W Europe. Introduced as ornamental.

Botanical subregions: CC.

Distribution Sydney area:

Select locations: CC: Bargo (1953).

Habitat

Habitat: Garden areas.

Altitude: 500–1000 m **Annual rainfall:** 900–1400 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Frequently cultivated and semi naturalised in gardens in Blue Mountains. One record, possibly naturalised, at Bargo in 1953.

Euphrasia arguta**SCROPHULARIACEAE****Life history**

Growth form: Erect densely hairy herb 20–35 cm high, with opposite deeply-lobed leaves.

Vegetative spread:

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: White to lilac with yellow markings, October–January.

Fruit/seed: Ribbed, bristly capsule 4–7 mm long, with many seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Partially parasitic with haustoria connecting it to other plants (Harden 1992).

Distribution

Status/origin: Native.

Botanical subregions: NC NT CT NWS CWS.

Distribution Sydney area: ?Bathurst.

Select locations:

Habitat

Habitat: Grassy areas near rivers.

Altitude: 700 m

Annual rainfall: 600 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Coded 3X on national rare species list (Briggs & Leigh 1996). No collections for at least 75 years and probably extinct (Barker 1982).

Euphrasia bowdeniae**SCROPHULARIACEAE****Life history**

Growth form: Perennial herb 7–20 cm high

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Mauve to violet,

Fruit/seed: Capsule 5 mm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Upper Blue Mountains.

Select locations: CT: Blackheath, Wentworth Falls, Mt Solitary.

Habitat

Habitat: Shallow soil on ledges of sandstone cliffs.

Altitude: 750–1000 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Rare.

Vegetation: e.g. with *Epacris reclinata*, *Dracophyllum secundum*, *Sprengelia* sp.

Substrate: Damp shallow soil on sandstone rock faces and ledges, low nutrients.

Exposure:

Conservation

Conservation: Coded 2RCit on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.

Euphrasia collina* subsp. *paludosa**SCROPHULARIACEAE****Life history**

Growth form: Perennial herb or subshrub 5–60 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or pale to dark blue to purple or pink, August–February.

Fruit/seed: Capsule 4–15 mm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT CT ST NWS CWS NWP; Vic., S.A. (extinct).

Distribution Sydney area: Botany Bay and Eastern Suburbs, Western Blue Mountains.

Select locations: CC: Rose Bay, Botany, La Perouse. CT: Rylstone, Currant Mountain Gap, Orange, Newnes Plateau, Bell, Blackheath, Wentworth Falls, Little River, Jenolan Caves, Mt Werong.

Habitat

Habitat:

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Occasional–frequent.

Vegetation: Open-forest e.g. with *Eucalyptus obliqua*, *E. dives*, *E. fastigata*, *E. punctata*; in sandy swamps in the Eastern Suburbs e.g. with Cyperaceae.

Substrate: Sandy or clayey soils on sandstone, metamorphics, limestone, granite.

Exposure:

Conservation

Conservation: Eastern Suburbs population last collected in 1900, now extinct.

Conservation status elsewhere unknown.

Euphrasia collina* subsp. *speciosa**SCROPHULARIACEAE****Life history**

Growth form: Erect, perennial herb or subshrub 5–60 cm high, variable habit.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Bluish–purple, August–October, peak October.

Fruit/seed: Capsule 5–14 mm long, with many seeds 0.4–0.9 mm long.

Dispersal, establishment & growth: Diaspore: seeds.

Fire response: Not known, noted flowering in season after fire (Herb. specimen).

Interaction with other organisms: Parasitic on the roots of other plants (Beadle et al. 1982)

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT ST.

Distribution Sydney area: Coast, Western Blue Mountains.

Select locations: CC: Doyalson, Chain Valley Bay, Wyong, Heathcote, Helensburgh, Bulli Pass Lookout. CT: Mullions Range SF, Portland, Glanmire, Newnes Plateau, Clarence, Wombeyan, Wingello.

Habitat

Habitat: Hillsides, ridges.

Altitude: 0–1000 m

Annual rainfall: 600–1400 mm

Typical local abundance: Occasional.

Vegetation: Open-forest, woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Angophora costata*; heath e.g. with *Ricinocarpos pinifolius*, *Acacia longifolia*, *Dillwynia retorta*.

Substrate: Infertile soils. Water table mostly high, non-saline.

Exposure:

Conservation

Conservation: Apparently rare, Woronora Plateau last collected 1945, though collected at Chain Valley Bay (1999). Conservation status unknown. Reported in Royal NP.

Euphrasia orthocheila* subsp. *orthocheila**SCROPHULARIACEAE****Life history**

Growth form: Erect annual herb 18–60 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, November–December.

Fruit/seed:

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: ?NC NT CT; Qld.

Distribution Sydney area: Orange district.

Select locations: CT: No confirmed material for Sydney area.

Habitat

Habitat:

Altitude: 600–1000 m

Annual rainfall: 700–1100 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Rare in Sydney area. Coded 3RC- on national rare species list (Briggs & Leigh 1996). Known only from a few old collections and possibly extinct in the area.

Euphrasia scabra**SCROPHULARIACEAE****Life history**

Growth form: Erect annual herb 8–50 cm high. Semi-parasitic (Thompson 1992).

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Yellow, hairy, October–February. Probably self-pollinated, but native bees reported on flowers (Thompson 1992).

Fruit/seed: Capsule 5–9 mm long, with many small seeds. Probably has soil-stored seedbank (Gilfedder & Kirkpatrick 1997), sets abundant seed but reproduction is strongly influenced by seasonal factors (Thompson 1992).

Dispersal, establishment & growth: Diaspore: small seed without appendages for dispersal. Germination in laboratory facilitated by cold treatment at 5°C in darkness for 48 days, then 20°C with 16 hours light then 8 hours darkness; for germination in shadehouse or field, broadcast seed on bare soil early autumn, germinates after cold nights in late autumn–winter; seed directly into natural soil with herbaceous hosts (Scarlett & Parsons 1992).

Fire response:

Interaction with other organisms: Wide variety of host plants (Thompson 1992).

Distribution

Status/origin: Native.

Botanical subregions: CT ST; Vic., Tas., S.A. (extinct), W.A., (possibly extinct in NSW).

Distribution Sydney area: Tablelands.

Select locations: CT: Bathurst Plains (1817), Jenolan Caves (1899).

Habitat

Habitat: Damp, grassy areas.

Altitude: 600–1000 m

Annual rainfall: 700–1100 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Listed as Endangered (Schedule 1) NSW *Threatened Species Conservation Act 1995*. Coded 3KCa on national rare species list (Briggs & Leigh 1996). Rare, known only from a few old collections and probably extinct in area now. Barker (1982) reports that although apparently widespread and common in Australia in the nineteenth century it has seldom been collected since and is probably threatened with extinction over its range.

Decline of Tasmanian populations may relate to increasing shrub cover (Gilfedder & Kirkpatrick 1997). Victorian populations threatened by grazing of stock and feral animals, competition from introduced shrubs and grasses, as well as altered burning and hydrological regimes (Thompson 1992).

Glossostigma elatinoides**SCROPHULARIACEAE****Life history**

Growth form: Aquatic or terrestrial mat-forming perennial herb, rooting at nodes.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Blue, December–May.

Fruit/seed: Capsule with many seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: ?NC CC SC NT CT ST SWS SWP; S.A., Vic., Tas., N.Z.

Distribution Sydney area: Sporadic.

Select locations: CC: Hoxton Park (1998). CT: Oberon (1979).

Habitat

Habitat: Riverflats or beside freshwater swamps.

Altitude: 0–1000 m **Annual rainfall:** 800–1100 mm

Typical local abundance: Rare.

Vegetation:

Substrate: Drying mud of riverbank, medium nutrients.

Exposure:

Conservation

Conservation: Rare, known from two records in Sydney region.

Gratiola pedunculata**SCROPHULARIACEAE****Life history**

Growth form: Perennial herb 13–50 cm high, with creeping rootstock rooting at nodes.

Vegetative spread: Rooting at nodes.

Longevity:

Primary juvenile period:

Flowers: White to pink with yellow, spring–summer.

Fruit/seed: Capsule 3–5 mm long, with small, numerous seeds, mature in Autumn.

Dispersal, establishment & growth: probably wind-dispersed. Coloniser.

Fire response: Probably rarely burnt.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT NWP SWP; Qld, Vic., S.A.

Distribution Sydney area: Coast.

Select locations: CC: Colo Gorge, Richmond, Warrimoo, Cowan Creek, Belmore, Doonside, Toongabbie, Campbelltown, Bomaderry. CT: Bungonia Lookout.

Habitat

Habitat: River or lagoon banks and other damp places.

Altitude: 0–400 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Rare–occasional.

Vegetation: Aquatic or swamp vegetation.

Substrate: Poorly drained sites on clayey alluvium, medium nutrients.

Exposure:

Conservation

Conservation: Now restricted due to destruction of habitat. Vulnerable in Western Sydney (James et al. 1999). Conserved in Dharug NP.

Gratiola peruviana**SCROPHULARIACEAE****Life history**

Growth form: Decumbent to erect perennial herb usually 10–30 cm high, with toothed stem-clasping leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pink with red-purple stripes, spring–summer.

Fruit/seed: Capsule 4–7 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST CWS; Qld, Vic., Tas., S.A., W.A., N.Z., S Amer.

Distribution Sydney area: Mainly Tablelands.

Select locations: CC: Yarramundi, Hornsby, Beecroft, Campbelltown. CT: Ilford, Glanmire, Lidsdale, Hartley Vale, Tuglow Caves, Boyd Plateau, Mt Werong, Wombeyan Caves, Hanging Rock Swamp, Bundanoon, Wingello.

Habitat

Habitat: Edges of creeks, swamps.

Altitude: 0–1000 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Plateau swamp e.g. with *Sphagnum* sp., *Isolepis* sp., *Myriophyllum* sp., *Eleocharis lepidosperma*; wet meadow e.g. with *Eucalyptus bridgestiana*, *E. macrorhyncha*, *E. viminalis*.

Substrate: Moist silt and mud on alluvium, medium nutrients.

Exposure:

Conservation

Conservation: Mainly on Tablelands, rare on coast. Conservation status not known but swamp margin habitats vulnerable to disturbance. Reported in Kanangra Boyd NP.

Gratiola pubescens**SCROPHULARIACEAE****Life history**

Growth form: Erect to procumbent perennial herb 2–20 cm high, with stem-clasping, toothed leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or pink-purple, October–March.

Fruit/seed: Capsule 3–4 mm long, with numerous seeds.

Dispersal, establishment & growth: Diaspore: seed

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC ST; Vic., Tas., S.A., W.A.

Distribution Sydney area: Coast.

Select locations: CC: Morisset, Lake Woodford, Manly Dam, Maroubra, Bundeena, Marley Lagoon, Thirlmere.

Habitat

Habitat: Coastal lagoon, lake margins.

Altitude: 0–400 m **Annual rainfall:** 1000–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Leptocarpus tenax*, *Schoenus brevifolius*, *Goodenia paniculata*, *Philydrum lanuginosum*.

Substrate: Sandy soils on hind dunes, low nutrients, poorly-drained to moist.

Exposure:

Conservation

Conservation: Conservation status not known. Reported in Royal NP.

Kickxia elatine* subsp. *crinita* **SCROPHULARIACEAE**

Twining Toadflax

Life history

Growth form: Prostrate, spreading perennial hairy herb.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, January–April, June.

Fruit/seed: Brown-white, thin-walled capsule 3–4 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Europe.

Botanical subregions: CT ST NWS CWS SWS NWP NFWP; Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Wondabyne, Clyde, Doonside. CT: Orange, Mandurama, Clarence Siding (1900).

Habitat

Habitat: Gardens, roadsides, creekbeds.

Altitude: 0–1000 m **Annual rainfall:** 700–1000 mm

Typical local abundance:

Vegetation:

Substrate: Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Minor weed.

Kickxia elatine* subsp. *elatine* **SCROPHULARIACEAE**

Woolly Toadflax

Life history**Growth form:** Prostrate, spreading perennial hairy herb.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, March–June.**Fruit/seed:** Brown-white, thin-walled capsule 3–4 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and W Asia.**Botanical subregions:** CC; Vic.**Distribution Sydney area:****Select locations:** CC: Greystanes (1993), Picnic Point (1986), Casula (1993). CT: Katoomba (1997).**Habitat****Habitat:** Gardens, creeks.**Altitude:** 0–1000 m**Annual rainfall:** 900–1200 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Clay soils on shale, alluvium.**Exposure:****Conservation****Conservation:** Weed of gardens, occasionally naturalised in wet places, recently recorded.***Kickxia spuria* subsp. *integrifolia* *****SCROPHULARIACEAE**

Round-leaved Toadflax

Life history**Growth form:** Spreading herb to 25 cm high, with stems to 100 cm long.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Purple and yellow, November–April.**Fruit/seed:** Light-brown, thin-walled capsule 3–4 mm long.**Dispersal, establishment & growth:** Diaspore: seed, probably dispersed by wind and water.**Fire response:****Interaction with other organisms:** Probably eaten by stock.**Distribution****Status/origin:** Exotic, native to Europe and W Asia. Probably introduced as weed.**Botanical subregions:** CC NWS CWS; Vic., ?Tas., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Campbelltown (1903).**Habitat****Habitat:****Altitude:** 0–200 m**Annual rainfall:** 700–800 mm**Typical local abundance:****Vegetation:****Substrate:** Clay soils.**Exposure:****Conservation****Conservation:** Weed of cultivated paddocks on Western Slopes e.g. near Tamworth.

Only one record for Sydney area at Campbelltown in 1903.

Limosella australis**SCROPHULARIACEAE**

Australian Mudwort

Life history**Growth form:** Semi-aquatic perennial herb, often stoloniferous.**Vegetative spread:** Stolons form plants 1–2 cm apart.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** White, flowering when exposed, sometimes when lower parts are inundated by water, August–April.**Fruit/seed:** Dark brown capsule 2–3 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC NT CT ST CWS SWS SWP; Vic., Tas., S.A., W.A., N.Z., ?Eur.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Lane Cove, Prestons. CT: Oberon (1959), Clarence (1901), Carcoar (1907), Edith (1966).**Habitat****Habitat:** Swamps, mudflats, creeks.**Altitude:** 0–1000 m **Annual rainfall:** 700–1100 mm**Typical local abundance:** Rare.**Vegetation:** Sedgeland e.g. with *Juncus usitatus*, *Cyperus flaccidus*.**Substrate:** Fine silt to clay soils on shales, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Old collections for Central Tablelands but first collected on coast in 1992.

Possibly introduced at Lane Cove (council nursery) in potplants from other areas. Status at Prestons unknown.

Linaria incarnata* **SCROPHULARIACEAE****Life history****Growth form:** Erect annual herb 15–60 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Reddish purple to pink with yellow, winter–spring.**Fruit/seed:** Capsule 4–5 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Portugal & Spain. Introduced as ornamental.**Botanical subregions:** CC NWP SFWP.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Cambelltown (1966), Nowra (1933).**Habitat****Habitat:** Disturbed areas.**Altitude:** 0–300 m **Annual rainfall:** 700–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** There are a couple of records for this species from the Sydney area but it is not clear whether the species is truly naturalised.

Linaria pelisseriana* **SCROPHULARIACEAE**

Pelisser's Toadflax

Life history**Growth form:** Slender erect herb 20–70 cm high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Purple-violet, spring.**Fruit/seed:** Capsule 2 mm long, with numerous seeds.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Europe.**Botanical subregions:** CC ?SC NT ST NWS CWS SWS SWP; Qld, Vic.**Distribution Sydney area:** Morisset.**Select locations:** CC: Morisset (1926).**Habitat****Habitat:** Disturbed areas along roadsides and railway lines.**Altitude:** 0–200 m**Annual rainfall:** 1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Minor weed, only recorded for Morisset in Sydney.***Linaria vulgaris* *****SCROPHULARIACEAE****Life history****Growth form:** Erect perennial herb 2–60 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, spring–autumn.**Fruit/seed:** Mature capsule not seen.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe.**Botanical subregions:** NC CC ?ST; Vic.**Distribution Sydney area:** Nowra area.**Select locations:** CC: Kangaroo Valley, Nowra.**Habitat****Habitat:****Altitude:** 0–400 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Minor weed.

Mimulus gracilis

SCROPHULARIACEAE

Slender Monkey-flower

Life history**Growth form:** Erect to ascending stoloniferous perennial or annual herb 4–35 cm high.**Vegetative spread:** Roots from stolons.**Longevity:****Primary juvenile period:****Flowers:** Blue, purple or lilac, with yellow, May–September.**Fruit/seed:** Capsule 5–6 mm long, with many seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC SC NT CT NWS CWS SWS NWP SWP; Qld, Vic., N.T., S.A., W.A., India, southern Afr.**Distribution Sydney area:** Tablelands.**Select locations:** CT: Mudgee (1850), Blue Mountains (old record, undated).**Habitat****Habitat:** Swamps, creeks (Harden 1992).**Altitude:****Annual rainfall:****Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Rare, probably extinct.***Mimulus moschatus* ***

SCROPHULARIACEAE

Musk Monkey-flower

Life history**Growth form:** Procumbent or ascending, sticky, hairy musk-scented perennial herb.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, November–February.**Fruit/seed:** Egg-shaped capsule 5–6 mm long, with many seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N America.**Botanical subregions:** CC CT ST; Vic., Tas., S.A.**Distribution Sydney area:****Select locations:** CC: Kedumba River, Macquarie Rivulet. CT: Orange, Katoomba Falls.**Habitat****Habitat:** Moist sites, creekbanks, waterfalls.**Altitude:** 0–1000 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Riparian forest e.g. with *Casuarina cunningghamiana* and sedges.**Substrate:** Sandy alluvium, low nutrients.**Exposure:****Conservation****Conservation:** Minor weed.

Mimulus repens**SCROPHULARIACEAE****Life history**

Growth form: Terrestrial or occasionally aquatic annual or perennial herb, forming mats.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Blue, purple or pink, with yellow or white, September–April.

Fruit/seed: Capsule 5 mm long, with many seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC SWP NFWP SFWP; Qld, Vic., Tas., S.A., W.A., N.Z.

Distribution Sydney area: Sporadic.

Select locations: CC: Avoca (1971), Wollongong (1911). CT: Kings Tableland (1887).

Habitat

Habitat: Swampy sites, edges of lakes, watercourses, ephemeral wet areas.

Altitude: 0–1000 m

Annual rainfall: 1000–1200 mm

Typical local abundance:

Vegetation:

Substrate: Wet sand, saline.

Exposure:

Conservation

Conservation: Rare, only one recent record, Avoca (1971).

Misopates orontium* **SCROPHULARIACEAE**

Lesser Snapdragon

Life history

Growth form:

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: White with blue, purple or pink, September–February.

Fruit/seed: Capsule 7–9 mm long, with many seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native of Mediterranean region.

Botanical subregions: NC CC NWS CWS NWP; Qld, Vic., S.A., W.A.

Distribution Sydney area: Coast.

Select locations: CC: Richmond, Carlingford, Pennant Hills, Lindfield, Meadowbank, Leichhardt, Bunnerong, Warrimoo.

Habitat

Habitat: Roadsides, railways, embankments.

Altitude: 0–300 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassy areas.

Substrate: Sandy to clay soil on sands, shale low–medium nutrients.

Exposure:

Conservation

Conservation: Weed of cultivation and disturbed sites, minor weed.

Nemesia strumosa* **SCROPHULARIACEAE****Life history****Growth form:** Herb 15–40 cm high**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Orange with pale yellow, and bluish, purplish markings, October.**Fruit/seed:** Capsule 12–15 mm long, with many seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa. Introduced as ornamental.**Botanical subregions:** CC.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Woy Woy, Picnic Point.**Habitat****Habitat:** Moist sites.**Altitude:** 0–100 m**Annual rainfall:** 900–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** There are a couple of records of this species from the Sydney area although it is not clear whether the species is truly naturalised.***Orobanche minor* *****SCROPHULARIACEAE**

Broomrape

Life history**Growth form:** Erect herb 10–40 cm high, apparently tuberous. Root parasite e.g. on *Glechoma hederacea* causing patchy dieback in host, also on *Trifolium* sp., *Tropaeolum pentaphyllum*.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale blue to whitish,**Fruit/seed:** Capsule 5–8 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Parasitic on the roots of garden and pasture plants (Harden 1992).**Distribution****Status/origin:** Exotic, native to Europe.**Botanical subregions:** NC CC CT ST CWS SWS SWP; Vic., Tas., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Concord (1910), Foxground, Kangaroo Valley. CT: Mt Canobolas, Kelso, Mittagong.**Habitat****Habitat:** Gardens, pastures, orchards.**Altitude:** 0–1000 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Clay loam on shale, granite, medium nutrients.**Exposure:****Conservation****Conservation:** Occasionally naturalised, localised.

Parahebe lithophila**SCROPHULARIACEAE****Life history**

Growth form: Trailing perennial, with stems 50 cm long, more or less woody at the base, rooting at the nodes.

Vegetative spread: By rooting from nodes of stems.

Longevity:

Primary juvenile period:

Flowers: Pale violet, September–October.

Fruit/seed: Capsule 3–5 mm long, February.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Southern Blue Mountains.

Select locations: CT: Yerranderie, McMahons Lookout, Kanangra Walls, Mt Colong,

Habitat

Habitat: Cliffs or rock exposures.

Altitude: 650–1000 m **Annual rainfall:** 1000–1200 mm

Typical local abundance: Rare.

Vegetation: Cliff face plants e.g. with *Pyrrosia rupestris*, *Dendrobium striolatum*, *Liparis reflexa*, *Crassula* sp., *Hymenophyllum cupressiforme*; in forest e.g. with *Eucalyptus deanei*, *E. sieberi*, *E. piperita*, *E. agglomerata*.

Substrate: Sandstone or quartzite cliffs, shallow humus soil, low nutrients.

Exposure: Sheltered, south-facing slopes.

Conservation

Conservation: Local endemic coded 2RC- on national rare species list (Briggs & Leigh 1996). Reported from Blue Mountains National Park.

Parentucellia latifolia* **SCROPHULARIACEAE**

Red Bartsia

Life history

Growth form: Slender erect hairy herb 5–30 cm high, partly parasitic; leaves opposite, simple, toothed.

Vegetative spread:

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Red-purple or rarely white, with a tubular, ribbed calyx, September–December, peak October.

Fruit/seed: Capsule 6 mm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Mediterranean region.

Botanical subregions: NC CC SC CT ST CWS SWS SWP; Vic., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Epping, Ashfield, Peakhurst, Glenfield, Marayong, Liverpool. CT: Orange, Carcoar, Blayney.

Habitat

Habitat: Disturbed areas, roadsides, pastures.

Altitude: 0–1000 m **Annual rainfall:** 700–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grasslands, native pastures.

Substrate: Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Minor weed.

Parentucellia viscosa* **SCROPHULARIACEAE**

Yellow Bartsia

Life history**Growth form:** Slender erect, sticky, hairy herb 5–30 cm high, partly parasitic; leaves opposite, simple, toothed.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Yellow, with a tubular, finely ribbed calyx, November–January.**Fruit/seed:** Capsule 11–18 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Mediterranean region.**Botanical subregions:** CC CT SWS; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Marayong. CT: Wentworth Falls.**Habitat****Habitat:** Roadsides.**Altitude:** 0–1000 m**Annual rainfall:** 800–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Known from only a couple of records in the Sydney area.***Scrophularia nodosa* *****SCROPHULARIACEAE**

Figwort

Life history**Growth form:** Perennial herb with erect stems 30–80 cm high, with a nodular rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Green and purplish brown, summer.**Fruit/seed:** Capsule 5 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe.**Botanical subregions:** CC CT;**Distribution Sydney area:** Widespread.**Select locations:** CC: Mangrove Mountain, Macquarie Falls, Albion Park (1963). CT: Robertson.**Habitat****Habitat:** Damp or shady places, pastures, roadsides, wasteland, creek flats.**Altitude:** 0–700 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Edge of rainforest e.g. with *Austrocynoglossum latifolium*.**Substrate:** Clay soils on basalt.**Exposure:****Conservation****Conservation:** Minor weed.

Verbascum blattaria* **SCROPHULARIACEAE**

Moth Mullein

Life history**Growth form:** Biennial herb 0.5–1.2 m high.**Vegetative spread:****Longevity:** 2 years.**Primary juvenile period:** Less than 2 years.**Flowers:** Pale pink, white or yellow, December–April. Moths feed on flowers (Brown 2001).**Fruit/seed:** Hairy capsule 8 mm long, with numerous seeds, December–April. Stored seed viable after 120 years (Brown 2001).**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Eurasia.**Botanical subregions:** CC NT CT ST SWS; Vic., Tas.**Distribution Sydney area:** Widespread.**Select locations:** CC: Macquarie Fields, Douglas Park, Broughton Vale, Cambewarra.**Habitat****Habitat:** Disturbed ground, pastures.**Altitude:** 0–300 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Sandy to clayey soils.**Exposure:****Conservation****Conservation:** Minor weed.***Verbascum thapsus* subsp. *thapsus* *****SCROPHULARIACEAE**

Great Mullein, Aarons Rod

Life history**Growth form:** Biennial herb, occasionally annual, 0.5–2 m high, with greyish or whitish covering of hairs; taproot stout and deep.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:** 1–2 years.**Primary juvenile period:** Less than 2 years.**Flowers:** Yellow, January–March, maturing along the stalk from the base upwards, opening early morning and closing by mid-afternoon; flowers self-pollinate if cross-pollination does not occur (Parsons & Cuthbertson 1992).**Fruit/seed:** Hairy 2-celled capsule 7–10 mm diam., with several hundred fruit per plant, splitting into 2 segments at maturity; seeds reddish brown, less than 1 mm long, with up to 600 seeds per fruit (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: very small seed, most falling within 1.5 m of parent plant; no special mechanism for dispersal but dispersed by contamination of materials and objects; seed viable after storage for a long time 35 years by experiment, 650 years (reported in Denmark); seeds germinate in autumn and spring, with a rosette of leaves and a stout taproot formed by summer (Parsons & Cuthbertson 1992).**Fire response:****Interaction with other organisms:** The woolly leaves were used by the ancient Greeks as lamp wicks, Romans dipped the flowering stems in oil and tallow for use as torches, and there was wide medicinal use for gout, toothache, warts, diarrhoea, stomach cramps, chest pains, coughs, asthma and as a sedative (Parsons & Cuthbertson 1992).**Distribution****Status/origin:** Exotic, native to Eurasia. Introduced as ornamental, with seed listed in nursery catalogues from 1845, naturalised in Victoria 1887, possibly earlier in other states (Parsons & Cuthbertson 1992).**Botanical subregions:** CC SC NT CT ST NWS CWS SWP NFWP; Vic., Tas., S.A.**Distribution Sydney area:** Sporadic**Select locations:** CC: Mascot. CT: Mt Towinhingy, Capertee.

	Habitat
Habitat: Disturbed ground, pastures, roadsides, wasteland.	
Altitude: 0–900 m	Annual rainfall: 700–1100 mm
Typical local abundance: Frequent.	
Vegetation: Woodland.	
Substrate: Sandy soils, also clay soils on basalt. Grows well on dry, well-drained soils of low fertility and high pH (Parsons & Cuthbertson 1992).	
Exposure:	
	Conservation
Conservation: Sporadic records for Sydney area. Control by removing taproot; biological control was attempted in America in 1930s by use of a weevil which destroys the seed (Parsons & Cuthbertson 1992).	

Verbascum virgatum* **SCROPHULARIACEAE**

Twiggy Mullein, Green Mullein

	Life history
Growth form: Biennial herb 1–2 m high.	
Vegetative spread: No (McIntyre et al. 1995).	
Longevity: 2 years.	
Primary juvenile period: Less than 2 years.	
Flowers: Yellow, with purple centre, November–March.	
Fruit/seed: Hairy capsule 5–8 mm long, with numerous seeds, November–March.	
Dispersal, establishment & growth: Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995).	
Fire response:	
Interaction with other organisms:	
	Distribution
Status/origin: Exotic, native to W Europe.	
Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A.	
Distribution Sydney area: Widespread.	
Select locations: CC: Llandilo, Wahroonga, Royal Botanic Gardens (1902), Meadowbank, Flemington Saleyards, Mount Annan. CT: Orange, Eglinton (1895), Glanmire, Wombeyan Caves, Bundanoon.	
	Habitat
Habitat: Disturbed ground, roadsides, near habitation, pastures.	
Altitude: 0–1000 m	Annual rainfall: 700–1400 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Grassland e.g. with <i>Themeda australis</i> .	
Substrate: Sandy soil on sandstone, clay soils on shale, basalt.	
Exposure:	
	Conservation
Conservation: Minor weed of disturbed ground.	

Veronica anagallis-aquatica* **SCROPHULARIACEAE**

Blue Water Speedwell

Life history**Growth form:** Perennial herb to 80 cm high, with stout, hollow stems and stout rhizomes.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:** Blue or lilac, September–January.**Fruit/seed:** Capsule 2–4 mm long, November–March.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic.**Botanical subregions:** CC SC CT ST SWS SWP; Vic., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Kellyville, Yarramundi, Regentville, Mt Ousley, Unanderra, Goodmans Ford. CT: Bathurst, Carcoar, Mt Canobolas, Wombeyan Caves.**Habitat****Habitat:** Banks of streams, drainage channels.**Altitude:** 0–800 m**Annual rainfall:** 600–1600 mm**Typical local abundance:****Vegetation:** Creekline vegetation e.g. with *Ranunculus repens*; grassy woodland e.g. with *Scutellaria humilis*, *Geranium solanderi*, *Cynoglossum suaveolens*.**Substrate:** Mud on alluvium, sometimes inundated.**Exposure:****Conservation****Conservation:** Widespread weed of watercourses.***Veronica arvensis* *****SCROPHULARIACEAE**

Wall Speedwell

Life history**Growth form:** Annual herb with hairy stems to 10 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** 2 months.**Flowers:** Pale blue or lilac, September–November.**Fruit/seed:** Capsule 1–3 mm long, September–November.**Dispersal, establishment & growth:** Diaspore: seed, soil-stored seedbank, germinating in gardens in spring, possibly in response to cultivation.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and W Asia.**Botanical subregions:** CC NT CT ST NWS CWS SWS NWP SWP; LHI, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wisemans Ferry, Glenorie, Cheltenham, Roseville, Balgowlah, Glenfield, Mt Kembla, Albion Park. CT: Orange, Mt Canobolas, Jenolan Caves, Robertson.**Habitat****Habitat:** Grassy areas, disturbed sites, lawns and gardens.**Altitude:** 0–1350 m**Annual rainfall:** 800–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Eucalypt woodland e.g. with *Eucalyptus pauciflora*.**Substrate:** Clay soils on shale, basalt, limestone, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Weed of gardens and disturbed sites. Not likely to invade bushland.

Veronica brownii**SCROPHULARIACEAE****Life history**

Growth form: Perennial herb with arching or prostrate stolons to 50 cm or more long, rooting at nodes; flowering stems 10–25 cm high.

Vegetative spread: Local spread by stolons.

Longevity:

Primary juvenile period:

Flowers: Pale lilac, November–December.

Fruit/seed: Capsule 2–4 mm long.

Dispersal, establishment & growth: Diaspore: seed.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT.

Distribution Sydney area: Blue Mountains.

Select locations: CC: Grose Valley. CT: Mt Coricudgy, Mt Victoria, Blackheath, Katoomba.

Habitat

Habitat: Slopes.

Altitude: 350–1100 m **Annual rainfall:** 1000–1200 mm

Typical local abundance: Frequent.

Vegetation: Eucalypt forest e.g. with *Eucalyptus punctata*, *E. piperita*, *E. cypellocarpa*.

Substrate: Clay loams on sandstones, shales, medium nutrients, well-drained.

Exposure:

Conservation

Conservation: Local endemic species, conservation status unknown.

Veronica calycina**SCROPHULARIACEAE**

Hairy Speedwell

Life history

Growth form: Perennial herb with stolons to 50 cm long, rooting at nodes.

Vegetative spread: Stolons rooting at nodes.

Longevity:

Primary juvenile period:

Flowers: Pale blue or lilac, spring–summer.

Fruit/seed: Capsule 3–6 mm long.

Dispersal, establishment & growth: Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST NWS CWS; Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Helensburgh. CT: Hargraves, Mt Coricudgy, Mullion Range, Sunny Corner, Bell, Mt Wilson, Mount Tomah, Oberon, Jenolan Caves, Mt Werong, Mt Colong.

Habitat

Habitat: Wide range of habitats.

Altitude: 0–1100 m **Annual rainfall:** 800–1400 mm

Typical local abundance:

Vegetation: Eucalypt forest

Substrate:

Exposure:

Conservation

Conservation: Conservation status unknown.

Veronica gracilis**SCROPHULARIACEAE****Life history**

Growth form: Perennial herb with slender rhizomes to 60 cm long; flowering stems to 25 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pale lilac or blue, November–December, peak November.

Fruit/seed: Glossy capsule 4 mm long, with hairs.

Dispersal, establishment & growth: Diaspore: seed.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic., Tas., S.A.

Distribution Sydney area: Tablelands.

Select locations: CT: Hargraves, Orange, Mt Piper, Hampton, Oberon, Mt Werong, Bindook Swamp, Robertson, Wingecarribee Swamp.

Habitat

Habitat: Swampy sites.

Altitude: 600–1000 m **Annual rainfall:** 800–1600 mm

Typical local abundance: Occasional.

Vegetation: Grassland, woodland e.g. with *Eucalyptus pauciflora*, *E. dalrympleana*.

Substrate: Clay soils on alluvium, basalt, medium–high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Veronica notabilis**SCROPHULARIACEAE****Life history**

Growth form: Perennial stoloniferous herb with flowering stems to 40 cm high.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Lavender or white, October–December.

Fruit/seed: Glossy capsule 5 mm long, October–December.

Dispersal, establishment & growth: Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST; Vic., Tas.

Distribution Sydney area: Illawarra area.

Select locations: CC: Clifton, Mt Kembla, Macquarie Pass. CT: Fitzroy Falls.

Habitat

Habitat: Moist cleft in rocks.

Altitude: 0–600 m **Annual rainfall:** 1200–1600 mm

Typical local abundance:

Vegetation: Rainforest, moist forest

Substrate:

Exposure:

Conservation

Conservation: Appears to be rare, last collected in 1948 at Macquarie Pass.

Veronica peregrina* **SCROPHULARIACEAE**

Wandering Speedwell

Life history**Growth form:** Annual herb with erect hairy stems to 20 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Pale lavender or white, October–November.**Fruit/seed:** Capsule 3 mm long, October–November.**Dispersal, establishment & growth:** Diaspore: seed, possibly spread over golfcourse by mowers (Herb. note).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to America.**Botanical subregions:** CC CT ST NWS CWS SWS NWP SWP SFWP; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Lane Cove, Nortons Basin. CT: Oberon.**Habitat****Habitat:** Pastures, disturbed sites, creekbanks.**Altitude:** 0–100 m**Annual rainfall:** 900–1200 mm**Typical local abundance:** Frequent.**Vegetation:** Riparian scrub e.g. with *Casuarina cunninghamiana*, *Tristaniopsis laurina*, *Backhousia myrtifolia*; woodland e.g. with *Eucalyptus viminalis*, *E. pauciflora*.**Substrate:** Clay soils on alluvium.**Exposure:****Conservation****Conservation:** Rare weed in Sydney area though widespread in inland districts.***Veronica persica* *****SCROPHULARIACEAE**

Creeping Speedwell

Life history**Growth form:** Herb with sprawling or erect hairy stems to 30 cm long.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Blue or bluish white, July–November. Probably pollinated by hoverflies (Syrphidae), native bee (P. Kubiak pers. comm.).**Fruit/seed:** Capsule 5 mm long, with hairs on margin, July–November.**Dispersal, establishment & growth:** Diaspore: seed. Diaspore mobile (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:** Small black ants observed probably feeding on nectar (P. Kubiak pers. comm.).**Distribution****Status/origin:** Exotic, native to Europe.**Botanical subregions:** NC CC CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Llandilo, Pennant Hills, Cheltenham, Castle Hill, Glenfield, Campbelltown, Albion Park. CT: Bathurst, Orange, Carcoar.**Habitat****Habitat:** Pasture, disturbed sites, gardens, footpaths.**Altitude:** 0–1000 m**Annual rainfall:** 600–1200 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Clay soils on Wianamatta Shale, alluvium.**Exposure:****Conservation****Conservation:** Weed of gardens.

Veronica plebeia**SCROPHULARIACEAE**

Trailing Speedwell

Life history**Growth form:** Perennial herb with stolons to 50 cm long.**Vegetative spread:** Stolons rooting at nodes.**Longevity:****Primary juvenile period:****Flowers:** Pale blue or lilac, September–June, peak October–January, April. Probably pollinated by native bees, with flies (Diptera) also involved (P. Kubiak pers. comm.).**Fruit/seed:** Capsule 3–6 mm long. Seed weight: 16 950 seeds per gram (Morgan & Lunt 1994).**Dispersal, establishment & growth:** Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995). By experiment, germination 84% with exposure to light at 20°C; darkness suppressed germination (Morgan & Lunt 1994).**Fire response:****Interaction with other organisms:** Heavily cropped by rabbits; black ants probably feed on nectar (P. Kubiak pers. comm.).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS NWP; Qld, Vic., S.A., *W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Howes Valley, Culoul Range, Kurrajong, Avoca Beach, Dennistone, Wahroonga, Balgowlah, Royal Botanic Gardens, Kogarah, Homebush, Lady Carrington Drive, Campbelltown, Albion Park, Cambewarra Range. CT: Mt Towinhingy, Glen Davis, Wolgan Gap, Lithgow, Blackheath, Yerranderie, Mt Colong, Mt Gibraltar.**Habitat****Habitat:** Eucalypt forest**Altitude:** 0–1100 m**Annual rainfall:** 600–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist forest e.g. with *Eucalyptus viminalis*, *E. fastigata*, *E. pilularis*; dry forest e.g. with *Eucalyptus punctata*, *E. fibrosa*; woodland e.g. with *Angophora bakeri*, *Eucalyptus sclerophylla*, *Melaleuca decora*, *Eucalyptus moluccana*, *E. tereticornis*, *Eucalyptus tereticornis*. Grassy woodland (Morgan & Lunt 1994).**Substrate:** Clay soils on shale, basalt.**Exposure:****Conservation****Conservation:** Widespread and probably adequately conserved. Reported in Yengo NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP.

Veronica serpyllifolia* **SCROPHULARIACEAE****Life history****Growth form:** Perennial herb, with stems prostrate or erect to 10 cm high.**Vegetative spread:** Stolons rooting at nodes.**Longevity:****Primary juvenile period:****Flowers:** Blue, spring–summer.**Fruit/seed:** Capsule 2–4 mm long.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and W Asia.**Botanical subregions:** CC NT ST NWS CWS SWS; Qld, Vic., Tas.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: Lane Cove River, Manly, Croydon, Minnamurra Falls.**Habitat****Habitat:** Moist sites, lawns, paths.**Altitude:** 0–100 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Weed of lawns in suburban areas.***Veronica* sp. **A** sensu****SCROPHULARIACEAE****Life history****Growth form:** Perennial herb with slender stems 10–25 cm high; rhizomes to 25 cm long.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:** Lilac or pale blue, November–December.**Fruit/seed:** Capsule 3 mm long.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT ST; Vic., S.A.**Distribution Sydney area:** Lithgow to Robertson.**Select locations:** CT: Lithgow, Mt Werong, Tomat Swamp, Wingecarribee Swamp.**Habitat****Habitat:** Swamps.**Altitude:** 600–1000 m**Annual rainfall:** 900–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Peaty swamp e.g. with *Leptospermum lanigera*, *L. juniperinum*, *Eucalyptus ovata*.**Substrate:****Exposure:****Conservation****Conservation:** Lithgow is northern geographical limit, conservation status unknown.

Veronica sp. C

SCROPHULARIACEAE

Life history

Growth form: Perennial herb with flowering stems to 30 cm high.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Lavender or white, spring–autumn.

Fruit/seed: Capsule 5 mm long.

Dispersal, establishment & growth: Diaspore: seed.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC NT CT CWS; Qld, Vic.

Distribution Sydney area: Upper Blue Mountains.

Select locations: CT: Mt Wilson, Katoomba.

Habitat

Habitat:

Altitude: 700–1000 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Rare.

Vegetation: Moist eucalypt forest; edge of rainforest.

Substrate: Clay soils on basalt or shale, medium–high nutrients.

Exposure:

Conservation

Conservation: Rare, conservation status unknown.

Selago corymbosa *

SELAGINACEAE

Life history

Growth form: Perennial shrub 30–60 cm high; branches covered with fine hairs.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, September–November.

Fruit/seed: Fruit 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa. Introduced as ornamental.

Botanical subregions: CC.

Distribution Sydney area: Camden.

Select locations: CC: Camden.

Habitat

Habitat: Slopes, cemetery.

Altitude: 70 m **Annual rainfall:** 750 mm

Typical local abundance: Frequent.

Vegetation: Pasture.

Substrate:

Exposure:

Conservation

Conservation: Cultivated as ornamental. Reported naturalised in Camden Cemetery (originally planted) and adjacent Cawdor Road (1965, 1966, 1983, 1993). Capacity to spread further unknown.

***Selago thunbergii* ***

SELAGINACEAE

Life history

Growth form: Perennial much-branched shrub 30–60 cm high; branches covered with fine hairs.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Whitish, turning blue on drying, winter.

Fruit/seed: Fruit 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa. Introduced as ornamental.

Botanical subregions: NT CT.

Distribution Sydney area: Sporadic.

Select locations: CC: Berala. CT: Wentworth Falls.

Habitat

Habitat: Railway cutting.

Altitude: 0–1000 m

Annual rainfall: 900–1200 mm

Typical local abundance:

Vegetation:

Substrate: Clay soils on shale.

Exposure:

Conservation

Conservation: Cultivated as ornamental, sometimes naturalised. Naturalised at Berala (1984) not clear whether naturalised at Wentworth Falls.

***Ailanthus altissima* ***

SIMAROUBACEAE

Tree of Heaven

Life history**Growth form:** Tree to 8 m high, deciduous.**Vegetative spread:** Suckers to form dense thickets.**Longevity:** Indefinite.**Primary juvenile period:** More than 2 years (Parsons & Cuthbertson 1992).**Flowers:** White or greenish, summer; male flowers emit an offensive odour which attracts insects (Parsons & Cuthbertson 1992).**Fruit/seed:** Dry, indehiscent winged fruit (samara), yellowish, 3.5–5 cm long. Mature late summer and autumn (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: fruit, bird, water and wind-dispersed (Carr et al. 1992), vegetative dispersal by root pieces and cuttings (Parsons & Cuthbertson 1992).**Fire response:****Interaction with other organisms:** Can cause contact dermatitis when plants in flower; suspected of causing death in sheep (Whittet 1958). Listed 1871 in Victoria as a plant of potential importance to the silk industry as a food for silkworms; cultivated in China to feed the larvae of silk moth *Attacus cynthia*, used for production of shantung silk; allelopathic substances in leaves adversely affect the growth of other plants (Parsons & Cuthbertson 1992).**Distribution****Status/origin:** Exotic, native to China. Introduced as ornamental, known to be at Camden Park in 1845; recognised as a potential weed by 1930 (Parsons & Cuthbertson 1992).**Botanical subregions:** NC CC SC CT ST NWS CWS SWS SFWP; Qld, Vic., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Castlereagh, Wisemans Ferry, Blacktown. CT: Orange, Blayney.**Habitat****Habitat:** River edges.**Altitude:** 0–1000 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Clay or loam soils, withstanding harsh environments (Parsons & Cuthbertson 1992).**Exposure:****Conservation****Conservation:** Often cultivated. May be locally naturalised due to its suckering habit, which makes eradication difficult (Harden 1991).***Cestrum aurantiacum* ***

SOLANACEAE

Orange Cestrum

Life history**Growth form:** Hairy shrub to 4 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Orange-yellow, tubular, May–July, November.**Fruit/seed:** White berry 10 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Poisonous to stock (Whittet 1958).**Distribution****Status/origin:** Exotic, native to tropical America. Introduced as ornamental.**Botanical subregions:** NC CC SC; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Kurrajong (1985), Upper Cordeaux Dam (1957), Gerringong (1952).

Habitat: Creeks, disturbed sites. Altitude: 0–400 m Annual rainfall: 1000–1200 mm Typical local abundance: Vegetation: Edge of rainforest. Substrate: Exposure:	Habitat
Conservation: Garden escape, occasionally locally naturalised.	Conservation

***Cestrum parqui* ***

SOLANACEAE

Green *Cestrum*, Green Poisonberry

Growth form: Woody shrub to 3 m high, with unpleasant odour from crushed leaves. Vegetative spread: Longevity: Primary juvenile period: More than 2 years (Parsons & Cuthbertson 1992). Flowers: Greenish to yellow, through summer and autumn, with an unpleasant odour by day, fragrant at night (Parsons & Cuthbertson 1992). Flowers visited by honeybees and hoverfly (Syphidae) fed on pollen (P. Kubiak pers. comm.) they may be involved with pollination. Fruit/seed: Purplish black berry 10–15 mm long, with 1–2 seeds. Dispersal, establishment & growth: Diaspore: fruit, dispersed by birds, water. Seed dormancy in soil for many years (Parsons & Cuthbertson 1992). Fire response: Interaction with other organisms: Attractive to animals, toxic to stock including cattle, sheep, horses, pigs, poultry causing death, also reported toxic to birds and bees (Parsons & Cuthbertson 1992). Protective clothing should be used when removing plants to avoid skin reactions (Muyt 2001).	Life history
Status/origin: Exotic, native to S America (Chile). Introduced as ornamental or hedge plant (Parsons & Cuthbertson 1992). Botanical subregions: NC CC CS NWS SWS NWP; Qld, Vic., S.A. Distribution Sydney area: Suburban areas. Select locations: CC: Barrenjoey, Forestville Park (L.McD.), Manly West, Mascot (1965), Granville, Lansvale, Minnamurra.	Distribution
Habitat: Gardens, headlands, river flats. Altitude: 0–100 m Annual rainfall: 700–1200 mm Typical local abundance: Occasional. Vegetation: Substrate: Sandy to clay soils. Exposure: Full sun to light shade.	Habitat
Conservation: Garden escape, naturalised and with potential to invade bushland. Control by removal of roots, use of herbicide, and follow-up treatment of seedlings (Parsons & Cuthbertson 1992).	Conservation

Cyphanthera albicans* subsp. *albicans

SOLANACEAE

Grey Ray Flower

Life history**Growth form:** Erect shrub to 3 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to creamy white, August–December, peak September.**Fruit/seed:** Capsule 2–8 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC NT CT ST CWS; Qld, Vic.**Distribution Sydney area:** Widespread, but sporadic.**Select locations:** CC: Douglas Park (1910, 1966, 1978, 1984). CT: Rylstone, Glen Davis, South Bowenfels, Berrima (1902).**Habitat****Habitat:** Rocky hillsides, riverbanks.**Altitude:** 0–1000 m**Annual rainfall:** 800–900 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Eucalypt forest; shrubland e.g. with *Acacia binervia*, *Banksia spinulosa*, *Exocarpos cupressiformis*.**Substrate:** Sandy soils on sandstone hillslopes, riverine alluvium, low nutrients.**Exposure:****Conservation****Conservation:** Rare, known from only a few locations. Conservation status unknown.***Cyphanthera scabrella***

SOLANACEAE

Life history**Growth form:** Erect or scrambling shrub to 1.3 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Creamy-white, often tinged with yellowish green, September–October, peak September.**Fruit/seed:** Capsule 2–8 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Blue Mountains.**Select locations:** CC: Bowens Creek, Erskine Creek.**Habitat****Habitat:** Rocky slopes.**Altitude:** 0–600 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Eucalypt forest bordering creekside rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Coded 2RC- on national rare species list (Briggs & Leigh 1996). Bowens Creek population reported recently but Erskine Creek, Nepean River population not reported since 1888–1899. Reported in Blue Mountains NP.

***Cyphomandra betacea* ***

SOLANACEAE

Tree Tomato, Tamarillo

Life history

Growth form: Small foul-smelling tree.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pink, fleshy, throughout the year.

Fruit/seed: Dark red, dull berry, 5–7 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America. Introduced as food plant.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area:

Select locations: CC: Springwood 1977.

Habitat

Habitat: Gullies.

Altitude: 400 m

Annual rainfall: 1000 mm

Typical local abundance: Rare.

Vegetation: Edge of gully rainforest.

Substrate: Sandy soil on sandstone.

Exposure:

Conservation

Conservation: Cultivated for its edible fruits. Only record, Springwood 1977.

***Datura ferox* ***

SOLANACEAE

Fierce Thornapple, Longspine Thornapple

Life history**Growth form:** Stout herb.**Vegetative spread:** No.**Longevity:** 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** White or pale lavender, trumpet-shaped, summer–autumn, open for only a short time, possibly one day (Parsons & Cuthbertson 1992).**Fruit/seed:** Capsule 2–4 cm long, with up to 60 stout sharp spines 10–15 mm long; seed black or grey, very numerous in each fruit (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: seeds and capsules, dispersed by water or on machinery or vehicles, in mud; vegetative dispersal by pieces of root; seed dormancy by a chemical inhibitor in the seedcoat must be leached out or broken down before germination; seeds require an after-ripening period of 5–11 months before germination; germination throughout the year, mainly in warmer months, within 3 days of exposure to water; alternating temperatures 20–35°C for optimum germination and germination stimulated by cultivation, possibly by exposure to light (Parsons & Cuthbertson 1992).**Fire response:****Interaction with other organisms:** Plants in Qld defoliated by introduced Three-lined Potato Beetle *Lema trilineata*; all parts of the plant are poisonous to humans, particularly seeds, and leaves may cause headaches, nausea and dermatitis; stock may be poisoned by contamination of hay with seed; grown commercially in some European countries and India for medicinal purposes; used in genetic studies, useful as indicator plants in virological research (Parsons & Cuthbertson 1992).**Distribution****Status/origin:** Exotic, native to China.**Botanical subregions:** CC CT NWS CWS SWS NWP SWP; Qld, Vic., Tas., N.T., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Flemington, Campbelltown (1966), Menangle Park. CT: Newnes.**Habitat****Habitat:** Wasteland.**Altitude:** 0–700 m**Annual rainfall:** 700–900 mm**Typical local abundance:** Occasional.**Vegetation:** Wasteland weeds.**Substrate:** Sandy soils.**Exposure:** Full sun.**Conservation****Conservation:** Occasional weed of wasteland. Control by hand removal of isolated plants before fruiting, herbicide treatment of seedlings, possible biological control in future (Parsons & Cuthbertson 1992).

***Datura stramonium* ***

SOLANACEAE

Common Thornapple

Life history**Growth form:** Stout herb.**Vegetative spread:** No.**Longevity:** 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** White or pale lavender, trumpet-shaped, summer–autumn, open for only a short time, possibly one day (Parsons & Cuthbertson 1992).**Fruit/seed:** Capsule 2–5 mm long, splitting into 4 segments, with more than 100 large, erect spines; seed black or grey, 600–700 in each fruit, 30 000 seed per plant, throughout summer (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: seeds and capsules, dispersed by water or in mud on machinery or vehicles; vegetative dispersal by pieces of root; seed dormancy controlled by a chemical inhibitor in the seedcoat that must be leached out or broken down before germination; seeds require an after-ripening period of 5–11 months before germination (Parsons & Cuthbertson 1992).

Optimum germination with alternating temperatures 20–35°C, throughout the year, mainly in warmer months, within 3 days of exposure to water; germination stimulated by cultivation, possibly by exposure to light, seed buried 15 cm does not germinate; 91% seed viable after burial for 39 years, by experiment (Parsons & Cuthbertson 1992).

Fire response:**Interaction with other organisms:** All parts of the plant are poisonous to humans, leaves may cause headaches, nausea and dermatitis; stock may be poisoned by contamination of hay with seed; grown commercially in some European countries and India for medicinal purposes; used in genetic studies, useful as indicator plants in virological research; plants in Qld defoliated by introduced Three-lined Potato Beetle *Lema trilineata* discovered in 1970s (Parsons & Cuthbertson 1992).**Distribution****Status/origin:** Exotic, probably native of N America.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wahroonga, Cheltenham, Centennial Park (1913), Rockdale (1901), Cooks River, Bents Basin. CT: Sofala, Coxs River.**Habitat****Habitat:** River flats, roadsides.**Altitude:** 0–700 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** With other weeds e.g. *Cirsium vulgare*, *Bidens pilosa*, *Conium maculatum*.**Substrate:** Sandy or stony soils, medium nutrients.**Exposure:** Full sun.**Conservation****Conservation:** Occasional weed of disturbed sites. Control by hand removal of isolated plants before fruiting, herbicide treatment of seedlings, possible biological control in future (Parsons & Cuthbertson 1992).

Duboisia myoporoides

SOLANACEAE

Corkwood

Life history**Growth form:** Tall erect shrub or small tree to 20 m high, with thick, corky bark.**Vegetative spread:** Root suckers after flood damage (Colo R).**Longevity:****Primary juvenile period:****Flowers:** White, September–December, peak October.**Fruit/seed:** Purple-black, globose berry, 4–8 mm diam., mature November–December.

Mature October–January, seed weight 656 000 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Diaspore: fruit, probably bird-dispersed. Fresh seed germinates readily, with pulp removed (Floyd 1989).**Fire response:** Resprouts from base (Adam & Williams 2001).**Interaction with other organisms:** Reported to be toxic to cattle, horses and humans; chemicals in branches used by Aboriginal people to stun eels; source of hyoscyne for medicinal drugs; fruit eaten by Figbird, Green Catbird, Lewins Honeyeater and Topknot Pigeon (Floyd 1989).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT; Qld, N. Caledonia.**Distribution Sydney area:** Coast and Hawkesbury–Nepean River.**Select locations:** CC: Boorai Creek, Ourimbah, Gunderman, Marramarra Creek (L.McD.), Narrabeen, Blakehurst, Liverpool, Audley, Douglas Park, Bargo, Macquarie Pass, Minnamurra Falls.**Habitat****Habitat:** Riverbanks, margins of rainforest.**Altitude:** 0–400 m**Annual rainfall:** above 800–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Riverbank scrub e.g. with *Backhousia myrtifolia*, *Casuarina cunninghamiana*, *Angophora subvelutina*, and margins of rainforest.**Substrate:** Deep sandy alluvial soils, along levee banks and in gullies, also occasionally on rocky hillsides on sandstone, medium-high nutrient.**Exposure:** Mid shade–full sun.**Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Garigal NP,***Hyoscyamus niger* ***

SOLANACEAE

Black Henbane

Life history**Growth form:** Foetid annual or biennial herb to 50 cm high.**Vegetative spread:** No.**Longevity:** 1–2 years.**Primary juvenile period:****Flowers:** Pale yellow, summer.**Fruit/seed:** Capsule 25 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Mediterranean region.**Botanical subregions:** CC; Vic., S.A.**Distribution Sydney area:****Select locations:** CC: Glenbrook.

Habitat: Altitude: 0–300 m Annual rainfall: 900–1200 mm Typical local abundance: Vegetation: Substrate: Exposure:	Habitat
Conservation: Probably not naturalised in Sydney area. Only known from one collection in Glenbrook area in 1906.	Conservation

***Lycium barbarum* ***

SOLANACEAE

Chinese Boxthorn

Growth form: Shrub to 2.5 m high Vegetative spread: Longevity: Primary juvenile period: Flowers: Mauve, summer–autumn. Fruit/seed: Red berry 4 mm diam., with about 20 seeds. Dispersal, establishment & growth: Fire response: Interaction with other organisms:	Life history
Status/origin: Exotic, native to China. Introduced as ornamental. Botanical subregions: NC CC SC CT ST CWS; Qld, Vic., Tas., S.A. Distribution Sydney area: Sporadic. Select locations: CC: Wilberforce, Watsons Bay (1914), Leumeah, Campbelltown. CT: Cullen Bullen.	Distribution
Habitat: Riverbanks, rubbish dumps, old gardens. Altitude: 0–700 m Annual rainfall: 700–1200 mm Typical local abundance: Occasional. Vegetation: Substrate: Exposure:	Habitat
Conservation: Garden escape, occasionally naturalised in Sydney area.	Conservation

***Lycium ferocissimum* ***

SOLANACEAE

African Boxthorn

Life history

Growth form: Intricately branched shrub to 4 m high, with long rigid branches; lateral branches end in stout spines. Unchecked plants can grow much larger; extensive deep, branched taproot, produces new growth when broken (Parsons & Cuthbertson 1992). Plants can lose leaves and become virtually dormant during extended dry spells or over winter in some districts (Muyt 2001).

Vegetative spread: No.

Longevity:

Primary juvenile period: More than 2 years (Parsons & Cuthbertson 1992).

Flowers: Pale lilac or white, January–May. Produces flowers on old wood (Parsons & Cuthbertson 1992).

Fruit/seed: Dull orange-red berry, with 35–70 seeds, January–May.

Dispersal, establishment & growth: Diaspore: seed, dispersed by birds, foxes, skinks, viable when excreted; seeds spread as contaminate of agricultural produce, and in gravel or mud (Parsons & Cuthbertson 1992), dispersed by skinks, water, machinery; broken stem and root pieces, dispersed by floods, machinery and during removal can remain viable for several months before taking root; often establishes under trees as a result of birds dispersing fruits; germination at any time of year (Muyt 2001).

Fire response: Probably reprints from base.

Interaction with other organisms: Foodplant of Stubble Quail *Coturnix pectoralis*, berries eaten by Black-faced Cuckoo-shrike *Coracina novaehollandiae*, seeds eaten by Eastern Bristlebird *Dasyornis brachypterus*; flowers eaten by Tawny-crowned Honeyeater *Phylidonyris melanops* (Barker & Vestjens 1989,1990). Berries suspected poisonous to animals; berries attractive to birds (Whittet 1958). Fruit provides a breeding place for fruit fly, beetles, tomato fly, house fly (Parsons & Cuthbertson 1992). Thickets commonly harbour rabbits so there is often little other vegetation around infestations (Muyt 2001).

Distribution

Status/origin: Exotic, native to S Africa. Used as a hedge plant throughout Australia (Whittet 1958). Reported at Camden Park in 1850.

Botanical subregions: NC CC SC CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., N.T., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Lady Robinsons Beach (1913), Blacktown, Towra Point, Cronulla, Liverpool, Campbelltown, Five Is. CT: Bathurst.

Habitat

Habitat: Urban and agricultural wasteland. Coastal sand dunes (Carolin & Clarke 1991).

Altitude: 0–700 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

Substrate: Clay soils on shale.

Exposure: Partial shade to full sun.

Conservation

Conservation: A tough weed of disturbed areas surviving under a range of conditions including in poor, shallow or rocky soils, salt-laden winds, exposed locations and droughts (Muyt 2001). Declared noxious weed for whole NSW. Control by physical removal and burning, with follow-up for several years to treat seedlings or regrowth (Parsons & Cuthbertson 1992).

***Lycopersicon esculentum* ***

SOLANACEAE

Tomato

Life history**Growth form:** Short-lived perennial herb 0.5–1.5 high, often densely hairy.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** 3 months.**Flowers:** Yellow, late spring–summer.**Fruit/seed:** Red berry 10–20 mm diam.**Dispersal, establishment & growth:** Dispersed in mud on cars (Wace 1977).**Fire response:** Probably killed.**Interaction with other organisms:** Foodplant of Grey Teal *Anas gibberifrons* (Barker & Vestjens 1989, 1990).**Distribution****Status/origin:** Exotic, native to S America. Introduced as food plant.**Botanical subregions:** CC; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Roseville, Domain, Randwick, Lower Cataract River.**Habitat****Habitat:****Altitude:** 0–400 m**Annual rainfall:** 800–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Commonly cultivated garden plant, possibly occasionally naturalised.***Nicandra physalodes* ***

SOLANACEAE

Apple-of-Peru

Life history**Growth form:** Herb to 2 m high.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Pale blue to mauve, summer–autumn.**Fruit/seed:** Pale yellow, dryish berry 10–22 mm diam., January–May.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Peru. Introduced as ornamental.**Botanical subregions:** NC CC SC NT CWS NWP; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Richmond, Cowan, Lane Cove River, Elizabeth Bay, Penrith.**Habitat****Habitat:** Riverbanks.**Altitude:** 0–200 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Weedy sites e.g. with *Ricinus communis*, *Tagetes minuta*, *Foeniculum vulgare*.**Substrate:** Sandy to loamy alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Cultivated as ornamental, occasionally naturalised.

Nicotiana forsteri

SOLANACEAE

Life history**Growth form:** Herb to 1.5 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Tubular, March–April.**Fruit/seed:** Capsule 5–11 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC; LHI, Qld, N Cal.**Distribution Sydney area:** Coastal ranges.**Select locations:** CC: Grose Valley, Burning Palms, Jamberoo, Cambewarra Range.

Habitat**Habitat:** On rocks in caves.**Altitude:** 0–400 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Rare.**Vegetation:** Moist eucalypt forest.**Substrate:** Clay soils on basalt, shale.**Exposure:**

Conservation**Conservation:** Appears to be rare. Kiama is southern geographical limit. Conservation status unknown.***Nicotiana glauca* ***

SOLANACEAE

Tree Tobacco

Life history**Growth form:** Erect, often spindly, tree-like shrub to 6 m high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Tubular, mainly spring.**Fruit/seed:** Capsule 7–13 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Exotic, native to Argentina.**Botanical subregions:** NC CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, N.T., Vic., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Nortons Basin. CT: Bathurst, Turondale, Coxs River.

Habitat**Habitat:** Disturbed areas.**Altitude:** 0–800 m**Annual rainfall:** 700–1100 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Riverine forest e.g. with *Casuarina cunninghamiana*, *Tristaniopsis laurina*, *Backhousia myrtifolia*, *Melaleuca styphelioides*.**Substrate:** Sandy loam on alluvium, sediments, low to medium nutrients.**Exposure:**

Conservation**Conservation:** Occasionally naturalised.

Nicotiana suaveolens

SOLANACEAE

Native Tobacco

Life history

Growth form: Herb to 1.5 m high.
Vegetative spread:
Longevity:
Primary juvenile period:
Flowers: Tubular, spring–summer.
Fruit/seed: Capsule 7–12 mm long.
Dispersal, establishment & growth:
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Vic.
Distribution Sydney area: Widespread.
Select locations: CC: Culoul Range, Lake Macquarie, Freemans Reach, Bar Is (Hawkesbury River), Albion Park. CT: Bathurst, Jenolan Caves, Wombeyan Caves, Abercrombie Caves.

Habitat

Habitat: Creek banks, rocky slopes.
Altitude: 0–800 m **Annual rainfall:** 700–1200 mm
Typical local abundance: Frequent–occasional.
Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora floribunda*.
Substrate: Clay soils on limestone, basalt, shell middens, medium to high nutrients.
Exposure:

Conservation

Conservation: Uncommon, conservation status unknown.

***Physalis ixocarpa* ***

SOLANACEAE

Ground Cherry

Life history

Growth form: Hairy herb to 50 cm high.
Vegetative spread:
Longevity: Less than 1 year.
Primary juvenile period: Less than 1 year.
Flowers: Pale yellow, summer.
Fruit/seed: Berry 11–14 mm diam.
Dispersal, establishment & growth:
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Mexico.
Botanical subregions: NC CC NT NWS CWS NWP SWP; LHI, Qld, S.A.
Distribution Sydney area: Sporadic.
Select locations: CC: Richmond, Riverstone, Glenfield, Albion Park.

Habitat

Habitat: Cultivated areas, pastures.
Altitude: 0–200 m **Annual rainfall:** 800–1000 mm
Typical local abundance:
Vegetation:
Substrate: Clay soils in shale, medium nutrients.
Exposure:

Conservation

Conservation: Occasional weed of cultivated areas.

Physalis minima

SOLANACEAE

Wild Gooseberry

Life history**Growth form:** Bushy herb to 50 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Pale creamy-yellow, summer.**Fruit/seed:** Berry 8–14 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Probably native to Australia.**Botanical subregions:** NC CC NWS; Qld, N.T., W.A., Amer., Asia, Afr.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Riverstone (1984), Peshurst (1911).**Habitat****Habitat:** Weedy areas.**Altitude:** 0–100 m**Annual rainfall:** 800–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Sydney is southern geographical limit, rare, conservation status unknown.***Physalis peruviana* ***

SOLANACEAE

Cape Gooseberry

Life history**Growth form:** Short-lived, densely hairy shrub to 100 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Dull yellow with purple-brown spots, summer.**Fruit/seed:** Pale yellow-green to gold, aromatic berry, 10–20 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Fruit eaten by Yellow-faced Honeyeater *Lichenostomus chrysops* (Barker & Vestjens 1990).**Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC; LHI, Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Widespread on coast.**Select locations:** CC: Mt Warrawalong, Wondabyne, Wisemans Ferry, Grose Vale, Pennant Hills, Manly, Nortons Basin, Audley, Port Hacking, Wollongong, Burragorang, Cambewarra.**Habitat****Habitat:** Disturbed sites, creekbanks.**Altitude:** 0–300 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Weed of disturbed sites.

***Salpichroa organifolia* ***

SOLANACEAE

Pampas Lily-of-the-valley

Life history**Growth form:** Scrambling hairy herb, with stout rootstock and rhizomes.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or cream, September–March. Probably pollinated by honeybees (P. Kubiak pers. comm.).**Fruit/seed:** White to pale yellow berry 13–18 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Shoots apparently eaten by rabbits; beetles, possibly *Epilachna dormica*, feed on leaves (Coccinellidae) (P. Kubiak pers. comm.).**Distribution****Status/origin:** Exotic, native to N America. Introduced as ornamental.**Botanical subregions:** CC SC CT ST CWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: North Ryde, Hunters Hill, Balgowlah, Royal Botanic Gardens, Vacluse, Centennial Park. CT: Orange, Bathurst.**Habitat****Habitat:** Wasteland, footpaths, stonewalls.**Altitude:** 0–1000 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Common in urban wasteland, widely distributed and naturalised in many parts of the world.

Solanum americanum

SOLANACEAE

Glossy Nightshade

Life history

Growth form: Spreading herb or short-lived shrub to 1.3 m high. Considered to be more than one species by some workers, or sometimes subspecies are distinguished (Harden 1992).

Vegetative spread: No.

Longevity: Short-lived.

Primary juvenile period:

Flowers: White or with purple and yellow-green, at any time of year, peak January–May.

Fruit/seed: Shiny purple-black berry 6–9 mm diam., with more than 40 seeds per fruit, 1–1.5 mm long, at any time of year.

Dispersal, establishment & growth: Diaspore: fruit, seeds.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT NWS CWS SWP; LHI, Qld, *Vic., *N.T., *W.A., cosmop.

Distribution Sydney area: Coastal, riverine.

Select locations: CC: Norah Head, Wisemans Ferry, Brooklyn, Cowan, Barrenjoey, Epping, Penrith, Maroubra, La Perouse, Mount Annan, Bulli, Cambewarra. CT: Hill Top.

Habitat

Habitat: Riverbanks, coastal headlands, roadside.

Altitude: 0–600 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional.

Vegetation: Dry rainforest e.g. with *Aphanopetalum resinum*; riparian forest e.g. with *Casuarina cunninghamiana*; woodland e.g. with *Eucalyptus moluccana*; margins of wetlands e.g. with *Phragmites*; coastal grassland e.g. with *Themeda australis*.

Substrate: Clay soils on shale, alluvium, sandstone colluvium, medium nutrients, sometimes poorly-drained.

Exposure:

Conservation

Conservation: Widespread plant of disturbed habitats. Conservation status unknown. Reported in Brisbane Water NP, Lion Island NR, Marramarra NP.

Solanum aviculare

SOLANACEAE

Kangaroo Apple

Life history

Growth form: Erect shrub to 4 m high; leaves entire or lobed.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Blue-violet, August–December. Probably pollinated by native bees and honeybees (P. Kubiak pers. comm.).

Fruit/seed: Orange-red to scarlet berry 10–15 mm diam., December–April.

Dispersal, establishment & growth: Diaspore: fruit. Coloniser of disturbed sites.

Fire response:

Interaction with other organisms: Edible when completely ripe, but not palatable to everyone (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., S.A., W.A., N.G., N.I., N. Cal., N.Z.

Distribution Sydney area:

Select locations: CC: Culoul Range, Mt Keira, Saddleback Mountain. CT: Mount Tomah, Mandurama, Kanangra, Fitzroy Falls, Meryla SF, Robertson.

Habitat: Rainforest margins. Altitude: 0–1000 m Annual rainfall: 700–1600 mm Typical local abundance: Frequent–occasional. Vegetation: Rainforest e.g. with <i>Doryphora sassafras</i> , <i>Acacia melanoxylon</i> , <i>Acmena smithii</i> ; moist forest e.g. with <i>Eucalyptus fastigata</i> , <i>Syncarpia glomulifera</i> . Substrate: Clay soils on basalt, slates. Exposure:	Habitat
Conservation: Conservation status unknown. Reported in Robertson NR.	Conservation

Solanum brownii

SOLANACEAE

Violet Nightshade

Growth form: Erect shrub to 2 m high, with prickles. Vegetative spread: Longevity: Primary juvenile period: Flowers: Pale blue, July–October. Fruit/seed: Berry 15–20 mm diam, yellow, greenish or white; seeds 2–3 mm long. Dispersal, establishment & growth: Probably bird-dispersed. Fire response: Probably killed. Dramatic increase in population after wildfire (in Victoria) (Seddon & Cameron 1985). Interaction with other organisms:	Life history
Status/origin: Native.	Distribution
Botanical subregions: NC CC SC NT CT ST NWS CWS; Qld, Vic.	
Distribution Sydney area: Coast and ranges.	
Select locations: CC: Mt Kindarun, Mt Wareng, Mt Yengo, Matcham, Gosford, Mt Kembla, Albion Park, Macquarie Pass, Barrengarry Pass, Kangaroo Valley Bungonia Lookdown. CT: Mt Towinhingy, Genowlan Mountain, Mt Armour.	
Habitat: Hillsides, creekbanks.	Habitat
Altitude: 0–900 m Annual rainfall: 800–1600 mm	
Typical local abundance: Frequent–occasional.	
Vegetation: Rainforest, moist open-forest e.g. with <i>Eucalyptus smithii</i> , <i>E. quadrangulata</i> , <i>E. fastigata</i> , <i>E. saligna</i> ; open-forest e.g. with <i>Eucalyptus tereticornis</i> , <i>Angophora floribunda</i> , <i>Brachychiton populneus</i> .	
Substrate: Clay soils on basalt, alluvium, high nutrients.	
Exposure:	Conservation
Conservation: Conservation status unknown.	

Solanum campanulatum

SOLANACEAE

Life history**Growth form:** Short-lived perennial shrub to 1 m high, with abundant prickles.**Vegetative spread:** No.**Longevity:** Short-lived.**Primary juvenile period:****Flowers:** Lavender-purple, at any time of year.**Fruit/seed:** Berry 20–25 mm diam., green-yellow when young, changing to whitish at maturity, later becoming dark brown and wrinkled, persisting on bush.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CWS; Qld.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Howes Valley, Glen Davis, Culoul Range, Jiliby Jiliby, Kurrajong Heights, West Head, Homebush, Mulgoa, Nortons Basin, Douglas Park, Bargo.**Habitat****Habitat:** Rocky hillsides.**Altitude:** 0–600 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Moist forest e.g. with *Syncarpia glomulifera*, *Allocasuarina torulosa*, *Angophora costata*, *Eucalyptus piperita*; open-forest e.g. with *Eucalyptus eximia*.**Substrate:** Sandy loam on sandstone, sometimes with clay influence, medium nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Bargo is southern geographical limit. Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP.***Solanum capsicoides* ***

SOLANACEAE

Devil's Apple

Life history**Growth form:** Annual or short-lived shrub to 1 m high, with yellowish prickles on most parts.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, spring-summer.**Fruit/seed:** Bright orange-scarlet, berry 20–35 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to C America.**Botanical subregions:** NC CC NWS; Qld.**Distribution Sydney area:****Select locations:** CC: Dapto (1940).**Habitat****Habitat:****Altitude:** 0–100 m**Annual rainfall:** 1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Only one record, Dapto 1940.

***Solanum chenopodioides* ***

SOLANACEAE

Whitetip Nightshade

Life history**Growth form:** Sprawling perennial herb to 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, October–April, peak March–April. Probably pollinated by native bees (P. Kubiak pers. comm.).**Fruit/seed:** Black berry 5–9 mm diam., with deflexed peduncle, December–June, peak March.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Argentina.**Botanical subregions:** NC CC SC NT CT; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Putty Road, Kurrajong Heights, Glenorie, Castle Hill, Centennial Park, Blacktown, Liverpool, Audley, Mount Annan. CT: Glen Davis, Bowenfels, Mount Tomah, Robertson, Barrengarry.**Habitat****Habitat:** Gullies, creeks, riverbanks, roadsides.**Altitude:** 0–1000 m**Annual rainfall:** 800–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Rainforest, riparian forest e.g. with *Casuarina cunninghamiana*; woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.**Substrate:** Clay soils on shale, alluvium, basalt, medium–high nutrients.**Exposure:****Conservation****Conservation:** Weed of disturbed sites.***Solanum cinereum***

SOLANACEAE

Narrawa Burr

Life history**Growth form:** Erect or bushy, hairy shrub to 1 m high, with prickles on most parts.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Mauve–purple, July–May.**Fruit/seed:** Dark brown berry 15–20 mm diam.**Dispersal, establishment & growth:****Fire response:** Probably killed.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., *S.A.**Distribution Sydney area:****Select locations:** CC: Putty, Gosford, Penshurst, Marsden Park, The Oaks, Mount Annan, Picton, Mt Armour. CT: Gaspers Mountain, Winburndale, Wallerawang.**Habitat****Habitat:** Grassland and grassy woodland.**Altitude:** 0–900 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus viminalis*; woodland e.g. with *Eucalyptus tereticornis*, *E. moluccana*, *E. crebra*; grassland e.g. with *Themeda australis*.**Substrate:** Clay soils on shale, basalt, quartzite, medium nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

Solanum elegans

SOLANACEAE

Spiny Kangaroo Apple

Life history

Growth form: Erect, hairy, shrub to 1 m high, with prickles scattered on branches and leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Purple, September–October.

Fruit/seed: Red berry 10–15 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC SC NT CT ST NWS CWS; Qld, Vic.

Distribution Sydney area: Western Blue Mountains.

Select locations: CT: Lithgow, Wiagdon, Mt Armour, Yerranderie.

Habitat

Habitat: Rocky hillsides.

Altitude: 0–900 m

Annual rainfall: 700–900 mm

Typical local abundance: Occasional.

Vegetation: Open-forest.

Substrate: Sandy clay loam on sandstone, skeletal slaty soils, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

***Solanum jasminoides* ***

SOLANACEAE

Potato Climber, Jasmine Nightshade

Life history

Growth form: Perennial climber; leaves with hairy domatia on lower surface.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or pale blue, summer–autumn.

Fruit/seed: Dark blue to shiny black berry 7–9 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America. Introduced as ornamental.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area:

Select locations: CC: Minnamurra (1954).

Habitat

Habitat:

Altitude: 0–200 m

Annual rainfall: 1400–1600 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure: Full sun.

Conservation

Conservation: Garden plant occasionally naturalised. Only record is Minnamurra Falls 1954.

Solanum linearifolium

SOLANACEAE

Mountain Kangaroo Apple

Life history**Growth form:** Erect shrub to 4 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Purple violet, September–May.**Fruit/seed:** Deep yellow and reddish purple berry 15–20 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT ST NWS CWS SWS NWP; Vic.**Distribution Sydney area:****Select locations:** CC: Culoul Range, Yarramundi, Burragorang, Wollongong, . CT:

Winburndale, Tarana, Kanangra, Mt Wilson, Jenolan Caves, Abercrombie Caves, Joadja.

Habitat**Habitat:** Disturbed or open areas.**Altitude:** 0–700 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Syncarpia glomulifera*, *Backhousia myrtifolia*, *Acacia elata*, *Eucalyptus punctata*.**Substrate:** Sandy skeletal soil on basalt, limestone, granite, shale-enriched sandstone, medium nutrients.**Exposure:****Conservation****Conservation:** Conservation status not known.***Solanum linnaeanum* ***

SOLANACEAE

Apple of Sodom

Life history**Growth form:** Hairy shrub to 1 m high, with yellowish prickles scattered on most parts.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale purple-blue, at any time of year.**Fruit/seed:** Yellow berry 20–30 mm diam., turning brown or black.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa & Mediterranean region. Reported by Robert Brown to be introduced to Sydney by 1804 (Maiden 1909).**Botanical subregions:** NC CC SC SWP; Qld, Vic., S.A., W.A.**Distribution Sydney area:** Coast.**Select locations:** CC: Gosford, Coogee (1891), La Perouse, Kurnell, Cooks River, Oatley, Stanwell Park, Mount Annan.**Habitat****Habitat:****Altitude:** 0–200 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:****Substrate:** Sandy soils on dunes, also on volcanic soil and clay.**Exposure:****Conservation****Conservation:** Occasionally naturalised in Sydney suburban areas, though most records are pre 1950.

***Solanum mauritianum* ***

SOLANACEAE

Wild Tobacco Bush

Life history**Growth form:** Shrub or small tree to 4 m high, grey-green, with a covering of star-like hairs.**Vegetative spread:** No.**Longevity:** Probably 30 years (M. Clarke pers. comm.).**Primary juvenile period:****Flowers:** Violet. Synchronous flowering, March–October, peak October. Possibly pollinated by honeybees (P. Kubiak pers. comm.).**Fruit/seed:** Dull yellow, hairy berry 10–15 mm diam.**Dispersal, establishment & growth:** Diaspore: fruit, seed. Bird-dispersed (Floyd 1966).

Soil-stored seed viable up to 30 years (M. Clarke pers. comm.).

Fire response:**Interaction with other organisms:** Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Ripe fruit eaten by Red-whiskered *Bulbuls Pycnonotus jocosus* (P. Kubiak pers. comm.).**Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC SWS; LHI, Qld, S.A.**Distribution Sydney area:** Widespread on coast.**Select locations:** CC: Dora Creek, Yarramalong, Yarramundi, Cheltenham, Eastwood, Wahroonga (1911), Rose Bay (1890), Nortons Basin, Kembla Grange, Liverpool.**Habitat****Habitat:** Disturbed areas, riverbanks.**Altitude:** 0–200 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Moist open-forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*; riverine forest e.g. with *Casuarina cunninghamiana*, *Tristaniopsis laurina*, *Backhousia myrtifolia*; estuarine forest e.g. with *Casuarina glauca*.**Substrate:** Clay soils on shale, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Weed of disturbed sites, particularly in rainforest regrowth north of Sydney.***Solanum nigrum* ***

SOLANACEAE

Black-berry Nightshade

Life history**Growth form:** Herb or short-lived perennial shrub to 1 m high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:** Short-lived perennial.**Primary juvenile period:** 4 months after high-intensity fire.**Flowers:** White, March–September.**Fruit/seed:** Dull black berry, with 20–35 seeds, 1.8–2.2 mm long.**Dispersal, establishment & growth:** Diaspore: fruit, with morphology for dispersal by ingestion (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Seed soil-stored possibly with dormancy mechanism possibly recruiting after high intensity fire but not after other disturbance.**Fire response:** Vigorous recruitment from soil-stored seed after high intensity fire 1/1994 at Narrabeen, though not common pre-fire.**Interaction with other organisms:** Foodplant of Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990), fruit eaten by Lewin's Honeyeater *Meliphaga lewinii* (Barker & Vestjens 1990). Ripe berries eaten by Red Mistletoe Bird (Cook 2001).

Distribution

Status/origin: Exotic, native to Europe.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., N.T., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Woy Woy (1916), Cheltenham, Northbridge, Ashfield, La Perouse, Penshurst (1911), Mount Annan, Cobbitty, Goodmans Ford. CT: Bathurst, Mount Tomah, Medlow, Abercrombie Caves, Hill Top (1916), Robertson.

Habitat

Habitat: Disturbed sites, edge of moist areas.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*; grassland, wetland margins.

Substrate: Clay soils on basalt, shale, alluvium, also on sandy soils, medium to low nutrients.

Exposure: Full sun.

Conservation

Conservation: Widespread weed especially near habitation or in horticultural crops. Capable of invading bushland (McRae 1990).

Solanum opacum**SOLANACEAE**

Green-berry Nightshade

Life history

Growth form: Sprawling, almost prostrate annual herb to 1 m diameter.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, March–July.

Fruit/seed: Berry 8–10 mm diam.

Dispersal, establishment & growth: Bird-dispersed (Floyd 1966).

Fire response:

Interaction with other organisms: Seed eaten by Crimson Rosella *Platycercus elegans* (Lepschi 1993).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS NWP SWP; Qld, Vic., Tas., S.A., N.G.

Distribution Sydney area: Sporadic.

Select locations: CC: Mooney Mooney, Kurnell, Vineyard Creek. CT: Mount Tomah, Jenolan Caves, Kanangra.

Habitat

Habitat: Wet areas along creeks, disturbed sites.

Altitude: 0–1000 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest.

Substrate: Clay soils on shale, basalt, sometimes poorly-drained, medium to high nutrients. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (Benson & McDougall 1991).

Conservation status elsewhere unknown. Reported in Garigal NP, Sydney Harbour NP.

Solanum parvifolium

SOLANACEAE

Life history**Growth form:** Erect woody shrub to 1 m high, with prickles.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale blue or white, mainly winter–spring.**Fruit/seed:** Bright red berry 5–8 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NT CT NWS NWP SWP; Qld.**Distribution Sydney area:****Select locations:** CT: Berrima (1906).

Habitat**Habitat:****Altitude:** 600 m**Annual rainfall:** 900–1000 mm**Typical local abundance:****Vegetation:** Woodland.**Substrate:****Exposure:**

Conservation**Conservation:** Mainly north from Tooraweenah. Isolated record for Berrima in 1906.***Solanum physalifolium* var. *nitidibaccatum* ***

SOLANACEAE

Life history**Growth form:** Sprawling annual herb to 0.5 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, mainly summer.**Fruit/seed:** Green to purplish green berry 5–8 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Exotic, native to America and Europe.**Botanical subregions:** CC CT CWS; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Mainly Tablelands.**Select locations:** CC: Kogarah (1898). CT: Bathurst, Blayney (1951), Canyonleigh.

Habitat**Habitat:** Cultivated areas.**Altitude:** 0–700 m**Annual rainfall:** 700–1200 mm**Typical local abundance:****Vegetation:****Substrate:** Sandy soils, alluvium.**Exposure:**

Conservation**Conservation:** Rare weed of cultivation.

Solanum prinophyllum

SOLANACEAE

Forest Nightshade

Life history**Growth form:** Sprawling herb to 0.5 m high, with prickles on most parts.**Vegetative spread:** No.**Longevity:** Annual or short-lived perennial.**Primary juvenile period:** 5–6 months (L.McD.).**Flowers:** Lilac-blue, September–October.**Fruit/seed:** Green or purple berry, 15–20 mm diam., December–May.**Dispersal, establishment & growth:** Diaspore: fruit.**Fire response:** Killed, vigorous growth of seedlings after high intensity fire (1/1994), and fruiting within 5 months (at Mona Vale, L. McD.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Bouddi, Wisemans Ferry, Grose Vale, Penshurst, Homebush, Cobbitty, Douglas Park. CT: Rylstone, Bilpin, Mt Wilson, Glen Davis.**Habitat****Habitat:** Creeks, rocky hillsides.**Altitude:** 0–1000 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus viminalis*, *E. radiata*, *Angophora floribunda*; dry rainforest with *Streblus brunonianus*.**Substrate:** Sandy loams, clay loam along creek, and on rocky hillsides, on shale, basalt, volcanic necks, medium–high nutrients, well-drained.**Exposure:** Light shade.**Conservation****Conservation:** Conservation status unknown. Reported in Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP.***Solanum pseudocapsicum* ***

SOLANACEAE

Madeira Winter, Jerusalem Cherry

Life history**Growth form:** Shrub to 2 m high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** White, October–January.**Fruit/seed:** Bright orange-red berry 10–15 mm diam.**Dispersal, establishment & growth:** Diaspore: fruit, dispersed by Pied Currawong *Strepera graculina*, with maximum number of seed per pellet 300, average 60 (Buchanan 1989a).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC NT NWS CWS SWS NWP SWP; Qld, Vic., S.A., W.A.**Distribution Sydney area:** Widespread on coast.**Select locations:** CC: Kurrajong Heights, Springwood, Cherrybrook, Eastwood, Douglas Park, Menangle, Thirroul, Mt Keira, Sublime Point, Albion Park, Burragorang, Foxground.**Habitat****Habitat:** Disturbed moist sites, creekbanks.**Altitude:** 0–200 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Rainforest, moist open-forest e.g. with *Syncarpia glomulifera*.**Substrate:** Clay soil on basalt, shale alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Weed of moist sites e.g. in rainforest regrowth.

Solanum pungetium

SOLANACEAE

Eastern Nightshade

Life history

Growth form: Sprawling, annual or short-lived perennial herb to 1.5 m high, with star-like hairs and scattered prickles on branches and leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pale purple, mainly September–November.

Fruit/seed: Yellow berry 25–30 mm diam.

Dispersal, establishment & growth: Vertebrate-adapted fleshy fruit for dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST; Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Rockdale, Kogarah, Cronulla, Waterfall, Austinmer, Albion Park, Macquarie Pass, Saddleback Mountain, Foxground, Kangaroo Valley, Cambewarra.

CT: Hampton, Jenolan Caves, Moss Vale, Robertson.

Habitat

Habitat: Variable, disturbed sites in forest.

Altitude: 0–1000 m

Annual rainfall: 900–1600 mm

Typical local abundance: Occasional.

Vegetation: Rainforest, moist open-forest e.g. with *Eucalyptus pilularis*, *E. quadrangulata*, *Syncarpia glomulifera*.

Substrate: Clay soils on shale, basalt, also sand dunes, medium–high nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Brisbane Water NP, Marramarra NP, Robertson NR.

***Solanum radicans* ***

SOLANACEAE

Life history

Growth form: Sprawling annual or perennial herb with branches to 2 m long, frequently rooting at nodes.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: White, February–March.

Fruit/seed: Dull yellow-green berry 4–5 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Argentina.

Botanical subregions: NC CC CT ST CWS.

Distribution Sydney area: Widespread.

Select locations: CC: Kurrajong Heights, Richmond, Campbelltown, Burragarang Valley, Bullio, Goodmans Ford. CT: Wombeyan Caves.

Habitat

Habitat: Creekbanks.

Altitude: 0–600 m

Annual rainfall: 700–1200 mm

Typical local abundance: Occasional.

Vegetation: With other weeds e.g. *Solanum nigrum*, *Chondrilla juncea*.

Substrate: Sandy to clayey soils on alluvium.

Exposure:

Conservation

Conservation: Weed of cultivation.

***Solanum seafortianum* ***

SOLANACEAE

Brazilian Nightshade

Life history**Growth form:** Perennial climber.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Mauve-blue, mainly spring and autumn.**Fruit/seed:** Bright red berry 8–12 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to W Indes. Introduced as an ornamental climber.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Sydney suburbs.**Select locations:** CC: Bellevue Hill.**Habitat****Habitat:****Altitude:** 0–100 m**Annual rainfall:** 1200 mm**Typical local abundance:****Vegetation:****Substrate:** Sandy soil.**Exposure:****Conservation****Conservation:** Cultivated as ornamental. Reported from Cooper Park, Bellevue Hill in 1989 but it is not known whether it is a naturalised population or a garden escape.***Solanum simile***

SOLANACEAE

Oondoroo

Life history**Growth form:** Erect shrub to 2 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Violet, mainly spring.**Fruit/seed:** Greenish or purplish berry 10–15 mm diam.**Dispersal, establishment & growth:****Fire response:** Abundant after fire (Harden 1992).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT CWS SWS SWP SFWP; Vic., S.A., W.A.**Distribution Sydney area:****Select locations:** CT: Wallerawang (1917).**Habitat****Habitat:****Altitude:** 900–1000 m**Annual rainfall:** 800–900 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Rare, only Sydney area collection is from Wallerawang in 1917.

***Solanum sisymbriifolium* ***

SOLANACEAE

Life history

Growth form: Erect annual or short-lived perennial herb to 1.5 m high, with prickles on most parts.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White or pale blue, spring–summer.

Fruit/seed: Bright red berry, 15–20 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America.

Botanical subregions: CC NWP; Qld, W.A.

Distribution Sydney area: Sydney suburban areas.

Select locations: CC: Toongabbie Creek, Ermington, Rydalmere, Rosehill, Springwood (1936), Revesby.

Habitat

Habitat: Disturbed sites.

Altitude: 0–500 m

Annual rainfall: 1000–1100 mm

Typical local abundance: Rare.

Vegetation: With weedy species e.g. *Foeniculum vulgare*, *Verbena bonariensis*.

Substrate:

Exposure:

Conservation

Conservation: Localised weed of several disturbed sites in suburban areas; Ermington–Rydalmere–Toongabbie (collected 1971–73), Revesby (1992) and Springwood (1936–37).

Solanum stelligerum

SOLANACEAE

Devil's Needles

Life history

Growth form: Erect woody shrub to 2 m high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Lilac–white, September–April.

Fruit/seed: Bright red berry, 5–10 mm diam., December–March.

Dispersal, establishment & growth: Diaspore: fruit.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT ST CWS; Qld.

Distribution Sydney area: Coastal ranges.

Select locations: CC: Mt Yengo, Avoca, Church Point, Grose Vale, Cobbitty, Razorback, Bulli, Mt Keira, Lake Illawarra, Macquarie Pass.

Habitat

Habitat: Gullies.

Altitude: 0–200 m

Annual rainfall: 700–1400 mm

Typical local abundance: Rare.

Vegetation: Dry rainforest e.g. with *Streblus brunonianus*, and eucalypt forest e.g. with *Eucalyptus tereticornis*.

Substrate: Clay loams on rocky sites from shale, basalt, medium–high nutrients, well-drained.

Exposure: Sheltered sites.

Conservation

Conservation: Conservation status unknown.

***Solanum trifolium* ***

SOLANACEAE

Three-flowered Nightshade

Life history**Growth form:** Sprawling annual herb, with stems to 1 m long, sometimes rooting at nodes.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or rarely pale lavender, February–March.**Fruit/seed:** Whitish green, marbled berry 8–12 mm diam., February–March.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N America.**Botanical subregions:** CC NT CT ST NWS CWS SWS SWP; Qld, Vic., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Penrith, Glenfield (1932). CT: Winburndale (1955).**Habitat****Habitat:** Disturbed areas.**Altitude:** 0–1000 m**Annual rainfall:** 600–800 mm**Typical local abundance:** Rare.**Vegetation:** With other weeds e.g. *Paspalum dilatatum*, *Sida rhombifolia*.**Substrate:** Clay soils on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Uncommon weed of disturbed areas.***Solanum vescum***

SOLANACEAE

Kangaroo Apple

Life history**Growth form:** Erect or spreading shrub to 2 m high.**Vegetative spread:****Longevity:****Primary juvenile period:** Less than 1 year.**Flowers:** Violet, August–January. June, after high intensity fire (1/1994) at Katandra Bushland Sanctuary (L.McD.)**Fruit/seed:** Greenish berry, 20–25 mm diam. September–November. Seed probably soil-stored, with long viability.**Dispersal, establishment & growth:****Fire response:** Probably killed. Seen after high intensity fire (1/94) in Katandra, in area previously unburnt for more than 50 years; not listed for Katandra by R. Coveny 1967 (L. McD.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS NWP; Qld, Vic., Tas.**Distribution Sydney area:** Mainly coast.**Select locations:** CC: Wyrribalong, Mona Vale (L.McD.), Bayview, Towra Point, Cronulla, Waterfall, Douglas Park, Macquarie Pass. CT: Coricudgy, Mount Tomah, Mittagong.**Habitat****Habitat:** Disturbed sites.**Altitude:** 0–1000 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest, hind-dune forest, coastal scrub e.g. with *Leptospermum laevigatum*.**Substrate:** Various coastal sands, clay soils on basalt.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Wyrribalong NP.

Stackhousia monogyna**STACKHOUSIACEAE**

Creamy Candles, Creamy Stackhousia

Life history**Growth form:** Perennial herb to 70 cm high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** White to deep yellow, September–December.**Fruit/seed:** Dry fruit, usually of 3 nutlets.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Tablelands.**Select locations:** CC: Gosford. CT: Rylstone, Mullion Range, Lithgow, Blackheath (1910), Boyd Plateau, Mt Werong, Mt Jellore (1912), Fitzroy Falls (1900).**Habitat****Habitat:****Altitude:** 0–1100 m **Annual rainfall:** 600–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus fastigata*, *E. dalrympleana*, *E. viminalis*; woodland e.g. with *Eucalyptus pauciflora*, *E. albens*, *E. goniocalyx*, *E. macrorhycha* with grass understorey.**Substrate:** Sandy loam to gravelly clay on sandstone, quartzite, low nutrients.**Exposure:****Conservation****Conservation:** Mainly restricted to Tablelands with one record from Gosford (1926).

Conservation status unknown. Reported in Kanangra Boyd NP.

Stackhousia muricata**STACKHOUSIACEAE****Life history****Growth form:** Perennial or annual herb to 60 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow-green, pale or dark yellow, September–November.**Fruit/seed:** Dry fruit, of 1–3 nutlets, November.**Dispersal, establishment & growth:****Fire response:** Regrows after burning off, though not known whether from seed or resprout (Herb. specimen).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT NWS CWS SWS NWP SWP NFWP; Qld, S.A., W.A.**Distribution Sydney area:** Western Sydney.**Select locations:** CC: Glenfield, Minto, Camden.**Habitat****Habitat:****Altitude:** 0–300 m **Annual rainfall:** 700–900 mm**Typical local abundance:****Vegetation:** Woodland and grassland e.g. with *Themeda australis*, *Aristida ramosa* (Cumberland Plain Woodland).**Substrate:** Loamy soils on Wianamatta Shale, medium nutrients, well-drained.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney, localised population not conserved (James et al. 1999).

Stackhousia nuda

STACKHOUSIACEAE

Life history**Growth form:** Perennial herb to 100 cm high.**Vegetative spread:****Longevity:** 25–60 years (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** Yellow to yellow-green, December.**Fruit/seed:** Dry fruit of 1–3 nutlets.**Dispersal, establishment & growth:** Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts (D. Keith pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT; Qld, Vic.**Distribution Sydney area:** Mainly coast.**Select locations:** CC: Brisbane Water NP, Cronulla, Maddens Plains, Bulli Pass, Minnamurra. CT: Carrington Falls.**Habitat****Habitat:** Swamp margins, coastal flats.**Altitude:** 0–500 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Wet heath e.g. with *Banksia robur*, *Sprengelia incarnata*, *Empodisma minus*, *Lepyrodia scariosa*.**Substrate:** Moist sand, often peaty sites on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Rare in Sydney area, conservation status unknown. Reported in Brisbane Water NP, Ku-ring-gai Chase NP, Garigal NP.***Stackhousia spathulata***

STACKHOUSIACEAE

Life history**Growth form:** Perennial herb to 50 cm high, with thick stock usually buried by drifting sand.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, small tubular, grouped together at top of stems, early spring to summer.**Fruit/seed:** Dry fruit of nutlets, breaking into 3 segments at maturity.**Dispersal, establishment & growth:** Diaspore: segment of fruit.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Coastline.**Select locations:** CC: Wamberal Beach, Cronulla Beach.**Habitat****Habitat:** Sandy areas near beaches and lagoons.**Altitude:** 0–100 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Rare.**Vegetation:** Open-forest, heath.**Substrate:** Beach sand of foredunes.**Exposure:****Conservation****Conservation:** Rare in Sydney area, conservation status unknown, beach habitat vulnerable to disturbance.

Stackhousia viminea**STACKHOUSIACEAE**

Slender Stackhousia

Life history**Growth form:** Perennial herb to 70 cm high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Greenish to yellow, tubular, September–February, peak October–December. Hoverfly (Syrphidae) visited flowers, apparently feeding (P. Kubiak pers. comm.), may be involved in pollination.**Fruit/seed:** Dry fruit, of 1–3 nutlets, November–February.**Dispersal, establishment & growth:** No special morphology for dispersal (Westoby et al. 1990).**Fire response:****Interaction with other organisms:** Possibly eaten by rabbits (P. Kubiak pers. comm.).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS; Qld, Vic., Tas., N.T., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Somersby, Pitt Town, Jerusalem Bay, Hornsby, Ingleside, Manly, La Perouse, Oatley, Como, Doonside, Liverpool, Glenmore Park, Mt Ousley, Darkes Forest, Thirlmere. CT: Clarence, Mount Tomah, Blackheath, Boyd Plateau, Bowral, Bundanoon, Penrose.**Habitat****Habitat:** Woodland.**Altitude:** 0–1100 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. tereticornis*, *E. moluccana*, *E. sclerophylla*, *E. piperita*, *Angophora costata*.**Substrate:** Clay soils on Wianamatta Shale, alluvium, occasionally on sandstone, low–medium nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown — many old collections — may have been more conspicuously abundant than now. Reported in Wollemi NP, Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP.**Brachychiton acerifolius****STERCULIACEAE**

Flame Tree, Illawarra Flame Tree

Life history**Growth form:** Deciduous tree to 35 m high.**Vegetative spread:** No.**Longevity:** Long.**Primary juvenile period:****Flowers:** Red flowers produced on leafless branches attract Rainbow Lorikeets (L.McD.)**Fruit/seed:** Dry capsule 10 cm long, with numerous seeds embedded by interlocking of star-like hairs. Seeds oval, 1 cm long enclosed in a yellow hairy covering; 2600–2770 fresh seeds per kilogram; germination 5–140 days for germination of 90%; seed stored at room temperature for 2.5 years giving germination of 71% declining to 9% after 4.5 years; mature February–August (Floyd 1989).**Dispersal, establishment & growth:** Diaspore: seed, dispersed by birds, fruit reported from pellets of Currawongs (Buchanan 1989a).**Fire response:****Interaction with other organisms:** Larvae of the yellow peach moth *Conogethes punctiferalis* feed on seed capsules and leaves in northern NSW (Common 1990). Food plant of butterfly larvae *Polyura pyrhus sempronius*, *Candalides absimilis* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC CWS; Qld.**Distribution Sydney area:** Gosford, Illawarra.**Select locations:** CC: Narara Creek, Peats Ridge, Albion Park, Whispering Gallery.

Habitat**Habitat:** Steep slopes.**Altitude:** 0–300 m**Annual rainfall:** above 1400 mm.**Typical local abundance:****Vegetation:** Sub-tropical rainforest e.g. with *Dendrocnide*.**Substrate:** Clay soils on basalt, high nutrients, well-drained.**Exposure:** Sheltered situations.**Conservation****Conservation:** Native in rainforest at Gosford and Illawarra but planted widely in Sydney area. Seedlings establish in Sydney urban bushland from seed of garden plants but are unlikely to reach maturity.***Brachychiton populneus* subsp. *populneus*****STERCULIACEAE**

Kurrajong

Life history**Growth form:** Evergreen tree to 20 m high, deep-rooting.**Vegetative spread:** No.**Longevity:** More than 100 years.**Primary juvenile period:****Flowers:** Creamy-white, November.**Fruit/seed:** Dry capsule 4–7 cm long, splitting at maturity to release 8–18 seeds. Lower surface of seeds covered with irritant hairs, ripen May–June. Seeds yellow, July–October (Floyd 1989).**Dispersal, establishment & growth:** Diaspore: seed, fresh seeds germinate without treatment. Probably no soil-stored seedbank. Large seed size favours recruitment in competition with eucalypts, grasses and herbs (Steenbeeke 2001).**Fire response:** Resprouted from base, St Albans 1994 (E. Ashby pers. comm.).**Interaction with other organisms:** Host to parasitic shrub *Notothixos subaureus* (Downey 1998). Currawongs digest yellow part of fruit and void black seed (Vaughan 2001). Host to Longicorn Beetle *Agrianome spinicollis* (Hawkeswood & Dauber 1991), Auger Beetle *Bostrychopsis jesuita* (Jones & Elliot 1986). Food plant of butterfly Eastern Flat *Netrocoryne repandra repandra*, *Polyura pyrrius sempronius* (Common & Waterhouse 1981) and *Delias argenthona argenthona* (Common & Waterhouse 1981).

Seeds are nutritious, 18% protein, 25% fat, with high levels of zinc and magnesium, popular with Aboriginal people, eaten raw or roasted after removal of irritating hairs; tubers from young trees eaten (Low 1988). Bark fibre used by Aboriginal people for cords and nets (Cribb & Cribb 1981). Seeds used as a coffee substitute (Cribb & Cribb 1984). Kurrajongs probably allowed to persist in agricultural lands because they provide dense shade for stock and fodder during drought (Steenbeeke 2001). Aboriginal people tapped roots for water (Cribb & Cribb 1984).

Distribution**Status/origin:** Native, cultivated for shade and fodder (Harden 1990).**Botanical subregions:** NC CC SC NT CT NWS CWS SWS; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Watagan, McMasters Beach, Newport, Newington, Campbelltown, Razorback, Jamberoo, Kowmung River. CT: Glen Davis, Bathurst, Wombeyan Caves.**Habitat****Habitat:** Hillsides, riverflats.**Altitude:** 0–800 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Rare–to occasional.**Vegetation:** Forest e.g. with *Eucalyptus acmenoides* on coast, and woodland e.g. with *Eucalyptus crebra*, *E. tereticornis*.**Substrate:** Clay soils from conglomerate, shales, occasionally sandstones, medium nutrients. Kurrajongs are related to deep soils that stay damp, volcanic sediments and limestone with high clay content, derived from alkaline materials, and granite soils that are relatively high in moisture-holding clays (Steenbeeke 2001).**Exposure:** Full sun–light shade.**Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), status elsewhere unknown.

Commersonia fraseri**STERCULIACEAE**

Brush Kurrajong

Life history

Growth form: Small tree or shrub; leaves irregularly toothed, with the lower surface hairy, pale whitish grey.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Small, September–November, peak September. Flowers visited by large wasp (*P. Kubiak* pers. comm.), may be involved in pollination.

Fruit/seed: Bristly capsule 15–25 mm diam., November–January. Seeds 2 mm long, 800 000 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Coloniser, quick growth rate.

Fire response: Resprouts at ground level (Herb. record).

Interaction with other organisms: Leaves with many holes probably due to insects feeding (*P. Kubiak* pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST; Qld, Vic.

Distribution Sydney area: Gosford, Illawarra.

Select locations: CC: Mt Yengo, Mandalong, Erskine Creek, Douglas Park, Shellharbour, Albion Park, Macquarie Pass, Broughton Vale. CT: Carrington Falls.

Habitat

Habitat: Riverbanks

Altitude: 0–600 m

Annual rainfall: above 700 mm

Typical local abundance: Frequent.

Vegetation: Moist open-forest e.g. with *Angophora floribunda*, *Syncarpia glomulifera*, *Eucalyptus saligna*.

Substrate: Sandy-loam, alluvial, also rarely on basalt, high nutrients, well-drained.

Exposure: Sheltered situations.

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

Keraudrenia corollata var. **denticulata****STERCULIACEAE****Life history**

Growth form: Shrub 1–2 m high, rusty-hairy; simple leaves prominently toothed.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Petals absent, calyx white to pinkish, March, August–September.

Fruit/seed: Capsule 10 mm diam., very hairy.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Colo River.

Select locations: CC: Colo River.

Habitat

Habitat: Edge of floodplain.

Altitude: 0–100 m

Annual rainfall: 900–1000 mm

Typical local abundance: Rare.

Vegetation: Open-forest e.g. with *Eucalyptus deanei*, *Tristaniopsis laurina*, *Backhousia myrtifolia*, *Commersonia fraseri*, *Rulingia dasyphylla*, *Hibiscus heterophyllus*.

Substrate: Sandy soil on sandstone banks or edge of floodplain, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Rare, local population confined to Colo River between Lower Portland and Gees Lagoon, southern geographical limit. Listed as an Endangered Population in Hawkesbury Local Government area under NSW *Threatened Species Conservation Act* 1995. Threats include weed invasion, road maintenance, fragmentation, grazing and rural land clearing. Not known to occur in a conservation area.

Lasiopetalum ferrugineum* var. *cordatum**STERCULIACEAE****Life history**

Growth form: Shrub to 1 m high, with a covering of rusty hairs; leaves ovate-lanceolate, more than 10 mm wide.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Hairy, with prominent calyx and minute petals. Buds present for many months before flowers open July–December, peak September–October.

Fruit/seed: Hairy capsule 3–5 mm diam.

Dispersal, establishment & growth:

Fire response: Probably killed.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC CT ST NWS.

Distribution Sydney area: Blue Mountains, Hornsby Plateau.

Select locations: CC: Gospers Creek, Blaxland, West Pennant Hills, Euroka Creek, Nortons Basin, Thirlmere. CT: Mt Wilson, Blackheath, Wentworth Falls.

Habitat

Habitat:

Altitude: 0–1000 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Corymbia eximia*, *C. gummifera*, *Allocasuarina torulosa*, *Eucalyptus punctata*, *E. crebra*.

Substrate: Sandy soils on sandstone, sometimes with local clay influence, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Yengo NP.

Lasiopetalum ferrugineum* var. *ferrugineum

STERCULIACEAE

Life history

Growth form: Shrub to 1 m high, with a covering of rusty hairs; leaves narrow-elliptic to lanceolate less than 10 mm wide.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Cream and brown, hairy, with prominent calyx and minute petals. Buds present for many months before flowers open (L.McD.). Some flowers open anytime, peak August–October. Insects attracted to flowers include small weevil feeding on pollen, bugs feeding on buds, and native bee (P. Kubiak pers. comm.).

Fruit/seed: Hairy capsule 3–5 mm diam., September–December.

Dispersal, establishment & growth: Ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981). Soil-stored seedbank (Fox 1988), possibly viable more than 50 years (at Katandra Bushland Sanctuary, L.McD.).

Fire response: Killed by fire (Fox 1988), may also resprout (T. Auld pers. comm.). Seedling recruitment probably fire related (at Gordon). Seedlings prolific after high intensity fire 1/1994 at Katandra Bushland Sanctuary, in an area previously unburnt for more than 50 years (L.McD.).

Interaction with other organisms: Larvae of unidentified weevil feed on developing seeds in fruit (T. Auld pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Vic.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Narara, Woy Woy, South Maroota, Berowra, Annangrove, Hornsby, Blaxland, Dee Why Lagoon, Frenchs Forest, Lindfield, Willoughby, North Head, The Spit, Kedumba Valley, Bondi, Rose Bay, Long Bay, Oatley, Bundeena, Waterfall, Appin, Buxton, Bargo, Nortons Basin, Hill Top. CT: Glen Davis, Hill Top, Penrose.

Habitat

Habitat: Hillsides.

Altitude: 0–600 m

Annual rainfall: 600–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *E. resinifera*; heath e.g. with *Banksia ericifolia*, *Grevillea buxifolia*.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Marramara NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Sydney Harbour NP.

Lasiopetalum joyceae

STERCULIACEAE

Life history

Growth form: Erect or straggling shrub to 2 m high, with narrow leaves.

Vegetative spread: No.

Longevity:

Primary juvenile period: 2 years (R. Doig pers. comm.).

Flowers: Pinkish to reddish brown, or yellowish, hairy, with prominent calyx and minute petals, March–October, peak October. Buds present for many months before flowers open (L.McD.).

Fruit/seed: Hairy capsule 3–5 mm diam., October. Ripe November–January (R. Doig pers. comm.).

Dispersal, establishment & growth: Diaspore: seed, drops to soil surface below plant and may be dispersed by water to lower ground; germinated readily after prescribed fire (at Mt Colah) with subsequent seedling survival rate of less than 10% (R. Doig pers. comm.).

Fire response: Killed by fire (Herb. specimen).

Interaction with other organisms:

Distribution**Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Hornsby Plateau.**Select locations:** CC: Berrilee, Berowra, Annangrove, Mt Ku-ring-gai, Mt Colah, Coal and Candle Creek.**Habitat****Habitat:** Rocky slopes, rock platforms, clifftops.**Altitude:** 0–200 m**Annual rainfall:** ? 900–1200 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Woodland e.g. with *Corymbia gummifera*, *Eucalyptus haemastoma*, *Angophora costata*, *E. squamosa*, *Banksia serrata*, *Banksia ericifolia*, *Eucalyptus piperita*, *Angophora floribunda*, *Allocasuarina littoralis*. Common in moss beds on rock platforms (R. Doig pers. comm.).**Substrate:** Shallow sandy soil on sandstone, sometimes with clay influence, low nutrients.**Exposure:** Full sun to light shade.**Conservation****Conservation:** Local endemic, listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Coded 2RC- on national rare species list (Briggs & Leigh 1996). Vulnerable in Western Sydney (James et al. 1999). Reported in Ku-ring-gai Chase NP. Populations at edge of urban areas threatened by frequent fire (R. Doig pers. comm.).***Lasiopetalum macrophyllum*****STERCULIACEAE****Life history****Growth form:** Erect shrub 1–2 m high, with broad leaves 10–40 mm wide.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Prominent calyx and minute petals, hairy on outer surface, August–November, peak September. Buds present for many months before flowers open (L.McD.)**Fruit/seed:** Hairy capsule 3–5 mm diam., November–December.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST CWS; Vic., Tas.**Distribution Sydney area:** Widespread.**Select locations:** CC: Olney State Forest, Narrara, Wondabyne, Mooney Mooney, Brooklyn, Marramarra Creek (L.McD.), West Head, Towlers Bay (L.McD.), Bankstown, Ingleburn, Thirlmere. CT: Grose River, Yerranderie.**Habitat****Habitat:** Shore and lower slopes of waterways, creekbanks.**Altitude:** 0–500 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus botryoides*, *Allocasuarina torulosa*, *Angophora floribunda*, *Tristaniopsis laurina*.**Substrate:** Sandy loam on sandstone, sometimes with shale influence, alluvium, volcanic neck, low to medium nutrients.**Exposure:****Conservation****Conservation:** Uncommon, localised in Northern areas of Sydney. Conservation status unknown. Reported in Brisbane Water NP, Marramarra NP, Ku-ring-gai Chase NP.

Lasiopetalum parviflorum**STERCULIACEAE****Life history**

Growth form: Shrub 0.5–1 m high, with narrow leaves.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Prominent calyx and minute petals, whitish-hairy on outer surface, August–November. Buds present for many months before flowers open (L.McD.). Pollen eaten by small weevil (Curculionidae) (P. Kubiak pers. comm.).

Fruit/seed: Hairy capsule 3–5 mm diam., September–November.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT.

Distribution Sydney area: Sydney, Southern Highlands.

Select locations: CC: Cheltenham, West Pennant Hills, Lane Cove, Concord, Newington, Chester Hill, Oatley, Rookwood, Granville, Liverpool, Bents Basin, Douglas Park, Buxton, Cambewarra, Bomaderry. CT: Hill Top, Mt Jellore.

Habitat

Habitat: Open-forest or cleared areas.

Altitude: 0–600 m

Annual rainfall: 900–1200 mm

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus paniculata*, *E. resinifera*, *E. punctata*, *Melaleuca decora*; Scribbly Gum Forest e.g. with *Eucalyptus piperita*, *Angophora costata*.

Substrate: Clay soils on shale (e.g. Wianamatta Shale), occasionally on sandstones, medium nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Dalrymple Hay NR, Morton NP.

Lasiopetalum rufum**STERCULIACEAE****Life history**

Growth form: Erect or diffuse shrub 0.5–1 m high, with narrow leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Prominent calyx and minute petals, hairy, July–November, peak September. Buds present for many months before flowers open (L.McD.).

Fruit/seed: Hairy capsule 3–5 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Mainly Woy Woy to Menai.

Select locations: CC: Putty, Kulnura, Mill Creek, Maroota, Kenthurst, Annangrove, Springwood, Cowan, Frenchs Forest, Castlecrag, Fairfield, Menai, Heathcote, Waterfall, Maldon, Cataract Dam.

	Habitat
Habitat: Ridges, rocky ledges, creekbanks.	
Altitude: 0–400 m	Annual rainfall: 900–1400 mm
Typical local abundance: Occasional–frequent.	
Vegetation: Heath to woodland e.g. with <i>Angophora bakeri</i> , <i>A. hispida</i> , <i>Corymbia gummifera</i> , <i>Eucalyptus haemastoma</i> , <i>Corymbia eximia</i> , <i>Eucalyptus piperita</i> , <i>E. punctata</i> .	
Substrate: Sandy soil on sandstone, low nutrients, well-drained.	
Exposure:	
	Conservation
Conservation: Local endemic species. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Dharug NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Royal NP.	

Rulingia dasyphylla

STERCULIACEAE

Kerrawang

Life history

Growth form: Shrub 1–4 m high.
Vegetative spread:
Longevity:
Primary juvenile period:
Flowers: Pinkish, often flowering while young, July–November, peak September. Probably pollinated by flies (Diptera), with native bees, beetles (Coleoptera), and diurnal moths playing a role (P. Kubiak pers. comm.).
Fruit/seed: Capsule 5–7 mm diam, with rigid bristles, October–March.
Dispersal, establishment & growth:
Fire response: Killed, recruitment from seed, fruit within a year (Deepwater Creek).
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: NC CC SC NT CT NWS CWS; Qld, Vic.
Distribution Sydney area: Widespread.
Select locations: CC: Widden Valley, Culoul Range, Springwood, Lower Portland, Pearl Beach, Wondabyne, Mooney Mooney, Maroota, Roseville, Northbridge, Manly, Oatley, Rookwood, Nortons Basin, Douglas Park, Thirlmere. CT: Kandos, Capertee, Mount Tomah, Yerranderie, Mt Jellore.

Habitat

Habitat:	
Altitude: 0–1000 m	Annual rainfall: 800–1200 mm
Typical local abundance: Rare–occasional.	
Vegetation: Heath to woodland e.g. with <i>Corymbia eximia</i> , <i>C. gummifera</i> , <i>Eucalyptus sparsifolia</i> , <i>E. squamosa</i> ; open-forest e.g. with <i>Eucalyptus deanei</i> , <i>Angophora costata</i> , <i>Eucalyptus botryoides</i> ; swamp forest margins e.g. with <i>Eucalyptus robusta</i> , <i>Melaleuca linariifolia</i> .	
Substrate: Sandy soils on sandstones, volcanic necks, low nutrients.	
Exposure:	
	Conservation
Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation elsewhere unknown. Reported in Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP.	

Rulingia hermanniifolia

STERCULIACEAE

Life history

Growth form: Prostrate or trailing shrub with stems to 1 m long. Distinctive juvenile foliage. Growth rapid where nutrients and light are available. No vegetative spread or rooting from nodes.

Vegetative spread: No.

Longevity: 5–10 years. [In cultivation, 2–3 year growth spurt after germination followed by gradual decline (Knox et al. 1994).]

Primary juvenile period: 2–2.5 years (Herb. specimen).

Flowers: Pinkish, August–October, peak September.

Fruit/seed: Hairy capsule 4–6 mm diam., with bristles. Seed small.

Dispersal, establishment & growth: Diaspore: seed, probably wind-dispersed.

Soil-stored seedbank with dormancy period up to 30 years in soil. In nursery situation, easily propagated from seed, with no pre-treatment, within 3 weeks.

Fire response: Killed, re-established from soil-stored seed (Herb. specimen). Not present in bushland unburnt for 30 years but appeared after fire, evidently from soil-stored seed (at Mosman). Germinates within a year of fire.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT.

Distribution Sydney area: Mainly coastal.

Select locations: CC: Bouddi, Newport, Manly, Botany Bay, Long Bay, La Perouse, Cronulla, Jibbon Hill, Darkes Forest. CT: Bundanoon, Wingello.

Habitat

Habitat: Sandstone cliffs, edges.

Altitude: 0–500 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath/scrub e.g. with *Banksia ericifolia*, *Allocasuarina distyla*, *Melaleuca nodosa*, *Calytrix tetragona*.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure: Full sun.

Conservation

Conservation: Restricted populations. Coded 3RCa on national rare species list (Briggs & Leigh 1996). Reported in Bouddi NP, Sydney Harbour NP, Royal NP.

Rulingia prostrata

STERCULIACEAE

Life history

Growth form: Prostrate shrub forming dense mats 30–50 cm across and up to 5 cm high, sparsely covered with star-like hairs.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pinkish, October–December.

Fruit/seed: Capsule 8–10 mm diam, with bristles covered with star-like hairs, October–March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT; Vic.

Distribution Sydney area: Southern Highlands.

Select locations: CC: Thirlmere Lakes. CT: Penrose SE, Wingello.

Habitat

Habitat: Gullies, near swamps.
Altitude: 400–700 m **Annual rainfall:** 900–1000 mm
Typical local abundance: Rare.
Vegetation: Woodland e.g. with *Eucalyptus mannifera*, *Dillwynia ramosissima*.
Substrate: Sandy soil.
Exposure:

Conservation

Conservation: Listed as Endangered (Schedule 1) NSW *Threatened Species Conservation Act 1995*. Coded 2ECi on national rare species list (Briggs & Leigh 1996). Thirlmere Lakes is northern geographical limit.

Rulingia rugosa

STERCULIACEAE

Life history

Growth form: Shrub 1–2 m high, with leaf margins coarsely toothed.
Vegetative spread:
Longevity:
Primary juvenile period:
Flowers: Pink.
Fruit/seed: Capsule 8–15 mm diam., with bristles, summer to autumn.
Dispersal, establishment & growth:
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: CC SC ?NT CWS.
Distribution Sydney area:
Select locations: CC: St Albans.

Habitat

Habitat: Hillsides.
Altitude: 0–300 m **Annual rainfall:** 900 mm
Typical local abundance: Rare.
Vegetation: Open-forest
Substrate: Sandy soil.
Exposure:

Conservation

Conservation: Rare, with only one record for Sydney area at St Albans (1970).

Seringia arborescens**STERCULIACEAE****Life history**

Growth form: Tall shrub to 8 m high, with rusty-hairy branches; leaves simple, toothed.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Greenish white.

Fruit/seed: Capsule 10 mm diam., October.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld, N.G.

Distribution Sydney area: Sporadic.

Select locations: CC: Wye, Nortons Basin, Byrnes Gap.

Habitat

Habitat: Ridges, hillsides, gullies.

Altitude: 0–600 m **Annual rainfall:** 900–1100 mm

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Corymbia gummifera*; moist open-forest e.g. with *Eucalyptus deanei*, *Syncarpia glomulifera*, *Allocasuarina torulosa*.

Substrate: Sandy loam to gravelly clay on sandstone.

Exposure:

Conservation

Conservation: Rare, conservation status unknown. Reported in Blue Mountains NP.

Levenhookia dubia**STYLIDIACEAE**

Hairy Stylewort

Life history

Growth form: Erect herb 2–6 cm high, with hairy red stems.

Vegetative spread: No.

Longevity: Less than one year.

Primary juvenile period: Less than one year.

Flowers: Whitish with yellow, spring–summer.

Fruit/seed: Hairy capsule 1–2 mm long

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC NWS CWS SWS NWP; Vic., Tas., S.A., W.A.

Distribution Sydney area:

Select locations: CC: Richmond.

Habitat

Habitat: Damp ground.

Altitude: 0–30 m **Annual rainfall:** 800 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Reported once at Richmond in 1910, growing plentifully but overrun by couch grass. Possibly introduced from western NSW with stock. Probably extinct in the area now.

Stylidium debile

STYLIDIACEAE

Frail Triggerplant

Life history**Growth form:** Herb 15–30 cm high, with leaves scattered along stem (Bean 1999).**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pink, March. Adapted for pollination by insects.**Fruit/seed:** Capsule 3–5 mm long, with brown seeds 0.5 mm long (Bean 1999).**Dispersal, establishment & growth:****Fire response:** Probably killed.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT; Qld.**Distribution Sydney area:** Botany Bay, Tuggerah Lakes.**Select locations:** CC: Gosford State Nursery (1917), Tuggerah Lakes (1903), Alexandra Swamp (1888).**Habitat****Habitat:** Creekbanks, swampy ground.**Altitude:** 0–100 m**Annual rainfall:** 1000–1200 mm**Typical local abundance:****Vegetation:** Probably in swampy areas with *Melaleuca quinquenervia*.**Substrate:** Sand to pale silty clay (Bean 1999), low nutrients.**Exposure:****Conservation****Conservation:** Probably extinct in the greater Sydney region (Bean 1999), most recent record Gosford State Nursery (1917). Alexandria is southern geographical limit.***Stylidium despectum***

STYLIDIACEAE

Dwarf Triggerplant

Life history**Growth form:** Erect herb to 15 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Whitish to pale pink, October–December. Adapted for pollination by insects.**Fruit/seed:** Very narrow capsule 5–7 mm long, with many dull brown, smooth seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC NT ST NWS CWS SWS SWP; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Cooks River.**Select locations:** CC: Tempe.**Habitat****Habitat:** Drying swamp flats and watercourses.**Altitude:** 0–50 m**Annual rainfall:** 1100 mm**Typical local abundance:****Vegetation:****Substrate:** Probably on mudflats of the Cooks River.**Exposure:****Conservation****Conservation:** Recorded from Illawarra Road, Tempe in 1891. Not recorded in Sydney area since and now presumably extinct.

Styloidium graminifolium

STYLIDIACEAE

Grass Triggerplant

Life history

Growth form: Perennial herb with short stems and grass-like basal leaves. Short, thick, tuberous roots, and longer thin roots (at Penrose).

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Pale to bright pink, October–August, peak October–December, column sensitive, with a trigger-like action when touched during pollination. Probably pollinated by native bees (P. Kubiak pers. comm.). Probably pollinated by native bee *Chalicodoma derelicta* (Bernhardt & Burns-Balogh 1983).

Fruit/seed: Egg-shaped capsule 5–12 mm long, with tawny coloured seeds, December–February. Seeds small, difficult to germinate.

Dispersal, establishment & growth: Diaspore: seeds, no particular morphology for dispersal (McIntyre et al. 1995).

Fire response: Stems killed. Resprouted at Agnes Banks (Benson 1981). Regrowth only from surviving rootstocks, seedlings recorded less than 1 year after fire and reached sexual maturity during first growing season (Purdie 1977).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS; Qld, Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Melong Swamps, Berowra, Ages Banks, Berkshire Park, Pennant Hills, Glenbrook, Silverwater, Rookwood, Kogarah, Lucas Heights, Thirlmere Lakes. CT: Newnes Plateau, Yetholme, Mount Tomah, Mt Victoria, Katoomba, Mittagong, Joadja Creek, Bundanoon, Penrose.

Habitat

Habitat: Swampy hollows, steep slopes, cliff faces.

Altitude: 0–1000 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *E. pilularis*, *Angophora floribunda*; woodland e.g. with *Eucalyptus sclerophylla*, *E. mannifera*, *Corymbia gummifera*; sedgeswamp e.g. with *Gymnoschoenus sphaerocephalus*, *Empodisma* sp.

Substrate: Sandy soils on sandstone, sands, peaty sand.

Exposure:

Conservation

Conservation: Conservation status unknown.

Styloidium laricifolium

STYLIDIACEAE

Tree Triggerplant

Life history

Growth form: Small shrub to 30–150 cm high, with linear leaves..

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pale pink, September–December, peak September–October. Adapted for pollination by insects.

Fruit/seed: Oblong capsule 8–12 mm long, with numerous dark brown seeds, October–December.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS; Qld, Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Kindarun Mountain, Putty, Pearl Beach, Grose Vale, Glenbrook, Oatley, Macquarie Pass. CT: Olinda, Wentworth Falls, Kanangra, Mt Jellore, Mittagong, Robertson.

<p>Habitat: Rocky sites, clifftops, ridges. Altitude: 0–1000 m Annual rainfall: 700–1400 mm Typical local abundance: Occasional. Vegetation: Open-forest e.g. with <i>Corymbia eximia</i>, <i>Eucalyptus agglomerata</i>, <i>E. piperita</i>, <i>Angophora bakeri</i>. Substrate: Sandy soils on sandstone, conglomerate, low nutrients. Exposure:</p>	Habitat
<hr/>	
<p>Conservation: Conservation status not known.</p>	Conservation

Stylidium lineare

STYLIDIACEAE

Narrow-leaved Triggerplant

Life history

Growth form: Small perennial herb, with very narrow basal leaves.
Vegetative spread:
Longevity: 5–20 years (D. Keith pers. comm.).
Primary juvenile period:
Flowers: Pink to deep red, October–June, October, peak November–December, column with a trigger-like action when touched during pollination. Adapted for pollination by insects.
Fruit/seed: Oblong capsule 5–10 mm long, with dark brown seeds, January–April.
Dispersal, establishment & growth: No special morphology for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).
Fire response: Stems killed, basal sprouts from rhizome. Secondary juvenile period 2 years (D. Keith pers. comm.).
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: CC SC CT ST.
Distribution Sydney area: Widespread on sandstone plateaus.
Select locations: CC: Somersby, Bowen Mountain, Hornsby, Bantry Bay, Ryde, Mosman, Long Bay, Como, Waterfall, Maddens Plains, Barren Grounds, Loddon Falls. CT: Gospers Mountain, Clarence, Katoomba, Wentworth Falls, Hill Top, Robertson.

Habitat

<p>Habitat: Poorly-drained plateaus, ridges. Altitude: 0–1000 m Annual rainfall: 1000–1400 mm Typical local abundance: Frequent. Vegetation: Open forest e.g. with <i>Corymbia gummifera</i>, <i>Angophora costata</i>, <i>Eucalyptus punctata</i>, <i>E. sieberi</i>; heath e.g. with <i>Banksia robur</i>, <i>Xyris</i>, <i>Restio complanatus</i>; mallee. Substrate: Moist sandy, or gravelly soils on sandstone. Exposure: Full sun.</p>	Habitat
<hr/>	
<p>Conservation: Conservation status unknown. Reported in Wollemi NP, Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP, Royal NP.</p>	Conservation

Stylidium productum**STYLIDIACEAE**

Triggerplant

Life history**Growth form:** Perennial herb with sprawling and elongating stems to 50 cm long.**Vegetative spread:** Adventitious roots develop along stems and form new plants.**Longevity:****Primary juvenile period:****Flowers:** Pink, November–January, peak December. Probably pollinated by native bees and honeybees (P. Kubiak pers. comm.).**Fruit/seed:** Egg-shaped capsule 5–10 mm long.**Dispersal, establishment & growth:****Fire response:** Stems killed, resprouts from rhizome.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC CT.**Distribution Sydney area:** Widespread.**Select locations:** CC: Culoul Range, Kulnura, Kurrajong Heights, Grose Vale, Springwood, Asquith, Terrey Hills, O'Hares Creek, Waterfall, Stanwell Park. CT: Kandos, Blackheath, Katoomba, Wentworth Falls.**Habitat****Habitat:** Ridges, rocky hillsides, gullies.**Altitude:** 0–1000 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest e.g. with *Corymbia gummifera*, *Angophora costata*, *Eucalyptus piperita*, *E. sclerophylla*, *E. sieberi*, *E. punctata*; woodland e.g. with *Corymbia eximia*, *C. gummifera*.**Substrate:** Shallow sandy soil on sandstone, low nutrient soils, well-drained.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Brisbane Water NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP.***Symplocos stawellii*****SYMPLOCACEAE**

White Hazelwood

Life history**Growth form:** Shrub or small tree to 17 m high, with hairy branchlets and alternate, simple leaves.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Whitish, April–August.**Fruit/seed:** Blue to black fleshy fruit 8–12 mm long. Seeds brown, pear-shaped 8 mm long, mature October–April (Floyd 1989).**Dispersal, establishment & growth:** Germination from fresh seed (Floyd 1989).**Fire response:****Interaction with other organisms:** Fruit eaten by Rose-crowned Fruit-dove and Superb Fruit-dove (Floyd 1989).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Lisarow, Gosford, Cattai, Hacking River.

	Habitat
Habitat: Usually along creeks (Floyd 1989).	
Altitude: 0–200 m	Annual rainfall: 900–1400 mm
Typical local abundance:	
Vegetation: Rainforest e.g. with <i>Acmena smithii</i> , <i>Ceratopetalum apetalum</i> , <i>Cryptocarya glaucescens</i> , <i>Schizomeria ovata</i> .	
Substrate: Clay soils on shales, claystones, alluvium, medium–high nutrients.	
Exposure:	
	Conservation
Conservation: Conservation status unknown. Royal National Park is southern geographical limit.	

Symplocos thwaitesii**SYMPLOCACEAE**

Buff Hazelwood

	Life history
Growth form: Shrub or small tree to 15 m high,	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: White, September–December.	
Fruit/seed: Purple to black fleshy fruit 5–12 mm long. Fruit mature January–March (Floyd 1989).	
Dispersal, establishment & growth: Germination from fresh seed (Floyd 1989).	
Fire response:	
Interaction with other organisms: Fruit eaten by Green Catbird (Floyd 1989).	
	Distribution

Status/origin: Native.**Botanical subregions:** NC CC SC CT CWS; Qld, Vic.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Ourimbah, Gosford, Bola Creek, Mt Keira, Gerringong.

CT: Robertson NR.

	Habitat
Habitat: Usually along creeks (Floyd 1989).	
Altitude: 0–760 m	Annual rainfall: 1200–1800 mm
Typical local abundance: Rare.	
Vegetation: Sub-tropical and warm-temperate rainforest e.g. with <i>Doryphora sassafras</i> , <i>Ceratopetalum apetalum</i> , <i>Acacia melanoxylon</i> , <i>Acmena smithii</i> , <i>Guioa semiglauca</i> , <i>Cryptocarya glaucescens</i> .	
Substrate:	
Exposure:	
	Conservation
Conservation: Conservation status unknown. Reported in Brisbane Water NP, Robertson NR.	

Gnidia squarrosa *

THYMELAEACEAE

Life history

Growth form: Erect bushy shrub 0.4–1.2 m high, with hairy stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Petals scale-like.

Fruit/seed: Small dry fruit.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Africa.

Botanical subregions: CC.

Distribution Sydney area:

Select locations: CC: South Head. CT: no information.

Habitat

Habitat:

Altitude:

Annual rainfall:

Typical local abundance:

Vegetation: Woodland e.g. with *Banksia integrifolia*.

Substrate:

Exposure:

Conservation

Conservation: Sometimes cultivated, occasionally naturalised.

Pimelea curviflora var. *curviflora*

THYMELAEACEAE

Life history

Growth form: Subshrub or shrub 20–150 cm high, with hairy stems.

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Yellow, October–May, peaks March, December.

Fruit/seed: 1-seeded green nut 2–4 mm long,

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995). Declines in absence of fire — out-competed by other shrubs (L.McD.).

Fire response: Seedlings appeared after fire where previously not known (Lane Cove) (Van Klaphe pers. comm.).

Interaction with other organisms: Fruit toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Hornsby Plateau.

Select locations: CC: South Maroota, Glenorie, Kellyville, Cheltenham, Cottage Point, Tumbledown Dick Hill, Wheeler Heights, Manly (1899), Five Dock (1907), Bellevue Hill (1895), Gladesville (1884), Northmead.

Habitat

Habitat: Ridgetops, upper slopes.

Altitude: 0–300 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Corymbia eximia*, *Eucalyptus capitellata*, *E. sieberi*, *E. punctata*; open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *Corymbia gummifera*, *Eucalyptus sieberi*.

Substrate: Shaley/lateritic soils over sandstone, shale/sandstone transition, low nutrients.

Exposure: Full sun to light shade.

Conservation

Conservation: Restricted local endemic. Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. The number of collections before 1900, suggests it was originally common. Many old collection sites have now been built on. Reported in Wollemi NP, Muogamarra NR, Ku-ring-gai Chase NP.

Pimelea curviflora* var. *divergens**THYMELAEACEAE****Life history**

Growth form: Tufted subshrub 20–50 cm high.

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Greenish yellow, hairy, in heads.

Fruit/seed: 1-seeded green nut 2–4 mm long.

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995).

Fire response:

Interaction with other organisms: Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CT NT NWS NWP; Qld, Vic.

Distribution Sydney area:

Select locations: CT: Leura.

Habitat

Habitat:

Altitude: 900 m

Annual rainfall: 1400 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Rare, Leura is southern geographical limit, last collected 1908. Conservation status unknown.

Pimelea curviflora* var. *gracilis**THYMELAEACEAE****Life history****Growth form:** Subshrub 50–150 cm high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Greenish yellow, hairy, in heads, October–December.**Fruit/seed:** 1-seeded green nut 2–4 mm long, occasionally curved.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995). Some records for disturbed sites e.g. confined to old tracks (at Glenorie) and may be a colonising species.**Fire response:****Interaction with other organisms:** Toxic to stock (Harden 1990).**Distribution****Status/origin:** Native.**Botanical subregions:** CC NT CT ST SWS; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Glenorie, Dapto. CT: Orange, Mt Canobolas, Carcoar, Hill Top.**Habitat****Habitat:** Ridges.**Altitude:** 0–1000 m**Annual rainfall:** 750–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Woodland e.g. with *Allocasuarina torulosa*, *Acacia fimbriata*.**Substrate:** Loam on basalt, sandy clay loam on sandstone, medium to high nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Muogamarra NR.***Pimelea curviflora* var. *sericea*****THYMELAEACEAE****Life history****Growth form:** Subshrub 15–30 cm high.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Greenish yellow, hairy, in heads, November–January.**Fruit/seed:** 1-seeded green nut 2–4 mm long.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:** Toxic to stock (Harden 1990).**Distribution****Status/origin:** Native.**Botanical subregions:** CC SC CT ST NWS CWS SWS; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Tablelands.**Select locations:** CT: Mt Canobolas, Bathurst, Rydal, Lithgow, Carcoar, Berrima, Wingello.**Habitat****Habitat:** Hillsides.**Altitude:** 700–1000 m**Annual rainfall:** 600–1000 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus albens*; grassland.**Substrate:** Clay soils on shale, basalt.**Exposure:****Conservation****Conservation:** Conservation status unknown, few collections, 13/18 specimens collected pre-1950.

Pimelea glauca

THYMELAEACEAE

Life history

Growth form: Much-branched shrub to 1 m high.

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Creamy-white, in heads.

Fruit/seed: 1-seeded green nut 4 mm long.

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995).

Fire response:

Interaction with other organisms: Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP NWP; Qld, Vic., Tas., S.A.

Distribution Sydney area:

Select locations: CC: Liverpool (1818), Cobbitty, Camden (1990). CT: Bathurst, Portland, Wallerawang, Rydal, Carcoar, Mt Werong, Wombeyan Caves, Bowral.

Habitat

Habitat:

Altitude: 0–1000 m **Annual rainfall:** 600–1000 mm

Typical local abundance: Rare.

Vegetation: Grassland e.g. with *Themeda australis*.

Substrate: Clay loam on shale, medium nutrients.

Exposure:

Conservation

Conservation: Rare, vulnerable in Western Sydney (James et al. 1999), last collected in Central Tablelands in 1962 (at Wombeyan Caves).

Pimelea humilis

THYMELAEACEAE

Life history

Growth form: Erect or straggling shrub to 50 cm high, with hairy stems. Similar to *P. linifolia* subsp. *linifolia* but differing with hairs on stems (Threlfall 1982).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bisexual or female, hairy, whitish, in heads.

Fruit/seed: 1-seeded green nut 4 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: SC CT ST; Vic., Tas., S.A.

Distribution Sydney area: Robertson.

Select locations: CT: Robertson.

Habitat

Habitat:

Altitude: 600 m **Annual rainfall:** 1600 mm

Typical local abundance:

Vegetation: Open-forest, heath.

Substrate: Sandy soil on sandstone.

Exposure:

Conservation

Conservation: Rare in Sydney area, only record Robertson (1967), its northern geographical limit. Not common in NSW (Harden 1990).

Pimelea latifolia* subsp. *elliptifolia

THYMELAEACEAE

Life history**Growth form:** Shrub 10–50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish yellow to white, hairy, in heads, October–December.**Fruit/seed:** 1-seeded green nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CT CWS.**Distribution Sydney area:** Rylstone to Capertee.**Select locations:** CT: Rylstone, Mt Gundangaroo, Glen Davis.

Habitat**Habitat:** Steep rocky slopes, creek banks.**Altitude:** 400–800 m **Annual rainfall:** 600–650 mm**Typical local abundance:** Occasional.**Vegetation:** Eucalypt woodland with *Leptospermum* understorey.**Substrate:** Sandy alluvium, sandy soil on sandstone.**Exposure:**

Conservation**Conservation:** Rare, few records, conservation status unknown.***Pimelea latifolia* subsp. *hirsuta***

THYMELAEACEAE

Life history**Growth form:** Spreading shrub 10–50 cm high, with hairy stems and leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish yellow to white.**Fruit/seed:** 1-seeded green nut 4 mm long**Dispersal, establishment & growth:** Diaspore: seed, ant-adapted food body for dispersal (Westoby et al. 1990).**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Wyong, Colo Heights, Gosford, Mooney Mooney, Kurrajong Heights, Lovett Bay, Newport, Narrabeen (L.McD.) CT: Glen Davis, Wentworth Falls, Barbers Creek.

Habitat**Habitat:****Altitude:** 0–1000 m **Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Corymbia maculata*, *Eucalyptus paniculata*.**Substrate:** Sandy loam on shales.**Exposure:**

Conservation**Conservation:** Sporadic occurrences, conservation status unknown, reported in Brisbane Water NP, Ku-ring-gai Chase NP.

Pimelea ligustrina* subsp. *hypericina

THYMELAEACEAE

Life history**Growth form:** Shrub 1–3 m high**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Whitish, hairy, in heads, September–November, peak October.**Fruit/seed:** 1-seeded green nut 3–5 mm long, October.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT.**Distribution Sydney area:** Illawarra.**Select locations:** CC: Cessnock, Waterfall, Otford, Bulli, Mt Kembla, Macquarie Pass, Minnamurra Falls. CT: Burrawang.**Habitat****Habitat:** Hillsides.**Altitude:** 0–600 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Moist eucalypt forest.**Substrate:** Clay soils on basalt, shale.**Exposure:****Conservation****Conservation:** Rare, many old collections, conservation status unknown. Reported in Wollemi NP.***Pimelea ligustrina* subsp. *ligustrina***

THYMELAEACEAE

Life history**Growth form:** Shrub 2 m high**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Whitish, hairy, in heads, September–December.**Fruit/seed:** 1-seeded green nut 3–5 mm long, November–December.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Food plant of butterfly larvae *Candalides xanthospilos* which feed at night, sheltering under leaf litter during the day (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC SC NT CT ST; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Mainly Tablelands.**Select locations:** CC: Otford, Albion Park. CT: Coricudgy, Winburndale Creek, Bathurst, Mt Canobolas, Blackheath, Jenolan Caves, Mt Werong, Wombeyan Caves, Bundanoon.**Habitat****Habitat:** Gullies.**Altitude:** 0–1000 m**Annual rainfall:** 600–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Rainforest e.g. with *Acmena smithii*, *Cassine australe*, *Wilkiea huegeliana* (on the coast); moist forest to woodland e.g. with *Eucalyptus viminalis*, *E. blaxlandii* (on Tablelands).**Substrate:** Clay soils on basalt, high nutrients, though also on sandstone.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Wollemi NP.

Pimelea linifolia* subsp. *caesia**THYMELAEACEAE****Life history**

Growth form: Prostrate or clump-forming shrub to 50 cm high, with bluish leaves. Similar to *P. glauca* (Threlfall 1982).

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: White or occasionally pink, hairy, in heads, November–December.

Fruit/seed: 1-seeded green nut 3–5 mm long.

Dispersal, establishment & growth: Diaspore: seed, with food body adapted for ant-dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms: Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC SC NT CT ST NWS CWS SWS; Vic.

Distribution Sydney area: Tablelands.

Select locations: CT: Towac (Orange), Springside, Mt Werong.

Habitat

Habitat:

Altitude: 900–1000 m **Annual rainfall:** 900–1000 mm

Typical local abundance:

Vegetation: Open-forest.

Substrate: Well-drained, but not rocky soil.

Exposure:

Conservation

Conservation: Rare, last collected 1958, conservation status unknown.

Pimelea linifolia* subsp. *collina**THYMELAEACEAE****Life history**

Growth form: Shrub to 1 m high.

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: White or occasionally pink, usually silky-hairy, in heads, November–January.

Fruit/seed: 1-seeded green nut 3–5 mm long, November–January.

Dispersal, establishment & growth: Diaspore: seed, with food body adapted for ant-dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms: Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST NWS CWS NWP; Qld.

Distribution Sydney area: Mainly Upper Blue Mountains.

Select locations: CC: Como (1916), Coolangatta (Berry). CT: Clarence, Katoomba, Leura, Wentworth Falls, Bundanoon.

Habitat

Habitat:

Altitude: 0–1000 m **Annual rainfall:** 1100–1400 mm

Typical local abundance: Occasional.

Vegetation: Open-forest; heath

Substrate: Sandy soils on sandstone, also basalt (at Coolangatta).

Exposure:

Conservation

Conservation: Rare on coast, probably extinct at Como. Last collected on Central Tablelands 1966. Conservation status unknown.

Pimelea linifolia* subsp. *linifolia**THYMELAEACEAE****Life history**

Growth form: Erect, prostrate or occasionally clump-forming shrub to 1.5 m high.

Vegetative spread: No (McIntyre et al. 1995).

Longevity: 5–20 years (D. Keith pers. comm.).

Primary juvenile period: 4 years (Benson 1985), 2–6 years (D. Keith pers. comm.).

Flowers: White or occasionally pink, hairy, in heads. Flowering at any time, peak August–October, pollinated by moths e.g. *Pollanisus* sp. (Pyke 1981), butterflies, honeybees, native bees and flies (P. Kubiak pers. comm.).

Fruit/seed: 1-seeded green nut 3–5 mm long, at any time.

Dispersal, establishment & growth: Food body ant-adapted for dispersal (Westoby et al. 1990). Soil-stored seedbank (Fox 1988). Often prolific germination after fire.

Fire response: Killed and re-established from soil-stored seed. Killed by fire (D. Keith pers. comm., Fox 1988). Killed, seedlings recorded less than 1 year after fire (Purdie 1977). Seedlings 5 months after high-intensity fire at Katandra Bushland Sanctuary 1994, in an area previously unburnt for more than 50 years (L.McD.).

Interaction with other organisms: Food plant of butterfly larvae *Candalides xanthospilos* which feed at night, sheltering under leaf litter during the day (Common & Waterhouse 1981). Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Norah Head, North Entrance, Kulnura, Maroota, Berkshire Park, Glenbrook, Wahroonga, Avalon, Frenchs Forest, Willoughby, Mosman, Auburn, Coogee, Oatley, Kurnell, Long Bay, Liverpool, Waterfall, Camden, Maldon, Bargo, Cambewarra. CT: Kandos, Clandulla, Capertee, Orange, Katoomba, Wentworth Falls, Wombeyan Caves, Moss Vale, Barren Grounds, Bundanoon, Wingello.

Habitat

Habitat: Hillsides, sandhills, cliffs.

Altitude: 0–1000 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Corymbia gummifera*, *Eucalyptus sclerophylla*, *E. piperita*, *Angophora costata*; heath e.g. with *Angophora hispida*, *Banksia ericifolia*; sea cliff scrub.

Substrate: Sandy soils on sandstone, sandhills, occasionally on clay soils on shale, very low to low-nutrient soils, well-drained.

Exposure:

Conservation

Conservation: Widespread and probably adequately conserved. Reported in Wollemi NP, Bouddi NP, Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP, Royal NP.

Pimelea linifolia* subsp. *linoides**THYMELAEACEAE****Life history**

Growth form: Shrub to 2.5 m high.

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: White or occasionally pink, hairy, in heads, September–November, peak November.

Fruit/seed: 1-seeded green nut 3–5 mm long, September–December.

Dispersal, establishment & growth: Food body ant-adapted for dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Candalides xanthospilos* which feed at night, sheltering under leaf litter during the day (Common & Waterhouse 1981). Toxic to stock (Harden 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC CT CWS; Vic.

Distribution Sydney area: Upper Blue Mountains, Nepean River.

Select locations: CC: Burragorang, Cobbitty, Yerranderie. CT: Currant Mountain Gap, Blackheath, Katoomba, Wentworth Falls, Kings Tableland.

Habitat

Habitat: Rocky areas, ridgetops, cliffs.

Altitude: 0–1000 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus oreades*, *E. sparsifolia*, *E. rossii*; heath e.g. with *Allocasuarina nana*.

Substrate: Clayey to sandy soils on sandstone, low nutrients.

Exposure: Exposed conditions in Blue Mountains (Harden 1990).

Conservation

Conservation: Rare on Nepean River, conservation status in Blue Mountains not known. Reported in Wollemi NP.

Pimelea spicata**THYMELAEACEAE****Life history**

Growth form: Slender, erect to decumbent shrub up to 50 cm high, with carrot-like taproot.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: White often tinged with pink, in heads, flowers at any time, peak March–April.

Fruit/seed: 1-seeded green nut 3 mm long. Seed tiny black, collected June, some germination without treatment (P. Hind).

Dispersal, establishment & growth: Diaspore: seed, possibly ant-dispersed (NPWS 2000).

Fire response: Resprouts from a carrot-like tap root after fire. Requires fire-free period of more than 3 years to develop a fire-resistant taproot (NPWS 2000).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Western Sydney, Illawarra coastline.

Select locations: CC: Greystanes, Horsley Park, Bass Hill, Marayong, Lansdowne, Casula, Denham Court, Narellan, Mount Annan, Mt Warrigal, Shellharbour, Kiama, Minnamurra Headland.

Habitat

Habitat: Gentle rises, coastal headland.
Altitude: 0–100 m **Annual rainfall:** 700–1400 mm
Typical local abundance: Frequent–occasional.
Vegetation: Woodland with *Eucalyptus moluccana*, *E. tereticornis* (Cumberland Plain Woodland); grassland and coastal scrub e.g. with *Banksia integrifolia*, *Westringia fruticosa*.
Substrate: Clay loam on Wianamatta Shale, Bumbo latite, medium nutrients, well-drained.
Exposure:

Conservation

Conservation: Local endemic, listed as Endangered (Schedule 1) NSW *Threatened Species Conservation Act 1995*. Coded 3ECi on national rare species list (Briggs & Leigh 1996). Vulnerable in Western Sydney (James et al. 1999), in view of now limited distribution. It is now known from only a few sites including Mount Annan Botanic Gardens near Campbelltown, private property and Commonwealth-owned land at Narellan and small populations at Georges River and Maryong.

On the Illawarra it occurs on the Minnamurra Headland and another small population occurs on Crown land at Shellharbour. While the population at Mount Annan is protected in a botanical garden no populations are formally protected in conservation reserves. The best population of the species is at Narellan, where it is not conserved. Threatened by the weed Bridal Creeper at some sites. Threatening processes include frequent fire, clearing, mowing, grazing, rubbish dumping (NPWS 2000).

Pimelea treyvaudii

THYMELAEACEAE

Life history

Growth form: Erect or sprawling shrub to 60 cm high.
Vegetative spread:
Longevity:
Primary juvenile period:
Flowers: White, hairy, in heads, December.
Fruit/seed: 1-seeded green nut 3–5 mm long.
Dispersal, establishment & growth:
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: CT ST CWS; Vic.
Distribution Sydney area: Orange area.
Select locations: CT: Lewis Ponds, Orange.

Habitat

Habitat:
Altitude: 800–1000 m **Annual rainfall:** 750–1000 mm
Typical local abundance:
Vegetation: Open-forest
Substrate:
Exposure:

Conservation

Conservation: Rare, few collections, last collected 1969. Conservation status unknown.

Wikstroemia indica**THYMELAEACEAE****Life history**

Growth form: Shrub usually to 1.5 m high, with opposite leaves and reddish-brown tough 'bootlace' bark that strips very readily. Crushed leaves with unpleasant odour (Low 1988).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Greenish yellow to white, sporadic throughout the year.

Fruit/seed: 1-seeded fleshy fruit, red when ripe, December–January.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Fruit palatable but poisonous (Low 1988, Everist 1974). Bark used for string in Asia.

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, Asia to Pac Is.

Distribution Sydney area: Coastal.

Select locations: CC: Parnell, Avoca, Brooklyn, Barrenjoey, Long Reef, Narrabeen, Clontarf, Mosman, Forest Island (RNP)

Habitat

Habitat: Slopes near the sea.

Altitude: 0–400 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Occasional.

Vegetation: Rainforest; open-forest e.g. with *Eucalyptus pilularis*, *Syncarpia glomulifera*, *Livistona australis*; scrub–woodland e.g. with *Lomandra longifolia*.

Substrate: Sandy soils on sandstone, dune sand, low–medium nutrients.

Exposure: Light shade.

Conservation

Conservation: Illawarra is southern geographical limit. Conservation status unknown.

Reported in Yengo NP, Bouddi NP, Brisbane Water NP, Lion Island NR, Sydney Harbour NP, Royal NP.

Tetratheca bauerifolia**TREMADRACEAE****Life history**

Growth form: Compact shrub to 30 cm high, with small leaves in whorls.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, October–December, peak October.

Fruit/seed: Hairy capsule; seeds not seen.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT ST; Vic.

Distribution Sydney area: Tablelands.

Select locations: CT: Winburndale NR, Mullion Creek, Portland, Kanangra, Gerringong Falls, Taralga.

Habitat

Habitat: Exposed rocky areas.

Altitude: 600–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent.

Vegetation: Woodland e.g. with *Eucalyptus macrorhyncha*, *E. goniocalyx*; heath e.g. with *Eucalyptus stricta*, *Allocasuarina nana*, *Banksia marginata*.

Substrate: Clay soils to sandy soils on sandstone, quartzite, granite, shale, low nutrients.

Exposure:

Conservation

Conservation: Winburndale is northern geographical limit. Conservation status unknown, no collections from Central Tablelands since 1978. Reported in Budderoo NP.

Tetradthea decora**TREMANDRACEAE****Life history**

Growth form: Shrub 30–40 cm high, with densely hairy, ridged stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, September–November.

Fruit/seed: Hairy capsule 4–5 mm long; seeds brown 4 mm long, with an appendage, October.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT NWS.

Distribution Sydney area: Widespread but sporadic.

Select locations: CC: Howes Valley, Putty, Ingleside. CT: Kedumba Valley, Narrow Neck Peninsula, Mt Dingo, Mt Mouin, Jamieson Valley.

Habitat

Habitat: Creeks, ridges.

Altitude: 0–1000 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus deanei*, *E. benthamii*; woodland e.g. with *Angophora bakeri*; heath.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Tetradthea ericifolia**TREMANDRACEAE****Life history**

Growth form: Shrub 15–40 cm high, with small leaves in whorls, with rhizomes (Herb. specimen).

Vegetative spread:

Longevity:

Primary juvenile period: 3 years (Benson 1985).

Flowers: Deep lilac-pink, at any time, with peak August–October.

Fruit/seed: Hairy capsule 6–8 mm long; seeds brown 2–3 mm long, with an appendage.

Dispersal, establishment & growth: Food body ant-adapted for dispersal (Rice & Westoby 1981, Westoby et al. 1990).

Fire response: Probably resprouts from rhizome.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC CT ST.

Distribution Sydney area: Widespread.

Select locations: CC: Wondabyne, Glenorie, Cowan, Hornsby, Terrey Hills, Duffys Forest, Allambie Heights, Bantry Bay, Manly, Bondi, Wedderburn, Springwood. CT: Mount Tomah, Wentworth Falls, Mittagong.

Habitat

Habitat: Hillsides.

Altitude: 0–1000 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Angophora costata*, *Eucalyptus sieberi*, *E. punctata*, *Corymbia gummifera*, *Eucalyptus piperita*; heath e.g. with *Banksia serrata*, *Acacia suaveolens*, *Actinotus minor*.

Substrate: Sandy soil on sandstone, low nutrients, well-drained.

Exposure: Full sun.

Conservation

Conservation: Probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP.

Tetratheca glandulosa**TREMANDRACEAE****Life history**

Growth form: A low-growing spreading shrub about 20 cm high, with woody rootstock.

Vegetative spread:

Longevity: Possibly medium.

Primary juvenile period:

Flowers: Pink, March–December, peak August–November. Pollination possibly by small native bee (P. Kubiak pers. comm.).

Fruit/seed: 3–7 mm long, seeds less than 3 mm long, probably January.

Dispersal, establishment & growth:

Fire response: Resprouted after fire at Marramarra NP (L.McD.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Hornsby Plateau.

Select locations: CC: Sackville, Kulnura, Mangrove Mountain, Wisemans Ferry, Maroota, Glenorie, Arcadia, Cowan, Ingleside, Duffys Forest, Mt Colah, North Wahroonga, Thornleigh, Belrose, Frenchs Forest, Allambie Heights, Brookvale, Manly, The Spit, Balmain, Auburn.

Habitat

Habitat: Edge of plateau, hillsides.

Altitude: 0–300 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Grevillea speciosa*, *Grevillea buxifolia*, *Eucalyptus luehmanniana*; scrub e.g. with *Banksia ericifolia*, *Allocasuarina distyla*; sclerophyll woodland e.g. with *Eucalyptus haemastoma*, *Banksia serrata*, *Corymbia gummifera*, *Eucalyptus capitellata*.

Substrate: Clayey sand on sandstone or shale sandstone transition, low nutrients.

Exposure: Full sun to light shade.

Conservation

Conservation: Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act 1995*. Endemic to Central Coast, coded 2VC- on national rare species list (Briggs & Leigh 1996). Reported in Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Dalrymple Hay NR, Garigal NP, Lane Cove NP.

Tetratheca juncea**TREMANDRACEAE****Life history**

Growth form: A prostrate, usually leafless, shrub with stems to 1 m long. Juvenile plants with alternate narrow lanceolate leaves (Norton 1994).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, July–December, peak September. Possibly pollinated by sonicating bee *Lestio* sp. (R. Payne pers. comm.).

Fruit/seed: Capsule 6–8 mm long, with seeds 4 mm long, September–December, peak October.

Dispersal, establishment & growth: Diaspore: seed, short-distance ballistic dispersal (R. Payne pers. comm.).

Fire response: Resprouts from rootstock after high intensity, fast fire, but slow fires with high fuel loads may kill rootstock (Norton 1994).

Interaction with other organisms: Mycorrhiza-dependent, making it difficult to translocate (R. Payne pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC.

Distribution Sydney area: Helensburgh to Port Jackson, North from Lake Macquarie.

Select locations: CC: Swansea, Catherine Hill Bay, Lake Munmorah, Charmhaven, Five Dock (1884), Cooks River (1905), Carlton, Kogarah (1893), Bexley (1913), Undercliff (1889), Tempe (1891), Helensburgh (1893).

Habitat

Habitat: Ridges.

Altitude: 0–200 m

Annual rainfall: 1000–1200 mm

Typical local abundance: Rare–occasional.

Vegetation: Restricted to open-forest e.g. with *Angophora costata*, *Eucalyptus haemastoma*, *E. globoidea*, *Corymbia gummifera*, *Eucalyptus capitellata*, *E. globoidea* (R. Payne pers. comm.).

Substrate: Sandy skeletal soil on sandstone, sandy-loam soils, low nutrients. Clayey soil from conglomerates, pH-neutral (Norton 1994). Moisture requirement is critical, neither too wet nor too dry (R. Payne pers. comm.).

Exposure: East to south aspects (Norton 1992).

Conservation

Conservation: Listed as Vulnerable (Schedule 2) NSW *Threatened Species Conservation Act* 1995. Coded 3VCa on national rare species list (Briggs & Leigh 1996). Only old records for Port Jackson to Helensburgh (1885–1905), where it is presumed extinct. Poorly conserved elsewhere. Reported in Awabakal NR (Payne 1993).

Tetratheca neglecta**TREMANDRACEAE**

Life history

Growth form: A compact or occasionally diffuse shrub 15–60 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, September–November.

Fruit/seed: Capsule 6 mm long, seed not seen.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT.

Distribution Sydney area: Botany Bay to Barren Grounds.

Select locations: CC: Arncliffe to Canterbury (1886), Oatley Park, Menai, Gynea, Waterfall, Helensburgh, West Dapto. CT: Byrnes Gap, Barren Grounds, Carrington Falls.

Habitat

Habitat: Ridgetops, plateaus.

Altitude: 0–600 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Banksia paludosa*, *Melaleuca squarrosa*, *Empodisma minus*, *Eucalyptus camfieldii*, *E. luehmanniana*; woodland e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *E. haemastoma*, *E. punctata*, *E. fibrosa*.

Substrate: Sandy loam soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Local endemic species. Main populations conserved but outliers such as West Dapto not conserved. Coded 3RC- on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP, Budderoo NP, Heathcote NP, Royal NP.

Tetratheca rubioides**TREMANDRACEAE****Life history**

Growth form: Compact shrub 30–60 cm high, with erect or ascending branches and densely hairy stems. Hybridizes with *T. thymifolia* (Harden 1992).

Vegetative spread: Rhizomatous (Herb. specimen).

Longevity: Indefinite.

Primary juvenile period:

Flowers: Deep lilac-pink, September–December, peak October–November.

Fruit/seed: Capsule 5 mm long; seeds brown, 3 mm long, with an appendage.

Dispersal, establishment & growth:

Fire response: Resprouts from rootstock (Herb. specimen).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC CT ST.

Distribution Sydney area: Blue Mountains.

Select locations: CC: Bilpin, Burrellow Swamp, Bowen Mountain. CT: Rylstone, Kekeelbon Mountains, Clarence, Bell, Blackheath, Wentworth Falls, Mt Wilson.

Habitat

Habitat: Plateau, slopes.

Altitude: 400–1100 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Eucalyptus stricta*, *Allocasuarina nana*, *Banksia ericifolia*, *Epacris microphylla*; open-forest e.g. with *Eucalyptus sieberi*, *E. macrorhyncha*.

Substrate: Shallow sandy soil on sandstone, low nutrients.

Exposure: Full sun to light shade.

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP.

Tetratheca rupicola**TREMANDRACEAE****Life history**

Growth form: Compact or diffuse shrub 20–40 cm high, with small leaves in whorls. Superficially similar to *T. ericifolia*, *T. neglecta*, and *T. rubioides* (Harden 1992).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, mainly September–December, peak October–November.

Fruit/seed: Capsule 5–7 mm long; brown seeds 4 mm long, with an appendage, November–December.

Dispersal, establishment & growth:

Fire response: Resprouts from woody rootstock (Herb. note).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT.

Distribution Sydney area: Blue Mountains.

Select locations: CC: Berambing, Springwood, Nepean Dam. CT: Bungleboori Creek, Mt Wilson, Blackheath, , Katoomba, Wentworth Falls.

Habitat

Habitat: Ridges, plateaus.

Altitude: 200–1000 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *E. sieberi*, *E. sclerophylla*, *Corymbia gummifera*, *Eucalyptus radiata*; heath e.g. with *Eucalyptus stricta*, *Lambertia formosa*.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Blue Mountains NP.

Tetratheca shiressii**TREMANDRACEAE****Life history**

Growth form: Undershrub 30–75 cm high, with opposite linear leaves on glabrous branches and broader, whorled leaves on hairy branches; multiple stems arising from woody base.

Vegetative spread:

Longevity:

Primary juvenile period: 3–4 years (Benson 1985).

Flowers: Deep lilac-pink, mainly July–October, peak August–September.

Fruit/seed: Capsule 7 mm long; seeds not seen.

Dispersal, establishment & growth: Food body ant-adapted for dispersal (Westoby et al. 1990).

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Gosford area, Port Hacking to Bulli.

Select locations: CC: Mangrove Mountain, Wondabyne, Kariong, Port Hacking, Waterfall, Wattamolla, O'Hares Creek, Helensburgh, Bulli Pass.

Habitat

Habitat: Rocky, sandy or swampy sites.

Altitude: 0–300 m

Annual rainfall: 1200–1600 mm

Typical local abundance: Frequent.

Vegetation: Heath e.g. with *Angophora hispida*, *Banksia ericifolia*, *Eucalyptus camfieldii*, *E. luehmanniana*; open-forest e.g. with *Eucalyptus capitellata*, *E. sieberi*, *Angophora costata*, *Corymbia gummifera*.

Substrate: Sandy soil on Hawkesbury sandstone, low nutrients.

Exposure: Full sun to light shade.

Conservation

Conservation: Local endemic species, conservation status unknown. Reported in Brisbane Water NP, Royal NP.

Tetradthea thymifolia**TREMANDRACEAE****Life history**

Growth form: Erect straggling shrub 20–100 cm high, with whorled leaves; stems with bristly ridges. Hybridizes with *T. rubioides* (Harden 1992).

Vegetative spread: Stoloniferous and suckering (Herb. specimen) possibly allowing spread.

Longevity:

Primary juvenile period:

Flowers: Deep lilac-pink, August–December, peak September–November.

Fruit/seed: Capsule 4–6 mm long; brown seeds 3 mm long, with an appendage.

Dispersal, establishment & growth: Diaspore: seed, soil-stored seedbank (Fox 1988).

Fire response: Probably killed — seedlings reported at Brisbane Water (Benson 1985). Killed by fire at Myall Lakes (Fox 1988). Probably resprouts at Kurrajong heights, Mittagong (Herb. specimen). May flower within two years of fire.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST; Qld, Vic.

Distribution Sydney area: Hornsby Plateau and Blue Mountains.

Select locations: CC: Putty, Mt White, Colo Heights, Bilpin, Kurrajong Heights, Galston, Asquith, Wahroonga, Duffys Forest, Narrabeen, Botany Bay, Picton, Thirlmere, Colo Vale, Jamberoo, Berry, Kangaroo Valley, Cambewarra. CT: Mt Wilson, Wombeyan Caves, Bowral, Moss Vale, Belmore Falls, Bundanoon, Wingello.

Habitat

Habitat: Hillslopes, rocky outcrops.

Altitude: 0–1000 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Angophora costata*, *Corymbia gummifera*, *Eucalyptus blaxlandii*, *E. piperita*, *Corymbia eximia*, *Eucalyptus punctata*; heath e.g. with *Angophora hispida*.

Substrate: Sandy soils on sandstones, possibly clay influenced at (Deep Creek).

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NP, Ku-ring-gai Chase NP, Garigal NP.

Tropaeolum majus* **TROPAEOLACEAE**

Nasturtium

Life history

Growth form: Herb with more or less succulent branches to 50 cm long and circular leaves.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Red, yellow and orange, spring–autumn. Honeybees visiting flowers (P. Kubiak pers. comm.) may be involved in pollination.

Fruit/seed: Comprised of 3 nutlets 10 mm long.

Dispersal, establishment & growth: Attractive fleshy edible fruits or seeds dispersed by animals; gravity or water (Anon 1991).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America. Introduced as ornamental.

Botanical subregions: CC; S.A.

Distribution Sydney area: Suburban areas.

Select locations: CC: Northbridge (1965), Curl Curl, Manly, La Perouse, Audley (1975).

Habitat: Roadsides, moist gullies. Altitude: 0–100 m Annual rainfall: 1200–1400 mm Typical local abundance: Frequent–occasional. Vegetation: Disturbed sites. Substrate: Sandy soils on sandstone, alluvium, medium nutrients. Exposure:	Habitat
Conservation: Widely cultivated, minor localised weed in coastal suburbs.	Conservation

***Celtis occidentalis* ***

ULMACEAE

Hackberry

Life history

Growth form: Medium-sized deciduous tree, generally 6–10 m high, leaf margins coarsely toothed, upper surface of leaves scabrous.
Vegetative spread: No.
Longevity:
Primary juvenile period:
Flowers: Clustered, unisexual and/or bisexual.
Fruit/seed: Round fleshy fruit 10 mm diam., purple or nearly black.
Dispersal, establishment & growth: Diaspore: fleshy fruit probably bird-dispersed.
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Exotic, native to North America. Introduced as ornamental.
Botanical subregions: NC CC; Qld.
Distribution Sydney area: Nepean River.
Select locations: CC: Cobbitty, Mount Annan, Camden (1947), Razorback.

Habitat

Habitat: Riverbanks, floodplains.
Altitude: 0–100 m **Annual rainfall:** 700–800 mm
Typical local abundance: Frequent.
Vegetation: Weedy sites e.g. with *Ligustrum*, *Gleditsia*, *Olea europea* subsp. *africana*.
Substrate: Sandy loam on alluvium, shale, medium nutrients.
Exposure:

Conservation

Conservation: Probably originated from cultivation in Camden area. Now naturalised along Nepean River, Camden–Cobbitty floodplain and Penrith, Richmond–Windsor floodplain (Benson & Howell 1993). Also spreading in Cumberland Plain Woodland remnants on shale hills in Camden area.

Celtis paniculata

ULMACEAE

Native Celtis

Life history**Growth form:** Small to medium evergreen tree to 10 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Clustered, with male and female flowers in separate inflorescences.**Fruit/seed:** Black egg-shaped fleshy fruit 10 mm diam., August–March. Fruit with one seed 5 mm diam. (Floyd 1989).**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Chrysomelid beetle *Menippus fugitivus* (listed as Endangered, TSC Act) appears to be dependent on this foodplant at Grays Point Reserve, Sutherland (NSW *Threatened Species Conservation Act 1995*). Food plant of butterfly larvae *Polyura pyrrhus sempronius* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld, Malesia, Pac Is.**Distribution Sydney area:** Coastline, sporadic.**Select locations:** CC: Narrabeen, Grays Point, Port Hacking, Bass Point, Shellharbour.**Habitat****Habitat:** Coastal sand.**Altitude:** 0–50 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Littoral rainforest e.g. with *Elaeodendron*, *Bauerella*, *Ficus obliqua*.**Substrate:** Sands or sandy soils over basalt.**Exposure:****Conservation****Conservation:** Rare plant in remnant of the Endangered Ecological Community Sutherland Shire Littoral Rainforest (TSC Act 1995) at Grays Point Reserve, with a population of 10–15 trees. Only other recent records are from Bass Point.***Trema aspera***

ULMACEAE

Native Peach, Poison Peach

Life history**Growth form:** Shrub or small tree, with hairy young branches.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Small, greenish, November.**Fruit/seed:** Fleshy fruit 4 mm diam., shiny black, matures January–June. Some green and black fruit all year (L. Parkinson pers. comm.).**Dispersal, establishment & growth:** Diaspore: drupe, bird-dispersed e.g. Currawongs (Wallace 1997). Soil-stored seedbank (Floyd 1966). Coloniser. Grew from seedling to 3–4 m high in 3 years (at Beecroft).**Fire response:** Killed by high-intensity fire, recruits from soil-stored seed. Frequent seedlings after high-intensity fire at Katandra Bushland Sanctuary 1994 (L.McD.).**Interaction with other organisms:** Fruit eaten by Brown Cuckoo-dove, Figbird, Lewins Honeyeater, Olive-backed Oriole (Floyd 1989), Brown Pigeon, King Parrot at Stanwell Park (T. Auld pers. comm.). Recorded as being toxic to stock but is not usually eaten except in dry periods. Larvae of moth *Aenetus splendens* on plant (Common 1990).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS NWP; Vic., Qld, N.T.**Distribution Sydney area:** Widespread.**Select locations:** CC: Ourimbah, Mooney Mooney, Grose Vale, Dennistone, Narrabeen, Kogarah, Nortons Basin, Elderslie, Razorback, Mt Ousley, Minnamurra Falls. CT: Mt Armour, Meryla Pass.

	Habitat
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Habitat: Levee banks.	
Altitude: 0–600 m	Annual rainfall: 700–1400 mm
Typical local abundance: Occasional–frequent.	
Vegetation: Moist open-forest and open rocky areas e.g. with <i>Eucalyptus saligna</i> , <i>E. paniculata</i> in regrowth and margins of rainforest. Rainforest regrowth, along tracks (Floyd 1989).	
Substrate: Soils from shale, slates, volcanic necks, medium nutrients, well-drained.	
Exposure: Sheltered.	
	Conservation
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Conservation: Conservation status unknown. Reported in Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP.	

Australina pusilla

URTICACEAE

	Life history
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Growth form: Perennial herb.	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: Separate male and female flowers on the same plant, October–January.	
Fruit/seed:	
Dispersal, establishment & growth:	
Fire response:	
Interaction with other organisms:	
	Distribution
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Status/origin: Native.	
Botanical subregions: NC CC SC NT CT ST; Qld, Vic., Tas.	
Distribution Sydney area: Mainly Illawarra and Southern Highlands.	
Select locations: CC: Mt Keira, Kangaroo Valley. CT: Kanangra, Robertson, Belmore Falls.	
	Habitat
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Habitat: Moist, rocks near waterfalls.	
Altitude: 0–1000 m	Annual rainfall: 1100–1600 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Moist forest.	
Substrate: Moist rocks, sandstone.	
Exposure: Mid shade to full shade.	
	Conservation
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Conservation: Regionally rare in Illawarra region (Mills 1988). Reported in Robertson NR.	

Dendrocnide excelsa

URTICACEAE

Giant Stinging Tree

Life history

Growth form: Tree to 40 m high with fluted trunks, with stinging hairs that cause an intense persistent sting, on the leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Small, in unisexual inflorescences, summer. Male and female flowers on separate plants (Harden 1990).

Fruit/seed: Dry fruit 2 mm long, whitish, pink to purplish, with fleshy stalk, April–September.

Dispersal, establishment & growth: Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Common in disturbed areas where it may establish quickly.

Fire response:

Interaction with other organisms: Fruit eaten by Green Catbird and Regent Bowerbird; leaves often riddled with holes from feeding of chrysomelid beetle *Hoplostines viridipennis*; Known to cause immediate, very painful rash and swelling due to plant chemicals (Bass 1987) so although the fruit is edible, the stinging hairs make this inadvisable for humans (Floyd 1989).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT NWS CWS; Qld.

Distribution Sydney area: Widespread.

Select locations: CC: Calga, Barrenjoey, Royal NP, Albion Park, Minnamurra Falls, Kanangra Walls.

Habitat

Habitat: Disturbed areas.

Altitude: 0–500 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Dry subtropical rainforest e.g. with *Streblus brunonianus*, *Elaeocarpus kirtonii*, *Brachychiton acerifolius*, *Cassine australis*.

Substrate: Clay soils on basalt, shale, medium to high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Elatostema reticulatum* var. *reticulatum

URTICACEAE

Life history**Growth form:** Coarse straggling herb to 50 cm high, with succulent stems occasionally setting roots.**Vegetative spread:** Localised, suckering spread.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Very small, white or yellowish flowers in dense heads, male and female flowers separate, September–March, peak January–February.**Fruit/seed:****Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld.**Distribution Sydney area:** Illawarra and Southern Highlands.**Select locations:** CC: Macquarie Pass, Yellow Rock, Saddleback Mountain, Bellawongarah, Cambewarra Mountain. CT: Moss Vale, Carrington Falls, Fitzroy Falls, Belmore Falls.

Habitat**Habitat:** Along streams or on moist, shaded rock faces below waterfalls.**Altitude:** 0–500 m**Annual rainfall:** 900–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Rainforest e.g. with *Ceratopetalum apetalum*, *Streblus brunonianus*, *Callicoma serratifolia*, *Tristaniopsis laurina*.**Substrate:** Moist rock faces e.g. on sandstone, basalt.**Exposure:** Sheltered.

Conservation**Conservation:** Conservation status unknown. Reported Macquarie Pass NP.

Parietaria debilis

URTICACEAE

Native Pellitory

Life history**Growth form:** Weak herb to 30 cm high.**Vegetative spread:****Longevity:** Less than one year.**Primary juvenile period:** Less than one year.**Flowers:** Tiny bisexual and unisexual flowers on the same plant. Few flowers and low pollen density (Bass & Bass 1990).**Fruit/seed:** Dry, indehiscent, 1-seeded fruit (achene).**Dispersal, establishment & growth:** Diaspore: fruit**Fire response:****Interaction with other organisms:** Not known to cause allergic reactions in Australia (Bass & Bass 1990).**Distribution****Status/origin:** Native.**Botanical subregions:** CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., N.T., S.A., W.A., trop**Distribution Sydney area:** Razorback, Orange areas.**Select locations:** CC: Razorback Mountain, Douglas Park. CT: Junction Reefs.**Habitat****Habitat:** Shady clefts in rocky cliffs, under overhangs.**Altitude:** 0–600 m**Annual rainfall:** 700–800 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Associated with *Casuarina cunninghamiana* along river edges.**Substrate:** Rocky clefts on calcareous sandstone, slaty metamorphics, well-drained.**Exposure:****Conservation****Conservation:** Rare, likely to be inadequately conserved in area, last reported at Razorback in 1969.***Parietaria judaica* ***

URTICACEAE

Pellitory

Life history**Growth form:** Perennial herb with reddish, wiry stems to 40 cm long, with fine irritant hairs on both sides of leaves. Underground root system is extensive and becomes woody with age (Trounce 1990).**Vegetative spread:** Roots from buried nodes (Parsons & Cuthbertson 1992, Bass & Bass 1990).**Longevity:** Perennial.**Primary juvenile period:****Flowers:** Tiny, numerous. Flowers throughout the year with main pollen peak September–December with secondary lower peak in February; masses of pollen released by explosive dehiscence of anthers (Bass 1987), predominantly in morning, closely related to fluctuations in temperature and humidity (Bass & Bass 1990).**Fruit/seed:** Small, black seed. Large soil-stored seedbank, one square metre of plants produces 250 000 seeds; 90 000 seeds/m² in dense shade (Bass & Bass 1990).**Dispersal, establishment & growth:** Diaspore: seed, water and wind-dispersed, plant fragments with flowerheads carrying seeds stick to clothing and animals, dispersed in soil on machinery, footwear and in turf; vegetative spread from root fragments (Trounce 1990).

Disturbance stimulates mass germination (Blood 2001). Germination over wide range of temperatures (4–35°C) optimum 21°C, more than 60% germination at 10°C–27°C, germination more than 75% at 20°C ± 0/5°C in light and dark (Bass & Bass 1990). Seeds germinate 10°C–27°C, optimum 21°C; major growth period from mid-winter until following autumn (Parsons & Cuthbertson 1992, 2001). Very little seed dormancy at 20°C so despite the high seed production, it can be eradicated within 3 months; rapidly re-colonises areas of bare soil after removal and there may be massive regeneration from woody rootstock after application of herbicide (Trounce 1990).

Fire response:

Interaction with other organisms: Known to cause immediate, very painful rash and swelling due to plant chemicals; people have developed asthma for the first time due to exposure to pollen after pulling out the plant — most exposure is to plants growing near homes (Bass 1987), pollen causes allergic rhinitis, asthma, conjunctivitis (Trounce 1990). Protect face and wear protective clothing when removing this weed.

Distribution

Status/origin: Exotic. First sighted at Woolloomooloo 1901, the seed probably arrived in shipload of Italian marble, colonised at North Sydney, spread quickly (Bass 1990).

Botanical subregions: CC NWS; Vic., S.A., W.A.

Distribution Sydney area: Palm Beach to Otford and west to Nepean River (Trounce 1990).

Select locations: CC: Mona Vale (L.McD.), Harbord, Lane Cove, Woolloomooloo, Paddington, Tamarama, Balmain, Dawes Point, Meadowbank, Mt Druitt.

Habitat

Habitat: Waste areas and crevices of stone walls and footpaths, rocky foreshores; flourishes in a Mediterranean-type climate (Trounce 1990).

Altitude: 0–200 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–dominant.

Vegetation:

Substrate: Disturbed ground on sandstone and shale.

Exposure: Full sun to dense shade. Tolerant of frost, extremely tolerant of desiccation (Blood 2001).

Conservation

Conservation: Restricted to inner Sydney suburbs before 1980 but now much more widespread. Spread through soil disturbance in urban development e.g. recent spread (since 1983) at Taronga Zoo after soil disturbance during upgrading (Bass 1987). Common in Sydney gardens, roadsides, wall crevices, and footpaths. Invades urban bushland (Trounce 1990). Declared noxious weed.

Pilea microphylla* **URTICACEAE**

Artillery Plant

Life history

Growth form: Herb to 30 cm high, without stinging hairs.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Very small, December.

Fruit/seed:

Dispersal, establishment & growth: Soil-stored seedbank (Fox 1988).

Fire response: Killed by fire (Fox 1988).

Interaction with other organisms:**Distribution**

Status/origin: Exotic, native to tropical America.

Botanical subregions: CC; Qld.

Distribution Sydney area: Sporadic.

Select locations: CC: Kulnura, Swansea (1940).

Habitat**Habitat:**

Altitude: 0–100 m **Annual rainfall:** 1100–1200 mm

Typical local abundance:

Vegetation:**Substrate:****Exposure:****Conservation**

Conservation: Sometimes localised, reported naturalised around Lake Macquarie (Harden 1990).

***Soleirolia soleirolii* ***

URTICACEAE

Corsican Carpet, Baby's Tears

Life history

Growth form: Slender creeping herb with more or less succulent stems, rooting at the nodes and forming dense mats; leaves small and roundish.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Very small; separate male and female flowers on same plant, October.

Fruit/seed: Dry fruit.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to W Mediterranean area, Corsica, Sardinia and Balearic Is.

Botanical subregions: CC; Vic., S.A.

Distribution Sydney area: Sydney suburbs, localised.

Select locations: CC: Narrabeen (1984), Cremorne (1956).

Habitat

Habitat: Shady gullies.

Altitude: 0–100 m

Annual rainfall: 1200–1400 mm

Typical local abundance:

Vegetation: Moist gully vegetation e.g. with *Acmena smithii*, *Callicoma serratifolia*, *Ceratopetalum apetalum*.

Substrate: Sandy alluvial soil.

Exposure:

Conservation

Conservation: Not widely naturalised. Potential to spread unknown.

***Urtica dioica* ***

URTICACEAE

Stinging Nettle, Giant Nettle

Life history

Growth form: Perennial herb 30–150 cm high, with stinging hairs; rhizome woody, much-branched (Ciba-Geigy 1968–).

Vegetative spread: Rhizomatous, tendency to form dense clumps (Ciba-Geigy 1968–).

Longevity:

Primary juvenile period:

Flowers: Small, green or white, unisexual.

Fruit/seed: Dry fruit. Dispersed long distance by water, animals, birds and man — short distance spread by wind (Ciba-Geigy 1968–).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Sometimes consumed as a spinach-like vegetable, used for preparation of hair lotion (Ciba-Geigy 1968–).

Distribution

Status/origin: Exotic, native of Mediterranean and America.

Botanical subregions: CC.

Distribution Sydney area: Sporadic.

Select locations: CC: Waterloo (1912).

Habitat

Habitat:

Altitude: 0–50 m

Annual rainfall: 1200 mm

Typical local abundance:

Vegetation:

Substrate: Very fertile soils rich in humus, nitrogen and moisture indicator (Ciba-Geigy 1968–).

Exposure:

Conservation

Conservation: Known only from one old collection, Waterloo (1912).

Urtica incisa

URTICACEAE

Stinging Nettle, Scrub Nettle

Life history

Growth form: Perennial herb to 100 cm high, erect or trailing, roots at nodes, leaves covered with stinging hairs, dioecious.

Vegetative spread: Capable of vegetative spread up to 1 m. (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Small, green or white, separate male and female flowers on the same plant, at any time of year, peak September–October.

Fruit/seed: Dry, indehiscent.

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995).

Fire response: Stems killed, resprouts from roots.

Interaction with other organisms: Foodplant of butterfly larvae *Vanessa itea*, the larvae feed at night (Common & Waterhouse 1981). Beetle *Hoplostines viridipennis* mates and feeds on the leaves, seen during summer (Hawkeswood 1987). Known to cause immediate, very painful rash and swelling due to plant chemicals (Bass 1987). Aboriginal people reportedly boiled scrub nettles to make poultices (Low 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., NZ, N Cal.

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Grose Vale, Wahroonga, Kogarah, Ingleburn, Bents Basin, Razorback, Mt Kembla, Albion Park, Berry. CT: Rylstone, Wattle Flat, Capertee, Newnes, Glen Davis, Mt Wilson, Edith, Jenolan Caves, Mt Jellore, Robertson, Bundanoon.

Habitat

Habitat: Creeks, mountain gullies, stock camps, waste places.

Altitude: 0–1000 m

Annual rainfall: 700–1800 mm

Typical local abundance: Frequent.

Vegetation: Rainforest e.g. with *Doryphora sassafras*; dry rainforest e.g. with *Aphitonia excelsa*, *Brachychiton populifolius*; woodland e.g. with *Eucalyptus blakelyi*, *E. tereticornis*; riparian forest e.g. with *Eucalyptus benthamii*, *Leptospermum* sp.

Substrate: Soils on basalt and alluvium, slates, shales, high nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Robertson NR.

***Urtica urens* ***

URTICACEAE

Small Nettle

Life history**Growth form:** Herb to 60 cm high, with stinging hairs on stems and leaves.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Separate male and female flowers on same plant at any time of year.**Fruit/seed:** Dry, indehiscent.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Foodplant of butterfly caterpillar *Vanessa itea* (Coupar & Coupar 1992), the larvae feed at night (Common & Waterhouse 1981). Foodplant of Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990). Known to cause immediate, very painful rash and swelling due to plant chemicals (Bass 1987). Leaves and young stems used as a vegetable after boiling for a few minutes to remove formic acid (Binden 1996).**Distribution****Status/origin:** Exotic, native to Europe. Reported by Robert Brown to be introduced to Sydney by 1804 (Maiden 1909).**Botanical subregions:** NC CC SC ST NWS CWS NWP SWP; LHI, Qld, Vic., Tas., N.T., S.A., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Cheltenham, Woolloomooloo Bay (1902), Vaucluse, Llandilo, Glenfield, Albion Park. CT: Moss Vale.**Habitat****Habitat:** Weedy areas, sheep pens, septic drains.**Altitude:** 0–600 m **Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Weedy areas.**Substrate:** Locally moist sites on clay soils.**Exposure:****Conservation****Conservation:** Widespread relatively uncommon weed, not invasive of bushland.***Centranthus ruber* subsp. *ruber* ***

VALERIANACEAE

Red Valerian, Kiss-me-Quick

Life history**Growth form:** Perennial herb to 70 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pink to rose-red, rarely white, mainly August–December.**Fruit/seed:** Dry, indehiscent.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and W Asia. Introduced as ornamental.**Botanical subregions:** CC CT ST NWS; LHI, Qld, Vic., Tas., N.T., S.A., W.A.**Distribution Sydney area:** Widespread but sporadic.**Select locations:** CC: Lidcombe (1964). CT: Sofala, Blackheath, Jenolan Caves (1978).**Habitat****Habitat:** Rockfaces, embankments, retaining walls.**Altitude:** 0–1000 m **Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Rockfaces, sandstone, metamorphics.**Exposure:****Conservation****Conservation:** Cultivated and sometimes naturalised locally. Dense patches (up to 1000 plants) may form over 10 years (Herb. record).

Clerodendrum tomentosum**VERBENACEAE****Life history**

Growth form: Shrub or small tree 1–10 m high, usually velvety.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, October–December, peak November. Pollination both automatic and open (Adam & Williams 2001). Butterfly visiting flowers (P. Kubiak pers. comm.) may be a pollinator.

Fruit/seed: Succulent, black fruit (drupe), 8–10 mm long, seated in an enlarged red fleshy calyx, mature January–February. Seeds 4750 per kilogram (Floyd 1989).

Dispersal, establishment & growth: Diaspore: fleshy fruit, vertebrate-adapted dispersal (Westoby et al. 1990). Germination from fresh seed (Floyd 1989).

Fire response: Stems killed, resprouts from base.

Interaction with other organisms: Fruit eaten by Satin Bowerbird (Floyd 1989).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT CWS; Qld, W.A.

Distribution Sydney area: Coast and western Sydney.

Select locations: CC: Mangrove Creek, Avalon, Eastwood, Newington, Cronulla, Penrith, Liverpool, Burragorang, Berry. CT: Bilpin, Murdering Gully.

Habitat

Habitat: Creek banks.

Altitude: 0–700 m

Annual rainfall: above 700 mm

Typical local abundance: Rare–occasional.

Vegetation: Wet eucalypt forest e.g. with *Eucalyptus saligna*, but often persisting in cleared places; also dry ‘rainforest-type’ scrub e.g. Razorback.

Substrate: Alluvial soils, clay soils from shale, basalt, volcanic necks, medium nutrient soils.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Blue Mountains NP, Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP.

Gmelina leichhardtii

VERBENACEAE

White Beech

Life history**Growth form:** Tree to 30 m high, often semi-deciduous**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Creamy white with yellow and purple markings, November–January.**Fruit/seed:** Succulent, 15–20 mm diam., bluish purple when ripe. Fruit 148 per kilogram, mature February–May (Floyd 1989).**Dispersal, establishment & growth:** Germination very slow e.g. 37% after 5 months, facilitated by removal of flesh then soaking seed for 2 months before drying in sun for 1 day, followed by further soaking before sowing (Floyd 1989).**Fire response:****Interaction with other organisms:** Fruit eaten by Topknot Pidgeon and Wompoo Fruit-dove (Floyd 1989).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Wyong, Illawarra.**Select locations:** CC: Yarramalong, Wheeny Creek, Broughton Mill Creek, Minnamurra Falls.**Habitat****Habitat:** Rainforest.**Altitude:** 0–300 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Rainforest**Substrate:** Clay soils on basalt, shale, high nutrients.**Exposure:****Conservation****Conservation:** Regionally rare in Illawarra region (Mills 1988), last collected in Wyong area in 1916.***Lantana camara* ***

VERBENACEAE

Lantana

Life history**Growth form:** Aromatic shrub to 3 m high, with long weak branches and 4-angled stems with numerous prickles and robust rootstock.**Vegetative spread:** Sprawling stems root at nodes (L.McD.), new canes produced on the crown and from lateral roots in early spring, roots sucker if damaged or broken (Parsons & Cuthbertson 1992).**Longevity:****Primary juvenile period:****Flowers:** White, yellow, orange, red or pink in various combinations, in heads, at any time of year. Probably pollinated by butterflies, honeybees, and large native bees, with flies playing a minor role (P. Kubiak pers. comm.).**Fruit/seed:** Black, fleshy, 5 mm diam., with one black seed (Buchanan 1989). Fruit in clusters of 1–20 (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: fruit, vertebrate-adapted for dispersal (Westoby et al. 1990). Dispersed by Pied Currawong *Strepera graculina*, with maximum number of seed per pellet 131, average 42 (Buchanan 1989), Seeds germinate at any time of year if there is sufficient moisture, growth is slow at first as rootstock and laterals are established, then stems of adjacent plants intertwine forming thickets; germination of *Lantana* seeds inhibited by leachates from Crofton weed (Parsons & Cuthbertson 1992).**Fire response:** Resprouts.**Interaction with other organisms:** Rainbow Lorikeet *Tricholossus haematodus* feeds on berries (Barker & Vestjens 1989). Fruit eaten by Crimson Rosella *Platycercus elegans*, Red-whiskered Bulbul *Pycnonotus jocosus*; shoots eaten by rabbits (P. Kubiak pers. comm.). Host plant of Cerambycid beetles *Ceresium australe*, *Phlyctaenodes pustulatus* (Hawkeswood 1993).

Provides sheltered habitat for Paralysis Tick *Ixodes holocyclus* (B. Conroy pers. comm.). Larvae of moth *Epinotia lantana* feed on flowers and developing fruit; it was introduced to Australia from Mexico in 1914 to assist control of *Lantana* (Common 1990). Allelopathic substances increase competitive ability with native species (Cronk & Fuller 1995), leachates from all parts of the plants known to inhibit germination and growth of other plants and organisms including human cholera pathogen *Vibrio cholerae*; toxic to sheep and cattle, causing photosensitisation and other symptoms leading to death (Parsons & Cuthbertson 1992).

Distribution

Status/origin: Exotic, native to tropical S America. Grown by Macarthur at Camden Park in 1843 (Parsons & Cuthbertson 1992), introduced as a hedge plant.

Botanical subregions: NC CC SC; LHI, Qld., N.T.

Distribution Sydney area: Widespread at lower elevations.

Select locations: CC: Gosford, Lion Is (L.McD.), Barrenjoey, Brooklyn, Kurmond, Cheltenham, Woolloomooloo Bay, Oatley, Casula, La Perouse, The Oaks, Cobbitty, Albion Park, Bass Point, Berry, Bomaderry.

Habitat

Habitat: Gullies, ridges, disturbed areas.

Altitude: 0–300 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent.

Vegetation: Disturbed and undisturbed forests, *Casuarina* woodland, coastal scrub and heath.

Substrate: Sandy soils on sand dunes, sandstone, clay soil on shale, alluvium, low to medium nutrients, well-drained.

Exposure:

Conservation

Conservation: Established weed since 1902. Declared noxious weed in 50 council areas (Parsons & Cuthbertson 2001).

Lantana montevidensis* **VERBENACEAE**

Creeping Lantana

Life history

Growth form: Decumbent shrub less than 30 cm high, often forming low, dense thickets.

Vegetative spread: Trailing stems may root at nodes (Parsons & Cuthbertson 2001).

Longevity:

Primary juvenile period:

Flowers: Purplish, at any time of year.

Fruit/seed: Reddish brown, fleshy berry, 8 mm diam., seeds 4 mm long (Parsons & Cuthbertson 2001).

Dispersal, establishment & growth: Diaspore: fruit, dispersed by fruit-eating animals and birds, also water-dispersed during heavy rain and in mud; seeds germinate at any time of year, when moisture is available, growth rate is slow until rootstock is established (Parsons & Cuthbertson 2001). Fruiting rarely reported in Sydney area.

Fire response:

Interaction with other organisms: Toxic to cattle (Everist 1974).

Distribution

Status/origin: Exotic, native to Uruguay and southern Brazil, introduced as ornamental (Parsons & Cuthbertson 2001).

Botanical subregions: NC CC NWS; Qld.

Distribution Sydney area: Mainly Sydney suburbs.

Select locations: CC: Northbridge (1967), Concord (1952), Garden Island Naval Depot, Penrith (1964), Casula.

Habitat

Habitat: Wasteland, rocky areas.

Altitude: 0–50 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional.

Vegetation: Eucalypt woodland.

Substrate: Sandy soils on sandstone, shale, low nutrients.

Exposure: Full sun.

Conservation

Conservation: Cultivated in gardens and landscaping, occasionally naturalised locally.

Oncinocalyx betchei

VERBENACEAE

Life history

Growth form: Perennial herb, with numerous erect branches arising near the base of the plant.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, mainly summer.

Fruit/seed: Dry, separating into 4 segments.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CT NWS CWS; Qld.

Distribution Sydney area:

Select locations: CT: Hargraves.

Habitat

Habitat: Disturbed sites.

Altitude: 800 m

Annual rainfall: 700 mm

Typical local abundance: Occasional.

Vegetation: Woodland.

Substrate:

Exposure:

Conservation

Conservation: Rare in the area, only known from one collection in 1961.

***Phyla nodiflora* ***

VERBENACEAE

Lippia, Carpet Weed

Life history

Growth form: Perennial herb 30–90 cm long, with trailing or ascending stems, often rooting at nodes.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Purple or pink to white, mainly October–April.

Fruit/seed: Small, dry, 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic.

Botanical subregions: NC CC CWS NWP SWP SFWP; Qld, S.A., N.T., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Tuggerah Lakes (1900), Richmond (1910), Flemington (1969), Kurnell (1906).

Habitat

Habitat: Moist or wet areas.

Altitude: 0–200 m

Annual rainfall: 800–1200 mm

Typical local abundance:

Vegetation:

Substrate: Variable, sandy and clay soils.

Exposure:

Conservation

Conservation: Not common, last recorded in 1969 at Flemington and now probably extinct there.

Verbena bonariensis* **VERBENACEAE**

Purpletop

Life history**Growth form:** Perennial herb 0.6–2 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Blue, dark violet-purple or lavender-pink, mainly October–June, peaks March, October. Probably pollinated by honeybees, native bees and butterflies (P. Kubiak pers. comm.).**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit. No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).**Fire response:** Resprouts from rootstock (at Shellharbour).**Interaction with other organisms:** Food plant of butterfly larvae *Junonia villida calybe* (Common & Waterhouse 1981). Heavily cropped by rabbits (P. Kubiak pers. comm.). Suspected of causing illness, death and abortion in cattle (Everist 1974).**Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Maraylya, Hornsby, Cheltenham, Gladesville, Port Jackson (1881), La Perouse, Heathcote, Liverpool, Campbelltown, Menangle, Bargo, Jamberoo Mountain. CT: Wentworth Falls, Paddys River.**Habitat****Habitat:** Wasteland and cultivated areas, roadsides, creeks, swamp margins.**Altitude:** 0–1000 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Grassland, woodland e.g. with *Eucalyptus tereticornis*, *E. moluccana*, *E. crebra*, *E. longifolia*.**Substrate:** Clay soils and on shale, basalt, alluvium, medium to high nutrients. Recorded on saline sites in western NSW (Semple 1993).**Exposure:** Full sun.**Conservation****Conservation:** Widespread weed of rural areas.

***Verbena caracasana* ***

VERBENACEAE

Life history

Growth form: Perennial herb, usually 1–1.5 m high, or to 2 or 3 m high, with toothed, lanceolate leaves and condensed rootstock (Michael 1997).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Lilac.

Fruit/seed: Dry, separating at maturity into 4, 1-seeded segments; produces abundant seed (Michael 1997).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Central and S America.

Botanical subregions: CC NT ST NWS NFWP;

Distribution Sydney area: Sydney area.

Select locations: CC: Maraylya, North Richmond, Cockle Creek, Epping, Flemington (1969), Liverpool (1968), Heathcote.

Habitat

Habitat: Along watercourses (Michael 1997), disturbed sites, paddocks.

Altitude: 0–100 m

Annual rainfall: 800–1200 mm

Typical local abundance:

Vegetation:

Substrate: Clay soils on shale.

Exposure:

Conservation

Conservation: Occasional weed of suburban and rural areas.

***Verbena gaudichaudii* ***

VERBENACEAE

Common Verbena

Life history

Growth form: Perennial herb 0.3–1 m high.

Vegetative spread: No.

Longevity: Up to 25 years (Herb. note).

Primary juvenile period:

Flowers: Pale pink or lilac, mainly October–January.

Fruit/seed: Dry, separating at maturity into 4, 1-seeded segments.

Dispersal, establishment & growth: Diaspore: a 1-seeded segment of the fruit.

Fire response:

Interaction with other organisms: Rev. Woolls, in 1867, noted its use as a tonic. Suspected of causing illness, death and abortion in cattle (Everist 1974).

Distribution

Status/origin: Exotic, native to Mediterranean region.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Wondabyne, Casula, Cobbitty, Mount Annan, Menangle, Thirlmere (1891); CT: Kanangra, Wombeyan Caves, Barbers Creek (1898).

Habitat

Habitat: Disturbed areas and wasteland, roadsides.

Altitude: 0–700 m

Annual rainfall: 700–1200 mm

Typical local abundance: Occasional.

Vegetation: Grassland e.g. with *Themeda australis*; dry rainforest.

Substrate: Clay soils on shale, basalt, medium to high nutrients.

Exposure:

Conservation

Conservation: Weed of rural areas.

***Verbena hispida* ***

VERBENACEAE

Rough Verbena

Life history**Growth form:** Spreading or decumbent perennial herb 0.4–1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Purple, at any time of year.**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC NWS CWS NWP SWP SFWP.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Wisemans Ferry (1969), Pennant Hills, Emu Plains (1912), Flemington Saleyards (1969).**Habitat****Habitat:** Disturbed areas.**Altitude:** 0–200 m**Annual rainfall:** 700–1200 mm**Typical local abundance:****Vegetation:** Rainforest gully e.g. with *Livistona australis*.**Substrate:****Exposure:****Conservation****Conservation:** Occasional weed of disturbed sites.***Verbena incompta* sp. nov. ***

VERBENACEAE

Life history**Growth form:** Erect perennial herb 0.5–1.5 m high, with 4-angled stems and prominent long hairs; similar to *V. bonariensis* but with smaller flowers arranged in a circle below the top of the spikes (Michael 1995).**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Blue to reddish-purple.**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments, each 1.5 mm long.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, probably native to S America.**Botanical subregions:** NC CC SC NT CT ST SWP; LHI, Qld, S.A., N.T., Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Somersby, Lower Portland, Windsor, Hornsby, Cheltenham, Prospect, Glenbrook, Government House (1902), Flemington, Heathcote, Kangaroo Valley, Berry (1925). CT: Capertee, Mount Tomah, Bullaburra, Woodstock, Robertson, Paddys River, Barrengarry.**Habitat****Habitat:** Moist, disturbed places, creeks, roadsides, drains, pastures.**Altitude:** 0–1000 m**Annual rainfall:** 700–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*, *Eucalyptus punctata*, *E. moluccana*.**Substrate:** Variable, clay soil on shale, diatremes, also on sands, sandstone.**Exposure:****Conservation****Conservation:** Widespread weed of disturbed sites.

***Verbena litoralis* ***

VERBENACEAE

Life history**Growth form:** Perennial herb to 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Blue to purple, at any time, peak March–May. Probably pollinated by honeybees, native bees, and to a lesser extent, butterflies (P. Kubiak pers. comm.).**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit.**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Exotic, native of S America.**Botanical subregions:** NC CC ST; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Dural, Hornsby, Pennant Hills, Epping, Northbridge, Mosman, Concord, Auburn, The Domain (1902), Cooks River (1912), Liverpool, La Perouse, Camden, Tahmoor.

Habitat**Habitat:** Walking tracks, roadsides, disturbed areas.**Altitude:** 0–300 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus saligna*, edge of mangroves.**Substrate:** Clay soils on shale, medium nutrients.**Exposure:**

Conservation**Conservation:** Widespread weed of disturbed sites.***Verbena quadrangularis* ***

VERBENACEAE

Life history**Growth form:** Perennial herb 1–2 m high, with erect 4-angled branches.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Blue to reddish-purple, January–April.**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Exotic, introduced from S America.**Botanical subregions:** NC CC NT CT ST NWS CWS SWS; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Pennant Hills, Cheltenham, Prestons, Camden (1972), Woronora River.

CT: Paddys River.

Habitat**Habitat:** Creekbanks.**Altitude:** 0–600 m**Annual rainfall:** 700–1400 mm**Typical local abundance:****Vegetation:****Substrate:** Clay soil on alluvium and shale, medium nutrients.**Exposure:**

Conservation**Conservation:** Relatively recently recorded weed.

***Verbena rigida* ***

VERBENACEAE

Veined Verbena

Life history**Growth form:** Perennial herb 0.2–0.5 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Reddish purple, pale lilac, or blue-violet, at any time of year, peaks March, October–December.**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit.**Fire response:****Interaction with other organisms:** Suspected of causing constipation and fever in cattle (Everist 1974).**Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC NT NWS SWS; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Eraring, Morisset, Woy Woy, Richmond (1910), Eastwood, Colyton, Mulgoa, Domain (1899), Mount Annan, Mt Kembla, Bass Point, Gerrington, Minnamurra Falls. CT: Carcoar.**Habitat****Habitat:** Wasteland, pastures.**Altitude:** 0–860 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Grassland e.g. with *Themeda australis*.**Substrate:** Clay soils on shale, alluvium, diatremes, medium nutrients.**Exposure:****Conservation****Conservation:** Weed of disturbed sites.***Verbena* × *brasiliensis* ***

VERBENACEAE

Life history**Growth form:** Perennial herb 1–2 m high, with coarsely toothed leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Purple, at any time of year.**Fruit/seed:** Dry, separating at maturity into 4, 1-seeded segments.**Dispersal, establishment & growth:** Diaspore: a 1-seeded segment of the fruit.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC.**Distribution Sydney area:** Northern Sydney suburbs.**Select locations:** CC: Newport (1994), Epping (1994), Gladesville (1995).**Habitat****Habitat:** Wasteland and cultivated areas.**Altitude:** 0–200 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:****Substrate:** Clay soils on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Occasional weed in suburban areas, only recently recorded.

Viburnum suspensum* **VIBURNACEAE *****Life history**

Growth form: Bushy shrub to 2 m high, with conspicuous lenticels appearing warty.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, sometimes tinged with pink, spring.

Fruit/seed: Red, fleshy 6–8 mm long, with one seed.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Japan. Introduced as ornamental.

Botanical subregions: CC.

Distribution Sydney area:

Select locations: CC: Middle Head (1974).

Habitat

Habitat:

Altitude: 0–100 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Occasional.

Vegetation: Headland scrubland.

Substrate: Sandy soil on sandstone.

Exposure:

Conservation

Conservation: Cultivated as an ornamental with one record, possibly naturalised near old gun emplacements at Middle Head.

Hybanthus monopetalus**VIOLACEAE**

Slender Violet-bush

Life history

Growth form: Perennial herb to 60 cm, with narrow

Vegetative spread: No (McIntyre et al. 1995).

Longevity:

Primary juvenile period:

Flowers: Blue-mauve, at any time, peak October–February. Probably pollinated by native bees and possibly small butterfly (P. Kubiak pers. comm.).

Fruit/seed: Thick-walled, distinctly 3-sided capsule (Bennett 1972) 3–6 mm long, with 3–6 pitted seeds, October–March.

Dispersal, establishment & growth: Diaspore: seed, with food body adapted for ant dispersal (Westoby et al. 1990). Soil-stored seedbank (Fox 1988).

Fire response: Killed by fire (Fox 1988).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS NWP SWP; Qld, Vic., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Culoul Range, Pearl Beach, Springwood, Kowmung, Ingleside, Bobbin Head, North Head, La Perouse, Auburn, Douglas Park, Oakdale. CT: Mt Coricudgy, Wallerawang, Clarence, Mt Tomah, Blackheath, Hill Top, Penrose, Fitzroy Falls.

Habitat

Habitat: Dry hillsides, ridges.

Altitude: 0–1000 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *E. sclerophylla*, *E. macrorhyncha*, *Angophora floribunda*, *Eucalyptus piperita*; woodland e.g. with *Corymbia eximia*, *Eucalyptus punctata*, *Corymbia gummifera*; heath e.g. with *Allocasuarina nana*, *Leptospermum trinervium*.

Substrate: Sandy soils on sandstone, granite, quartzite, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Lane Cove NP.

Hybanthus stellarioides

VIOLACEAE

Spade Flower

Life history

Growth form: Perennial herb or small shrub to 60 cm high, with stems and narrow leaves usually hairy.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, solitary, summer

Fruit/seed: Thick-walled, distinctly 3-sided capsule (Bennett 1972) 4–9 mm long, with 5–12 pitted seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically (Bennett 1972). Probably with ant-adapted food body for further dispersal.

Fire response:

Interaction with other organisms: Food plant of butterfly *Acraea andromacha andromacha* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Cumberland Plain.

Select locations: CC: Cattai, Prospect.

Habitat

Habitat: Dry rocky slopes or along creeks.

Altitude: 0–200 m

Annual rainfall: 700–900 mm

Typical local abundance: Rare.

Vegetation: Woodland e.g. with *Eucalyptus tereticornis*, *E. moluccana*, *Indigofera australis*.

Substrate: Clay soils on shale.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney, recorded from Cattai and Prospect, the southern geographical limit (James et al. 1999).

Hybanthus vernonii* subsp. *scaber

VIOLACEAE

Life history

Growth form: Perennial herb to 1 m high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Mauve, solitary, spring–summer.

Fruit/seed: Thick-walled, distinctly 3-sided capsule (Bennett 1972) 6–8 mm long, with 3–6 smooth seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed ballistically (Bennett 1972), probably with ant-adapted food body for further dispersal.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC SC CT.

Distribution Sydney area: Coast and ranges.

Select locations: CT: Bundanoon.

Habitat

Habitat:

Altitude: 600 m

Annual rainfall: 1100 mm

Typical local abundance:

Vegetation: Eucalypt open-forest.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown, only collection for Sydney area is Bundanoon in 1957.

Hybanthus vernonii* subsp. *vernonii

VIOLACEAE

Life history**Growth form:** Perennial herb to 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Mauve, solitary, July–February, peak September.**Fruit/seed:** Thick-walled, distinctly 3-sided capsule (Bennett 1972) 6–8 mm long, with 3–6 smooth seeds.**Dispersal, establishment & growth:** Diaspore: seed, dispersed ballistically (Bennett 1972), with ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Vic.**Distribution Sydney area:** Coastal ranges.**Select locations:** CC: Springwood, Boorai Ridge, East Kurrajong, Windsor, Berowra, Mona Vale, Frenchs Forest, Manly, Waterfall, Bomaderry.**Habitat****Habitat:****Altitude:** 0–500 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Heath to woodland e.g. with *Corymbia gummifera*, *C. eximia*, *Angophora costata*, *A. hispida*, *Boronia ledifolia*, *Lasiopetalum ferrugineum*, grasses.**Substrate:** Sandy soil mostly on Hawkesbury Sandstone, low nutrients.**Exposure:** Full sun to light shade.**Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Reported in Marramarra NP, Muogamarra NR, Garigal NP, Royal NP.***Hymenanthera dentata***

VIOLACEAE

Tree Violet

Life history**Growth form:** Rigid much branched shrub to 4 m high, often spinescent.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Pale yellow, August–October.**Fruit/seed:** Purplish, globose berry, 4–5 mm diam., matures December–April.**Dispersal, establishment & growth:** Diaspore: berry, adapted for dispersal by ingestion (McIntyre et al. 1995).**Fire response:** Stems killed, resprouts from base within 6 months.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS; Vic., Tas., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Cattai NP, Bents Basin, Razorback, Douglas Park, Wollongong, Albion Park, Macquarie Pass, Kangaroo Valley, Berry. CT: Mt Coricudgy, Jenolan Caves, Mount Tomah, Mt Colong, Robertson.

	Habitat
Habitat: Often along creeks, riverbanks, and rocky slopes.	
Altitude: 0–1000 m	Annual rainfall: 700–1600 mm
Typical local abundance: Frequent–occasional.	
Vegetation: Near rainforest e.g. with <i>Acacia melanoxylon</i> , or dry rainforest; floodplain forest e.g. with <i>Tristaniopsis laurina</i> , <i>Eucalyptus benthamii</i> , <i>E. elata</i> .	
Substrate: Clay soils on basalt, limestone, riverbanks with sandy alluvium, medium to high nutrient soils, well-drained. Possibly indicative of calcareous influence.	
Exposure: Light shade.	
	Conservation
Conservation: Widespread and probably adequately conserved. Reported in Robertson NR.	

***Viola arvensis* ***

VIOLACEAE

Field Pansy

Life history**Growth form:** Annual or biennial herb, with decumbent stems.**Vegetative spread:** No.**Longevity:** 1–2 years.**Primary juvenile period:****Flowers:** Creamy-white with yellow-orange base, November.**Fruit/seed:** Capsule 5–9 mm long.**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N Africa, Europe, W Asia.**Botanical subregions:** NC CT ST: Vic., Tas.**Distribution Sydney area:** Sporadic.**Select locations:** CT: Robertson (1905), Kowmung River (1976).**Habitat****Habitat:** Pastures, disturbed, moist sites, riverflats.**Altitude:** 600–900 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Sandy alluvium.**Exposure:****Conservation****Conservation:** Rare, only a couple of reports for Sydney area. Unlikely to invade bushland.

Viola betonicifolia

VIOLACEAE

Life history**Growth form:** Perennial herb with triangular leaves and short erect stems.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Violet to whitish, August–November, peak October–November.**Fruit/seed:** Capsule 7–13 mm long,**Dispersal, establishment & growth:** Diaspore: seed 2.5 mm long with elaiosome, ant-dispersed (J. Howell pers. comm.). No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWP; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Ourimbah, Berkshire Park, Hornsby, Manly, Rookwood, Lane Cove, Unanderra. CT: Orange, Mullion Range, Mt Werong, Tuglow Caves, Abercrombie Caves, Wildes Meadow, Penrose.**Habitat****Habitat:** Hillsides, ridges.**Altitude:** 0–1000 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Woodland e.g. with *Eucalyptus pauciflora*, *E. macrorhyncha*, *E. goniocalyx*; grassland.**Substrate:** Various, on basalt, quartzite, granite, alluvium, well-drained.**Exposure:****Conservation****Conservation:** Previously more common around Sydney on better soils but now rare.

Vulnerable in Western Sydney (James et al. 1999). Reported in Bouddi NP.

Viola caleyana

VIOLACEAE

Swamp Violet

Life history**Growth form:** Perennial herb with stems to 30 cm long and leaves heart-shaped.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to pale violet, October–March, peak November.**Fruit/seed:** Capsule 7–9 mm long,**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST; Tas.**Distribution Sydney area:** Widespread.**Select locations:** CC: Mogo Creek, Avoca North, Coomonderry Swamp. CT: Cudgegong River, Hampton, Tuglow Caves, Wingecarribee Swamp, Long Swamp (Kodela 1992), Penrose.**Habitat****Habitat:** Swamps, wet meadows, creeks.**Altitude:** 0–1000 m**Annual rainfall:** 700–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Upland peat swamp e.g. with *Chorizandra cymbaria*, *Phragmites australis*; shrubland e.g. with *Melaleuca ericifolia*; riparian scrub e.g. with *Casuarina cunninghamiana*, *Tristaniopsis laurina*, *Backhousia myrtifolia*.**Substrate:** Peaty to alluvial soils, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status not known.

Viola fuscoviolacea

VIOLACEAE

Life history**Growth form:** Herb with short stems, mat-forming.**Vegetative spread:** Stoloniferous (James 1996).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Blackish violet, inconspicuous, November–January.**Fruit/seed:** Capsule 4–7 mm long,**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NT CT ST; Vic., Tas.**Distribution Sydney area:** Newnes Plateau, Southern Highlands.**Select locations:** CT: Ben Bullen SF, Murrays Swamp (Newnes SF), Wingecarribee Swamp.**Habitat****Habitat:** Swamp edges.**Altitude:** 600–1000 m**Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Peatland e.g. with *Gymnoschoenus sphaerocephalus*, *Leptospermum* sp., *Baeckea* sp., *Sphagnum* sp.**Substrate:** Peaty sediments, low nutrients, poorly-drained.**Exposure:****Conservation****Conservation:** Few records, conservation status unknown.

Viola hederacea

VIOLACEAE

Ivy-leaved Violet

Life history

Growth form: Perennial herb with short erect stems; fleshy taproot. Variable complex with several forms recognised base mainly on leaf shape (Harden 1990).

Vegetative spread: Spreads by stolons several metres at least, mat-forming.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Mauve and white, August–May, peak October, February. Flowers visited by hoverfly, probably feeding (P. Kubiak pers. comm.).

Fruit/seed: Capsule, 4–6 mm long, seeds c. 1.5 mm long, mature November–June.

Dispersal, establishment & growth: Diaspore: seed, ant-adapted food body (Westoby et al. 1990). Soil-stored seedbank (Fox 1988).

Fire response: Probably resprouts from fleshy taproot (L.McD.). Possibly resprouts after high-intensity fire at Narrabeen 1994, flowering within 4 months of fire (Kubiak pers. comm.).

Killed by fire (Fox 1988).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST CWS; Qld, Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Putty, Wheeny Creek, Windsor, Yarramundi, Ourimbah, Wyong, Mangrove Creek, Wisemans Ferry, St Ives, Auburn, Kurnell, Menangle, Orangeville, Helensburgh, Appin, Albion Park, Bargo, Nowra. CT: Coricudgy, Newnes Plateau, Mt Hay, Blackheath, Wentworth Falls, Boyd Range, Mittagong, Wildes Meadow, Mt Werong, Bundanoon, Penrose SF.

Habitat

Habitat: Sheltered moist places, creekbanks.

Altitude: 0–1000 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist eucalypt forest or floodplain forest e.g. with *Eucalyptus deanei*, *E. saligna*, *E. pilularis*, *Syncarpia glomulifera*, *Backhousia*, *Ceratopetalum apetalum*, *Casuarina glauca*; peaty swamp e.g. with *Gymnoschoenus sphaerocephalus*, *Leptospermum* sp., *Baeckea* sp.; riparian scrub e.g. with *Melaleuca linariifolia*.

Substrate: Sandy or clay soils on sandstone, shale, alluvium, medium nutrients. Water table mostly high, moisture supply continuous, fresh.

Exposure: Mid shade to full sun.

Conservation

Conservation: Widespread and probably adequately conserved. Reported in Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP, Robertson NR.

Viola odorata *

VIOLACEAE

Sweet Violet

Life history

Growth form: Perennial herb with short erect stems; stolons hairy.

Vegetative spread: Stoloniferous spread over several square metres.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Deep violet to white, June–September.

Fruit/seed: Capsule with tiny seed.

Dispersal, establishment & growth: Diaspore: seed, with elaiosome containing diglyceride which attracts ants (Beattie 1982).

Fire response:

Interaction with other organisms:

<p>Status/origin: Exotic, native to Europe, N Africa, and Middle East. Introduced as ornamental.</p> <p>Botanical subregions: CC CT NWS; Vic., S.A.</p> <p>Distribution Sydney area: Sporadic.</p> <p>Select locations: CC: Cheltenham, Menangle. CT: Robertson (1951).</p>	<p>Distribution</p>
<p>Habitat: Watercourses, wet places.</p> <p>Altitude: 0–700 m Annual rainfall: 800–1600 mm</p> <p>Typical local abundance:</p> <p>Vegetation:</p> <p>Substrate: Alluvium.</p> <p>Exposure:</p>	<p>Habitat</p>
<p>Conservation: Occasionally naturalised garden escape (Harden 1990). Potential to invade bushland unknown.</p>	<p>Conservation</p>

Viola sieberiana

VIOLACEAE

<p>Growth form: Perennial herb with short erect stems forming rosettes. Hybrids between <i>V. hederacea</i> and <i>V. sieberiana</i> (Harden 1990).</p> <p>Vegetative spread: Stoloniferous.</p> <p>Longevity:</p> <p>Primary juvenile period:</p> <p>Flowers: Pale mauve to white, August–March, peak September–November.</p> <p>Fruit/seed: Capsule 4–5 mm long, September–March.</p> <p>Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).</p> <p>Fire response: Resprouts (D. Keith pers. comm.).</p> <p>Interaction with other organisms:</p>	<p>Life history</p>
<p>Status/origin: Native.</p> <p>Botanical subregions: CC SC CT; Vic., Tas., S.A.</p> <p>Distribution Sydney area: Widespread.</p> <p>Select locations: CC: Gosford, Cronulla, Waterfall, Stanwell Park. CT: Newnes Plateau, Mount Tomah, Bilpin, Jamieson Valley, Robertson, Bundanoon.</p>	<p>Distribution</p>
<p>Habitat: Moist ground, moist rocky crevices.</p> <p>Altitude: 0–1000 m Annual rainfall: 1000–1600 mm</p> <p>Typical local abundance: Frequent–occasional.</p> <p>Vegetation: Open-forest e.g. with <i>Angophora costata</i>, <i>Syncarpia glomulifera</i>, <i>Acacia elata</i>, <i>Eucalyptus sieberi</i>; open moist sites e.g. with <i>Chorizandra sphaerocephala</i>, <i>Baumea rubiginosa</i>, <i>Epacris obtusifolia</i>.</p> <p>Substrate: Moist soil on sandstone, or shaly sandstone, low nutrients.</p> <p>Exposure:</p>	<p>Habitat</p>
<p>Conservation: Conservation status unknown. Reported in Muogamarra NR, Garigal NP, Royal NP.</p>	<p>Conservation</p>

Korthalsella rubra subsp. ***rubra***

VISCACEAE

Life history

Growth form: Small erect stem-parasitic perennial to 16 cm high, with flattened branches forming cladodes.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Very small, separate male and female flowers, July–September.

Fruit/seed: Berry-like, pear-shaped fruit less than 2 mm long, with one disc-shaped seed 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Parasitic on wide range of trees in rainforest and moist eucalypt forest (Harden 1992).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST; LHI, Qld, Vic.

Distribution Sydney area: Mainly Illawarra.

Select locations: CC: Mt Keira, Mt Kembla, Kiama, Cambewarra. CT: Colong Caves.

Habitat

Habitat: Stem parasite.

Altitude: 0–600 m

Annual rainfall: 800–1600 mm

Typical local abundance:

Vegetation: Rainforest e.g. with *Doryphora sassafras*; moist open-forest.

Substrate: Parasitic on *Alyxia ruscifolia*, *Cassine australis*, *Sloanea australis*, *Trochocarpa laurina*, *Doryphora sassafras*, *Acmena smithii*, *Tristaniopsis laurina*, *Melaleuca ericifolia*, *Syzygium oleosum*, *Geijera salicifolia*, peach tree (Downey 1998).

Exposure:

Conservation

Conservation: Regionally rare in Illawarra region (Mills 1988). Conservation status elsewhere unknown.

Notothixos cornifolius

VISCACEAE

Kurrajong Mistletoe

Life history

Growth form: Spreading or hanging stem-parasitic shrub, with stems to 1 m long, and a covering of white or tawny short hairs.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Small separate male and female flowers, August.

Fruit/seed: Berry-like, egg-shaped 7 mm long, with a single sticky seed.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995).

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT CT ST NWS CWS SWS.

Distribution Sydney area:

Select locations: CC: Bulga. CT: Capertee Valley.

	Habitat
Habitat: Parasitic, almost exclusively, on stems of plants in the Sterculiaceae family (Harden 1992).	
Altitude: 0–600 m	Annual rainfall: 700–800 mm
Typical local abundance: Frequent.	
Vegetation: Open-forest.	
Substrate: Parasitic on <i>Brachychiton populneus</i> , many infestations on one tree, other trees unaffected (Herb. note).	
Exposure:	
	Conservation
Conservation: Conservation status unknown.	

Notothixos subaureus

VISCACEAE

Golden Mistletoe

Life history

Growth form: Erect or spreading stem-parasitic shrub to 0.6 m diam., with a covering of bright golden short hairs, sometimes grey or silvery.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Small separate male and female flowers, at any time of year.

Fruit/seed: Berry-like, egg-shaped 7 mm long, with a single sticky seed.

Dispersal, establishment & growth:

Fire response: High population densities in coastal *Casuarina glauca* open-forest (in Qld) ascribed to cessation of annual burning for a period of 12 years (Reid 1987).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT NWS CWS; Qld, Vic.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Gosford, Mt White, Wisemans Ferry, Mt Colah, Hornsby, Dee Why, Rose Bay, Carlton, Lady Carrington Drive, Waterfall, Blaxland.

Habitat

Habitat: Parasitic, usually on plants in the Loranthaceae family (Harden 1992).

Altitude: 0–400 m **Annual rainfall:** 1000–1400 mm

Typical local abundance:

Vegetation: Open-forest, woodland. Host trees include: *Allocasuarina littoralis*, *Casuarina cunninghamiana*, *C. glauca*, *Angophora subvelutina*, *Eucalyptus pilularis*, *Grevillea robusta*, *Brachychiton populneus* (Downey 1998).

Substrate: Parasitic on *Amyema cambagei*, *A. congener*, *A. miquelii*, *A. pendula*, *Dendrophthoe vitellina*, *Muellerina celastroides*, *M. eucalyptoides*, *Viscum articulatum* (Downey 1998).

Exposure:

Conservation

Conservation: Conservation status unknown.

Viscum articulatum

VISCACEAE

Life history

Growth form: Slender, hanging stem-parasitic shrub to 1 m long, with a covering of bright golden short hairs, sometimes grey or silvery; leaves minute.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Small separate male and female flowers, at any time of year.

Fruit/seed: White, yellowish or pink, roundish, berry-like 4–6 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., W.A., Asia, Pac Is.

Distribution Sydney area: Coastal.

Select locations: CC: Glenbrook, Kiama.

Habitat

Habitat: Parasitic on the stems of Lorantheaceae, other species of Viscaceae and *Exocarpos* (Harden 1992).

Altitude: 0–400 m

Annual rainfall: 1000–1400 mm

Typical local abundance:

Vegetation:

Substrate: Parasitic on species of *Allocasuarina littoralis*, *Casuarina cunninghamiana*, *C. glauca*, *Amyema bifurcata*, *A. cambagei*, *A. congener*, *A. miquelii*, *Amylothea dictyophleba*, *Dendrothoe vitellina*, *Angophora costata*, *Lophostemon confertus*, *Exocarpos cupressiformis* (Downey 1998).

Exposure:

Conservation

Conservation: Kiama is southern geographical limit.

Cayratia clematidea

VITACEAE

Slender Grape

Life history

Growth form: Weak climber with stems to 2 m long and compound leaves with 5 leaflets and tendrils; underground stem forming small tubers.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Greenish, February–March.

Fruit/seed: Black berry, 5–7 mm diam., with 2–4 seeds, March–September, peak May.

Dispersal, establishment & growth: Diaspore: fleshy fruit, vertebrate-adapted dispersal (Westoby et al. 1990). Quick growth rate. Coloniser. Partial die-back in winter (D. Ondinea pers. comm.).

Fire response: Resprouts from rootstock.

Interaction with other organisms: Larval food plant of moths *Agarista agricola*, *Gnathothlibus eras*, *Hippotion celerio*, and Hawk Moth *Acosmeryx anceus* (Common 1990). Tubers roasted and eaten by Aboriginal people (Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT NWS; Qld.

Distribution Sydney area: North from Nowra district.

Select locations: CC: Mt Yengo, Calga, West Head (L.McD.), Eastwood, Newington, Prospect, Razorback, Audley, Bulli, Kiama. CT: Kowmung River, Wollondilly River, Meryla Pass.

<p>Habitat: Levee banks, margin of rainforest. Altitude: 0–600 m Annual rainfall: above 700 mm Typical local abundance: Occasional. Vegetation: Moist eucalypt forest e.g. with <i>Eucalyptus saligna</i>, <i>E. paniculata</i>; dry rainforest e.g. with <i>Alectryon subcinereus</i>, <i>Aphanopetalum resinosum</i>, <i>Streblus brunonianus</i>; estuarine creekside woodland e.g. with <i>Casuarina glauca</i>, <i>Melaleuca styphelioides</i>, <i>Glochidion ferdinandi</i>. Substrate: Clay loam from shale, basalt, quartzite, medium–high nutrients. Exposure: Sheltered, mid-shade.</p>	Habitat
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Conservation	
<p>Conservation: Conserved in Western Sydney (James et al. 1999). Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Royal NP.</p>	

Cissus antarctica

VITACEAE

Native Grape, Water Vine

Life history

Growth form: Vigorous woody climber; leaves simple, toothed, with tendrils and domatia.
Vegetative spread:
Longevity: ? long.
Primary juvenile period:
Flowers: Yellowish, November–January.
Fruit/seed: Purplish–black berry, 15 mm diameter, with 1–2 seeds, mainly March–May.
Dispersal, establishment & growth: Diaspore: fruit, dispersed by birds.
Fire response:
Interaction with other organisms: Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995), Satin Bowerbird (Vaughan 2001). Host plant of Cerambycid beetles *Notoceresium setistriatum*, *Tessaromma nanum* (Hawkeswood 1993). Larval food plant of noctuid moth *Cruria donowani* and sphingid moth *Acosmeryx anceus* (Common 1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST CWS; Qld.

Distribution Sydney area: Widespread on coastal ranges.

Select locations: CC: Wyong, Calga, Pearl Beach, Grose Vale, Barrenjoey, Eastwood, Manly, Kurnell, Cronulla, Otford, Mt Keira, Kiama, Cobbitty, Cambewarra, Kurrajong, Razorback.

Habitat

Habitat: Rainforest and sheltered places.

Altitude: 0–500 m **Annual rainfall:** above 700 mm

Typical local abundance: Frequent–occasional. Often dominant, excluding other plant species.

Vegetation: Dry rainforest e.g. with *Glochidion ferdinandi*, *Alectryon subcinereus*, *Streblus brunonianus*, *Ficus rubiginosa*, *Dendrocnide excelsa*.

Substrate: Dry sheltered gullies with some nutrient enrichment from shale, basalt, medium to high-nutrient soils. Saline-tolerant, grows just above shore e.g. at West Head, Lion Island (L.McD.).

Exposure: Sheltered sites.

Conservation

Conservation: Conserved in Western Sydney (James et al. 1999), probably adequately conserved elsewhere. Reported in Bouddi NP, Brisbane Water NP, Lion Island NR, Ku-ring-gai Chase NP, Sydney Harbour NP.

Cissus hypoglauca

VITACEAE

Giant Water Vine

Life history

Growth form: Large woody climber, with rusty-pubescent new growth, tendrils and divided leaves of 5 leaflets.

Vegetative spread: No.

Longevity: Long.

Primary juvenile period:

Flowers: Yellow, September–December.

Fruit/seed: Globular, bluish-black berry 1–2 cm diam., may be held on vine until following Spring, though probably mature by May. Mature April (L. Parkinson pers. comm.). Fruit is edible, though rather astringent and irritant. Seeds c. 4 mm diam.

Dispersal, establishment & growth: Diaspore: fruit. Probably mainly bird-dispersed (both vertebrate and ant-adapted, Westoby et al 1990). Difficult to germinate. Growth rate medium.

Fire response: Stems killed by high intensity fire, resprouts from base.

Interaction with other organisms: Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT CWS; Qld, Vic., N.G.

Distribution Sydney area: Widespread. Chiefly coastal, inland to Rylstone district.

Select locations: CC: Kincumber, Narrabeen, Beecroft, Oatley, Waterfall, Razorback, Mt Keira, Cambewarra. CT: Rylstone, Blackheath, Kanangra, Hill Top.

Habitat

Habitat: Rainforest and sheltered places.

Altitude: 0–1000 m

Annual rainfall: above 700 mm

Typical local abundance: Frequent. Often dominant in vegetation, excluding other species.

Vegetation: Rainforest and moist gullies e.g. with *Eucalyptus saligna*, *Callicoma serratifolia*.

Substrate: Soil from basalt, shale and enriched sandstone, fertile–very fertile. Watertable mostly low, intermittent, fresh.

Exposure: Light–mid shade.

Conservation

Conservation: Widespread and probably adequately conserved. Reported in Wollemi NP, Blue Mountains NP, Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP, Royal NP.

Cissus opaca

VITACEAE

Small-leaved Water Vine

Life history

Growth form: Slender scrambling climber, with large underground tubers; leaves usually divided with 3–5 leaflets.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellowish, summer.

Fruit/seed: Roundish, purplish berry 12 mm diam., usually with 1 seed.

Dispersal, establishment & growth:

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT NWS CWS NWP; Qld.

Distribution Sydney area: Camden–Yerranderie area.

Select locations: CC: Mount Annan, Razorback Range, Scotts Main Range.

	Habitat
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Habitat: Often on rocky outcrops.	
Altitude: 0–400 m	Annual rainfall: 700–900 mm
Typical local abundance: Rare.	
Vegetation: Dry rainforest scrub or shrubby woodland e.g. with <i>Clerodendrum tomentosum</i> , <i>Cayratia clematidea</i> .	
Substrate: Dry, rocky loose scree on shale with ?calcareous influence, medium nutrient soils, well-drained.	
Exposure:	
	Conservation
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Conservation: Rare, a north coast species with southern limit in Sydney area. Vulnerable in Western Sydney (James et al. 1999). Razorback population is not conserved. Scotts Main Range is within Warragamba Catchment area.	

Cissus sterculifolia

VITACEAE

	Life history
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Growth form: Woody climber, with tendrils and divided leaves, usually with 5 leaflets and prominent domatia.	
Vegetative spread:	
Longevity:	
Primary juvenile period:	
Flowers: White, spring–summer.	
Fruit/seed: Purplish berry 15 mm diam., usually with 1 seed.	
Dispersal, establishment & growth:	
Fire response:	
Interaction with other organisms:	
	Distribution
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Status/origin: Native.	
Botanical subregions: NC CC SC; Qld, N.G.	
Distribution Sydney area: Coast.	
Select locations: CC: Ourimbah, Mt Keira, Minnamurra Falls.	
	Habitat
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Habitat: Rainforest.	
Altitude: 0–300 m	Annual rainfall: 1200–1400 mm
Typical local abundance: Occasional.	
Vegetation: Subtropical and littoral rainforest e.g. with <i>Sloanea woollsii</i> , <i>Archontophoenix cunninghamiana</i> .	
Substrate: Clay soils on shale, alluvium, high nutrients.	
Exposure:	
	Conservation
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Conservation: Rare, conservation status unknown.	

***Parthenocissus quinquefolia* ***

VITACEAE

Virginia Creeper

Life history**Growth form:** Woody climber with tendrils.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish, spring–summer.**Fruit/seed:** Bluish berry 3–5 mm diam., with 1–4 seeds.**Dispersal, establishment & growth:** Diaspore: fruit.**Fire response:****Interaction with other organisms:** Fruit reported from pellets of Currawongs (Buchanan 1989a).**Distribution****Status/origin:** Exotic, native to N America. Introduced as ornamental.**Botanical subregions:** CC.**Distribution Sydney area:** Gosford, Georges River.**Select locations:** CC: Gosford (1987), Casula (1967).**Habitat****Habitat:****Altitude:** 0–200 m**Annual rainfall:** 900–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Growing with *Lonchocarpus japonica*.**Substrate:** Sandy soil on alluvium.**Exposure:****Conservation****Conservation:** Cultivated as ornamental, occasionally recorded as garden escape or naturalised. Potential to invade bushland unknown.***Tetrastigma nitens***

VITACEAE

Life history**Growth form:** Glabrous woody climber, with tendrils and divided leaves of 3 leaflets mostly.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Greenish, November.**Fruit/seed:** Blackish berry 15–20 mm long, with 1–4 wrinkled seeds**Dispersal, establishment & growth:** Diaspore: fruit.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC CWS; Qld.**Distribution Sydney area:** Wyong to Gosford area.**Select locations:** CC: Broken Back, Mount Warrawolong, Martinsville, Avoca, Matcham, Green Point.**Habitat****Habitat:** Gullies, creeks.**Altitude:** 0–500 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Gully rainforest e.g. with *Ceratopetalum apetalum*, *Sloanea australis*, *Glochidion ferdinandi*, *Eucalyptus deanei*.**Substrate:** Sandy loam on alluvium, Narrabeen sandstone, basalt, medium–high nutrients.**Exposure:****Conservation****Conservation:** Gosford is southern geographical limit, conservation status not known. Reported in Yengo NP.

Tasmannia insipida**WINTERACEAE**

Brush Pepperbush

Life history

Growth form: Shrub to 1–3 m high, with simple leaves, green and glossy on both surfaces; crushed leaves have a peppery taste.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: White, September–November. Male and female flowers usually on separate plants (Harden 1990). Pollination both automatic and open (Adam & Williams 2001).

Fruit/seed: Purplish berry, sometimes white mottled with red 12–20 mm long, matures, January–August, peak April. Small seed.

Dispersal, establishment & growth: Diaspore: fruit, probably bird-dispersed.

Fire response: Probably killed.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST; Qld.

Distribution Sydney area: Widespread

Select locations: CC: Wamberal, Olney, Somersby Falls, McCarrs Creek, Bola Creek, Belambie Creek, Minnamurra. CT: Coricudgy, Mt Wilson, Bowens Creek, Blackheath, Wentworth Falls, Woodford, Robertson, Fitzroy Falls.

Habitat

Habitat: Creek lines, shady gullies.

Altitude: 0–1000 m

Annual rainfall: 1000–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Rainforest e.g. with *Doryphora sassafras*, *Ceratopetalum apetalum*, *Hedycarya angustifolia*, *Acmena smithii*, *Backhousia myrtifolia*.

Substrate: Sandy alluvium, basalt, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP, Brisbane Water NP, Ku-ring-gai Chase NP, Robertson NR.

Tasmannia lanceolata

WINTERACEAE

Mountain Pepperbush

Life history**Growth form:** Shrub to 2 m high**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, summer, September–November.**Fruit/seed:** Purplish, fleshy berry 5 mm diam. Fruit weight 214 mg, c. 10 seeds per fruit (extra data on seed & pulp characteristics in French 1991). Fruit mature March–April; seed stored at room temperature viable for up to one year (Floyd 1989).**Dispersal, establishment & growth:** Diaspore: berry.**Fire response:****Interaction with other organisms:** Foodplant of butterfly caterpillar *Graphium macleayanum* (Coupar & Coupar 1992).**Distribution****Status/origin:** Native.**Botanical subregions:** ST CT ST; Vic., Tas.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Blackheath, Kanangra Creek.**Habitat****Habitat:** Rocky slopes, moist sites.**Altitude:** 1000–1100 m **Annual rainfall:** 1000–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Moist eucalypt forest e.g. with *Eucalyptus fastigata*, *E. dalrympleana*, *E. radiata*, *Leptospermum polygalifolium*, *Gleichenia dicarpa*; woodland e.g. with *Callicoma serratifolia*, *Blechnum nudum*.**Substrate:** Wet sandy soil on sandstone.**Exposure:****Conservation****Conservation:** Blackheath is northern geographical limit. Conservation status unknown. Reported in Blue Mountains NP, Boyd NP.**Tribulus micrococcus**

ZYGOPHYLLACEAE

Yellow Vine, Spineless Caltrop

Life history**Growth form:** Herb with prostrate to ascending branches to more than 1 m long.**Vegetative spread:****Longevity:** Probably short-lived.**Primary juvenile period:****Flowers:** Yellow, February–May.**Fruit/seed:** Dry, hairy, separates into 5 spiny segments; each 3–5 mm long, with 1–3 seeds, March–May.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT NWS CWS SWS NWP; Qld.**Distribution Sydney area:** Western Sydney, Bathurst.**Select locations:** CC: Campbelltown, St Marys, Casula, East Hills, Camden. CT: Bathurst.**Habitat****Habitat:** Disturbed places, embankments.**Altitude:** 0–800 m **Annual rainfall:** 600–800 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Clay and loam soils on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Possibly introduced to Sydney area from western NSW with livestock.

Tribulus terrestris* **ZYGOPHYLLACEAE**

Caltrop, Cat-head

Life history

Growth form: Prostrate herb with branches to 80 cm long. There may be an inland native species with more rounded fruit and shorter spines. Taproot long, slender, woody with many fibrous lateral roots (Parsons & Cuthbertson 1992).

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Yellow, February–March.

Fruit/seed: Woody, spiny burr, separates into 5 spiny segments; each 4–8 mm long, with 2–4 yellow seeds. Fruit formed continuously throughout summer and autumn (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Diaspore: burr, dispersed by attachment to feet and fur of animals and vehicle tyres; germination rate of 84% reported and buried seeds remain viable for several years (Parsons & Cuthbertson 1992). High reproduction capacity and ability to germinate rapidly with low moisture (Squires 1969), on soils made bare by drought, overgrazing, or mechanical disturbance (Everist 1974).

Fire response:

Interaction with other organisms: Cause of sudden death in sheep (Hurst 1942), causing staggers, photosensitivity, nitrate poisoning resulting in death; spines on fruit damage feet of horses, sheep, cattle and dogs and cause nuisance on playing fields; seeds sometimes attacked by small native moth *Aristotelia* sp. (Parsons & Cuthbertson 1992). May be more toxic when there is vigorous growth in hot weather (Everist 1974). Spiny burrs may contaminate harvested dried fruit (Scott & Morrison 1996).

Distribution

Status/origin: Exotic, native to Mediterranean region. Introduced by early 1900s (Squires 1969).

Botanical subregions: NC CC CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., N.T., S.A., W.A., Medit region.

Distribution Sydney area: Sporadic.

Select locations: CC: Wondabyne (1978), Flemington Saleyards (1969). CT: Bathurst (1909).

Habitat

Habitat: Along tracks, around habitation.

Altitude: 0–1000 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Rare.

Vegetation:

Substrate: Will grow on most soils, with light-textured soils most favourable (Parsons & Cuthbertson 1992).

Exposure:

Conservation

Conservation: Probably introduced from western NSW and only recorded sporadically. Probably extinct at Flemington. Control by repeated cultivation and burning of fruit; overseas research into control by weevils (Parsons & Cuthbertson 1992).

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