



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.

Ecology of Sydney plant species

Part 10 Monocotyledon families Lemnaceae to Zosteraceae

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Abstract: Ecological data in tabular form are provided on 668 plant species of the families Lemnaceae to Zosteraceae, 505 native and 163 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, Canada Bay, Canterbury, Cessnock, Crookwell, 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: Lemnaceae, Liliaceae, Lomandraceae, Luzuriagaceae, Najadaceae, Orchidaceae, Philydraceae, Phormiaceae, Poaceae, Pontederiaceae, Posidoniaceae, Potamogetonaceae, Restionaceae, Ripogonaceae, Smilacaceae, Sparganiaceae, Thismiaceae, Typhaceae, Uvulariaceae, Xanthorrhoeaceae, Xyridaceae, Zingiberaceae, Zosteraceae.

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.

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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 10 of the *Ecology of Sydney plant species* covers the Monocotyledon families alphabetically from Lemnaceae to Zosteraceae and includes Poaceae.

Methods

Part 10 follows the format used in Parts 1–9 (Benson & McDougall 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002). 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, Canada Bay, Canterbury, Cessnock, Crookwell, 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 (Interim Biogeographic Regionalisation for Australia).

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: Monocot families Agavaceae to Juncaginaceae (*Cunninghamia* 7(4) 2002)

Part 10: Monocotyledon families Lemnaceae to Zosteraceae, including 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.

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* and Plantnet:
<http://plantnet.rbgsyd.nsw.gov.au/>

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 10

Part 10 covers 668 plant species of the monocotyledon families Lemnaceae to Zosteraceae, 309 native and 4 naturalised exotics.

Plant families in this part are Lemnaceae, Liliaceae, Lomandraceae, Luzuriagaceae, Najadaceae, Orchidaceae, Philydraceae, Phormiaceae, Poaceae, Pontederiaceae, Posidoniaceae, Potamogetonaceae, Restionaceae, Ripogonaceae, Smilacaceae, Sparganiaceae, Thismiaceae, Typhaceae, Uvulariaceae, Xanthorrhoeaceae, Xyridaceae, Zingiberaceae, Zosteraceae.

The largest families in this part are Poaceae (347 species) and Orchidaceae (220 species). The large grass family Poaceae provides many opportunities for ecological work as, although a few species, mainly exotics are known well, the ecology of most native species is poorly known. Ecological aspects of Orchidaceae biology are discussed in a separate paper (Weston et al. this issue).

Of the other families very little ecological work has been done. Our main knowledge on families such as Lomandraceae, Restionaceae, Xanthorrhoeaceae and Xyridaceae is confined to a general knowledge of their distributions, while for the water plants such as families Najadaceae, Pontederiaceae, Posidoniaceae, Potamogetonaceae and Zosteraceae, our records still give us only a sketchy idea of this. There is more ecological knowledge on groups in the Liliaceae, particularly coming out of work on restoration of grassy woodland and other remnant vegetation types. Such work stimulates studies on pollination, seed dispersal and establishment, and fire and herbivore regimes, as well as the genetic patterns in populations.

Concluding remarks on the Ecology of Sydney Plants project

With the completion of the final part (Part 10), the Ecology of Sydney Plants project as originally envisaged in 1993, comes to a conclusion. How we develop it from here is still to be decided, but it is hoped that it will be made available electronically. In the meantime there are sufficient hardcopy back issues of *Cunninghamia* for all Parts. These are available through the Gardens Shops at Sydney, Mount Annan and Mount Tomah, or through phone orders to Mount Annan (phone 02 4634 7935). Copies from Part 8 onwards are also available on the Botanic Gardens Trust Website as PDF files, (earlier issues will be added later).

The ten part series (actually 11 parts as Part 7 is divided into Parts 7a and 7b) has provided ecological data in tabular form is on 3550 plant species, 2626 native and 924 exotics (mostly naturalised) occurring in the Sydney region, defined by the Central Coast and Central Tablelands botanical subdivisions of New South Wales. This compares with approximately 3500 species that we anticipated in 1993. In concluding we would like to make some general observations on research needed to fill some of the gaps we have encountered in our work.

Longevity

Despite its prime importance in terms of population and community dynamics we have found longevity to be a very neglected field. While resprouting species may be very long-lived or of indefinite lifespan, many fire-sensitive shrub species and early colonizer species have relatively short life spans, and may need locally altered conditions to provide conditions for new recruitment. Even more so for herbaceous species, yet most lifeform descriptions in handbooks limit descriptions to either *annual* or *perennial* (i.e. 1 year or many years). Indeed the rarest lifeform category amongst native

Sydney plants is annual, of which we have very few; most are really short lived perennials. Studies of longevity do take time but we should at least begin marked reference studies that can be continued by other workers.

Primary juvenile period

There is still very little information on this aspect, though its importance in fire regimes affecting fire sensitive plants, particularly shrubs, is being broadly recognised. Unfortunately actions are more likely to be based on generalisations. We need more actual observational data.

Flowers/ Fruits

Studies on Pollination vectors and plant/ insect and plant/ bird interactions are increasing. Fruit is still probably the most neglected descriptive field. Most handbooks ignore fruiting times, particularly for species which lack traditional coloured fruit, such as rainforest species. Yet timing of fruiting is important for seed collecting. The size of a potential seed crop may also be important for predicting potential species seedbanks, There are very few plants for which there is information in the literature on the number of seed per plant (averages or ranges etc), yet some species have a few seeds while others have thousands.

Dispersal, establishment and growth

Dispersal mechanisms have aroused some interest in terms of disperser but we need distance estimates etc. This is particularly important in relation to species in small or isolated sites

Fire response

Fire research is the main area where we have made substantial progress in recent years. There is now an increasing number of observations on fire responses and the direct implications of fire, but there is still little known about subsequent responses such as amount of recruitment, affects of herbivory on seedlings etc.

Interaction with other organisms

Still little on aspects other than pollination and seed dispersal. There is a need more observations on seed predation.

Status/origin

Many exotic species are represented by only a few specimens in herbaria, and old collections are often not clearly indicated as naturalized or planted. This may lead to an over-estimate of the number of truly naturalized species. We need better collections of exotics with comments on their populations local origin, extent etc. We need more research on distribution and genetic makeup of some exotic species. Some previously accepted exotic weed species may indeed be native cosmopolitan, while others may have both native and exotic forms e.g *Cynodon dactylon*.

Distribution in Sydney area

We need to develop mapping of individual species distributions. This is likely to lead to the observation of interesting patterns and revealing correlations with environmental features.

Altitude

We had previously considered altitude important only in terms of understanding a species' habitat range. However altitudinal range will be an important component in determining a species' vulnerability to climate change, particularly through increased temperatures and decreased rainfall. Indeed species limited to high elevations may be some of the most potentially threatened species.

Annual rainfall

Like altitude, annual rainfall is another parameter that will have implications in terms of potential climate change. Species with narrow rainfall requirements are likely to be more susceptible to climate change than species with broader requirements.

Substrate

Geological and soil information has been generally available from recent specimens though it is generally lacking from old collections. Geological information is more readily available for tree and shrub species than for herbaceous species, with grass specimens in particular having very limited collecting information. In general we need more research on herbaceous and grassy species.

Conservation

Since 1996 listing species of conservation significance using ROTAP criteria (Briggs & Leigh 1988), has been replaced in NSW by the Threatened Species Conservation Act which gives legislative protection to species listed under the Schedules of the Act. Under the Threatened Species Conservation Act, taxa may be listed as endangered or vulnerable species or endangered populations. Some publications of new species still only provide ROTAP criteria (Briggs & Leigh 1988), rather than assessing threats in terms of the TSC act. Alternatively, IUCN Criteria should be provided as these can be directly related to the TSC act determinations. More emphasis on regional conservation significance is needed.

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Monocotyledon families Lemnaceae to Zosteraceae

LEMNACEAE

Lemna disperma (*L. minor*)

Duck Weed

Life history

GROWTH FORM: Herb floating on surface of water, with solitary root and solitary thalli, or connected to form small groups.

VEGETATIVE SPREAD: New leaf-like thallus emerges from a budding pouch on margin of thallus.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: April, May, monoecious.

FRUIT/SEED: Reproduction usually vegetative. Abundant fruiting appears to enable the species to survive periodic droughts (Evans 1970).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Black Swan *Cygnus atratus*, Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons* (Barker & Vestjens 1989,1990). Provides food for crustaceans and molluscs and cover for fish (Wetlands: resource material for teachers www.dse.vic.gov.au)

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NWS CWS SWS NWP SWP; Tas., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Lurnea (1987).

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Still or flowing fresh water.

EXPOSURE:

Conservation

Conservation status unknown.

LEMNACEAE

Spirodela polyrrhiza (*Lemna oligorrhiza* var. *pleiorrhiza*)

Life history

GROWTH FORM: Herb floating on surface of water, with 5–18 roots per thallus and thalli solitary or connected to form small groups.

VEGETATIVE SPREAD: New leaf-like thallus emerges from a budding pouch on margin of thallus.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Not recorded in Australia.

FRUIT/SEED: Reproduction vegetative only.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC SWS; Qld, N.T., temp & trop. regions.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Kogarah (1899).

Habitat

HABITAT:

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Still or slowly moving fresh water.

EXPOSURE:

Conservation

Conservation status unknown.

LEMNACEAE

Spirodela punctata

(*Lemna oligorrhiza* var. *oligorrhiza*, *Spirodela pusilla*)

Life history

GROWTH FORM: Herb floating on surface of water, with 1–11 roots per thallus and thalli solitary or connected to form small groups.

VEGETATIVE SPREAD: New leaf-like thallus emerges from a budding pouch on margin of thallus.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Reproduction usually vegetative. Fruiting enables the species to survive long droughts when surface waters disappear, also a minute live growing point may persist in fronds that had largely decayed (Evans 1970).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST CWS SWS SWP; Qld, Vic., S.A., W.A., India, China, SE Asia, Polynesia, NZ.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Pitt Town, Penrith, Waterloo (1886), Cabramatta Creek, Liverpool, Kogarah (1888), Cronulla to Kurnell, Windang, Bulli, Upper Nattai River. **CT:** Bathurst, Coxs River.

Habitat

HABITAT: Creeks, dams, ponds.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: With creekside vegetation e.g. *Triglochin*, *Myriophyllum*, *Eleocharis sphacelata*, *Cotula coronopifolia*, *Casuarina glauca*.

SUBSTRATE: On the surface of still or slowly moving fresh water. Grows in waters enriched by drainage from sources such as abattoirs (Evans 1970).

EXPOSURE:

Conservation

Conservation status unknown.

LEMNACEAE

Wolffia angusta

Life history

GROWTH FORM: Rootless herb floating on surface of water, with thalli solitary or connected in pairs.

VEGETATIVE SPREAD: New leaf-like thallus emerges from a budding pouch on margin of thallus.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: February.

FRUIT/SEED: Reproduction usually vegetative.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Gosford, Glenorie, Kellyville, Kogarah, The Oaks.

Habitat

HABITAT: Fresh water dams and waterholes.
 ALTITUDE: 0–400 m ANNUAL RAINFALL: 900–1200 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION:
 SUBSTRATE: On the surface of still water.
 EXPOSURE:

Conservation

Conservation status unknown.

LEMNACEAE

Wolffia australiana**Life history**

GROWTH FORM: Rootless herb floating on surface of water, with thalli solitary or connected in pairs.
 VEGETATIVE SPREAD: New leaf-like thallus emerges from a budding pouch on margin of thallus.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: April.
 FRUIT/SEED: Reproduction usually vegetative.
 DISPERSAL, ESTABLISHMENT & GROWTH: Fronds sometimes observed to sink in winter, appearing on the surface again in spring (B. Briggs pers. comm.).
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC SC CT ST CWS; Vic, S.A., N.Z.
 DISTRIBUTION SYDNEY AREA: Sporadic.
 SELECT LOCATIONS: **CC:** Casula, Mount Annan. **CT:** Orange.

Habitat

HABITAT: Fresh water dams and waterholes. Appears to flourish best in waters enriched by drainage from the surface of grazing land or from cattle yards (Evans 1970).
 ALTITUDE: 0–900 m ANNUAL RAINFALL: 700–900 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION: For example with *Typha*, *Cotula coronopifolia*.
 SUBSTRATE: Floating on still or running water.
 EXPOSURE:

Conservation

Conservation status unknown.

LILIACEAE

***Lilium formosanum* ***

Formosan Lily

Life history

GROWTH FORM: Perennial herb, annual aerial stem; bulbs with numerous thickened, imbricate fleshy scales and fibrous roots.
 VEGETATIVE SPREAD: Clump-forming.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Fragrant, white, bell-shaped, January–April, peak March.
 FRUIT/SEED: Cylindrical capsule 5–8 cm long, with numerous winged seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH: Prolific seeder and germinator (Anon 1991); seed wind-dispersed along roadsides possibly assisted by turbulence from heavy vehicles (A. Rodd pers. comm. 1994). Bulbs dispersed by gravity and water.
 FIRE RESPONSE: Resprouted after fire (1/1994) at Lane Cove, secondary juvenile period about 9 months (P. Kubiak pers. comm.).
 INTERACTION WITH OTHER ORGANISMS: Control by spraying with 1: 70–100 glyphosate between flowering and fruiting period or 1: 1 using wiper or weed wand (NSW Agriculture Environmental Weed Control Permit: www.northcoastweeds.org.au).

Distribution

STATUS/ORIGIN: Exotic, native to Taiwan.
 BOTANICAL SUBREGIONS: NC CC SC CT; LHI, Vic.
 DISTRIBUTION SYDNEY AREA: Widespread Blue Mountains and coast.
 SELECT LOCATIONS: **CC:** Kariong, Kurrajong, Springwood, Frenchs Forest, Royal NP, Mt Keira, Glen Davis. **CT:** Mount Tomah.

Habitat

HABITAT: Disturbed sites, roadsides.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1200 mm
 TYPICAL LOCAL ABUNDANCE: Frequent–occasional.
 VEGETATION:
 SUBSTRATE: Clay to sandy soils on shale, sandstone, low to medium nutrients, well-drained.
 EXPOSURE: Light shade to full sun.

Conservation

Listed as an environmental weed in Blue Mountains City Council area. Extent elsewhere unknown.

LOMANDRACEAE

Lomandra brevis**Life history**

GROWTH FORM: Rhizomatous, perennial herb to 15 cm high, forming tussocks to 20 cm diam., leaves long, narrow, with inrolled margins.
 VEGETATIVE SPREAD: Clump-forming.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Small, inconspicuous, yellow, male and female flowers on separate plants, spring and autumn.
 FRUIT/SEED: Capsule.
 DISPERSAL, ESTABLISHMENT & GROWTH: Seed with ant-adapted elaiosome.
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC.
 DISTRIBUTION SYDNEY AREA: Coast and lower Blue Mountains.
 SELECT LOCATIONS: **CC:** Cowan, Berowra, Hornsby, Ingleside, Blaxland, Kogarah, Sutherland.

Habitat

HABITAT: Damp sandy soils or sheltered areas.
 ALTITUDE: 0–400 m ANNUAL RAINFALL: 1000–1200 mm
 TYPICAL LOCAL ABUNDANCE: Occasional–frequent.
 VEGETATION: Open-forest to woodland e.g. with *Eucalyptus sieberi*, *E. haemastoma*, *E. piperita*, *Angophora costata*, *Corymbia gummifera*, *Allocasuarina torulosa*, *Allocasuarina littoralis*, *Banksia serrata*, *Leptospermum trinervium*, *Grevillea buxifolia*.
 SUBSTRATE: Sandy soil from sandstone, low nutrients.
 EXPOSURE:

Conservation

Local endemic species, uncommon, coded 2RC- on national rare species list (Briggs & Leigh 1996). Threatened by bushrock removal (NPWS 1999) and clearing for housing development e.g. at Hornsby. Reported in Ku-ring-gai Chase NP, Muogamarra NR, Royal NP.

LOMANDRACEAE

Lomandra confertifolia* subsp. *pallida**Life history**

GROWTH FORM: Perennial herb, with tufted stems, short or elongated, erect or decumbent.
 VEGETATIVE SPREAD:
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Small, inconspicuous, male and female flowers on separate plants, late winter to spring.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterflies *Trapezites* species (Common & Waterhouse 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT CWS; Qld.

DISTRIBUTION SYDNEY AREA: Western Blue Mountains.

SELECT LOCATIONS: **CC:** Howes Mountain. **CT:** Running Stream, Genowlan Mountain, Marangaroo Creek, Glen Davis.

Habitat

HABITAT: Rocky places, hillsides.

ALTITUDE: 300–1000 m ANNUAL RAINFALL: 600–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Dry eucalypt forest.

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

EXPOSURE:

Conservation

Sydney is southern geographical limit (Harden 1993). Conservation status unknown.

LOMANDRACEAE

Lomandra confertifolia subsp. *rubiginosa*

Life history

GROWTH FORM: Perennial herb, with stems elongated usually somewhat decumbent, stout.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Small, inconspicuous, male and female flowers on separate plants, autumn–spring.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterfly larvae *Trapezites eliena*, *T. maheta praxedes* and *T. phigalioides* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST CWS.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Berowra, Terrey Hills, Campbelltown, Bargo. **CT:** Coricudgy, Gaspers Mountain, Capertee, Hazelbrook, Colo Vale.

Habitat

HABITAT: Slopes, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Corymbia eximia*, *Eucalyptus pilularis*, *Corymbia gummifera*, *Eucalyptus punctata*, *Syncarpia glomulifera*.

SUBSTRATE: Sandy soil on sandstone.

EXPOSURE:

Conservation

Conservation status unknown.

LOMANDRACEAE

Lomandra cylindrica

Life history

GROWTH FORM: Sparsely tufted perennial herb.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Small, yellow, inconspicuous, male and female flowers on separate plants, July–December, peak October.

FRUIT/SEED: Capsule, September–November.

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm., P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Lake Macquarie, Palm Beach, Asquith, Hornsby, Rookwood, Glenbrook, Mulgoa, Kentlyn, Darkes Forest. **CT:** Rylstone, Lithgow, Wentworth Falls, Hill Top.

Habitat

HABITAT: Ridges, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Corymbia gummifera*, *Eucalyptus piperita*, *Angophora costata*; heath e.g. with *Banksia oblongifolia*, *Banksia ericifolia*, *Angophora hispida*.

SUBSTRATE: Sandy soil on sandstone, gravelly shale, low nutrients.

EXPOSURE: Full sun to mid-shade.

Conservation

Rylstone is northern geographical limit. Conservation status unknown.

LOMANDRACEAE

Lomandra filiformis subsp. *coriacea*

Life history

GROWTH FORM: Perennial herb forming sparse or short tussocks, occasionally in short, dense mats to 20 cm diam.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Small, yellow, inconspicuous, male and female flowers on separate plants, mainly September–November.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Regrowth from rhizomes (Fox 1988, D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterflies *Trapezites* species (Common & Waterhouse 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT ST NWS CWS SWS SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wisemans Ferry, Richmond, Hornsby, Lidcombe, Waterfall, Helensburgh, Austinmer, Thirlmere. **CT:** Mullions Range, Orange, Oberon, Capertee Valley, Hartley, Lithgow, Mt Armour, Mittagong, Robertson.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Angophora bakeri*, *Eucalyptus fibrosa*, *E. punctata*, *Angophora costata*, *Eucalyptus viminalis*, *E. melliodora*, *E. agglomerata*.

SUBSTRATE: Sandy to clay soils from shale, igneous rocks, Tertiary alluvium, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

LOMANDRACEAE

Lomandra filiformis subsp. *filiformis***Life history**

GROWTH FORM: Perennial herb forming sparse or short tussocks, occasionally in short, dense mats to 20 cm diam.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Small, yellow, inconspicuous, male and female flowers on separate plants, August–October, peak October.

FRUIT/SEED: Capsule, October–November.

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouts from rhizomes, secondary juvenile period 1 year (D. Keith pers. comm., P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterfly larvae *Trapezites eliena*, *T. phigalia phigalia*, *T. luteus leucus* and *T. phigalioides* (Common & Waterhouse 1981). Eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Kulnura, Woy Woy, Wondabyne, Scheyville, Castlereagh, Glenbrook, Berowra Waters, Palm Beach, Beecroft, North Ryde, Malabar, Glenfield, Silverdale, Kiama. **CT:** Mt Coricudgy, North Tomah, Robertson.

Habitat

HABITAT: Hillsides, slopes, headlands.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *E. piperita*, *E. punctata*, *Angophora costata*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*; scrub e.g. with *Banksia aemula*, seacliff scrub.

SUBSTRATE: Sandy soils on sandstone, sand, shale, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

LOMANDRACEAE

Lomandra filiformis subsp. *flavior***Life history**

GROWTH FORM: Perennial herb forming sparse or short tussocks, occasionally in short, dense mats to 20 cm diam.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: male and female flowers on separate plants, August–November.

FRUIT/SEED: Capsule

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterflies *Trapezites* species (Common & Waterhouse 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT NWS NWP.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Putty, Vineyard. **CT:** Currant Mountain Gap, Orange, Mt Hay.

Habitat

HABITAT: Hillsides, ridges, tocky outcrops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Heath e.g. with *Eucalyptus stricta*; open-forest e.g. with *Eucalyptus tereticornis*, *E. fibrosa*.

SUBSTRATE: Sandy soil on sandstone, sandy alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

LOMANDRACEAE

*Lomandra fluviatilis***Life history**

GROWTH FORM: Tufted perennial herb. Possibly hybridizes with *Lomandra longifolia* (Harden 1993).

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow or cream, male and female flowers on separate plants, September–November, peak October.

FRUIT/SEED: Capsule, December.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted after high intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Valley, Colo River, Bowen Mountain, Marramara Creek, Galston Gorge, Middle Harbour Creek, Waterfall, O'Hares Creek, Bargo River, Glenbrook Creek, Nortons Basin, The Woolwash. **CT:** Wentworth Falls.

Habitat

HABITAT: Creekbeds or rocky creekbanks, dry rocky hillsides.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Riparian scrub e.g. *Tristaniopsis laurina*, *Lomandra longifolia*, *Callicoma serratifolia*, *Casuarina cunninghamiana*.

SUBSTRATE: Sandstone rocks or sand along creeks in flood zone, low nutrients. Well-drained, not in standing water. Water table permanently high.

EXPOSURE:

Conservation

Coded 3RCa on national rare species list (Briggs & Leigh 1996). Vulnerable in Western Sydney (James et al. 1999). Reported in Marramara NP, Garigal NP, Royal NP.

LOMANDRACEAE

Lomandra glauca

Pale Mat-rush

Life history

GROWTH FORM: Caespitose perennial herb or stems shortly decumbent in small dense mats.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, male and female flowers on separate plants, September–November.

FRUIT/SEED: Capsule, October–November.

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Stems killed, reprints from base, secondary juvenile period almost 1 year after high intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Leaves apparently eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST CWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Valley, Bouddi, Maroota, Agnes Banks, Castlereagh SF, Bilgola Heights, Pennant Hills, Mosman, Centennial Park, Malabar. **CT:** Olinda, Clarence, Kanangra, Katoomba, Springwood, Yerranderie.

Habitat

HABITAT: Hillsides, rocky ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Angophora hispida*, *Banksia serrata*, *Banksia aemula*; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Corymbia gummifera*, *Eucalyptus haemastoma*, *E. fibrosa*.

SUBSTRATE: Sandy soils on dunes, sandstone, low nutrients, well-drained. EXPOSURE:

Conservation

Conservation status unknown. Reported in Ku-ring-gai Chase NP, Royal NP.

LOMANDRACEAE

Lomandra gracilis**Life history**

GROWTH FORM: Perennial herb forming sparse tussocks.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, mainly October.

FRUIT/SEED: Capsule

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990). ?Myrmecochore (Rice & Westoby 1981).

FIRE RESPONSE: Stems killed, reprints from base. Resprouted after high intensity fire (1/1994), secondary juvenile period 1 year at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Possibly eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Putty, Bouddi, Wondabyne, Dharug NR, Bowen Mountain, Springwood, Terrey Hills, Berowra, Narrabeen, Centennial Park, Homebush, Padstow Heights, Waterfall, Campbelltown, O'Hares Creek, Nowra. **CT:** Mt Solitary, Hazelbrook.

Habitat

HABITAT: Rocky situations, ridges, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Corymbia gummifera*, *Syncarpia glomulifera*.

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

EXPOSURE:

Conservation

Royal NP is southern geographical limit.

LOMANDRACEAE

Lomandra longifolia

Spiny-headed Mat-rush

Life history

GROWTH FORM: Tufted, rhizomatous perennial herb to 1 m tall, dioecious.

VEGETATIVE SPREAD: Very limited spread.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: About 2–3 years.

FLOWERS: Dense clusters of tiny yellow flowers in a panicle, perfumed, male and female flowers similar on separate plants, August–November.

FRUIT/SEED: October–January.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed with ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).

FIRE RESPONSE: Foliage killed but resprouts from rhizomes (Fox 1988), no seedlings recorded less than 1 year after fire (Purdie 1977), secondary juvenile period 1 year after high intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Larvae of moth *Lophocalama neurites* feed at night on the leaves and shelter deep in the plant during the day; leaves mined by larvae of moth *Apatetris miarodes* (Common 1990). Foodplant of butterfly larvae *Trapezites eliena*, *T. phigalioides*, *T. petalia* and *Trapezites symmommus symmommus*, which feed on leaves during winter and pupate in leaves in spring–summer (Common & Waterhouse 1981). Leaves apparently eaten by rabbits (P. Kubiak pers. comm.). Leaves used by Aboriginal people for basket making; early settlers used leaves to tie grape vines (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS NWP; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread on coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Mt Yengo, Ourimbah, Gordon, Manly, Bradleys Head, Springwood, Kogarah Bay, Kemps Creek, Menai, Stanwell Park, Thirlmere, Albion Park. **CT:** Mt Coricudgy, Wolgan Gap, Clarence, Mt Wilson, Hill Top, Moss Vale.

Habitat

HABITAT: Gullies, creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath and riparian scrub e.g. with *Leptospermum* dune scrub with *Banksia*; woodland and moist eucalypt forest e.g. with *Eucalyptus pilularis*, *E. saligna*.

SUBSTRATE: Variety of situations on sand, sandstone, shale, basalt and alluvium, low to high nutrients.

EXPOSURE: Full sun–to light shade.

Conservation

Widespread and probably adequately conserved. Reported in Blue Mountains NP, Brisbane Water NP, Lion Is NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP. Often a persistent survivor in disturbed bush. Its recent increased use in urban landscaping and roadside planting has resulted in the introduction of non-local forms, which are inappropriate when used in or near bushland areas.

LOMANDRACEAE

Lomandra micrantha* subsp. *tuberculata

Small-flowered Mat-rush

Life history

GROWTH FORM: Tufted perennial herb.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish yellow to dark red, male and female flowers on separate plants, March–April, August–September.

FRUIT/SEED: Capsule. Viability of fresh seed 96% (Vigilante et al. 1998).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts (Vigilante et al. 1998), flowering 15 months after intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast and Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Wisemans Ferry, Bilpin, Pennant Hills, Willoughby, Heathcote, Minnamurra Falls. **CT:** Blackheath, Kanangra Walls, Lawson.

Habitat**HABITAT:**

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Banksia serrata*; moist scrub e.g. with *Gleichenia microphylla*.

SUBSTRATE: sandy soil on sandstone, low nutrients, moist.

EXPOSURE:**Conservation**

Gosford is northern geographical limit (Harden 1993). Conservation status unknown.

LOMANDRACEAE

Lomandra montana**Life history**

GROWTH FORM: Tufted perennial herb

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, March, August.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT CWS.

DISTRIBUTION SYDNEY AREA: Restricted areas of Blue Mountains, Rylstone.

SELECT LOCATIONS: **CC:** Bilpin, Linden. **CT:** Coorongooba Creek, Mount Tomah, Blackheath, Wentworth Falls.**Habitat**

HABITAT: Near creeks, waterfalls, moist cliffs, rock crevices.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Rainforest e.g. with *Doryphora sassafras*, *Acmena smithii*, *Ceratopetalum apetalum*; moist eucalypt forest e.g. with *Eucalyptus deanei*.

SUBSTRATE: Sandy soils on sandstone, basalt, low–medium nutrients, moist.

EXPOSURE:**Conservation**

Conservation status unknown. Reported in Blue Mountains NP.

LOMANDRACEAE

Lomandra multiflora

Many-flowered Mat-rush

Life history

GROWTH FORM: Tufted perennial herb.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, September–November. Grasshopper fed on pollen (P. Kubiak pers. comm.).

FRUIT/SEED: Capsule, September–February. Viability of fresh seed 96% (Vigilante et al. (1998).

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersal: ant-adapted food body (Westoby et al. 1990).

FIRE RESPONSE: Regrowth from rhizomes, no seedlings recorded within 1 year after fire (Purdie 1977, Vigilante et al. (1998), secondary juvenile period 1 year after high intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterfly larvae *Trapezites eliena* and *T. petalia* (Common & Waterhouse 1981).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., N.T, ?S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Berowra, Como, Rookwood, Kemp's Creek, Liverpool, Glenbrook, Heathcote, Bargo River, Coaldale, Bomaderry.**CT:** Rylstone, Mt Coricudgy, Cadia, Lewis Ponds, Bathurst, Pantoneys Crown, Lithgow, Hartley, Katoomba, Yerranderie.**Habitat**

HABITAT: Hillsides, crests.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus fibrosa*, *E. mannifera*, *E. rossii*, *E. bridgesiana*, *E. albens*; open-forest e.g. with *Syncarpia glomulifera*, *Angophora costata*, *Eucalyptus piperita*.

SUBSTRATE: Clay soils on shale, basalt, metamorphics, occasionally on sandstone, low to medium nutrients, well-drained.

EXPOSURE:**Conservation**

Conserved in Western Sydney (James et al. 1999). Reported in Brisbane Water NP, Marramatta NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.

LOMANDRACEAE

Lomandra obliqua**Life history**

GROWTH FORM: Low stoloniferous perennial herb, stems to 50 cm, may be glaucous.

VEGETATIVE SPREAD: Plants capable of vegetative spread.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, October–December.

FRUIT/SEED: Capsule; seed 3 mm diam.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed. Ant-adapted food body for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts from base, secondary juvenile period almost 1 year after high intensity fire (1/1994) at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Sometimes heavily cropped by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Putty, Kulnura, Mogo Creek, Springwood, Hornsby, Beecroft, Mosman Bay, Parramatta, Nortons Basin, Picton, Bargo River, Darkes Forest. **CT:** Rylstone, Wentworth Falls, Kanangra, Kangaloon, Wombeyan Caves.**Habitat**

HABITAT: Rocky slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Corymbia eximia*, *Eucalyptus punctata*, *Corymbia gummifera*, *Syncarpia glomulifera*; open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *Eucalyptus piperita*.

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

EXPOSURE:**Conservation**

Widespread and probably adequately conserved. Reported in Brisbane Water NP, Marramatta NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.

LUZURIAGACEAE (PHILESIACEAE)

Eustrephus latifolius

Wombat Berry

Life history

GROWTH FORM: Vine with stems to 6 m long, sometimes much branched, and with tuberous roots, narrow-leaved forms occur occasionally.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink to mauve or white, September–November. Probably pollinated by honeybees *Apis mellifera*; small beetles (Coleoptera) seen on flowers (P. Kubiak pers. comm.).

FRUIT/SEED: Globular, fleshy, yellow-orange capsule, 10–20 mm diam. Seeds numerous, black, with prominent white aril, January–September. DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed/fruit, bird-dispersed e.g. Currawongs (Wallace 1997).

FIRE RESPONSE: Stems killed, resprouts from base (after high-intensity fire at Narrabeen 1/1994), secondary juvenile period 3 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Moth larvae *Cryptoptila immersana* feed between joined leaves (Common 1990). White tuberous roots edible raw (Cribb & Cribb 1984).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS; Qld, Vic., Pac.Is, Malesia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Mooney Mooney, Hornsby, Manly, Cooks River, Auburn, Grose Vale, Razorback, Mt Keira, Bass Point, Minnamurra Falls. **CT:** Mount Tomah, Jenolan Caves, Robertson.

Habitat

HABITAT: Gullies and moist hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist rainforest e.g. with *Doryphora sassafras*, dry rainforest e.g. with *Aphanopetalum apetalum*; moist eucalypt forest e.g. with *Eucalyptus pilularis*, *E. saligna*, *E. obliqua*, *E. piperita*.

SUBSTRATE: Clay loam from shale, basalt, volcanic necks, medium–high nutrients, well-drained.

EXPOSURE: Sheltered sites, mid-shade.

Conservation

Probably adequately conserved. Reported in Blue Mountains NP, 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, Robertson NR.

LUZURIAGACEAE (PHILESIACEAE)

Geitonoplesium cymosum

Scrambling Lily

Life history

GROWTH FORM: Vine with stems to 8 m long.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mauve to white, September–November, peak September.

FRUIT/SEED: Fleshy purple-black berry, 10–20 mm diam., with numerous black seeds, aril absent, August–November, March–April.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fleshy fruit, vertebrate-adapted dispersal (Westoby et al. 1990).

FIRE RESPONSE: Stems killed, reprints from base (after high-intensity fire Narrabeen 1/1994), flower buds after 3 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ?ST; LHI, Qld, Vic., Pac.Is., Malesia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Ourimbah, Mona Vale, Balmoral, Razorback, Otford, Dapto, Shellharbour, Kangaroo Valley. **CT:** Mt Wilson, Jenolan Caves, Robertson.

Habitat

HABITAT: Gullies, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist rainforest e.g. with *Doryphora sassafras*; dry rainforest e.g. with *Cassine australis*, moist eucalypt forest e.g. with *Eucalyptus pilularis*, *E. piperita*, *Syncarpia glomulifera*; coastal sites e.g. with *Casuarina glauca*, *Myoporum*.

SUBSTRATE: Clay loam from shale, basalt, limestone, occasionally on sandstone, medium to high nutrients, well-drained.

EXPOSURE: Sheltered sites, mid-shade.

Conservation

Probably adequately conserved. Reported in 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, Robertson NR.

NAJADACEAE

Najas browniana

Waternymph

Life history

GROWTH FORM: Submerged aquatic monoecious annual or short-lived perennial with stems to 1 m long.

VEGETATIVE SPREAD:

LONGEVITY: Short-lived.

PRIMARY JUVENILE PERIOD:

FLOWERS: Warmer months.

FRUIT/SEED: Capsule, with one seed 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld, Vic., N.T., W.A., N. Caledonia.

DISTRIBUTION SYDNEY AREA: Hawkesbury–Nepean River.

SELECT LOCATIONS: **CC:** Lower Portland (1994).

Habitat

HABITAT: Rivers.

ALTITUDE: 0–2 m ANNUAL RAINFALL: 800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Static to slow moving fresh water less than 3 m deep.

EXPOSURE:

Conservation

Conservation status unknown.

NAJADACEAE

Najas tenuifolia

Waternymph, Thin-leaved Naiad

Life history

GROWTH FORM: Submerged aquatic herb, with stems to 1 m long.

VEGETATIVE SPREAD:

LONGEVITY: Annual or short-lived perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: February–May.

FRUIT/SEED: Capsule, with one seed 2 mm long, February–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS SWS SWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Wisemans Ferry, Patonga Creek, Villawood, Duck Creek, Penrith Weir, Luddenham, Menangle, Cobbitty, The Oaks, Burragorang Valley.

Habitat

HABITAT: Wetland.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Aquatic vegetation e.g. with *Potamogeton crispus*, *Hydrilla verticillata*, *Limnosella australis*.

SUBSTRATE: Fresh water less than 3 m deep.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

*Acianthus amplexicaulis***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers often on stolons and a single heart-shaped leaf, dark green above and reddish purple below; flowering stem to 8 cm high with up to 20 tiny flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: March–May. Self-pollinating (Jones 1988).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period February–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Gosford area.

SELECT LOCATIONS: CC: Wyrribalong.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Moist coastal scrub; littoral rainforest.

SUBSTRATE: Dune sand, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wyrribalong NP, the southern geographical limit.

ORCHIDACEAE

*Acianthus apprimus***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers and daughter tubers on stolons, a single heart-shaped leaf, dark green above and reddish purple below; flowering stem to 20 cm high with up to 9 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind pers. comm., Jones 1991).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pinkish and dark purplish, February–April. Possibly pollinated by tiny flies (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period February–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT.

DISTRIBUTION SYDNEY AREA: Boyd Plateau.

SELECT LOCATIONS: CT: Kanangra–Boyd.

Habitat

HABITAT: Grassy ridge.

ALTITUDE: 1000 m ANNUAL RAINFALL: 1100 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus pauciflora*.

SUBSTRATE:

EXPOSURE: South and east aspects (Steenbeeke 1997).

Conservation

Rare, Boyd Plateau is southern geographical limit. Coded 2R on national rare species list (Briggs & Leigh 1996). Reported in Kanangra-Boyd NP.

ORCHIDACEAE

Acianthus caudatus

Mayfly Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers and daughter tubers on stolons, a single heart-shaped leaf, dark green above and reddish purple below; flowering stem to 25 cm high with up to 9 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous, forming colonies by vegetative multiplication of tubers (P. Weston, Herb. note, James 1988, Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Purple with odour of rotting meat (P. Weston, Herb. note), July–September, peak August. Possibly pollinated by tiny flies (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period February–August. Grows in loose, open colonies (Jones & Jones 2000).

FIRE RESPONSE: Abundant following fire (P. Weston, Herb. note), presumably resprouting from tubers. Secondary juvenile period 10 months, after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Wondabyne, Glenorie, Cowan, Springwood, Frenchs Forest, Pymble, Roseville, Longeville, Cronulla, Waterfall.

CT: Katoomba, Hill Top.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Low scrub; open-forest e.g. with *Eucalyptus punctata*, *E. piperita*, *Angophora costata*, *Corymbia gummifera*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE: Light shade (Bishop 1996).

Conservation

Conservation status unknown. Reported in Dharug NP, Blue Mountains NP, Royal NP.

ORCHIDACEAE

*Acianthus collinus***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers and daughter tubers on stolons, a heart-shaped leaf, dark green above and reddish purple beneath; flowering stem to 15 cm high with up to 9 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: June–August. Possibly pollinated by tiny flies (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period February–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST NWS CWS.

DISTRIBUTION SYDNEY AREA: Orange–Molong area.

SELECT LOCATIONS: **CT:** Molong.

Habitat

HABITAT: Moist areas. Relatively dry habitats (Bishop 1996).

ALTITUDE: 600 m **ANNUAL RAINFALL:** 700 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Low forest e.g. with *Callitris* and *Eucalyptus sideroxylon*.

SUBSTRATE: Grey clay loam.

EXPOSURE:

Conservation

Only one record for Sydney area at Molong. Conservation status unknown.

ORCHIDACEAE

Acianthus exsertus

Mosquito Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers and daughter tubers on stolons, a single heart-shaped leaf, dark green above and reddish purple below; flowering stem to 20 cm high with up to 20 flowers (Bishop 1996, Jones 1988).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale green with purplish labellum, possibly pollinated by tiny flies (Bishop 1996), March–July, peak April–May.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990). Active growing period February–August.

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:** Mogo Creek, Glenbrook, Kurrajong Heights, Glenhaven, West Head, Pennant Hills, Middle Harbour, Lindfield, Rouse Hill, Gladesville, Ingleburn, Waterfall, Kangaroo Valley. **CT:** Cullen Bullen, Winburndale, Kanimbla Valley, Jenolan Caves, Woodford, Mittagong, Mt Gibraltar.

Habitat

HABITAT:

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus sclerophylla*, *E. sieberi*, *Corymbia gummifera*; moist forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*; rainforest e.g. with *Doryphora sassafras*, *Acmena smithii*.

SUBSTRATE: Sandy soil on sandstone, trachyte, volcanic breccia, low–medium nutrients.

EXPOSURE: Mid-shade. S and E aspects (Steenbeeke 1997).

Conservation

Conservation status unknown. Reported in Yengo NP, Dharug NP, Georges River NR, Royal NP.

ORCHIDACEAE

Acianthus fornicatus

Pixie Caps

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers and daughter tubers on stolons, a single heart-shaped leaf, dark green above and reddish purple below; flowering stem to 30 cm high with up to 10 translucent flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind pers. comm., Jones 1988).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pinkish, insect-like (Jones & Jones 2000), May–August, peak June. Possibly pollinated by tiny flies (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Grows in dense, often extensive colonies (Jones & Jones 2000). Active growing period February–August.

FIRE RESPONSE: Resprouts at base or below (Fox 1988). Fruit 8 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wamberal, Duffys Forest, Mona Vale, Hornsby, Turramuirra, Berrys Bay, Gladesville, Bankstown, Rookwood, Kurnell, Jannali, Heathcote, Bundeena, Campbelltown, Burragorang Valley, Cordeaux Dam. **CT:** Mt Wilson, Hartley.

Habitat

HABITAT:

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*; woodland e.g. with *Corymbia gummifera*, *Corymbia eximia*, *Eucalyptus melliodora*, *E. macrorhyncha*; edge of rainforest.

SUBSTRATE: Sandy soil on sandstone, dune sand, metamorphics, basalt, low to medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Acianthus pusillus

Gnat Orchid

Life history

GROWTH FORM: Small seasonally deciduous terrestrial herb, with paired tubers and daughter tubers on stolons, one heart-shaped leaf, dark green above and reddish purple or greenish beneath; flowering stem to 18 cm high with up to 18 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (Backhouse & Jeanes 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Dull green to pinkish or reddish, insect-like, March–August. Possibly pollinated by tiny flies (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH: Growing period February–August.
 FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), fruit 26–30 weeks later (P. Kubiak pers. comm.).
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., S.A.
 DISTRIBUTION SYDNEY AREA: Sporadic.
 SELECT LOCATIONS: **CC**: Norah Head, Kulnura, Waterfall.

Habitat

HABITAT: Moist habitats.
 ALTITUDE: 0–300 m ANNUAL RAINFALL: 1200–1400 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION: Heath; open-forest; rainforest margins.
 SUBSTRATE: Sandy soils (Bishop 1996).
 EXPOSURE: Shade.

Conservation

ORCHIDACEAE

Adenochilus nortonii

Life history

GROWTH FORM: Slender evergreen terrestrial herb, with fleshy rhizome, few roots and 1 leaf per shoot; flowering stem to 15 cm high with 1 flower (Bishop 1996, Jones 1988).
 VEGETATIVE SPREAD: Yes (P. Hind pers. comm.).
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: November–December. Possibly pollinated by bees or wasps (Pridgeon et al. 2001), not self-pollinated (Jones 1988).
 FRUIT/SEED: Capsule with numerous minute winged seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC NT CT.
 DISTRIBUTION SYDNEY AREA: Mainly Blue Mountains.
 SELECT LOCATIONS: **CC**: Helensburgh. **CT**: Mt Victoria, Blackheath, Wentworth Falls, Woodford.

Habitat

HABITAT: Wet rocky crevices of rock faces, leaf litter, rock overhangs, near creeks.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent–occasional.
 VEGETATION: Grows with Sphagnum moss, *Gleichenia*, *Blechnum*, *Todea barbara*, *Bauera rubioides*, *Callicoma serratifolia*.
 SUBSTRATE: Moist sandstone overhangs, low nutrients, permanent moisture.
 EXPOSURE:

Conservation

Helensburgh is southern geographical limit. Conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

Arthrochilus huntianus

Elbow Orchid

Life history

GROWTH FORM: Saprophytic, leafless, seasonal terrestrial herb, with paired tuberosids and slender wiry, reddish flowering stem to 15 cm high with up to 10 flowers.
 VEGETATIVE SPREAD: No (Pridgeon & Chase 1995).
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:

FLOWERS: Bronzy to reddish green, November–March, peak January. Pollinated by the sexual deception of male thynnine wasps, *Arthrothynnus huntianus*; the flowers mimic both appearance and sex pheromones of wingless females (Jones & Jones 2000, Mant et al. 2002).
 FRUIT/SEED: Capsule with numerous minute seeds, released 8–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH: Plants grow as scattered individuals or in loose groups (Jones 1988).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC NT CT SWS; Vic.
 DISTRIBUTION SYDNEY AREA: Sporadic.
 SELECT LOCATIONS: **CT**: Mt Victoria, Jenolan Caves.

Habitat

HABITAT: Ridgetops, with plentiful leaf litter and often extensive bare ground (Bishop 1996).
 ALTITUDE: 800–1000 m ANNUAL RAINFALL: 900–1000 mm
 TYPICAL LOCAL ABUNDANCE: Occasional.
 VEGETATION: Open-forest e.g. with *Eucalyptus sieberi*, *E. piperita*, *E. sclerophylla* with shrubby understorey.
 SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. May be inconspicuous and readily overlooked (Jones & Jones 2000). Conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

Arthrochilus prolixus (prev. conf. with *A. irritabilis*)

Life history

GROWTH FORM: Seasonally deciduous, leafless terrestrial herb, with paired tuberosids and daughter tubers; flowering stem to 32 cm with up to 20 flowers (Bishop 1996).
 VEGETATIVE SPREAD: Stoloniferous (Jones 1991).
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Pale green with purple to reddish hairs, December–May. Probably pollinated by sexual deception of male thynnine wasps *Arthrothynnus*.
 FRUIT/SEED: Capsule with numerous minute winged seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH: Active growth period summer (Pridgeon et al. 2001).
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC; Qld.
 DISTRIBUTION SYDNEY AREA: Sporadic.
 SELECT LOCATIONS: **CC**: Narrabeen.

Habitat

HABITAT: Ridges, slopes.
 ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION: Open-forest.
 SUBSTRATE: Reported from rotting sawdust heaps.
 EXPOSURE:

Conservation

Mainly is the southern geographical limit (Harden 1993). Conservation status unknown.

ORCHIDACEAE

Bulbophyllum elisae

Pineapple Orchid

Life history

GROWTH FORM: Rhizomatous, evergreen epiphytic or epilithic terrestrial herb, forming dense mats.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green, May–December.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC NT CT CWS; Qld.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: CT: Corricudgy (1897), Rylstone.

Habitat

HABITAT:

ALTITUDE: 600–1300 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest.

SUBSTRATE: Trees or exposed rocks.

EXPOSURE:

Conservation

Blue Mountains is southern geographical limit. Conservation status unknown. Reported from Blue Mountains NP (P. Weston pers. comm.).

ORCHIDACEAE

Bulbophyllum exiguum**Life history**

GROWTH FORM: Rhizomatous epiphytic or epilithic evergreen herbs, forming dense mats. Pseudobulbs topped with a single flat, dark green leaf (Jones & Jones 2000).

VEGETATIVE SPREAD: Rhizomatous. Forming extensive spreading patches (Jones & Jones 2000).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish to cream, with 1–5 flowers, March–May.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Culoul Range, Wyong, Wisemans Ferry, Maroota, Springwood, Wahroonga, Waterfall, Bulli, Bomaderry Creek. CT: Robertson.

Habitat

HABITAT: Near streams.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Rainforest e.g. with *Tristaniopsis laurina*, *Ceratopetalum apetalum*, *Callicoma serratifolia*; moist open-forest e.g. with *Syncarpia glomulifera*, *Backhousia myrtifolia*.

SUBSTRATE: Sandstone boulders, trees.

EXPOSURE: Deep shade.

Conservation

Vulnerable in Western Sydney (James et al. 1999). Reported in Blue Mountains NP, Royal NP.

ORCHIDACEAE

Bulbophyllum minutissimum**Life history**

GROWTH FORM: Rhizomatous epiphytic or epilithic evergreen herb, forming dense mats. Leaves minute, scale-like deciduous; the entire photosynthetic portion of the plant consists of hollow pseudobulbs and the minute leaf (Schwartz 1997).

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: October–November.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Qld.

DISTRIBUTION SYDNEY AREA: Coastal.

SELECT LOCATIONS: CC: Kiama.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest; open-forest.

SUBSTRATE: Trees and rocks. Commonly found on the undersides of branches of *Ficus macrophylla* or mangroves (Schwartz 1997).

EXPOSURE:

Conservation

Regionally rare in Illawarra region (Mills 1988).

ORCHIDACEAE

Bulbophyllum shepherdii (*B. crassulifolium*)

Wheat-leaved Orchid

Life history

GROWTH FORM: Rhizomatous epiphytic or epilithic evergreen herb, prostrate, forming dense mats.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Whitish, September–November.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Matcham, Waterfall, Springwood.

Habitat

HABITAT:

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Rainforest e.g. with *Backhousia myrtifolia*, *Trochocarpa laurina*.

SUBSTRATE: Rocks or trees.

EXPOSURE: Deep shade.

Conservation

Reported in Blue Mountains NP. Conservation status unknown.

ORCHIDACEAE

Burnettia cuneata

Lizard Orchid

Life history

GROWTH FORM: Seasonal leafless terrestrial, saprophytic herb to 13 cm when flowering. Tuber present and capable of surviving many seasons underground without producing a leaf or flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: 2–4 years (Pridgeon & Chase 1995).

PRIMARY JUVENILE PERIOD:

FLOWERS: White–pinkish, outside with dark striations on veins, September–October. Probably pollinated by native bees (Pridgeon et al. 2001), not self-pollinating (Jones 1988).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Flowers exclusively after fire (Bishop 1996), with plants dying after flowering. No replacement tubers (Pridgeon et al. 2001).

INTERACTION WITH OTHER ORGANISMS: Associated with *Melaleuca squarrosa* (Pridgeon et al. 2001).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Illawarra–Southern Highlands.

SELECT LOCATIONS: CC: Waterfall, Bulli Pass, Jamberoo Mountain, Robertson, Mt Kembla.

Habitat

HABITAT: Swampy thickets.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Shrubby swamps dominated by *Melaleuca* and *Leptospermum*, possibly partly parasitic on *Melaleuca squarrosa* (Bishop 1996).

SUBSTRATE: Wet peaty soil, low nutrients.

EXPOSURE:

Conservation

Coded 3RC- on national rare species list (Briggs & Leigh 1996). Waterfall is northern geographical limit. Reported in Royal NP, Barren Grounds NR.

ORCHIDACEAE

***Caladenia alata* (C. holmesii)**

Fairy Orchid

Life history

GROWTH FORM: Terrestrial seasonal deciduous herb, with underground paired tubers, single leaf.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Short-lived, white or pink, September–October, peak September.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Wyong, Calga, Wahrenonga, Grose Vale, Avoca Reserve, Grose Wold (R.G Coveny), Marsfield, Kurnell, Loddon River. CT: Belmore Falls.

Habitat

HABITAT: Moist sites, edge of sandstone outcrops, swamps, near lakes.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Corymbia gummifera*, *Eucalyptus piperita*; scrub e.g. with *Kunzea ambigua*.

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Caladenia australis* (C. reticulata,*Life history**

GROWTH FORM: Seasonally dormant terrestrial herb, with underground paired tubers, narrow leaf to 12 cm long, sparsely hairy.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish cream with red stripes, flower stalk to 40 cm high, September–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: More easily found after fire (Bishop 1996).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT ST CWS SWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS:

Habitat

HABITAT:

ALTITUDE: ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland or low open-forest (Bishop 1996).

SUBSTRATE:

EXPOSURE:

Conservation

ORCHIDACEAE

***Caladenia capitellata* (C. filamentosa var. tentaculata)**

Green Comb, Fringed Spider Orchid

Life history

GROWTH FORM: Terrestrial seasonally deciduous herb, with underground paired tubers, single hairy leaf and flowering stems to 45 cm high.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish, September–December, peak October.

FRUIT/SEED: Capsule with numerous, minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST NWS CWS SWS NWP SWP ?SFWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Coast and Bathurst/Orange area.

SELECT LOCATIONS: CC: Gladsville, Cooks River, Jann ali. CT: Orange, Hill End, Marrangaroo, Wentworth Falls, Hill Top, Abercrombie Caves.

Habitat

HABITAT: Rocky hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus rossii*, *E. polyanthemos*, *E. macrorhyncha*.

SUBSTRATE: Stony soils on shales, slate porphyry, low nutrients.

EXPOSURE:

Conservation

Rare, last Coastal record is Janali 1933. Conservation status elsewhere unknown.

ORCHIDACEAE

Caladenia carnea

Pink Fairy, Pink Fingers

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers, single leaf.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink, August–October, peak September.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Winter-growing.

FIRE RESPONSE: Resprouts at base or below (Fox 1988). Flowering 9 months after high intensity fire (1/1994 at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Agnes Banks, Villawood, Sutherland, Holsworthy, Loddon River. **CT:** Coricudgy, Mt Victoria, Katoomba Falls, Mt Werong, Mittagong.

Habitat

HABITAT: Often in or recolonising cleared areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–rare.

VEGETATION: Woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Angophora costata*, *Eucalyptus sclerophylla*, *E. cannonii*, *E. amplifolia*, *E. obliqua*, *Banksia serrata*, *Banksia ericifolia*.

SUBSTRATE: Sandy soil on sandstone, granite, slates, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP.

ORCHIDACEAE

Caladenia catenata (*C. alba*)

White Caladenia, White Fingers

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers, single leaf.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White, mainly August–October, peak September.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990), probably wind-dispersed.

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), green fruit 10 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic., N.Z.

DISTRIBUTION SYDNEY AREA: Coast and hinterland.

SELECT LOCATIONS: **CC:** Ourimbah, Terrigal, Mt Irvine, Richmond, Glenbrook, Hornsby, Ryde, Rookwood, St Marys, Bankstown, Tempe, La Perouse, Oatley, Kurnell, Bola Creek, Waterfall, Mt Kembla.

Habitat

HABITAT: Hillsides, slopes.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus sieberi*, *E. piperita*, *Syncarpia glomulifera*; woodland with *Eucalyptus fibrosa*, *E. parramattensis*, *Melaleuca decora*.

SUBSTRATE: Sandy to clay soils on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE: SW aspect, bright light but protected locations (Steenbeeke 1997).

Conservation

Conserved in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Royal NP.

ORCHIDACEAE

Caladenia clavigera

Clubbed Spider Orchid, Small Spider Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers, single leaf, flowering stem to 40 cm high.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green with maroon stripes, usually only one flower, with metallic odour (Bishop 1996), October–November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Bathurst area.

SELECT LOCATIONS: **CT:** Yetholme, Abercrombie Caves, Tarana.

Habitat

HABITAT: Ridges.

ALTITUDE: 500–1000 m ANNUAL RAINFALL: 600–800 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Eucalypt open-forest, woodland.

SUBSTRATE: Skeletal clayey soil, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wambool NR.

ORCHIDACEAE

Caladenia congesta

Black Tongue Caladenia

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single leaf; flowering stem to 60 cm high with 1–4 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Bright pink, October–December, peak November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Bathurst area, Southern Highlands.

SELECT LOCATIONS: **CT:** Yetholme, Mullion Creek, Wildes Meadow.

Habitat

HABITAT: Ridges.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus rossii*, *E. goniocalyx*.

SUBSTRATE: Shallow stony soils on sandstones, shales, low nutrients.

EXPOSURE:

Conservation

Rare (Bishop 1996), conservation status unknown.

ORCHIDACEAE

ORCHIDACEAE

Caladenia cucullata

Hooded Caladenia

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single leaf; flowering stem to 25 cm high with up to 5 flowers.

VEGETATIVE SPREAD: Not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Cream inside, outer surfaces greenish-brown or purplish, September–November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Winter-growing vegetative shoots from tubers.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Associated with mycorrhizal fungi (Jones & Elliot 1986).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST CWS SWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT:** Yetholme, Newnes, Katoomba, Abercrombie Caves.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus rossii*; margins of shrub swamps e.g. with *Gymnoschoenus sphaerocephalus*.

SUBSTRATE: Shallow stony soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

ORCHIDACEAE

Caladenia curtisepala (prev. incl. in *C. carnea*)**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single leaf; flowering stem to 20 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale pink or white inside, yellowish green on outside, with musky or spicy scent (Bishop 1996), August–September.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Mt Ku-ring-gai.

SELECT LOCATIONS: **CC:** Mt Ku-ring-gai.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*.

SUBSTRATE: Sandy soils on Hawkesbury sandstone, low nutrients.

EXPOSURE:

Conservation

Restricted to dry sclerophyll forest on Hawkesbury Sandstone (Harden 1993). Reported in Ku-ring-gai Chase NP.

*Caladenia dimorpha***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single leaf; flowering stem to 30 cm high with up to 3 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White inside, outside surfaces greenish to light brown, with scent of coumarin (Bishop 1996), September–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Some records from areas previously burnt.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS SWS; Vic.

DISTRIBUTION SYDNEY AREA: Blue Mountains to Orange.

SELECT LOCATIONS: **CT:** Mullions Range, Orange, Capertee, Wallerawang, Bowenfels, Mt Cameron, Clarence, Mt Irvine, Bell, Woodford, Katoomba, Trunkey Creek, Abercrombie Caves, Mittagong, Taralga.

Habitat

HABITAT: Slopes.

ALTITUDE: 700–1100 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus viminalis*, *E. radiata*; woodland e.g. with *Eucalyptus mannifera*.

SUBSTRATE: Gravelly soil on metamorphics, basalt, low to medium nutrients, well-drained.

EXPOSURE: Mid-shade.

Conservation

Uncommon, Blue Mountains is northern geographical limit.

Conservation status unknown.

Caladenia filamentosa

Daddy Long-legs

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single leaf; flowering stem to 40 cm high with up to 4 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Maroon to cream, September–November. Flowers visited by thynnine wasps, *Chilothynnus trochanterinus*, *Aeolothynnus* sp. (at Mullion Creek, Bower n.d.).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWP; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread, sporadic.

SELECT LOCATIONS: **CC:** Manly, Como, Wedderburn. **CT:** Abercrombie Caves.

Habitat

HABITAT:

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Eucalypt woodland.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation Conservation status unknown. Occurrence is very unpredictable (Bishop 1996).

ORCHIDACEAE

Caladenia fitzgeraldii

Spider Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single narrow leaf to 14 cm long; flowering stem to 35 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish green with red markings, August–November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS.

DISTRIBUTION SYDNEY AREA: Wellington–Bathurst area (Harden 1993).

SELECT LOCATIONS: **CT**: Clarence.

Habitat

HABITAT:

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 900–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE: Gravelly or rocky soil.

EXPOSURE:

Conservation

Only Sydney area record is Clarence in 1961. Conservation status unknown.

ORCHIDACEAE

*Caladenia fuscata***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers, single narrow leaf to 15 cm long, sparsely hairy; flowering stem to 15 cm with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Inner surface white to pink, out surface reddish brown, September–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Ourimbah, Yarramalong, Terrey Hills, Riverstone, Wedderburn, Burragorang. **CT**: Yetholme, Blackheath, Wentworth Falls, Megalong Valley, Bowral, Abercrombie Caves.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus mannifera*, *E. radiata*, *E. rossii*, *Melaleuca decora*, with grassy or shrubby understorey.

SUBSTRATE: Gravelly sandy to clay soils on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Caladenia gracilis (*C. angustata*)

Musky Caladenia

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single narrow leaf to 30 cm long, sparsely hairy; flowering stem to 40 cm with up to 6 flowers (Bishop 1996).

VEGETATIVE SPREAD: Not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White, often pinkish or bronzy markings, with musky to soapy scent, October–November, peak October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Winter-growing, producing vegetative shoots from bulbs, some records after fire.

INTERACTION WITH OTHER ORGANISMS: Associated with mycorrhizal fungi (Jones & Elliot 1986).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Mainly Upper Blue Mountains.

SELECT LOCATIONS: **CT**: Clarence, Hassans Walls, Mt Irvine, Mt Wilson, Katoomba, Bullaburra, Mt Werong, Trunkey Creek, Oberon, Mittagong, Abercrombie Caves.

Habitat

HABITAT: Ridges and slopes.

ALTITUDE: 600–1100 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus sieberi*, *E. macrorhyncha*; woodland e.g. with *Eucalyptus mannifera*, *E. radiata*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Caladenia hillmanii (*Caladenia* sp. B)**Life history**

GROWTH FORM: Seasonally dormant terrestrial herb, with underground paired tubers, narrow leaf to 6–12 cm long, sparsely hairy. Broadly overlaps geographically with *C. species C* but no intergrades recorded (Harden 1993).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Light pink with red-purple blotches, August–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC.

DISTRIBUTION SYDNEY AREA: Coastal, sporadic (Bishop 1996).

SELECT LOCATIONS:

Habitat

HABITAT:

ALTITUDE: ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Low open-forest with heathy understorey (Bishop 1996).

SUBSTRATE: Pale grey sandy soils (Bishop 1996).

EXPOSURE:

Conservation

ORCHIDACEAE

ORCHIDACEAE

Caladenia iridescens

Bronze Caladenia

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a sparsely hairy, single narrow leaf to 10 cm long; flowering stem to 15 cm with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish yellow, unscented, September–November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT; Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: CC: Elanora Heights. CT: Mt Wilson, Blackheath, Wentworth Falls, Lawson, Woodford.

Habitat

HABITAT: Ridgetops, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *E. sieberi*, *E. sclerophylla*.

SUBSTRATE: Stony sand over sandstone, low nutrients.

EXPOSURE:

Conservation

Mainly Blue Mountains, only one record from the Coast (Elanora Heights 1953). Conservation status unknown.

ORCHIDACEAE

ORCHIDACEAE

Caladenia phaeoclavia**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a narrow hairy leaf to 13 cm long, with red-purple blotches; flowering stem 10–25 cm high, usually with 1 flower (Bishop 1996). Often grows with *C. tentaculata*, which it closely resembles (Harden 1993).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: With dark red stripes, October–November.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS SWS; Vic.

DISTRIBUTION SYDNEY AREA: Bathurst area.

SELECT LOCATIONS: CT: Yetholme, O'Connell.

Habitat

HABITAT: Grassy or rocky sites on slopes or ridges.

ALTITUDE: 800–900 m ANNUAL RAINFALL: 700 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus macrorhyncha*, *E. gonicalyx*; woodland e.g. with *Eucalyptus melliodora*, *E. bridgesiana*, *E. blakelyi*.

SUBSTRATE: Loamy soil on alluvium, low nutrients.

EXPOSURE:

Conservation

Bathurst is northern geographical limit. Conservation status unknown. Reported in Wamberal NR.

Caladenia picta (*Caladenia alba* var. *picta*)**Life history**

GROWTH FORM: Terrestrial seasonally deciduous herb, with underground paired tubers and a single sparsely hairy narrow leaf to 8 cm long; flowering stem 15 cm high, usually with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White and pinkish, mainly May–June.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Appears to be Autumn-growing.

FIRE RESPONSE: One record from recently burnt area.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: CC: Wisemans Ferry, Springwood, Narrabeen, Kurnell, Picnic Point, Lugarno, Burragorang Valley.

Habitat

HABITAT:

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus sieberi*, *Syncarpia glomulifera*.

SUBSTRATE: Shallow, clay-loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Newcastle is northern geographical limit, conservation status unknown. Reported in Royal NP.

Caladenia quadrifaria (*Caladenia* sp. C)**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single sparsely hairy narrow leaf to 16 cm long; flowering stem to 20 cm high with 1–2 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Inner surface bright pink, outer surface greenish pink, September–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT.

DISTRIBUTION SYDNEY AREA: North from Bateau Bay.

SELECT LOCATIONS: CC: Lake Macquarie, Bateau Bay.

Habitat

HABITAT: Slopes and ridges.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest often under *Allocasuarina* species

SUBSTRATE: Sandy or shallow clay loams.

EXPOSURE:

Conservation

Bateau Bay is southern geographical limit.

ORCHIDACEAE

Caladenia tessellata

Thick Lip Spider Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single sparsely hairy narrow leaf to 6 cm long; flowering stem to 30 cm high with 1–2 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Cream-coloured with reddish stripes, flower stalk to 25 cm high, August–November, peak September.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Reported to be evident only after a fire (Bishop 1996).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC ST; Vic.

DISTRIBUTION SYDNEY AREA: Coast, Swansea to Loftus.

SELECT LOCATIONS: C: Wyong, Berowra, Castlecrag, Tempe, Como, Sutherland, Loftus.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1100–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Heath. Often in very dense shrubbery (Bishop 1996).

SUBSTRATE: Clay, loam or sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Listed as Endangered (Schedule 1) under the NSW Threatened Species Conservation Act 1995, as most of Sydney habitat has been destroyed by urban development. It is now only known from 3 populations in the Wyong area (and one population near Braidwood), with a total population size is less than 50 individuals (Final Determination 2002 NSW Scientific Committee). It is not known to occur in any conservation area. Swansea is the northern geographical limit. Continuing decline of individuals and populations, threatened by habitat degradation and pedestrian activity; not known to occur within any conservation reserve (NPWS website:

www.nationalparks.nsw.gov.au).

ORCHIDACEAE

Caladenia testacea

Honey Caladenia

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers and a single sparsely hairy narrow leaf to 5 cm long; flowering stem to 18 cm high with 1–2 flowers, a variable species (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White or pale green to greenish yellow, unscented, September–February.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Flowering 18 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Bilpin, Glenorie, Lower Portland, Fox Valley, North Rocks. CT: Hill End, Lithgow, Fitzroy Falls, Penrose, Abercrombie Caves.

Habitat

HABITAT: Slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Woodland e.g. with *Eucalyptus haemastoma*, *E. piperita*, *Corymbia gummifera*, *E. melliodora*, *E. rossii*, *E. macrorhyncha*; heath e.g. with *Eucalyptus stricta*, *Leptospermum*.

SUBSTRATE: Sandy, stony soils on sandstone, slates, low nutrients.

EXPOSURE:

Conservation

Newcastle is northern geographical limit. Conservation status unknown.

ORCHIDACEAE

Calanthe triplicata

Christmas Orchid

Life history

GROWTH FORM: Terrestrial evergreen herb, with pseudobulb 3–8 cm long; leaves 25–90 cm long, 6–18 cm wide, inflorescence to 1.5 cm long, with up to 40 flowers.

VEGETATIVE SPREAD: Yes, rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White, October–January.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT; Qld, Asia, Malaysia, Melanesia.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Cooranbong, Yarramalong, Somersby.

Habitat

HABITAT: Rainforest floor, creek bank.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest; moist open-forest

SUBSTRATE:

EXPOSURE: Dense shade.

Conservation

Illawarra district is southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Caleana major

Large Duck Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with narrow leaf, underground paired tubers and stolons, with daughter tubers; flowering stem to 40 cm high with up to 5 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Reddish brown to shiny purple (or rarely greenish with dark spots), flower stalk 40 cm high, September–February, peak October–November. Flowers may last for up to 2 months (Pridgeon & Chase 1995). Pollinated by pseudocopulation by male sawfly *Pterygophorus* (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouts at base or below (Fox 1988). Fruit 12 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Upper Colo, Glenbrook, Bilpin, Linden, Sackville, Agnes Banks, Pittwater, Hornsby, Frenchs Forest, Manly, Bondi, La Perouse, Kurnell, Waterfall, Bundeena, Mt Jamberoo, Nowra, Hill Top. **CT:** Mt Wilson, Mt Victoria, Wentworth Falls, Werong, O'Connell.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Open-forest; woodland e.g. with *Corymbia gummifera*, *Eucalyptus sieberi*, *E. piperita*, *Angophora costata*, *Eucalyptus sclerophylla*, *E. parramattensis*, *E. mannifera*, *E. rossii*; swampy heath e.g. with *Banksia ericifolia*, *Banksia serrata*, *Lambertia formosa*.

SUBSTRATE: Sandy or gravelly soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Agnes Banks NR, Royal NP.

ORCHIDACEAE

Calochilus campestris (*Calochilus saprophyticus*)

Copper Beard Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers; flowering stem to 60 cm high with up to 15 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (P. Hind pers. comm., Jones 1988), not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale green, with purple stripes and purplish beard; flower stalk to 60 cm high, September–October, peak October. Self-pollinating, also pollinated by scolis wasps *Campsomeris*, by sexual deception (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds, October–December.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove and Narrabeen), flowering 10 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Upper Colo, Lower Portland, Maroota, Gosford, Mulgoa, Castlereagh, Hornsby, Frenchs Forest, Lindfield, Gladesville, Maroubra, Cooks River, East Hills. **CT:** Wentworth Falls (1889).

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Forest e.g. with *Angophora costata*, *Corymbia gummifera*; woodland e.g. with *Eucalyptus sclerophylla*, *E. parramattensis*, *Angophora bakeri*.

SUBSTRATE: Sandy to clayey soil on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Calochilus gracillimus

Slender Beard Orchid, Late Beard Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with narrow leaf and underground paired tubers; flowering stem to 45 cm high with up to 9 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (Jones 1988).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green with purple stripes and purple to bronze beard, flower stalk to 45 cm high, late October–early February. Probably self-pollinating.

FRUIT/SEED: Capsule with numerous minute winged seeds, January–February.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT CWS; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Woy Woy, Sackville, Middle Cove.

CT: Mt Irvine, Wentworth Falls, Woodford.

Habitat

HABITAT: Ridgetops, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest; woodland e.g. with *Casuarina*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Calochilus paludosus

Red Beard Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with narrow leaf and paired tubers; flowering stem to 35 cm high with up to 9 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (P. Hind pers. comm., Jones 1988).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green, often with reddish veins and red to coppery beard, flower stalk to 35 cm high, September, peak October. Self-pollinating, occasionally insect-pollinated (Van de Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove and Narrabeen), green fruit 41 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST CWS SWS; Qld, Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Gosford, Pearl Beach, Agnes Banks, Glenbrook, Berowra, Pennant Hills, Mosman, Gladesville, Centennial Park, Cambridge Park, Bankstown, Royal NP, Bargo. **CT:** O'Connell, Bell, Victoria Falls, Wentworth Falls (1898), Woodford.

Habitat

HABITAT: Dry ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *Syncarpia glomulifera*, *Acmena smithii*; woodland e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. sclerophylla*, *E. parramattensis*; heath e.g. with *Banksia ericifolia*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Calochilus robertsonii (*C. imberbis*)

Purplish Beard Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with narrow leaf and paired tubers; flowering stem to 45 cm high with up to 9 flowers, a variable species (Bishop 1996).

VEGETATIVE SPREAD: No (P. Hind pers. comm., Jones 1988). Not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Reddish brown with darker stipes and purple-maroon or bronzy beard, flower stalk 46 cm high, September–October. Self-pollinating, occasionally insect-pollinated (Van de Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), flowering 39–41 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., N.T., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Woy Woy, Agnes Banks, Blaxland, Hornsby, Longeville, East Hills, Kurnell, Sutherland. **CT:** Dunns Swamp, Mullion Range, Capertee, Yetholme, Lawson, Abercrombie Caves, Mittagong.

Habitat

HABITAT: Gentle slopes.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Eucalypt woodland e.g. with *Eucalyptus sclerophylla*, *Angophora costata*, *Eucalyptus parramattensis*, *Angophora bakeri*, *Eucalyptus rossii*; heath e.g. with *Banksia ericifolia*, *Eucalyptus obstans*.

SUBSTRATE: Sandy soil on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Chiloglottis chlorantha**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers, flowering stem to 5 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous, forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish green, September–November. Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria* sp.; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC ?ST.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Jamberoo Mountain. **CT:** Kanangra.

Habitat

HABITAT: Moist sheltered slopes.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Boyd Plateau is northern geographical limit (Bishop 1996).

Conservation status unknown.

ORCHIDACEAE

Chiloglottis diphylla**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers, flowering stem to 10 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish, with insect-like black callus, January–May. Thynnine wasps *Neozeleboria*, *Eirone*, attracted to flowers (Bower n.d.). Pollinated by the sexual deception of male thynnine wasps, *Arthrothynnus latus*; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Reported flowering 6 months after fire.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Govetts Leap Creek, Royal NP.

Habitat

HABITAT: Moist areas in forest.

ALTITUDE: 0–600 mm ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist open-forest e.g. with *Eucalyptus deanei*, *Syncarpia glomulifera*.

SUBSTRATE: Loamy soil on shale, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown, reported in Royal NP.

ORCHIDACEAE

Chiloglottis formicifera

Ant Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers; flowering stem to 10 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind, P. Weston pers. comm.), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish brown with shiny black ant-like callus, August–November, peak September. Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria* sp.; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC**: Cattai Creek, Burns Bay, Audley, Loftus, Bala Creek, Woronora, Waterfall, Burratorang Valley, Springwood.

CT: Mt Irvine, Mt Cameron.

Habitat

HABITAT: Moist areas in forest.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*, *Syncarpia glomulifera*, *Acacia melanoxylon*, *E. viminalis*, *E. radiata*.

SUBSTRATE: Loamy soil on shales, basalt, sandstone, low to high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Chiloglottis palachila**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers; flowering stem to 16 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (Jones 1991), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Brownish with blackish ant-like callus, November–February. Pollinated by the sexual deception of male thynnine wasps, *Chilothychnus palachilus*, the flowers mimicking both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT.

DISTRIBUTION SYDNEY AREA: Bathurst area.

SELECT LOCATIONS: **CT**: Sunny Corner.

Habitat

HABITAT: Ridgetop.

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus rubida*, *Poa*, *Pteridium esculentum*.

SUBSTRATE: Clay soil on basalt, high nutrients.

EXPOSURE:

Conservation

Rare in Central Tablelands, known only from Sunny Corner near Bathurst, its southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Chiloglottis reflexa**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers; flowering stem to 18 cm high with flower (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind, P. Weston pers. comm.), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Reddish or greenish, with black insect-like callus, January–May, peak March. Thynnine wasps (*Neozeleboria* sp.) attracted to flowers (at Mt Wilson, Bower n.d.). Pollinated by the sexual deception of male thynnine wasps; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: May colonise the fibrous trunk of tree fern *Dicksonia antarctica* (Pridgeon et al. 2001).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Windsor, Glenhaven, Glenbrook, Springwood, Asquith, Hornsby, Lane Cove, Waterfall, Jamberoo Mountain.

CT: Running Stream, Belah Swamp, Winburndale, Porters Retreat, Mt Wilson, Wentworth Falls, Woodford, Kanimbla Valley, Mittagong, Penrose.

Habitat

HABITAT: Gullies, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. deanei*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus pauciflora*, *Acacia melanoxylon*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Blue Mountains is northern geographical limit. Conservation status unknown.

ORCHIDACEAE

Chiloglottis seminuda**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers that may be at the end of stolons, and daughter tubers, flowering stem to 6 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (P. Weston pers. comm.), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to reddish, with black insect-like callus, January–April. Attempted mating with flowers by thynnine wasps, *Neozeleboria*, *Aeolothynnus westwoodi* (Bower n.d.). Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria* sp.; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST.

DISTRIBUTION SYDNEY AREA: Mainly Southern Highlands.

SELECT LOCATIONS: **CC:** Wedderburn. **CT:** Woodford, Bowral, Fitzroy Falls, Bundanoon.

Habitat

HABITAT: Moist areas of forest.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus radiata*.

SUBSTRATE: Sandy loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Woodford is the northern geographical limit. Conservation status unknown.

ORCHIDACEAE

Chiloglottis sylvestris

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers that may be at the end of stolons, with daughter tubers, flowering stem to 5 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (P. Weston pers. comm.), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish pink, with reddish black insect-like callus, December–May. Thynnine wasps (*Neozeleboria proxima*, *Eirone* sp.) attracted to flowers (Bower n.d.). Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria* sp.; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ?SC NT; Qld.

DISTRIBUTION SYDNEY AREA: Woronora Plateau.

SELECT LOCATIONS: **CC:** Appin Road.

Habitat

HABITAT: Moist situations.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Dry eucalypt forest e.g. with *Doryanthes excelsa*, *Imperata cylindrica*

SUBSTRATE: Sandy clay loam on shale, medium nutrients.

EXPOSURE:

Conservation

Robertson is the southern geographical limit (Harden 1993). Conservation status unknown.

ORCHIDACEAE

Chiloglottis trapeziformis

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 basal leaves, tubers and stolons with daughter tubers; flowering stem to 8 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (Prideon & Chase 1995), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Brownish, with a short shiny black ant-like callus, August–October, peak October. Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria* sp., flowers mimicking both appearance and sex pheromones of wingless females (Mant et al. 2002). Flowers are self-compatible but pollinated by *Neozeleboria cryptoides* (Oakwood n.d.).

FRUIT/SEED: Capsule with numerous minute winged seeds. Capsule mature, and seeds released 1 month after pollination (Oakwood n.d.).

DISPERSAL, ESTABLISHMENT & GROWTH: Grows to maximum height after pollination (Oakwood n.d.).

FIRE RESPONSE: Recorded from one site burnt several years previously.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread but sporadic.

SELECT LOCATIONS: **CC:** Mill Creek, Burns Bay (1887).

CT: Mt Victoria, Bowral, Penrose.

Habitat

HABITAT: Sheltered hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional, occurring as small discrete patches.

VEGETATION: Open-forest e.g. with *Eucalyptus saligna*, *Syncarpia glomulifera*, *Allocasuarina torulosa*.

SUBSTRATE: Loams on shale, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Dharug NP.

ORCHIDACEAE

Chiloglottis trilabra

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, stolons with daughter tubers, and 2 basal leaves; flowering stem to 8 cm high with 1 flower (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (Prideon & Chase 1995), forming clonal colonies.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish brown, with a black insect-like callus, December–May. Pollinated by the sexual deception of male thynnine wasps, *Neozeleboria proxima*; the flowers mimic both appearance and sex pheromones of wingless females (Mant et al. 2002).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST CWS; ?Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT:** Mt Wilson, Kanangra Walls, Wombeyan Caves.

Habitat

HABITAT: Moist areas.

ALTITUDE: 1000–1200 m ANNUAL RAINFALL: 1100 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus dalrympleana*, *E. pauciflora*.

SUBSTRATE: Gravelly loam on granite, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra-Boyd NP.

ORCHIDACEAE

Corybas aconitiflorus

Spurred Helmet Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb with underground replacement and daughter tubers and a single leaf, the lower surface purplish; short erect flowering stem (Bishop 1996).

VEGETATIVE SPREAD: Yes (P. Hind pers. comm.), stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, purplish, March–July, peak May. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE: Some reports from recently burnt areas.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Woy Woy, Kurrajong Heights, Springwood, Hornsby, Terrey Hills, Pennant Hills, Ryde, Nattai, Woronora River, Loftus, Bulli Pass. **CT:** Mt Wilson, Woodford.

Habitat

HABITAT: Gullies, rock ledges.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. globoidea*, *Corymbia gummifera*; heath e.g. with *Corymbia gummifera*, *Acacia suaveolens*, *Banksia ericifolia*, with leaf mould and thick undergrowth.

SUBSTRATE: Sandy soil on sandstone, laterite, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Corybas barbarae

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb with replacement and daughter tubers, a single round leaf, the lower surface purplish and a short, erect flowering stem (Bishop 1996).

VEGETATIVE SPREAD: Yes (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, white to pinkish, May–July. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Northern edge of Sydney (Bishop 1996).

SELECT LOCATIONS: **CC:** Hornsby.

Habitat

HABITAT: Rocky ridges (Bishop 1996).

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest.

SUBSTRATE: Poof sandy soil, low nutrients.

EXPOSURE:

Conservation

Hornsby is southern geographical limit.

ORCHIDACEAE

Corybas fimbriatus

Fringed Helmet Orchid

Life history

GROWTH FORM: Seasonal terrestrial herb with underground replacement and daughter tubers and a single leaf, the lower surface transparent; flowering stem short, leaning back (Bishop 1996).

VEGETATIVE SPREAD: Yes (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, reddish purple, April–August, peak June. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Mangrove Creek, Hornsby, Bobbin Head, Kurnell, Moorebank, Como, Waterfall, Burragorang Valley, Woronora River, Kiama. **CT:** Jenolan Caves, Cullen Bullen.

Habitat

HABITAT: Moist forest.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent, often in extensive colonies (Bishop 1996).

VEGETATION: Moist open-forest, woodland e.g. with *Banksia serrata*.

SUBSTRATE: Sandy soils on dune sand, sandstone, low nutrients.

EXPOSURE:

Conservation

Poorly known local forms occur in the Liverpool area and in *Corymbia maculata* forest at Appin (Bishop 1996). Conservation status unknown.

ORCHIDACEAE

Corybas fordhamii

Banded Helmet Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb with replacement and daughter tubers and a single leaf, the lower surface transparent; flowering stem fine, to 12 mm high with 1–2 flowers, curving backwards (Bishop 1996).

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, reddish purple and white, July–September. Needs very high humidity for flower development, flowers with a strong scent of mushrooms, probably mimic small toadstools and attracting fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE: Often flowers prolifically in season following fire (Bishop 1996).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Scattered on coast and tablelands (Keith 1994).

SELECT LOCATIONS: **CC**: Bedford Creek, O'Hares Creek (Keith 1994), Lodden River.

Habitat

HABITAT: Damp shady situations.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Wet heathland e.g. with *Banksia robur*, *Gymnoschoenus sphaerocephalus*, *Hakea teretifolia*.

SUBSTRATE: Black peaty soil on sandstone, low nutrients, poorly-drained.

EXPOSURE:

Conservation

Uncommon in Sydney region (Keith 1994).

ORCHIDACEAE

Corybas hispidus

Bristly Helmet Orchid

Life history

GROWTH FORM: Terrestrially deciduous seasonal herb with underground replacement and daughter tubers and a single round leaf, the lower surface transparent; flowering stem short, leaning back (Bishop 1996).

VEGETATIVE SPREAD: Yes (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, reddish purple and white, February–May. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT**: Cullen Bullen, Victoria Pass, Woodford.

Habitat

HABITAT: Sheltered slopes, gullies.

ALTITUDE: 500–900 m ANNUAL RAINFALL: 600–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent, forming large loose colonies (Bishop 1996).

VEGETATION: Moist eucalypt forest e.g. with *Pteridium esculentum*.

SUBSTRATE: Loamy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Corybas pruinus

Toothed Helmet Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb with underground replacement and daughter tubers and a single leaf, the lower surface transparent; flowering stem short, leaning back (Bishop 1996).

VEGETATIVE SPREAD: Yes (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, reddish purple and grey green, April–July, peak May–June. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC**: Woodford, Glenbrook, West Head, Hornsby, West Pennant Hills, Ryde, Gladesville, Waverley, Royal NP.

Habitat

HABITAT: Moist sheltered forest.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *Syncarpia glomulifera*, with moist shrubby or fern understorey; rainforest margins.

SUBSTRATE: Clay and loam soils on shale, sandstones, low to medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Royal NP.

ORCHIDACEAE

Corybas undulatus

Tailed Helmet Orchid

Life history

GROWTH FORM: Terrestrially deciduous seasonal herb with underground replacement and daughter tubers and a single round leaf, the lower surface reddish; flowering stem short, leaning back (Bishop 1996).

Smallest of the helmet orchids.

VEGETATIVE SPREAD: Probably (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, purplish red and white, May–July. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast, sporadic.

SELECT LOCATIONS: **CC**: Terrey Hills (1976), Duffys Forest (1976), Frenchs Forest, Warumbul (RNP).

Habitat

HABITAT: Ridges

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Scattered.

VEGETATION: Wet heath e.g. with *Banksia ericifolia*, *Allocasuarina distyla*, *Angophora hispida*, *Corymbia gummifera*.

SUBSTRATE: Damp sand or leaf mould on sandstone, low nutrients, periodically moist.

EXPOSURE:

Conservation

Rarely recorded and easiest to find after bushfires (Bishop 1996), only 8 specimens recorded with most recent collection 1976. Coded 3KC on national rare species list (Briggs & Leigh 1996).

ORCHIDACEAE

Corybas unguiculatus

Small Helmet Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb with underground replacement and daughter tubers and a single leaf, the lower surface purplish; flowering stem straight, leaning strongly backwards (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, purple, May–July. Flowers probably mimic small toadstools and may be pollinated by fungus gnats (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period March–August.

FIRE RESPONSE: Reported from sites burnt in previous year.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Coast south from Gosford.

SELECT LOCATIONS: CC: Woy Woy, Terrey Hills, Pennant Hills, Kurnell, Heathcote, Helensburgh, Bulli Pass, Jamberoo Mountain, Seven Mile Beach.

Habitat

HABITAT:

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Coastal heath e.g. with *Banksia ericifolia*, *Angophora hispida*; open-forest e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Syncarpia glomulifera*.

SUBSTRATE: Sandy soils on sandstone, laterite, low nutrients.

EXPOSURE:

Conservation

Gosford in northern geographical limit. Conservation status unknown. Reported in Royal NP, Seven Mile Beach NP.

ORCHIDACEAE

Cryptostylis erecta

Tartan Tongue Orchid

Life history

GROWTH FORM: Terrestrial evergreen herb, with a tuberous rhizome, fleshy roots and basal leaves with lower surfaces purple; flowering stem to 50 cm high with up to 12 flowers (Bishop 1996).

VEGETATIVE SPREAD: Rhizomatous, growing in small, spreading clumps (Jones 1988).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Forming a hood, lilac with maroon lines, November–February. Pollinated by pseudocopulation by ichneumonid wasp *Lissopimpla excelsa* attracted initially by scent (Coleman 1930).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), flowering 12 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Vic.

DISTRIBUTION SYDNEY AREA: Mainly Coast.

SELECT LOCATIONS: CC: Munmorah, Burralow Creek, Pittwater, Berowra, Narrabeen, Forestville, Manly, Lindfield, Lane Cove, Mosman, Centennial Park, Kogarah, Kurnell. CT: Katoomba.

Habitat

HABITAT: Slopes, creekbanks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *E. piperita*, *Syncarpia glomulifera*; heath.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Dharug NP, Ku-ring-gai Chase NP, Sydney Harbour NP.

ORCHIDACEAE

Cryptostylis hunteriana

Leafless Tongue Orchid

Life history

GROWTH FORM: Terrestrial leafless saprophytic herb, with a tuberous rhizome and fleshy roots; flowering stem pale yellow to 45 cm high with up to 10 flowers (Bishop 1996).

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Maroon, conspicuously hairy, November–February, sporadic, not repeated over subsequent seasons (Bell 2001). Pollinated by pseudocopulation by ichneumonid wasp *Lissopimpla excelsa* (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Reported from areas burnt 1–3 years previously (Bell 2001).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Vic.

DISTRIBUTION SYDNEY AREA: Lake Macquarie to Pittwater.

SELECT LOCATIONS: CC: Chain Valley Bay, Vales Point, Freemans Waterhole, Wye, Charmhaven, West Head (Bell 2001).

Habitat

HABITAT: Coastal plains.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Coastal Plains Scribbly Gum Woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Eucalyptus capitellata*, *Angophora inopina*, *Angophora costata*, with shrubby understorey (Bell 2001).

SUBSTRATE: Dry sandy loams on Triassic Narrabeen geology, low nutrients.

EXPOSURE:

Conservation

Listed as Vulnerable (Schedule 2) under the NSW Threatened Species Conservation Act 1995. Inadequately conserved and threatened by habitat loss and fragmentation, frequent fire during the flowering season, weed invasion and modification of habitat by nutrient enrichment (Bell 2001). Reported in Ku-ring-gai Chase NP.

ORCHIDACEAE

Cryptostylis leptochila

Small Tongue Orchid

Life history

GROWTH FORM: Terrestrial evergreen herb, with a tuberous rhizome, fleshy roots and basal leaves, the lower surfaces purple; flowering stem to 40 cm high with up to 15 flowers (Bishop 1996).

VEGETATIVE SPREAD: Rhizomatous, growing in small, spreading clumps (Jones 1988).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Maroon, minutely hairy, November–March, peak January. Pollinated by pseudocopulation by ichneumonid wasp *Lissopimpla excelsa* attracted initially by scent (Coleman 1927).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Blue Mountains and Southern Highlands.

SELECT LOCATIONS: CT: Bathurst, Bell, Mt Wilson, Katoomba, Carrington Falls, Kangaroo Valley, Robertson, Mittagong.

Habitat

HABITAT:

ALTITUDE: 300–1100 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest.

SUBSTRATE: Sandy soil on sandstone.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Cryptostylis subulata

Large Tongue Orchid

Life history

GROWTH FORM: Terrestrial evergreen herb, with a tuberous rhizome, fleshy roots and basal leaves, with both surfaces dark green to yellow green; flowering stem to 80 cm high with up to 14 flowers (Bishop 1996).

VEGETATIVE SPREAD: Rhizomatous, growing in small, spreading clumps (Jones 1988).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Red brown, minutely hairy, October–March, peak December–January. Pollinated by pseudocopulation by ichneumonid wasp *Lissopimpla excelsa* attracted initially by scent (Coleman 1929).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouts (D. Keith pers. comm.), fruit beginning to form 2 years after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Leaves eaten by rabbits, considerable damage by scratching, possibly seeking roots (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: CC: Toukley, Bilpin, Woodford, Glenbrook, Cheltenham, Narrabeen, Centennial Park, Como, Nowra, Hill Top, Kangaroo Valley. CT: Mt Wilson, Katoomba, Wentworth Falls, Lawson, Barren Grounds.

Habitat

HABITAT: Slopes, rock outcrops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Corymbia gummifera*, *Eucalyptus sieberi*, *E. piperita*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

***Cyanicula caerulea* (*Caladenia caerulea*)**

Blue Caladenia, Blue Fairy, Parson-in-the-pulpit

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with underground paired tubers, single narrow leaf to 7 cm long.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue or rarely white, July–October.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Winter-growing.

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., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Bateau Bay, Forresters Beach, Glenbrook, Castle Hill, Beecroft, Killara, Lane Cove, Rose Bay, Saltpan Creek, Oatley, Wedderburn, Woronora River. CT: Capertee Valley, Turondale, Yetholme, Abercrombie Caves.

Habitat

HABITAT: Ridges or slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus rossii*; shrubland.

SUBSTRATE: Shallow stony soils on sandstone, metamorphics, low nutrients, periodically moist.

EXPOSURE:

Conservation

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

ORCHIDACEAE

Cymbidium suave

Snake Orchid

Life history

GROWTH FORM: Epiphytic herb, with narrow leathery leaves 10–60 cm long, stems not prominently differentiated to form pseudobulbs.

VEGETATIVE SPREAD: Yes, rhizomatous and stoloniferous (Jones 1988).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence 10–35 cm long, with 10–50 olive green flowers, October–December, peak November.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably killed by high intensity fire (1/94 at Lane Cove and Narrabeen), plant burnt by low intensity fire (1/1994) resprouted, and flowered 92 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Mooney Mooney, Glenbrook, Luddenham, Pittwater, Hornsby, Penhurst, Waterfall, Martinsville, Burragarang Valley, Kangaroo Valley. CT: Leura.

Habitat

HABITAT: Epiphytic on hollow limbs and tree trunks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest; woodland e.g. with *Eucalyptus fibrosa*.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Ku-ring-gai Chase NP, Royal NP.

ORCHIDACEAE

ORCHIDACEAE

Cyrtostylis reniformis (*Acianthus reniformis*)**Gnat Orchid****Life history**

GROWTH FORM: Erect seasonally deciduous terrestrial herb 5–27 cm high, with paired tubers and daughter tubers on stolons; a single, basal heart-shaped leaf; flowering stem 8 cm high with up to 4 flowers (Bishop 1996).

VEGETATIVE SPREAD: Stoloniferous (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Light reddish brown or darker, or rarely light yellowish green, June–October. Pollinated by minute species of *Diptera*, attracted by abundance of nectar (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growth period March–September (Pridgeon et al. 2001).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Baulkham Hills, Hornsby, Lane Cove, Como.

CT: Jenolan Caves, Abercrombie Caves.

Habitat

HABITAT:

ALTITUDE: 0–800 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus rossii*, *E. macrorhyncha*; heath.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Dendrobium schoeninum (*Dockrillia schoenina*)**Pencil Orchid****Life history**

GROWTH FORM: Spreading epiphytic or lithophytic evergreen herb with wiry branching stems, grooved leaves and flowering stem to 3 cm high with up to 4 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale green or mauve with red or purple markings.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Watagans.

SELECT LOCATIONS: **CC**: Click Creek.

Habitat

HABITAT: Rainforest margins, swamps, along streams.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Rainforest e.g. with *Acmena smithii*, *Sloanea woollsii*.

SUBSTRATE: On *Casuarina glauca*, *Casuarina cunninghamiana*, rainforest trees and rocks (Bishop 1996).

EXPOSURE: Shade.

Conservation

Reported in Watagans NP, the northern geographical limit.

Dipodium hamiltonianum**Life history**

GROWTH FORM: Terrestrial, leafless mycoheterotrophic evergreen herb; inflorescence to 90 cm long with up to 35 flowers.

VEGETATIVE SPREAD: No (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers generally bright yellow, or sometimes dull yellowish green (Dockrill 1992), September–February.

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ?ST NWS CWS SWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Orange area.

SELECT LOCATIONS: **CT**: Ophir (1965).

Habitat

HABITAT:

ALTITUDE: 900 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Saprophytic species of *Dipodium* appear to have a strong dependence on eucalypts (Bishop 1996).

SUBSTRATE: Acidic, sandy soils

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Dipodium punctatum**Life history**

GROWTH FORM: Terrestrial, leafless mycoheterotrophic herb; inflorescence to 100 cm long, with up to 60 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink with purple blotching, December–April. Pollinated by native bee *Chalicodoma derelicta* (Bernhardt & Burns-Balogh 1983).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouts at base or below (Fox 1988), flowering 2 years after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC**: Yarralong, St Albans, Springwood, Vineyard, Berowra, Longeville, Ryde, North Head, Helensburgh, Kiama, Foxground. **CT**: Lithgow, Bathurst, Robertson.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *E. amplifolia*; woodland e.g. with *Eucalyptus crebra*. Saprophytic species of *Dipodium* appear to have a strong dependence on eucalypts (Bishop 1996).

SUBSTRATE: Clay soils on shales.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

*Dipodium roseum***Life history**

GROWTH FORM: Terrestrial leafless mycoheterotrophic herb; flowering stem to 80 cm high, with up to 40 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink, flower stalk without spots, inflorescence 30–80 cm long, December–January.

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST SWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Mountain, Glenbrook, Bradleys Head.

CT: Dunns Swamp, Winburndale NR, Cullen Bullen, Newnes SF, Mt Wilson, Mt Piddington, Wingello, Bundanoon, Wombeyan Caves, Mittagong

Habitat

HABITAT:

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional–frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus radiata*, *E. dives*, *E. mannifera*, *E. globoidea*, *E. sieberi*, *E. piperita*. Saprophytic species of *Dipodium* appear to have a stong dependence on eucalypts (Bishop 1996).

SUBSTRATE: Variety of soils, sandy soils from sandstone, conglomerate.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP.

ORCHIDACEAE

*Dipodium variegatum***Life history**

GROWTH FORM: Terrestrial mycoheterotrophic herb, with short rhizome and thick fleshy roots (Dockrill 1992); flowering stem to 80 cm long, with up to 50 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Cream to pale pink, usually spotted with maroon blotches, mainly August–January.

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts at base or below (Fox 1988), flowering 1 year after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Bateau Bay, Woy Woy, Killcare, Springwood, Warrimoo, Hornsby, Belrose, Manly, Lane Cove, Tempe, Penshurst, Waterfall, Berry. **CT:** Katoomba.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *Corymbia gummifera*; heath. Saprophytic species of *Dipodium* appear to have a stong dependence on eucalypts (Bishop 1996).

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Diuris aequalis (*Diuris maculata* var. *concolor*)

Buttercup Doubletail

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2 narrow leaves 10–20 cm long in a basal tuft, and flowering stem to 45 cm high with up to 5 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Golden yellow to orange, October–December. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of small-flowered *Gompholobium* species; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous, minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST.

DISTRIBUTION SYDNEY AREA: Mainly ranges and Tablelands.

SELECT LOCATIONS: **CC:** Castlereagh. **CT:** Boyd River, Yetholme.

Habitat

HABITAT: Amongst grass

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1100 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Open-forest e.g. with *Eucalyptus dalrympleana*, *E. pauciflora*, *E. fibrosa*, *E. parramattensis*.

SUBSTRATE: Clay loam on granite, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Listed as Endangered (Schedule 1) under the NSW Threatened Species Conservation Act 1995 and listed nationally under Environment Protection and Biodiversity Conservation Act 1999. Extinct in western Sydney (Bishop 1996). Reported in Kanangra Boyd NP.

ORCHIDACEAE

Diuris alba (*Diuris punctata* var. *alba*)**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 1–3 narrow leaves in a basal tuft and flowering stems to 40 cm, with up to 7 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White with lilac or purple markings, August–October, peak September. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996). Probably pollinated by halictine bees (Coleman 1930).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS; Qld.

DISTRIBUTION SYDNEY AREA: North from Gosford.

SELECT LOCATIONS: **CC**: Doyalson, Putty, Wamberal.

Habitat

HABITAT: Grassy slopes.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Angophora costata*, with grassy understorey e.g. *Themeda australis*.

SUBSTRATE: Grey sandy soil on conglomerate.

EXPOSURE:

Conservation

Wamberal is southern geographical limit, conservation status unknown.

ORCHIDACEAE

Diuris aurea

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 1 or 2 narrow leaves 10–20 cm long in a basal tuft, and flowering stems to 60 cm high, with up to 5 flowers.

VEGETATIVE SPREAD: Not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Golden yellow to orange with dark markings, September–October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996). Probably pollinated by halictine bees (Coleman 1930).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (11/1994 at Narrabeen), green fruit 10 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT ST.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC**: Chain Valley Bay, Lake Haven, Lower Portland, Castlereagh, Londonderry, Marsden Park, North Rocks, Douglas Park, Thirlmere, Bargo. **CT**: O'Connell.

Habitat

HABITAT: Moist grassland.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus fibrosa*, *E. sclerophylla*, *E. haemastoma*, *Angophora costata*, *Corymbia gummifera*.

SUBSTRATE: Sandy loam on conglomerate, claystone, Tertiary alluvium.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Castlereagh NR, Dharug NP.

ORCHIDACEAE

Diuris bracteata

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with 2 narrow leaves in a basal tuft, and tubers.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow with blackish markings, September. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Lower North Shore, Gosford.

SELECT LOCATIONS: **CC**: Gladesville (1889), Gosford.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soil on sandstone.

EXPOSURE:

Conservation

Previously known only from the original collection near Gladesville on the Parramatta River before 1889, but recently rediscovered in Gosford area. Listed as presumed Extinct (Schedule I) NSW Threatened Species Conservation Act 1995; listed nationally Extinct by the Commonwealth Endangered Species Protection Act 1992. Coded IX on national rare species list (Briggs & Leigh 1996).

ORCHIDACEAE

Diuris brevissima

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers and 2 narrow leaves 30 cm long in a basal tuft.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Light yellow with red-brown markings, October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: **CT**: Wentworth Falls.

Habitat

HABITAT:

ALTITUDE: 1000 m ANNUAL RAINFALL: 1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Recorded from only one site in the Blue Mountains. Bishop (1996) regards this species merely as a form of *D. maculata*.

ORCHIDACEAE

Diuris chryseopsis

Small Snake Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb. Grows singly or in tufts of up to 5 plants, with stems to 30 cm high with 1–4 nodding flowers (Jones & Jones 2000).

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Bright lemon yellow with brown streaks and markings, August–October (Jones & Jones 2000), September–October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Often grows in loose colonies (Jones & Jones 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST SWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Putty. **CT:** Wattle Flat, Sofala, Jenolan Caves, Mt Werong, Abercrombie Caves, Bowral, Burrawang.

Habitat

HABITAT: Moist grassy areas.

ALTITUDE: 300–900 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland; woodland.

SUBSTRATE: Sandy loam, shallow clay loams (Jones 1998).

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Diuris dendrobioides (*Diuris punctata* var. *minor*)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2 narrow leaves 10–25 cm long in a basal tuft, and flowering stems to 40 cm, with up to 6 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Mauve with purple markings, October–January. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC NT CT ST NWS CWS SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Penrose.

Habitat

HABITAT:

ALTITUDE: 700 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassy open-forest.

SUBSTRATE: Sandy clay loam.

EXPOSURE:

Conservation

Only CT record is Penrose.

ORCHIDACEAE

Diuris lanceolata

Snake Orchid, Golden Moths

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with 3–9 narrow leaves in a basal tuft, and tubers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.), not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale yellow to bright yellow, nodding, September–October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST; Vic., Tas., ?S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Ingleburn. **CT:** Sofala, Orange, Mt Victoria, Burrawang, Abercrombie Caves,

Habitat

HABITAT: Moist grassy areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Eucalypt woodland, cleared areas.

SUBSTRATE: Clay or peaty soils on shale, alluvium, low nutrients.

EXPOSURE: Probably full sun.

Conservation

Conservation status unknown.

ORCHIDACEAE

Diuris maculata

Spotted Doubletail

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2–3 narrow leaves in a basal tuft, and flowering stems to 40 cm high, with up to 10 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow with brown markings, August–October. Self-compatible and attracts pollinators e.g. native bees *Leioproctus* sp., by floral mimicry of *Daviesia* species and *Pultenaea scabra* — they are remarkably similar in colour and shape to *D. maculata* (Hutchinson et al. 1986).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Summer-dormant species producing vegetative shoots from bulbs during winter, no seedlings recorded less than 1 year after fire (Purdie 1977).

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), green fruit 33–36 weeks later; flowering appeared to peak in the first year after fire (P. Kubiak pers. comm.). Dramatic increase in flowering after hot summer fires (Beardsell et al. 1986).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; ?Vic.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Riverstone, North Ryde, Casula, Holsworthy, Bulli–Appin Road.

Habitat

HABITAT: Hilltops, slopes.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Amongst grass in woodland e.g. with *Eucalyptus fibrosa*, *Melaleuca decora*.

SUBSTRATE: Sandy clay on Tertiary alluvium, low nutrients, well-drained.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999).

ORCHIDACEAE

Diuris pardina (*Diuris maculosissima*)

Leopard Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2–3 narrow leaves in a basal tuft, and flowering stems to 40 cm high, with up to 10 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, heavily marked with red-brown, August–October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996). No nectar produced but possibly pollinated by food deception of food-seeking insects such as bees (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST CWS SWS SWP; Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Glenorie, Blaxland, Marsden Park, Rosehill, Kentlyn, Wedderburn, Darkes Forest. **CT:** Mullion Range, Cullen Bullen, Yetholme, Clarence, Katoomba, Abercrombie Caves, Hill Top, Mittagong.

Habitat

HABITAT: Slopes, ridges.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Amongst grass in open-forest e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *E. pilularis*, *E. sclerophylla*, *Angophora costata*.

SUBSTRATE: Sandy loam on sandstone, metamorphics, low nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Diuris pedunculata

Small Snake Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, usually with 2 narrow leaves 4–12 cm long in a basal tuft, and flowering stem to 18 cm high with 1–2 flowers (Bishop 1996).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Drooping, bright yellow with dark markings, August–September. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Palatable to rabbits (Leigh et al. 1987).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST CWS SWS SWP; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Hawkesbury River (Bishop 1996).

SELECT LOCATIONS: No specimens available.

Habitat

HABITAT: Moist grassy areas.

ALTITUDE: **ANNUAL RAINFALL:**

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE:

EXPOSURE:

Conservation

Listed as Endangered (Schedule I) NSW Threatened Species Conservation Act 1995; listed nationally Endangered by the Commonwealth Endangered Species Protection Act 1992; listed nationally under the Environment Protection and Biodiversity Conservation Act 1999. Coded 2E on national rare species list (Briggs & Leigh 1996). Port Jackson is southern geographical limit; now rare due to destruction of habitat (Harden 1993).

ORCHIDACEAE

Diuris platichila**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, usually with 2 narrow leaves 35 cm long in a basal tuft, and flowering stems 60 cm high with up to 8 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow with dark markings, October. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT CWS.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: **CT:** Kandos, Glen Alice, Capertee, Mt Victoria, Blackheath.

Habitat

HABITAT: Hilltops, slopes.

ALTITUDE: 500–1000 m **ANNUAL RAINFALL:** 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus rossii*, *E. sideroxylon*.

SUBSTRATE: Sandy clay.

EXPOSURE:

Conservation

Restricted to the Blue Mountains (Harden 1993), conservation status unknown.

ORCHIDACEAE

Diuris praecox**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2 or 3 narrow leaves in a basal tuft, and flowering stems to 40 cm high with up to 10 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, nodding, with dark brown markings, August–September. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphiid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC.

DISTRIBUTION SYDNEY AREA: Wyong area.

SELECT LOCATIONS: **CC:** Doyalson, Bateau Bay.

Habitat

HABITAT: Hills, slopes (Jones 1991).

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Shrubland e.g. with *Allocasuarina distyla*, stunted eucalypt woodland.

SUBSTRATE: Loam to ironstone clay soil on sandstone, low nutrients, periodically wet.

EXPOSURE:

Conservation

Listed as Vulnerable (Schedule 2) NSW Threatened Species Conservation Act 1995; listed nationally Vulnerable by the Commonwealth Endangered Species Protection Act 1992. Ourimbah is southern geographical limit.

ORCHIDACEAE

Diuris punctata var. *punctata*

Purple Donkey Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 2 narrow leaves 15–30 cm long in a basal tuft, and flowering stems to 60 cm high with up to 10 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.), not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Mauve to purple, with darker markings or yellow, September–December. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

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., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Tinda Creek, Marsden Park, Londonderry, Ryde, Glenfield, Douglas Park, Thirlmere, Bargo. **CT:** Tallong.

Habitat

HABITAT: Slopes.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Angophora bakeri*, *Eucalyptus fibrosa*; shrubswamp.

SUBSTRATE: Sandy loam on Tertiary alluvium, Recent alluvium, low nutrients.

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999). Reported in Wollemi NP.

ORCHIDACEAE

Diuris sulphurea (*Diuris latifolia*)

Tiger Orchid, Hornet Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, 1–3 linear leaves to 50 cm long in a basal tuft, and flowering stem to 60 cm high with up to 7 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.), not stoloniferous (Pridgeon & Chase 1995), this is uncertain, but some clumps are so dense and so localised that vegetative spread seems likely (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Bright yellow, September–December. Short flowering season, usually no more than 2 weeks; pollinators attracted by mimicry of other nearby plants; probably pollinated mainly by small bees, and possibly syrphid flies and beetles (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Swamp, Bilpin, Riverstone, Kenthurst, Quakers Hill, Ingleburn, Douglas Park, Bargo. **CT:** Orange, Blackheath, Wentworth Falls, Mt Werong.

Habitat

HABITAT: Grassland

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–frequent.

VEGETATION: Open-forest and woodland e.g. with *Eucalyptus fibrosa*, *E. sclerophylla*, *E. tereticornis*, *E. melliodora*, *E. blakelyi*, *E. parramattensis*, *Angophora floribunda*, often with grassy understorey.

SUBSTRATE: Loamy soils on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999).

ORCHIDACEAE

Dockrillia cucumerina (*Dendrobium cucumerinum*)

Cucumber Orchid

Life history

GROWTH FORM: Epiphytic or epilithic evergreen herb with prostrate, wiry, creeping stems rooting freely along most of the length.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Cream to pale yellow or green and white with reddish purple striations, November–February.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Campbelltown. **CT:** Kanangra Walls, Megalong.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Riverflat Forest.

SUBSTRATE: Almost exclusively epiphytic on *Casuarina cunninghamiana* but also occasionally on other tree species, including *Backhousia myrtifolia*, and on rocks (Harden 1993).

EXPOSURE:

Conservation

Campbelltown is southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Dockrillia fairfaxii (*Dendrobium fairfaxii*)

Rat's Tail Orchid

Life history

GROWTH FORM: Epiphytic or rarely epilithic evergreen herb with pendent to spreading, wiry stems.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to cream with red or purple striations, September–October.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT**: Wentworth Falls, Jenolan Caves, Oberon.

Habitat

HABITAT:

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest.

SUBSTRATE: Slatey rock.

EXPOSURE:

Conservation

Blue Mountains is southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Dockrillia linguiformis (*Dendrobium linguiforme*)

Life history

GROWTH FORM: Evergreen herb with prostrate stems and flattened succulent leaves. Extensive creeping and branching rhizomes, forming extensive mats (Dockrill 1992).

VEGETATIVE SPREAD: Rhizomatous (P. Weston pers. comm.), forming extensive mats.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White, spidery, with musk-like scent, nectarless, September–October. Pollinated by various insects including hover flies, ichneumon wasps, thynnid wasps and native bees, attracted by scent (Van de cingel 2001).

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: As an epiphyte it does not attain the dimensions that it sometimes does as a lithophyte, it may grow into a large mat or a long strand (Dockrill 1992).

FIRE RESPONSE: Killed by high intensity fire (1/1994 at Lane Cove and Narrabeen); few partly scorched plants resprouted at Lane Cove (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Leaves eaten by Swamp Wallaby (at Katandra Bushland Sanctuary, L.McD.)

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA: Widespread on coast.

SELECT LOCATIONS: **CC**: Drews Creek, Mill Creek, Mogo Creek, Mangrove Creek, Springwood, Hornsby, Narrabeen, Manly, Kogarah, Wedderburn, Waterfall, Nowra.

Habitat

HABITAT: On tree trunks and rocks.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 1100–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest e.g. on *Casuarina cunninghamiana*; rainforest.

SUBSTRATE: Rocks, tree trunks or soil.

EXPOSURE: Exposed on rocks.

Conservation

Conservation status unknown. Reported in Yengo NP, Dharug NP.

ORCHIDACEAE

Dockrillia pugioniformis (*Dendrobium pugioniforme*)

Dagger Orchid

Life history

GROWTH FORM: Epiphytic or epilithic evergreen herb with pendent, wiry stems. Sporadically hybridizes with *D. striolatum* (Harden 1993).

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to pale brown and white to cream with markings brown and purple, September–November. Probably bee-pollinated (Jones 1983).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Olney SF, Mount Tomah, Mount Riverview, Clifton, Cambewarra. **CT**: Mt Coricudgy, Mt Wilson, Kanangra, Robertson.

Habitat

HABITAT: On trees and sandstone rocks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest e.g. with *Doryphora sassafras*; open-forest e.g. with *Angophora costata*, *Corymbia gummifera*, *Syncarpia glomulifera*.

SUBSTRATE: Sandy to clay soils on sandstone, shale, basalt, low-high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Robertson NR.

ORCHIDACEAE

Dockrillia striolata (*Dendrobium striolatum*)

Life history

GROWTH FORM: Epilithic evergreen herb, with spreading to pendent, wiry stems and narrow, terete succulent leaves 4–11 cm long. Sporadically hybridizes with *D. pugioniforme* (Harden 1993).

VEGETATIVE SPREAD: Mat-forming (Bishop 1996).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Cream to dull yellow, September–November.

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST CWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Woodford, Glenbrook, Coalcliff. **CT:** Mt Banks, Mount Tomah, Katoomba, Bundanoon, Tallong.

Habitat

HABITAT: Growing on rocks, in gullies, cliff faces.

ALTITUDE: 0–1000 m ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest; rainforest, heath.

SUBSTRATE: Rocky outcrops of sandstone, low nutrients.

EXPOSURE: Exposed situations (Harden 1993).

Conservation

Hunter River is northern geographical limit. Conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

Dockrillia teretifolia (*Dendrobium teretifolium*)

Rat's Tail Orchid

Life history

GROWTH FORM: Epiphytic and epilithic evergreen herb growing on rocks or trees, with spreading to pendent, wiry stems and narrow, terete, succulent leaves 10–60 cm long.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to pale yellow, July–October. Probably pollinated by *Trigona* bees (Jones 1983).

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CWS; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coast.

SELECT LOCATIONS: **CC:** Tuggerah Lakes, Woy Woy, Pittwater, Rhodes, Undercliffe, Loftus, The Basin RNP, Calderwood.

Habitat

HABITAT: Growing on rocks and trees.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Estuarine swamp woodland e.g. with *Casuarina glauca*, *Avicennia marina*.

SUBSTRATE: Rocks and trees, mainly on *Casuarina glauca* (Harden 1993).

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Eriochilus autumnalis**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, a single basal leaf sometimes often not fully developed at flowering; flowering stem to 12 cm high with up to 3 flowers (Bishop 1996).

VEGETATIVE SPREAD: Not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to pale pink, March–April.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growth period autumn–winter.

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), flowering 16 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Lower Portland, Pittwater, Asquith, Woodford, Glenbrook, Fox Valley, Pennant Hills, Kangaroo Valley. **CT:** Capertee, O'Connell, Abercrombie Caves.

Habitat

HABITAT: Ridgetops, rock platforms.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Angophora hispida*, *Banksia ericifolia*; woodland e.g. with *Corymbia gummifera*, *Eucalyptus haemastoma*, *E. piperita*, *E. melliodora*, *E. blakelyi*. On sandstone ledges with moss (Bishop 1996).

SUBSTRATE: Shallow sandy soils on Hawkesbury Sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Uncommon. Nowra is southern geographical limit.

ORCHIDACEAE

Eriochilus cucullatus**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with tubers, a basal solitary leaf often not fully developed at flowering; flowering stem to 25 cm high with up to 5 flowers (Bishop 1996).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White to deep pink, December–May.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growth period autumn–winter.

Fire response:

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:** Gaspers Mountain, Gladesville, Parramatta, Orchard Hills, Liverpool, Menangle, Broughton Pass. **CT:** Mullions Range, Jenolan Caves, Capertee, Cullen Bullen, Mt Victoria, Blackheath, Wentworth Falls, Leura, Woodford, Penrose, Abercrombie Caves.

Habitat

HABITAT: Moist open habitats.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus deanei*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus punctata*, *Angophora costata*, *Angophora bakeri*, *Eucalyptus sclerophylla*, *E. moluccana*, *E. tereticornis*; heath e.g. with *Kunzea capitata*.

SUBSTRATE: Sandy soils on sandstone, clay soil on shale.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Yengo NP.

ORCHIDACEAE

ORCHIDACEAE

Erythrorchis cassythoides (*Galeola cassythoides*)**Life history**

GROWTH FORM: Leafless climbing mycoheterotrophic herb, with stems 6 m long and roots at nodes, usually attached to tree trunks. Aerial roots act as hooks; stems die back annually (P. Weston Herb. note) ?after flowering and fruiting.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow to greenish, September–December. Pollinated by small bees attracted by the perfume (Jones 1994).

FRUIT/SEED: Capsule 6–20 cm long, with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Lane Cove, Kentlyn.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. pilularis*, *Corymbia gummifera*, *Syncarpia glomulifera*, *Allocasuarina littoralis* and shrubby understorey.

SUBSTRATE: Sandy soil on sandstone, attached to bark of trees, eucalypts, stumps and logs.

EXPOSURE:

Conservation

Regionally rare in Illawarra region, its southern geographical limit (Mills 1988). Conservation status elsewhere unknown.

ORCHIDACEAE

Gastrodia procera (*Gastrodia entomogama*)**Life history**

GROWTH FORM: Robust seasonal terrestrial mycoheterotrophic herb, with shoots from an underground tuberous rhizome, stem 90 cm high with up to 75 flowers.

VEGETATIVE SPREAD: No (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Light to dark brown, October–January.

FRUIT/SEED: Capsule 25–30 cm long, with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast and mountains.

SELECT LOCATIONS: **CC:** Woy Woy, Hornsby, Middle Harbour, Hunters Hill, Oatley, Heathcote, Bulli Pass. **CT:** Mt Wilson, Mount Tomah, Exeter.

Habitat

HABITAT: In accumulated litter.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Moist open-forest

SUBSTRATE: Loamy soils on basalt, high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

Gastrodia sesamoides

Cinnamon Bells, Potato Orchid

Life history

GROWTH FORM: Slender terrestrial mycoheterotrophic herb 18–75 cm high, with shoots from a tuberous rhizome and scale-like leaves.

VEGETATIVE SPREAD: No (P. Weston pers. comm.).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Brown/white, cinnamon-scented, August–January. Pollinated by *Exoneura* bees that gather pseudopollen from the labellum (Jones 1985).

FRUIT/SEED: Capsule 10–15 cm long, with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore mobile (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Fleshy tubers roasted and eaten by Aboriginal people (Cribb & Cribb 1984).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coast and mountains.

SELECT LOCATIONS: **CC:** Somersby, Lane Cove, Loftus, Mt Kembla.

CT: Orange, Mt Cameron, Mt Wilson, Blackheath, Leura, Jenolan Caves, Wombeyan Caves.

Habitat

HABITAT: In accumulated litter or dead trees.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus radiata*, *E. sieberi*, *E. piperita*, *E. viminalis*; gallery rainforest.

SUBSTRATE: Loamy soils on sandstone, alluvium, basalt, low to high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Genoplesium apostasioides

(*Prasophyllum apostasioides*, *P. anomalum*, *P. bowdeniae*)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 30 cm high with up to 15 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish green and reddish, December–April, flowers apparently apomictic and seldom opening (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Prideon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: **CT:** Woodford, Wentworth Falls.

Habitat

HABITAT: Slopes, moss gardens.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; heath.

SUBSTRATE: Sandstone outcrops, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Genoplesium archeri (*Prasophyllum archeri*)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, with single basal leaf per shoot and flowering stem to 20 cm high with up to 20 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish and purplish to purplish red with darker stripes, November–March. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Dural, Oxford Falls, Rookwood. **CT:** Kanimbla Valley, Mittagong, Woodford, Boyd River, Yetholme.

Habitat

HABITAT: Mossy sites.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Open-forest and woodland e.g. with *Eucalyptus rossii*, *E. goniocalyx*.

SUBSTRATE: Clay soils on shale, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Genoplesium baueri

Life history

GROWTH FORM: Leafless, saprophytic terrestrial herb, with paired tubers, flowering stem to 15 cm with 1–3 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and red or reddish, December–March. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH: Noted as generally rare and easiest to find after fire (Bishop 1996). Older Herbarium records indicate local populations persisted for up to 7 years e.g. Gladesville, recorded 1884, 1885, 1887 and Cowan recorded 1948, 1949, 1950, 1955.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CT SC.

DISTRIBUTION SYDNEY AREA: Pittwater to Nowra.

SELECT LOCATIONS: **CC:** Cowan, Pittwater, Pennant Hills, Gladesville, Loftus, Waterfall, Yanderra.

Habitat

HABITAT: Ridges, ‘moss gardens’.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Acacia suaveolens*, *Acacia myrtifolia*; *Kunzea ambigua* open-forest.

SUBSTRATE: Sandy or clayey soil on sandstone, laterite low nutrients.

EXPOSURE:

Conservation

Proposed listing as Vulnerable (Schedule 2) NSW Threatened Species Conservation Act 1995. Species has declined as a result of urban development, and is likely to be affected by inappropriate fire regimes (P. Adam NPWS website). Rare, only 6 records in the last 50 years, though recorded from 7 locations prior to that. Listed as Vulnerable (Schedule 2) NSW Threatened Species Conservation Act 1995. Threatened by urban and infrastructure development; likely to be affected by inappropriate fire regimes. Coded 3RC- on national rare species list (Briggs & Leigh 1996). Reported in Berowra Valley Regional Park, Lane Cove NP, Royal NP.

ORCHIDACEAE

Genoplesium citriodorum

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and stem to 35 cm with up to 33 crowded flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Dark purplish black, lemon-scented, January–February. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: **CC:** Bilpin, Faulconbridge. **CT:** Woodford.

Habitat

HABITAT: Near mossy seepage areas.

ALTITUDE: 300–600 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Kunzea ambigua*, *Hakea teretifolia*; woodland e.g. with *Corymbia gummifera*, *Eucalyptus burgessiana*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Local endemic, restricted to Blue Mountains. Conservation status unknown.

ORCHIDACEAE

Genoplesium despectans (*Prasophyllum despectans*)

Sharp Midge Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 25 cm high with up to 45 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Dark purple or green with purple markings, January–April. In the Illawarra–Jervis Bay region is a form that has tiny, very short-lived and apparently self pollinating flowers with a recurved labellum

tip (Bishop 1996). Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Illawarra area.

SELECT LOCATIONS: **CC:** Heathcote, Jervis Bay. **CT:** Carrington Falls.

Habitat

HABITAT: Often on slopes and ridges.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Heathcote is the northern geographical limit. Conservation status unknown.

ORCHIDACEAE

Genoplesium eriochilum (*Prasophyllum eriochilum*)

Life history

GROWTH FORM: Terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 20 cm with up to 20 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Nodding, dark brown to purple, November–January. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: One record from burnt area, others from undisturbed sites.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT.

DISTRIBUTION SYDNEY AREA: Mt Wilson–Blackheath.

SELECT LOCATIONS: **CT:** Mt Wilson, Mt Irvine, Mt Victoria, Blackheath.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 900–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Allocasuarina nana*, *Leptospermum trinervium*.

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Local endemic species. Restricted to Upper Blue Mountains. Conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

Genoplesium filiforme

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 30 cm high with up to 30 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish to purple, February–April. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001). Flowers abundantly only after fire (Keith 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: One record for area burnt in previous year.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Coast and hinterland.

SELECT LOCATIONS: **CC:** Howes Valley, Wisemans Ferry, West Head, Ingleburn, Loftus, Waterfall.

Habitat

HABITAT: Ridgetops, ‘moss gardens’.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest; heath e.g. with *Banksia ericifolia*; woodland e.g. with *Corymbia eximia*.

SUBSTRATE: Sandy soil over sandstone, laterite, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Genoplesium fimbriatum

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 35 cm with up to 30 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and pale red, lemon-scented, January–May. Flowers visited by very small black flies (P. Kubiak pers. comm.). Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 5 months after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Narrabeen), fruit 21–22 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Asquith, Crosslands, Frenchs Forest, Lindfield, Castle Hill, Loftus, Waterfall, Nowra. **CT:** Blackheath, Penrose.

Habitat

HABITAT: Rocky outcrops.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Banksia ericifolia*.

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Nowra is southern geographical limit. Conservation status unknown. Reported in Brisbane Water NP, Royal NP.

ORCHIDACEAE

*Genoplesium insignis***Life history**

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 18 cm with 5–12 flowers (Jones 2001). Similar to *G. archeri* (Jones 2001).

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Dark purple to dark reddish, August–November (Jones 2001). Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule not seen.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Jones (2001) reports ‘flowering of this orchid may be stimulated by fire (or at least flowering plants are more readily discerned on burnt ground’.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Charmhaven–Wyong.

SELECT LOCATIONS: CC: Charmhaven–Wyong.

Habitat

HABITAT: Ridgetops.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Heathland e.g. with shrubs and patches of *Themeda australis* (Jones 2001).

SUBSTRATE: Grey to white sand, low nutrients.

EXPOSURE:

Conservation

Known from only 3 populations, totalling less than 20 plants between Charmhaven and Wyong; protected to some extent in the Lake Macquarie SRA (Jones 2001). Listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995.

ORCHIDACEAE

*Genoplesium morinum***Life history**

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 24 cm with up to 20 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Nodding, dark reddish purple, December–January. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT.

DISTRIBUTION SYDNEY AREA: Boyd Plateau.

SELECT LOCATIONS: CT: Boyd Plateau.

Habitat

HABITAT:

ALTITUDE: 1000 m ANNUAL RAINFALL: 900–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Montane forests; sedgeland e.g. with *Empodisma minus*.

SUBSTRATE: Peaty soils, low nutrients.

EXPOSURE:

Conservation

Local endemic, known only from Kanangra Boyd NP, conservation status unknown.

ORCHIDACEAE

Genoplesium nudiscapum (*Prasophyllum nudiscapum*)**Dense Midge Orchid****Life history**

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 18 cm with up to 20 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Nodding, yellowish, brownish or dark purple, January–March. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Asquith, Yanderra. CT: Mt Victoria, Woodford.

Habitat

HABITAT: Ridgetops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Heath, woodland e.g. with *Eucalyptus oreades*, *E. stricta*.

SUBSTRATE: Sandy to clay loam over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Royal NP.

ORCHIDACEAE

Genoplesium nudum (*Prasophyllum nudum*)**Tiny Midge Orchid****Life history**

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 30 cm high with up to 40 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Nodding, green and red, or reddish purple, December–March. Self-pollinated (Jones 1972).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Central Mangrove. CT: Bell, Boyd Crossing.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Open-forest, heath.

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Genoplesium plumosum (*Prasophyllum plumosum*)

Tallong Midge Orchid

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 15 cm high, with up to 8 crowded flowers (Bishop 1996).

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and purplish, March–April. Observed flowering 4–6 weeks after good autumn rains, may not flower if rainfall does not occur prior to flowering period (NPWS 2001). Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH: Dies back after flowering and fruiting, existing as a dormant tuber for most of the year (NPWS 2001).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Fruiting stems eaten by native herbivores, but also possibly by rabbits (NPWS 2001).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Kurnell (1928, 1947), NPWS (2001).

CT: Tallong.

Habitat

HABITAT: Forest margins, ridges. Areas with exposed rock and stunted woodland with open-heath understorey, areas with bare ground (NPWS 2001).

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Low scrub/heath e.g. with *Kunzea parvifolia*, *Calytrix tetragona*, *Dillwynia* sp.

SUBSTRATE: Very shallow moss-covered soils over sandstone sheets (NPWS 2001).

EXPOSURE:

Conservation

First discovered on Kurnell Peninsula in January 1928 but now believed to be extinct there (NPWS 2001). Now known in the Tallong area. Listed as Endangered (Schedule 1) under the NSW Threatened Species Conservation Act 1995. Reported in Morton NP (NPWS 2001).

ORCHIDACEAE

Genoplesium pumilum (*Prasophyllum pumilum*)

Green Midge Orchid

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stems to 20 cm with up to 20 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to yellow-green, sometimes with red markings, January–May. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 4 months after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Narrabeen), fruit 17 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST; Qld, Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** West Head, Coal and Candle Creek, Oxford Falls, Collaroy, Castlecrag, Mt Keira. **CT:** Woodford.

Habitat

HABITAT: Ridgetops.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Moss gardens in heath e.g. with *Banksia ericifolia*, *Kunzea ambigua*.

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Brisbane Water NP, Royal NP.

ORCHIDACEAE

Genoplesium rufum (*Prasophyllum rufum*)

Red Midge Orchid

Life history

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 25 cm with up to 25 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.), not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Light red to dark red, January–April. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6 months after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove and Narrabeen), fruit 24–26 weeks later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Dural, Heathcote, Bargo. **CT:** Yetholme, Capertee, Blackheath, Boyd Plateau, Woodford, Yerrinbool, Bowral.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest; heath e.g. with *Angophora hispida*, *Leptospermum trinervium*.

SUBSTRATE: Sandy soils over sandstone, shales.

EXPOSURE:

Conservation

Conservation status unknown. Reported from Kanangra Boyd NP, Heathcote NP.

ORCHIDACEAE

*Genoplesium ruppii***Life history**

GROWTH FORM: Deciduous terrestrial herb, 12–23 cm tall.
 VEGETATIVE SPREAD: No.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Greenish with a dark purple labellum, in a raceme, pollinator unknown, January–April.
 FRUIT/SEED: Capsule with dust-like seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, wind-dispersed.
 FIRE RESPONSE: Possibly resprouts.
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS:
 DISTRIBUTION SYDNEY AREA: North from Hornsby.
 SELECT LOCATIONS: **CC:** Wyong.

Habitat

HABITAT: Range of habitats, in swamp, grassland, and forest.
 ALTITUDE: ANNUAL RAINFALL:
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: *Melaleuca*-dominated semi-swamp; *Themeda australis* grassy areas adjacent to low sites dominated by *Banksia robur* and heathy forest.
 SUBSTRATE: On clay soils, lateritic and gravelly soils.
 EXPOSURE:

Conservation

Suggested 2R (Jones 2001).

ORCHIDACEAE

Genoplesium sagittiferum (*Prasophyllum sagittiferum*)**Life history**

GROWTH FORM: Seasonal terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 20 cm with up to 15 flowers.
 VEGETATIVE SPREAD: No (P. Hind pers. comm.).
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Green with reddish stripes, December–April. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).
 FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC SC CT ST; Vic.
 DISTRIBUTION SYDNEY AREA: Mainly Tablelands.
 SELECT LOCATIONS: **CC:** Howes Swamp. **CT:** Yetholme, O'Connell, Boyd Hill Swamp, Woodford, Tallong.

Habitat

HABITAT: Ridges, swamps.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1000 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: Woodland e.g. with *Eucalyptus rossii*, *E. mannifera*, *E. macrorrhyncha*; heath e.g. with *Hakea teretifolia*; sedgeland e.g. with *Empodisma minus*.
 SUBSTRATE: Sandy soil over sandstone, low nutrients.
 EXPOSURE:

Conservation

Blue Mountains is northern geographical limit. Conservation status unknown. Reported in Wollemi NP, Wambool NR.

ORCHIDACEAE

Genoplesium simulans

(*Prasophyllum morrisii* var. *intermedium*)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 16–46 cm high, with paired tubers and a single basal leaf per shoot.
 VEGETATIVE SPREAD: No.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Dark purplish black, January–March. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).
 FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC CT.
 DISTRIBUTION SYDNEY AREA: Mainly Blue Mountains.
 SELECT LOCATIONS: **CC:** Bell, Bilpin, Bowen Mountain, Cheltenham, Oxford Falls, Douglas Park, Mt Keira. **CT:** Clarence, Mount Tomah, Mt Wilson, Mt Irvine, Wentworth Falls, Woodford.

Habitat

HABITAT: Ridges.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm
 TYPICAL LOCAL ABUNDANCE: Occasional.
 VEGETATION: Woodland e.g. with *Eucalyptus sieberi*, *E. piperita*, *Corymbia gummifera*; scrub e.g. with *Kunzea ambigua*. Favours moss gardens of low heathy vegetation around sandstone outcrops (Bishop 1996).
 SUBSTRATE: Shallow sandy soil over sandstone rock, low nutrients, periodically wet.
 EXPOSURE:

Conservation

Local endemic species, conservation status unknown.

ORCHIDACEAE

Genoplesium woollsii (*Prasophyllum woollsii*)**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, single basal leaf per shoot and flowering stem to 40 cm with up to 35 flowers.
 VEGETATIVE SPREAD: No (P. Hind pers. comm.).
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Nodding, dark purple with darker stripes, March–April. Probably pollinated by small (vinegar) flies (Drosophilids or Chironomids) (Van der Cingel 2001).
 FRUIT/SEED: Capsule with numerous minute winged seeds. Seeds shed 6–12 weeks after pollination (Pridgeon et al. 2001).
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC SC CT.
 DISTRIBUTION SYDNEY AREA: Sporadic.
 SELECT LOCATIONS: **CC:** Asquith, Cheltenham, Heathcote. **CT:** Fitzroy Falls, Carrington Falls.

Habitat

HABITAT: Ridgetops, 'moss gardens'.
 ALTITUDE: 0–700 m ANNUAL RAINFALL: 1000–1400 mm
 TYPICAL LOCAL ABUNDANCE:

VEGETATION: 'Moss gardens' in woodland and heath e.g. with *Banksia oblongifolia*, *Leptospermum trinervium*.

SUBSTRATE: Sandy soils over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Glossodia major

Waxlip Orchid

Life history

GROWTH FORM: Very slender seasonally deciduous terrestrial herb, with tubers and hairy leaf to 15 cm long; flowering stem to 30 cm with 1–2 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Purple, August–October. Probably pollinated by native bees by food deception (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Fire is not an essential pre-requisite for flowering, but it enhances flowering (Pridgeon et al. 2001). Apparently resprouted after high intensity fire (1/1994 at Narrabeen), flowering 7 Months later (P. Kubiak pers. comm.).

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:** Bateau Bay, Colo Heights, Blaxland, Wisemans Ferry, Maroota, Asquith, Frenchs Forest, Kentlyn, Marsden Park, Kogarah, Villawood, Waterfall, Wedderburn, Wallacia, Burragarang Valley. **CT:** Yetholme, Hill End, Capertee, Lithgow, Mullion Range, Jenolan Caves, Abercrombie Caves.

Habitat

HABITAT: Ridges, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest and woodland e.g. with *Eucalyptus punctata*, *E. piperita*, *E. sclerophylla*, *E. rossii*, *E. viminialis*, *E. bridgesiana*, *E. macrorhyncha*; coastal heath.

SUBSTRATE: Clay loam on sandstone, metamorphics, quartzite, conglomerate, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Glossodia minor

Small Waxlip Orchid

Life history

GROWTH FORM: Seasonal slender terrestrial herb, with tubers, very hairy leaf to 3 cm long and flowering stem 5–16 cm high with a single flower.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Deep violet blue, August–September. Probably pollinated by native bees by food deception (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990). Active growth period autumn–winter.

FIRE RESPONSE: Resprouts (D. Keith pers. comm.). Fire is not an essential pre-requisite for flowering, but it enhances flowering (Pridgeon et al. 2001). Fruit 9 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Swansea, Bateau Bay, Glenbrook, Cowan, Bilgola, Fox Valley, Lindfield, Epping, Rose Bay, Kurnell, Jannali, Sutherland, Wedderburn. **CT:** Mittagong.

Habitat

HABITAT:

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Banksia serrata*, *Kunzea ambigua*, *Corymbia gummifera*, *Eucalyptus haemastoma*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Liparis coelogyneoides

Life history

GROWTH FORM: Evergreen epiphytic or rarely an epilithic herb, with pseudobulbs, clump-forming.

VEGETATIVE SPREAD: Rhizomatous (P. Weston pers. comm.).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale green, November–March, flower with unpleasant urine-like scent, pollinated by small flies that feed on nectar produced by the labellum (Bishop 1996). Produces flowers only from new growth (Walsh 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Caterpillars consume new growth, young leaves and juvenile racemes; case-moth larvae eat leaves (Walsh 1996).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT; Qld.

DISTRIBUTION SYDNEY AREA: Colo area.

SELECT LOCATIONS: **CC:** Upper Colo.

Habitat

HABITAT:

ALTITUDE: 0–300 m ANNUAL RAINFALL: 900–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest

SUBSTRATE: On trunks and branches, occasionally on rocks.

EXPOSURE: Heavy to light shade (Walsh 1996).

Conservation

Upper Colo River is southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Liparis reflexa

Life history

GROWTH FORM: Evergreen epilithic or rarely a terrestrial herb, with pseudobulbs, clump-forming.

VEGETATIVE SPREAD: Rhizomatous (P. Weston pers. comm.).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish, cream or yellow with age, with a strong unpleasant odour, February–June. Pollinated by sarcophagid (Wallace 1974) or mycetophilid (Adams & Lawson 1993) flies (P. Weston pers. comm.).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Severely burnt plants killed, whereas more lightly burnt pseudobulbs resprouted after high intensity fire (1/1994 at Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT CWS.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Springwood, Woodford, Culoul Ranges, Wisemans Ferry, Windsor, Berowra, Pittwater, Mt Ku-ring-gai, Oatley, Heathcote, Bomaderry Creek, Hill Top. **CT:** Coricudgy, Yerranderie.

Habitat

HABITAT: Usually on rocks in gullies, creeklines.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Rainforest e.g. with *Backhousia myrtifolia*; open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*.

SUBSTRATE: Sandstone boulders, rock faces.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Ku-ring-gai Chase NP.

ORCHIDACEAE

*Lyperanthus suaveolens***Life history**

GROWTH FORM: Slender seasonally deciduous terrestrial herb, with tubers and daughter tubers on stolons, a single narrow leaf, and flowering stem to 45 cm high with up to 8 flowers (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (Pridgeon & Chase 1995, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish brown or dark reddish brown, mainly August–September. Can be very sweetly and strongly fragrant (Bishop 1996). Possibly bee-pollinated (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds. Seed dispersal occurs 8–12 weeks after pollination (Pridgeon et al. 2001).

DISPERSAL, ESTABLISHMENT & GROWTH: Active growth period autumn–winter.

FIRE RESPONSE: Resprouts at base or below (Fox 1988), flowered 9 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT.

DISTRIBUTION SYDNEY AREA: Widespread, coast.

SELECT LOCATIONS: **CC:** Doyalson, Bateau Bay, Mooney Mooney, Castlereagh, Springwood, Glenbrook, Hornsby, Frenchs Forest, Gladesville, Centennial Park, Kurnell, Oatley, Voyager Point, Kentlyn, Bundeena. **CT:** Abercrombie Caves.

Habitat

HABITAT: Grassy slopes.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest to woodland e.g. with *Angophora costata*, *Eucalyptus haemastoma*, *Corymbia gummifera*, *Eucalyptus sclerophylla*, *E. fibrosa*, *Melaleuca nodosa*.

SUBSTRATE: Sandy soil on sandstone, dune sand, Tertiary alluvium, shale, low nutrients, well-drained.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). reported in Ku-ring-gai Chase NP, Royal NP.

ORCHIDACEAE

*Microtis angusii***Life history**

GROWTH FORM: Stout seasonally deciduous herb 25–60 cm high, with paired tubers 8–10 mm diam. and stolons with daughter tubers. Flowering stems with 20–60 flowers (Jones 1996).

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: May–October (Jones 1996).

FRUIT/SEED: Capsule 5–6 mm long, with numerous minute seeds (Jones 1996).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Ingleside.

SELECT LOCATIONS: **CC:** Ingleside.

Habitat

HABITAT:

ALTITUDE: 200 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Low woodland with grass species.

SUBSTRATE: Lateritic shale on Wianamatta Shale (Jones 1996).

EXPOSURE:

Conservation

Listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995. Known from only one locality close to a major road; site has suffered considerable degradation and invasion by Coolatai Grass *Hypparrhenia hirta* (Jones 1996).

ORCHIDACEAE

Microtis parviflora (*Microtis bipulvinaris*)

Slender Onion Orchid

Life history

GROWTH FORM: Slender to robust seasonally deciduous terrestrial herb 15–50 cm high, with paired tubers and stolons with daughter tubers, a single narrow basal leaf.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: 1–2 years (Pridgeon et al. 2001).

FLOWERS: Green, September–December. Pollinated by worker ants, of the genus *Iridomyrmex*, attracted to nectar at the base of the labellum (Peakall & Beattie 1989).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Seeds readily germinate and can quickly colonise new sites, especially areas of disturbance (Pridgeon et al. 2001).

FIRE RESPONSE: Resprouts (Fox 1988).

INTERACTION WITH OTHER ORGANISMS: In the field, *Microtis parviflora* has a narrow ecological specificity, with *Epulorhiza repens* and *Epulorhiza* sp. the mycorrhizal fungi of *M. parviflora*.

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT CWS; Qld, Vic., Tas., S.A., NZ, N. Caledonia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Swamp, Cattai Ridge, Agnes Banks. **CT:** Lidsdale, Bathurst, Wentworth Falls, Wingecarribee Swamp, Penrose.

Habitat

HABITAT: Wet places.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *Angophora costata*, *Eucalyptus fibrosa*; grassland e.g. with *Themeda australis*.

SUBSTRATE: Sandy loam over sandstone, shale, alluvium, low–medium nutrients, moist.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation elsewhere unknown. Reported in Wambool NR.

ORCHIDACEAE

Microtis rara

Scented Onion Orchid

Life history

GROWTH FORM: Slender, seasonally deciduous terrestrial herb, with paired tubers and stolons with daughter tubers, and a single narrow basal leaf 20–50 cm long.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Fragrant, green, October–January.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts at base or below (Fox 1988).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Mt Irvine, Woodford, Glenbrook, Windsor, Pittwater, St Ives, Longeville, East Hills, Kurnell, Woronora River, Liverpool, Darkes Forest, Loddon River. **CT:** Penrose.

Habitat

HABITAT: Ridges, plateaus.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Banksia oblongifolia*; woodland e.g. with *Melaleuca decora*, *Eucalyptus fibrosa*.

SUBSTRATE: Sandy soil on sandstone, alluvium, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Microtis unifolia

Life history

GROWTH FORM: Slender to robust seasonally deciduous terrestrial herb 20–60 cm high, with paired tubers and stolons with daughter tubers, and a single narrow basal leaf 8–60 cm long. .

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: 1–2 years (Pridgeon et al. 2001)

FLOWERS: Lightly scented, green or yellow-green, spring–summer. Pollinated by worker ants, of the genus *Iridomyrmex*, attracted to nectar at the base of the labellum (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Seeds readily germinate and can quickly colonise new sites, especially areas of disturbance (Pridgeon et al. 2001).

FIRE RESPONSE: Resprouts (Fox 1988). Green fruit 10 months after high intensity fire (1/1994 at Lane Cove), flowering much diminished in subsequent years (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A., Norfolk Is., N.Z., N. Caledonia, E Asia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Forresters Beach, Springwood, Woodford, Castlereagh, Terrey Hills, Hornsby, Fox Valley, Mosman, Centennial Park, Kurnell, Kentlyn, Mulgoa, Liverpool, Stanwell Park. **CT:** Clarence, O'Connell, Blackheath, Wingecarribbee Swamp, Moss Vale, Penrose.

Habitat

HABITAT: Rock outcrops, swamp margins.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus piperita*, *Corymbia gummifera*, *Eucalyptus haemastoma*, *E. melliodora*, *E. blakelyi*, *E. bridgesiana*; heath e.g. with *Kunzea ambigua*, *Leptospermum trinervium*, *Calytrix tetragona*.

SUBSTRATE: Sandy soil on sandstone, peaty soil on alluvium, low nutrients, moist.

EXPOSURE: Full sun to light shade.

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Botany Bay NP, Royal NP, Cecil Hoskins NR.

ORCHIDACEAE

Orthoceras strictum

Horned Orchid

Life history

GROWTH FORM: Rigid erect, seasonally deciduous herb with tubers, 2–5 narrow leaves in a basal tuft, and stem to 60 cm high with up to 9 flowers. May be confused with *Lyperanthus suaveolens* (Bishop 1996).

VEGETATIVE SPREAD: No (Pridgeon & Chase 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish green to very dark brown, late spring to summer. Obligately self-pollinating with no opportunity for outcrossing (Pridgeon et al. 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period late autumn–winter (Pridgeon et al. 2001).

FIRE RESPONSE: Fruit forming 2 years after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Culoul Range, Terrigal, Somersby, Riverstone, Pittwater, Bobbin Head, Frenchs Forest, Manly, Willoughby, Glenbrook, Parramatta, Bundeena, Waterfall. **CT:** Bell, Mt Victoria, Mt Irvine, Little Hartley, Blackheath, Leura, Hill Top, Mittagong, Penrose.

Habitat

HABITAT: Moist to wet sites in open areas, ridges, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *E. piperita*, *E. sieberi*, *E. radiata*, *E. mannifera*; moist heath e.g. with *Hakea teretifolia*, *Leptospermum trinervium*.

SUBSTRATE: Gravelly loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Papillilabium beckleri**Life history**

GROWTH FORM: Epiphytic evergreen herb, with one shoot, often suspended by one of the numerous tangled aerial roots.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and white, sometimes with purple or crimson markings, September–November. Not self-pollinating but pollinators unknown (Van der Cigel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Calna Creek, Waterfall.

Habitat

HABITAT: Along creeks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Gallery rainforest e.g. with *Ceratopetalum apetalum*, *Tristaniopsis laurina*.

SUBSTRATE: On outer twigs of trees.

EXPOSURE:

Conservation

A monotypic genus. Royal National Park is the southern geographical limit. Conservation status unknown.

ORCHIDACEAE

Paracaleana minor (*Caleana minor*)

Small Duck Orchid

Life history

GROWTH FORM: Terrestrial seasonally deciduous herb, with underground paired tubers narrow leaf and stolons, with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Pridgeon et al. 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Reddish brown to yellowish green, flower stalk to 18 cm high, November–January. Pollination by pseudocopulation by male thynnine wasps *Thynnותרneria armiger*, attracted by pheromones (Pridgeon et al. 2001). Some populations in the Blue Mountains are likely to be opmictic (Jones 1977).

FRUIT/SEED: Capsule with numerous minute winged seeds.

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., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Upper Colo, Hornsby, Pittwater, Narrabeen, Wahroonga, Gladesville, Bundeena, Menai, Darkes Forest, Mt Kembla, Nowra. **CT:** Yetholme, Bell, Blackheath, Mt Irvine, Mt Victoria.

Habitat

HABITAT: Slopes and ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest, heath e.g. with *Kunzea ambigua*.

SUBSTRATE: Gravelly soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Plectorrhiza tridentata

Tangle Orchid

Life history

GROWTH FORM: Hanging, evergreen epiphyte, often suspended by one of the numerous aerial roots, leaves green to purplish.

VEGETATIVE SPREAD: Rarely by branching.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White with green or brown markings, September–January. Not self-pollinating (Van der Cingal 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Kincumber, Mill Creek, Calna Creek, Springwood, Waterfall, Mt Kembla. **CT:** Mount Tomah.

Habitat

HABITAT: Along creeks.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Rainforest.

SUBSTRATE: On outer branches of trees e.g. *Ceratopetalum apetalum*, *Tristaniopsis laurina*, *Backhousia myrtifolia*, rarely on rocks. Sandy alluvium from sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP, Dharug NP, Royal NP.

ORCHIDACEAE

Prasophyllum affine**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf 50 cm long, and stem 40 cm with up to 40 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Tints of green, red, brown, and purple, October–November, strongly perfumed (Harden 1993). Does not flower unless rainfall occurs prior to flowering period; flowers open progressively from lowest to topmost buds; pollinated mainly by Flower Wasps (Thynninae: *Neozeloboria*, *Lopohocheilus anilitatus*), and ants (NPWS 2003).

FRUIT/SEED: Capsule with numerous minute winged seeds, mature mid-December, wind-dispersed (NPWS 2003).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, wind-dispersed.

Plant persists for most of the year as a dormant tuber; leaf begins to appear in late winter, plant only visible for about a month after flowering (NPWS 2003).

FIRE RESPONSE: Flowers more freely after fire (Harden 1993).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC; Vic.

DISTRIBUTION SYDNEY AREA: South Head to Botany Bay.

SELECT LOCATIONS: **CC:** Port Jackson (1803).

Habitat

HABITAT: Coastal heathland (Bishop 1996).

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Low heathland, sedgeland e.g. with *Allocasuarina paludosa*, *Lambertia formosa*, *Lomandra obliqua*, *Ptilothrix deusta* and sedges (NPWS 2003).

SUBSTRATE: Grey–brown clay soils, low nutrients, poorly-drained (NPWS 2003).

EXPOSURE:

Conservation

Listed as Endangered (Schedule 1) under the NSW Threatened Species Conservation Act 1995 and Commonwealth Environmental Protection & Biodiversity Conservation Act 1999. Type locality is Port Jackson between South Head and Botany Bay but it has not been collected there since 1803. The only known existing occurrence in NSW is Jervis Bay area where it is threatened by proposed development and stock grazing (NPWS 1999); disturbance such as fire and slashing is likely to be a threatening process during growth and reproductive period, winter–December (NPWS 2003).

ORCHIDACEAE

Prasophyllum appendiculatum

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, single narrow basal leaf 30 cm long and stem to 40 cm high.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Up to 20 flowers, strongly 2-coloured red-brown and pale green, sweetly scented, October–November, with or without fire.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Vic.

DISTRIBUTION SYDNEY AREA: Southern Highlands.

SELECT LOCATIONS: **CC:** Budderoo Creek. **CT:** Carrington Falls.

Habitat

HABITAT: Damp places.

ALTITUDE: 500–600 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist heathland, often fringing swamps.

SUBSTRATE: Sandy soil over sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Mittagong is northern geographical limit. Conservation status unknown.

ORCHIDACEAE

Prasophyllum australe

Southern Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf 35 cm long and stem to 90 cm high with up to 50 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White with reddish brown and green stipes, highly fragrant, September–January. Flowers abundantly only after fire (Keith 1996). Pollinated by Ichneumon and thynnine wasps (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

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 to Blue Mountains.

SELECT LOCATIONS: **CC:** La Perouse, Long Bay, O'Hares Creek, Loddon River. **CT:** Mt Irvine, Blackheath, Wentworth Falls.

Habitat

HABITAT: Swamps, peat bogs.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist heath e.g. with *Banksia robur*, *Gleichenia*, *Gymnoschoenus sphaerocephalus*.

SUBSTRATE: Peaty sandy soils over sandstone, low nutrients, permanently moist.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Prasophyllum brevilabre

Short-lipped Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, a single narrow basal leaf to 35 cm long, and stem to 48 cm high with up to 30 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish with red markings or dark purplish green, July–December. Flowers abundantly only after fire (Keith 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.). Flowered within 10 months after medium intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Castle Hill, Wahroonga, Castlereagh, Waterfall, O'Hares Creek. **CT:** Yetholme, Mt Wilson, Blackheath, Katoomba, Oberon, Jenolan Caves, Wanganderry, Bowral, Barbers Creek.

Habitat

HABITAT: Ridges, plateaus.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist heath e.g. with *Banksia paludosa*, *Banksia oblongifolia*; woodland e.g. with *Eucalyptus sieberi*, *E. sclerophylla*, *E. rossii*, *Angophora bakeri*, *E. parramattensis*.

SUBSTRATE: Sandy, often lateritic soil over sandstone, conglomerate, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Prasophyllum elatum

Tall Leek Orchid, Piano Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, variable, with paired tubers, a single narrow basal leaf to 120 cm long, and stem to 150 cm high with up to 60 flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale yellowish green to brownish or purplish black, sweetly scented, August–October. Flowers abundantly only after fire (Keith 1996). Pollinated by thynnine wasps (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), flowering appeared to be stimulated, secondary juvenile period 10 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Associated with mycorrhizal fungi (Jones & Elliot 1986).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT CWS NWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Doyalson, Wyong, Tuggerah, Bateau Bay, Somersby, Hazelbrook, Hornsby, Fox Valley, Frenchs Forest, Willoughby, Kentlyn, Kurnell, Sutherland, Appin, Helensburgh, Thirlmere. **CT**: Blackheath, Barbers Creek, Robertson.

Habitat

HABITAT: Slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath and scrub e.g. with *Banksia ericifolia*, *Angophora hispida*, *Allocasuarina littoralis*.

SUBSTRATE: Sandy stony soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Prasophyllum flavum

Life history

GROWTH FORM: Seasonal, leafless terrestrial herb with paired tubers, and stem to 90 cm high with up to 50 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green or yellow and red-brown, November–January.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC**: Bowen Mountain, Glenbrook, Hornsby, Lane Cove, Loftus. **CT**: Mount Tomah, Mt Wilson, Wentworth Falls, Katoomba, Leura, Hill Top.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Moist and drier open-forest

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Prasophyllum fuscum

Slaty Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 40 cm high with paired tubers, a single narrow basal leaf to 45 cm long, and stem to 40 cm high with up to 30 flowers.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish often with purple tints, sweetly fragrant, October–December, not particularly fire-stimulated.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains and Hawkesbury.

SELECT LOCATIONS: **CC**: Port Jackson (1802–5). **CT**: Bell, Mt Victoria, Wentworth Falls, Leura.

Habitat

HABITAT: Moist areas, often along seepage lines

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Moist sedgeland e.g. with *Hakea*.

SUBSTRATE: Sandy soils on Hawkesbury sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Local endemic species listed as Vulnerable (Schedule 2) under the NSW Threatened Species Conservation Act 1995, now apparently confined to the Upper Blue Mountains.

ORCHIDACEAE

Prasophyllum odoratum

Rogers Scented Leek Orchid, Sweet Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf to 70 cm long and stem to 50 cm high.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and white or with reddish stripes, very fragrant to spicy, September–November. Self-pollinated but primarily pollinated by flies (Syrphidae) and also male native bees *Leioproctus* sp.; ants and flies remove nectar but do not appear to transport pollen (Bernhardt & Burns-Balogh 1986).

FRUIT/SEED: Capsule with numerous minute winged seeds. Approximately 52% of flowers per stem set seed (Bernhardt & Burns-Balogh 1986).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Flowers profusely 6–8 months after fire (Bernhardt & Burns-Balogh 1986).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST SWS SWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC**: Frenchs Forest. **CT**: Mt Canobolas, Lithgow, Penrose.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodlands e.g. with *Eucalyptus dives*, *E. rubida*, *E. sieberi*; heathy grassland e.g. with *Brachyloma daphnoides*.

SUBSTRATE: Sandy soil on sandstone, clay soil on basalt, low to high nutrients.

EXPOSURE:

Conservation

A complex of several as yet undetermined taxa. Some forms flower only after fires, others flower freely without fire (Bishop 1996). Conservation status unknown.

ORCHIDACEAE

ORCHIDACEAE

*Prasophyllum pallens***Life history**

GROWTH FORM: Deciduous terrestrial herb 20–40 cm tall.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Tawny green to greenish white in a raceme, with a 'rather unpleasant musty fragrance, which is very noticeable in warm to hot weather', November–December.

FRUIT/SEED: Capsule with dust-like seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, wind-dispersed.

FIRE RESPONSE: Possibly resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS:

DISTRIBUTION SYDNEY AREA: Higher parts of Blue Mountains, particularly Blackheath–Mt Banks.

SELECT LOCATIONS: **CT:** Mt Banks, Blackheath.

Habitat

HABITAT:

ALTITUDE: 1000–1100 m ANNUAL RAINFALL: mm

TYPICAL LOCAL ABUNDANCE: .

VEGETATION: Dense low heath.

SUBSTRATE: Shallow sandy soils over sandstone, moist to wet.

EXPOSURE: Full sun.

Conservation

Suggested 2R (Jones 2000).

ORCHIDACEAE

Prasophyllum patens

Broad-lipped Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf to 30 cm long and stem 10–30 cm high.

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green and white, lemon-scented, August–December.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Usually flowers after fires.

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., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Lake Macquarie, Dangar Island, Lindfield, Lane Cove, Jannali. **CT:** Portland, Wentworth Falls, Jenolan Caves.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Grevillea oleoides*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

Prasophyllum rogersii

Marsh Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf to 30 cm long and stem to 30 cm high with up to 15 well-spaced flowers.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellowish green, rarely purple, with pinkish to reddish brown tints, faintly scented, December–February.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT; Vic.

DISTRIBUTION SYDNEY AREA: Boyd Plateau.

SELECT LOCATIONS: **CT:** Boyd Plateau.

Habitat

HABITAT: Marshy places, swamps.

ALTITUDE: 1000–1200 m ANNUAL RAINFALL: 1100 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Hummocky sedgeland e.g. with *Empodisma minus*, *Baloskion australe*, *Xyris*.

SUBSTRATE: Loamy peaty soils, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra Boyd NP.

ORCHIDACEAE

Prasophyllum striatum

Streaked Leek Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf to 20 cm long and stem to 30 cm high.

VEGETATIVE SPREAD: No (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Up to 10 flowers with white, green and red-brown stripes, musky odour, March–June.

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Narrabeen), fruit forming 4 months later (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Woy Woy, West Head, Oxford Falls, Royal NP, Dapto, Cambewarra. **CT:** Mt Wilson, Katoomba, Blackheath, Woodford, Kanangra.

Habitat

HABITAT: Damp places, depressions on rocks, swamp margins.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1100–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Heath e.g. with *Leptospermum trinervium*, *Darwinia fascicularis*, *Allocasuarina nana*.

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

*Prasophyllum uroglossum***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a single narrow basal leaf to 20 cm long and stem to 45 cm high.

VEGETATIVE SPREAD: No (P. Hind pers. comm.). Some vegetative reproduction (NPWS 1999).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Brown, purple-red and green, with strong sweet scent, October–November. Intense Gardenia-like perfume; probably pollinated by thynnid wasps and possibly hover flies (Syrphiidae) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Leaf emerges in April and remains until after seed dispersal, probably late December–January (Bishop 1996). Dormant phase during summer (NPWS 1999).

FIRE RESPONSE: Good flowering response after fire 3 months earlier (at Wingecarribee Swamp, P. Kodela pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT.

DISTRIBUTION SYDNEY AREA: Southern Highlands.

SELECT LOCATIONS: **CT:** Wingecarribee Swamp, Burrawang.

Habitat

HABITAT: Bogs, sometimes in running water, wetland margin.

ALTITUDE: 680 m **ANNUAL RAINFALL:** 1500 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Sedgeland e.g. with *Baumea rubiginosa* and scattered *Leptospermum obovatum*. Open heathland; ecotone between grassy woodland–forest and swamp (NPWS 1999).

SUBSTRATE: Peaty silty loam, medium nutrients. Moist but not wet soils (Bishop 1992).

EXPOSURE: Full sun, slight shelter from scattered low shrubs (Bishop 1992).

Conservation

Local endemic population, restricted to Burrawang district, very rare, listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995. Threatened during growth period from April–January by disturbance and by direct competition from shrubs or weeds; some disturbance such as burning and weed control during short dormant period February–March could be beneficial, however repeated burning may destroy germinating seeds (Bishop 1992). Not known to occur in any conservation reserve (NPWS 1999).

ORCHIDACEAE

*Pterostylis aciculiformis***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, to 25 cm high, with paired tubers that may be at the end of stolons.

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, transparent, with green and tan, September–November. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted, flowering 18–28 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST CWS SWS; Vic.

DISTRIBUTION SYDNEY AREA: Tablelands, Southern Highlands.

SELECT LOCATIONS: **CT:** O'Connell, Abercrombie River, Burrawang, Wingecarribee Swamp.

Habitat

HABITAT: Ridges, slopes, swamp margins.

ALTITUDE: 600–900 m **ANNUAL RAINFALL:** 800–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus rossii*, *E. polyanthemos*, *E. blakelyi*; sedgeland of *Baumea rubiginosa*.

SUBSTRATE: Peaty silty loam, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis acuminata

Pointed Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 24 cm high, with paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white, March–May. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988). Host to mycorrhizal fungus *Rhizoctania solani* (Perkins & McGee 1994).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Kurrajong Heights, Kenthurst, Asquith, Baulkham Hills, Lindfield, Gladsville, Kurnell, Bundeena, Waterfall, Thirlmere. **CT:** Woodford.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–200 m **ANNUAL RAINFALL:** 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*, *Eucalyptus fibrosa*, *E. eugenioides*, *E. maculata*.

SUBSTRATE: Sandy soil on sandstone, sometimes with shale influence, low to medium nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

*Pterostylis aestivalis***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 35 cm high, with with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, bluish green and white, January–April. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Orange area.

SELECT LOCATIONS: **CT:** Canobolas.

Habitat

HABITAT: Grassy slopes.

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Montane woodland e.g. with *Poa* sp.

SUBSTRATE:

EXPOSURE:

Conservation

Mt Canobolas is northern geographical limit. Conservation status unknown.

ORCHIDACEAE

*Pterostylis alata***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 25 cm high, with rosette and stem leaves, and paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white with brown, March–August. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST CWS; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Bathurst to Orange area.

SELECT LOCATIONS: **CT:** Winburndale, Orange.

Habitat

HABITAT: Moist, shady slopes.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE:

EXPOSURE:

Conservation

Conservation status unknown. Reported in Winburndale NR.

ORCHIDACEAE

*Pterostylis alveata***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 16 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white, shiny, March–June. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Colo, Seven Mile Beach.

Habitat

HABITAT: Dune crests and slopes.

ALTITUDE: 0–200 m ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Scrub e.g. with *Leptospermum laevigatum*.

SUBSTRATE: Dune sand, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Seven Mile Beach NP.

ORCHIDACEAE

Pterostylis baptistii

King Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 40 cm high, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green and white, with brown, July–October. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coast, sporadic.

SELECT LOCATIONS: **CC:** Lake Macquarie, Wallarah Creek, Porters Creek Swamp, Woy Woy, Narrabeen, La Perouse, Oatley, Bundeena, Dapto, Nowra.

Habitat

HABITAT: Sheltered slopes.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Angophora costata*, *Eucalyptus robusta*, *E. longifolia*; scrub e.g. with *Melaleuca nodosa*, *M. sieberi*, *M. linariifolia*.

SUBSTRATE: Sandy to silty loams on alluvium, sandstone, low nutrients, moist to wet soils.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis bicolor

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 40 cm high, with paired tubers and flowering stem to 40 cm high with up to 20 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green with darker lines, shiny, September–November. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Riverstone.

SELECT LOCATIONS: **CC**: Riverstone.

Habitat

HABITAT: Hilltop.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus* sp., *Melaleuca* sp. with grassy understorey.

SUBSTRATE: Gravelly loam on shale, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis Botany Bay Bearded Greenhood

(*Pterostylis* sp. 15)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with paired tubers and rosette leaves.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Helmet-like shape, translucent green with dark green veins, August–September, pollinated by insects (NPWS 2000). Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds, possibly taking up to 3 months to ripen and dehisce, depending on weather conditions (NPWS 2000, 2001).

DISPERSAL, ESTABLISHMENT & GROWTH: Mid-winter growth followed by flowering, then plant dies back to tubers (NPWS 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Eastern suburbs, Botany Bay.

SELECT LOCATIONS: **CC**: Maroubra (1908), Kurnell.

Habitat

HABITAT: Coast.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Heath e.g. with *Melaleuca nodosa*, *Baeckea imbricata*.

SUBSTRATE: Skeletal sandy soils derived from sandstone, low nutrients, moist (Bishop 1996).

EXPOSURE: Light shade.

Conservation

Rare, listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995; first recorded in Maroubra 1908 although now extinct there. Currently known from only one small population in Botany Bay NP where it is threatened by human activity as it is close to a major fire trail (NPWS 2000).

ORCHIDACEAE

Pterostylis coccinea

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, white and bluish green, reddish or reddish brown, February–July. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS; Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Gladesville, Rouse Hill, Bass Hill, La Perouse, Botany, Rookwood, Bundeena, Burragorang Valley, Seven Mile Beach. **CT**: Yetholme, Boyd Crossing, Mt Gibraltar, Blackheath, Mt Jellore, Oberon.

Habitat

HABITAT: Amongst grass.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *E. radiata*, *E. fastigata*, *Angophora costata*.

SUBSTRATE: Clay loam on basalt, sandstone, medium to high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Royal NP.

ORCHIDACEAE

Pterostylis concinna

Trim Greenhood

Life history

GROWTH FORM: Seasonally deciduous, very slender terrestrial herb, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous, may form large colonies (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, white and dark green, with brown, May–September. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted, beginning to fruit 30 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CWS; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Mainly coast.

SELECT LOCATIONS: **CC:** Sackville, Castlereagh (P. H.), Kenthurst, Lindfield, Boronia Park, La Perouse, Bass Hill, Georges River, Holsworthy, Warumbul, Seven Mile Beach.

Habitat

HABITAT: Moist areas.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata* and grassy understorey; shrubland e.g. with *Kunzea ambigua*.

SUBSTRATE: Sandy to loamy soil on sandstone, sand, shale, low nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Royal NP, Blue Mountains.

ORCHIDACEAE

Pterostylis curta

Blunt Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, white and green, with brown, July–October, peak May. Pollination by pseudocopulation of male fungus gnats (Mycetophilidae) (Bernhardt 1995).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; LHI, Qld, Vic., Tas., S.A., N. Caledonia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Glen Davis, Barbers Creek, Putty, Yarramalong, Ourimbah, Bateau Bay, Glenbrook, Sackville, Hornsby, Manly, Gladesville, Holsworthy, Heathcote, Mt Kembla, Macquarie Pass, Yerranderie, Wombeyan Caves. **CT:** Katoomba, Kangaroo Valley.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora floribunda*, *Eucalyptus umbra*, *Corymbia gummifera*, *Eucalyptus globoidea*, *E. botryoides*; rainforest margins.

SUBSTRATE: Sandy loamy soil on sandstone, shale, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Pterostylis cynnocephala

Swan Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green with darker lines, shiny, August–January. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT:** Abercrombie Caves.

Habitat

HABITAT:

ALTITUDE: ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; grassland

SUBSTRATE:

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

*Pterostylis daintreana***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with with rosette and stem leaves, and paired tubers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green and white, shiny, March–July, peak May. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouted, fruiting 31 weeks after high intensity fire (1/1994 at Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: **CC:** Calga, Woy Woy, Wondabyne, Cowan, Lindfield, Castle Cove, Manly, Lane Cove, Lugarno, Waterfall, Dapto, Nowra. **CT:** Woodford.

SELECT LOCATIONS: Mainly coast.

Habitat

HABITAT: Ridgetops, 'moss gardens'.

ALTITUDE: 0–600 m **ANNUAL RAINFALL:** 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Kunzea ambigua*, *Leptospermum trinervium*, *Darwinia fascicularis*.

SUBSTRATE: On sandstone sheets and flat rocks, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. R eported in Royal NP, Heathcote NP.

ORCHIDACEAE

Pterostylis decurva

Summer Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, pale green to dark green and white, with brown, October–March. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Kanangra area.

SELECT LOCATIONS: **CT:** Jenolan Caves, Kanangra, Porters Retreat.

Habitat

HABITAT: Ridges.

ALTITUDE: 1000 m **ANNUAL RAINFALL:** 1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus pauciflora*, *E. dalrympleana*.

SUBSTRATE: Gravelly loam on granite, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra Boyd NP.

ORCHIDACEAE

Pterostylis erecta

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 35 cm high, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, white to greenish brown to dark brown markings, July–September. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast, sporadic.

SELECT LOCATIONS: **CC:** Pittwater, Lindfield, Audley, Waterfall.

Habitat

HABITAT: Sheltered sites.

ALTITUDE: 0–200 m **ANNUAL RAINFALL:** 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest e.g. with *Angophora costata*.

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Pterostylis fischii

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 25 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect green, white and rusty brown, February–May. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: ?NC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT:** Yetholme, Mount York, Grose Valley, Murruin Creek.

Habitat

HABITAT: Valleys, slopes.

ALTITUDE: 600–1000 m **ANNUAL RAINFALL:** 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Amongst grass and low shrubs in open-forest e.g. with *Eucalyptus piperita*, *Acacia falciformis*.

SUBSTRATE: Sandy soil on sandstone, metamorphics.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis furcata

Sickle Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, dark green and white, December–March. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC ST; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Southern Highlands, Kanangra.

SELECT LOCATIONS: **CC:** Burrawang. **CT:** Penrose, Bowral, Kanangra Boyd, Hampton, Yetholme.

Habitat

HABITAT: Creeks, swamps.

ALTITUDE: 600–1000 m **ANNUAL RAINFALL:** 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Empodisma minus*, *Hydrocotyle*, *Ranunculus*.

SUBSTRATE: Peaty to sandy soils, sandy alluvium, wet areas, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra Boyd NP.

ORCHIDACEAE

Pterostylis gibbosa (*Pterostylis ceriflora*)

Illawarra Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 45 cm high, with rosette leaves, paired tubers and stolons with daughter tubers. Similar to *Pterostylis saxicola* (Jones & Clements 1997). Occurs in clumps or scattered clusters (NPWS 2002).

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, bright green with transparent patches, August–November. Usually 9–10 flowers per spike, the lowest opening first; pollination is generally by pseudocopulation, male insects of the families Mycetophilidae (fungus gnats, *Mycoma* sp.) (NPWS 2002), or Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsules brownish, erect, 7–8 mm long, (Jones & Clements 1997), with numerous minute seeds, wind-dispersed; seed may remain dormant for up to two seasons; seed set in spring does not germinate until autumn and requires specific strain of the mycorrhizal fungus *Ceratobasidium cornigerum* for successful germination (Quality Environmental Management 1994); this widespread fungus is associated with leaf litter (NPWS 2002). High seed viability (76% in one study), seed set 11% (NPWS 2002).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Tubers allow fire survival; occasional fire may be necessary for establishment of seeds and seedlings (NPWS 2002).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally

associated with a soil fungus and require its presence to germinate (Cady 1988). Associated with mycorrhizal fungus *Ceratobasidium cornigerum*, its growth stimulated in autumn by cooler temperatures and moist conditions; inflorescence of *P. gibbosa* grazed by rabbits and stock (QEM 1994).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC.

DISTRIBUTION SYDNEY AREA: Lake Illawarra area.

SELECT LOCATIONS: **CC:** Prospect to South Creek (1803), Yallah, Albion Park, Nowra.

Habitat

HABITAT: Woodland, ridgetops, grassy understorey.

ALTITUDE: 10–150 m (Jones & Clements 1997).

ANNUAL RAINFALL: 800–1100 mm

TYPICAL LOCAL ABUNDANCE: Occasional to frequent.

VEGETATION: Woodland with grassy understorey e.g. with *Melaleuca decora*, *M. styphelioides*, *Eucalyptus amplifolia*, *E. tereticornis*, *E. longifolia*, *Angophora floribunda* (QEM 1994). Woodland e.g. with *Acacia falcata*, *Corymbia maculata*, *Eucalyptus paniculata*, *Leucopogon juniperinus*, *Themeda australis* (NPWS 2002).

SUBSTRATE: Silty loams and sandy clay loams, poorly drained (Jones & Clements 1997). Red or yellow podzolic soils on siltstones, shales and fine sandstones of Berry formation, poorly drained, only likely to be waterlogged for short periods following heavy rain (QEM 1994). In abundant to deep leaf litter (at Nowra); soils all leached and acidic with clay subsoils that impair drainage (NPWS 2002).

EXPOSURE:

Conservation

Listed as Endangered (Schedule I) NSW Threatened Species Conservation Act 1995. Extinct in Western Sydney (James et al. 1999). Now confined to relict patches of vegetation around Lake Illawarra, one site near Nowra and one site at Milbodale in the Hunter Valley. Threatened by grazing, trampling, weed invasion, frequent late-winter hazzard reduction burns, development and chemicals from adjacent industrial or urban property that could kill the associated fungus (QEM 1994).

ORCHIDACEAE

Pterostylis grandiflora

Cobra Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 40 cm high, with rosette and stem leaves, and paired tubers with stolons and daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white with deep red-brown, April–August. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Pearl Beach, Wamberal, Springwood, West Head, Warriewood, Duffys Forest, Lindfield, Centennial Park, Macquarie Fields, Kogarah, Rookwood, Heathcote, Woronora, Waterfall, Darkes Forest, Mt Kembla. **CT:** Mount Tomah, Katoomba, Woodford.

Habitat

HABITAT: Moist shady slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*, *E. globoidea*.

SUBSTRATE: Sandy loam over sandstone, sandy alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Pterostylis hildae

Rainforest Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 15 cm high, with rosette leaves, paired tubers and stolons with daughter tubers, and flowering stem to 15 cm high (Bishop 1996).

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, white and green with brown, July–September.

Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Mt Kembla, Macquarie Pass. **CT:** Bundanoon.

Habitat

HABITAT:

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist open-forest; rainforest

SUBSTRATE: Sandy loam over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis hispidula**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with rosette leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, nodding, translucent with green and brown, March–July. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Bulli Pass. **CT:** Mount Tomah, Bundanoon.

Habitat

HABITAT: Moist areas, ridgetops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1400–1600 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Eucalypt open-forest

SUBSTRATE: Sandy soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Morton NP.

ORCHIDACEAE

Pterostylis laxa**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 40 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, slightly nodding, green and white with dark green or brown, March–May. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST CWS; Vic.

DISTRIBUTION SYDNEY AREA: Southern Highlands, Blue Mountains.

SELECT LOCATIONS: **CT:** Mt Gibraltar, Grose Valley, Bungonia Gorge.

Habitat

HABITAT: Amongst grass on slopes.

ALTITUDE: 500–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

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

SUBSTRATE: Stony brown loam from trachyte.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis longifolia

Tall Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 15–40 cm high, with rosette and stem leaves and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green and white, shiny, April–August. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouted, flowering 24–33 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Broken Back, Bateau Bay, Gibba Swamp, Kurrajong Heights, Pittwater, Dural, Hornsby, Wahroonga, Ryde, Bankstown, Oakdale, Heathcote, Mt Keira, Bomaderry, O'Hares Creek. **CT:** Mt Irvine, Medlow Bath, Wentworth Falls, Woodford, Abercrombie Caves.

Habitat

HABITAT: Depressions.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus globoidea*; coastal scrub.

SUBSTRATE: Sandy soil on sandstone, low nutrients, moist areas.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wyrabalong NP, Yengo NP, Royal NP.

ORCHIDACEAE

*Pterostylis longipetala***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 25 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, slightly nodding, green and white, with pink to red or red-brown, April–June. Probably pollinated by pseudocopulation by fungus gnats (Mycetophilidae) (Adams & Lawson 1993).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Douglas Park.

Habitat

HABITAT: Moist slopes

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE:

EXPOSURE:

Conservation

Only record in areas is Douglas Park in 1992. Conservation status unknown.

ORCHIDACEAE

Pterostylis mutica

Midget Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 35 cm high, with rosette and stem leaves and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, pale green to yellowish green, August–November. Pollination is almost certainly by pseudocopulation by fungus gnats (Mycetophilidae) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Riverstone, Glenbrook, Killara, East Hills, Ingleburn, Kentlyn. **CT:** Rylstone, Bathurst, Wentworth Falls, Abercrombie River, Capertee.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest; grassland; woodland e.g. with *Eucalyptus rossii*, *E. polyanthemos*, *E. viminalis*, *E. bridgesiana*, *E. crebra*.

SUBSTRATE: Clay soil on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis nutans

Nodding Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with rosette leaves, paired tubers and stolons with daughter tubers. Hybridizes with *P. furcata* (Harden 1993).

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, nodding, translucent with green and brown, March–October, peak June–September. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Seed, no special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouted, some plants beginning to fruit 36 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Terrigal, Wamberal, Kurrajong Heights, Glenbrook, Patonga Creek, Ingleside, Gladesville, Kurnell, Long Bay, Rookwood, Mortlake, Bass Hill, Loftus, Campbelltown, Bulli Pass, Barrengarry, Minnamurra Falls, Bomaderry, Yerranderie. **CT:** Orange, Jenolan Caves, Mt Wilson, Blackheath, Katoomba, Woodford.

Habitat

HABITAT: Gullies, creekbanks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus piperita*, *E. deanei*; coastal scrub e.g. with *Kunzea ambigua*, *Melaleuca nodosa*.

SUBSTRATE: Sandy soils on sandstone, medium nutrients.

EXPOSURE: Mid-shade.

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Royal NP.

ORCHIDACEAE

Pterostylis obtusa

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 25 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers. Hybridizes with *P. ophioglossa* (Harden 1993).

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, dark green and white, shiny, February–June. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST WS; LHI, Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Drews Creek, Culool Range, Kurrajong, Avalon, Baulkham Hills, Hornsby, Kurnell, Razorback, Burragarang Valley, Mt Keira, Nowra. **CT:** Capertee, Mt Wilson, Grose Valley, Woodford.

Habitat

HABITAT: Moist slopes and ridges, gullies.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland, dry rainforest, moist eucalypt forest.

SUBSTRATE: Loamy soils on sandstone, dune sand, shale, basalt.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Yengo NP.

ORCHIDACEAE

Pterostylis ophioglossa

Snake Tongue Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with rosette leaves, paired tubers and stolons with daughter tubers. Hybridizes with *P. concinna* (Harden 1993).

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, white with tan or reddish stripes, April–June. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Wilberforce, Riverstone, Agnes Banks, Mt Druitt (P.H.), Gladesville, Rookwood, Burragarang Valley.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1100 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; scrub

SUBSTRATE: Clay soils on shale.

EXPOSURE: Sheltered.

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis parviflora

Tiny Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 8–15 cm high, with rosette and stem leaves, paired tubers and stolons with daughter tubers. A complex of variants including a brown-flowered group (Harden 1993).

VEGETATIVE SPREAD: No (P. Hind pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white, February–June, peak April. Probably pollinated by fungus gnats (Mycetophilidae) (Van der Cingel 2001). Can set seed without pollination.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Summer-dormant species producing vegetative shoots from bulbs during winter, no seedlings recorded less than 1 year after fire (Purdie 1977).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

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:** Colo Heights, Wisemans Ferry, West Head, Hornsby, Cheltenham, Epping, Ryde, Rockdale, Kurnell, Waterfall, Dapto. **CT:** Rylstone, Yetholme, Capertee, O'Connell, Mt Canobolas, Mt Wilson, Mt Irvine, Wentworth Falls, Woodford, Kanangra Walls, Abercrombie Caves, Fitzroy Falls, Mittagong.

Habitat

HABITAT: Plateaus, slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Corymbia gummifera*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus rossii*, *E. macrorhyncha*, *E. mannifera*; heath e.g. with *Kunzea ambigua*, *Baekkea imbricata*, *Darwinia fascicularis*, *Banksia ericifolia*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Blue Mountains NP, Royal NP, Kanangra Boyd NP.

ORCHIDACEAE

Pterostylis pedoglossa

Prawn Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 15 cm high, very slender, with rosette leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (P. Hind pers. comm.). Colony-forming, multiplying slowly (Banks 1996).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green and white, March–July. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly coast, sporadic.

SELECT LOCATIONS: **CC:** Woy Woy, Maroubra, Waterfall, Kurnell, Heathcote (Banks 1996), Bundeena. **CT:** Capertee.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Banksia ericifolia*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Apparently isolated non-coastal population in the Lithgow–Newnes area e.g. Capertee (Bishop 1996). Sydney is northern geographical limit. Conservation status unknown. Reported in Royal NP (Banks 1996).

ORCHIDACEAE

Pterostylis pedunculata

Maroonhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 25 cm high, with rosette leaves, paired tubers and stolons with daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, white and green, July–November. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; ?Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Mill Creek, Sackville, Longueville, McMahons Lookout, Macquarie Pass, Bundeena, Mt Kembla, Seven Mile Beach. **CT:** Mt Canobolas, Mount Tomah, Mt Irvine, Wombeyan Caves, Mt Werong, Kanimbla Valley.

Habitat

HABITAT: Moist sheltered sites, dunes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus radiata*, *Syncarpia glomulifera*; littoral rainforest e.g. with *Cupaniopsis anacardioides*, *Banksia integrifolia*; gallery rainforest e.g. with *Backhousia myrtifolia*.

SUBSTRATE: Sandy to loamy soils on sand, sandstone, granite, basalt, medium to high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Dharug NP, Royal NP.

ORCHIDACEAE

Pterostylis plumosa (*P. barbata*)

Bearded Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb 15 cm high, with rosette and stem leaves and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, translucent with dark green lines, August–October. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Does not reproduce by multiple tubers but spreads only by seed, germinating readily in freshly-turned soil (Hatch 1985).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Kurnell–Port Jackson, Bathurst–Abercrombie.

SELECT LOCATIONS: **CC:** Maroubra Bay, Kurnell. **CT:** Abercrombie Caves.

Habitat

HABITAT: Sheltered slopes, plateaus.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Coastal scrubs e.g. with *Melaleuca nodosa*, *Baeckea imbricata*; open-forest.

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Bathurst is northern geographical limit (Harden 1993). Conservation status unknown.

ORCHIDACEAE

*Pterostylis pulchella***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers and stolons with daughter tubers, and stems to 15 cm high with rosette and stem leaves.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, white with green and red to red-brown, February–May. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST.

DISTRIBUTION SYDNEY AREA: Southern Highlands.

SELECT LOCATIONS: **CC:** Belmore Falls, Minnamurra Falls. **CT:** Fitzroy Falls.

Habitat

HABITAT: Close to waterfalls, moist sheltered ridges.

ALTITUDE: 200–600 m ANNUAL RAINFALL: 1400–1600 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest below falls e.g. with *Ceratopetalum apetalum*, *Callicoma serratifolia*.

SUBSTRATE:

EXPOSURE:

Conservation

Listed as Vulnerable (Schedule 2) NSW Threatened Species Conservation Act 1995. Reported in Budderoo NP, Morton NP.

ORCHIDACEAE

Pterostylis pusilla

Ruddyhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with rosette leaves, and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, pointed outwards, transparent with green and red markings, September–November. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT CWS SWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Kurrajong, Londonderry, Riverstone, Burragarang Valley. **CT:** Portland.

Habitat

HABITAT: Amongst litter.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest

SUBSTRATE:

EXPOSURE:

Conservation

ORCHIDACEAE

*Pterostylis reflexa***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with rosette and stem leaves, and paired tubers with stolons and daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, erect, green and white with red-brown, February–June, peak April. Probably pollinated by fungus gnats (Mycetophilidae) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Culoul Range, Woy Woy, West Head, Avalon, Killara, Gladsville, Bundeena, Wedderburn. **CT:** Capertee, O'Connell, Bimlow, Mittagong, Tallong.

Habitat

HABITAT: Ridges, slopes, gullies.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest, woodland e.g. with *Eucalyptus melliodora*, *E. bridgesiana*, *E. blakelyi*.

SUBSTRATE: Clay loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Ku-ring-gai Chase NP.

ORCHIDACEAE

*Pterostylis revoluta***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 15 cm high, with rosette and stem leaves, and paired tubers with stolons and daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, slightly nodding, pale green and white, February–June. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Woy Woy, Sackville North, Glenbrook, Bass Hill, Kurnell, Cronulla. **CT:** Winburndale, Yetholme, Capertee, Bowral.

Habitat

HABITAT: Sheltered slopes, ridges, dunes.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Banksia serrata*, *Eucalyptus rossii*.

SUBSTRATE: Sandy soils on dunes, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Yengo NP.

ORCHIDACEAE

Pterostylis rufa (*Pterostylis pusilla* var. *prominens*)

Rusty Hood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 30 cm high, with rosette and stem leaves, and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, dark reddish brown and translucent, September–November. Probably pollinated by fungus gnats (Mycetophilidae) (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT.

DISTRIBUTION SYDNEY AREA: Western Sydney, Bathurst.

SELECT LOCATIONS: **CC:** Freemans Reach, Riverstone, Marayong, Rookwood, Bankstown, Cow Pasture (1803), Wilton. **CT:** Glanmire, Yetholme.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland e.g. with *Eucalyptus crebra*, *Themeda australis*.

SUBSTRATE: Clay soils on shale, laterite, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis saxicola (*Pterostylis* sp. *E*)

Sydney Plains Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a rosette and stem leaves. Similar to *Pterostylis gibbosa* (Jones & Clements 1997).

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, transparent and red-brown, with dark red-brown markings, October–December (Jones & Clements 1997). Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsules brownish, erect, 7–8 mm long, (Jones & Clements 1997), with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** South Creek/Toongabbie (1804), Emu Plains (1835), Campbelltown (1989, CANB), Kentlyn (1996, CANB).

Habitat

HABITAT: Forest, woodland, close to streams, among rocks (Jones & Clements 1997).

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional; scattered individuals or small groups and loose colonies.

VEGETATION: Woodland e.g. with *Eucalyptus crebra*.

SUBSTRATE: Shallow sandy clay loams, sandy soil over flat sheets of sandstone and crevices between sandstone boulders (Jones & Clements 1997).

EXPOSURE:

Conservation

Local endemic species, listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995. Development pressures, increased access and increased use of sites are likely to result in habitat loss and degradation, directly threatening existing populations and reducing the area of available habitat.

ORCHIDACEAE

Pterostylis* sp. *B (*Pterostylis revoluta*)**Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb to 25 cm high, with rosette and stem leaves, and paired tubers with stolons and daughter tubers.

VEGETATIVE SPREAD: Stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, slightly nodding, green and white with red or red-brown, March–June. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Colo Heights, Killara. **CT:** Bowral.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest e.g. with *Leptospermum trinervium*, *Allocasuarina*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Pterostylis truncata

Little Dumpies

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 15 cm high, with rosette and stem leaves, and paired tubers with stolons and daughter tubers.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, semi-erect, white with green and brown stripes, February–July, peak April. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; Vic.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Colo Heights, Thirlmere. **CT:** Winburndale, Capertee, Cullen Bullen, Grose Valley, Kanimbla Valley, Wombeyan Caves, Yerranderie, Mittagong, Bowral, Mt Gibraltar.

Habitat

HABITAT: Sheltered ridges, slopes.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *E. radiata*, *Syncarpia glomulifera*, *Eucalyptus ovata*.

SUBSTRATE: Sandy to gravelly loam on sandstone, trachyte.

EXPOSURE: Sheltered.

Conservation

Conservation status unknown.

ORCHIDACEAE

*Pterostylis tunstallii***Life history**

GROWTH FORM: Seasonally deciduous terrestrial herb 15–50 cm high, with paired tubers, rosette and stem leaves, and flowering stem to 50 cm high with up to 10 flowers (Bishop 1996).

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, green and white, shiny, July–August. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC CT; Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT:** Wentworth Falls, Woodford.

Habitat

HABITAT: Moist areas.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*.

SUBSTRATE: Sandy loam over sandstone, low nutrients.

EXPOSURE:

Conservation

Robertson is northern geographical limit (Harden 1993). Conservation status unknown.

ORCHIDACEAE

Pterostylis woollsii

Long-tailed Greenhood

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 45 cm high, with rosette and stem leaves, and paired tubers.

VEGETATIVE SPREAD: No (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Hood-shaped, transparent with green reddish tonings, October–December. Pollination is almost certainly by pseudocopulation; all known *Pterostylis* pollinators have been male insects of the families Mycetophilidae (fungus gnats) and Culicidae (mosquitoes) (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: *Pterostylis* species are generally associated with a soil fungus; seeds require the presence of this fungus to germinate (Cady 1988).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT NT NWS CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT:** Abercrombie Caves.

Habitat

HABITAT: Among rocks, on ridges, slopes.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest, amongst grass

SUBSTRATE:

EXPOSURE:

Conservation

Rare, one record for the area is Abercrombie Caves, although there is an old record for Richmond. Coded 3RC- on national rare species list (Briggs & Leigh 1996).

ORCHIDACEAE

Pyrochoris nigricans (*Lyperanthus nigricans*)**Life history**

GROWTH FORM: Robust terrestrial herb 10–30 cm high, with tubers and daughter tubers on stolons; whole plant dries to jet black colour.

VEGETATIVE SPREAD: Yes, stoloniferous (Jones & Clements 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Red and white, August–November. Bee-pollinated (Jones 1981).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Active growing period autumn–winter (Pridgeon et al. 2001).

FIRE RESPONSE: Mass flowering events follow hot summer fires, especially where there have been long intervals between burns (Pridgeon et al. 2001).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Bunnerong.

Habitat

HABITAT:

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Heath; woodland; scrub

SUBSTRATE:

EXPOSURE:

Conservation

Only Sydney area record is for Bunnerong in 1946. Conservation status unknown.

ORCHIDACEAE

Rhizanthella slateri (*Cryptanthemis slateri*)

Underground Orchid

Life history

GROWTH FORM: Subterranean, holomycotropic herb with fleshy underground stem to 15 cm long, whitish, often branching, with prominent, fleshy, overlapping bracts; no roots. Head of about 25–35 flowers (Annable 1989), covered by leaf litter or just protruding above soil level.

VEGETATIVE SPREAD: Yes, by branching rhizomes (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Purplish, tubular, up to 30, maturing below the soil surface or extending 2 cm above the ground, October–November. Pinkish flowers turn purple after exposure to sunlight (Stephenson 1997).

FRUIT/SEED: Fleshy indehiscent, reddish berry with 50–150 non-winged seeds, protruding just above soil surface.

DISPERSAL, ESTABLISHMENT & GROWTH: Almost entire life cycle spent underground (Annable 1989). Fleshy fruits may be ingested by small herbivores.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Not associated with any single species of host, found with *Tristaniopsis laurina*, *Syncarpia glomulifera*, *Casuarina* species (Bishop 1996).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ?SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Blue Mountains, Dharug NP (Harden 1993).

SELECT LOCATIONS: **CC:** Mill Creek, Wattagan Mountains, Wisemans Ferry, Agnes Banks, Blue Mountains, Nowra.

Habitat

HABITAT: Creekbed, slopes.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 800 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Gallery rainforest with *Ceratopetalum apetalum*, *Tristaniopsis laurina*; open-forest with tussock grass (Bishop 1996).

SUBSTRATE: Shallow to deep loams, sandy alluvium, low nutrients.

EXPOSURE:

Conservation

Listed as Vulnerable (Schedule 2) under the NSW Threatened Species Conservation Act 1995. Reported in Dharug NP. Seldom seen, usually only isolated plants found accidentally while excavating (Bishop 1996). Recently reported from the Nowra area (1997) where a property owner was removing *Leptospermum* (Stephenson 1997).

ORCHIDACEAE

Rimacola elliptica

Green Beaks, Green Rock Orchid

Life history

GROWTH FORM: Epilithic evergreen herb, with basal leaves, inflorescence to 10 cm long, and fleshy roots but no tubers.

VEGETATIVE SPREAD: Yes, rhizomatous, forming localised congested clumps (P. Hind, P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White or green with reddish brown markings, November–December. Possibly pollinated by small black wasps (Jones 1988).

FRUIT/SEED: Capsule with numerous minute winged seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts (Bantry Bay 1991). Flowering 9 months after high intensity fire (1/1994 at Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Bilpin, Dural, Pittwater, Narrabeen, Middle Harbour. **CT:** Blackheath, Wentworth Falls, Katoomba, Woodford.

Habitat

HABITAT: Wet crevices, damp ledges of sandstone cliffs.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Amongst mosses, grasses and ferns e.g. with *Gleichenia rupestris*, *Dracophyllum secundum*, *Baeckea linifolia*.

SUBSTRATE: Peaty soils on sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Brisbane Water NP, Royal NP.

ORCHIDACEAE

Sarcophilus australis

Butterfly Orchid

Life history

GROWTH FORM: Semi-pendant evergreen epiphyte, usually with 1 shoot, stems 0.5–7 cm long.

VEGETATIVE SPREAD: No.

LONGEVITY: Short-lived (Walsh 2001).

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to brown or rarely yellow, October–December. Flowers seen on tiny plants 3 cm high (Walsh 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990). Prolific germination (Walsh 2001).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Epiphytic on *Tristaniopsis laurina*.

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Marramarra Creek, Coal and Candle Creek.

Habitat

HABITAT: Creekbanks. In gullies (Walsh 2001).

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional to frequent.

VEGETATION: Temperate rainforest e.g. with *Tristaniopsis laurina*, *Lomandra fluviatilis*.

SUBSTRATE: On outer branches of trees, *Tristaniopsis laurina*.

EXPOSURE:

Conservation

Hunter River is northern geographical limit. Reported in Marramarra NP.

ORCHIDACEAE

Sarcochilus falcatus

Orange Blossum Orchid

Life history

GROWTH FORM: Semi-pendant evergreen epiphytic, or rarely an epilithic herb, with 1 or rarely 2 or more shoots and stems to 8 cm long.

VEGETATIVE SPREAD: Rarely, by branching.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White with purple mid-line, June–October.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coast and Tablelands.

SELECT LOCATIONS: **CC:** Kangaroo Valley, Bulli, Mt Kembla.

CT: Mount Tomah, Mt Wilson, Oberon.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grows on a variety of rainforest tree species, but also on *Doryphora sassafras*, *Pittosporum undulatum* and *Backhousia myrtifolia*.

SUBSTRATE: On tree trunks, commonly *Acacia melanoxylon*, rarely on rocks.

EXPOSURE:

Conservation

ORCHIDACEAE

*Sarcochilus hillii***Life history**

GROWTH FORM: Semi-pendant evergreen epiphytic, or rarely an epilithic herb with creeping roots, linear leaves, 1 or rarely several shoots and stems to 2 cm long.

VEGETATIVE SPREAD: Rarely, by branching.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White to pale pink, October–December.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Mill Creek, Pittwater, Church Point, Kentlyn, Hill Top.

Habitat

HABITAT: Along creeks.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Gallery rainforest on sandstone, alluvium with a variety of hosts including *Tristaniopsis laurina*, *Pittosporum undulatum*, *Backhousia myrtifolia*.

SUBSTRATE: On tree trunks, mostly *Backhousia myrtifolia*, rarely on rocks.

EXPOSURE:

Conservation

Regionally rare in Illawarra region (Mills 1988), conservation status elsewhere unknown. Reported in Dharug NP.

ORCHIDACEAE

*Sarcochilus olivaceus***Life history**

GROWTH FORM: Semi-pendant evergreen epiphytic, or rarely an epilithic herb with creeping roots, 1 or rarely 2 or more shoots and stems to 7 cm long.

VEGETATIVE SPREAD: Rarely, by branching.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to yellow, November–December.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coast.

SELECT LOCATIONS: **CC:** Mountain Lagoon, Waterfall, Bulli Pass.

CT: Wentworth Falls.

Habitat

HABITAT: Gullies, creekbanks.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Rainforest

SUBSTRATE: On trees e.g. *Trochocarpa laurina*, more rarely on rocks.

EXPOSURE:

Conservation

Reported in Royal NP.

ORCHIDACEAE

Spiranthes sinensis subsp. *australis*

(*Spiranthes australis*)

Ladies' Tresses

Life history

GROWTH FORM: Slender deciduous terrestrial herb, with fleshy roots, stem 16–50 cm high, and basal leaves.

VEGETATIVE SPREAD: No (McIntyre et al. 1995), not stoloniferous (Pridgeon & Chase 1995).

LONGEVITY: Short-lived, 5 years (P. Hind pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Bright pink in dense spiral, mainly November–March.

Pollinated by small native bees but apparently self-pollinating forms are not uncommon around Sydney and probably elsewhere (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore mobile (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Bilpin, Waterfall, Mt Keira. **CT:** Hill Top, Lidsdale, Woodford, Luthers Creek, Wingecarribee Swamp, Penrose, Fitzroy Falls.

Habitat

HABITAT: Boggy places, wetland margins, creeks.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus radiata*, *E. sclerophylla*; wet heath; montane sedgeland e.g. with *Lythrum salicaria*, *Centella asiatica*, *Phragmites australis*.

SUBSTRATE: Loamy sand to clay on alluvium, sandstone, low nutrients, moist. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra Boyd NP, Royal NP.

ORCHIDACEAE

Tetrabaculum melaleucaphilum

(*Dendrobium melaleucaphilum*)

Spider Orchid

Life history

GROWTH FORM: Epiphytic or epilithic evergreen herb, with succulent stems.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green to deep dull yellow, September–October.

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Wheeny Creek, Gosford.

Habitat

HABITAT: On trees or on rocks.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Frequently on *Melaleuca styphelioides*, less commonly on rainforest trees or on rocks.

EXPOSURE:

Conservation

Listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995. Main threat is illegal collection and bark-stripping of host *Melaleuca* trees; also threatened by repeated burning, clearing and draining resulting in degradation of habitat (NPWS website). Lower Blue Mountains is southern geographical limit.

ORCHIDACEAE

Tetrabaculum tetragonum (*Dendrobium tetragonum*)

Tree Spider Orchid

Life history

GROWTH FORM: Epiphytic evergreen herb with succulent stems.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Green, dull yellow and cream with reddish lines, September–October.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld

DISTRIBUTION SYDNEY AREA: Mainly Illawarra area.

SELECT LOCATIONS: CC: Somersby, Waterfall, Helensburgh, Otford, Mt Kembla.

Habitat

HABITAT: Along streams.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest

SUBSTRATE: On rainforest trees.

EXPOSURE:

Conservation

Regionally rare in Illawarra region (Mills 1988), the southern geographical limit.

ORCHIDACEAE

Thelyphyton gracilicaulis (*Dendrobium gracilicaule*)

Life history

GROWTH FORM: Epiphytic or epilithic evergreen herb, with succulent cylindrical stems and creeping roots.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Dull yellow, September–October. Probably pollinated by *Trigona* bees (Jones 1983).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Gosford, Wisemans Ferry, Kiama.

Habitat

HABITAT: On rainforest trees and occasionally on rocks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Kiama is southern geographical limit, conservation status unknown.

ORCHIDACEAE

Thelyphyton speciosus (*Dendrobium speciosum*)

Rock Lily

Life history

GROWTH FORM: Epilithic or rarely epiphytic robust evergreen herb with erect to spreading succulent stems and creeping or aerial roots; leaves thick and leathery.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to deep dull yellow, September–October. Provides a 'big bang' effect or gregarious flowering through visual display of over 1000 flowers per plant and by fragrance (Van de Cingel 2001). Self-infertile, pollinated by *Trigona* bees (Jones 1983).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts from base, stimulating a tenfold increase in number of new shoots after moderate burning (Adams 1986).

INTERACTION WITH OTHER ORGANISMS: Leaves eaten by Swamp Wallaby (at Katandra Bushland Sanctuary, L.McD.). Shoots, inflorescences eaten by *Dendrobium* Beetle *Stethopachys formosa* (P. Weston pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT CWS; Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Peats Ridge, Cowan Creek, Glenbrook, Hornsby, Hunters Hill, Wedderburn, Burratorang Valley. **CT:** Coricudgy Range.

Habitat

HABITAT: On rocks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 m

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. punctata*.

SUBSTRATE: Rock crevices, shelves, on sandstone boulders, low nutrients, well-drained.

EXPOSURE: Light shade to full sun.

Conservation

Populations of *D. speciosum* complex comprise a single but highly variable species; it is strongly recommended that individuals be specified by their geographical origin for identification (Burke & Adams 2002). *D. speciosum* is under heavy pressure from collecting (Burke & Adams 2002).

ORCHIDACEAE

Thelychiton tarberi (*Dendrobium tarberi*)

Rock Lily

Life history

GROWTH FORM: Epilithic or epiphytic evergreen herb, with succulent stems 20–100 cm long. Sometimes hybridizes with *D. gracilicaule*.

VEGETATIVE SPREAD: Yes, rhizomatous (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to cream, August–October. Pollinated by bees in the genera *Trigona*, *Homalictus*, *Lasioglossum*, *Hylaeus* (Adams 1991).

FRUIT/SEED: Capsule with numerous, minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Shoots and inflorescences eaten by *Dendrobium* Beetle *Stethopachys formosa* Baly (P. Weston pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT; Qld.

DISTRIBUTION SYDNEY AREA: Gosford area.

SELECT LOCATIONS: **CC:** Peats Ridge.

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Rainforest; open-forest

SUBSTRATE: On trees e.g. *Ficus macrophylla*, and rocks.

EXPOSURE:

Conservation

Peats Ridge is southern geographical limit, conservation status unknown.

ORCHIDACEAE

Thelymitra carnea

Tiny Sun Orchid, Pink Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tuberoids, a linear leaf to 15 cm long and stem to 35 cm high, with up to 4 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink to reddish or rarely yellow, opening on hot, sunny often humid days (Bishop 1996), September–November.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ; Qld, Vic, Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Somersby, Cowan, Wahroonga, Willoughby, Gladesville, La Perouse, Rookwood, Jannali, Engadine. **CT:** Rylstone, Bathurst, Wentworth Falls, Woodford.

Habitat

HABITAT: Ridgetops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Kunzea ambigua*; woodland e.g. with *Eucalyptus haemastoma*, *E. piperita*, *Corymbia gummifera*, *Angophora costata*, *Eucalyptus sclerophylla*.

SUBSTRATE: Sandy stony soil on sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wambool NR.

ORCHIDACEAE

Thelymitra circumsepta (*Thelymitra retecta*)

Naked Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tuberoids, a thick to leathery lanceolate leaf 20 cm long and stem to 60 cm high, with up to 10 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White or pale blue lilac, December–January. Self-pollinated, opening on hot days or not at all, rarely more than one flower open per spike on any one day, probably cleistogamous (Calder & Sydes 1993).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Mainly Upper Blue Mountains.

SELECT LOCATIONS: **CC:** O'Hares Creek. **CT:** Newnes Plateau, Mt Irvine, Mt Victoria, Blackheath.

Habitat

HABITAT: Ridges, seepage areas. Sedgeland swamp (Calder & Sydes 1993).

ALTITUDE: 400–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus sieberi*, *E. piperita*, *E. macrorhyncha*.

SUBSTRATE: Sandy soil on sandstone, laterite, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Thelymitra cyanea

Veined Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tuberoids, a thick to fleshy linear leaf 25 cm long and stem to 50 cm high.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue and veined or white to pink with darker veins, opening on hot, sunny often humid days (Bishop 1996), November–February.
 FRUIT/SEED: Capsule with numerous minute seeds.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC NT CT ST; Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Southern Highlands, upper Blue Mountains.

SELECT LOCATIONS: **CC:** Woronora Plateau. **CT:** Clarence, Blackheath, Penrose.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sphagnum bogs, open-forest among grasses and sedges.

SUBSTRATE: Peaty soils on sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

Thelymitra erosa (subsp. *alpicola*, J. Jeanes ms)

(*Thelymitra pulchella*)

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 60 cm high, with fleshy dark green leaf to 12 cm long. *Thelymitra pulchella* is now regarded as NZ endemic (J. Jeanes pers. comm.).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink to blue, veined, opening on hot, sunny often humid days (Bishop 1996), January–February. Autogamous (J. Jeanes pers. comm.).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST; Vic., N.Z.

DISTRIBUTION SYDNEY AREA: Boyd Plateau (Bishop 1996).

SELECT LOCATIONS: **CT:** Boyd Plateau.

Habitat

HABITAT: Bogs, beside streams or in soaks and swamps (J. Jeanes pers. comm.).

ALTITUDE: 800–1100 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Heathy *Sphagnum* bogs. Moist alpine heathlands e.g. with *Baeckea gunniana* (Bishop 1996).

SUBSTRATE:

EXPOSURE:

Conservation

ORCHIDACEAE

Thelymitra ixiooides var. *ixiooides*

Dotted Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, variable, with narrow leaf to 20 cm long and stem to 60 cm high with up to 9 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue to pinkish, opening on hot, sunny often humid days (Bishop 1996), August–December, peak September. Many flowers on the spike open at one time, self-compatible but pollinated by native bees, *Exoneura* and *Lasioglossum* species; also frequently visited by hoverflies but they are not pollinators; the scattered occurrence of *T. ixodes* in communities, where other plants contribute more to the floral display, ensure that the deception of floral mimicry (see *T. nuda*) is not easily learnt by its pollinators (Calder & Sydes 1993).

FRUIT/SEED: Capsule with numerous minute winged seeds. In the field, 28% of flowers set fruit and mature to release seed (Calder & Sydes 1993).

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouted, fruiting 10 months after high intensity fire (1/1994 at Lane Cove and Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coast, Blue Mountains.

SELECT LOCATIONS: **CC:** Wye, Ourimbah, Forresters Beach, Springwood, Cowan, Mt Colah, Pittwater, Frenchs Forest, Lane Cove, Manly, Como (1887), Waterfall. **CT:** Corricudgy Range, Wallerawang, Blackheath, Wentworth Falls, Woodford, Mittagong.

Habitat

HABITAT: Often along roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath; open-forest.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

Thelymitra malvina

Life history

GROWTH FORM: Seasonally deciduous, slender to robust terrestrial herb, with paired tubers, a stout fleshy leaf 10–30 cm long and stem 30–65 cm high, with up to 15 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue, pink, white or mauve to deep violet, sweetly fragrant, August–November. Flowers open, usually all at once on hot, sunny day; self-pollinated or pollinated by bees (Bishop 1996).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC; Qld, Vic., ?Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Kurnell.

Habitat

HABITAT: Seepage areas.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Tall open-forest; seepage areas in heath e.g. with *Melaleuca nodosa*, *Baeckea imbricata*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Botany Bay NP.

ORCHIDACEAE

Thelymitra media* var. *media

Tall Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a lanceolate leaf to 30 cm long and stems to 90 cm high, with up to 25 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue with streaks of pink, opening on hot, sunny often humid days (Bishop 1996), October–January, especially after fire.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Lindfield, Uloola Track. **CT:** Fitzroy Falls.

Habitat

HABITAT: Plateaus, near swamps.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Swamp margins.

SUBSTRATE: Sandy soil on sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Hawkesbury River is northern geographical limit. Conservation status unknown. Reported in Royal NP.

ORCHIDACEAE

Thelymitra merraniae

Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 20 cm high, with linear leaf to 12 cm long. Intergrades with *T. ixioides* and maybe a hybrid (Harden 1993).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale greenish blue, opening on hot, sunny often humid days (Bishop 1996), October–November.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC; Vic., S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS:

Habitat

HABITAT:

ALTITUDE: ANNUAL RAINFALL:

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Wet heath

SUBSTRATE: Peaty soils

EXPOSURE:

Conservation

ORCHIDACEAE

Thelymitra nuda

Plain Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a narrow leaf 10–30 cm long and stems to 60 cm high, with up to 20 sweetly fragrant flowers, often forming extensive colonies; extremely variable.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Blue, white to pink, or mauve to deep violet, sweetly fragrant, opening on hot, sunny often humid days (Bishop 1996), August–November. Flowers open when temperature exceeds 20°C, are commonly visited by syrphid flies but pollinated by female bees, *Lasioglossum* sp., that apply thoracic vibration; *T. nuda* appears to mimic blue-purple flowered plants that are typically buzz-pollinated e.g. *Thysanotus patersonii*, *Dichopogon fimbriatus* (Bernhardt & Burns-Balogh 1986). Also self-pollinating (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts (Fox 1988).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Corrabare SF, Jamberoo Mountain.

Habitat

HABITAT:

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Heath; woodland e.g. with *Angophora costata*, *Allocasuarina torulosa*.

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

EXPOSURE:

Conservation

Conservation status unknown.

ORCHIDACEAE

***Thelymitra pauciflora* (complex)**

Slender Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb, with paired tubers, a narrow leaf to 20 cm long and stems to 50 cm high, with up to 25 but usually about 4 flowers.

VEGETATIVE SPREAD: Yes, local vegetative spread (P. Hind pers. comm.) in some populations (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Greyish blue to bright blue, white to pink, or purple, August–January. Flowers open on hot, sunny often humid days, a self-pollinating species that has developed many distinctive forms (Bishop 1996, Bates 1999).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Summer-dormant species producing vegetative shoots from bulbs during winter, no seedlings recorded up to 1 year after fire (Purdie 1977).

FIRE RESPONSE: Probably resprouted, green fruit 10 months after high intensity fire (1/1994 at Lane Cove and Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Palatable to rabbits (Leigh et al. 1987). Tubers eaten by Aboriginal people (Herb. note 1981).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Kenthurst, Killara, Marsden Park, Castlereagh SF, Cape Solander, Bundeena. **CT:** Bathurst, Capertee, Blackheath, Wentworth Falls, Kanangra Walls, Wildes Meadow, Penrose.

Habitat

HABITAT: Gentle slopes, sandstone pavements.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest and woodland e.g. with *Eucalyptus radiata*, *E. dives*, *E. haemastoma*, *E. piperita*, *Corymbia gummifera*, *Angophora costata*; heath e.g. with *Allocasuarina distyla*, *Banksia ericifolia*, *Baeckea imbricata*.

SUBSTRATE: Sandy stony soil on sandstone, Tertiary alluvium.

EXPOSURE:

Conservation

Possibly the most common Thelymitra species, often persisting in areas where original vegetation has been severely disturbed (Harden 1993). Conserved in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Wambool NR, Wollemi NP, Garigal NP, Botany Bay NP.

ORCHIDACEAE

Thelymitra venosa

Large Veined Sun Orchid

Life history

GROWTH FORM: Seasonally deciduous terrestrial herb to 70 cm high, with tubers and a thick to fleshy linear leaf to 30 cm long; stem to 70 cm high with up to 6 flowers.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Bright blue with darker veins or rarely white to pink or greenish blue, opening on hot, sunny often humid days (Bishop 1996), October–December. Self-pollinating (Van der Cingel 2001).

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Mainly Blue Mountains.

SELECT LOCATIONS: **CC:** Castlecove (1940), Mt Kembla (1891).

CT: Mt Banks, Blackheath, Katoomba, Wentworth Falls, Lawson.

Habitat

HABITAT: Damp areas, creek edges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1100–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: In damp clumps of cushion mosses or in low vegetation e.g. heath.

SUBSTRATE: Peaty soil over sandstone, low nutrients.

EXPOSURE:

Conservation

Local endemic, conservation status unknown. Reported in Blue Mountains NP.

ORCHIDACEAE

***Tropilis aemula* (*Dendrobium aemulum*)**

Ironbark Orchid, White Feather Orchid

Life history

GROWTH FORM: Epiphytic evergreen herb, with radiating cylindrical, succulent stems, leathery leaves and warty roots. Three 'ecological' forms recognised in NSW, Ironbark form: usually on *Eucalyptus paniculata* and close relatives; Brush Box form: almost exclusively on *Lophostemon confertus*; rainforest form: on a variety of rainforest trees, particularly *Backhousia myrtifolia* (Harden 1993).

VEGETATIVE SPREAD: Rhizomatous, forming compact clumps (P. Weston pers. comm.).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: White to pale yellow but often aging to pink, inflorescence 2–10 cm long, July–October.

FRUIT/SEED: Capsule with numerous minute seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Upper Colo, Somersby Falls, Mill Creek, Hornsby, Woodford, Glenbrook, Hunters Hill.

Habitat

HABITAT:

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Gallery rainforest e.g. with *Ceratopetalum apetalum*, *Tristaniopsis laurina*, *Backhousia myrtifolia*.

SUBSTRATE: Epiphyte on trees e.g. *Ceratopetalum apetalum*, *Backhousia myrtifolia*.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP.

PHILYDRACEAE

Philydrum lanuginosum

Frogsmouth

Life history

GROWTH FORM: Erect, rhizomatous, perennial aquatic herb to 2 m high; leaves mostly basal, linear to 60 cm long.

VEGETATIVE SPREAD: No.

LONGEVITY: Probably short-lived

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, November–March, peak March.

FRUIT/SEED: Oblong capsule, about 10 mm long, with many tiny seeds, matures Jan–May.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, probably wind-dispersed.

FIRE RESPONSE: Probably resprouted, fruiting 5 months after high intensity fire (1/1994 at Narrabeen (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT CWS SWP; Qld, Vic., N.T., W.A., Asia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Mellong Swamp, MacDonald River, Wyong, Tuggerah, Annangrove, West Head, Hornsby, Agnes Banks, Shane Park, Glenfield, Glenbrook, Botany, Fairy Meadow, Berry.

CT: upper Cudgegong River, Paddys River, Mittagong.

Habitat

HABITAT: Wetlands, margins of ponds.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: With other wetland species e.g. *Eleocharis sphacelata*, *Viminaria juncea*, *Chorizandra cymbaria*, *Typha*, *Persicaria*.

SUBSTRATE: Sandy alluvium, low to medium nutrients, water table mostly high, moisture supply intermittent, fresh.

EXPOSURE: Full sun.

Conservation

Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella caerulea var. *assera***Life history**

GROWTH FORM: Perennial, tufted herb to 1.8 m high, scaly stems with extra shoots from leaf sheaths, strap-like leaves to 75 cm long, and fibrous roots

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale to mid-blue, October–January. Buzz-pollinated by female bees primarily in the families Anthophoridae (*Exoneura* spp.) and Halictidae (*Lasioglossum*, *Nomia* spp.) (Bernhardt 1995). Only 20% of all flowers on an inflorescence set fruit suggesting they do not self-pollinate (Bernhardt 1995).

FRUIT/SEED: Berry 7–12 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Mooney Mooney, Royal NP (Bernhardt 1995), Thirlmere Lakes, Mt Cambewarra. **CT:** Yerranderie.

Habitat

HABITAT: Riverbanks, hillsides.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Rainforest, riverine forest, moist forest e.g. with *Syncarpia glomulifera*.

SUBSTRATE: Clay soil on basalt, volcanic necks, alluvium, medium to high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

PHORMIACEAE (LILIACEAE)

Dianella caerulea var. *caerulea***Life history**

GROWTH FORM: Tufted perennial herb, to 0.5 m high, with fibrous roots.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mid to dark blue, September–November.

FRUIT/SEED: Berry 7–12 mm long, November–December.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fruit, vertebrate-dispersed e.g. Currawongs, seeds attractive to ants, flesh and some seeds consumed in situ (French & Westoby 1996). Germination may be seasonal triggered by temperature/humidity (K. Townsend, Gumnuts 43), requires no pre-treatment but is sometimes slow to germinate e.g. one month (H. Knowles, Gumnuts 43).

FIRE RESPONSE: Resprouts at base or below (Fox 1988), (Bantry Bay, LMCD). Secondary juvenile period 11–12 months after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Fruit reported from pellets of Currawongs (Buchanan 1989a). Leaves eaten by rabbits (P. Kubiak pers. comm.). Food plant of butterfly larvae *Toxidia peron* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT CWS; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Hornsby, Avalon, Rose Bay, Maroubra, Oatley, Hill Top, Kangaroo Valley. **CT:** Mount Tomah, Mt Solitary, Fitzroy Falls, Bundanoon.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*; heath.

SUBSTRATE: Clay soils on shale, volcanics, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP.

PHORMIACEAE (LILIACEAE)

Dianella caerulea var. *cinerascens***Life history**

GROWTH FORM: Perennial, tufted herb, with stems less than 10 cm long, fibrous roots.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Creamy-green to pale blue, September–November.

FRUIT/SEED: Berry 7–12 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT NWS CWS.

DISTRIBUTION SYDNEY AREA: Putty area.

SELECT LOCATIONS: **CC:** Laguna, Putty.

Habitat

HABITAT: Hillsides, rock outcrops.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Eucalypt open-forest and woodland.

SUBSTRATE: Shallow sandy loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Putty is southern geographical limit, conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella caerulea var. *producta***Life history**

GROWTH FORM: Perennial, tufted herb to 1.3 m high, conspicuously elongated scaly stems with extra shoots from leaf sheaths on old stems, fibrous roots.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Greenish white to bright blue, October–December. Probably pollinated by native bees gathering pollen (P. Kubiak pers. comm.).

FRUIT/SEED:

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Bucketty, Cheltenham, Narrabeen, Manly, La Perouse, Hurstville, Nowra. **CT:** Mount Tomah, Blackheath.

Habitat

HABITAT: Rocky hillsides, gullies, rock cracks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. radiata*, *E. sieberi*, *E. oreades*.

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

EXPOSURE:

Conservation

Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella caerulea* var. *protensa**Life history**

GROWTH FORM: Perennial, tufted herb to 0.5 m high, with elongated scaly stems, fibrous roots.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale blue

FRUIT/SEED: Berry 7–12 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Hill Top. **CT:** Mount Tomah.

Habitat

HABITAT:

ALTITUDE: 500–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest e.g. with *Eucalyptus radiata*, *E. sieberi*.

SUBSTRATE: Sandy soils on sandstone, low nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella caerulea* var. *vannata**Life history**

GROWTH FORM: Perennial, tufted herb to 1.3 m high, with elongated stems, fibrous roots.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Very pale to mid-blue

FRUIT/SEED: Berry 7–12 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT; Qld, N.G.

DISTRIBUTION SYDNEY AREA: Blue Mountains

SELECT LOCATIONS: **CC:** Manly, Woodford. **CT:** Mt Victoria.

Habitat

HABITAT: Valleys, rock outcrops.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; rainforest

SUBSTRATE: Sandy alluvium.

EXPOSURE:

Conservation

Southern geographical limit Blue Mountains. Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella congesta**Life history**

GROWTH FORM: Perennial herb to 1 m high, with fibrous roots.

VEGETATIVE SPREAD: Forming mats to 20 m diam.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mid- to dark blue, spring–summer.

FRUIT/SEED: Berry 6–12 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: An effective sand-binder (Harden 1993).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Wamberal (1911), Robinsville Beach, Bulli (1891).

Habitat

HABITAT: Coastal sand dunes.

ALTITUDE: 0–20 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: e.g. with *Lomandra longifolia*.

SUBSTRATE: Coastal sand dunes, low nutrients.

EXPOSURE:

Conservation

Rare, last collected in 1911 at Wamberal.

PHORMIACEAE (LILIACEAE)

Dianella crinoides**Life history**

GROWTH FORM: Perennial, tufted herb to 0.8 m high, roots fleshy-fibrous.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mid- to dark blue, November–December.

FRUIT/SEED: Berry 6–8 mm long, spring–summer.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Barrack Point, Kiama.

Habitat

HABITAT: Coastal headlands.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Headland grassland.

SUBSTRATE: Loamy grey soils, rock crevices on basalt, high nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported from Killalea State Park in 1996.

PHORMIACEAE (LILIACEAE)

Dianella longifolia var. *longifolia* (*Dianella laevis*)**Life history**

GROWTH FORM: Perennial, tufted herb, with fleshy-fibrous or tuberous roots; leaves to 80 cm long.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Whitish to dark blue or blue-green, mainly October–December.

FRUIT/SEED: Berry 3–7 mm long, mature, mainly November–January.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore vertebrate-dispersed by ingestion (McIntyre et al. 1995). Germination takes approx. 4 months (with 52 seedlings per gram seed); germinates well with or without fermentation (Greening Australia 1996b).

FIRE RESPONSE: Resprouts.

INTERACTION WITH OTHER ORGANISMS: Leaves used by Aboriginal people for making baskets (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS SWS NWP; all states.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Grose Vale, Barrenjoey, Richmond, Marayong, Kemps Creek, Milperra, Rockdale, Campbelltown, Menangle, Bass Point, Kangaroo Valley. **CT:** Hampton, Yerranderie, Bowral.

Habitat

HABITAT: Creeks, riverbanks, coastal headlands.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. dives*, *E. fastigata* with grassy understory; coastal headland grassland.

SUBSTRATE: Clay soils on shale, alluvium, medium nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella longifolia var. *stenophylla***Life history**

GROWTH FORM: Perennial tufted herb to 0.5 m high, with strap-like leaves to 80 cm long and tuberous roots.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pale blue to whitish, October–November.

FRUIT/SEED: November–February.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore vertebrate-dispersed by ingestion (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Pitt Town (1984), St Marys (1886), Werrington (1968).

Habitat

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland e.g. with *Eucalyptus crebra*, *E. tereticornis*.

SUBSTRATE: Clay loam soils on Wianamatta Shale, medium nutrients.

EXPOSURE:

Conservation

Rare, not recorded in James et al. (1999). Conservation status unknown.

PHORMIACEAE (LILIACEAE)

*Dianella prunina***Life history**

GROWTH FORM: Perennial tufted herb to 2 m high, with glaucous strap-like leaves to 90 cm long, roots fleshy-fibrous.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mid-blue to dark violet, October–December.

FRUIT/SEED: Berry 5–8 mm long, October–November.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed.

FIRE RESPONSE: Resprouts (Bantry Bay, LM cD). Secondary juvenile period 51 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains–Wollombi.

SELECT LOCATIONS: **CC:** South Maroota, Canoelands, Kulnura, Wollombi, Glenbrook, Hornsby, Wahroonga, Castlecove. **CT:** Howes Mountain, Lawson, Woodford, Bundanoon.

Habitat

HABITAT: Dry ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Angophora costata*, *Corymbia gummifera*, *Corymbia eximia*, *Eucalyptus punctata*, *E. sparsifolia*.

SUBSTRATE: Sandy soils on sandstone, low nutrients, well-drained.

EXPOSURE:

Conservation

Local endemic species, conservation status unknown.

PHORMIACEAE (LILIACEAE)

Dianella revoluta var. *revoluta***Life history**

GROWTH FORM: Perennial tufted herb to 1 m high, with fibrous roots and strap-like leaves to 85 cm long, often glaucous, sometimes reddish at base.

VEGETATIVE SPREAD: Clump-forming to 1.5 m diam.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Mid to dark blue or violet, October–November. Probably pollinated by native bees gathering pollen (P. Kubiak pers. comm.).

FRUIT/SEED: Blue berry 4–10 mm long. Mature December–January (Greening Australia 1996b). Viability of fresh seed 80% (Vigilante et al. (1998).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore vertebrate-dispersed by ingestion (McIntyre et al. 1995). Germination takes approx. 2 years (with 66 seedlings per gram seed); seed should be smoked for 1 hour (Greening Australia 1996b,c).

FIRE RESPONSE: Regrowth from rhizomes, no seedlings recorded more than 1 year after fire (Purdie 1977, Vigilante et al. (1998). Flowering 94 weeks after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS SWS NWP SWP SFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wollombi, Kulnura, Lower Portland, Agnes Banks, Londonderry, Glenbrook, Barrenjoey, Cheltenham, Vacluse, Centennial Park, Kogarah, Taren Point, Rookwood, Concord, Chullora, Willmot, Couridjah, Bimlow.

Habitat

HABITAT: Eucalypt woodland, seacliffs.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. punctata*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus haemastoma*, *Corymbia gummifera*, *E. fibrosa*, *E. sclerophylla*; seacliff scrub e.g. with *Banksia integrifolia*.

SUBSTRATE: Sandy to clay soil on sandstone, sand, shale, low nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Sydney Harbour NP.

PHORMIACEAE (LILIACEAE)

*Dianella tasmanica***Life history**

GROWTH FORM: Perennial tufted herb to 0.9 m high, to 0.3 m high, roots fibrous, leaves to 95 cm long.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Lavender to violet, October.

FRUIT/SEED: Berry 12–25 mm long. Mature January–February (Greening Australia 1996b).

DISPERSAL, ESTABLISHMENT & GROWTH: Probably vertebrate-dispersed. Germination takes approx. 83 days (with 127 seedlings per gram seed); germinates well without fermentation (Greening Australia 1996b).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Southern Highlands and Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Yengo. **CT:** Hassans Walls, Mount Tomah, Blackheath, Boyd Plateau, Nattai Creek, Burrawang, Cambewarra Mountain, Wingello.

Habitat

HABITAT: Creekbanks.

ALTITUDE: 100–1200 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus agglomerata*, *E. sclerophylla*, *E. pauciflora*, *E. dalrympleana*, *E. radiata*.

SUBSTRATE: Shallow, often sandy alluvial soils, low nutrients.

EXPOSURE:

Conservation

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

PHORMIACEAE (LILIACEAE)

*Stypandra glauca***Life history**

GROWTH FORM: Tufted perennial herb, usually 1.5 m high, often flowering when less than 30 cm high, variable according to stage of growth.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Deep blue to white, July–November, peak October.

FRUIT/SEED: Black capsule 3–12 mm long, with seeds 1.5–3 mm long. Mature November–December. Viability of fresh seed 71% (Vigilante et al. 1998).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts from rhizome (Vigilante et al. (1998).

INTERACTION WITH OTHER ORGANISMS: May be toxic to livestock if eaten when flowering (Harden 1993).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., S.A., W.A., ?N.Cal.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Newnes, Sackville, Wheeny Creek, Yarramundi, Grose River, Bankstown, Ingleburn, Cobbitty, Menangle, Burragorang.

CT: Currant Mountain Gap, Cargo, Capertee, Bathurst, Blackheath, Jenolan Caves, Mt Werong, Hill Top, Bowral.

Habitat

HABITAT: Hillsides, moist gullies, ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest; woodland e.g. with *Angophora costata*, *Eucalyptus punctata*, *Angophora floribunda*.

SUBSTRATE: Shallow stony soil or clayey soils on sandstone, quartzite, alluvium, granite, often with clay influence, low to medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Thelionema caespitosum (*Stypandra caespitosa*)**Life history**

GROWTH FORM: Perennial tufted herb 30–90 cm high, to 20 cm diam. at base; forms hybrids with *T. umbellatum*.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Deep blue to white or pale yellow, October–December. Probably pollinated by native bees gathering pollen (P. Kubiak pers. comm.).

FRUIT/SEED: Dark brown or black capsule 4–10 mm long, with shiny seeds 2–3 mm long. Mature November–February.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted, fruiting 2 years after high intensity fire (1/1994 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Yarramundi, Londonderry, Cheltenham, Manly, Centennial Park, La Perouse, Oatley, Woodford, Loddon Falls, Bomaderry. **CT:** Currant Mountain Gap, Sunny Corner, Blackheath, Mt Werong, Kanangra Walls, Yerranderie, Barbers Creek.

Habitat

HABITAT: Damp heaths.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Kunzea ambigua*; woodland e.g. with *Angophora bakeri*, *Eucalyptus parramattensis*, *E. sclerophylla*.

SUBSTRATE: Sandy or peaty soils on sandstone, Tertiary alluvium, low nutrients, moist sites.

EXPOSURE:

Conservation

Uncommon on Central Coast, and apparently more conspicuous in past (14/18 Herbarium specimens from Central Coast collected prior to 1960, 14/21 Tablelands specimens collected prior to 1960). Conservation status unknown.

PHORMIACEAE (LILIACEAE)

Thelionema umbellatum (*Stypandra umbellata*)**Life history**

GROWTH FORM: Perennial tufted herb to 40 cm high, to 20 cm diam. at base; forms hybrids with *T. caespitosum*.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: White, spring. Flowers September–December, peak September (Barren Grounds 1990).

FRUIT/SEED: Dark brown or black capsule 5–7 mm long, shiny seeds 2–3 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast and Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Swansea, Hornsby, Curl Curl, Watsons Bay, La Perouse, Kurnell, Waterfall, Sublime Point, Carrington Falls.

CT: Narrow Neck, Wentworth Falls.

Habitat

HABITAT: Rock ledges, ridges.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Coastal heath e.g. with *Melaleuca nodosa*, *Leptospermum laevigatum*, *Banksia ericifolia*; montane heath e.g. with *Allocasuarina nana*, *Leptospermum trinervium*.

SUBSTRATE: Shallow sandy or peaty soils on sandstone, low nutrients, moist to poorly-drained.

EXPOSURE:

Conservation

Swansea is northern geographical limit, conservation status unknown.

POACEAE

Agrostis bettyae (*Agrostis* species *A sensu*)**Life history**

GROWTH FORM: Loosely tufted perennial herb to 90 cm tall, sometimes with short horizontal rhizome (Jacobs 2001).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spikelets often strongly purplish (Jacobs 2001).

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST NWS SWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains, Boyd Plateau, Wingello.

SELECT LOCATIONS: **CT:** Katoomba, Boyd Plateau, Oberon, Wingello.

Habitat

HABITAT: Montane sedgeland.

ALTITUDE: 900–1100 m **ANNUAL RAINFALL:** 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Sedgeland e.g. with *Carex appressa*; wet heath e.g. with *Leptospermum*, *Baeckea utilis*, *Empodisma minus*.

SUBSTRATE: Clay to organic sediments on granite, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Agrostis capillaris * (*A. tenuis* *)

Browntop Bent

Life history

GROWTH FORM: Tufted or rhizomatous perennial herb to 0.5 m high.

VEGETATIVE SPREAD: Sometimes stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal, vegetative and wind-dispersal (Carr et al. 1992), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Some plants flowering in October, 10 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Palatable to sheep and cattle (Herb. record 1955).

Distribution

STATUS/ORIGIN: Exotic, native to Europe, Asia & N Africa. Probably introduced as a turf species.

BOTANICAL SUBREGIONS: CC SC NT CT ST CWS SWS; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread but mainly Tablelands.

SELECT LOCATIONS: **CC:** Richmond (1910), Arncliffe (1910), La Perouse,

Kentlyn. **CT:** Orange, Capertee, Yetholme, Blackheath, Hampton,

Katoomba, Wentworth Falls, Woodford, Mittagong, Moss Vale,

Robertson, Barrengarry.

Habitat

HABITAT: Roadsides, creekbanks, wet places.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Montane sedgeland e.g. with *Juncus*, *Carex*, *Lycopus australis*; coastal sedgeland e.g. with *Isolepis nodosa*.

SUBSTRATE: Clay loam from coal measures, alluvium, basalt, sandy soils on sandstone, sand, granite. Acid soils, low nutrients.

EXPOSURE:

Conservation

Major turf species. Weed of pastures.

POACEAE

Agrostis gigantea * Redtop Bent**Life history**

GROWTH FORM: Erect, tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: Probably mainly dispersed by rhizome fragments in garden waste.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Grazed by cattle.

Distribution

STATUS/ORIGIN: Exotic, Native to Europe & Asia. Probably introduced as turf grass.

BOTANICAL SUBREGIONS: CC SC NT CT ST; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Narrara (1898), Wyong (1905), Richmond (1911), Neutral Bay, Kogarah (1899), Menai, Picton, Berry.

CT: Mt Wilson, Katoomba (1922).

Habitat

HABITAT: Near water, creeks.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Riparian vegetation e.g. with *Paspalum distichum*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

POACEAE

Agrostis stolonifera *

Creeping Bent

Life history

GROWTH FORM: Erect or ascending, tufted, stoloniferous perennial herb to 0.4 m high.

VEGETATIVE SPREAD: Stoloniferous, forming dense turf.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: December–March.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Some plants flowering in October, 10 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to northern N America. Introduced as lawn grass.

BOTANICAL SUBREGIONS: CC CT ST; Qld, Vic., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Centennial Park (1934).

CT: Oberon, Orange, Blackheath, Katoomba (1898).

Habitat

HABITAT: Lawns, urban areas.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Common in lawns

SUBSTRATE: Clay soil on basalt.

EXPOSURE:

Conservation

Minor weed of pastures, roadsides, waste areas (Harden 1993).

POACEAE

Agrostis venusta

Graceful Bent

Life history

GROWTH FORM: Very slender, erect, tufted annual herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST NWS SWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Orange.

SELECT LOCATIONS: **CT:** Orange (1906).

Habitat

HABITAT:

ALTITUDE: 800–900 m **ANNUAL RAINFALL:** 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rare, only record is from Orange in 1906.

POACEAE

Agrostis viridis * (*A. semiverticillata*)

Water Bent

Life history

GROWTH FORM: Erect or ascending, robust, stoloniferous perennial herb to 0.6 m high.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean.

BOTANICAL SUBREGIONS: CC ST SWS SFWP; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Suburban areas, sporadic.

SELECT LOCATIONS: **CC:** Dulwich Hill (1934), Riverwood, La Perouse (1948).

Habitat

HABITAT: Near or in water, wasteland.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

First recorded in 1934, recent recording from Saltpan Creek (1994), weed potential unknown.

POACEAE

Aira caryophylla *

Silvery Hairgrass

Life history

GROWTH FORM: Slender, erect annual herb to 0.3 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD:

FLOWERS: October–November.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive, animal and wind-dispersed (McIntyre et al. 1995, Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC SC CT ST CWS SWS SWP; Qld, Vic., Tas., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Gladesville (1884), Glenfield, Nowra.

CT: Fitzroy Falls (1930).

Habitat

HABITAT: Pastures, disturbed grassland.

ALTITUDE: 0–700 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pastures, grassland.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Weed in pastures, roadsides.

POACEAE

Aira cupaniana *

Silvery Hairgrass

Life history

GROWTH FORM: Delicate, slender herb to 0.5 m high, stems solitary or tufted.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Little value as stock feed (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Wyong, Wahrenonga, Ryde (1884), Cooks River (1909), Kangaroo Valley. **CT:** Bathurst (1963), Woodford (1947).

Habitat

HABITAT: Pastures, disturbed areas.

ALTITUDE: 0–700 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland, open-woodland.

SUBSTRATE: Clay soils from shales, medium nutrients.

EXPOSURE:

Conservation

Relatively uncommon weed of disturbed sites.

POACEAE

Aira elegantissima * (*Aira elegans*)

Delicate Hairgrass

Life history

GROWTH FORM: Delicate, slender, erect herb to 0.5 m high, stems solitary or tufted.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NT CT ST CWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Bathurst–Orange area.

SELECT LOCATIONS: **CT:** Blayney, Orange, Newbridge, Abercrombie Caves (1959).

Habitat

HABITAT: Pastures, disturbed areas.

ALTITUDE: 800–1000 m **ANNUAL RAINFALL:** 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland; woodland.

SUBSTRATE:

EXPOSURE:

Conservation

POACEAE

Aira praecox *

Early Hairgrass

Life history

GROWTH FORM: Delicate slender herb to 0.2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC; Vic., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Mainly coast.

SELECT LOCATIONS: **CC:** Bellevue Hill (1913), Centennial Park (1909), Bronte (1913). **CT:** Blackheath (1991).

Habitat

HABITAT:

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soils on sand, sandstone, low nutrients.

EXPOSURE:

Conservation

Appears to have been widely established in the Eastern Suburbs by 1920 but to have only been reported recently from the Upper Blue Mountains.

POACEAE

Aira provincialis ***Life history**

GROWTH FORM: Delicate, slender, erect annual to 0.5 m high, stems solitary or tufted.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains.

SELECT LOCATIONS: **CT:** Woodford (1948).

Habitat

HABITAT: Parkland, disturbed areas.

ALTITUDE: 600 m **ANNUAL RAINFALL:** 1000–1100 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland.

SUBSTRATE:

EXPOSURE:

Conservation

Only record is for Woodford in 1948. Current status unknown.

POACEAE

Alopecurus myosuroides * (*Alopecurus agrestis*)

Slender Foxtail

Life history

GROWTH FORM: Erect, slender tufted herb, to 0.7 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia.

BOTANICAL SUBREGIONS: NC CT CWS; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Tablelands, sporadic.

SELECT LOCATIONS: CT: Bathurst (1910), Kangaloon (1939).

Habitat

HABITAT: Cultivated, disturbed ground.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Weed of cultivated ground, rarely recorded.

POACEAE

Alopecurus pratensis *

Meadow Foxtail

Life history

GROWTH FORM: Tufted or decumbent perennial herb to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CT ST SWP; Qld, Vi c., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Richmond (1908), Bathurst (1995).

Habitat

HABITAT: Wet areas of pastures.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rarely recorded.

POACEAE

Ammophila arenaria *

Marram Grass

Life history

GROWTH FORM: Densely tufted rhizomatous perennial herb to 1.2 m high, with rigid stems.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal, water and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: CC: Unanderra (1938), Kiama (1946).

Habitat

HABITAT: Foreshores.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Coastal sand dunes, low nutrients.

SUBSTRATE:

EXPOSURE:

Conservation

Planted as a binder on sand dunes, often naturalising and replacing native species (Harden 1993).

POACEAE

Amphibromus nervosus (*Amphibromus neesii*)**Life history**

GROWTH FORM: Tufted perennial herb, occasionally rooting at nodes, 1.3 m high, with erect stems.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain or flooding.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS SWS NWP SWP SFWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Bathurst–Orange area.

SELECT LOCATIONS: CC: Camden (1934). CT: Nashdale (1991), Bathurst (1992).

Habitat

HABITAT: Floodplains, riverbanks, moist sites.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Riparian woodland e.g. with *Eucalyptus dalrympleana*, *E. stellulata*; woodland e.g. with *Eucalyptus blakelyi*, *E. melliodora*.

SUBSTRATE: Clay soils on alluvium, shales, low–medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Mainly Bathurst–Orange area, old record for Camden (1934). Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

Amphibromus pithogastrus (*Amphibromus* sp. A)**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high, with erect stems and occasionally with corm-like swellings on lower nodes.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain or flooding.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST SWS; Vic.

DISTRIBUTION SYDNEY AREA: Oberon.

SELECT LOCATIONS: **CT:** Oberon (1953, 1990).

Habitat

HABITAT: Seasonally swampy areas.

ALTITUDE: 800–1200 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Swampy areas.

SUBSTRATE:

EXPOSURE:

Conservation

Rare, only two records from Oberon (1953, 1990). Coded 3K on national rare species list (Briggs & Leigh 1996). Current conservation status unknown.

POACEAE

Amphipogon strictus var. *strictus*

Greybeard Grass

Life history

GROWTH FORM: Perennial herb to 0.4 m high, with single stems arising at close intervals from rhizome.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts and flowers after fire.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast and Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Killara, Voyager Point, Bundeena. **CT:** Lithgow, Clarence, Bell, Mt Victoria, Blackheath, Wentworth Falls, Mittagong, Wingello, Barbers Creek.

Habitat

HABITAT: Swamp margins, damp places on rocky hillsides or ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus longifolia*, *E. parramattensis*, *Melaleuca decora*; coastal heath e.g. with *Angophora hispida*, *Banksia serrata*, *Anisopogon avenaceus*; montane heath e.g. with *Allocasuarina nana*, *Leptospermum trinervium*, *Dampiera stricta*.

SUBSTRATE: Sandy soil on sandstone, Tertiary alluvium, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Ancistrachne maidenii**Life history**

GROWTH FORM: Scrambling perennial herb, with rigid decumbent stems and ascending branches.

VEGETATIVE SPREAD: May be some stoloniferous spread.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: January–June.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Hawkesbury River area.

SELECT LOCATIONS: **CC:** Wisemans Ferry, Maroota, Brooklyn, Berowra Creek, Cowan Creek, Erskine Creek.

Habitat

HABITAT: Slopes, rock outcrops near creeks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Corymbia eximia*, *Eucalyptus punctata*, *Angophora costata*, *Eucalyptus piperita*, *Angophora floribunda*, and shrubby understorey.

SUBSTRATE: Sandy soils on transitional geology between Hawkesbury and Wattagan soil landscapes, low nutrients, well-drained.

EXPOSURE:

Conservation

Restricted local endemic, listed as Vulnerable (Schedule 2) NSW Threatened Species Conservation Act 1995. Sydney is southern geographical limit. Reported in Ku-ring-gai Chase NP.

POACEAE

Andropogon virginicus *

Whisky Grass, Broomsedge

Life history

GROWTH FORM: Tufted, branched, erect perennial herb with solid stems to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Long distance wind-dispersed (Buchanan 1989b). Grows vigorously with dense cover, invades burnt or bare areas (Cronk & Fuller 1995).

FIRE RESPONSE: Resprouted, fruiting in May, 5 months after high intensity fire (1/94 at Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Allelopathic (Cronk & Fuller 1995).

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coast.

SELECT LOCATIONS: **CC:** Terrey Hills (1960), Turrumurra, Willoughby, Kurnell, Clyde, Penrith. **CT:** Bowral (1982).

Habitat

HABITAT: Roadsides, track edges, vacant fields, rocky hillsides.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Roadsides, not penetrating into dry forests.

SUBSTRATE: Mostly soils on sandstone, occasionally on shale, basalt. Tolerates very low levels of nutrients (Cronk & Fuller 1995).

EXPOSURE: Full sun.

Conservation

First reported from horse-riding paddocks in Terrey Hills in 1960 (Herb. record). Encroaches into disturbed and open sites in bushland.

POACEAE

Anisopogon avenaceus

Oat Spear Grass

Life history

GROWTH FORM: Erect, tufted, or shortly rhizomatous, glabrous perennial herb to 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring. Flowers visited by Honeybee *Apis mellifera* gathering pollen (P. Kubiak pers. comm.).

FRUIT/SEED: Dry, 1-seeded, indehiscent, stiffly-pointed, hairy, with slender straight or twisted bristle to 2.5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Adhesive, attaches to clothing (L. McD.)

FIRE RESPONSE: Resprouted, fruiting 1 year after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Scattered plants eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Asquith, Terrey Hills, Cheltenham, Manly, Northbridge, Hunters Hill, Rose Bay, Kogarah, Kentlyn, Thirlmere, Hill Top, Cambewarra. **CT:** Narrow Neck, Woodford, Carrington Falls.

Habitat

HABITAT: Plateaus.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*; heath e.g. with *Eucalyptus stricta*, *Allocasuarina nana*, *Kunzea capitata*.

SUBSTRATE: Sandy to loamy soils on sandstone, low nutrients, dry sites.

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Blue Mountains NP, Ku-ring-gai NP, Royal NP, Thirlmere Lakes NP.

POACEAE

***Anthoxanthum odoratum* ***

Sweet Vernal Grass

Life history

GROWTH FORM: Tufted perennial herb to 1 m high, forming tussocks, with scent of coumarin.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: October–January.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Mechanism for dispersal undefined (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Possibly unpalatable to stock (Herb. note).

Distribution

STATUS/ORIGIN: Exotic, native to Europe and temp. Asia, naturalised in many countries.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST ?NWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Rhodes, Centennial Park, Kogarah (1899), Berry. **CT:** Orange, Blackheath, Katoomba (1908), Wentworth Falls, Woodford, Coss River (1904), Berrima, Bundanoon.

Habitat

HABITAT: Mown or grazed areas, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: With roadside grasses.

SUBSTRATE: Moist peaty or sandy soils on sandstone, clay soils on basalt, low nutrients.

EXPOSURE:

Conservation

Widespread in mown or grazed areas.

POACEAE

Aristida behriana

Bunch Wiregrass

Life history

GROWTH FORM: Short, tufted, tussocky perennial herb to 0.4 m high, with slender wiry stems.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer or in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to 6 cm long, often purple.

DISPERSAL, ESTABLISHMENT & GROWTH: Adhesive diaspore.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., N.T., S.A.

DISTRIBUTION SYDNEY AREA: Orange area.

SELECT LOCATIONS: **CT:** Nashdale.**Habitat**

HABITAT:

ALTITUDE: 800 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Grassland; open-woodland

SUBSTRATE: Loamy soils

EXPOSURE:

Conservation

Only Sydney area record is from Orange area in 1991, conservation status unknown.

POACEAE

Aristida benthamii* var. *spinulifera

Wire Grass

Life history

GROWTH FORM: Slender, compactly tufted, perennial herb to 1 m high, with slender wiry stems.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to 1.5 cm long, January–April.

DISPERSAL, ESTABLISHMENT & GROWTH: Adhesive diaspore.

FIRE RESPONSE: Resprouted, mature fruit August, 8 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CWS; Qld.

DISTRIBUTION SYDNEY AREA: Widespread on the coast.

SELECT LOCATIONS: **CC:** Upper Colo, Patonga, Narrabeen, Glenbrook, Valley Heights, Menai.

Habitat

HABITAT: Slopes, rock platform, roadsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus punctata*, *Corymbia eximia*; with *Kunzea rupestris* at Maroota SF.

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Aristida calycina var. *calycina*

Wire Grass

Life history

GROWTH FORM: Tufted, erect perennial herb to 2 m high, with stongly branched, wiry stems.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with divergent 3-branched awn to 3 cm long, March–June.

DISPERSAL, ESTABLISHMENT & GROWTH: Adhesive diaspore.

FIRE RESPONSE: Resprouted, fruiting in July, 6 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS NWP SWP NFWP; Qld, Vic., N.T., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Lower Portland, East Kurrajong, Richmond, Randwick. **CT:** Currant Mountain Gap, Capertee Valley, Lithgow, Blackheath, Wentworth Falls, Tuena.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus rossii*, *Corymbia gummifera*, *Eucalyptus albens*; heath e.g. with *Angophora hispida*, *Banksia ericifolia*.

SUBSTRATE: Sandy soils on sandstone, volcanics, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Aristida jerichoensis var. *jerichoensis*

Jericho Wiregrass

Life history

GROWTH FORM: Compactly tufted perennial herb to 0.9 m high, with wiry stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer or in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to ?2.5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Narrabeen. **CT:** Clarence, Wentworth Falls.

Habitat

HABITAT: Rocky hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Eucalypt forest.

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Aristida jerichoensis var. *subspinulifera*

Jericho Wiregrass

Life history

GROWTH FORM: Compactly tufted perennial herb to 0.9 m high, with wiry stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to ?2.5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native, but exotic in CC.

BOTANICAL SUBREGIONS: *CC NT NWS CWS SWS NWP SWP NFWP SFWP; Qld, N.T.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Flemington Saleyards (1969), Kogarah (1896), Picnic Point (1993).

Habitat

HABITAT: Rocky hillsides.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Scrub e.g. with *Angophora hispida*, *Banksia oblongifolia*.

SUBSTRATE: Clay soil on laterite, low nutrients.

EXPOSURE:

Conservation

CONSERVATION: Introduced to Central Coast area, probably with stock, though possibly naturally occurring at Picnic Point (Herb. record).

POACEAE

Aristida ramosa var. *ramosa*

Wire Grass

Life history

GROWTH FORM: Tussocky perennial herb to 1.2 m high

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, November–June.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Resprouts from base. Fruiting 4–6 months after high intensity fire (1/94 at Lane Cove and Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT; Qld, Vic., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Berowra, Glenbrook, Woodford, Londonderry, Cheltenham, Gladesville, Manly, Centennial Park, Toongabbie, Homebush, Bringelly, Mount Annan, Bargo. **CT:** Sofala, Blackheath, Kowmung River, Hill Top, Mittagong.

Habitat

HABITAT: Slopes, gullies, gorges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *Angophora bakeri*, *Eucalyptus sclerophylla*, *E. dives*, *E. mannifera*; scrub e.g. with *Banksia aemula*.

SUBSTRATE: Clay soil on shale, Tertiary alluvium, quartzite, slates, sandy soils on dune sand, low–medium nutrients.

EXPOSURE: Full sun to mid shade.

Conservation

Conservation status unknown.

POACEAE

Aristida ramosa var. *scaberula* (*Aristida echinata*)

Life history

GROWTH FORM: Tussocky perennial herb to 1.2 m high, with stiff wiry stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: February–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to 2 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ST NWS CWS SWS NWP SWP; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Pitt Town, Flemington, Centennial Park, East Hills.

Habitat

HABITAT: Slopes.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus sclerophylla*, *Angophora bakeri*, *Eucalyptus crebra*, *E. eugenioides*.

SUBSTRATE: Clay soils on shale, Tertiary alluvium, low nutrients

EXPOSURE:

Conservation

Records from Flemington Saleyards indicate dispersal with stock. Appears to be rare, conservation status unknown.

POACEAE

Aristida ramosa var. *speciosa* (*Aristida personata*)

Life history

GROWTH FORM: Tussocky perennial herb to 1.2 m high, with stiff wiry stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to 2 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Host plant of common army worm *Pseudotia convecta* (Herb. specimen 1967).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS SWS NWP; Qld, S.A.

DISTRIBUTION SYDNEY AREA: Western Sydney to Shoalhaven.

SELECT LOCATIONS: **CC:** Prospect, Luddenham, Flemington Saleyards, Camden, Menangle Park, Picton, Wilton, Albion Park, Shoalhaven River.

Habitat

HABITAT: Roadsides, cemeteries.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland, heath e.g. with *Leptospermum polygalifolium*, *Leptospermum trinervium*, *Amperea xiphoclada*.

SUBSTRATE: Clayey to sandy soils on shale, sandstone, low nutrients

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Aristida vagans

Threeawn Speargrass

Life history

GROWTH FORM: Erect tufted or rhizomatous perennial herb to 80 cm high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, October–June.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Resprouts from base. Fruiting 4–6 months after high intensity fire (1/94 at Lane Cove and Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Some plants eaten by rabbits (P. Kubiak pers. comm.). Seed eaten by finches (J. Neil, Gumnuts 46, 2002).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Cheltenham, Frenchs Forest, North Ryde, Gladesville, Kogarah, Doonside, Bringelly, Mount Annan, Appin.

CT: Mt Armour, Kowmung River, Hill Top.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*.

SUBSTRATE: Clayey to gravelly clay soils on shales, medium nutrients.

EXPOSURE:

Conservation

Reported in Royal NP. Conservation status unknown.

POACEAE

Aristida warburgii**Life history**

GROWTH FORM: Compact, tufted perennial herb to 1.2 m high, with wiry stems.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent, with 3-branched awn to 4.5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts (D. Keith pers. comm.). Fruit 4 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Upper Colo, Ebenezer, Richmond, Hunters Hill, Doonside, Duck Creek, Kedumba River, Yennora, Bondi, Liverpool, Milperra, Lugarno, Mt Keira. **CT:** Megalong Valley.

Habitat

HABITAT: Rocky ridges.

ALTITUDE: 0–600 m **ANNUAL RAINFALL:** 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus umbra*, *E. tereticornis*, *E. fibrosa*; woodland e.g. with *Eucalyptus sclerophylla*, *Angophora bakeri*, *Melaleuca decora*; open-heath e.g. with *Banksia oblongifolia*, *Bauera rubioides*.

SUBSTRATE: Sandy loam on sandstone, metasediments, alluvial sand, gravel, low nutrients. Tertiary alluvium (T. James pers. comm.).

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

***Arrhenatherum elatius* var. *bulbosum* ***

Bulbous Oatgrass, Onion Twitch

Life history

GROWTH FORM: Loosely tufted perennial herb to 1.5 m high, with erect or slightly spreading stems and bulbous stem bases. Small form with white-striped leaves is sometimes grown as ornamental (Harden 1993).

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995), also dispersed in dumped garden refuse.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS SWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Dooralong, Gunderman, Richmond (1917).

CT: Hampton, Berambing (1971), Mount Tomah (1956), Leura (1973), Robertson.

Habitat

HABITAT: Roadsides.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland e.g. with *Paspalum dilatatum*, *Hypochoeris radicata*.

SUBSTRATE: Loamy soils on alluvium.

EXPOSURE:

Conservation

CONSERVATION: Weed of natural or man-made grasslands (Harden 1993).

POACEAE

***Arrhenatherum elatius* var. *elatius* ***

False Oatgrass

Life history

GROWTH FORM: Loosely tufted perennial herb to 1.5 m high, with erect or slightly spreading stems. Small form with white-striped leaves is sometimes grown as ornamental (Harden 1993).

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia.

BOTANICAL SUBREGIONS: CC SC NT ST CWS; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Rhodes (1934).

Habitat

HABITAT:

ALTITUDE: 0–50 m **ANNUAL RAINFALL:** 1000 m

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland

SUBSTRATE: Edge of salt swamp.

EXPOSURE:

Conservation

Only naturalised record is edge of salt swamp at Rhodes in 1934.

POACEAE

Arundinella nepalensis

Reedgrass

Life history

GROWTH FORM: Tufted perennial herb, with erect cane-like stems to 3 m high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers January–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS NWP; Qld, N.T., W.A., Asia.

DISTRIBUTION SYDNEY AREA: Lower Blue Mountains.

SELECT LOCATIONS: **CC:** Kurrajong Heights, Richmond, Londonderry, Woodford.

Habitat

HABITAT: Drainage lines.

ALTITUDE: 0–500 m **ANNUAL RAINFALL:** 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Dry woodland, grassland

SUBSTRATE:

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

***Arundo donax* ***

Giant Reed

Life history

GROWTH FORM: Tall, perennial reed to 6 m high, with thick, creeping, knotty rhizomes; stems woody to 2 cm diam, in large clumps similar to bamboo.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent, March–May.

DISPERSAL, ESTABLISHMENT & GROWTH: Water and possibly vegetative dispersal in garden refuse.

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Europe and Asia. Cultivated as ornamental.

BOTANICAL SUBREGIONS: NC CC NT NWS SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sydney suburban areas

SELECT LOCATIONS: CC: Gosford, Beacon Hill, Tamarama Beach, Macquarie Fields, Campbelltown.

Habitat

HABITAT: Riverbanks, parks, gardens.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay soils on shale, alluvium.

EXPOSURE: Full sun to light shade.

Conservation

Declared noxious weed category W4a in many Sydney council areas and Blue Mountains, where it may not be sold, propagated, or knowingly distributed and must be prevented from growing within 3 m of the property boundary (NSW Agriculture website: www.agric.nsw.gov.au).

POACEAE

***Austrodanthonia auriculata* (*Danthonia auriculata*)**

Lobed Wallaby Grass

Life history

GROWTH FORM: Slender, tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC ST CWS SWS SWP; Vic., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Colo Vale

SELECT LOCATIONS: CC: Colo Vale (1911).

Habitat

HABITAT:

ALTITUDE: 500 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Loamy or clay soil

EXPOSURE:

Conservation

Only one record from Colo Vale near Mittagong in 1911. Conservation status unknown.

POACEAE

***Austrodanthonia bipartita* (*Danthonia linkii* var. *linkii*)**

Wallaby Grass

Life history

GROWTH FORM: Variable, densely tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spikelets loosely clustered, spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seedheads appear white and fluffy, seed is hairy (Waters et al. 2000), mature December–February (Greening Australia 1996).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, adhesive (McIntyre et al. 1995). Optimum germination above 20°C, although rainfall may be more important than temperature, with seed more than 6 months old to overcome dormancy, sown in April–May (Waters et al. 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Year-long green plant produces high quality fodder during cooler months, encouraged by moderate grazing (Waters et al. 2000).

Distribution

STATUS/ORIGIN: Native.

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

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Grose River, Homebush, Wentworthville, Wallacia, Campbelltown, Douglas Park, Bargo. CT: Orange, Lithgow, Katoomba.

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus longifolia*, *E. crebra*; riparian vegetation e.g. with *Acacia longifolia*, *Grevillea sericea*.

SUBSTRATE: Clay soils on shale, alluvium, occasionally on sandstone, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

***Austrodanthonia caespitosa* (*Danthonia caespitosum*)**

Ringed Wallaby Grass

Life history

GROWTH FORM: Variable, tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: 5–6 years, favoured by grazing (Waters et al. 2000).

PRIMARY JUVENILE PERIOD:

FLOWERS: Early spring, infrequently at other times (Waters et al. 2000).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seedheads appear white and fluffy (Waters et al. 2000), mature December–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Prolific seedling recruitment, optimum germination at 15°C for seed more than 6 months old, to overcome dormancy and longevity (Waters et al. 2000). Germination approx. 26 days, typical rate 160 per gram of seed (Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990). Useful for fodder, responds well to moderate grazing (Waters et al. 2000).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Vic., Tas., S.A., W.A., N.Z., N America.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Awaba, Mosman, Homebush Bay, Ingleburn. **CT:** Blayney, Bathurst, Tuena, Bowral.

Habitat

HABITAT: Grasslands.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grasslands.

SUBSTRATE: Clay to heavy clay soils on slate, shales, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Austrodanthonia carphoides

(*Danthonia*, *Rytidosperma carphoides*, *Notodanthonia*)

Short Wallaby Grass

Life history

GROWTH FORM: Small, erect tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–January.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST CWS SWS NWP SWP; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Mainly Bathurst area.

SELECT LOCATIONS: **CC:** Ingleburn (1943). **CT:** Winburndale Creek, Sunny Corner, Lidsdale, Bathurst, Wallerawang.

Habitat

HABITAT:

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–800 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland, woodland

SUBSTRATE: Heavy soils on slate, granite.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrodanthonia eriantha (*Danthonia eriantha*)

Wallaby Grass

Life history

GROWTH FORM: Erect densely tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–February.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Central awn/bristle twisted and brown at the lower end.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Campbelltown (1963). **CT:** Hill End, Orange, Lewis Ponds, Cadia, Rockley, Kanangra Walls, Marulan.

Habitat

HABITAT: Plains.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-woodland; heath e.g. with *Allocasuarina nana*.

SUBSTRATE: Clay soils on shales, basalt, quartzite, sand over sandstone, low–medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Only one coastal record, at Campbelltown in 1963. Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

POACEAE

Austrodanthonia laevis (*Danthonia laevis*)

Wallaby Grass

Life history

GROWTH FORM: Erect, densely tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Longer, central awn/bristle loosely twisted once or twice.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWS NWP; Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Bathurst–Oberon, Southern Highlands.

SELECT LOCATIONS: **CC:** Colo Vale. **CT:** Pyramul, Mullions Range, Oberon, Black Springs, Burruga, Mt Werong, Richlands, Moss Vale.

Habitat

HABITAT:

ALTITUDE: 600–1100 m ANNUAL RAINFALL: 650–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Eucalypt open-woodland, grassland.

SUBSTRATE: Clay soils on basalt, shale, quartzite, granite, medium nutrients.

EXPOSURE:

Conservation

Only coastal record is Colo Vale, near Moss Vale in 1911. Conservation status unknown.

POACEAE

Austrodanthonia linkii (*Danthonia linkii* var. *fulva*)

Wallaby Grass

Life history

GROWTH FORM: Variable, densely tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995). Green all year (Waters et al. 2000).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn/bristle. Mature December–February (Greening Australia 1996).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST NWS CWS SWS SWP; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Hunters Hill, Bankstown, Homebush, Rookwood, Penshurst, Mount Annan. **CT:** Winburndale, Capertee Valley, Mt Wilson, Katoomba, Wombeyan Caves.

Habitat

HABITAT: Gentle, steep hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest, woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. albens*.

SUBSTRATE: Heavy clay or loamy soils on shale, limestone, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Austrodanthonia monticola (*Danthonia monticola*,

Rytidosperma monticulum, *Notodanthonia monticola*)

Wallaby Grass

Life history

GROWTH FORM: Erect, densely tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with central awn/bristle twisted at the lower end.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS SWP; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CT:** Lidsdale, Lithgow, Hartley, Blackheath, Lawson, Katoomba, Wentworth Falls, Woodford, Bindook, Kanangra Walls, Mount Jellore, Fitzroy Falls, Penrose, Tallong.

Habitat

HABITAT: Exposed rock platforms, ridges.

ALTITUDE: 500–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus dives*, *E. mannifera*; low woodland e.g. with *Eucalyptus eximia*, *E. considiana*; heath e.g. with *Hakea teretifolia*, *Allocasuarina nana*, *Kunzea capitata*, *Kunzea ambigua*, *Leptospermum trinervium*.

SUBSTRATE: Sandy soils on sandstone, metamorphics, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Morton NP.

POACEAE

Austrodanthonia penicillata (*Danthonia penicillata*)

Slender Wallaby Grass

Life history

GROWTH FORM: Erect, tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–January.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with central awn/bristle twisted and brown at the lower end.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST SWS NFWP; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Oberon–Bathurst area.

SELECT LOCATIONS: **CC:** Bargo. **CT:** Yetholme, Tarana, Oberon, Wentworth Falls, Black Springs, Taralga.

Habitat

HABITAT: Slopes

ALTITUDE: 400–1100 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland, open woodland

SUBSTRATE: Clay to sandy soils on basalt, sandstone, granite, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrodanthonia pilosa (*Danthonia pilosa*)

Smooth-flowered Wallaby Grass

Life history

GROWTH FORM: Tufted perennial herb to 50 cm high, with ligule a minutely fringed rim.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed 0.5 mm long (Lamp et al. 1990). Mature January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Total germination approx. 35 days (typical rate 370 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS NWP SWP NFWP; Qld, Vic., Tas., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Bilpin, Pennant Hills, Ryde, Homebush, Bass Hill, Guildford, Glenfield, Hurstville, Campbelltown. **CT:** Hargraves, Windeyer, Pyramul, Hill End, Mullion Creek, Orange, Lewis Ponds, Yetholme, Tarana, Blayney, Blackheath, Oberon, Rockley, Katoomba, Jenolan River, Richlands, Moss Vale.

Habitat

HABITAT: Slopes, hillsides.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus melliodora*, *E. tereticornis*, *E. moluccana*, *E. crebra*.

SUBSTRATE: Clay soils on shale, slate, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Austrodanthonia racemosa (*Danthonia racemosa*,

Rytidosperma racemosum, *Notodanthonia racemosa*)

Wallaby Grass

Life history

GROWTH FORM: Perennial herb to 60 cm high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Total germination approx. 37 days (typical rate 557 per gram of seed, Greening Australia 1996a). ‘Abundant in the spring and during the moist summer and autumn months Grows well in the shade (Blakely, Herb. note 1914).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; LHI, Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Kurrajong Heights, Richmond, Glenbrook, Woodford, Wahroonga, Epping, Gladesville, Rose Bay, Georges Hall, Peakhurst, Glenfield, Botany Swamp, Cobbitty, Camden, Mount Annan, Campbelltown, Douglas Park, Bargo, Dapto, Albion Park, Kangaroo Valley, Berry. **CT:** Windeyer, Sofala, Portland, Bathurst, Yetholme, O’Connell, Tarana, Blayney, Mandurama, Black Springs, Oberon, Richlands, Hill Top, Wombeyan Caves.

Habitat

HABITAT: Grassland, pastures.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist to dry open-forest e.g. with *Eucalyptus longifolia*, *E. crebra*; woodland e.g. with *Eucalyptus moluccana*, *E. crebra*; grassland e.g. with *Themeda australis*.

SUBSTRATE: Clay soils on shale, volcanics, slate, basalt, granite, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Austrodanthonia richardsonii

(*Danthonia richardsonii*)

Wallaby Grass

Life history

GROWTH FORM: Erect, tufted perennial herb to 1 m high, green all year.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer (Waters et al. 2000).

FRUIT/SEED: Primary dormancy period 6 months (Waters et al. 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Prolific seedling recruitment, with optimum germination above

20°C for seed more than 6 months old, sown close to soil surface in April–May (Waters et al. 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Absence of grazing results in decline in plant numbers and longevity (Waters et al. 2000).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWS NWPSWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Mainly Bathurst area.

SELECT LOCATIONS: **CC:** Awaba (1914). **CT:** Bathurst, Mount Tomah (1900).

Habitat

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy to medium clay soils on granite, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrodanthonia setacea (*Danthonia setacea*)

Small-flowered Wallaby Grass

Life history

GROWTH FORM: Erect densely tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers in response to rain.

FRUIT/SEED: Mature December–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Total germination approx. 24 days (typical rate 376 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST NWS CWS SWS NWP SWP NFWP NFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Homebush, Hunters Hill, Rookwood, Macquarie Fields, Campbelltown. **CT:** Mandurama.

Habitat

HABITAT: Grassland.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland, grassland.

SUBSTRATE: Clay soils on shale, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

Austrodanthonia tenuior (*Danthonia tenuior*,

Rytidosperma tenuis, *Notodanthonia tenuior*)

Wallaby Grass

Life history

GROWTH FORM:

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: October–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, October–May.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Resprouted, fruiting April–July, 4–6 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SFWP; Qld, Vic., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coast and lower Blue Mountains.

SELECT LOCATIONS: **CC:** Awaba, Bilpin, Richmond, Glenbrook, Hornsby, Wahroonga, Willoughby, Manly, Bondi, Vacluse, Homebush, Hurstville, Rookwood, La Perouse, Kemps Creek, Liverpool, Ingleburn, Campbelltown, Darkes Forest, Yanderra, Mt Keira, Albion Park.**CT:** Wentworth Falls, Woodford, Hill Top, Moss Vale.**Habitat**

HABITAT: Ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*, *Angophora costata*, *Eucalyptus piperita*; woodland e.g. with *Eucalyptus fibrosa*, *E. sclerophylla*, *Banksia serrata*.

SUBSTRATE: Sandy to clay soils on shale, sandstone, dune sand, low–medium nutrients.

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Royal NP, Dalrymple Hay NR.

POACEAE

Austrofestuca eriopoda (*Festuca eriopoda*)

Snow Fescue

Life history

GROWTH FORM: Erect, densely tufted perennial to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC NT CT ST SWS; Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains, Oberon area.

SELECT LOCATIONS: **CT:** Clarence, Blackheath, Oberon, Gingkin.**Habitat**

HABITAT:

ALTITUDE: 1000–1100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; grassland, sometimes in damp sites.

SUBSTRATE:

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrofestuca hookeriana (*Festuca hookeriana*)

Hooker's Fescue

Life history

GROWTH FORM: Erect tufted perennial herb to 1.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST; Vic, Tas.

DISTRIBUTION SYDNEY AREA: Bundanoon.

SELECT LOCATIONS: **CT:** Bundanoon (1935).**Habitat**

HABITAT: Swampy places.

ALTITUDE: 700 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest; grassland

SUBSTRATE:

EXPOSURE:

Conservation

Only Sydney area record is Bundanoon in 1935, the northern geographical limit in 1935. Conservation status unknown.

POACEAE

Austrofestuca littoralis (*Festuca littoralis*)

Beach Fescue

Life history

GROWTH FORM: Erect tufted perennial herb to 0.6 m high, with vertical branching rhizome.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coastal beaches.

SELECT LOCATIONS: **CC:** The Entrance, Wamberal (1896), Avoca North, McMasters Beach, Mona Vale, Dee Why, Manly Beach, Bondi Bay (1842), Maroubra Bay (1897), Cronulla, Austinmer, Wollongong, Port Kembla.**Habitat**

HABITAT: Coastal beach dunes

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soil on beach dunes, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa aristiglumis (*Stipa aristiglumis*)

Plains Grass

Life history

GROWTH FORM: Tufted perennial herb to 2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 2.5–4 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT NWS CWS SWS NWP SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Menangle Park (1969). **CT:** Bathurst (1941).**Habitat**

HABITAT:

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–700 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Remnant scrub.

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Western species, possibly introduced to coast with stock.

POACEAE

Austrostipa bigeniculata (*Stipa bigeniculata*)**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 3–6 cm long, December–February.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC CT ST NWS CWS SWS NWP SWP; Vic., Tas., N.Z.

DISTRIBUTION SYDNEY AREA: Bathurst–Orange area.

SELECT LOCATIONS: **CT:** Orange, Bathurst, Mandurama.**Habitat**

HABITAT: Wooded areas.

ALTITUDE: 700–900 m ANNUAL RAINFALL: 600–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soils on granite, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa densiflora (*Stipa densiflora*)**Life history**

GROWTH FORM: Tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 3.5–4.5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** The Oaks (1966), Orangeville (1969).**CT:** Ilford, Sodwalls, Joadja.**Habitat**

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–900 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland.

SUBSTRATE: Clay soils on shale, low nutrients

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa elegantissima (*Stipa elegantissima*)

Feather Speargrass

Life history

GROWTH FORM: Tufted perennial herb to 1 m high, with short rhizome.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 2–5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Palatable to stock.

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC ST NWS CWS SWS NWP SWP NFWP SFWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Centennial Park (1909).**Habitat**

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Western species, with one record for Centennial Park in 1909, but probably introduced with stock.

POACEAE

Austrostipa mollis (*Stipa mollis*)**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer, or in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 6–10 cm long, October–December.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS SWP SFWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast, Southern Highlands.

SELECT LOCATIONS: **CC:** Bondi, Centennial Park (1894), Moore Park (1892), Tempe, Rockdale, Kogarah, Maroubra, Long Bay. **CT:** Hartley Vale, Hill Top, Mittagong.

Habitat

HABITAT: Sandy areas.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus mannifera*; seacliff scrub e.g. with *Banksia ericifolia*, *Juncus kraussii*.

SUBSTRATE: Sandy soils on sandstone, dune sand, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa nitida* (*Stipa nitida*)*Life history**

GROWTH FORM: Tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 4.5–7 cm long, August–September.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Flemington.

SELECT LOCATIONS: **CC:** Flemington Saleyards (1968–69).

Habitat

HABITAT: Saleyards.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Sandy soils, low nutrients.

EXPOSURE:

Conservation

Only record is Flemington saleyards (1968–69), likely to have been introduced with stock from western NSW and probably extinct there now.

POACEAE

Austrostipa nodosa* (*Stipa nodosa*)*Life history**

GROWTH FORM: Tufted perennial herb to c. 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 4.5–10 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, S.A.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Hornsby (1914). **CT:** Bathurst, Lucknow, Blayney, Hill Top (1911), Wingello (1913).

Habitat

HABITAT:

ALTITUDE: 0–800 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Heavier soils

EXPOSURE:

Conservation

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

POACEAE

Austrostipa pubescens* (*Stipa pubescens*)*Life history**

GROWTH FORM: Tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 6–10 cm long, October–April, peak November–January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS: Some leaves eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Morisset, Kulnura, Lower Portland, Calga, Cheltenham, Northbridge, Ryde, Glenbrook, Woodford, Gladesville, Kemps Creek, Kogarah, Oakdale, Stanwell Park, Kangaroo Valley, Bomaderry. **CT:** Newnes Plateau, Mount Wilson, Blackheath, Katoomba, Wentworth Falls, Hill Top, Mittagong, Robertson.

Habitat

HABITAT: Forest and woodland.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus botryooides*, *Syncarpia glomulifera*, *Eucalyptus punctata*, *Angophora bakeri*; woodland e.g. with *Eucalyptus fibrosa*, *E. sclerophylla*, *Melaleuca decora*, *Banksia serrata*; heath e.g. with *Eucalyptus stricta*.

SUBSTRATE: Sandy soils on sandstone, sandstone/shale transition.

EXPOSURE:

Conservation

Reported from Blue Mountains NP.

POACEAE

***Austrostipa ramosissima* (*Stipa ramosissima*)**

Stout Bamboo Grass

Life history

GROWTH FORM: Tufted perennial herb to 2.5 m high, with branching stems and short rhizomes.

VEGETATIVE SPREAD: Yes.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Opportunistically throughout the year, peak October–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 6–10 cm long, fruiting at any time, peak summer.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS NWP; LHI, Qld.

DISTRIBUTION SYDNEY AREA: Mainly Hawkesbury–Nepean River system. SELECT LOCATIONS: **CC**: Upper Colo River, Grose Vale, Kurrajong, Gordon, Eastwood, Cabramatta, Casula, Bents Basin, Menangle, Elderslie, Picton, Razorback, Burragarang Lookout, Bargo, Lake Illawarra, Broughton Creek. **CT**: Turon River, Kowmung River, Armour Range, Hill Top.

Habitat

HABITAT: Moist gullies, creekbanks..

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Near open-forest or woodland, in riverflat forest e.g. with *Angophora subvelutina*, *Eucalyptus elata*, *Backhousia myrtifolia*, *Tristaniopsis laurina*; dry scrub e.g. Elderslie Banksia Scrub with *Banksia integrifolia*.

SUBSTRATE: Sandy to gravelly clay soil on shale, alluvium, sandstone, medium nutrients. Water table mostly low, moisture supply intermittent, fresh.

EXPOSURE: Light shade.

Conservation

Conservation status unknown.

POACEAE

Austrostipa rudis* subsp. *nervosa

(*Stipa rudis* subsp. *nervosa*)

Life history

GROWTH FORM: Tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 2–9 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Morphology for dispersal by adhesion (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Annangrove, Hornsby, Homebush, Greenacre, Kogarah, Wallacia, Woodford, The Oaks, Albion Park, Nowra.

CT: Capertee, Kirkconnell, Clarence, Katoomba, Hill Top, Mt Jellore.

Habitat

HABITAT: Hillsides, creek flats.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *E. pilularis*, *Melaleuca linariifolia*; woodland e.g. with *Eucalyptus radiata*, *E. blaxlandii*; riparian forest e.g. with *Casuarina cunninghamiana*.

SUBSTRATE: Sandy clay soils on shale, alluvium, sandstone, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa rudis* subsp. *rudis (*Stipa rudis* subsp. *rudis*)**Life history**

GROWTH FORM: Tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 2–9 cm long. Mature December–February (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Morphology for dispersal by adhesion (McIntyre et al. 1995). Total germination approx. 98 days, (typical rate 12 per gram of awned seed, Greening Australia 1996a). Possibly a coloniser of bare sites.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Bilpin, Grose River, Springwood, Hornsby, Pymble, Lane Cove, Merrylands, Parramatta, Duck River, Milperra, Liverpool, Oakdale, Picton, Hill Top. **CT**: Clarence, Mt Victoria, Blackheath, Katoomba, Jenolan River, Robertson, Barbers Creek.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*; woodland e.g. with *Eucalyptus crebra*, *E. melliodora*, *E. macrorhyncha*; heath e.g. with *Angophora hispida*, *Eucalyptus ligustrina*, *Hakea dactyloides*. Also with *Eucalyptus moluccana*, *E. resinifera*, *E. punctata* (T. James pers. comm.).

SUBSTRATE: Clay soil on shale, sandy soils on sandstone, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Dalrymple Hay NR, Royal NP.

POACEAE

Austrostipa scabra* subsp. *falcata (*Stipa falcata*)

Speargrass

Life history

GROWTH FORM: Tufted perennial herb to c. 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 3–7 cm long, September–January.

DISPERSAL, ESTABLISHMENT & GROWTH: Morphology for dispersal by adhesion (McIntyre et al. 1995)..

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST CWS SWS SWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Mainly Bathurst area.

SELECT LOCATIONS: **CC**: Homebush (1929), Rookwood (1930). **CT**: Peel, O’Connell, Turondale, Bathurst, Rydal.

Habitat

HABITAT:

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus macrorhyncha*, *E. blakelyi*. SUBSTRATE: Sandy clay soils on shale, granite, metamorphics, low nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa scabra subsp. *scabra*

Speargrass

Life history

GROWTH FORM: Tufted perennial herb to c. 0.6 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 3–7 cm long, October–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWS NWP SWP;

Qld, Vic., Tas., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Castlereagh, Epping, Campbelltown, Menangle Park, Douglas Park, The Oaks. **CT**: Bathurst, Lucknow, Mittagong.**Habitat**

HABITAT: Ridges.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland e.g. with *Themeda australis*.

SUBSTRATE: Clay soils on shale, volcanics, medium nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Austrostipa semibarbata (*Stipa semibarbata*)**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 7–11 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Berrima.

SELECT LOCATIONS: **CT**: Berrima (1935).**Habitat**

HABITAT:

ALTITUDE: 600 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Open-forest.

SUBSTRATE: Sandy soils.

EXPOSURE:

Conservation

CONSERVATION: Only one record for the area at Berrima in 1935, at the northern geographical limit. Conservation status unknown.

POACEAE

Austrostipa setacea (*Stipa setacea*)

Corkscrew Grass

Life history

GROWTH FORM: Tufted perennial herb to c. 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Most of the year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 2.5–4 cm long. Mature November–March (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Total germination approx. 50 days, typical rate 4 per gram of seed (Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWS NWP SWP;

Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Mainly south-western Sydney.

SELECT LOCATIONS: **CC**: Glenfield, Liverpool, Cobbitty, Mount Annan, Picton. **CT**: Jenolan River.**Habitat**

HABITAT: Slopes, gully sides.

ALTITUDE: 0–350 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. melliodora*; grassland.

SUBSTRATE: Clay soils on shales, metamorphics, low–medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Austrostipa verticillata (*Stipa verticillata*)**Life history**

GROWTH FORM: Tufted perennial herb to 2 m high, with short rhizome.

VEGETATIVE SPREAD: Yes.

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: Most of the year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn 3–5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS SWS NWP SWP;

Qld.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC**: Berowra Creek, Richmond, Penrith, Homebush, Kogarah, Georges River, Glenfield.**Habitat**

HABITAT: Levee banks on floodplain and estuary.

ALTITUDE: 0–200 m ANNUAL RAINFALL: above 700 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Riverflat forest e.g. with *Casuarina cunninghamiana*, *Stipa ramosissima*; saline flats.

SUBSTRATE: Sandy alluvial to gravelly clay soils, well-drained, medium nutrients. Sometimes with some saline influence. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999).

***Avena barbata* ***

Bearded Oat

Life history

GROWTH FORM: Herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Mainly September–December.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with bristles and awns 3–6 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Mediterranean.

BOTANICAL SUBREGIONS: NC CC ST NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Suburban areas.

SELECT LOCATIONS: CC: Glenorie, Richmond, Killara, Northbridge, Lane Cove, Rhodes, Centennial Park (1899), Paddington (Cooper Park), Rookwood Cemetery, Macquarie Fields. CT: Orange, Blayney, Carcoar, Medlow Bath, Sutton Forest.

Habitat

HABITAT: Disturbed land, roadsides, embankments.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–rare.

VEGETATION: Weedy sites.

SUBSTRATE: Disturbed soils, various.

EXPOSURE:

Conservation

Weed of disturbed land, not invading bushland.

POACEAE

VEGETATION: Weedy sites.

SUBSTRATE: Disturbed sites on sandstone, shale, coastal headlands.

EXPOSURE:

Conservation

Common weed of disturbed ground.

POACEAE

***Avena ludoviciana* ***

Ludo Wild Oats

Life history

GROWTH FORM: Robust herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awns 2–6 cm long, October–December.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and W Asia.

BOTANICAL SUBREGIONS: NC CC CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sydney suburbs, Bathurst area.

SELECT LOCATIONS: CC: Killara (1952), Flemington, Liverpool.

CT: Bathurst.

Habitat

HABITAT: Agricultural land, wasteland, railway lines..

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Weedy sites.

SUBSTRATE: Disturbed soils.

EXPOSURE:

ConservationWeed of crops, not invading bushland. Recorded naturalising relatively recently compared with other *Avena* species.

POACEAE

***Avena fatua* ***

Wild Oats

Life history

GROWTH FORM: Robust herb to 1.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with bristles and awns 2–5 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990). Pollen known to cause allergy in humans, mainly September–December (Bass & Wrigley 1984).**Distribution**

STATUS/ORIGIN: Exotic, probably native to Mediterranean.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., Tas., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Cheltenham, Killara, Manly, Homebush, McMahons Point (1914), Centennial Park, Campbelltown, Douglas Park.

Habitat

HABITAT: Disturbed ground, roadsides, railways.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

POACEAE

***Avena sativa* ***

Oats

Life history

GROWTH FORM: Robust herb to 1.5 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awns 2–5 cm long, November–February.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Some plants fruiting 43 weeks after high intensity fire; possibly grew from seed introduced post-fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons*, juvenile leaves eaten by Australian Shelduck *Tadorna tadornoides*, seeds eaten by Singing Bushlark *Mirafra javanica* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Europe and Central and W Asia. Introduced as cereal.

BOTANICAL SUBREGIONS: CC SC NT CT CWS SWS SWP NFWP; LHI, Qld, Vic., SA., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Cheltenham, Clifton Gardens, Concord, Homebush (1895), Campbelltown, Thirlmere. **CT:** Medlow Bath.

Habitat

HABITAT: Wasteland, railway lines, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Weedy sites.

SUBSTRATE: Shale, sandstone.

EXPOSURE:

Conservation

Widely cultivated as a cereal crop. Probably dropped from trucks or trains. Not spreading.

POACEAE

Avena sterilis *

Oat

Life history

GROWTH FORM: Herb to 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awns 3–9 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC NT ST; Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Richmond (1922), North Ryde (1954), Flemington Saleyards (1969).

Habitat

HABITAT: Roadsides.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Roadside weeds.

SUBSTRATE:

EXPOSURE:

Conservation

Weed of roadsides.

POACEAE

Axonopus fissifolius * (*Axonopus affinis* *)

Narrow-leafed Carpet Grass

Life history

GROWTH FORM: Stoloniferous perennial herb to 0.5 m high.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Warmer months.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: 'Cattle do not eat it' (Herb. note 1936).

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWP SWP; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Tuggerah, Wisemans Ferry (1938), Spencer, Gordon, Homebush (1931), Centennial Park, Penrith, Audley, Berry, Cambewarra (1936). **CT:** Woodford.

Habitat

HABITAT: Lawns, creek banks.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pasture, open-woodland e.g. with *Eucalyptus punctata*, *E. eugenioides*.

SUBSTRATE: Sandy soils on alluvium, volcanics, low nutrients.

EXPOSURE:

Conservation

A lawn species naturalising in run-down pastures.

POACEAE

Bothriochloa biloba

Life history

GROWTH FORM: Erect or decumbent tufted perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, with awn to 3 cm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native, but naturalised in CC.

BOTANICAL SUBREGIONS: NC *CC NT NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Homebush.

SELECT LOCATIONS: **CC:** Rookwood (1935), Homebush (1930).

Habitat

HABITAT: Woodland.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland.

SUBSTRATE: Clay soil on shale, low nutrients.

EXPOSURE:

Conservation

Introduced to Sydney area, Homebush–Rookwood (1930–35), probably with stock. Probably extinct there now.

POACEAE

Bothriochloa decipiens

Red Grass, Redleg Grass, Pitted Bluegrass

Life history

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS SWS NWP SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney (T. James pers. comm.).

SELECT LOCATIONS: **CC:** Flemington Saleyards, Prospect, Blacktown, Mt Druit, Penrith, Parramatta (T. James pers. comm.).

Habitat

HABITAT: Remnant woodland (T. James pers. comm.). Saleyards.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Eucalypt woodland e.g. with *Eucalyptus moluccana*, *E. crebra*, *E. fibrosa* (T. James pers. comm.).

SUBSTRATE: Clay soils on shale (T. James pers. comm.).

EXPOSURE:

Conservation

Many records from woodland in western Sydney (see James et al. 1999, T. James pers. comm.).

POACEAE

Bothriochloa macra (*B. ambigua*)

Red Grass, Red Leg Grass

Life history

GROWTH FORM: Low-growing tussock grass to 1 m high, with greenish to brownish sparsely hairy leaves (Waters et al. 2000).

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Produces reddish-purple flowering stems, summer and early autumn (Waters et al. 2000). Appears to flower most when competition from other vegetation is removed by burning, grazing or mowing (DHB).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–February (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Dormancy period of a few months can be broken by light, germination rate of wild seed 40–90%; optimal germination at 25–30 °C (Waters et al. 2000). Total germination approx. 36 days, typical rate 309 per gram of seed (Greening Australia 1996a).

FIRE RESPONSE: Resprouts; burning promoted synchronous ripening of seed heads (in CT mid September 1991, Waters et al. 2000).

INTERACTION WITH OTHER ORGANISMS: Seeding stems avoided by stock (Waters et al. 2000). Widespread in overgrazed paddocks (Harden 1993).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Colo, Hornsby, Denistone, Ashfield, Hurstville, Villawood, Doonside, Glenfield, Campbelltown, Razorback, Lake Illawarra, Dapto, Hill Top, Gerringong. **CT:** Orange, Bathurst, Jenolan Caves, Glen Davis, Lithgow, Moss Vale.

Habitat

HABITAT: Slopes, undulating country.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *E. melliodora*, *E. albens*; lightly-grazed grasslands with *Themeda australis* (Waters et al. 2000).

SUBSTRATE: Clay soils on shale, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Withstands drought (Waters et al. 2000).

Conservation

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

POACEAE

Brachyachne convergens

Common Native Couch, Spider Grass

Life history

GROWTH FORM: Ascending or erect annual herb to 0.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Flowers in response to rain or flooding (Harden 1993).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Young growth contains HCN (Harden 1993).

Distribution

STATUS/ORIGIN: Native, but exotic in Central Coast.

BOTANICAL SUBREGIONS: *CC NWP; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA: Cabramatta.

SELECT LOCATIONS: **CC:** Cabramatta.

Habitat

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Alluvial soils, medium nutrients.

EXPOSURE:

Conservation

Introduced to Sydney area from western NSW. Only one old record, from Cabramatta.

POACEAE

Brachypodium distachyon *

False Brome

Life history

GROWTH FORM: Erect, loosely tufted annual herb to 0.5 m high, with conspicuously hairy nodes and bent stems.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal-dispersed (Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Food plant of butterfly larvae *Geitoneura klugii klugii*, and probably *Heteronympha merope merope* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean.

BOTANICAL SUBREGIONS: CC SWS; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Kangaroo Valley.

SELECT LOCATIONS: **CC:** Kangaroo Valley (1958).

Habitat

HABITAT: Disturbed areas.

ALTITUDE: 300 m ANNUAL RAINFALL: 1300 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Pasture.

SUBSTRATE:

EXPOSURE:

Conservation

Introduced as pasture in Kangaroo Valley in 1958.

POACEAE

Briza maxima *

Quaking Grass

Life history

GROWTH FORM: Glabrous herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Water, animal, and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE: Probably killed, fruiting December–January, 12 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC CT ST NWS CWS SWS SWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Matcham, Grose Vale, Barrenjoey, Epping, Northbridge, Mosman, Gladesville (1884), Centennial Park, Cooks River, Concord, Taren Point, Rookwood Cemetery, Thirlmere Lakes, Kangaroo Valley. **CT:** Blackheath, Moss Vale.

Habitat

HABITAT: Disturbed areas, gardens, embankments, paths.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Weedy, grassy areas, swamp margins e.g. with *Melaleuca*.

SUBSTRATE: Clay soils on ironstone, shale, alluvium, also on sandy soils, low–medium nutrients.

EXPOSURE:

Conservation

Common weed of disturbed sites.

POACEAE

***Briza minor* ***

Shivery Grass

Life history

GROWTH FORM: Glabrous herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: September–November.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, September–November.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977). Water, animal and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE: Probably killed; fruiting October, 10 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Exotic, native to 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:** Gosford, Cheltenham, Curl Curl (1889), Sydney (1804), Bulli Pass, Glenfield, Mount Annan, Thirlmere Lakes, Kangaroo Valley. **CT:** Orange, Burrawang.

Habitat

HABITAT: Disturbed areas, wasteland, gardens.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Pastures, weedy sites e.g. with *Briza maxima*, *Verbena bonariensis*, *Holcus lanatus*.

SUBSTRATE: Clay soils on shale, alluvium, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Full sun.

Conservation

Weed of disturbed areas. Reported by Robert Brown to be introduced to Sydney as early as 1804 (Maiden 1909). Not likely to invade bushland.

POACEAE

Briza subaristata* **Life history**

GROWTH FORM: Glabrous perennial herb to 80 cm high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Some plants fruiting December, 12 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: NC CC ST.

DISTRIBUTION SYDNEY AREA: Mainly Sydney suburban areas.

SELECT LOCATIONS: **CC:** Castle Hill, St Ives, Pennant Hills, Seaforth, Balls Head (1948), Shane Park, Blacktown, Mt Druiitt, Condell Park, Narwee, Wilton.

Habitat

HABITAT: Disturbed sites, lawns, swamp edges, remnant woodland.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soil on shale, low to medium nutrient soils.

EXPOSURE:

Conservation

Becoming increasingly dominant in disturbed Cumberland Plain Woodland in western Sydney (T. James pers. comm.).

POACEAE

Bromus alopecuroides* * (*B. alopecuroides*)*Life history**

GROWTH FORM: Slender annual herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC NT ST NWS CWS SWS SWP; Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Flemington Saleyards (1969), Glenfield (1963).

Habitat

HABITAT: Roadside.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Rare weed, mainly grows in wheat growing areas of central western NSW.

POACEAE

Bromus arenarius

Sand Brome

Life history

GROWTH FORM: Erect or ascending annual herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring or in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ST NWS CWS SWS NWP SWP NFWP

SFWP; Qld, Vic., Tas., S.A., W.A.; America, S America, N.Z.

DISTRIBUTION SYDNEY AREA: Centennial Park.

SELECT LOCATIONS: **CC:** Centennial Park (1909).

Habitat

HABITAT:

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Probably sandy soils.

EXPOSURE:

Conservation

Grows in drier areas of NSW. Early record from Centennial Park in 1909. May be a deliberate introduction.

POACEAE

Bromus brevis* **Life history**

GROWTH FORM: Annual or biennial herb, sometimes rhizomatous to 0.6 m high, with stout stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Mechanism for dispersal undefined (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Flemington (1969). **CT:** Bathurst, Orange (1948), Perthville, Leura.

Habitat

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Sandy soils on sandstone.

EXPOSURE:

Conservation

Disturbed sites on Tablelands, not invading bushland. Only record for coast was from Flemington Saleyards presumably introduced with stock and now extinct there.

POACEAE

***Bromus catharticus* * (*B. unioloides*)**

Prairie Grass

Life history

GROWTH FORM: Densely tufted, robust annual or perennial herb to 1 m high, with erect or spreading stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Mechanism for dispersal undefined (McIntyre et al. 1995).

FIRE RESPONSE: Some plants flowering October, 39 weeks after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans, mainly September–December (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to America, Asia, Africa. Probably introduced as pasture grass.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1910), Cheltenham, Manly, Lane Cove, Gladesville (1884), Homebush, Brighton, Liverpool, Menangle, Albion Park, Kangaroo Valley. **CT:** Blayney, Oberon, Leura, Jenolan Caves, Bowral.

Habitat

HABITAT: Disturbed areas, roadsides, riverbanks, pastures.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland remnant e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Sandy to clayey soils on sandstone, shale, alluvium, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Widespread weed of disturbed ground, also cultivated as a pasture species.

POACEAE

***Bromus diandrus* ***

Giant Brome

Life history

GROWTH FORM: Tufted, often robust annual herb to 1 m high, with stout stems.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Some plants flowering October, 41 weeks after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native to Mediterranean region.

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:** Gosford, Richmond (1906), Lindfield, Gladesville (1887), Hunters Hill, Centennial Park, Camden, Campbelltown, Buxton, Kangaroo Valley. **CT:** Orange, Hill End, Mittagong, Moss Vale.

Habitat

HABITAT: Disturbed areas, damp areas, near creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1300 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland, woodland, weedy sites.

SUBSTRATE: Clayey to sandy soils. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

CONSERVATION: Widespread weed of disturbed sites, not invading bushland.

POACEAE

***Bromus hordeaceus* ***

Soft Brome

Life history

GROWTH FORM: Erect tufted annual or biennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995), animal and wind-dispersed (Carr et al. 1992).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Asia, Europe.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Cheltenham, McMahons Point (1914), Flemington. **CT:** Jenolan Caves (1900), Mittagong, Moss Vale (1895), Bowral.**Habitat**

HABITAT: Gardens, disturbed areas.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Pasture.

SUBSTRATE:

EXPOSURE:

Conservation

Weed of gardens and disturbed sites.

POACEAE

***Bromus madritensis* ***

Madrid Brome

Life history

GROWTH FORM: Short-lived tufted annual herb, to 0.6 m high, with slender stems.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: August–November.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, November.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: ‘Seeds’ may cause a problem to grazing sheep (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC NT ST NWS SWS NWP NFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast and western Sydney, Orange area.

SELECT LOCATIONS: **CC:** Richmond (1916), Beecroft, Hunters Hill (1912), Ashfield (1921), Liverpool. **CT:** Junction Reefs (1991).**Habitat**

HABITAT: Drier areas, wasteland.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Weedy sites, grassland, remnant woodland e.g. with *Eucalyptus melliodora*.

SUBSTRATE: Sandy to clay soils.

EXPOSURE:

Conservation

POACEAE

***Bromus molliformis* ***

Soft Brome

Life history

GROWTH FORM: Erect, tufted herb to 0.9 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1912), Terrey Hills, Pennant Hills, Kogarah (1893), Homebush, Parramatta, Casula, Buxton.**Habitat**

HABITAT: Grasslands, roadsides.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland e.g. with *Austrodanthonia racemosa*, *Vulpia*, *Briza*.

SUBSTRATE: Clay soils on shale. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Widespread, not invading bushland.

POACEAE

***Bromus racemosus* ***

Smooth Brome

Life history

GROWTH FORM: Erect or ascending annual or biennial herb to 1.1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC SC NT; Vic.

DISTRIBUTION SYDNEY AREA: Richmond.

SELECT LOCATIONS: **CC:** Richmond (1912).**Habitat**

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Only record for Sydney area is from Richmond in 1912.

POACEAE

***Bromus rubens* ***

Red Brome

Life history

GROWTH FORM: Tufted erect annual herb to 0.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring or in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney, Orange.

SELECT LOCATIONS: **CC:** Flemington, Macquarie Fields (1965), Marayong (1966), Menangle (1963). **CT:** O'Connell (1960), Junction Reefs.**Habitat**

HABITAT: Disturbed sites, embankments.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Remnant woodland e.g. with *Eucalyptus melliodora*.

SUBSTRATE: Various soils.

EXPOSURE:

Conservation

Mainly in drier areas of NSW.

POACEAE

***Bromus secalinus* ***

Rye Brome

Life history

GROWTH FORM: Erect, tufted annual or biennial herb to c. 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NT CT.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Richmond (1908). **CT:** Bathurst (1899).**Habitat**

HABITAT: Disturbed areas.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Old records for Bathurst and Richmond (1899–1908) but not recorded since.

POACEAE

***Bromus sterilis* ***

Sterile Brome

Life history

GROWTH FORM: Annual or biennial herb to 0.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Asia, Europe.

BOTANICAL SUBREGIONS: CC NT CT CWS SWS; Qld, Tas., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Port Jackson (1912). **CT:** Bathurst (1916), Leura (1910).**Habitat**

HABITAT: Disturbed areas.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Old records from Port Jackson, Leura and Bathurst (1910–1916) but not recorded since.

POACEAE

POACEAE

***Bromus tectorum* ***

Drooping Brome

Life history

GROWTH FORM: Erect or spreading annual herb to 0.6 m high, with slender stems.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC NT ST SWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Richmond.

SELECT LOCATIONS: **CC:** Richmond (1910).**Habitat**

HABITAT: Roadsides, waste areas.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Old collection from Agricultural College Richmond in 1910–1911 'spontaneous in grass garden'. No records since.

POACEAE

Capillipedium parviflorum

Scented-top Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, December–January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS; Qld, N.T.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Pendle Hill, Doonside, Mulgoa, Campbelltown, Albion Park, Rossmore.**Habitat**

HABITAT: Woodland remnants, cemeteries.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland e.g. with *Bothriochloa macra*, *Microlaena stipoides*, *Themeda australis*.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

CONSERVATION: Vulnerable in Western Sydney (James et al. 1999). Very rarely recorded by Tozer (2003).

POACEAE

Capillipedium spicigerum

Scented-top Grass

Life history

GROWTH FORM: Tufted perennial herb to more than 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: May–August.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Possibly more likely in disturbed, open areas than in woodland remnants (Herb. record).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP; Qld, N.T.

DISTRIBUTION SYDNEY AREA: Gosford–Wyong, western Sydney.

SELECT LOCATIONS: **CC:** Swansea, Wyee, Mooney Mooney, Cowan Creek, Richmond, Barrenjoey, Gladesville, Orchard Hills, Cabramatta, Macquarie Fields, Prospect, Greystanes, Glenfield.**Habitat**

HABITAT: Moist places, creek banks, embankments.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; grassland e.g. with *Themeda australis*, *Bothriochloa macra*.

SUBSTRATE: Clay soil on shale, alluvium, low–medium nutrients.

EXPOSURE:

Conservation

CONSERVATION: Vulnerable in Western Sydney (James et al. 1999), very rarely recorded by Tozer (2003). Conservation status elsewhere unknown.

POACEAE

Catapodium rigidum *

Rigid Fescue

Life history

GROWTH FORM: Small annual herb to 0.3 m high, with rigid stems.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native of Europe and Asia.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS SWP NFWP;

LHI, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic along the coast.

SELECT LOCATIONS: **CC:** Woolloomooloo Bay (1902), Coalcliff (1934).**Habitat**

HABITAT: Disturbed areas.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Not recorded for Sydney area since 1934 but more common on Western Slopes.

POACEAE

Cenchrus caliculatus (*C. australis*)

Hillside Burrgrass

Life history

GROWTH FORM: Robust, scrambling perennial herb to 1.5 m high, forming clumps or straggly over vegetation.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: December–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, March–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS SWS; Qld, N.Z., N.G., Pac.I.

DISTRIBUTION SYDNEY AREA: Widespread but sporadic.

SELECT LOCATIONS: **CC:** Howes Valley, Wondabyne, Berowra Creek, Cowan Creek, Clifton Gardens, Grose Vale, Kogarah, Como, Audley, Camden, Mount Annan, Razorback, Nowra. **CT:** Kowmung River, Mt Armour.**Habitat**

HABITAT: Wooded hillsides, riverflats, creekbanks.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus punctata*, *Angophora costata*, margins of dry rainforest e.g. with *Aphanopetalum resinosum*.

SUBSTRATE: Soils on slate, shale, basalt, sandy alluvium, low nutrients.

EXPOSURE:

Conservation

CONSERVATION: Many old collections e.g. Como 1898, Grose Vale 1910, but few recent ones. Not recorded for western Sydney by James et al. (1999), though recorded at Mount Annan and Razorback.

POACEAE

***Cenchrus echinatus* ***

Mossman River Grass

Life history

GROWTH FORM: Tufted, clump-forming annual herb to 0.9 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer, cylindrical spike.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seedhead with up to 50 burrs (Weeds Australia www.weeds.org.au).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: burrs containing seed, attach to animals, clothing, bags and float in water; seed germinates spring–summer (Weeds Australia www.weeds.org.au).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Burrs reduce value of wool and make shearing hazzardous; spines on burrs penetrate hides, lowering value (Weeds Australia www.weeds.org.au).

Distribution

STATUS/ORIGIN: Exotic, native to N & S America.

BOTANICAL SUBREGIONS: NC CC NWP NFWP; Qld, N.T.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Lane Cove (1994), Casula (1992).

Habitat

HABITAT: Coastal, estuarine, and river sands.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Sandy soils.

EXPOSURE:

Conservation

Recently recorded from disturbed bank at Casula and garden bed at Lane Cove. Elsewhere in NSW reported from coastal, estuarine and river sands. Major weed if allowed to mature, creates a problem in recreation areas (Weeds Australia www.weeds.org.au). Capacity to spread in Sydney is unknown.

POACEAE

***Cenchrus incertus* ***

Spiny Burrgrass

Life history

GROWTH FORM: Tufted annual or occasionally biennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 2 years.

PRIMARY JUVENILE PERIOD: Less than 2 years.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to N & S America.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS SWS NWP SWP; all mainland States.

DISTRIBUTION SYDNEY AREA: Glen Davis .

SELECT LOCATIONS: **CC:** Glen Davis (1956).

Habitat

HABITAT: Disturbed areas.

ALTITUDE: 600 m ANNUAL RAINFALL: 600–700 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Sandy soil.

EXPOSURE:

Conservation

Noxious weed, prohibited from sale in NSW (NSW Agriculture website: www.agric.nsw.gov.au). Only record for Sydney area is from Glen Davis in 1956, where it was 'growing in patches up to 7 acres'.

POACEAE

***Cenchrus longispinus* ***

Spiny Burrgrass

Life history

GROWTH FORM: Tufted annual herb to 0.9 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to north and central America.

BOTANICAL SUBREGIONS: NC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; all mainland States except N.T.

DISTRIBUTION SYDNEY AREA: Orange.

SELECT LOCATIONS: **CT:** Orange (1954), Kelso (1922).

Habitat

HABITAT: Cultivated and disturbed areas.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Noxious weed, prohibited from sale in NSW (NSW Agriculture website: www.agric.nsw.gov.au). Mainly a species of western areas. Limited to several old records for Central Tablelands.

POACEAE

***Chionochloa pallida* (*Danthonia pallida*)**

Silvertop Wallaby Grass, Redanther Wallaby Grass

Life history

GROWTH FORM: Robust, densely caespitose perennial herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Total germination approx. 67 days (typical rate 110 per gram of seed-smoked) (Greening Australia 1996a).

FIRE RESPONSE: Stems killed, resprouts from base. Regrowth only from surviving tussocks, seedlings recorded less than 1 year after fire (Purdie 1977).

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:** Howes Valley, Pulbah Island, Berkshire Park, Hornsby, Rockdale, Minto, O'Hares Creek, Thirlmere, Douglas Park. **CT:** Orange, Lewis Ponds, Hill End, Ilford, Capertee, Clarence, Mt Victoria, Mount Tomah, Blackheath, Katoomba, Wentworth Falls, Mt Jellore, Mittagong, Wingello.

Habitat

HABITAT: Ridges, hillslopes.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus globoidea*, *Corymbia gummifera*; woodland e.g. with *Eucalyptus polyanthemus*, *E. macrorhyncha*, *E. mannifera*, *E. dives*; heath e.g. with *Allocasuarina nana*, *Darwinia fascicularis*, *Eucalyptus stricta*.

SUBSTRATE: Sandy to clayey soils on sandstone, laterite, metamorphics, metasediments, low nutrient soils.

EXPOSURE:

Conservation

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

POACEAE

Chloris divaricata* var. *divaricata

Slender Chloris

Life history

GROWTH FORM: Erect, slender perennial herb to 0.5 m high, tufted to shortly stoloniferous.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain or flooding usually in warmer months.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP SWP NFWP; Qld, N.Cal.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Homebush Bay (1931), Prestons (1998).

Habitat

HABITAT:

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Scrub e.g. with *Melaleuca nodosa*.

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Not recorded by James et al. (1999) in Sydney area, only known from Homebush Bay in 1931 and Prestons in 1998. Mainly on alluvium subject to periodic flooding in western areas.

POACEAE

***Chloris gayana* ***

Rhodes Grass

Life history

GROWTH FORM: Erect perennial herb to 1.2 m high, usually stoloniferous, occasionally tufted.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, February–June.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts, some plants fruiting September, 8 months after high intensity fire (1/94 at Narrabeen) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Africa. Introduced as a pasture species.

BOTANICAL SUBREGIONS: NC CC SC NT NWS SWS NWP SWP; LHI, Qld, Vic., S.A., W.A., N.T., S Afr., Asia, Amer.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Richmond (1907), Kellyville, Carlingford, Berowra Creek, Warrawee (1914), Ashfield (1919), Bankstown (1930), Penrith, Lapstone Hill, Oakdale (1914), Doonside, Mount Annan, Cambewarra, Albion Park.

Habitat

HABITAT: Cultivated areas, roadsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; grassland with *Bursaria*, *Themeda*.

SUBSTRATE: Clay soils on shale, alluvium.

EXPOSURE:

Conservation

May invade native vegetation at disturbed sites. Cultivated at Agricultural College Richmond (1907–1921) and Sydney Botanic Gardens (1903, 1908). Naturalised at Warrawee (1914), Richmond (1921) and Bankstown (1930). Planted on roadsides as a soil stabiliser from 1960–2000. cultivated as a pasture species and seeded by air throughout Qld after 1975 for pasture improvement (Bass & Wrigley 1984). Very common in disturbed remnant woodland in western Sydney (T. James pers. comm.).

POACEAE

Chloris truncata

Windmill Grass

Life history

GROWTH FORM: Erect glabrous, herb to 50 cm high, with ligule of short hairs, sometimes with short, branched stolons; forming tussocks.

VEGETATIVE SPREAD: No.

LONGEVITY: 2–3 years (Waters et al. 2000).

PRIMARY JUVENILE PERIOD:

FLOWERS: Opportunistically, in response to rain. Resilient in mown areas, resprouting and flowering when less than 10 cm high (T. James pers. comm.).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit 3 mm long with seed 1.5 mm long (Lamp et al. 1990). Spikelets turn black at maturity, December–June; viability decreases after 12–30 months in storage (Waters et al. 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed; detached seedheads often blow along the ground, scattering seeds (McIntyre et al. 2000). Morphology for dispersal by adhesion and wind (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Total germination approx. 36 days (typical rate 835 per gram of seed, Greening Australia 1996a). Germination rate 30–40 % for seed in wild stands; light appears to assist germination, summer-growing, relying on spring and summer rainfall; coloniser (Waters et al. 2000).

FIRE RESPONSE: Resprouts from base.

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A., Eur., Amer.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Hornsby, Cheltenham, Epping, Penrith, Doonside, Homebush, Liverpool, Mount Annan, Berry. **CT:** Turondale, Capertee.

Habitat

HABITAT: Edge of tracks, open areas.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Woodlands e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. albens*, *E. melliodora*.

SUBSTRATE: Clay soils on shales, medium nutrients. Most soils ranging from clay to light sandy soils (Waters et al. 2000). Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

Chloris ventricosa

Tall Chloris

Life history

GROWTH FORM: Erect, stoloniferous perennial herb to 1 m high, with branched stems.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, February–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS NWP; Qld, Vic., S.A., Eur., N Amer.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Richmond, Homebush, Como, Toongabbie, Glenfield, Bringelly, Camden, Razorback, Burratorang Valley, Albion Park, Glen Davis,

Habitat

HABITAT: Undulating country.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 600–1100 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. albens*, *E. melliodora*.

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

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). Found in remnant woodland at Blacktown, Prospect, Mt Druitt (T. James pers. comm.). Conservation status elsewhere unknown.

POACEAE

Chloris virgata *

Feathertop Rhodes Grass

Life history

GROWTH FORM: Annual or short-lived perennial herb to 1.2 m high, tufted or stoloniferous.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC NT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, N.T., S.A., W.A., trop Amer.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Richmond (1912), North Sydney, Flemington, Ingleburn, Minto, Kiama.

Habitat

HABITAT: Cultivated, disturbed areas, roadsides, creeks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Weed of cultivation and disturbed areas.

POACEAE

Cleistochloa rigida (*Dimorphochloa rigida*)

Life history

GROWTH FORM: Shrubby perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer, flowers remain closed and are self-pollinating and set fertile seed.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Upper Colo, Wisemans Ferry, Warragamba, Glenbrook, Mulgoa, Bents Basin, Glen Davis. **CT:** Currant Mountain Gap.

Habitat

HABITAT: Rocky hillsides, ridges.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 600–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Dry scrub; open-forest e.g. with *Eucalyptus punctata*, *Corymbia eximia*.

SUBSTRATE: Sandy loam on sandstone, low nutrients.

EXPOSURE:

Conservation

Bents Basin is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

Coix lachryma-jobi *

Job's Tears

Life history

GROWTH FORM: Robust annual or perennial herb to 2 m high, with prop roots at base.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: 3 stamens, summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia, ornamental, grown for the hard grey seeds that are used to make bead necklaces (Klapake 2002).

BOTANICAL SUBREGIONS: NC CC.

DISTRIBUTION SYDNEY AREA: Sydney suburbs.

SELECT LOCATIONS: **CC:** Glebe, Clovelly (1956), Marayong, Minto (1951).

Habitat

HABITAT: Gardens.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Uncommon escape from cultivation (Klapake 2002).

POACEAE

***Cortaderia selloana* ***

Pampas Grass

Life history

GROWTH FORM: Herb, grows in tussocks, 2–4 m high, 2 m diam.

VEGETATIVE SPREAD: Rhizomatous, forms large dense clumps several metres across (Parsons & Cuthbertson 1992).

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD: 2–3 years.

FLOWERS: Late summer, on bisexual and female heads (Parsons & Cuthbertson 1992).

FRUIT/SEED: Enormous seed production when female and bisexual plants occur together (Parsons & Cuthbertson 1992). Seeds dimorphic with respect to hairs on lemmas; seeds from hermaphrodite flowers have few hairs and are not dispersed as far as seeds from female flowers, which have many hairs.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed-bearing florets, wind dispersed to 25 km; germinates in spring, growing slowly at first; a number of tillers and short rhizomes produced during first growth season (Parsons & Cuthbertson 1992). Seedling recruitment not fire related. Seedlings frost tender.

FIRE RESPONSE: Resprouts at ground level or below. Fruiting in May, 5 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America, introduced as ornamental.

BOTANICAL SUBREGIONS: CC CT; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast, with scattered populations inland.

SELECT LOCATIONS: CC: Wye, Killara, North Head, Centennial Park, Homebush (1931), Kings Cross, Kurnell, Leumeah.

Habitat

HABITAT: In places disturbed by mechanical means, close to settlement; along watercourses, drains and swamp margins, demolition and building sites.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional–frequent.

VEGETATION: Saltmarsh, sedge swamp.

SUBSTRATE: Variety of soils including coastal sands, heavy clays, peat-based swamp soil, medium nutrients. Water table mostly low, moisture supply intermittent, brackish–fresh.

EXPOSURE: Exposed; light–no shade.

Conservation

Establishes in disturbed areas, particularly moist, brackish sites, and spreads slowly locally. Listed as a noxious weed across NSW; garden plant of the 1970s, planted for fodder, windbreaks and soil stabiliser.

POACEAE

Cymbopogon refractus

Barbed Wire Grass

Life history

GROWTH FORM: Tufted perennial herb to 1 m high, aromatic when crushed, jagged ligule 2 mm long.

VEGETATIVE SPREAD: NO.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: January–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Stems droop at maturity and new plants establish within 1 m of parent plant (in garden, L.McD.).

FIRE RESPONSE: Resprouted, fruiting May–July, 5–7 months after high intensity fire (1/94 at Lane Cove) (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS NWP NFWP; Qld, Vic., N.T.

DISTRIBUTION SYDNEY AREA: Widespread on Coast.

SELECT LOCATIONS: CC: Morisset, Wamberal, Lower Portland, Richmond, Cheltenham, Homebush, Kurnell, Como, Lapstone, Wallacia, Mount Annan, Dapto. CT: Hill Top.

Habitat

HABITAT: Hillsides, slopes.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus umbra*, *E. paniculata*; woodland e.g. with *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis*, *E. fibrosa*, *Themeda australis*; vine scrub e.g. with *Aphanopetalum resinolum*, *Celastrus subspicatus*.

SUBSTRATE: Clay to loamy soils on shale, sandstone, low–medium nutrient soils.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Ku-ring-gai Chase NP.

POACEAE

Cynodon dactylon

Couch, Bermuda Grass

Life history

GROWTH FORM: Rhizomatous and/or stoloniferous mat-forming perennial herb to 0.3 m high, rooting at nodes, with ligule a dense row of short hairs on a membranous rim.

VEGETATIVE SPREAD: Spreads by rhizomes and stolons

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Mainly December–March (Bass & Wrigley 1984).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adapted for wind-dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977), animal, water and vegetative dispersal (Carr et al. 1992).

FIRE RESPONSE: Resprouts from rhizomes.

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause asthma in humans (Bass 1987). Foodplant of Australian Shelduck *Tadorna tadornoides* and seed eaten by Plumed Whistling Duck *Dendrocygna eytoni* and Freckled Duck *Stictonetta nervosa* (Barker & Vestjens 1989, 1990). Food plant of butterfly larvae *Taractrocer a papyria papyria*, *Ocybadistes walkeri sothis*, *Hypocysta metirius* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Native and exotic forms occur.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., cosmopolitan.

DISTRIBUTION SYDNEY AREA: Native forms restricted to estuarine areas.

SELECT LOCATIONS: CC: Lake Macquarie, Belrose, Manly, Centennial Park, Malabar, Penshurst, Campbelltown, Hill Top, Windang Island, Berry. CT: Mittagong.

Habitat

HABITAT: Wetland, estuarine areas (native form).

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Native form in swamp forest e.g. with *Casuarina glauca*. Introduced forms have naturalised in many types of vegetation including forest, woodland, grassland.

SUBSTRATE: Wide range of soil types from sands to clays (Lamp et al. 1990). Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Although introduced forms are most common e.g. in lawns, gardens, pastures and are widely naturalised (Robert Brown included it on his list of introduced plants in 1904, Groves 2002), the coarse erect form on saltmarshes seems to be native (SWL Jacobs pers. comm.).

POACEAE

***Cynodon incompletus* *** (*C. hirsutus*)**Life history**

GROWTH FORM: Stoloniferous perennial herb to 0.3 m high, without rhizomes.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S. Africa.

BOTANICAL SUBREGIONS: NC CC NT ST NWS CWS SWS NWP SWP; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Belrose, Glebe Island (1911), Campbelltown.

Habitat

HABITAT: Roadsides and heavily grazed pastures.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: First noted at Glebe Island in 1911 and then accidentally transferred in manure to the Sydney Botanic Gardens. Occasional roadside weed.

POACEAE

***Cynodon transvaalensis* ***

Florida Grass

Life history

GROWTH FORM: Rhizomatous and/or stoloniferous mat-forming perennial herb to 0.1 m high.

VEGETATIVE SPREAD: Stoloniferous, forming mats.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer if not mown.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Africa. Introduced as lawn grass.

BOTANICAL SUBREGIONS: CC CT; S.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Botanic Gardens (1937), Sydney (1957).

CT: Orange (1968).

Habitat

HABITAT: Creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Alluvial soil, medium nutrients.

EXPOSURE:

Conservation

Rarely grown lawn grass, established in Orange area in 1968.

POACEAE

***Cynosurus cristatus* ***

Crested Dog's Tail

Life history

GROWTH FORM: Compactly tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and SW Asia.

BOTANICAL SUBREGIONS: CC SC NT CT ST SWS; Vic., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT:** Orange (1949).

Habitat

HABITAT: Waste and cultivated areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Weed of waste areas and gardens in colder areas.

POACEAE

***Cynosurus echinatus* ***

Rough Dog's Tail

Life history

GROWTH FORM: Tufted annual herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Animal and water-dispersed (Carr et al 1992), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC NT CT ST SWS; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Hornsby, Hunters Hill (1913), Oakdale.

CT: Orange, Oberon, Leura (1934).

Habitat

HABITAT: Waste and cultivated areas, paddocks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

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

EXPOSURE:

Conservation

Uncommon weed.

POACEAE

Dactylis glomerata *

Cocksfoot

Life history

GROWTH FORM: Tufted perennial herb to 1.4 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent. Seed weight 0.7 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: Mechanism for dispersal undefined (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans, mainly September–December (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native of Mediterranean region. Introduced as pasture grass.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS SWS SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Springwood, Richmond, Manly, Centennial Park (1909), Kogarah, Cambewarra Range, Berry. **CT:** Orange, Millthorpe (1913), Mt Wilson (1896), Katoomba, Macquarie Pass, Robertson, Berry.

Habitat

HABITAT: Disturbed sites, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Moist fertile soils, basalt.

EXPOSURE:

Conservation

CONSERVATION: A pasture grass that has become naturalised in adjacent areas. Widespread.

POACEAE

Dactyloctenium australe *

Durban Grass

Life history

GROWTH FORM: Stoloniferous perennial herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Africa.

BOTANICAL SUBREGIONS: NC CC; Qld, N.T.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Botanic Gardens (1976).

Habitat

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Cultivated as a shade-tolerant lawn species, often naturalised in urban and coastal areas north from Sydney (Harden 1993), however, the only naturalised Sydney record is Botanic Gardens in 1976, although it was also recorded there in 1931–32).

POACEAE

Dactyloctenium radulans (*Eleusine radulans*)

Button Grass, Finger Grass

Life history

GROWTH FORM: Slender, tufted annual or short lived perennial herb to 0.2 m high.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ?NT NWS CWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Riverstone, Emerton, Flemington, Campbelltown, Menangle Park

Habitat

HABITAT: Disturbed sites.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Remnant woodland e.g. with *Eucalyptus fibrosa*, *E. tereticornis*.

SUBSTRATE: Clay to sandy soils on shales, medium nutrients.

EXPOSURE:

Conservation

Rare, mainly found in drier areas further west, and possibly introduced to the Sydney area with stock.

POACEAE

Danthonia longifolia (*Notodanthonia longifolia*)

Long-leaved Wallaby Grass

Life history

GROWTH FORM: Erect, densely tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

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: Widespread.

SELECT LOCATIONS: **CC:** Grose River, Frenchs Forest, Killara, Denistone, Newington, Bellevue Hill, Bondi, Rockdale, Como, Kowmung River, Kentlyn, Razorback, Douglas Park, Thirlmere, Hill Top, Albion Park, Macquarie Pass, Cambewarra. **CT:** Lithgow, Mount Tomah, Katoomba, Wentworth Falls, Abercrombie Caves, Yerranderie, Armour Range, Mt Gibraltar.

Habitat

HABITAT: Rocky hillsides, gullies, cliffines.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm
 TYPICAL LOCAL ABUNDANCE: Occasional.
 VEGETATION: Moist forest e.g. with *Eucalyptus saligna*, *E. pilularis*;
 woodland e.g. with *Angophora costata*, *Eucalyptus piperita*, *Corymbia*
gummifera, *Banksia serrata*, *Eucalyptus crebra*.
 SUBSTRATE: Rocky or sandy soils on sandstone, quartzite, slates, trachyte.
 EXPOSURE:

Conservation

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

POACEAE

Danthonia semiannularis

(*Notodanthonia semiannularis*)

Tasmanian Wallaby Grass

Life history

GROWTH FORM: Erect, caespitose perennial herb to 0.9 m high.
 VEGETATIVE SPREAD: No.
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring–summer.
 FRUIT/SEED: Dry, 1-seeded, indehiscent.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC CWS SWP; Vic., Tas., S.A., W.A., N.Z.
 DISTRIBUTION SYDNEY AREA: Concord to Kogarah.
 SELECT LOCATIONS: CC: Hornsby, Homebush, Rookwood, Kogarah, Lakemba, Mortdale, Concord West.

Habitat

HABITAT: Woodland.
 ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1200 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION: Probably occurred in Turpentine–Ironbark forest in inner western Sydney.
 SUBSTRATE: Clay soils on shale.
 EXPOSURE:

Conservation

Last recorded in 1939.

POACEAE

Deyeuxia angustifolia**Life history**

GROWTH FORM: Densely tufted slender perennial herb to 0.7 m high.
 VEGETATIVE SPREAD:
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring–summer.
 FRUIT/SEED: Dry, 1-seeded, indehiscent.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: SC CT ST.
 DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.
 SELECT LOCATIONS: CT: Mt Wilson, Blackheath, Katoomba, Leura, Wentworth Falls, Tarlo River.

Habitat

HABITAT: Gullies, crevices, moist places.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 800–1400 mm
 TYPICAL LOCAL ABUNDANCE: Occasional.
 VEGETATION: Moist eucalypt forest.
 SUBSTRATE: Sandy soils on sandstone, low nutrients.
 EXPOSURE:

Conservation

Mt Wilson is northern geographical limit. Conservation status unknown.

POACEAE

Deyeuxia appressa**Life history**

GROWTH FORM: Erect perennial herb to 0.9 m high.
 VEGETATIVE SPREAD:
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring–summer.
 FRUIT/SEED: Dry, 1-seeded, indehiscent.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC.
 DISTRIBUTION SYDNEY AREA: Hornsby to Riverwood.
 SELECT LOCATIONS: CC: Killara (1941), Salt Pan Creek (1930).

Habitat

HABITAT:
 ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1200 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION:
 SUBSTRATE: Wet ground.
 EXPOSURE:

Conservation

Locally restricted endemic species. Listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995 and listed nationally under Environment Protection and Biodiversity Conservation Act 1999. Last collected in 1941.

POACEAE

Deyeuxia brachyathera**Life history**

GROWTH FORM: Erect perennial herb to 1.2 m high.
 VEGETATIVE SPREAD:
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring.
 FRUIT/SEED: Dry, 1-seeded, indehiscent.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NT CT ST; Vic., Tas.
 DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.
 SELECT LOCATIONS: CT: Mt Wilson, Blackheath, Katoomba, Whalania Heights.

Habitat

HABITAT: Gullies, creeks.
 ALTITUDE: 900–1200 m ANNUAL RAINFALL: 1200–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: Shrubswamp e.g. with *Empodisma minus*, *Baeckea utilis*, *Geranium neglectum*, *Callistemon ptyoides*.
 SUBSTRATE: Sandy soils on sandstone, granite, low nutrients.
 EXPOSURE:

Conservation

Conservation status unknown. Recorded from Kanangra Boyd NP.

POACEAE

*Deyeuxia decipiens***Life history**

GROWTH FORM: Erect perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring. Flowers abundantly only after fire (Keith 1996).

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Hornsby, Northbridge, Castlecrag, Rose Bay, Darkes Forest, Mt Keira, Thirlmere. **CT**: Lithgow, Mt Banks, Leura, Wentworth Falls, Woodford, Oberon, Hill Top.

Habitat

HABITAT: Rocky hillsides, swamps.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Scrub e.g. with *Banksia robur*, *Leptospermum juniperinum*.

SUBSTRATE: Sandy soils on sandstone, poorly drained, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Recorded from Blue Mountains NP.

POACEAE

*Deyeuxia gunniana***Life history**

GROWTH FORM: Slender erect or ascending perennial herb to 0.4 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC NT CT ST; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Boyd Plateau.

SELECT LOCATIONS: **CT**: Luthers Creek, Jensen Swamp, Belarah Swamp.

Habitat

HABITAT: Swamps.

ALTITUDE: 1000–1200 m ANNUAL RAINFALL: 1000–1100 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Carex appressa*, *Xyris ustulata*, *Baeckea utilis*, *Empodisma minus*.

SUBSTRATE: Organic sediments on granite, low nutrients, permanently moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Kanangra Boyd NP.

POACEAE

*Deyeuxia imbricata***Life history**

GROWTH FORM: Erect perennial herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT NWS; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT**: Capertee (1959), Jenolan Caves (1900), Woodford (1947).

Habitat

HABITAT:

ALTITUDE: 600–800 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soils on sandstone, granitic soils, low nutrients.

EXPOSURE:

Conservation

Jenolan Caves is southern geographical limit. Rare, last collected 1959.

POACEAE

Deyeuxia innominata (sp. *D* aff. *parviseta*)**Life history**

GROWTH FORM: Erect, loosely or occasionally densely tufted perennial herb to 0.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Wentworth Falls.

SELECT LOCATIONS: **CT**: Wentworth Falls (1964).

Habitat

HABITAT: Seepage sites on hillsides.

ALTITUDE: 1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soil on sandstone, low nutrients, moist.

EXPOSURE: Shaded.

Conservation

Rare, only Sydney area record is from Wentworth Falls in 1964.

POACEAE

*Deyeuxia mckiei***Life history**

GROWTH FORM: Erect, loosely tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: NC SC NT CT; Qld.
DISTRIBUTION SYDNEY AREA: Mt Wilson.
SELECT LOCATIONS: **CT**: Mt Wilson.

Habitat

HABITAT: Mountain forests.
ALTITUDE: 1000 m ANNUAL RAINFALL: 1200–1400 mm
TYPICAL LOCAL ABUNDANCE:
VEGETATION: Forests.
SUBSTRATE:
EXPOSURE:

Conservation

Rare, only Sydney area record is from Mt Wilson area (1896, 1906).

POACEAE

Deyeuxia mesathera**Life history**

GROWTH FORM: Tufted perennial herb to 1.2 m high.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring.
FRUIT/SEED: Dry, 1-seeded, indehiscent.
DISPERSAL, ESTABLISHMENT & GROWTH:
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: CC CT ST; Vic., Tas.
DISTRIBUTION SYDNEY AREA: Sporadic.
SELECT LOCATIONS: **CC**: Castle Hill (1963), Killara (1941), Centennial Park (1899, 1973). **CT**: Bowral (1946).

Habitat

HABITAT: Swamps, riverbanks.
ALTITUDE: 0–600 m ANNUAL RAINFALL: 1000–1400 mm
TYPICAL LOCAL ABUNDANCE:
VEGETATION:
SUBSTRATE:
EXPOSURE:

Conservation

Sydney is the northern geographical limit. Rare, last recorded in 1973.

POACEAE

Deyeuxia microseta**Life history**

GROWTH FORM: Erect, slender, loosely tufted perennial herb to 1.2 m high.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring.
FRUIT/SEED: Dry, 1-seeded, indehiscent.
DISPERSAL, ESTABLISHMENT & GROWTH:
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: CT ST; Vic.
DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.
SELECT LOCATIONS: **CT**: Blackheath, Katoomba, Leura, Wentworth Falls.

Habitat

HABITAT: Seepage areas near falls.
ALTITUDE: 700–1000 m ANNUAL RAINFALL: 1200–1400 mm
TYPICAL LOCAL ABUNDANCE: Rare.
VEGETATION: Eucalypt forest.
SUBSTRATE: Sandy soils on sandstones, low nutrients, moist.
EXPOSURE:

Conservation

Blackheath is northern geographical limit, last collected 1964. Coded 3KC- on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.

POACEAE

Deyeuxia monticola* var. *monticola**Life history**

GROWTH FORM: Erect, tufted perennial herb to 0.7 m high.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring–summer.
FRUIT/SEED: Dry, indehiscent, 1-seeded.
DISPERSAL, ESTABLISHMENT & GROWTH:
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: NT CT ST; Vic., Tas.
DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.
SELECT LOCATIONS: **CT**: Mt Victoria (1896), Jenolan SF (1984).

Habitat

HABITAT: Wet, rocky places.
ALTITUDE: 1000–1100 m ANNUAL RAINFALL: 1000–1200 mm
TYPICAL LOCAL ABUNDANCE:
VEGETATION: Woodland e.g. with *Eucalyptus ovata*.
SUBSTRATE: Clay soils on Permian sediments, low nutrients.
EXPOSURE:

Conservation

CONSERVATION: Conservation status unknown.

POACEAE

Deyeuxia nudiflora**Life history**

GROWTH FORM: Slender perennial herb to 0.7 m high.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Summer.
FRUIT/SEED: Dry, indehiscent, 1-seeded.
DISPERSAL, ESTABLISHMENT & GROWTH:
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: CC SC CT ST.
DISTRIBUTION SYDNEY AREA: Widespread.
SELECT LOCATIONS: **CC**: Cowan Creek, Glenbrook Gorge, Kentlyn, Wallacia, Avon Dam, Broughtons Pass, Cambewarra Range.
CT: Clarence, Fitzroy Falls, Penrose.

Habitat

HABITAT: Creeks, swamps.
ALTITUDE: 0–1100 m ANNUAL RAINFALL: 800–1400 mm
TYPICAL LOCAL ABUNDANCE:
VEGETATION: Open-forest e.g. with *Corymbia gummifera*, *Angophora floribunda*, *Syncarpia glomulifera*; moist scrub e.g. with *Backhousia myrtifolia*.

SUBSTRATE: Sandy soils on sandstone, low nutrients, shaded.
EXPOSURE: Shade.

Conservation

Conservation status unknown, Clarence is the northern distributional limit.

POACEAE

Deyeuxia parviseta var. *boormanii*

Life history

GROWTH FORM: Loosely tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC NT CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.

SELECT LOCATIONS: **CT**: Lithgow, Mt Wilson, Mount Tomah, Katoomba, Wentworth Falls.

Habitat

HABITAT: Often in steep gorges, damp forest.

ALTITUDE: 1000–1100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Moist open-forest or rainforest.

SUBSTRATE: Sandy soils on sandstone, low nutrients, moist.

EXPOSURE: Shade.

Conservation

Conservation status unknown.

POACEAE

Deyeuxia parviseta var. *parviseta*

Life history

GROWTH FORM: Loosely tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, indehiscent, 1-seeded, January–February.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains, Illawarra.

SELECT LOCATIONS: **CC**: Maddens Plains, Mt Keira, Macquarie Pass.

CT: Clarence, Jenolan Caves, Mount Tomah, Blackheath, Wentworth Falls.

Habitat

HABITAT: Steep gorges, ridges, seepages.

ALTITUDE: 800–1100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus blaxlandii*, *E. sieberi*, *E. radiata*; moist gully forest e.g. with *Atherosperma moschatum*, *Callicoma serratifolia*, *Todea barbara*.

SUBSTRATE: Sandy soil on sandstone, low nutrients, moist, shaded.

EXPOSURE: Shade.

Conservation

Conservation status unknown.

POACEAE

Deyeuxia quadriseta

Life history

GROWTH FORM: Very variable perennial to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith p.c.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded. Mature January–February (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith p.c.). Total germination approx. 36 days (typical rate 1312 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE: Resprouts (D. Keith p.c.). Some plants fruiting November, 44 weeks after high intensity fire (1/94 at Lane Cove) (P. Kubiak p.c.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST SWS SWP; Vic., Tas., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC**: Galston, Narrabeen, Dee Why, Bellevue Hill, Centennial Park, Maroubra, Cooks River, Darkes Forest, Orangeville, Camden, Thirlmere, Hill Top. **CT**: Boyd Plateau, Jenolan Caves, Lawson, Mt Jellore, Mittagong, Wingecarribee Swamp.

Habitat

HABITAT: Moist areas, creeks, swamps.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus blaxlandii*, *E. radiata*, *E. sieberi*, *Angophora costata*, *E. piperita*, *Corymbia gummifera*; scrub e.g. with Melaleuca; headland scrub; swamp e.g. with *Viminaria juncea*, *Phragmites australis*.

SUBSTRATE: Sandy to clay soils on sandstone, shale, low–medium nutrients, moist.

EXPOSURE: Shaded.

Conservation

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

POACEAE

Deyeuxia scaberula

Life history

GROWTH FORM: Erect, slender perennial herb to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, indehiscent, 1-seeded. Mature January–February.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC**: Macquarie Pass (1965). **CT**: Mt Wilson (1903).

Habitat

HABITAT: Rocky habitats, seepage sites.

ALTITUDE: 300–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rare, Mt Wilson is the northern geographical limit, last recorded there in 1904.

POACEAE

***Dichanthium sericeum* subsp. *sericeum* (*D. affine*)**

Queensland Bluegrass

Life history

GROWTH FORM: Erect perennial herb to 30–80 cm high, densely branched at the base, with blue-green leaves.

VEGETATIVE SPREAD: No.

LONGEVITY: 3–4 years (Waters et al. 2000).

PRIMARY JUVENILE PERIOD:

FLOWERS: Mostly summer.

FRUIT/SEED: Mature November–May. Seed ripens intermittently; seed dormancy may be up to 60% (Waters et al. 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: One of the easiest native grasses to establish from seed, with rapid recruitment in wet warm conditions; optimum temperature for germination 20–30°C, germination 50–80% for seed 6–12 months old; germination may be substantially reduced after 4–5 years (Waters et al. 2000). Total germination approx. 16 days (typical rate 374 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Readily eaten by stock, although some graziers report that sheep rarely graze this species; tolerates moderate grazing (Waters et al. 2000).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney, Illawarra, Bathurst–Orange.

SELECT LOCATIONS: **CC:** Doonside, Homebush, Bringelly, Campbelltown, Razorback, Picton, Austinmer, Dapto. **CT:** Bathurst, Orange, Abercrombie River.**Habitat**

HABITAT: Roadsides, railway embankment.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland e.g. with *Themeda australis*; woodland e.g. with *Eucalyptus albens*, *Bothriochloa*.

SUBSTRATE: Clay soils on shale, volcanics, medium nutrients.

EXPOSURE: Not particularly drought tolerant (Waters et al. 2000).

Conservation

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

POACEAE

Dichelachne crinita**Life history**

GROWTH FORM: Tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded. Mature December–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Total germination approx. 34 days (typical rate 648 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove), secondary juvenile period 10–11 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; LHI, Qld, Vic., S.A., W.A., N.Z., Pac.Is.

DISTRIBUTION SYDNEY AREA: Coast and Tablelands.

SELECT LOCATIONS: **CC:** Morisset, Richmond, Gordon, Manly, Centennial Park, Homebush, Coogee, Cooks River, Liverpool, Elderslie, Menangle Park, Razorback. **CT:** Carcoar, Mt Victoria, Katoomba, Jenolan Caves, Hill Top, Moss Vale.**Habitat**

HABITAT: Headlands, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland to woodland; open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Corymbia gummifera*, *E. sieberi*; scrub e.g. with *Banksia integrifolia*, *Angophora subvelutina*; seacliff scrub, grassland.

SUBSTRATE: Sand or sandy soils from sandstone, shale, low nutrients.

EXPOSURE: Full sun.

Conservation

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

POACEAE

Dichelachne hirtella**Life history**

GROWTH FORM: Densely tufted perennial herb to 1.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST SWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Katoomba–Hartley Vale.

SELECT LOCATIONS: **CT:** Hartley Vale (1890), Katoomba (1908).**Habitat**

HABITAT:

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Montane woodland.

SUBSTRATE:

EXPOSURE:

Conservation

Katoomba–Hartley Vale population is a disjunct occurrence at the northern geographical limit, but has not been recorded since 1908 and may be extinct.

POACEAE

Dichelachne inaequiglumis**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST SWP; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread in wetter areas.

SELECT LOCATIONS: **CC:** Woodford, Glenbrook, St Ives, Epping, Kogarah, Villawood, Mt Keira, Albion Park. **CT:** Clarence, Mt Wilson, Blackheath, Jenolan SF, Lawson, Hazelbrook, Kowmung, Hill Top, Moss Vale, Wingecarribee Swamp, Paddys River.

Habitat

HABITAT: Moist places.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist eucalypt forest e.g. with *Eucalyptus radiata*, *E. ovata*; open-forest e.g. with *Banksia serrata*; heath e.g. with *Leptospermum trinervium*, *Leptospermum polygalifolium*; montane peatland e.g. with *Themeda australis*, *Carex* spp.

SUBSTRATE: Soils on sandstone, shale, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Dichelachne micrantha (*D. sciurea*)

Short-hair Plume Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD: 1 year (Purdie 1977).

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Coloniser of open, disturbed sites.

FIRE RESPONSE: Regrowth from surviving tussocks, seedlings recorded less than 1 year after fire and reached sexual maturity during first growing season (Purdie 1977). Flowering 4–10 months after high intensity fire (1/94 at Lane Cove & Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A., N.Z., N.G.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Annangrove, Shane Park, Cheltenham, Homebush, Bass Hill, Waverley, Sutherland, Mount Annan, Menangle, Mt Ousley, Dapto. **CT:** Jenolan River, Blackheath, Tuena-Golspie.

Habitat

HABITAT: Valleys, rocky country.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *E. pilularis*; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*; woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *E. melliodora*.

SUBSTRATE: Soils on shale, quartzites, claystones, sandstone.

EXPOSURE:

Conservation

CONSERVATION: Conserved in Western Sydney (James et al. 1999), found in Blacktown, Mt Druitt, Prospect (T. James pers. comm.), conservation status elsewhere unknown. Reported in Georges River NP.

POACEAE

Dichelachne parva**Life history**

GROWTH FORM: Tufted perennial herb to 80 cm high, leaves mostly basal.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Flowering complete in some plants 7–10 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST SWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Higher rainfall areas.

SELECT LOCATIONS: **CC:** Culoul Range, Galston, Hornsby, Cheltenham, Rhodes, Penshurst, Prospect, Albion Park, Thirlmere. **CT:** Blackheath, Katoomba, Hazelbrook, Mittagong.

Habitat

HABITAT: Damp places, gorges, ridgetops, moist forest.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *E. pilularis*, *Syncarpia glomulifera*; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus eugenioides*; woodland e.g. with *Eucalyptus moluccana*, *E. crebra*.

SUBSTRATE: On sandstone, granite, clay soil on shale, metasediments, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Dichelachne rara**Life history**

GROWTH FORM: Tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, January–February.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE: Flowering 10 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST CWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly higher rainfall areas.

SELECT LOCATIONS: **CC:** Terrey Hills, Pymble, Ingleburn, Mount Annan, Thirlmere, Darke Forest, Mt Keira. **CT:** Mt Wilson, Bell, Hartley Vale, Mt Victoria, Katoomba.

Habitat

HABITAT: Ridges, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*; open-forest e.g. with *Eucalyptus piperita*, *E. oreades*, *E. radiata*, *E. blaxlandii*, *E. globoidea*, *Angophora costata*; woodland e.g. with *Eucalyptus dives*, *E. mannifera*, *E. moluccana*, *E. crebra*; grassland e.g. with *Themeda australis*.

SUBSTRATE: Clay soil on shale, volcanics, occasionally sandstone, medium nutrients.

EXPOSURE:

Conservation

CONSERVATION: Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Dalrymple Hay NR.

POACEAE

Dichelachne sieberiana**Life history**

GROWTH FORM: Tufted annual or short-lived perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 5 years.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, January–February.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast and Blue Mountains.

SELECT LOCATIONS: **CC:** Hornsby, Pymble, Ryde, Homebush, Centennial Park, Kogarah. **CT:** Clarence, Mt Wilson, Mount Tomah, Mt Victoria, Katoomba, Wentworth Falls, Woodford, Mt Bindo.

Habitat

HABITAT: Gullies, slopes, ridges.

ALTITUDE: 0–1400 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Montane woodland e.g. with *Eucalyptus pauciflora*, *E. dabrympleana*; moist open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*.

SUBSTRATE: Clay soils on shale, metamorphics, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Digitaria aequiglumis* **Life history**

GROWTH FORM: Herb to 0.7 m high.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: January–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC; S.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Norahville, Watsons Bay (1912), Paddington (1912), Centennial Park (1905), Kurnell, Casula, Mt Keira.

Habitat

HABITAT: Swampy areas, lake margins, roadsides, disturbed sites.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Edge of *Baumea juncea* swamp.

SUBSTRATE: Sandy soil on sand, sandstone, low nutrients.

EXPOSURE:

Conservation

Weed of wet places.

POACEAE

Digitaria breviglumis* (*D. diminuta*)*Life history**

GROWTH FORM: Loosely tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Hinterland north from Kangaroo Valley.

SELECT LOCATIONS: **CC:** Upper Colo River, Richmond, Glenorie, Castlereagh, Oatley, Kogarah, Penrith, St Marys, Liverpool, Ingleburn, Kentlyn, Mulgoa, Erskine Creek, Menangle Park, Kowmung River, Kangaroo Valley.

Habitat

HABITAT: Gullies, exposed sites.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus agglomerata*, *Corymbia eximia*, *Syncarpia glomulifera*.

SUBSTRATE: Gravelly clay or sandy soils on sandstones, shales.

EXPOSURE:

Conservation

CONSERVATION: Kangaroo Valley is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

Digitaria brownii**Life history**

GROWTH FORM: Perennial herb to 0.8 m high

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A., India.

DISTRIBUTION SYDNEY AREA: Liverpool to Razorback, Bathurst area.

SELECT LOCATIONS: **CC:** Liverpool, Campbelltown, Menangle Park, Razorback. **CT:** Bathurst, Glen Davis.

Habitat

HABITAT:

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Woodland e.g. with *Eucalyptus albens*, *E. melliodora*; margins of dry rainforest, grassland.

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

EXPOSURE:

Conservation

Rare, conservation status unknown.

POACEAE

POACEAE

***Digitaria ciliaris* *** (*D. adscendens* *)

Summer Grass

Life history

GROWTH FORM: Variable annual usually less than 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: January–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed weight 6.5 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to tropical regions.

BOTANICAL SUBREGIONS: NC CC SC CT NWS CWS NWP SWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Beecroft, Hunters Hill (1890), Ryde (1885), Homebush, Parramatta (1886), Doonside, Como (1886), Werong Beach, Douglas Park, Albion Park, Five Islands, Kangaroo Valley, Berry.**CT:** Jenolan Caves (1900).**Habitat**

HABITAT: Disturbed sites, tracks, creekbanks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Widespread weed of cultivation.

POACEAE

Digitaria didactyla

Queensland Blue Couch

Life history

GROWTH FORM: Stoloniferous perennial herb to 0.4 m high, rooting and branching from the nodes.

VEGETATIVE SPREAD: Yes (McIntyre et al. 1995), can be mown to form lawn.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: October–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CWS; Qld, Asia.

DISTRIBUTION SYDNEY AREA: Coast north from Shellharbour.

SELECT LOCATIONS: **CC:** Church Point, Bayview, Lane Cove, Manly, Parsley Bay, Vaucluse, Centennial Park, Bondi, Bundeena, Shellharbour.**Habitat**

HABITAT: Damp soil, on coastal foreshores, beach margins.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soil on dune sand, sandstone, low nutrients, moist sites.

EXPOSURE:

Conservation

Native to foreshore sites from Palm Beach to Shellharbour (southern geographical limit), grown as a lawn grass.

Digitaria diffusa**Life history**

GROWTH FORM: Slender, decumbent perennial herb to 0.7 m high, branching and rooting at the nodes.

VEGETATIVE SPREAD: Yes (McIntyre et al. 1995), forming thin swards.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: March–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT NWS CWS SWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wyong, Upper Colo, Dural, Hornsby, Gordon, Pennant Hills, Homebush, St Marys, Kentlyn, Picton, Macquarie Pass.**CT:** Wentworth Falls, Kowmung River, Sutton Forest.**Habitat**

HABITAT: Creekflats, grassy slopes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soils on shale, alluvium, occasional on sandstone, low–medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

POACEAE

Digitaria divaricatissima

Umbrella Grass

Life history

GROWTH FORM: Erect, tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: February–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ?NT NWS CWS SWS NWP SWP NFWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Pymble, Epping, Balmoral, Lidcombe, Doonside, Mt Druitt, Casula, Campbelltown, Menangle, Douglas Park.**Habitat**

HABITAT: Cemeteries. Remnant woodland (T. James pers. comm.).

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999).

POACEAE

Digitaria ischaemum* **Life history**

GROWTH FORM: Spreading herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to temperate regions.

BOTANICAL SUBREGIONS: CC CT ST NWS CWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Cheltenham, Silverwater, Sutherland.**CT:** Orange, Hartley, Leura (1910), Hill Top (1915), Burradoo.**Habitat**

HABITAT: Disturbed open areas, lawns, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Lawns, grassland.

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Weed of disturbed sites.

POACEAE

Digitaria longiflora* (*D. propinqua*)*Life history**

GROWTH FORM: Annual or short-lived perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Richmond, Gladesville, Rose Bay, Oatley, Penshurst, Liverpool, Glenfield.**Habitat**

HABITAT: Riverbanks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Sandy soils on dunes, alluvium, sandstone, low nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Glenfield is the southern geographical limit.

POACEAE

Digitaria parviflora**Life history**

GROWTH FORM: Erect tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: February–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Resprouted, seeds shed 7 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Seed eaten by finches (J. Neil, Gumnuts 46, 2002).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast. Western Sydney, Blue Mountains (T. James pers. comm.).

SELECT LOCATIONS: **CC:** Glen Davis, Upper Colo, Wamberal, Woy Woy, Cowan, Pitt Town, Hornsby, Cheltenham, Deep Creek, Gladesville, Balmoral, Machins Crater, Lapstone, Homebush, La Perouse, Port Hacking, Mulgoa, Albion Park, Berry.**Habitat**

HABITAT: Ridges.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist to dry open-forest e.g. with *Eucalyptus piperita*, *Corymbia gummifera*, *Eucalyptus botryoides*; woodland e.g. with *Eucalyptus crebra*, *E. eugenioides*.

SUBSTRATE: Sandy to clay soils on sand, sandstone, shale, volcanics, low–medium nutrients, well-drained.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Digitaria ramularis**Life history**

GROWTH FORM: Slender perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS; Qld.

DISTRIBUTION SYDNEY AREA: Coast and hinterland.

SELECT LOCATIONS: **CC:** Boorai Ridge, Wisemans Ferry, Dural, Linden, Woodford, Hornsby, Cheltenham, Pennant Hills, Gladesville, St Marys, Ingleburn, Campbelltown, Douglas Park, Thirlmere, Kowmung River, Cambewarra.**Habitat**

HABITAT: Hillsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Dry open-forest.

SUBSTRATE: Sandy to clay soils on sandstone, shales, alluvium.

EXPOSURE:

Conservation

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

POACEAE

***Digitaria sanguinalis* ***

Summer Grass

Life history

GROWTH FORM: Variable spreading, tufted herb.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: January–February.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995). Seeds dispersed by wind, water, man and animals, tenacious competitor for space — spreading tufts (Ciba-Geigy 1968–), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Exotic, introduced from temperate regions.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Hornsby, Wahroonga, Woodford, Gladesville (1884), Homebush (1894), Doonside, Camden, Campbelltown, Lake Illawarra. **CT:** Bathurst, Blackheath.

Habitat

HABITAT: Gardens, railways, disturbed sites, beaches.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay to sandy soils. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Widespread weed of cultivation.

POACEAE

Digitaria violascens* **Life history**

GROWTH FORM: Low-growing herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Old World tropical regions.

BOTANICAL SUBREGIONS: NC CC NT CWS; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Cheltenham, Balgowlah, Concord, Botany Swamp (1912), Cooks River (1908), Mt Keira.

Habitat

HABITAT: Gardens, roadsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay to sandy soils.

EXPOSURE:

Conservation

Minor weed of cultivation.

POACEAE

Diplachne uninervia* **Life history**

GROWTH FORM: Tufted annual or short-lived perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Silverwater.

SELECT LOCATIONS: **CC:** Newington (1992).

Habitat

HABITAT: Estuarine, ditches, drains.

ALTITUDE: 0–20 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on alluvium, low nutrients, apparently salt-tolerant.

EXPOSURE:

Conservation

Exotic species, known only from Naval Arms Depot (now Newington NR) in 1992. Ability to spread unknown.

POACEAE

Dryopoa dives

Giant Mountain Grass

Life history

GROWTH FORM: Tall, reed-like, erect, coarse perennial herb to 3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Macquarie Pass.

SELECT LOCATIONS: **CC:** Macquarie Pass. **CT:** Macquarie Falls.

Habitat

HABITAT: Moist gullies.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest e.g. with *Ceratopetalum apetalum*, *Todea barbara*.

SUBSTRATE: Sandy soil on alluvium, medium nutrients, moist.

EXPOSURE:

Conservation

Uncommon, Macquarie Pass is northern geographical limit, conservation status unknown.

POACEAE

Echinochloa colona

Awnless Barnyard Grass

Life history

GROWTH FORM: Tufted herb to 0.6 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer, or in response to rain (Harden 1993).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Freckled Duck *Stictonetta nervosa* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ST NWS CWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Liverpool, Glenfield, Ingleburn, Camden.**Habitat**

HABITAT: Moist sites.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Clay soils on shale, alluvium, medium nutrients, subject to periodic flooding.

EXPOSURE:

Conservation

Species of western NSW possibly introduced to Sydney region with stock.

POACEAE

***Echinochloa crus-galli* ***

Barnyard Grass

Life history

GROWTH FORM: Variable annual herb to 1 m high. Stout stem with tufts of hair at the nodes (Ciba-Geigy 1968–).

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Pyramid-shaped inflorescence, January–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent, January–May, peak March.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed by wind, water, and animals — over long distances by man; spreads rapidly (Ciba-Geigy 1968–), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Killed.

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Straw-necked Ibis and Stubble Quail *Coturnix pectoralis*, foodplant of Freckled Duck *Stictonetta nervosa*, Grey Teal *Anas gibberifrons* and Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Europe. Often grown as a forage plant, with a high sugar content (Ciba-Geigy 1968–).

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., S.A., W.A., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wollombi, Wamberal, Sackville, Windsor, Richmond, Woodford, Beecroft, Cheltenham, Manly, Toongabbie, Lidcombe, Homebush, Kogarah (1886), Centennial Park (1899), Moorebank, Cobbitty (1915), Menangle (1898), Wollongong, Five Islands, Kangaroo Valley. **CT:** Orange, Bathurst, Bell, Kowmung River, Moss Vale.**Habitat**

HABITAT: Waste areas, riverbanks, creeks, gardens.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Loamy sandy soils on shale, alluvium, medium nutrients.

Soil nitrogenous, slightly acid, sandy-loamy, indicator of fertility (Ciba-Geigy 1968–). Salt-tolerant but high salinity may limit its distribution (Rahman & Ungar 1994).

EXPOSURE:

Conservation

Widespread weed of waste areas and agricultural land. Moderate or vigorous competitor for space and nitrogen (Ciba-Geigy 1968–).

POACEAE

***Echinochloa crus-pavonis* ***

South American Barnyard Grass

Life history

GROWTH FORM: Erect to decumbent annual herb to 1.3 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to tropical Africa and America.

BOTANICAL SUBREGIONS: NC CC CT; Qld, Vic., W.A., S Amer., N.Z.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Lane Cove, Homebush (1931), Camden (1966).**Habitat**

HABITAT: Wasteland, agricultural areas, gardens.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Occasional weed of cultivation, particularly in the Camden area.

POACEAE

***Echinochloa escentula* * (*E. utilis*)**

Japanese Millet

Life history

GROWTH FORM: Erect annual herb to 1 m high, with stout stems.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to eastern Asia. Introduced for fodder and grain.

BOTANICAL SUBREGIONS: NC CC CT ST NWS CWS NWP SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Homebush, Manly (1919), Centennial Park, Cambewarra. **CT:** Orange, Bathurst, Hill Top (1914).

Habitat

HABITAT: Roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Probably cultivated for forage, grain and sometimes used as a soil stabiliser. Used as cover crop at Clarence in 1992 (Herb. record). Common in birdseed and often grows from spilt grain. Not truly naturalised.

POACEAE

***Echinochloa frumentacea* ***

Siberian Millet

Life history

GROWTH FORM: Annual herb to 1 m high, stout towards the base.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to India. Introduced as stockfeed.

BOTANICAL SUBREGIONS: NC CC NT SWS NWP SWP; Qld, Vic., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Jillyby Jillyby (1909), Wyong (1909), Darkes Forest, Jamberoo.

Habitat

HABITAT: Paddock, roadsides.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Cultivated as forage and grain, and sometimes as a soil stabiliser. Occasional escape from cultivation, not truly naturalised.

POACEAE

Echinochloa telmatophila

Swamp Barnyard Grass

Life history

GROWTH FORM: Erect to spreading annual herb, with stout stems to 2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CWS; Qld, W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: CC: Colo, Wyong, Gosford, Howes Creek, Richmond (1885), Yarramundi, Bondi (1887), Centennial Park, Camden, Menangle.

Habitat

HABITAT: In or near ponds and streams, in shallow water.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy soil on alluvium, often in shallow water, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Echinopogon caespitosus* var. *caespitosus

Tufted Hedgehog Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.5 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: August–May, peak November–December.

FRUIT/SEED: Dry, 1-seeded, indehiscent. Autumn (L.McD.)

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). No special morphology for dispersal (Westoby et al. 1990). Secondary juvenile period 15–23 weeks (P. Kubiak pers. comm.).

FIRE RESPONSE: Reported after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Grazed by stock. Food plant of butterfly larvae *Taractrocera papyria papyria* (Common & Waterhouse 1981).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS; Qld, N.G.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Awaba, Matcham, Hornsby, Cheltenham, Roseville, Lane Cove, Hurstville, Castlereagh, Liverpool, Thirlmere, Bulli, Kangaroo Valley, Bomaderry. CT: Hartley Vale, Katoomba, Mittagong.

Habitat

HABITAT: Hillsides and ridges, levee banks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: above 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Syncarpia glomulifera*, *Eucalyptus globoidea*, *E. saligna*, *E. pilularis*, *E. viminalis*, *E. radiata*; woodland e.g. with *Eucalyptus dives*, *E. mannifera*. Also with *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis* (T. James pers. comm.).

SUBSTRATE: Clay soil from Wianamatta Shale, sandy loam from Permian-Shoalhaven sediments, sandy soil on sandstone, medium–low nutrients.

EXPOSURE: Mid–light shade.

Conservation

Widespread and relatively frequent, conserved in Western Sydney (James et al. 1999). Reported in Royal NP, Seven Mile Beach NP, Wambina NR.

POACEAE

Echinopogon cheelii

Long-flowered Hedgehog Grass

Life history

GROWTH FORM: Loosely tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).

FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: NT CT ST NWS; Vic.
DISTRIBUTION SYDNEY AREA: Blayney area.
SELECT LOCATIONS: **CT**: Neville (1950).

Habitat

HABITAT: Damp places in forest and grassland.
ALTITUDE: 800–1000 m ANNUAL RAINFALL: 800–1000 mm
TYPICAL LOCAL ABUNDANCE:
VEGETATION:
SUBSTRATE:
EXPOSURE:

Conservation

Known from only one record in the area, at Neville, south of Blayney in 1950.

POACEAE

Echinopogon ovatus

Forest Hedgehog Grass

Life history

GROWTH FORM: Perennial herb to 1.2 m high, with a long, slender rhizome.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring.
FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.
DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995).
FIRE RESPONSE:
INTERACTION WITH OTHER ORGANISMS: Young plants poisonous to stock (Harden 1993).

Distribution

STATUS/ORIGIN: Native.
BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A., W.A., N.Z., N.G.
DISTRIBUTION SYDNEY AREA: Widespread.
SELECT LOCATIONS: **CC**: Kurrajong, Mooney Mooney, Wahroonga, St Ives, Denistone, Homebush, Kogarah, Wallacia, Campbelltown, Stanwell Park. **CT**: Neville, Mt Wilson, Woodford, Macquarie Pass, Mittagong.

Habitat

HABITAT: Hillsides, roadsides.
ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm
TYPICAL LOCAL ABUNDANCE: Frequent.
VEGETATION: Moist forest e.g. with *Eucalyptus viminalis*, *E. piperita*, *Acacia melanoxylon*; eucalypt woodland e.g. with *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis*, *Bursaria spinosa*; vine scrub remnant e.g. with *Aphanopetalum resinsum*.
SUBSTRATE: Clay soils on shale, basalt, volcanics, medium nutrients.
EXPOSURE:

Conservation

Conserved in western Sydney (James et al. 1999). Reported in Blue Mountains NP, Thirlmere Lakes NP.

POACEAE

Ehrharta calycina *

Perennial Veldtgrass

Life history

GROWTH FORM: Tufted or rarely stoloniferous perennial to 0.7 m high.
VEGETATIVE SPREAD:
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring–summer.
FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Africa. Introduced as pasture species and for erosion control.
BOTANICAL SUBREGIONS: NC CC NT ST CWS SWS SWP; Vic., Tas., S.A., W.A.
DISTRIBUTION SYDNEY AREA: Coast.
SELECT LOCATIONS: **CC**: Wyong (1974), Mt White, Richmond (1910), Eastlakes, Botany Swamp (1912), Matraville (1982).

Habitat

HABITAT: Sand dunes, paddocks, disturbed areas.
ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1200 mm
TYPICAL LOCAL ABUNDANCE: Frequent.
VEGETATION:
SUBSTRATE: Sandy soils on dunes, alluvium, low nutrients
EXPOSURE:

Conservation

Pasture species in dry areas. Possibly introduced to Wyong area with cereal seed for dune rehabilitation prior to 1974 (Herb. record).

POACEAE

Ehrharta erecta *

Panic Veldtgrass

Life history

GROWTH FORM: Tufted perennial to 0.6 m high, with delicate annual-like rootstock.
VEGETATIVE SPREAD: Stoloniferous habit in moist situations (L.McD. e.g. at Gore Creek Reserve, Greenwich).
LONGEVITY:
PRIMARY JUVENILE PERIOD:
FLOWERS: Spring–summer.
FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.
DISPERSAL, ESTABLISHMENT & GROWTH: Secondary juvenile period 38 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).
FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).
INTERACTION WITH OTHER ORGANISMS: Foodplant of moth caterpillar *Anthelia ocellata* and butterfly caterpillar *Heteronympha merope* (Coupar & Coupar 1992). Apparently eaten by rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.). Outcompetes native grasses (L. McD.).

Distribution

STATUS/ORIGIN: Exotic, native to S Africa. Probably introduced as pasture species.
BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A.
DISTRIBUTION SYDNEY AREA: Urban areas.
SELECT LOCATIONS: **CC**: Turramurra, Cherrybrook, Lane Cove, Vacluse, Centennial Park, Homebush (1931), Weeney Bay, Carlton, Campbelltown, Austinmer. **CT**: Bathurst (1996).

Habitat

HABITAT: River edges, disturbed areas, roadsides, gardens.
ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm
TYPICAL LOCAL ABUNDANCE: Frequent.
VEGETATION: Woodland e.g. *Casuarina glauca*, *Juncus kraussii*.
SUBSTRATE: Disturbed soils on shales, sandstone, medium nutrients.
EXPOSURE: Full sun to shade.

Conservation

CONSERVATION: Weed of moist shady sites, often in gardens and more frequent since 1970s. Probably likely to spread in higher rainfall areas such as the Upper Blue Mountains. Aggressive species that invades natural areas including grassy woodlands, forests, heathlands and riparian areas.

POACEAE

POACEAE

***Ehrharta longiflora* ***

Annual Veldtgrass

Life history

GROWTH FORM: Tufted annual to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Africa.

BOTANICAL SUBREGIONS: NC CC SC CWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Kulnura, Pennant Hills, Beecroft, Lindfield, Lane Cove, Centennial Park, Arncliffe (1913), Kogarah (1945), Oatley, Razorback.

Habitat

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Light sandy or loamy soils on sandstone, sand, low nutrients.

EXPOSURE: Mid-shade.

Conservation

Weed of roadsides, invading bush margins.

POACEAE

***Ehrharta villosa* ***

Pypgrass

Life history

GROWTH FORM: Perennial herb to 0.9 m high, with contracted to long creeping rhizome.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S Africa. Introduced for sand stabilisation.

BOTANICAL SUBREGIONS: CC; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Botanic Gardens (1932), Port Kembla (1946).

Habitat

HABITAT: Sand dunes.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sand on sand dunes.

EXPOSURE:

Conservation

Grown on sand dunes as a sand-binder, occasionally becoming naturalised (Harden 1993).

***Eleusine indica* ***

Crowsfoot Grass

Life history

GROWTH FORM: Coarse, tufted annual or perennial herb to 0.8 m high, with ascending or prostrate stems branching at the base.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Flowering 15–18 weeks after resprouting following high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Plumed Whistling Duck *Dendrocygna eytoni* (Barker & Vestjens 1989,1990). Can be poisonous to stock (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to Africa and India.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS NWP SWP; LHI, Qld, N.T., Vic., Tas., S.A. W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond, Dural, Gordon, Manly, Sydney (1894), Rose Bay, Centennial Park, La Perouse, Flemington, Rockdale, Penrith, Camden, Albion Park, Five Islands.

Habitat

HABITAT: Lawns, crops, disturbed areas, roadsides, coastal headlands.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Clay soils on shale, sandy soils on sandstone, low–medium nutrients.

EXPOSURE:

Conservation

Common weed of lawns, pastures and disturbed areas.

POACEAE

***Eleusine tristachya* ***

Goose Grass, Crab Grass

Life history

GROWTH FORM: Coarse, tufted herb to 0.4 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Hornsby (1914), Sydney Botanic Gardens (1891), Lane Cove, Flemington, Concord, East Lakes, Glenfield, Narellan. **CT:** Bathurst, Hartley Vale (1947), Moss Vale.

Habitat

HABITAT: Disturbed areas, mown areas, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Sandy to clay soils on sand, alluvium, shale, low–medium nutrients.

EXPOSURE:

Conservation

Weed of lawns and disturbed areas.

POACEAE

Elymus scaber var. *scaber* (*Agropyron scabrum*)

Common Wheatgrass

Life history

GROWTH FORM: Loosely tufted perennial herb to 1 m high; leaves with some degree of twisting.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Short-lived perennial (Waters et al. 2000).

PRIMARY JUVENILE PERIOD:

FLOWERS: Spasmodically, summer to autumn, cold temperatures often required to stimulate flowering (Waters et al. 2000).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–January (Greening Australia 1996a), 100–200 seed per gram, with awn accounting for 7–18% of total weight (Waters et al. 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive (McIntyre et al. 1995). Total germination approx. 35 days (typical rate 47 per gram of seed, Greening Australia 1996a). Some seed germinates one month after harvesting, but some ecotypes may have dormancy of several months; 80% germination recorded after 8 years seed storage in the dark at room temperature (Waters et al. 2000).

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS: Considered valuable for stock, with high protein content 10–36%, but is usually only a minor component of pastures (Waters et al. 2000).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; ?LHI, Qld, Vic., Tas., S.A., W.A., NZ.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney (T. James p.c.).

SELECT LOCATIONS: **CC**: Ryde (1884), Kogarah (1900), Toongabbie (1993), Campbelltown (1962). **CT**: Canobolas (1936), Moss Vale (1895).

Habitat

HABITAT: Grassy woodland.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*.

SUBSTRATE: Clay soils on shale, medium nutrients, well-drained. Recorded on saline sites in western NSW (Semple 1993). Tolerates alkaline conditions (Waters et al. 2000).

EXPOSURE: Frost-tolerant (Waters et al. 2000).

Conservation

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

POACEAE

Elytrigia repens * (*Agropyron repens* *, *Elymus repens* *)

English Couch, Quick or Twitch Grass

Life history

GROWTH FORM: Perennial herb to 1 m high, with long, braching yellow or straw-coloured rhizomes.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Exotic, native to Eurasia.

BOTANICAL SUBREGIONS: SC NT CT ST CWS SWS SWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Orange area.

SELECT LOCATIONS: **CT**: Orange (1992).

Habitat

HABITAT: Pasture.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

A lawn grass planted in cool temperate areas.

POACEAE

Enneapogon gracilis

Slender Nineawn

Life history

GROWTH FORM: Slender, tufted annual or perennial herb to 0.7 m high, with knotty base.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Warmer months.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ST NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC**: Barrallier.

Habitat

HABITAT: Rock crevices.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Only Sydney area record is from Barrallier (1914, 1937) in Burratorang Valley, and may have been destroyed by Warragamba Dam.

POACEAE

Enneapogon nigricans

Niggerheads

Life history

GROWTH FORM: Tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–February (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: Total germination approx. 8 days, typical rate 148 per gram of seed (Greening Australia 1996a).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; N.T., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Bathurst area.

SELECT LOCATIONS: **CT:** Glanmire (1955), Bathurst (1886, 1912, 1945, 1958).

Habitat

HABITAT: Hillside, roadside.

ALTITUDE: 700 m ANNUAL RAINFALL: 700 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Gravelly soil on shale, granite, medium nutrients.

EXPOSURE:

Conservation

Last recorded in Bathurst area in 1958. Conservation status unknown.

POACEAE

Enteropogon acicularis (*Chloris acicularis*)

Life history

GROWTH FORM: Tufted perennial herb to c. 0.4 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer in response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS CWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Windsor (1950), Prospect (1935), Flemington Saleyards (1968).

Habitat

HABITAT: Grassland, saleyards.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland.

SUBSTRATE: Clay soils on gravelly shale, low nutrients.

EXPOSURE:

Conservation

A species of drier inland areas, possibly introduced into western Sydney area with stock.

POACEAE

Entolasia marginata

Bordered Panic

Life history

GROWTH FORM: Straggling or shrubby, wiry, perennial herb to 2 m high, with short rhizome.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: December–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. January–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted, fruit produced 7 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Seed eaten by finches (J. Neil, Gumnuts 46, 2002). Apparently eaten by rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Norville, Wyong, Upper Colo River, Wisemans Ferry, Hornsby, Beecroft, Como, Centennial Park, Kurnell, Audley, Londonderry, Glenbrook, Mulgoa, Oakdale, Mt Ousley, Berry.

CT: Blackheath, Woodford, Mittagong, Robertson.

Habitat

HABITAT: Riverbanks, creeks, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist eucalypt forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*, *Backhousia myrtifolia*; rainforest margins; dry open-forest and woodland e.g. with *Eucalyptus sieberi*, *E. piperita*, *E. gummiifera*, *E. sclerophylla*, *Angophora bakeri*.

SUBSTRATE: Deep loamy soils on sandstone, shale, volcanic necks, basalt, alluvium, medium nutrient.

EXPOSURE: Light shade–full sun.

Conservation

Widespread, conserved in Western Sydney (James et al. 1999), and elsewhere. Reported in Blue Mountains NP, Dharug NP, Ku-ring-gai Chase NP, Royal NP.

POACEAE

Entolasia stricta

Wiry Panic

Life history

GROWTH FORM: Straggling, or shrubby, wiry, rhizomatous, grass usually 0.8 m high, but up to 1.5 m high when straggling through undergrowth.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: October–May, peak November.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, November–May.

DISPERSAL, ESTABLISHMENT & GROWTH: No special dispersal morphology (Westoby et al. 1990). Coloniser. Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouted, fruit produced 5 months after high intensity fire (1/94 at Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Often heavily cropped by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS; Qld.

DISTRIBUTION SYDNEY AREA: Widespread on sandstone plateaus.

SELECT LOCATIONS: **CC:** Kulnura, Gosford, Maroota, Richmond, Springwood, Linden, Hornsby, West Head, Cheltenham, Gladesville, Vacluse, Botany Bay, Kurnell, Homebush, Lidcombe, Blacktown, Mt Druitt, Parramatta, Wilton, Oakdale, Bargo, Mt Keira, Jaspers Brush. **CT:** Mt Wilson, Katoomba, Lawson, Kowmung River, Hill Top, Robertson, Penrose.

Habitat

HABITAT: Hillsides, ridges.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus sieberi*, woodland e.g. with *Eucalyptus sclerophylla*, *E. eximia*, *E. punctata*, *Angophora bakeri*; open heath e.g. with *Eucalyptus stricta*. Also with *Eucalyptus fibrosa*, *E. crebra* (T. James pers. comm.).

SUBSTRATE: Sandy soils from dune sand, alluvial sand, sometimes peaty soils, or sandstone, quartzite, volcanics, low nutrients, sometimes periodically waterlogged. Tertiary alluvium, clay soils on shale (T. James pers. comm.).

EXPOSURE: Full sun–light shade.

Conservation

A common, widespread species, conserved in Western Sydney (James et al. 1999) and adequately conserved elsewhere. Reported in Blue Mountains NP.

POACEAE

Entolasia whiteana**Life history**

GROWTH FORM: Straggling or shrubby wiry perennial herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Most of the year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT; Qld.

DISTRIBUTION SYDNEY AREA: Coast north from Hill Top.

SELECT LOCATIONS: **CC:** Colo, Maroota, Hornsby, Lane Cove, Hunters Hill, Bankstown, Cronulla, Loftus. **CT:** Hill Top (1914).

Habitat

HABITAT: Ridges, upper slopes.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Eucalypt open-forest e.g. with *Angophora costata*, *Corymbia eximia*, *C. gummifera*, *Eucalyptus punctata*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Eragrostis benthamii (*E. philippica*)**Life history**

GROWTH FORM: Tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded, February–March.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS; Vic., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wondabyne, Woy Woy, Kurrajong Heights, Dural, Valley Heights, Hunters Hill, Balmoral, Woollahra, Cabramatta, Lansdowne, Cambewarra. **CT:** Lithgow, Mount Tomah, Lawson, Kowmung River, Hill Top, Bowral, Belmore Falls.

Habitat

HABITAT: Lower hillsides, flats, moist places.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland, open-forest.

SUBSTRATE: Sandy soils on sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Brisbane Water NP, Royal NP.

POACEAE

Eragrostis brownii

Brown's Love Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer or in response to rain.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by finches (J. Neil, Gumnuts 46, 2002).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Maroota, Dural, Agnes Banks, Castlereagh, Springwood, Linden Ridge, Manly, Hunters Hill, Villawood, Bondi, Rookwood, Centennial Park, Penrith, Liverpool, Kowmung River, La Perouse, Kogarah, Elderslie, Bulli Pass, Albion Park, Kangaroo Valley, Cambewarra Range. **CT:** Capertee Valley, Zig Zag, Katoomba, Hill Top, Mittagong.

Habitat

HABITAT: Ridges, stony hillsides, sand deposits, rock pavements.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open heath e.g. with *Eucalyptus stricta*, *Angophora hispida*, *Banksia ericifolia*; woodland e.g. with *Eucalyptus moluccana*, *E. fibrosa*, *E. punctata*, *E. sclerophylla*, *Corymbia eximia*; open-forest e.g. with *Eucalyptus botryoides*.

SUBSTRATE: Sandy soils on sandstone, Tertiary alluvium, dune sand, low nutrients.

EXPOSURE: Full sun.

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

***Eragrostis cilianensis* ***

Stinkgrass

Life history

GROWTH FORM: Tufted annual herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded, February–May.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Probably dispersed with stock.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, N.T., Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1907), Riverstone, Cowan (1918), Wahroonga, Narrabeen (1908), Manly (1885), Flemington Saleyards, Homebush, Glenfield, Camden, Bargo. **CT:** Glanmire, Bathurst (1913).

Habitat

HABITAT: Disturbed sites, cultivated land, creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus tereticornis*, *E. longifolia*, *E. eugenioides*.

SUBSTRATE: Clay soil on shale, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Weed of cultivation and disturbed ground.

POACEAE

***Eragrostis curvula* ***

African Lovegrass

Life history

GROWTH FORM: Tufted perennial herb to 1 m high, often tussocky.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mainly summer–autumn, flowerhead to 30 cm long (Weeds Australia www.weeds.org.au)

FRUIT/SEED: Dry indehiscent, 1-seeded. Seedhead lead-grey or grey-green with leaf tips often curly, open at maturity, seeds cream to brown about 1 mm long (Weeds Australia www.weeds.org.au)

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seeds, often spread in mud on vehicles and animals; seedlings grow rapidly after summer rain (Weeds Australia www.weeds.org.au). No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE: Resprouts. Spring burning promotes rapid growth to full maturity in early summer (Weeds Australia www.weeds.org.au)

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Africa. Introduced for pasture and soil stabilisation (NPWS website).

BOTANICAL SUBREGIONS: CC SC SC NT CT ST NWS CWS NWP SWP NFWP; S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Arcadia, Berkshire Park, Cherrybrook, Castle Hill (1958), St Marys, Clyde, Malabar, Narellan, Menangle Park. **CT:** Orange, Bathurst (1954), Wallerawang, Bell (1955), Hill Top (1976).

Habitat

HABITAT: Roadsides, watercourses, pastures.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Roadside vegetation, old pastures, Eastern Suburbs Banksia Scrub e.g. with *Acacia longifolia*, *Banksia aemula*.

SUBSTRATE: Sandy or gravelly soil on dune sand, Tertiary alluvium, sandy alluvium, shale, low–medium nutrients.

EXPOSURE: Full sun.

Conservation

CONSERVATION: A major weed along roadsides in western Sydney, Eastern Suburbs Banksia Scrub, and in the Blue Mountains. Reported from Hawkesbury Agricultural College Richmond (1912–1914) in flowerbed, and as extensively naturalised on Bathurst Experimental Farm in 1954 (Herb. specimen note). Major spread in Sydney occurred after 1960s from roadside and dune stabilisation programs e.g. Bell 1955, Castle Hill 1958, Narellan 1965, Malabar 1965. Still actively spreading, particularly along roadside margins. Noxious weed in NSW.

POACEAE

Eragrostis elongata

Clustered Lovegrass

Life history

GROWTH FORM: Tufted, annual or perennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer or in response to rain.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS SWS NWP SWP NFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast and western Sydney.

SELECT LOCATIONS: **CC:** Wyong (1903), Emu Plains, Pymble, Mosman (1921), Bellevue Hill (1904), Homebush (1896), Lidcombe, Mt Druitt, Cabramatta, Campbelltown, Ingleburn, Menangle Park, Upper Burrigorang.

Habitat

HABITAT: Sand scrub, riverbanks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland, coastal scrub.

SUBSTRATE: Sandy soils on dune sand, Tertiary alluvium, sandy alluvium, low nutrients. Clay soils on shale (T. James pers. comm.).

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), with most records pre- 1950.

POACEAE

Eragrostis leptostachya

Paddock Lovegrass

Life history

GROWTH FORM: Loosely tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted, flowering 2 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT NWS CWS; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread, western Sydney.

SELECT LOCATIONS: **CC:** Spencer, Lower Portland, Berowra Creek, Gordon, Cheltenham, Rooty Hill, Neutral Bay, Bondi, Liverpool, Kogarah, Glenbrook, Cobbitty, Orangeville, Campbelltown, Menangle, Razorback Range, Picton, Lake Illawarra, Kangaroo Valley. **CT:** Hartley, Hill Top, Mittagong.

Habitat

HABITAT: Paddocks, remnant woodland.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus melliodora*, *E. macrorhyncha*; grassland; margins of dry rainforest. Also with *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis* (T. James pers. comm.).

SUBSTRATE: Clay soil on shale, volcanics, sandy alluvium, medium nutrients.

EXPOSURE:

Conservation

Regarded as one of the commonest pasture grasses in coastal areas in early 20th century (Herb. notes 1914, 1941). Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

***Eragrostis mexicana* *** (*E. neomexicana* *)

Mexican Lovegrass

Life history

GROWTH FORM: Tufted variable annual herb to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC SC CT ST SWS SWP.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Bilpin, Richmond (1912), Doonside, Ryde, Marrickville (1908), Casula, Campbelltown. **CT:** Bathurst, Moss Vale, Robertson.**Habitat**

HABITAT: Disturbed areas, railways, saleyards.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Weed of disturbed areas and gardens.

POACEAE

Eragrostis molybdea**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), possibly a coloniser of bare sites.

FIRE RESPONSE: Resprouts from base.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT CT NWS CWS SWS NWP NFWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Menangle, Mt Keira. **CT:** Bathurst, Hartley, Hill Top.**Habitat**

HABITAT: Roadside.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland, woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay to sandy soils on shale, sandstone, low–medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Eragrostis parviflora

Weeping Lovegrass

Life history

GROWTH FORM: Tufted annual herb to 1.1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Richmond, Glenbrook, Mt Colah, Cheltenham, Homebush, Kogarah, Marayong, Emu Plains, Penrith, Parramatta, Liverpool, Narellan, Picton. **CT:** Bathurst.**Habitat**

HABITAT: Disturbed sites.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Clay soils on shale, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

***Eragrostis pilosa* ***

Soft Lovegrass

Life history

GROWTH FORM: Tufted annual herb to 0.6 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, February–March.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic.

BOTANICAL SUBREGIONS: NC CC NT CT ST SWP; Qld, Vic., N.T.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Richmond (1912), Dharruk, Wentworthville, Flemington, Abion Park. **CT:** Hartley, Bathurst (1912).**Habitat**

HABITAT: Roadsides.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Weedy grassland e.g. with *Paspalum dilatatum*, *Setaria*, *Plantago lanceolata*.

SUBSTRATE: Clay soils on shale, low–medium nutrients.

EXPOSURE:

Conservation

Weed of cultivation and disturbed ground.

POACEAE

Eragrostis sororia**Life history**

GROWTH FORM: Tufted scrambling perennial herb to 0.7 m high, with stems erect or scrambling over vegetation.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS NWP; Qld, Vic., N.G.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Lapstone (1935), Mosman (1945), Menangle (1969).

Habitat

HABITAT:

ALTITUDE: 0–300 m **ANNUAL RAINFALL:** 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy to clayey soils on shale, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Germination in glasshouse in summer, autumn and outside in winter, spring in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Suspected of causing photosensitisation in sheep (E. McBarron, Herb. note).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Mainly Upper Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CT:** Mt Lambie, Lithgow, Blackheath, Medlow Bath, Katoomba, Hill Top, Bowral, Berrima, Mittagong, Robertson, Barbers Creek.

Habitat

HABITAT: Disturbed sites, pastures.

ALTITUDE: 0–1100 m **ANNUAL RAINFALL:** 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland; native grassland

SUBSTRATE: Sandy soils on sandstone.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

***Eragrostis tenuifolia* ***

Elastic Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to India and Africa.

BOTANICAL SUBREGIONS: NC CC NT CT NWP.SFWP; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Swansea (1986), Beecroft (1978), Northbridge (1987), Lane Cove (1986), Mosman (1985), Sydney Botanic Gardens (1937). **CT:** Wombeyan Caves area (2001).

Habitat

HABITAT: Lawns, roadside grass verges.

ALTITUDE: 0–200 m **ANNUAL RAINFALL:** 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Riparian forest e.g. with *Casuarina cunninghamiana* (at Wombeyan).

SUBSTRATE: Sandy soils on sandstones, alluvium.

EXPOSURE: Full sun.

Conservation

Common in caravan parks, camping and recreation areas; appears to have spread since 1980s.

POACEAE

Eriachne glabrata

Wanderrrie Grass

Life history

GROWTH FORM: Loose or densely tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; N.T., W.A.

DISTRIBUTION SYDNEY AREA: Hawkesbury River to O'Hares Creek (Keith 1994).

SELECT LOCATIONS: **CC:** Terrey Hills, Manly (1907), Rose Bay (1898), Waterfall, Maddens Plains.

Habitat

HABITAT:

ALTITUDE: 0–400 m **ANNUAL RAINFALL:** 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Wet heath e.g. with *Banksia oblongifolia*, *Baeckea imbricata*; swamps e.g. with *Melaleuca quinquenervia*.

SUBSTRATE: Sandy soil on dune sand, sandstone, low nutrients, periodically moist.

EXPOSURE:

Conservation

CONSERVATION: Rare, O'Hares Creek is southern geographical limit (Keith 1994), reported in Royal NP.

POACEAE

Eragrostis trachycarpa**Life history**

GROWTH FORM: Tufted perennial herb to 80 cm high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

POACEAE

Eriochloa procera

Spring Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NCCCNWS NWPSWP; Qld, Vic., N.T., India, Malaysia.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Terrigal, Avoca, Wondabyne, Flemington Saleyards, Windang Island, Kiama.**Habitat**

HABITAT: Sea cliff ledges, wetter areas, disturbed sites.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Sandy to clay soils on gravel, shale, low-medium nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status of coastal sites unknown.

POACEAE

Eriochloa pseudoacrotricha

Early Spring Grass

Life history

GROWTH FORM: Loosely tufted, annual or short-lived perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Possibly a coloniser of bare sites.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS SWS NWPSWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Brush Farm (Eastwood), Parramatta, Prospect, Blacktown, Luddenham, Campbelltown, Bombo.**Habitat**

HABITAT: Roadsides. Remnant woodland on Cumberland Plain (T. James pers. comm.).

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland e.g. with *Bothriochloa macra*, *Chloris truncata*; woodland e.g. with *Eucalyptus tereticornis*, *E. fibrosa*.

SUBSTRATE: Clayey soil on shale, basalt, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

Festuca asperula

Graceful Fescue

Life history

GROWTH FORM: Rhizomatous tufted perennial herb to 0.9 m high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Mittagong (1941).**Habitat**

HABITAT: Montane woodland.

ALTITUDE: 600 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rare, only one record for Sydney area at Mittagong in 1941.

POACEAE

***Festuca elatior* * (*F. arundinacea*)**

Tall Fescue

Life history

GROWTH FORM: Tufted perennial herb to 1.2 m high, sometimes tussock-forming.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe. Introduced as pasture grass.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Nepean River.

SELECT LOCATIONS: **CC:** Menangle (1964), Maldon. **CT:** Orange (1950), Wentworth Falls.**Habitat**

HABITAT: Riverbanks, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Riparian vegetation e.g. with *Lomandra longifolia*, *Tristaniopsis laurina*.

SUBSTRATE: Sandy alluvial soil, low nutrients.

EXPOSURE:

Conservation

Planted as a pasture grass, occasionally naturalised.

POACEAE

Festuca pratensis *

Meadow Fescue

Life history

GROWTH FORM: Short-lived tufted perennial herb to 1.4 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS NWP; Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Pennant Hills (1990), Domain (1902), Port Botany, Waterfall (1987). **CT:** Oberon (1992).**Habitat**

HABITAT:

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Planted as pasture grass with occasional recent records of naturalising.

POACEAE

Festuca rubra subsp. *rubra* *

Red Fescue

Life history

GROWTH FORM: Rhizomatous tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Planted as lawn grass.

Distribution

STATUS/ORIGIN: Exotic, native to Europe, Asia and America.

BOTANICAL SUBREGIONS: NC CC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Windsor (1894). **CT:** Bathurst (1958), Katoomba (1994), Fitzroy Falls (1987).**Habitat**

HABITAT: Lawns, roadside.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Lawns.

SUBSTRATE:

EXPOSURE:

Conservation

Planted as a lawn grass.

POACEAE

Gastridium phleoides *

Nitgrass

Life history

GROWTH FORM: Tufted annual herb to 0.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CT; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Tarana (1941).**Habitat**

HABITAT:

ALTITUDE: 900 m ANNUAL RAINFALL: 800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rare weed of disturbed areas, only record at Tarana in 1941.

POACEAE

Glyceria australis

Australian Sweetgrass

Life history

GROWTH FORM: Tufted rhizomatous perennial herb to 1.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Germination in all seasons in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS NWP SWP; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Agnes Banks, Doonside, Parramatta, Moorebank, Liverpool, Orangeville. **CT:** Lidsdale, Gingkin, Bowral, Wingecarribee Swamp, Moss Vale.**Habitat**

HABITAT: Swamps, creekbanks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Coastal swamp vegetation e.g. with *Pseudoraphis paradoxa*, *Philydrum lanuginosum*, *Carex appressa*, *Cyperus gunnii*; upland swamps e.g. with *Eleocharis* spp. *Sparganium antipodum*, *Leptospermum*.

SUBSTRATE: Peaty alluvial soils, sandy clay on Tertiary alluvium, low nutrients, wet sites, sometimes in standing water.

EXPOSURE:

Conservation

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

POACEAE

***Glyceria declinata* ***

Sweetgrass

Life history

GROWTH FORM: Tufted rhizomatous perennial herb to 0.8 m high.

VEGETATIVE SPREAD: Rhizomes and stolons.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and America.

BOTANICAL SUBREGIONS: SC CT ST SWP; Vic.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Orange (1991), Katoomba (1998), Wingecarribee Swamp (1989).**Habitat**

HABITAT: Damp areas, creeks in water.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Margins of sedge swamp, montane peatland, riparian forest e.g. with *Eucalyptus dalrympleana*, *E. stellulata*.

SUBSTRATE: Peaty to clayey soil on sediments, low–medium nutrients, permanent moisture.

EXPOSURE:

Conservation

Weed of upland wetlands.

POACEAE

***Glyceria maxima* ***

Reed Sweetgrass

Life history

GROWTH FORM: Stout rhizomatous perennial herb to 2.5 m high, with hollow ribbed stems to 12 mm diam.

VEGETATIVE SPREAD: Forms dense monocultures (V. Klapake, Herb. note).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS NWP SWP; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Lane Cove (1984–94). **CT:** Oberon (1964), Ginkin (1977).**Habitat**

HABITAT: Wetlands, swampy pastures.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Bolboschoenus*, *Typha*.

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Planted in swampy areas as a fodder crop, now a significant weed of wetlands (Harden 1993).

POACEAE

***Hainardia cylindrica* *** (*Monerma cylindrica*)

Common Barbgrass

Life history

GROWTH FORM: Tufted, gregarious annual herb to 0.7 m high.

VEGETATIVE SPREAD: Forms extensive clumps (Herb. note).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to southern Europe.

BOTANICAL SUBREGIONS: NC CC SC ST NWS CWS SWS NWP SWP; LHI, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Lake Macquarie (1982), Bayview (1935), Neutral Bay (1916), Leumeah, Gunnamatta Bay (Port Hacking).**CT:** Lyndhurst Cemetery.**Habitat**

HABITAT: Brackish areas, estuaries, lawns.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Estuarine swamp.

SUBSTRATE: Brackish to saline alluvial soils. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Usually grows on saline soils or soils high in gypsum (Harden 1993).

Conservation

Weed of lawns and estuaries.

POACEAE

Hemarthria uncinata* var. *uncinata (*H. compressa*)

Matgrass

Life history

GROWTH FORM: Decumbent or ascending, creeping perennial herb to 1 m high, with many-noded, branched stems, sometimes forming mats.

VEGETATIVE SPREAD: Creeping rhizome. Forms broad spreading stands (Klapake 2002).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: December–March.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, flowering 3–5 months after high intensity fire (1/94 at Lane Cove & Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Rhizomes eaten by Purple Swamphen *Porphyrio porphyrio* (Lepschi 1993).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Norahville, Gosford, Richmond, Hornsby, Narrabeen, Cheltenham, Manly, Neutral Bay, Homebush, Centennial Park, Kogarah, Como, Darke Forest, Maddens Plains, Dapto, Cambewarra, Kangaroo Valley. **CT:** Orange, Bathurst, Cullen Bullen, Lithgow, Hartley, Mt Wilson, Katoomba, Colong, Mittagong, Paddys River, Barbers Creek.

Habitat

HABITAT: Damp places, estuaries, swamp margins.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Margins of swamps e.g. with *Banksia oblongifolia*, *Ptilothrix deusta*, *Empodisma minus*.

SUBSTRATE: Sandy to clay soils on alluvium sandstone, shale, basalt, low–high nutrients. Colonises low pH (2.5–6.5) acid sulphate estuarine soils in the Wyong area (Payne 1992).

EXPOSURE:

Conservation

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

POACEAE

***Holcus lanatus* ***

Yorkshire Fog

Life history

GROWTH FORM: Tufted, velvety perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry indehiscent, 1-seeded. Prolific seeder, individual plant can produce up to 240 000 seeds per annum; small seed 1.5 million per kilogram; seed germinates quickly after maturity, but may be delayed by freezing (NSW Agriculture website).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular mechanism for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990). In controlled situations can be useful pasture grass (NSW Agriculture website).

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS SWS SWP; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Hornsby, Rydalmere, Centennial Park, Coogee (1889), Picton (1912), Mt Kembla (1891), Berry (1912), Cambewarra.

CT: Sunny Corner, Blackheath, Katoomba, Jenolan Caves (1899), Hill Top (1913), Bowral (1913).

Habitat

HABITAT: Disturbed sites, drainage lines.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Wide range of soils, clay to sandy soils on shale, basalt, sandstone, poorly drained, low to high nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Weed in wet places, particularly on fertile soils.

POACEAE

***Holcus mollis* ***

Creeping Fog

Life history

GROWTH FORM: Rhizomatous perennial herb to 1 m high.

VEGETATIVE SPREAD: Deep rhizomes.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CT; Vic.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Mt Wilson (1953–58).

Habitat

HABITAT: Damp areas, gardens.

ALTITUDE: 1000 m ANNUAL RAINFALL: 1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soil on basalt, high nutrients.

EXPOSURE:

Conservation

Weed of damp areas. Deep underground runners made it a serious garden weed at Mt Wilson (Herb. note 1953–1958).

POACEAE

***Hordeum distichon* ***

Two Row Barley

Life history

GROWTH FORM: Erect annual herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Probably killed. Flowers produced 12 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC NWS CWS SWS SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coastal.

SELECT LOCATIONS: **CC:** Flemington, Penshurst, Casula, Ingleburn, Narellan, Campbelltown, Unanderra.

Habitat

HABITAT: Railway trucking yards, roadsides, railway lines.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

A cereal crop, evidently establishing temporarily along transport routes from spilt grain.

POACEAE

***Hordeum glaucum* ***

Northern Barley Grass

Life history

GROWTH FORM: Tufted annual herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS SWS NWP SWP
NFWP SFWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Domain (1962), Flemington Saleyards, Casula, Glenfield (1964).

Habitat

HABITAT: Saleyards, railways.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Widespread weed, often associated with livestock.

POACEAE

***Hordeum hystrix* ***

Mediterranean Barley Grass

Life history

GROWTH FORM: Tufted annual herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC NT ST CWS SWS SWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Richmond (1916), Flemington Saleyards (1968).

Habitat

HABITAT: Disturbed sites.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Infrequent weed of disturbed sites, often associated with livestock.

POACEAE

***Hordeum leporinum* ***

Barley Grass

Life history

GROWTH FORM: Tufted annual herb to 0.2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded. Seed weight 7.8 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa*, seed eaten by Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS SWS NWP SWP
NFWP SFWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Richmond, Epping, Ashton Park (1945), Domain (1902), Homebush (1930), Flemington Saleyards, Strathfield, Mount Annan.

Habitat

HABITAT: Roadsides, wasteland.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland.

SUBSTRATE: Sandy to clay soils on sandstones, shale, medium nutrients.

EXPOSURE:

Conservation

Widespread weed.

POACEAE

Hyparrhenia hirta

Coolatai Grass

Life history

GROWTH FORM: Densely tufted perennial herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Unpalatable to stock, reduces productivity of pastures (NPWS website).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced as a soil stabiliser (NPWS website).

BOTANICAL SUBREGIONS: CC NT NWS CWS SWS NWP; Qld, N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset (1993), Berowra (1993), Flemington (1977), Toongabbie Creek (1993).

Habitat

HABITAT: Roadsides.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *Angophora floribunda*.

SUBSTRATE: Sandy loam on clay, gravels.

EXPOSURE:

Conservation

Highly invasive grass that replaces other species and is capable of invading relatively undisturbed vegetation (NPWS website). Reported from Botanic Gardens Sydney in 1934 as being from 'ex Kenya'. Established at Flemington in 1977, presumably by stock movement. Initially establishing on roadsides, the extent of potential spread is unclear at this stage, though it is widespread in north western NSW.

POACEAE

Imperata cylindrica* var. *major

Blady Grass

Life history

GROWTH FORM: Perennial herb with tufts to 1.2 m high and deeply buried, pungent pointed wiry rhizomes, sometimes with tuber-like swellings on lower roots.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: November–March, stimulated by fire. Flowering prolifically within several weeks of high intensity fire (1/94 at Narrabeen, L.McD).
FRUIT/SEED: Dry, indehiscent, 1-seeded, 1–1.3 mm long, June–July. Fruit produced 3–5 months after the fire (1/94 at Lane Cove, P. Kubiak pers. comm.). I

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fruit, wind dispersed (Westoby et al. 1990). No germination after application of smoke for 1 hour (Greening Australia 1996c).

FIRE RESPONSE: Resprouts from rhizome (Fox 1988). Generally stimulated by fire and may become dominant after low intensity fire, though recorded in area not burnt for 20 years (at Mosman). Indicative of frequent burning; can be eliminated by regular mowing but not fire (J. Powell & H. Fallding pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Food plant of butterfly larvae *Taractrocera papyria papyria*, *Suniana lascivia lascivia*, *Telicota ancilla ancilla*, *Hypocysta metirius*, *Melanitis leda bankia*, *Xois arctoa arctoa* (Common & Waterhouse 1981). May be unpalatable to rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS SWS; Qld, Vic., Tas., N.T., S.A., W.A., S.E. Asia.

DISTRIBUTION SYDNEY AREA: Coast and lower Blue Mountains.

SELECT LOCATIONS: **CC:** Dural, Hornsby, Cheltenham, Homebush, Kogarah, Kurnell, Berkshire Park, Warrimoo. **CT:** Jenolan Caves (1900), Long Swamp (Kodela 1992).

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*, to drier forest e.g. *Eucalyptus piperita*, *Angophora costata*. Margin of upland mire (Kodela 1992).

SUBSTRATE: Usually on deep soils, sandy loam–sandy clays from shale, volcanic neck, low–medium nutrients.

EXPOSURE: Full sun–light shade.

Conservation

Probably adequately conserved. Reported in Blue Mountains NP.

POACEAE

Isachne globosa (*I. australis*)

Swamp Millet

Life history

GROWTH FORM: Aquatic or semi-aquatic perennial herb to c. 0.7 m high.

VEGETATIVE SPREAD: Weeping and rooting stems.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST SWS; Qld, Vic., N.T., S.A., N.Z., N.G., SE Asia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Upper Colo, Cattai Creek, Sackville, Richmond, Narrabeen, Manly Beach, Rockdale, Botany, Eastlakes, Cape Solander, Voyager Point, Casula, Berry. **CT:** Lidsdale, Blackheath, Kowmung River, Robertson, Belmore Falls, Barbers Creek, Tallong.

Habitat

HABITAT: Swamp margins.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Fresh wetland e.g. with *Eleocharis sphacelata*, *Persicaria strigosa*, *Persicaria hydropiper*, *Ranunculus inundatus*; Upland mire (Kodela 1992).

SUBSTRATE: Clayey to sandy alluvium on sand, shale, low nutrients.

EXPOSURE:

Conservation

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

POACEAE

Ischaemum australe var. *australe*

Life history

GROWTH FORM: Tufted, erect or scrambling, rhizomatous perennial herb with stems to 2 m long.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA: Coast, north of Sydney.

SELECT LOCATIONS: **CC:** Lake Macquarie, Morisset, Wyee Creek, Wyong, Maroubra Beach.

Habitat

HABITAT: Swamps, creeks.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedge swamp e.g. with *Baumea juncea*, *Sacciolepis indica*, *Paspalum orbiculare*; scrub e.g. with *Melaleuca sieberi*, *Melaleuca nodosa*; woodland e.g. with *Melaleuca quinquenervia*.

SUBSTRATE: Sandy soil on alluvium, low nutrients, poorly drained, fresh–?brackish.

EXPOSURE:

Conservation

Maroubra is southern geographical limit. Conservation status unknown.

POACEAE

Lachnagrostis aemula (*Agrostis aemula*)

Blowngrass

Life history

GROWTH FORM: Erect, tufted annual or perennial herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adapted for dispersal by adhesion and wind (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Morisset, Marayong, Roseville, Parramatta, Rookwood, East Hills, Glenfield, Hurstville, Camden, Dapto, Albion Park. **CT:** Orange, Mullion Creek, Oberon, Jenolan Caves, Hill Top, Mt Gibraltar, Moss Vale.

Habitat

HABITAT: Moist slopes, creekbanks, cemeteries.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: Woodland e.g. with *Eucalyptus blakelyi*, *E. melliodora*;
 grassland e.g. with *Themeda australis*.
 SUBSTRATE: Clay soils on shale, alluvium.
 EXPOSURE:

Conservation

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

POACEAE

Lachnagrostis billardierei* subsp. *billardierei

(*Agrostis billardieri*)

Coast Blowngrass

Life history

GROWTH FORM: Erect, tufted annual or perennial herb to 0.5 m high
 VEGETATIVE SPREAD:
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring.
 FRUIT/SEED: Dry, indehiscent, 1-seeded.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC; Vic., Tas., S.A.
 DISTRIBUTION SYDNEY AREA: Coastal foreshores.
 SELECT LOCATIONS: CC: Wamberal, Barrenjoey, Manly, Gladesville, Bondi, Gerringong.

Habitat

HABITAT: Coastal headlands, hillsides.
 ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION:
 SUBSTRATE: Sandy to clay soils on shales, laterite, sandstone, low nutrients; tolerates salt spray.
 EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Lachnagrostis filiformis

(*Agrostis avenacea* var. *avenacea*)

Blown Grass

Life history

GROWTH FORM: Variable annual or perennial herb to 70 cm high
 VEGETATIVE SPREAD: No (McIntyre et al. 1995).
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Spring–summer, November.
 FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–February (Greening Australia 1996a).
 DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adapted for dispersal by adhesion and wind (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Germination in all seasons in Northern Tablelands (Britton & Brock 1994). Coloniser. Total germination approx. 18 days (typical rate 2289 per gram of seed, Greening Australia 1996a).
 FIRE RESPONSE: Fruit produced 10–11 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., S.A., W.A., N.Z., Polynesia, America.
 DISTRIBUTION SYDNEY AREA: Widespread.
 SELECT LOCATIONS: CC: Morisset, Annangrove, Hornsby, Homebush, Botany Bay, Kemps Creek, Casula, Audley, Albion Park, Menangle, Otford, Bulli Pass, Bargo, Wollongong, Kangaroo Valley. CT: Oberon, Mt Wilson, Lawson, Mittagong, Hill Top, Capertee.

Habitat

HABITAT: Creek banks, road verges, cliff lines.
 ALTITUDE: 0–1100 m ANNUAL RAINFALL: 700–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent–occasional.
 VEGETATION: Grassy forest e.g. with *Eucalyptus saligna*; swampy forest e.g. with *Eucalyptus ovata*; grassy woodland, scrub e.g. with *Melaleuca decora*.
 SUBSTRATE: Clay soils on shale, volcanics, sandy alluvium, medium to high nutrients, moist sites. Recorded on saline sites in western NSW (Semple 1993).
 EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

***Lagurus ovatus* ***

Hair's Tail Grass

Life history

GROWTH FORM: Tufted, softly hairy annual herb to 0.6 m high.
 VEGETATIVE SPREAD: No.
 LONGEVITY: Less than 1 year.
 PRIMARY JUVENILE PERIOD: Less than 1 year.
 FLOWERS: Spring.
 FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS: Cultivated and used in dried flower arrangements.

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.
 BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., S.A., W.A.
 DISTRIBUTION SYDNEY AREA: Mainly coastal.
 SELECT LOCATIONS: CC: Richmond (1908), Manly, Centennial Park, Kogarah (1899), Long Bay, Kurnell, Bundeena, Austinmer. CT: Capertee (1907), Oberon (1926).

Habitat

HABITAT: Foreshores, hind dunes.
 ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION:
 SUBSTRATE: Sandy soils on dunes, sandstone.
 EXPOSURE:

Conservation

Minor weed.

POACEAE

***Lamarckia aurea* ***

Goldentop

Life history

GROWTH FORM: Tufted annual herb to 0.4 m high.
 VEGETATIVE SPREAD: No.
 LONGEVITY: Less than 1 year.
 PRIMARY JUVENILE PERIOD: Less than 1 year.
 FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC NT NWS CWS SWS NWP SWP NFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Estuaries.

SELECT LOCATIONS: CC: Homebush Bay, Concord (1910), Flemington, Tempe (1899).

Habitat

HABITAT: Disturbed areas.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale, alluvium.

EXPOSURE:

Conservation

Weed of disturbed areas.

POACEAE

Leersia hexandra

Swamp Ricegrass

Life history

GROWTH FORM: Aquatic or semi-aquatic perennial herb to 1.5 m high, with long branching rhizomes.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld, N.T.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Port Jackson (1802).

Habitat

HABITAT: Swamps, creeks.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Port Jackson is southern geographical limit, but has not been recorded since collection by Robert Brown in 1802. Probably extinct in the Sydney area now.

POACEAE

Leptochloa ciliolata

Life history

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Camden area.

SELECT LOCATIONS: CC: Grose Vale (1910), Mt Hunter, Razorback.

Habitat

HABITAT: Moist protected areas.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest remnant e.g. with *Corymbia maculata*, *Aphanopetalum resinsum*, *Rapanea variabilis*.

SUBSTRATE: Clay loam on shales, shaley sandstone medium nutrients.

EXPOSURE:

Conservation

Now confined to Razorback Range area. Conservation status unknown.

POACEAE

Leptochloa peacockii

Life history

GROWTH FORM: Tufted or tussock-forming perennial herb to 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to flooding.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Hawkesbury Agricultural College Richmond (1910).

Habitat

HABITAT: Areas subject to flooding.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 600–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

This is a species of drier areas. It is not clear whether this species occurred naturally in the Sydney area as all specimens from the area are from experimental stations, and could have been grown from seed from further afield.

POACEAE

Lolium loliaceum *

Stiff Ryegrass

Life history

GROWTH FORM: Tufted annual herb to 0.3 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC CWS SWS SWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Hunters Hill (1912), McMahons Point, Centennial Park (1899), Maroubra, Leumeah, Wollongong.

Habitat

HABITAT: Roadsides, gardens, headlands.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Grassland.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Uncommon weed of roadsides and crops.

POACEAE

Lolium multiflorum *

Italian Ryegrass

Life history

GROWTH FORM: Tufted annual or short-lived perennial herb to 1 m high.

Hybridizes with *Lolium perenne*, *L. rigidum* and other *Lolium* species.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore dispersed by adhesion (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Flowering 38–43 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced for pastures.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS CWS SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Epping, Northbridge, Circular Quay (1903), Glenfield, Camden, Campbelltown, Wollongong, Albion Park. **CT:** Hill Top (1912), Robertson.

Habitat

HABITAT: Roadsides, pastures, wasteland.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay to sandy soils, low–medium nutrients.

EXPOSURE:

Conservation

Pasture species, widespread weed of roadsides and crops.

POACEAE

Lolium perenne *

Perennial Ryegrass

Life history

GROWTH FORM: Loose to densely tufted annual or short-lived perennial herb to 80 cm high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: October–December.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed weight 1.9 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Flowering 44 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans, mostly September–January (Bass & Wrigley 1984). Foodplant of butterfly caterpillar *Heteronympha merope* (Coupar & Coupar 1992). Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Gladesville (1885), Centennial Park, Rockdale, Casula, Maldon, Berry, Kangaroo Valley. **CT:** Wallerawang, Blackheath, Moss Vale, Robertson.

Habitat

HABITAT: Roadsides, pastures.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland, woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soils.

EXPOSURE:

Conservation

Grown as pasture species, reported by Robert Brown as established in Sydney by 1804 (Maiden 1909). Planted in recreation areas (Harden 1993).

POACEAE

Lolium rigidum *

Wimmera Ryegrass

Life history

GROWTH FORM: Tufted annual herb to 0.9 m high, often reddish purple at base.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed weight 2.4 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed harvested by ants (Buckley 1982). Galls appear on plant when parasitised by nematode *Anguina agrostis* and bacterium *Corynebacterium rathayi*; the plant is then toxic to livestock in W.A. (Purcell 1985) and S.A. (McKay et al. 1985).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced for pastures.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; LHI, Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Glenorie, Wahroonga (1910), Balmoral, Hunters Hill (1912), Homebush (1930), Centennial Park (1899), Glenfield, Camden (1913), Wollongong. **CT:** Orange, Bathurst.

Habitat

HABITAT: Pastures, grassland.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay to sandy soils, low–medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

CONSERVATION: Grown as pasture species, widespread weed of crops (Harden 1993).

POACEAE

POACEAE

***Lolium temulentum* ***

Darnel

Life history

GROWTH FORM: Tufted annual herb to 0.9 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Mediterranean region. Reported by Robert Brown to be introduced to Sydney by 1804 (Maiden 1909).

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Manly (1885), Homebush (1895), Centennial Park (1899), Kogarah (1894), Coalcliff, Wollongong. **CT:** Hill Top (1913), Mittagong (1918).**Habitat**

HABITAT: Roadsides, wetland margins.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Previously a serious weed of winter cereal crops, but now uncommon (Harden 1993).

POACEAE

***Melinis minutiflora* ***

Molasses Grass

Life history

GROWTH FORM: Stoloniferous, aromatic perennial herb to 1.2 m high.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Colo Bridge (1986).**Habitat**

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Planted for pasture and erosion control, chiefly north of Coffs Harbour. Only record for Sydney area, in 1986 near Colo Bridge, covering an embankment.

***Melinis repens* *** (*Rhynchelytrum repens*)

Red Natal Grass

Life history

GROWTH FORM: Stoloniferous, aromatic perennial herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Covered with pink, red or shining white hairs, summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Probably resprouted, fruit produced 19–26 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC SC NWS CWS NWP; Qld, Vic., N.T., W.A., N.G.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Morisset, Cheltenham, Centennial Park (1912), Rookwood, Emu Plains, Glenbrook.**Habitat**

HABITAT: Roadsides, wasteland, disturbed areas.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

POACEAE

Microlaena stipoides* var. *brevisetata**Life history**

GROWTH FORM: Slender, tufted perennial herb to 0.7 m high, with contracted rhizome.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Most of the year, spikelets usually purplish.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT; Qld.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CT:** Mt Victoria (1886), Katoomba, Wentworth Falls (1894), Hill Top (1912), Carrington Falls.**Habitat**

HABITAT: Shaded sites.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Sandy soils on sandstone, low nutrients.

EXPOSURE:

Conservation

LOCALISED POPULATIONS IN SYDNEY AREA; Carrington Falls is southern geographical limit. Conservation status unknown.

POACEAE

Microlaena stipoides* var. *stipoides

Meadow Rice Grass, Weeping Grass

Life history

GROWTH FORM: Slender, tufted herb to 70 cm high, with contracted rhizome.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time of the year, spikelets green. Remains green during winter and has an indeterminate growth pattern with rapid growth and flowering whenever soil water is available from spring through autumn.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, seed heads slender, weeping. Mature December–April (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: No special dispersal morphology (Westoby et al. 1990). Total germination approx. 25 days, (typical rate 87 per gram of seed, Greening Australia 1996a); very little dormancy, germination can occur at any time of year, taking 7–15 days, but is very slow if soil temperature is below 10°C; plants develop slowly, may be out-competed by weeds (Waters et al. 2000).

FIRE RESPONSE: Resprouts, secondary juvenile period 4 months (Narrabeen 1994). Regrowth and suckers from rootstocks and lateral roots, no seedlings recorded less than 1 year after fire (Purdie 1977).

INTERACTION WITH OTHER ORGANISMS: One of the few Australian native grasses that provide forage during the critical winter–early spring period on the Northern Tablelands (Magcale et al. 1991). Valuable for maintaining stock in dry times. Food plant of butterfly larvae *Geitoneura acantha* and *Geitoneura klugii* (Coupar & Coupar 1992), *Taractrocera papyria papyria*, *Oreixenica lathoniella herceus* (Common & Waterhouse 1981). Seed eaten by finches (J. Neil, Gumnuts 46, 2002).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP; Qld, Vic., Tas., N.T., S.A., W.A., NZ, Pac Is, Malesia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Gosford, Pymble, Hunters Hill, Centennial Park, Homebush, Penshurst, Richmond, Mount Annan, Razorback, Dapto, Kangaroo Valley. **CT:** Kelso, Blackheath, Katoomba, Hill Top.**Habitat**

HABITAT: Damp shady areas. More fertile or protected areas of natural pastures particularly where there is some timber cover.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist eucalypt forest e.g. with *Eucalyptus saligna*, *E. pilularis*, *Angophora costata*, *Angophora floribunda*; woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Sandy loam–clay loams on shale, medium–high nutrients. Watertable mostly low, moisture supply intermittent, non saline. Wide variety of soil types, with pH less than 5.5, usually more abundant with pH down to 3.9 (Waters et al. 2000).

EXPOSURE: Sheltered, mid-shade.

Conservation

Conserved in Western Sydney (James et al. 1999). Conservation elsewhere unknown.

POACEAE

Microstegium nudum**Life history**

GROWTH FORM: Straggling annual or perennial herb to 50 cm high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld, SE Asia, Philippines.

DISTRIBUTION SYDNEY AREA: Hornsby.

SELECT LOCATIONS: **CC:** Hornsby (1915).**Habitat**

HABITAT: Stream banks.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE: Shade.

Conservation

Hornsby is southern geographical limit, but last recorded there in 1915. Now possibly extinct in Sydney area.

POACEAE

***Miscanthus sinensis* ***

Eulalia

Life history

GROWTH FORM: Erect, tufted perennial herb 2–3 m high, leaves mostly basal, leaves green throughout. Two varieties have been recognised.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer

FRUIT/SEED: Dry, indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, commonly cultivated, now escaped and naturalised.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Lower Blue Mountains.

SELECT LOCATIONS: **CT:** Woodford, Hazelbrook, Wahoonga (1952).**Habitat**

HABITAT: Roadsides, railway.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Locally naturalised along railway embankment Woodford to Hazelbrook (1945–1988).

POACEAE

***Nassella neesiana* * (*Stipa neesiana*)**

Chilean Needle Grass

Life history

GROWTH FORM: Densely tufted perennial herb to 0.8 m high; flat leaves to 5 mm wide, with rough margins and ribbed upper surface.

VEGETATIVE SPREAD: No.

LONGEVITY: More than 20 years (Agric. & Res. Management Council 2000).

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Produces two types of seeds: those borne on flowerheads (22 000 per plant per year), and stem seeds (cleistogenes) formed at nodes and sheath base of flowering stems that allow reproduction in absence of flowering (Agric. & Res. Management Council 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed adhesive, with apical hairs, attaches to machinery, clothing or livestock; seed viable for more than 12 years (Agric. & Res. Management Council 2000).

FIRE RESPONSE: Resprouts from base.

INTERACTION WITH OTHER ORGANISMS: Chokes out other species, invertebrate diversity low.

Distribution

STATUS/ORIGIN: Exotic, native to S America. Accidental introduction, probably as agricultural contaminant (NPWS website) first collected in NSW at Glen Innes 1944 (Agric. & Res. Management Council 2000).

BOTANICAL SUBREGIONS: CC NT CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Brush Farm Park (1986), Mt Druitt (1974), Pendle Hill, Ingleburn (1986), Mount Annan. **CT:** Bathurst (1972).

Habitat

HABITAT: Roadsides, pastures, grassy areas, along creeks and rivers (Agric. & Res. Management Council 2000).

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland, remnant woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Extremely hardy and aggressive grass, very resistant to mowing and drought. First recorded in Sydney area in 1970s. Spreading in western Sydney, situation in Bathurst area unknown. Listed as a Weed of National Significance and declared noxious in 11 local government areas (NPWS website).

POACEAE

Nassella trichotoma *

Serrated Tussock, Yass Tussock

Life history

GROWTH FORM: Densely tufted perennial herb to 0.7 m high. Distinctive weeping tussocky form and hairless, spineless ligule aids identification; deep fibrous root system.

VEGETATIVE SPREAD: No.

LONGEVITY: Possibly more than 20 years (Agricultural & Resource Management Council 2000).

PRIMARY JUVENILE PERIOD: 2 years (Agricultural & Resource Management Council 2000).

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed heads, long distance dispersal by wind up to 15 km (NSW Agriculture website) and by humans, animals and water; most seed germinates, needs rain in autumn, winter or spring; seed may remain viable for several decades; seed may be viable after passing through the digestive system of stock; seedlings slow-growing and weak (Agricultural & Resource Management Council 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Appears to be unattractive to stock (Herb. specimen 1948). Low feed value, unpalatable to livestock, reduces productivity of pastures (NPWS website).

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: CC SC NT CT ST CWS SWS; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly Tablelands.

SELECT LOCATIONS: **CC:** Unanderra, Kangaroo Valley. **CT:** Orange, Bathurst, Carcoar (1948), Blayney (1947), Little Hartley, Mount Tomah, Oberon (1946), Berrima (1950), Moss Vale (1937), Paddys River.

Habitat

HABITAT: Low fertility hilly areas, overgrazed pastures, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus viminalis*.

SUBSTRATE: Loams on shale, granite, low nutrients.

EXPOSURE: Full sun, drought resistant (NSW Agriculture website).

Conservation

Highly invasive, forms dense clumps and competes with and crowds out native species (NPWS website). Highly invasive of grasslands; tolerant to drought, fire and grazing with few natural enemies in Australia (Agricultural & Resource Management Council 2000). Weed of National Significance, declared noxious in all of NSW.

POACEAE

Notochloe microdon

Life history

GROWTH FORM: Tufted rhizomatous perennial herb to 0.7 m high, only conspicuous when flowering.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, peak summer.

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:** Lithgow, Newnes, Blackheath, Wentworth Falls, Lawson, Hazelbrook.

Habitat

HABITAT: Edges of swampy creeks

ALTITUDE: 700–1200 m ANNUAL RAINFALL: above 1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Wet heath, hanging swamps e.g. with *Gleichenia dicarpa*, *Baeckea linifolia*.

SUBSTRATE: Sandy loam from sandstone, low nutrients. Water table permanently high, moisture supply continuous.

EXPOSURE: Sheltered, full sun.

Conservation

Rare local endemic species, coded 2RC- on national rare species list (Briggs & Leigh 1996). Reported in Blue Mountains NP.

POACEAE

Oplismenus aemulus

Life history

GROWTH FORM: Weak, creeping, trailing perennial herb to 0.3 m high, leaves 4–18 mm wide.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: December–May.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No special dispersal morphology (Westoby et al. 1990). Coloniser of bare shady sites.

FIRE RESPONSE: Possibly killed, flowering 5 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Apparently eaten by rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT NWS SWS; Qld, Vic., N.G.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Colo River, Richmond, Glenbrook, Baulkham Hills, Doonside, Parsley Bay, Botany Bay, Gladesville, Waterfall, Bundeena, Hacking River, Cedar Creek, Burragorang Valley, Kowmung River, Cobbitty, Shellharbour, Minnamurra Falls, Kangaroo Valley, Berry. **CT:** Kanangra, Macquarie Pass.

Habitat

HABITAT: Gullies, wetland.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Moist eucalypt forest, rainforest e.g. with *Acmena smithii*; dry rainforest e.g. with *Streblus brunonianus*, *Cassine australis*, and woodland e.g. *Eucalyptus amplifolia*, *Casuarina glauca*, *Angophora floribunda*.

SUBSTRATE: Sandy loam from alluvium, shale, basalt, volcanic necks, medium nutrients.

EXPOSURE: Mid-shade.

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

Oplismenus imbecillis**Life history**

GROWTH FORM: Weak, creeping, trailing perennial herb to 30 cm high, leaves less than 7 mm wide.

VEGETATIVE SPREAD: Spreading.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time of year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed. Bird-dispersed (Floyd 1966). Summer growing, colonising bare sites.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS; Qld, Vic., N.T., N.G.

DISTRIBUTION SYDNEY AREA: Widespread on coast.

SELECT LOCATIONS: CC: Dural, Hornsby, Wahroonga, Balmoral, Bellevue Hill, Homebush, Oatley, Waterfall, Razorback, Kowmung River, Lake Illawarra, Cambewarra, Kiama.

Habitat

HABITAT: Shady forest, sheltered gullies.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Rainforest, moist eucalypt forest e.g. with *Eucalyptus saligna*, *Angophora costata*, *Eucalyptus piperita*, *E. globoidea*; light gaps in rainforest.

SUBSTRATE: Sandy to clay soils on sandstone, shale, basalt, water table mostly low, moisture supply intermittent, low to high nutrients.

EXPOSURE: Sheltered sites, mid-shade.

Conservation

Conservation status unknown.

POACEAE

Ottochloa gracillima**Life history**

GROWTH FORM: Slender perennial herb to 0.3 m high, with scrambling or decumbent stems. Roots at lower nodes, often forming green mats (Wheeler et al. 1990).

VEGETATIVE SPREAD: Mat-forming.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Gosford–Wyong.

SELECT LOCATIONS: CC: Erina Creek (1925), Wyong (1993).

Habitat

HABITAT: Shady areas often near water.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE:

EXPOSURE: Shade.

Conservation

Gosford is southern geographical limit. Conservation status unknown.

POACEAE

***Panicum antidotale* ***

Giant Panic Grass, Blue Panic

Life history

GROWTH FORM: Robust, tufted, shortly rhizomatous perennial herb to 1.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to India and Asia. Introduced as fodder species.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS NWP; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Clyde (1969).

Habitat

HABITAT: Wasteland.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Cultivated as fodder species, occasionally escaping, reported from railway yards at Clyde in 1969.

POACEAE

Panicum bisulcatum

Black-seeded Panic

Life history

GROWTH FORM: Semi-aquatic decumbent annual or short-lived perennial herb to 0.8 m high.

VEGETATIVE SPREAD: Roots at nodes.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded, purplish black.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS; Qld, Vic., Asia.

DISTRIBUTION SYDNEY AREA: Mainly Gosford–St Albans area.

SELECT LOCATIONS: CC: Webbs Creek, Wrights Creek, Ourimbah, Narara, Cattai Creek, Ryde.

Habitat

HABITAT: Near streams, marshes.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: In alluvium, mud, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Mainly associated with the Hawkesbury floodplain but was reported at Ryde in 1999. It may be dispersed in topsoil.

POACEAE

***Panicum capillare* var. *capillare* ***

Witchgrass

Life history

GROWTH FORM: Hairy, tufted annual herb to 0.8 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to N America.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP NFWP; Vic., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Orange area.

SELECT LOCATIONS: **CC:** Paddington (1912). **CT:** Orange (1936, 1948, 1978).

Habitat

HABITAT: Disturbed ground.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Mainly reported from Orange as weed of urban areas.

POACEAE

Panicum decompositum

Native Millet

Life history

GROWTH FORM: Densely tufted perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A., Pac.Is.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Richmond, Cheltenham, Doonside, Bringelly, Casula, Narellan, Mount Annan, Picton. **CT:** Bathurst (1903), Wombeyan Caves (1992).

Habitat

HABITAT: Ridges, cemeteries.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; grassland.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Rare, vulnerable in Western Sydney (James et al. 1999). Last reported from Bathurst in 1903.

POACEAE

Panicum effusum**Life history**

GROWTH FORM: Tufted, hairy perennial herb to 70 cm high

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore with morphology adapted for wind dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Possibly coloniser of disturbed sites.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A., N.I.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Awaba, Upper Colo, Pitt Town, Grose Vale, Vineyard, Hornsby, Penrith, Mulgoa, Liverpool, Cobbitty, Como, Mount Annan, Menangle, Picton, Cedar Creek, Kowmung River, Yanderra, Kangaroo Valley. **CT:** Capertee Valley, Meadow Flat, Bathurst, Yetholme, Blayney, Blackheath, Woodford, Wollondilly River, Moss Vale.

Habitat

HABITAT: Gullies, slopes, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *Melaleuca decora*, *Angophora floribunda*, *Eucalyptus albens*, *E. melliodora*.

SUBSTRATE: Clay soil on shale, metasediments, conglomerate, alluvium, medium to low nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Full sun.

Conservation

Conservation status unknown.

POACEAE

Panicum gilvum* * (*P. laevifolium* var. *contractum*)*Life history**

GROWTH FORM: Decumbent to erect annual herb, with stems to 0.7 m long.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore with morphology adapted for wind dispersal (McIntyre et al. 1995). Germination in all seasons in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Suspected of causing photosensitization in sheep (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS SWS SWP SFWP; Vic.

DISTRIBUTION SYDNEY AREA: Tablelands.

SELECT LOCATIONS: **CC:** Flemington Saleyards. **CT:** Orange, Bathurst, Lithgow, Hampton, Mt Wilson (1954), Oberon, Mittagong, Robertson (1949).

Habitat

HABITAT: Waste places, grassland.

ALTITUDE: 600–1000 m **ANNUAL RAINFALL:** 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Sandy soils on sandstone, granite, low nutrients.

EXPOSURE:

Conservation

Weed of cultivation in Tablelands, first recorded at Robertson in 1949.

POACEAE

***Panicum maximum* var. *maximum* ***

Guinea Grass

Life history

GROWTH FORM: Densely tufted perennial herb to 3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Woy Woy (2000), Richmond (1909).

Habitat

HABITAT: Roadsides, disturbed sites.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Planted as pasture species and probably cultivated at Richmond (Hawkesbury Agricultural College) in 1909. Recently recorded and presumed naturalised at Woy Woy.

POACEAE

***Panicum maximum* var. *trichoglume* ***

Green Panic

Life history

GROWTH FORM: Densely tufted perennial herb to 3 m high, with short stout rhizome.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Windsor (1950), The Domain (1965).

Habitat

HABITAT: Roadsides, disturbed sites.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soil on shale.

EXPOSURE:

Conservation

Planted as pasture species, occasionally naturalised.

POACEAE

***Panicum miliaceum* ***

Millet Panic, French Millet

Life history

GROWTH FORM: Tufted annual herb to 1.2 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Asia, India and Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC CT ST NWS CWS SWS SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Hunters Hill (1933), North Sydney (1914), Narellan, Campbelltown. **CT:** Medlow (1914), Mittagong (1918).

Habitat

HABITAT: Wastland, gardens.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Commonly cultivated and used for caged bird seed. Grows from dumped or waste seed, but not truly naturalised.

POACEAE

Panicum obseptum

White Water Panic

Life history

GROWTH FORM: Semi-aquatic decumbent perennial herb to 0.5 m high.

VEGETATIVE SPREAD: Creeping and rooting at nodes.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: November–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Germinates in winter in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coastal floodplains.

SELECT LOCATIONS: **CC:** Cattai, Richmond, Penrith, Orchard Hills, Parramatta, Gordon, Centennial Park, Menangle, Berry.

Habitat

HABITAT: Areas subject to flooding, lagoon margins, creeks.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Riverflat forest e.g. with *Casuarina glauca*, *Eucalyptus tereticornis*, *Angophora subvelutina*.

SUBSTRATE: Sandy to clayey alluvium, low to medium nutrients, periodically inundated.

EXPOSURE:

Conservation

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

POACEAE

Panicum pygmaeum

Pygmy Panic, Dwarf Panic

Life history

GROWTH FORM: Decumbent perennial herb to 0.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Warmer months.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT: Qld.

DISTRIBUTION SYDNEY AREA: Coastal.

SELECT LOCATIONS: **CC:** Ourimbah, Grose Vale (1910), Governor Game Lookout, Macquarie Pass.

Habitat

HABITAT: Rainforest margins.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Floor and margins of rainforest or e.g. with *Eupomatia laurina*, *Cryptocarya glaucescens*, *Oplismenus imbecillus*.

SUBSTRATE: Clay soil on shale, high nutrients.

EXPOSURE:

Conservation

CONSERVATION: Conservation status unknown. Reported in Royal NP.

POACEAE

Panicum schinzii * (*P. laevifolium* var. *laevifolium* *)

Life history

GROWTH FORM: Tufted annual herb to 0.8 m high

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977). Germination in glasshouse in spring (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC NT CT ST NWS SWP; S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Kiama (1961). **CT:** Leura (1986), Moss Vale (1964), Penrose (1963).

Habitat

HABITAT: Disturbed ground.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay subsoil over sandstone, low nutrients.

EXPOSURE:

Conservation

Introduced as pasture species, sporadically naturalised since 1960s mainly in Tablelands.

POACEAE

Panicum simile (*P. fulgidum*)

Two Colour Panic

Life history

GROWTH FORM: Tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: December–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted, fruit produced 4 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Some leaves eaten by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread on Coast and western Sydney.

SELECT LOCATIONS: **CC:** Annangrove, Richmond, Hornsby, Cheltenham, Frenchs Forest, Marsfield, Parramatta, Gladesville, Rose Bay, Rookwood, Tempe, Kogarah, Kurnell, Springwood, Warragamba, Wilton, Picton. **CT:** Woodford, Coxs River.

Habitat

HABITAT: Ridges, hillsides.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*, *E. paniculata*, *E. piperita*, *Angophora costata*, *Syncarpia glomulifera*. In woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra* (T. James pers. comm.).

SUBSTRATE: Clayey soils on shale, shale-influenced sandstone, quartzite, low–medium nutrients.

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

POACEAE

Parapholis incurva *

Coast Barb Grass

Life history

GROWTH FORM: Tufted annual herb to 0.1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region and northern Europe.

BOTANICAL SUBREGIONS: NC CC SC ST NWS CWS SWS NWP SWP
SFWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coastal estuaries, Brisbane Water to Wollongong.

SELECT LOCATIONS: **CC:** Woy Woy (1912), Brooklyn (1919), Parramatta (1897), Ashfield (1914), Centennial Park (1900), Cooks River (1917), Lugarno, Kogarah (1899), La Perouse, Wollongong (1909).

Habitat

HABITAT: Saline flats, rocky foreshore ledges.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Saltmarsh e.g. with *Suaeda australis*, *Sarcocornia quinquevervia*, particularly disturbed upper parts of saltmarsh.

SUBSTRATE: Muddy alluvium, sandy soil on sandstone, low–medium nutrients, appears to be salt-tolerant. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Full sun to light shade.

Conservation

Appears to have become widely naturalised in estuarine areas by 1920.

POACEAE

Paspalidium albovillosum

Life history

GROWTH FORM: Tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Parramatta–Kurrajong.

SELECT LOCATIONS: **CC:** Kurrajong, Kurmond, Windsor, Winston Hills.

Habitat

HABITAT: Woodland remnants.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; riverflat forest e.g. with *Angophora floribunda*, *Eucalyptus globoidea*, *Microlaena stipoides*.

SUBSTRATE: Clay soils on shale, alluvium, low–medium nutrients, damp shaded sites.

EXPOSURE: Mid-shade.

Conservation

Vulnerable in Western Sydney (James et al. 1999).

POACEAE

Paspalidium aversum

Life history

GROWTH FORM: Tufted perennial herb to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Reported in 1914 as one of the best native grasses, especially for haymaking (Herb. record).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT NWS CWS SWS NWP SWP; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Penrith, Rooty Hill, Gordon, Manly, Narellan, Menangle, Shoalhaven. **CT:** Bathurst (1903).

Habitat

HABITAT: Creek and drainage lines.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay soils on shale, medium nutrients, moist sites. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). Only record for Tablelands is from Bathurst in 1903.

POACEAE

Paspalidium criniforme

Life history

GROWTH FORM: Tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT NWP; Qld.

DISTRIBUTION SYDNEY AREA: Western Sydney, Illawarra.

SELECT LOCATIONS: **CC:** Bulga, Concord, Bass Hill, Hurstville, Mulgoa, Bents Basin, Razorback, Menangle, Maldon, Stanwell Park, Gooseberry Island.

Habitat

HABITAT: Creeks, gorges.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus eugenioides*; riparian vegetation e.g. with *Backhousia myrtifolia*.

SUBSTRATE: Clay soil on shale, alluvium, sandstone, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Paspalidium distans (*P. radiatum*)

Life history

GROWTH FORM: Tufted perennial herb to 70 cm high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: October–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Appears to be coloniser of disturbed sites. A resilient species that persists despite mowing etc. (T. James pers. comm.).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC ST NWS CWS SWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Kurmond, Mill Creek, Milson Island, Pitt Town, Riverstone, Mona Vale, Hornsby, Pennant Hills, Gladesville, Homebush, Centennial Park, La Perouse, Kogarah, Rockdale, Hurstville, Oatley, Rooty Hill, Doonside, Mulgoa, Liverpool, Mount Annan, Burragorang Valley.

Habitat

HABITAT: Open sites, roadsides. Remnant woodland (T. James pers. comm.).

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Casuarina glauca*; woodland e.g. with *Corymbia eximia*, *Corymbia gummifera*, *Angophora costata*, *Eucalyptus moluccana*, *E. tereticornis*; scrub e.g. with *Monotoca elliptica*; grassland e.g. with *Themeda australis*.

SUBSTRATE: Clay soils on shales, volcanics, sandy soils on dune sand, medium to low nutrients.

EXPOSURE:

Conservation

Conserved in western Sydney where it is very common, found at Prospect, Blacktown, Mt Druitt (T. James pers. comm.). Reported in Royal NP.

POACEAE

Paspalidium gracile

Slender Panic

Life history

GROWTH FORM: Wiry tufted perennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS NWP SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Mainly Picton to Wombeyan Caves.

SELECT LOCATIONS: **CC:** Castlereagh, Picton, Cedar Creek, Kowmung River, Wombeyan Caves.

Habitat

HABITAT: Hillsides, riverflats.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 800–800 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *Bursaria spinosa*, *Angophora floribunda*, *E. eugenioides*.

SUBSTRATE: Clay soils on shale, Devonian sediments, low–medium nutrients, dry sites.

EXPOSURE:

Conservation

Vulnerable in western Sydney (T. James pers. comm.), conservation status elsewhere unknown.

POACEAE

Paspalidium jubiflorum

Warrego Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.3 m high, with a contracted rootstock.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Seed germination variable after one month 0–80%, increases up to 18 months then declines rapidly (Waters et al. 2000).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Freckled Duck *Stictonetta nervosa*, Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT NWS CWS SWS NWP SWP NFWP SFWP; N.T., Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Hawkesbury Agricultural College (1914), Botanic Gardens (1938), Flemington Saleyards (1969), Bathurst Experimental Farm (1914).

Habitat

HABITAT:

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Species of drier inland areas, not recorded occurring naturally in Sydney area. Probably introduced to Sydney area with stock or in experimental plantings. No records of longterm naturalised populations.

POACEAE

Paspalum dilatatum *

Paspalum

Life history

GROWTH FORM: Tufted perennial herb with stems to 2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer–autumn. Pollen known to cause allergy in humans, mainly November–March (Bass & Wrigley 1984).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Resprouted, fruit produced 4 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990). Food plant of butterfly larvae *Taractrocera papyria papyria* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Exotic, native to S America. Introduced as fodder.

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:** Lower Portland, Cheltenham, Homebush, Belfield, Botanic Gardens, Sydney (1893), Sutherland, Corrimal, Lake Illawarra, Gerringong, Berry. **CT:** Bathurst, Hazelbrook, Bowral.

Habitat

HABITAT: Pastures, roadside edges, wet, low wet areas.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland, grassland, swamp e.g. with *Carex appressa*.

SUBSTRATE: Clay soils on shale, volcanics, alluvium, high–medium nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Widespread pasture species and weed of lawns and disturbed land. It appears to be gradually (over several decades) out-competed by native grasses such as *Microlaena* and *Themeda* where these are allowed to recolonise former pastures.

POACEAE

Paspalum distichum (*P. paspalodes*)

Water Couch

Life history

GROWTH FORM: Stoloniferous and rhizomatous perennial herb to 0.5 m high, with stolons to 5 m long, forming mats on edge and floating across water.

VEGETATIVE SPREAD: Yes.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer. November–April, peak April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Fertile florets 2.5–3 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed. Coloniser of bare, wet areas.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, N.T., Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Pitt Town, Shane Park, Yarramundi, Wahroonga, Centennial Park, Maroubra, Concord, Kogarah, Oatley, Cobbitty, Campbelltown, Stanwell Park, Berry. **CT:** Bathurst, Robertson.

Habitat

HABITAT: Wetlands, ponds, creeks.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Fresh swamp e.g. with *Eleocharis sphacelata*, *Ludwigia peploides*, *Myriophyllum*, *Persicaria*; less common in riparian woodland e.g. with *Casuarina glauca*.

SUBSTRATE: Sandy clay on alluvium, shale, medium nutrients, moist sites in and near fresh water. Occasionally in brackish water near the sea.

EXPOSURE: Full sun.

Conservation

Conserved in Western Sydney (James et al. 1999). Only record for Bathurst is 1910.

POACEAE

Paspalum notatum *

Bahia Grass

Life history

GROWTH FORM: Perennial herb to 1 m high, with stout rhizomes.

VEGETATIVE SPREAD: Stoloniferous, rooting at nodes.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: NC CC NWS; Qld, N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Blacktown (1962), Chipping Norton (1989, 1993).

Habitat

HABITAT: Roadsides, lawns.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Previously used as a pasture species, now mostly a weed of roadsides.

POACEAE

Paspalum orbiculare

Ditch Millet

Life history

GROWTH FORM: Tufted perennial herb with stems to 1 m high from knotted rootstock.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer–autumn.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Plumed Whistling Duck *Dendrocygna eytoni* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, N.T., W.A., N.G.

DISTRIBUTION SYDNEY AREA: Coastal.

SELECT LOCATIONS: **CC:** Morisset, Gosford, Richmond, Manly, Gladesville, Homebush, Kogarah, Como, Centennial Park, Malabar, Macquarie Fields, Austinmer.

Habitat

HABITAT: Swamps.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Hind dune swamp.

SUBSTRATE: Sandy soil on dunes, alluvium, low nutrients, moist, sometimes brackish.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999). Not known from any conservation reserves elsewhere (P. Adam pers. comm.).

POACEAE

Paspalum quadrifarium *

Tussock Paspalum

Life history

GROWTH FORM: Coarse tufted, often glaucous, perennial herb to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Mostly spring–autumn.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted, fruit produced 7–10 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: CC SWS; Qld.

DISTRIBUTION SYDNEY AREA: Gosford, Lane Cove area.

SELECT LOCATIONS: **CC:** Tuggerah (1921, 1990), Gosford (1955), Ettalong (1969), West Lindfield (1964), Manly Vale (1958–1962), Lane Cove River (1980), North Ryde (1987). **CT:** Mount Tomah Botanic Gardens.

Habitat

HABITAT: Riverbanks, creeks, roadsides.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Clayey alluvium, medium nutrients, moist sites.

EXPOSURE:

Conservation

Persists in disturbed but unmown sites (Harden 1993). Localised but possibly spreading in moist areas, recently reported from Mount Tomah.

POACEAE

***Paspalum urvillei* ***

Vasey Grass

Life history

GROWTH FORM: Erect tufted perennial herb to 2.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, dispersed in horse dung (Deep Creek).

FIRE RESPONSE: Resprouted, fruit produced 9 weeks after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.). Growing vigorously along tracks, and seeding, 14 months after fire, probably after resprouting (at Bantry Bay 1992).

INTERACTION WITH OTHER ORGANISMS: Food plant of butterfly larvae *Telicota ancilla ancilla* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Exotic, native to S America.

BOTANICAL SUBREGIONS: NC CC NT CWS SWS NWP SWP; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread on Coast.

SELECT LOCATIONS: **CC:** Gosford (1946), Glenorie (1947), Yarramundi, Narrabeen, Carlingford, Mosman (1948), Centennial Park, Malabar, Macquarie Fields, Mt Keira.

Habitat

HABITAT: Creeks, tracks, wet places.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Weedy sites e.g. with *Salix*, *Cyperus eragrostis*.

SUBSTRATE: Sandy to clay soils on alluvium, shale, low nutrients.

EXPOSURE:

Conservation

Widely naturalised in disturbed areas, common on bush tracks. Appears to spread more along tracks in wet places quickly once initially established.

POACEAE

***Paspalum vaginatum* (*P. distichum*)**

Salt-water Couch

Life history

GROWTH FORM: Rhizomatous and stoloniferous perennial herb to 50 cm high, with stolons to 5 m long.

VEGETATIVE SPREAD: Spread by rhizome.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, late summer; produces numerous seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Dispersed in mud on cars (Wace 1977). Water-dispersed as floating pieces of rhizome.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Black Swan *Cygnus atratus* and foodplant of Freckled Duck *Stictonetta nervosa*, Grey Teal *Anas gibberifrons* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CWS; Qld, N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sea coast and estuaries, Norville to Geringong.

SELECT LOCATIONS: **CC:** Norahville, Budgewoi, Gladesville, Five Dock Bay, Cooks River, Lurline Bay, Como, Five Islands, Gerringong.

Habitat

HABITAT: Brackish seeps on sandstone cliff edges.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: For example with *Westringia fruticosa*, *Isolepis nodosa*.

SUBSTRATE: Sandy to clayey soil on alluvium, beach sand, low nutrients, brackish. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

Pennisetum alopecuroides**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: January–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, January–April.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore morphology adapted for wind dispersal and adhesion (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 SWP; Qld, Vic., Tas., S.A., W.A., Asia.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Homebush (1894), Burning Palms RNP (1978), Stanwell Park (1891), Berry to Gerringong (1933), Bulli (1918).

CT: Winburndale (1910), Abercrombie.

Habitat

HABITAT: Headlands, creekbanks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassy headlands.

SUBSTRATE: Clay soils, probably on shale or alluvium, poorly-drained sites. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Relatively restricted in Sydney area, probably originally occurring mainly along the Illawarra coast. Very similar looking introduced species *P. setaceum* may be planted in mistake for *P. alopecuroides*.

POACEAE

***Pennisetum clandestinum* ***

Kikuyu Grass

Life history

GROWTH FORM: Perennial herb to 0.9 m high, with long stout rhizomes and stolons.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Rhizomes spread in dumped garden refuse.

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Leaves eaten by Purple Swamphen *Porphyrio porphyrio*, Coot *Fulica atra*, rhizomes and stolons eaten by Galah *Cacatua roseicapilla* (Lepschi 1993). Leaves sometimes eaten by rabbits (P. Kubiak pers. comm.). Food plant of butterfly larvae *Taractrocera papyria papyria* (Common & Waterhouse 1981). Apparently eaten by rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Exotic, native to tropical E Africa. Introduced as lawn, soil stabiliser and pasture species (NPWS website).

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS; Qld, N.T., Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread on Coast.

SELECT LOCATIONS: **CC:** Wyong Creek, Hawkesbury Agricultural College plots (1921), Bayview, Centennial Park, Concord, Campbelltown, Engadine (1937), Wollongong, Cambewarra.

Habitat

HABITAT: Disturbed sites, moist places.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland remnants.

SUBSTRATE: Clay to sandy soils on shale, sandstone, alluvium, low–high nutrients, moist.

EXPOSURE:

Conservation

Introduced experimentally in 1920s but major expansion for lawns, pasture and playing fields was after the 1950s; now a weed of gardens and roadsides, particularly on moist sites and at urban/bushland interface.

POACEAE

Pennisetum macrourum *

African Feather Grass

Life history

GROWTH FORM: Densely tufted rhizomatous perennial herb to 1.5 m high.

VEGETATIVE SPREAD: Rhizomes.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–autumn.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: mainly rhizomes or pieces of rhizomes transported after excavation; spikelets also spread by water and wind, bristles aid attachment to clothes and wool (Weeds Australia www.weeds.org.au)

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Not favoured by stock (Weeds Australia www.weeds.org.au)

Distribution

STATUS/ORIGIN: Exotic, native to S Africa. Introduced as ornamental.

BOTANICAL SUBREGIONS: CC SC; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Tascott (1970), Killara district (1947), Northbridge (1971), Centennial Park (1898, 1912, 1916, 1934, 1973), Kogarah (1989).

Habitat

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sandstone scrub.

SUBSTRATE: Sandy soils on dunes, alluvium.

EXPOSURE: Drought resistant.

Conservation

Introduced as ornamental in early 20th century, escaped and spreading in coastal areas (Harden 1993).

POACEAE

Pennisetum setaceum *

Fountain Grass

Life history

GROWTH FORM: Densely tufted perennial herb to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: CC CT SWS SFWP; Qld, S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Clyde (1969), Woolloomooloo (1963), Homebush (1931). **CT:** Wombeyan Caves.

Habitat

HABITAT: Riverbanks, rock crevices.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Sandy soil on sandstone, alluvium, granite, low nutrients, periodically moist.

EXPOSURE:

Conservation

Cultivated as ornamental, occasionally naturalised in disturbed sites in urban areas.

POACEAE

Pennisetum villosum *

Feathertop, White Foxtail

Life history

GROWTH FORM: Densely tufted rhizomatous perennial herb to 0.9 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Not eaten by stock (Herb. note).

Distribution

STATUS/ORIGIN: Exotic, native to N Africa, Arabia. Introduced as ornamental.

BOTANICAL SUBREGIONS: CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Parramatta (1931), Auburn, Ashfield (1919), Homebush (1894), Oatley (1915), Campbelltown (1949), Brownsville (1912), Lake Illawarra (1912), Minnamurra Point, Kiama (1907, 1939), W Cambewarra (1924). **CT:** Bathurst (1982), Katoomba (1999).

Habitat

HABITAT: Roadsides, wasteland.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Sandy to clay soils.

EXPOSURE:

Conservation

Introduced and frequently cultivated as ornamental, but now naturalised as a weed of footpaths and vacant land. Reported since 1890s in Sydney, along roadsides by 1919, spreading in Kiama in 1930s, naturalised in Tablelands since 1970s.

POACEAE

***Pentaschistis airoides* ***

False Hairgrass

Life history

GROWTH FORM: Slender tufted annual herb to 0.3 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CT ST CWS SWS SWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CT:** Bindook (1967).**Habitat**

HABITAT: Pasture and disturbed woodland.

ALTITUDE: 700 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Eucalyptus stricta*.

SUBSTRATE: Thin moss and soil layer on top of extensive flat rock, low nutrients.

EXPOSURE:

Conservation

CONSERVATION: Occasional minor weed.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed weight 1.5 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984). Causes 'staggers' in sheep and cattle (Culvenor 1985).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced as pasture species.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; LHI, Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Dural (1987), Campbelltown (1969).**CT:** Orange (1955), Robertson.**Habitat**

HABITAT: Pasture, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 800–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pastures.

SUBSTRATE: Clay soils on shale, basalt, medium to high nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Extensively cultivated on Tablelands as perennial pasture. Occasionally established on roadsides.

POACEAE

Phalaris angusta* **Life history**

GROWTH FORM: Tufted annual herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC ST; Qld, WA.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Ebenezer, Windsor (1949), Jamberoo, Kiama.**Habitat**

HABITAT: Areas susceptible to flooding.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pastures.

SUBSTRATE: Clay loam on shale, alluvium.

EXPOSURE:

Conservation

CONSERVATION:

POACEAE

***Phalaris aquatica* ***

Phalaris

Life history

GROWTH FORM: Erect tufted perennial herb to 1.5 m high, with hard crown of usually contracted rhizomes.

VEGETATIVE SPREAD: Yes (McIntyre et al. 1995).

POACEAE

***Phalaris arundinacea* var. *arundinacea* ***

Reed Canary Grass

Life history

GROWTH FORM: Robust, tufted and rhizomatous perennial to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Africa, America, Asia and Europe.

BOTANICAL SUBREGIONS: NC CC SC NT ST; Vic., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Beecroft (1982), Centennial Park (1977), Kangaroo Valley (1955), Kiama (1947).**Habitat**

HABITAT: Wetland margins, lawns.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy to clay soils on sand, shale, moist sites.

EXPOSURE:

Conservation

Sporadically naturalised in moist sites.

POACEAE

***Phalaris arundinacea* var. *picta* ***

Ribbon Grass

Life history

GROWTH FORM: Robust, tufted and rhizomatous perennial to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: CC SC NT CT NWS; Tas.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Cattai Creek (1996), Cheltenham (1951), Cooks River (1909). **CT:** Katoomba (1934).**Habitat**

HABITAT: Creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Grown as an ornamental, occasionally escaped or persistent in abandoned gardens (Harden 1993).

POACEAE

***Phalaris canariensis* ***

Canary Grass

Life history

GROWTH FORM: Tufted annual or short-lived perennial herb to 1.2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans, mainly September–December (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC CT CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Holroyd (1974), Homebush (1930), Penshurst (1908). **CT:** Orange (1914), Katoomba (1939).**Habitat**

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Occasional roadside weed. Reported by Robert Brown to be introduced to Sydney by 1804 (Maiden 1909). Cultivated to provide grain to caged birds (Harden 1993).

POACEAE

***Phalaris minor* ***

Lesser Canary Grass

Life history

GROWTH FORM: Tufted annual herb to 1.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984). Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced as pasture species.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1903), Beecroft, Gladesville (1884), Centennial Park (1899), Penshurst (1911), Dapto (1912), Kiama.**CT:** Jenolan Caves (1899), Bowral (1948).**Habitat**

HABITAT: Pastures, gardens.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Pasture species and minor weed of cultivation (Harden 1993).

POACEAE

***Phalaris paradoxa* ***

Paradoxa Grass

Life history

GROWTH FORM: Tufted annual to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984). Foodplant of Grey Teal *Anas gibberifrons*, seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).**Distribution**

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Flemington Saleyards (1968), Wollongong (1936).**Habitat**

HABITAT:

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Common weed of crops, occasionally reported in urban areas or associated with stock.

POACEAE

***Phleum pratense* ***

Timothy

Life history

GROWTH FORM: Tufted perennial herb to 1.5 m high, with stout stems, forming large clumps; often with swollen or bulbous base.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CC SC NT CT ST SWS NWP; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Tablelands.

SELECT LOCATIONS: **CC:** Botanic Garden (1904). **CT:** Tarana, Jenolan Caves (1900), Bowral (1948).

Habitat

HABITAT: Moist areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Soils on shale, granite, low nutrients.

EXPOSURE:

Conservation

Pasture and hay plant, with a few roadside occurrences at higher elevations.

POACEAE

***Phragmites australis* (*P. communis*)**

Common Reed

Life history

GROWTH FORM: Erect robust rhizomatous perennial, emergent aquatic reed to 6 m high.

VEGETATIVE SPREAD: Spreads extensively by horizontal rhizomes.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: August–October, March–June, peak March.

FRUIT/SEED: March. In Europe, seed production is virtually unknown, despite prolific flowering, and propagation is apparently exclusively vegetative (Chapman & Peat 1992). Germination in NSW is low but consistent (P. Adam pers. comm.).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, rhizome fragments. May grow all year but dies back after frosts. Fertile seed may be followed by seedlings in the same or following year; germination occurs in only a narrow range of habitats (Sainty & Jacobs 1981). Vertical rhizomes bear the aerial shoots and horizontal rhizomes are the regenerating agent and main food store (Sainty & Jacobs 1981).

FIRE RESPONSE: Resprouts from rhizomes after high-intensity fire (1/94 at Narrabeen, Lane Cove) secondary juvenile period almost 18 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT ST CWS SWS NWP SWP; Qld, Vic., Tas., N.T., S.A., W.A., cosmop.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wisemans Ferry, Richmond, Berowra Creek, Manly, Cooks River, Doonside, East Hills, Lake Illawarra, Menangle, Austinner, Shoalhaven. **CT:** Orange, Glanmire, O'Connell, Long Swamp (Kodala 1992), Macquarie Pass.

Habitat

HABITAT: Fresh or slightly brackish water to 2 m deep, creek banks, estuaries, wetlands.

ALTITUDE: 0–900 m ANNUAL RAINFALL: above 700 mm

TYPICAL LOCAL ABUNDANCE: Frequent–dominant.

VEGETATION: Saltmarsh margins e.g. with *Juncus kraussii*, *Samolus repens*; sedge/land or rushland e.g. with *Juncus* sp., *Carex* sp., along freshwater lake and river margins. Upland mire (Kodala 1992).

SUBSTRATE: Mainly alluvial mud but occasionally on sand or peat, medium–high nutrients. Water table mostly high–permanently high, moisture continuous, brackish, fresh. Killed by continuous exposure to sea strength salinity, sea flooding for a few days will cause severe damage (Sainty & Jacobs 1981).

EXPOSURE:

Conservation

Conserved in Western Sydney (James et al. 1999). Vulnerable to grazing or cutting in mid summer; burning is less damaging than cutting. Vernacular name 'thatchreed' in use in 1916 (Herb. note) (and used for thatch roofs in UK).

POACEAE

***Phyllostachys aurea* ***

Fishpole Bamboo

Life history

GROWTH FORM: Tall perennial herb, with woody stems 2–5 m high, 2–3 cm diam.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Rhizomes spread in dumped garden refuse.

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Culms used as walking sticks, umbrella shafts, fan handles, pipe stems and fishing rods, for furniture and handicrafts; the young shoots are edible (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to China. Introduced as ornamental.

BOTANICAL SUBREGIONS: NC CC.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Cattai Creek (1971), Windsor, Narrabeen.

Habitat

HABITAT: Creekbanks.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Sandy soil on alluvium, low nutrients.

EXPOSURE:

Conservation

Cultivated and persistent in abandoned gardens, spread vegetatively from dumped garden refuse. Declared noxious weed, prohibited from sale in many local government areas (NSW Agriculture website: www.agric.nsw.gov.au).

POACEAE

***Phyllostachys nigra* ***

Black Bamboo

Life history

GROWTH FORM: Tall perennial herb, with woody purplish black stems 3–6 m high, 1–3 cm diam.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Rhizomes spread in dumped garden refuse.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Stems used for construction of musical instruments, furniture and for handicrafts (Harden 1993).

Distribution

STATUS/ORIGIN: Exotic, native to China. Introduced as ornamental.

BOTANICAL SUBREGIONS: CC; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Kurrajong (1981), Hornsby (1968).**Habitat**

HABITAT: Roadside.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Persistent in abandoned gardens, rarely naturalised. Declared noxious weed, rhizomatous bamboo is prohibited from sale in many local government areas (NSW Agriculture website: www.agric.nsw.gov.au).

POACEAE

***Plinthanthesis paradoxa* (*Danthonia paradoxa*)**

Wallaby Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: November–January.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith p.c.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Wondabyne, Berowra, Hornsby, Frenchs Forest, Dee Why, Kogarah, La Perouse, Sutherland, Loftus, Burning Palms, Maddens Plains, Mt Keira. **CT:** Kanangra Walls.**Habitat**

HABITAT: Swamps, creeks, wet rocks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Empodisma minus*, *Lepyrodia scariosa*, *Banksia oblongifolia*; montane heath.

SUBSTRATE: Sandy soils on sandstone, poorly drained, moist, low nutrients.

EXPOSURE: Full sun, exposed sites.

Conservation

Wondabyne is northern geographical limit, conservation status unknown. Reported in Ku-ring-gai Chase NP, Royal NP.

POACEAE

***Plinthanthesis urvillei* (*Danthonia vickeryi*)**

Wallaby Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CT NWS.

DISTRIBUTION SYDNEY AREA: Upper Blue Mountains and Southern Highlands.

SELECT LOCATIONS: **CT:** Hassans Walls, Blackheath, Katoomba, Wentworth Falls, Robertson, Budderoo.**Habitat**

HABITAT: Rocky ledges, near falls.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Eucalypt forest, sedgeland e.g. with *Lepidosperma laterale*, *Baumea rubiginosa*; exposed heath e.g. with *Boronia anemonifolia*, *Leptospermum polygalifolium*, *Leptospermum trinervium*.

SUBSTRATE: Sandy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Budderoo Plateau is southern geographical limit. Conservation status unknown.

POACEAE

Poa affinis* (*P. caespitosa* var. *affinis*)*Life history**

GROWTH FORM: Tufted perennial herb to 1.2 m high, rarely rhizomatous.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT CWS; Vic.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Putty, Culoul Range, North Richmond, Gosford, Mooney Mooney, Kincumber, Kurrajong Heights, Annangrove, Wahroonga, Narrabeen, Pymble, Cheltenham, Manly, Hunters Hill, Neutral Bay, Bellevue Hill, Hurstville, Cooks River, Voyager Point, Audley, Wallacia. **CT:** Current Mountain Gap.**Habitat**

HABITAT: Creekbanks.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus piperita*, *E. saligna*, *E. pilularis*; woodland e.g. with *Angophora costata*, *Corymbia gummifera*, *Syncarpia glomulifera*.

SUBSTRATE: Soils on shale, sandstone, volcanics, low to medium nutrients.

EXPOSURE: Mid-shade, sheltered sites.

Conservation

Vulnerable in Western Sydney (James et al. 1999). Reported in Blue Mountains NP, Wollemi NP, Ku-ring-gai Chase NP, Dalrymple Hay NR, Heathcote NP.

POACEAE

***Poa annua* ***

Winter Grass, Annual Poa

Life history

GROWTH FORM: Tufted annual herb to 0.3 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Mainly winter–spring. Pollen known to cause allergy in humans, mostly August–November (Bass & Wrigley 1984).

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Probably killed. Flowered 7 months after high intensity fire (1/94 at Lane Cove) probably from seed (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Crimson Rosella *Platycercus elegans* (Lepschi 1993). Seed eaten by Stubble Quail *Coturnix pectoralis* (Barker & Vestjens 1989, 1990).

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS NWP SWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1903), Palm Beach, Cheltenham, Centennial Park, Cooks River, Bexley, Kangaroo Valley.

CT: Jenolan Caves (1900), Wentworth Falls, Berrima, Robertson.

Habitat

HABITAT: Cultivated and disturbed areas, roadsides, gardens.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Lawns.

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

EXPOSURE:

Conservation

Weed of cultivated land and other disturbed sites. Reported by Robert Brown to be introduced to Sydney by 1804 (Maiden 1909).

POACEAE

***Poa bulbosa* ***

Bulbous Poa

Life history

GROWTH FORM: Tufted, bulbous-based perennial herb to 0.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Miniature vegetative shoot sometimes replacing the spikelet, under favourable conditions, may fall, take root and serve as a vegetative propagule (Harden 1993).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NT CT ST CWS SWS SWP.

DISTRIBUTION SYDNEY AREA: Tablelands.

SELECT LOCATIONS: **CT:** Blayney (1991), Orange (1914), Tarana (1940).

Habitat

HABITAT: Grassland, disturbed sites.

ALTITUDE: 700–1000 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Occasional weed.

POACEAE

Poa cheelii**Life history**

GROWTH FORM: Perennial herb to 1 m high, with shoots arising from rhizomes.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Qld.

DISTRIBUTION SYDNEY AREA: Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CC:** Springwood, Glenbrook, Oakdale, Appin, Jamberoo Pass, Kangaroo Valley. **CT:** Newnes Plateau, Bell, Katoomba, Wentworth Falls, Hill Top, Fitzroy Falls, Penrose.

Habitat

HABITAT: Steep slopes, rocky ground.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus agglomerata*, *E. globoidea*.

SUBSTRATE: Stony soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

***Poa compressa* ***

Canada Bluegrass

Life history

GROWTH FORM: Stiff perennial herb to 0.6 m high, with wiry rhizomes.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe, and SW Asia.

BOTANICAL SUBREGIONS: CC NT CT ST NWS CWS; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Tablelands.

SELECT LOCATIONS: **CT:** Blackheath (1907).

Habitat

HABITAT:

ALTITUDE: 1000 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

CONSERVATION: Uncommon weed of pastures, reported from Blackheath in 1907.

POACEAE

Poa induta**Life history**

GROWTH FORM: Greyish green, densely tufted perennial herb to 1.1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Oberon area.

SELECT LOCATIONS: **CT:** Hampton (1956), Oberon (1955).

Habitat

HABITAT:

ALTITUDE: 900–1200 m ANNUAL RAINFALL: 800–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Montane woodland e.g. with *Eucalyptus darympleana*.

SUBSTRATE:

EXPOSURE:

Conservation

Oberon is northern geographical limit. Conservation status unknown but not collected since since 1959.

POACEAE

Poa labillardierei

Tussock

Life history

GROWTH FORM: Coarse, densely caespitose perennial to 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time of the year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature November–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995). Total germination approx. 39 days (typical rate 787 per gram of seed, Greening Australia 1996a).

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove) flowering within 10 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Prospect, Homebush, Rookwood, Centennial Park, Cooks River, Casula, Mt Annan, Audley, Picton, Albion Park, Kangaroo River, Macquarie Pass, Cambewarra. **CT:** Mt Canobolas, Blayney, Carcoar, Bathurst, Meadow Flat, Hampton, Oberon, Wentworth Falls, Hill Top, Mt Jellore, Robertson, Bowral.

Habitat

HABITAT: Riverflats, creeks, gullies.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus globoidea*, *E. viminalis*, *E. fastigata*; woodland e.g. with *E. macrorhyncha*, *E. melliodora*, *E. moluccana*, *E. tereticornis*; grassland e.g. with *Themeda australis*; clearings in rainforest.

SUBSTRATE: Clay soils on shale, metasediments, alluvium, basalt, medium to high nutrients.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Royal NP, Thirmer Lakes NP.

POACEAE

Poa meionectes**Life history**

GROWTH FORM: Tufted perennial herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: SC CT ST; Vic.

DISTRIBUTION SYDNEY AREA: Bathurst–Orange, Southern Highlands.

SELECT LOCATIONS: **CT:** Bathurst, Mt Jellore.

Habitat

HABITAT: Eucalypt woodland.

ALTITUDE: 600–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Rare, last recorded in Southern Highlands at Mt Jellore in 1935, and from Winburndale NR in 1974. Orange is northern geographical limit.

POACEAE

Poa poiiformis**Life history**

GROWTH FORM: Densely tufted erect perennial herb to 1 m high, with rhizomes.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time, in response to seasonal conditions.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Eaten by wombat (Burns 1996).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; LHI, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Coast, Botany Bay to Gerroa.

SELECT LOCATIONS: **CC:** Coogee, Botany, Sandringham, Maroubra, Kurnell, Garie Beach, Gerroa.

Habitat

HABITAT: Ocean foreshores, estuaries and cliffs, particularly with southerly aspect.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Coastal scrub e.g. with *Banksia integrifolia*, *Leptospermum* spp.

SUBSTRATE: Sandy soils on coastal sand dunes and coastal sandstone headlands, low nutrients.

EXPOSURE:

Conservation

CONSERVATION: Conservation status unknown. Reported from Royal NP.

POACEAE

Poa pratensis *

Kentucky Bluegrass

Life history

GROWTH FORM: Variable perennial herb to 0.9 m high, with slender creeping rhizomes, forming tufts or turf.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans, mostly August–November (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Asia. Introduced as lawn grass.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS SWP; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1912), Homebush Bay, Centennial Park, Leumeah, Unanderra, Dapto, Albion Park, Shellharbour, Kangaroo Valley, Berry. **CT:** Blayney, Sunny Corner, Bathurst (1910), Lyndhurst.

Habitat

HABITAT: Lawns, cemeteries, roadsides, pastures.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Grassland.

SUBSTRATE:

EXPOSURE:

Conservation

Commonly planted in lawns and pastures.

POACEAE

*Poa queenslandica***Life history**

GROWTH FORM: Tall, loosely tufted perennial to 1.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time, in response to seasonal conditions.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT ST; Qld.

DISTRIBUTION SYDNEY AREA: Illawarra.

SELECT LOCATIONS: **CC:** Bulli, Minnamurra Falls, Kangaroo Valley, Cambewarra Range.

Habitat

HABITAT: Margins of rainforest.

ALTITUDE: 0–400 m **ANNUAL RAINFALL:** 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Rainforest.

SUBSTRATE: Clay soils, high nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Poa sieberiana var. *cyanophylla***Life history**

GROWTH FORM: Densely tufted, usually greyish green perennial herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time, in response to seasonal conditions.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST SWS.

DISTRIBUTION SYDNEY AREA: Tablelands, Southern Highlands.

SELECT LOCATIONS: **CT:** Orange, Werong Range, Wingecarribee Swamp, Bundanoon, Wingello.

Habitat

HABITAT:

ALTITUDE: 700–1000 m **ANNUAL RAINFALL:** 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus dives*, *E. mannifera*, *E. dalrympleana*.

SUBSTRATE: Loamy soils on shale, low to medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

Poa sieberiana var. *sieberiana*

Snowgrass

Life history

GROWTH FORM: Densely tufted, usually greyish green perennial to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: At any time, in response to seasonal conditions.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–January (Greening Australia 1996a).

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995). Typical germination rate approx. 570 per gram of seed (Greening Australia 1996a).

FIRE RESPONSE: Resprouts from base.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Cheltenham, Gladesville, Rookwood, Hurstville, Glenfield, Campbelltown. **CT:** Hartley, Abercrombie Caves, Mt Jellore.

Habitat

HABITAT:

ALTITUDE: 0–900 m **ANNUAL RAINFALL:** 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Eucalypt forest, woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

*Poa tenera***Life history**

GROWTH FORM: Flaccid, trailing or tufted perennial herb, with stolons to 2 m long.

VEGETATIVE SPREAD: Stoloniferous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Food plant of butterfly larvae *Geitoneura klugii klugii*, and probably *Heteronympha merope merope* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST CWS ?SWS; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Tablelands.

SELECT LOCATIONS: CC: Nattai River (1912). CT: Current Mountain Gap, Towac, Bathurst, Blackheath, Jenolan Caves, Boyd Plateau, Bowral.

Habitat

HABITAT: Rock crevices, steep banks, shady moist areas.

ALTITUDE: 700–1100 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus dalrympleana*, *E. pauciflora*, *E. viminalis*; woodland e.g. with *Eucalyptus macrorhyncha*, *E. rossii*.

SUBSTRATE: Loamy soils on basalt, granite, medium nutrients, moist sites, well-drained.

EXPOSURE:

Conservation

CONSERVATION: Currant Mountain Gap is northern geographical limit. Conservation status unknown.

POACEAE

Poa trivialis *

Rough Meadowgrass

Life history

GROWTH FORM: Loosely tufted perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Uncommon weed of lawns and pastures (Harden 1993).

BOTANICAL SUBREGIONS: CC SWS.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: North Rocks (1966).

Habitat

HABITAT: Lawns, pastures.

ALTITUDE: 200 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

One Sydney record, from North Rocks in 1966, introduced in grass turf. Probably not truly naturalised.

POACEAE

Polypogon littoralis *

Perennial Beardgrass

Life history

GROWTH FORM: Loosely tufted perennial herb to 0.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe.

BOTANICAL SUBREGIONS: NC CC ST; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: CC: Wondabyne, Epping, Rydalmere, Watsons Bay (1912), Coogee, Riverwood, Homebush Bay, Bankstown, Austinner, Unanderra (1948).

Habitat

HABITAT: Wet, disturbed areas, railway lines, drains.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 900–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Scrubland e.g. with *Melaleuca*.

SUBSTRATE: Clay soil on shale, low nutrients, moist.

EXPOSURE:

Conservation

Weed of disturbed areas.

POACEAE

Polypogon monspeliensis *

Annual Beard Grass

Life history

GROWTH FORM: Loosely tufted annual herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: August–October.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC CT ST NWS CWS SWS NWP SWP NFWP SFWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Hornsby, Frenchs Forest, Dee Why, Northbridge, Dennistone, Ryde (1884), Wallacia, Haslams Creek, Tempe (1899), Rockdale (1899), Kurnell (1915), Cronulla. CT: Orange, Bathurst, Hartley, Mittagong (1918).

Habitat

HABITAT: River banks, river flats, ditches.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Saltmarsh, cliff-top seepage zones, open-forest e.g. with *Syntherisma glomulifera*.

SUBSTRATE: Clay to sandy soils on alluvium, shale, low nutrients.

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

EXPOSURE:

Conservation

A widespread weed, evidently well established by 1900.

POACEAE

Pseudoraphis paradoxa

Slender Mudgrass

Life history

GROWTH FORM: Stoloniferous perennial herb to 0.7 m high, with stolons to 5 m long.

VEGETATIVE SPREAD: Yes, stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: January–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, January–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coastal rivers and swamps.

SELECT LOCATIONS: **CC:** Colo River, Narrabeen, Maroubra, Kogarah, Kurnell, Bundeena, Menangle, Thirlmere Lakes, Wollondilly River.**Habitat**

HABITAT: Riverbanks, lake margins, swamps.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Eleocharis sphacelata*, *Lepidosperma longitudinale*; herbland e.g. with *Ranunculus inundatus*, *Myriophyllum*.

SUBSTRATE: Sandy soils on alluvium, low nutrients, moist, poorly-drained.

EXPOSURE: Full sun.

Conservation

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

POACEAE

Pseudoraphis spinescens

Spiny Mudgrass

Life history

GROWTH FORM: Stoloniferous herb to c. 1 m high, with stolons to 10 m long.

VEGETATIVE SPREAD: Yes, stoloniferous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Seed eaten by Plumed Whistling Duck *Dendrocygna eytoni* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS SWS NWP SWP SFWP; Qld, Vic., N.T., S.A., W.A., Asia, Malesia.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Windsor, Agnes Banks, Doonside, Taren Point.**Habitat**

HABITAT: Wetland.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Persicaria hydropiper*, *Eleocharis pallens*.

SUBSTRATE: Clay soils on shale, alluvium, medium to low nutrients, subject to periodic waterlogging.

EXPOSURE:

Conservation

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

POACEAE

Psilurus incurvus *

Bristle-tail Grass

Life history

GROWTH FORM: Small delicate annual herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: CT ST SWS; Vic., S.A.

DISTRIBUTION SYDNEY AREA: Bathurst area.

SELECT LOCATIONS: **CT:** Turondale (1987).**Habitat**

HABITAT: Hillsides.

ALTITUDE: 700 m ANNUAL RAINFALL: 600–700 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Native pasture.

SUBSTRATE: Sandy and stony soils on sediments, low nutrients.

EXPOSURE:

Conservation

CONSERVATION: Only record for Sydney area is from Turondale in 1987.

POACEAE

Rostraria cristata *

Annual Cat's Tail

Life history

GROWTH FORM: Tufted annual herb to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

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., W.A.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Woy Woy, Richmond (1906, 1913), Narrabeen Lagoon (1946), Cheltenham (1986), Homebush (1930), Centennial Park (1909), Casula, Kogarah (1899), Menangle (1894). **CT:** Hill Top (1912).**Habitat**

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland.

SUBSTRATE: Loamy soils on shale, alluvium, sand.

EXPOSURE:

Conservation

Widespread in disturbed habitats.

POACEAE

***Rottboellia cochinchinensis* *** (*R. exaltata*)**Life history**

GROWTH FORM: Robust annual herb to 3 m high, with prop roots.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic in CC, native to tropical Australia.

BOTANICAL SUBREGIONS: CC; LHI, Qld, N.T., trop. regions.

DISTRIBUTION SYDNEY AREA: Gosford area.

SELECT LOCATIONS: CC: Mangrove Mountain (1968).

Habitat

HABITAT: Tropical coastlines.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

A native species of tropical coastlines in Queensland and Northern Territory, it has been recorded from a cleared valley near Mangrove Mountain in 1968, presumably introduced either deliberately or accidentally.

POACEAE

Sacciolepis indica (*Panicum indicum*)

Indian Cupscale Grass

Life history

GROWTH FORM: Tufted annual herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: January–March.

FRUIT/SEED: Dry indehiscent, 1-seeded. February–May, peak March.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT; Qld, NT, India, Asia, Polynesia.

DISTRIBUTION SYDNEY AREA: Coast

SELECT LOCATIONS: CC: Putty, Morisset, Maroota, Richmond, Centennial Park, Kogarah, Kurnell, Camden, Bundeena, Berry, Coomonderry Swamp.

Habitat

HABITAT: Wet places, creek and swamp edges, wet meadow.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open-forest e.g. with *Syncarpia glomulifera*, *Callicoma serratifolia*; woodland e.g. with *Eucalyptus sclerophylla*, *Angophora bakeri*; sedgeland e.g. with *Baumea acuta*, *Eleocharis*, *Leptocarpus tenax*, *Xyris*.

SUBSTRATE: Sandy soils on sand, sandstone, permanently moist, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

POACEAE

***Secale cereale* ***

Cereal Rye, Ryecorn

Life history

GROWTH FORM: Erect annual herb to 1.2 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry indehiscent, 1-seeded.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region. Introduced as a crop plant.

BOTANICAL SUBREGIONS: NC CC NT ST NWS CWS SWS NWP; Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Flemington (1968), Razorback (1968).

Habitat

HABITAT:

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Cultivated for bread-making and stock feed, and as a short term cover crop; sometimes used in reclamation after mining. Occasionally recorded from roadsides and areas associated with stock, probably established from spilt seed and not truly naturalised.

POACEAE

***Setaria italica* ***

Foxtail Millet

Life history

GROWTH FORM: Tufted annual herb to 1.5 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to temperate regions. Introduced as a crop plant.

BOTANICAL SUBREGIONS: CC NT CT ST NWS SWS NWP SWP NFWP; Qld, Vic., S.A., W.A., India, Burma

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: Gosford (1884), Cowan (1921), Hornsby (1922), Cooks River (1929), Shellharbour (1966). CT: Orange (1950), Hill Top (1914).

Habitat

HABITAT: Railway lines, rubbish dumps.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1000 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION:

SUBSTRATE: Clay soils on shale.

EXPOSURE:

Conservation

Cultivated for birdseed, with occasional wild records in Sydney area, probably from spilt grain. Probably not truly naturalised.

POACEAE

***Setaria palmifolia* ***

Palm Grass

Life history

GROWTH FORM: Robust, tufted perennial herb to 1.5 m high; leaves palm-like, ligule with a very dense row of hairs.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer, panicle to 80 cm long.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Bird-dispersed ?

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove, Narrabeen), secondary juvenile period about 7 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to tropical areas of Old World. Introduced as garden ornamental.

BOTANICAL SUBREGIONS: NC CC SC CWS; LHI, Qld.

DISTRIBUTION SYDNEY AREA: Sydney suburbs.

SELECT LOCATIONS: CC: Beecroft (1979), Northbridge (1958), Lane Cove.

Habitat

HABITAT: Shady areas, gullies, creeks.

ALTITUDE: 0–200 m **ANNUAL RAINFALL:** 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Riparian vegetation.

SUBSTRATE: Sandy alluvial soil, medium nutrients, moist.

EXPOSURE:

Conservation

Occasional garden escape into bushland along creeks.

POACEAE

***Setaria parviflora* ***

(*S. geniculata* var. *pauciseta*, *S. gracilis*)

Slender Pigeon Grass

Life history

GROWTH FORM: Tufted perennial herb 1.2 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD: 2 months (Holm et al. 1997).

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Freshly harvested seed dormant but germinates readily in spring; grows best when surrounded by dominant plants; metabolic pathway C4 (Holm et al. 1997).

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Lane Cove), secondary juvenile period about 10 weeks (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Young plants palatable to livestock, but bristles on the inflorescence of mature plants injure mouths of cattle (Holm et al. 1997).

Distribution

STATUS/ORIGIN: Exotic, native to America.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS SWP; Vic., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1905), Berowra Creek, Penrith, Cheltenham, Doonside, Homebush, Neutral Bay, Centennial Park (1899), Kowmung River, Mount Annan (1987), Bargo, Wollongong, Kiama. **CT:** Bathurst, Lawson (1940), Linden.

Habitat

HABITAT: Roadsides, creeks, floodplains, disturbed areas, moist places.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland e.g. with *Bursaria spinosa*; open-forest e.g. with *Eucalyptus longifolia*, *E. crebra*.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

CONSERVATION: Weed of disturbed sites, widespread, common along the Kowmung River flats by 1951.

POACEAE

***Setaria pumila* * (*S. glauca*)**

Slender Pigeon Grass, Pale Pigeon Grass

Life history

GROWTH FORM: Loosely tufted, glabrous, annual herb with erect or ascending stems 50–100 cm high (Holm et al. 1997).

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: January–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, February–March.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Good herbage for stock (Herb. note 1914).

Distribution

STATUS/ORIGIN: Exotic, native to warm-temperate northern hemisphere. **BOTANICAL SUBREGIONS:** NC CC SC NT CT NWS CWS SWS; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coast, Southern Highlands.

SELECT LOCATIONS: **CC:** Cowan, Yarramundi, Wyong (1891), Matcham, Bilpin, Hornsby (1915), Cheltenham, Doonside, Gladesville (1887), Ryde (1912), Homebush, Centennial Park (1899), Hurstville (1896), Camden, Wollongong, Five Islands, Barrengarry. **CT:** Hill Top (1917), Moss Vale, Bundanoon.

Habitat

HABITAT: Disturbed areas, roadsides.

ALTITUDE: 0–700 m **ANNUAL RAINFALL:** 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pastures.

SUBSTRATE: Clay soils on shale, moist sites. Wide range of soil textures, pH 6–8 (Holm et al. 1997).

EXPOSURE:

Conservation

Widespread weed of cultivated and disturbed ground.

POACEAE

***Setaria sphacelata* ***

South African Pigeon Grass, Setaria

Life history

GROWTH FORM: Densely to compactly tufted perennial herb to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouted after high intensity fire (1/94 at Narrabeen), secondary juvenile period about 9 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to trop. and S Africa. Introduced as pasture grass.

BOTANICAL SUBREGIONS: NC CC SWP; Qld, Afr.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Clyde (1969), Centennial Park (1973, 1977), Camden (1960).

Habitat

HABITAT: Wasteland.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Sandy to clay soils.

EXPOSURE:

Conservation

Cultivated as pasture grass, occasionally naturalised.

POACEAE

***Setaria verticillata* ***

Whorled Pigeon Grass

Life history

GROWTH FORM: Loosely tufted annual herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to tropics and temperate regions of Old World.

BOTANICAL SUBREGIONS: CT ST CWS SWS NWP SWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT:** Sunny Corner (1952), Hazelbrook (1998).

Habitat

HABITAT: Cultivated or disturbed land.

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 900–1100 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Occasionally recorded in Tablelands.

POACEAE

***Setaria viridis* ***

Green Pigeon Grass

Life history

GROWTH FORM: Loosely tufted annual herb 5–50 (–80) cm high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to temperate regions.

BOTANICAL SUBREGIONS: NC NT CT ST CWS NFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CT:** Bathurst area (1978), Carcoar (1962), Orange (1948).

Habitat

HABITAT: Cultivated areas.

ALTITUDE: 800–1000 m ANNUAL RAINFALL: 800–1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Occasional weed of cultivation in Tablelands (Harden 1993).

POACEAE

***Sorghum bicolor* subsp. *drummondii* ***

(*S. sudanense*)

Cultivated Sorghum

Life history

GROWTH FORM: Tufted annual or weak perennial herb to 2.5 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, grain not exposed at maturity.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, probably native to Africa. Introduced as a crop plant.

BOTANICAL SUBREGIONS: NC CC SC NT NWS CWS SWS NWP SWP; Qld, Afri.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Flemington (1969), Narellan (1968).

Habitat

HABITAT: Disturbed sites, tips, saleyards.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Cultivated in almost all parts of NSW, sporadically recorded from disturbed sites, probably resulting from spilt grain, and not truly naturalised.

POACEAE

***Sorghum halepense* ***

Johnson Grass

Life history

GROWTH FORM: Rhizomatous perennial herb to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: January–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, March–April.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pollen known to cause allergy in humans (Bass & Wrigley 1984). Hybridizes with Grain Sorghum *S. bicolor* subsp. *bicolor*. Food plant of butterfly larvae *Telicota ancilla ancilla* (Common & Waterhouse 1981).

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond, Shane Park, Cheltenham, Homebush, Rhodes (1887), Flemington, Rockdale. **CT:** Orange, Tarana (1900), Barbers Creek (1898).

Habitat

HABITAT: Disturbed areas, river edges, creekbanks, roadsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Weedy sites e.g. with *Sida rhombifolia*, *Conyza*, *Plantago*.

SUBSTRATE: Sandy soil on alluvium, medium nutrients.

EXPOSURE:

Conservation

Weed of crops and disturbed areas.

POACEAE

Sorghum leiocladum

Wild Sorghum

Life history

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: November–March.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Morphology for dispersal by adhesion (McIntyre et al. 1995).

FIRE RESPONSE: Resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS; Qld, Vic., N.T.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney, Southern Highlands.

SELECT LOCATIONS: **CC:** Toongabbie, Prospect, Cobbitty, Camden, Mount Annan, Picton, Colo Vale. **CT:** Glen Davis, Wallerawang, Mt Victoria, Megalong, Jenolan Caves, Abercrombie Caves, Moss Vale, Berrima, Wingello.

Habitat

HABITAT: Grassy woodland.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 600–900 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Woodland e.g. with *Eucalyptus tereticornis*, *E. moluccana*, *E. crebra*, *E. melliodora*.

SUBSTRATE: Clay soil on shales, metasediments, granite, medium nutrients.

EXPOSURE:

Conservation

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

POACEAE

Spinifex sericeus (*S. hirsutus*)

Hairy Spinifex

Life history

GROWTH FORM: Stout, dioecious perennial herb with branched stolons and rhizomes to several metres long.

VEGETATIVE SPREAD: Stoloniferous, rhizomatous, rooting at nodes.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female or bisexual inflorescences, October–November.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Germination inhibited by white light, only occurring when seeds are deeply buried in moist soil (Langkamp 1987).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Flowers dyed various colours and used extensively in Millinery (Herb. note 1912).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; LHI, Qld, Vic., Tas., N.Z., Pac.Is.

DISTRIBUTION SYDNEY AREA: Coastal dunes and beaches.

SELECT LOCATIONS: **CC:** Terrigal Beach, Avalon, Narrabeen, Manly Beach, Bondi, Maroubra Beach, Brighton, Lady Robinsons Beach, Cronulla Beach, Bonny Vale, Wollongong.

Habitat

HABITAT: Shoreline, foredunes.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Forms dense mats on foredunes.

SUBSTRATE: Sand dunes, low nutrients.

EXPOSURE:

Conservation

Sand-binding and colonising grass on coastal dunes. Conservation status unknown.

POACEAE

Sporobolus africanus * (*S. indicus* var. *capensis*)

Parramatta Grass

Life history

GROWTH FORM: Tufted perennial herb to 0.9 m high, with strong root system.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer, inflorescence 10–18 cm long.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, sticky when wet adhering to animals and clothing; also spread in soil on machinery and vehicles (South Coast Weeds 2004, <http://www.esc.nsw.gov.au/Weeds>).

FIRE RESPONSE: Resprouts, flowering within 5 months after high intensity fire (1/94 at Lane Cove, Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Low feed value for stock (South Coast Weeds 2004, <http://www.esc.nsw.gov.au/Weeds>).

Distribution

STATUS/ORIGIN: Exotic, native to Africa.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS SWP; LHI, Qld, Vic., S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Milson Is, Hornsby, Beecroft, Doonside, Northbridge, Ryde (1888), Homebush (1894), Flemington, Bondi (1902), Mascot, Penrith, Oatley (1901), Kogarah, Stanwell Park, Dapto, Kangaroo Valley (1921). **CT:** Woodford, Mittagong, Cambewarra.

Habitat

HABITAT: Disturbed areas, road verges and tracks, pasture.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Pastures, woodland e.g. with *Eucalyptus punctata*, *Corymbia eximia*, *Eucalyptus moluccana*, *E. tereticornis*; road verges and pastures e.g. with *Paspalum dilatatum*, *Plantago lanceolata*, *Pennisetum clandestinum*.

SUBSTRATE: Sandy or clayey soil on shale, low to medium nutrients. Often on compacted soils.

EXPOSURE:

Conservation

Weed of disturbed areas and pastures.

POACEAE

Sporobolus caroli

Fairy Grass, Yakka Grass

Life history

GROWTH FORM: Tufted annual or perennial herb to 0.6 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., N.T., S.A.

DISTRIBUTION SYDNEY AREA: Flemington.

SELECT LOCATIONS: CC: Flemington Saleyards (1969).

Habitat

HABITAT: Saleyards.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 900 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

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

EXPOSURE:

Conservation

Native to drier inland areas, recorded only at Flemington saleyards in 1969, probably introduced to Sydney area with livestock. Probably extinct in the Sydney area now.

POACEAE

Sporobolus creber**Life history**

GROWTH FORM: Tufted perennial herb to 1.3 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE: Resprouts from base. Flowering within 4 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

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: Mainly Cumberland Plain.

SELECT LOCATIONS: CC: Turrumurra, Homebush, Centennial Park, Toongabbie, Engadine, Mount Annan, Picton, Cedar Creek. CT: Ophir, Orange.

Habitat

HABITAT: Grassy woodland.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *Angophora floribunda*, *E. eugenioides*; scrub e.g. with *Allocasuarina distyla*, *Angophora hispida*.

SUBSTRATE: Clay soils on shale, metasediments, laterite, medium–low nutrients. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

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

POACEAE

Sporobolus elongatus**Life history**

GROWTH FORM: Tufted perennial herb to 1 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: No particular morphology for dispersal (McIntyre et al. 1995).

FIRE RESPONSE: Probably resprouts.

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT NWS; Qld, S.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Lower Portland, Bayview, Pymble, Cheltenham, Homebush, Cooks River, Oatley, Bass Hill, Liverpool, Mount Annan, Razorback, Berry. CT: Woodford, Kowmung River, Hill Top.

Habitat

HABITAT: Low ridges.

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 soil on shale, volcanics.

EXPOSURE:

Conservation

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

POACEAE

***Sporobolus fertilis* *** (*Sporobolus indicus* var. *major* *)

Parramatta Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.6 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–autumn, inflorescence 25–50 cm long.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seeds, spread by water, wind and machinery; seeds become sticky at maturity and may attach to hair or fur; summer-growing (Weeds Australia www.weeds.org.au).

FIRE RESPONSE: Recovers rapidly from fire (Weeds Australia www.weeds.org.au).

INTERACTION WITH OTHER ORGANISMS: Unpalatable (Weeds Australia www.weeds.org.au).

Distribution

STATUS/ORIGIN: Exotic, native to Asia.

BOTANICAL SUBREGIONS: NC CC NWS; Qld, S.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: CC: North Parramatta (1954), Camden (1982), Berry (1993).

Habitat

HABITAT: Disturbed areas, roadside, low-lying land.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clay soils on shale, medium–low nutrients.

EXPOSURE:

Conservation

Major weed of disturbed and pastoral land (Weeds Australia www.weeds.org.au). Noxious weed in NSW (NPWS website: www.nationalparks.nsw.gov.au).

POACEAE

Sporobolus virginicus var. *minor*

Marine Couch

Life history

GROWTH FORM: Creeping rhizomatous or stoloniferous perennial herb to 0.5 m high, with leaves less than 1 mm wide.

VEGETATIVE SPREAD: Rhizomes and stolons.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer–autumn.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, S.A.

DISTRIBUTION SYDNEY AREA: Estuaries.

SELECT LOCATIONS: **CC:** Lane Cove River, Gladesville, Homebush Bay, Cabarita, Meadowbank, Salt Pan Creek, Weeney Bay, Kurnell, Georges River.**Habitat**

HABITAT: Saltmarsh.

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Saltmarsh e.g. with *Sarcocornia quinqueflora*, often between *Sarcocornia* and *Juncus* zones.

SUBSTRATE: Muddy sediments, periodically tidally inundated.

EXPOSURE:

Conservation

POACEAE

Sporobolus virginicus var. *virginicus*

Sand Couch

Life history

GROWTH FORM: Creeping rhizomatous or stoloniferous perennial herb to 0.5 m high, with leaves greater than 1 mm wide.

VEGETATIVE SPREAD: Rhizomes and stolons.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore seed, difficult to germinate (Clarke & Hannon 1970). Adults indifferent to waterlogging. No salt requirement; intolerant of undiluted seawater (Clarke & Hannon 1970).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Australian Shelduck *Tadorna tadornoides* (Barker & Vestjens 1989,1990).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; LHI, Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: **CC:** Cronulla.**Habitat**

HABITAT: Saltmarsh, more abundant in less saline river marshes than in bays (Clarke & Hannon 1970)

ALTITUDE: 0–50 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Saltmarsh, occurring on higher and less saline parts of *Sarcocornia* zone and also in *Juncus kraussii* zone, areas flooded infrequently and never diurnally (Clarke & Hannon 1970)

SUBSTRATE:

EXPOSURE:

Conservation

POACEAE

Stenotaphrum secundatum *

Buffalo Grass

Life history

GROWTH FORM: Stoloniferous perennial herb to 0.3 m high.

VEGETATIVE SPREAD: Spreads to form spongy turf.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: December–February.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: A food plant of butterfly *Melanitis leda bankia* (Common & Waterhouse 1981).**Distribution**

STATUS/ORIGIN: Exotic, native to America, Africa. Introduced as lawn grass.

BOTANICAL SUBREGIONS: NC CC SC SWS; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coastal.

SELECT LOCATIONS: **CC:** Barrenjoey, Bayview, Narrabeen Lakes, Homebush Bay, Rhodes (1885), Towra Point, Bundeena, Five Islands (1928), Cambewarra.**Habitat**

HABITAT: Near saltwater.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent to dominant.

VEGETATION: Saltmarsh; woodland e.g. with *Casuarina glauca*.

SUBSTRATE: Sandy soil on sand, sandstone, low–medium nutrients, salt-tolerant.

EXPOSURE: Full sun to light shade.

Conservation

Cultivated as a lawn grass elsewhere and naturalised chiefly in coastal and estuarine sites.

POACEAE

Tetrarrhena juncea Wiry Ricegrass**Life history**

GROWTH FORM: Tufted perennial herb, with much-branched wiry stems often scrambling to 4 m long.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Most of the year.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit, September–January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of butterfly larvae *Pasma tasmanica* (Common & Waterhouse 1981).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., W.A.

DISTRIBUTION SYDNEY AREA: Coast and upper mountains.

SELECT LOCATIONS: **CC:** Kurrajong Heights, Terrey Hills, Pennant Hills, Northbridge, Mosman, Oatley, Audley. **CT:** Bell, Mt Wilson, Katoomba, Lawson, Belmore Falls.**Habitat**

HABITAT: Hillsides, gullies, near creeks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Eucalyptus sieberi*, *E. punctata*, *Angophora costata*, *Eucalyptus piperita*, *Corymbia gummifera*, *Syncarpia glomulifera*; scrub e.g. with *Kunzea capitata*, *Banksia ericifolia*.

SUBSTRATE: Sandy to loamy soil on sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

Tetrarrhena turfosa

POACEAE

Life history

GROWTH FORM: Rhizomatous perennial herb forming compact tufts to 1.3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Spring–summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC NT CT ST; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Coast, Upper Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CC:** Centennial Park, Maddens Plains, Mt Keira.

CT: Mt Victoria, Blackheath, Katoomba, Wentworth Falls, Lawson, Hill Top, Robertson.

Habitat

HABITAT: Swamps, watercourses in high rainfall areas.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland/wet heath e.g. with *Gymnoschoenus sphaerocephalus*, *Baumea rubiginosa*, *Epacris obtusifolia*, *Gleichenia*, *Bauera*.

SUBSTRATE: Sandy soils on sandstone, sand, low nutrients, permanently moist.

EXPOSURE:

Conservation

Conservation status unknown.

Themeda australis

POACEAE

Kangaroo Grass

Life history

GROWTH FORM: Tufted perennial herb to 1.2 m high, often tinted red, tussocks up to 0.5 m across (Waters et al. 2000). Includes various forms including a low-growing coastal headland form.

VEGETATIVE SPREAD: No.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: 2 years (in garden, L. McD.).

FLOWERS: Mostly summer, December–April.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Mature December–March, depending on rainfall and temperature (Waters et al. 2000).

DISPERSAL, ESTABLISHMENT & GROWTH: Morphology for dispersal by adhesion (McIntyre et al. 1995). Gravity-dispersed, 1 m spread in 2 years from stems that droop at maturity (L. McD.). Primary dormancy usually breaks down slowly with storage periods of up to 12 months or more (Waters et al. 2000), to break dormancy, seed needs cold night temperatures or can be stored at 4°C for at least 1 month; total germination approx. 100 days (typical rate 13 per gram of awned seed, Greening Australia 1996a), Spring and summer-growing (Cunningham et al. 1981). A coloniser of bare clay banks and slopes.

FIRE RESPONSE: Resprouts at base (Fox 1988). Secondary juvenile period about 12 months after high intensity fire (1/94 at Lane Cove, Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Food plant of butterfly larvae *Geitoneura klugii klugii*, and probably *Geiton erua acantha acantha*, *Heteronympha merope merope* (Common & Waterhouse 1981). Will not tolerate continuous grazing, very palatable when young but has only moderate nutritive value with 3–12% crude protein (Waters et al. 2000).

Provides much needed roughage to offset the effects of highly improved grasslands (McBarron 1955). Pollen may cause allergy in humans (Bass & Wrigley 1984).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., NG.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Faulconbridge, Springwood, Pitt Town, Woy Woy, Milson Island, Barrenjoey, Hornsby, Cheltenham, Northbridge, Gladesville, Bradleys Head, Vaucluse, Centennial Park, Cooks River, Penshurst, St Marys, Mount Annan, Cobbitty, Bass Point, Bomaderry. **CT:** Capertee Valley, Ophir, Bathurst, Blayney, Carcoar, Junction Reefs, Jenolan Caves, Jellore Creek, Mittagong, Tallong, Barbers Creek.

Habitat

HABITAT: Grassy woodlands, coastal headlands, grassland.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 600–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Grassland and grassy woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *E. melliodora*; shrubby woodland e.g. with *Angophora costata*, *Melaleuca nodosa*, *Eucalyptus albens*, *E. Macrorhyncha*; headland grassy heath.

SUBSTRATE: Sandy soils to heavy clays on shale, laterite, basalt, volcanics, sandstone, low–high nutrients.

EXPOSURE: Full sun to light shade.

Conservation

Probably a dominant native species prior to settlement, but rapidly depleted by cultivation and grazing. Reported in Blue Mountains NP, Sydney Harbour NP.

POACEAE

Tragus australianus

Small Burrgrass

Life history

GROWTH FORM: Tufted annual herb, with erect or ascending stems to 0.4 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent burr.

DISPERSAL, ESTABLISHMENT & GROWTH: Burr dispersed by adhesion.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Western Sydney.

SELECT LOCATIONS: **CC:** Glenlee (1969), Richmond (1912), Homebush (1894), Flemington (1968), Mount Annan (2001).

Habitat

HABITAT: Saleyards, paddocks.

ALTITUDE: 0–300 m **ANNUAL RAINFALL:** 700–900 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland.

SUBSTRATE: Clay soils on shale, medium nutrients.

EXPOSURE:

Conservation

Occasionally recorded in western Sydney since 1894, but essentially a species of drier areas and probably introduced to Sydney area with live-stock e.g. at saleyards.

POACEAE

Triodia scariosa subsp. *scariosa*

Porcupine Grass

Life history

GROWTH FORM: Tussock and hummock-forming perennial herb to 1 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC NT CT NWS CWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Capertee Valley.

SELECT LOCATIONS: **CT:** Capertee Valley.**Habitat**

HABITAT: Rocky ridges

ALTITUDE: 600 m ANNUAL RAINFALL: 600–700 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Woodland e.g. with *Eucalyptus albens*.

SUBSTRATE: Low-nutrient soils.

EXPOSURE:

Conservation

Population in Capertee Valley is at the eastern limit of distribution.

Conservation status unknown.

POACEAE

Triraphis mollis

Purple Needlegrass

Life history

GROWTH FORM: Tufted annual or perennial herb to 0.8 m high.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: In response to rain.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Richmond (1912), Flemington (1968).**Habitat**

HABITAT: Saleyards.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Occasionally recorded in western Sydney since 1912 but essentially a species of drier areas and probably introduced to Sydney area with live-stock e.g. at saleyards.

POACEAE

Triticum aestivum * Wheat**Life history**

GROWTH FORM: Robust annual herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons*, seeds eaten by Singing Bushlark *Mirafra javanica*, Richard's Pipit *Anthus novaeseelandiae*, Olive Whistler *Pachycephala olivacea*, Brown Songlark *Cinclorhamphus cruralis*, *Origma Origma solitaria* (Barker & Vestjens 1989,1990). Pollen known to cause allergy in humans (Bass & Wrigley 1984).**Distribution**

STATUS/ORIGIN: Exotic, native to Mediterranean region, introduced as cereal crop.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Cheltenham, North Strathfield, Casula, Campbelltown, Douglas Park. **CT:** Medlow Bath.**Habitat**

HABITAT: Roadsides, railways, trucking yards.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Cultivated as cereal crop, occurs sporadically along roadsides and railways from spilt grain. Does not spread and is not truly naturalised.

POACEAE

Urochloa panicoides *

Urochloa Grass, Liverseed Grass

Life history

GROWTH FORM: Stoloniferous annual herb to 0.7 m high.

VEGETATIVE SPREAD:

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Pasture grass.

Distribution

STATUS/ORIGIN: Exotic, native to Africa. Probably introduced as pasture grass.

BOTANICAL SUBREGIONS: NC CC SC NT ST NWS CWS SWS NWP SWP NFWP; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Emerton (1993), Flemington (1969), Glenfield (1969), Campbelltown (1984).**Habitat**

HABITAT: Disturbed sites, lawns.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Remnant woodland e.g. with *Eucalyptus fibrosa*, *E. tereticornis*.

SUBSTRATE: Clay soil on shale.

EXPOSURE:

Conservation

Pasture grass, occasionally naturalised.

POACEAE

Urochloa piligera (*Brachiaria piligera*)

Hairy Armgrass

Life history

GROWTH FORM: Ascending annual herb to 1 m high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Summer.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS NWP; Qld, N.T., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Flemington (1969), Campbelltown (1981).**Habitat**

HABITAT: Saleyards, disturbed sites.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–900 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION:

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Occasionally recorded in western Sydney since 1969, but essentially a species of drier areas and probably introduced to Sydney area with livestock e.g. at saleyards.

POACEAE

Vulpia bromoides * (*Festuca bromoides*)

Squirrel Tail Fescue

Life history

GROWTH FORM: Tufted herb to 40 cm high.

VEGETATIVE SPREAD: No.

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit. Seed weight 0.5 mg (Buckley 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE: Killed, seedlings recorded less than 1 year after fire (Purdie 1977). Flowering in about 10 months after high intensity fire (1/94 at Lane Cove, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP NFWP; LHI, Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Springwood, Cheltenham, Manly (1885), Gladesville (1884), Parramatta (1886), Cooks River (1914), Centennial Park (1892), Glenfield, Liverpool, Wollongong. **CT:** Blayney, Bathurst, Lawson, Jenolan Caves (1899), Mittagong.**Habitat**

HABITAT: Disturbed places, paddocks.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland.

SUBSTRATE: Clay soils on shale, granite, sand.

EXPOSURE:

Conservation

Widespread in disturbed habitats.

POACEAE

Vulpia muralis * (*Festuca myuros*)**Life history**

GROWTH FORM: Tufted annual herb to 0.5 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive for dispersal (McIntyre et al. 1995).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Europe and Mediterranean region.

BOTANICAL SUBREGIONS: CC CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., W.A.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** St Marys (1966). **CT:** Trunkey (1992).**Habitat**

HABITAT: Disturbed areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Clay soil on shale, medium nutrients.

EXPOSURE:

Conservation

Occasional weed of disturbed sites.

POACEAE

Vulpia myuros * (*V. megalura*, *Festuca myuros*)

Rat's Tail Fescue

Life history

GROWTH FORM: Densely tufted annual herb to 0.6 m high.

VEGETATIVE SPREAD: No (McIntyre et al. 1995).

LONGEVITY: Less than 1 year.

PRIMARY JUVENILE PERIOD: Less than 1 year.

FLOWERS: Spring.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore adhesive for dispersal (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to Mediterranean region.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Richmond (1906), Cheltenham, Manly (1884), Gladesville, Homebush, Centennial Park, Ashfield (1914), Cooks River (1914), Flemington (1969), Bargo (1923), Thirlmere (1904), Kangaroo Valley (1929). **CT:** Katoomba (1934), Woodford, Wingello (1913).**Habitat**

HABITAT: Disturbed areas.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Grassland e.g. with *Themeda australis*; woodland.

SUBSTRATE: Clay soils on shale, basalt, sandstone, medium nutrients.

EXPOSURE:

Conservation

Widespread weed of disturbed sites.

POACEAE

Zoysia macrantha

Prickly Couch

Life history

GROWTH FORM: Strongly rhizomatous and stoloniferous perennial herb to 0.3 m high.

VEGETATIVE SPREAD: By rhizomes and stolons.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: October–January.

FRUIT/SEED: Dry, 1-seeded, indehiscent fruit.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic., Tas., Malaysia.

DISTRIBUTION SYDNEY AREA: Coastline estuaries.

SELECT LOCATIONS: **CC:** Lake Munmorah, Terrigal Beach, Patonga, Palm Beach, The Basin, Church Point, Narrabeen, Curl Curl, Manly, Homebush Bay, Maroubra Bay, Lady Robinsons Beach, Deadmans Creek, Windang Island, Shellharbour, Gerringong.

Habitat

HABITAT: Dunes, margins of salt swamps, creekbanks, seacliffs.

ALTITUDE: 0–100 m **ANNUAL RAINFALL:** 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Lake foreshores e.g. with *Isolepis nodosus*, *Phragmites australis*; coastal foreshores e.g. with *Carex*, *Sporobolus virginicus*.

SUBSTRATE: Sandy soils on dunes, alluvium, sandstone, low nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

PONTEDERIACEAE

***Eichhornia crassipes* ***

Water Hyacinth

Life history

GROWTH FORM: Aquatic floating herb with short leafy stem, sometimes rooting in mud to 65 cm high, with stolons 5–12 cm long (Michael 1997). Leaves of two types: long, narrow, erect to 60 cm long, others roundish to 30 cm diameter; roots fibrous, feather-like, dark-coloured emerging from a rhizome or crown (Parsons & Cuthbertson 2001).

VEGETATIVE SPREAD: Stoloniferous (Parsons & Cuthbertson 2001).

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Bluish purple, on a long stalk. Self-compatible (Cronk & Fuller 1995).

FRUIT/SEED: 3-celled capsule, with many tiny, ribbed seeds (Michael 1997) 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seeds, dispersed by birds and water; dormancy of about 12 weeks, drop to the bottom mud and germinate (when there is sufficient light) in spring, seedlings float to surface but most germination occurs on moist soil at water's edge; seed may lie dormant in dry mud for more than 15 years; major vegetative dispersal is from plantlets forming on stolons, with plant numbers doubling in 5 days and new plants flowering in 3–4 weeks (Parsons & Cuthbertson 2001).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Chokes irrigation systems, makes swimming and boating impossible, takes considerable oxygen from water, affecting health of fish and interferes with wildlife conservation reducing areas for waterbirds, provides ideal breeding sites for mosquitoes; extracts from leaf stalks have hormone activity which restricts the development of some insect species and acts as an ovicide

(Parsons & Cuthbertson 2001). In 1977 moth larvae *Sameodes albiguttalis* was introduced for control; the moth established and spread rapidly causing considerable damage in some areas. Another moth larvae from S. America, *Acigona infusella*, has also shown considerable promise (Common 1990) possible future control by use of other aquatic plants that produce allelopathic chemicals that restrict growth (Parsons & Cuthbertson 2001).

Distribution

STATUS/ORIGIN: Exotic, native to S America. A declared noxious weed in NSW.

BOTANICAL SUBREGIONS: NC CC NWP; Qld, Vic., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Hawkesbury–Nepean River.

SELECT LOCATIONS: **CC:** Penrith.

Habitat

HABITAT: Dams, streams, drains, irrigation channels (Parsons & Cuthbertson 2001).

ALTITUDE: 0–50 m **ANNUAL RAINFALL:** 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Stationary or slow-flowing, nutrient-rich water (Harden 1993) does not tolerate salinity above 1.6‰ (Parsons & Cuthbertson 2001).

EXPOSURE:

Conservation

Declared noxious weed in whole of NSW, universally regarded as one of the most serious aquatic weeds of the world (Parsons & Cuthbertson 2001).

POSITONIACEAE

Posidonia australis

Seagrass

Life history

GROWTH FORM: Submerged, rhizomatous, perennial seagrass.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Pollination occurs under water.

FRUIT/SEED: Fruit 15–30 mm long, with one seed to 20 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fruit, with spongy exterior, floating when first released.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Provides important habitat for fish (Middleton et al. 1984).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Coastal estuaries.

SELECT LOCATIONS: **CC:** Lake Macquarie, Woy Woy, Pittwater, Cowan Creek, Middle Harbour, Mosman, Botany Bay, Quibray Bay, Cronulla, Port Hacking.

Habitat

HABITAT: Coastal bays and inlets.

ALTITUDE: Below tide level. **ANNUAL RAINFALL:** not applicable

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Clear saline water 1–10 m deep, on sand or mud in estuarine or oceanic habitats (Harden 1993).

EXPOSURE:

Conservation

Conservation status unknown.

POTAMOGETONACEAE

Potamogeton crispus

Curly Pondweed

Life history

GROWTH FORM: Submerged, rhizomatous aquatic herb, with stems to 3 m long. Leaves elongated, deep green with strongly undulating edges (Romanowski 1998).

VEGETATIVE SPREAD:

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: Up to 10 flowers on an emergent spike 1–2 cm long, October–January.

FRUIT/SEED: Nutlet 5–7 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC CT ST NWS CWS NWP SWP; Qld, Vic., N.T., S.A., W.A., Eur, Asia, Afr.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Morisset, Picnic Point, Emu Plains, Wollondilly River. **CT:** Borenore, Kowmung River.

Habitat

HABITAT: Creeks, rivers.

ALTITUDE: 0–800 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: With other water plants.

SUBSTRATE: Shallow, slowly-flowing fresh water. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE:

Conservation

Conservation status unknown.

POTAMOGETONACEAE

*Potamogeton javanicus***Life history**

GROWTH FORM: Rhizomatous, almost turf-forming aquatic perennial.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: On an emergent spike 2 cm long, October–November.

FRUIT/SEED: Nutlet 2 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ; Qld, N.T., W.A., Asia.

DISTRIBUTION SYDNEY AREA: North of Botany Bay.

SELECT LOCATIONS: **CC:** Centennial Park, East Lakes, Botany, Penrith weir, Bents Basin.

Habitat

HABITAT: Lakes, creeks.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: With other aquatic plants e.g. *Hydrilla verticillata*, *Nymphaea*.

SUBSTRATE: Shallow water up to 2 m deep.

EXPOSURE:

Conservation

Conservation status unknown. Sydney is southern geographical limit.

POTAMOGETONACEAE

*Potamogeton ochreatus***Life history**

GROWTH FORM: Submerged rhizomatous aquatic herb.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Many flowers on an emergent spike to 3 cm long, October–December.

FRUIT/SEED: Nutlets 3–4 mm long, November–December.

DISPERSAL, ESTABLISHMENT & GROWTH: Germinates in winter in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS SWP; Qld, Vic., Tas., N.T., S.A., W.A., N.Z. & Asia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Wyong Creek, Centennial Park, Hacking River, Nepean River, Mulgoa, Warragamba River, Thirlmere Lakes, Cordeaux Dam, Macquarie Rivulet, Kangaroo River. **CT:** Bathurst, Orange, Oberon, Kanimbla Valley, Kowmung.

Habitat

HABITAT: Rivers, channels, lakes.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 600–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: With other waterplants e.g. *Vallisneria*, *Myriophyllum*, *Eleocharis sphacelata*.

SUBSTRATE: Still to strongly flowing fresh water from a few cm to 5 m deep, usually on deep silt and gravel, low nutrients.

EXPOSURE:

Conservation

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

POTAMOGETONACEAE

Potamogeton pectinatus

Sago Pondweed

Life history

GROWTH FORM: Submerged aquatic herb, with stems to 3 m long and a vigorous rhizome system that penetrates mud to 1 m and produces numerous fleshy root tubers.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Perennial.

PRIMARY JUVENILE PERIOD:

FLOWERS: In small groups on spike to 5 cm long, November–January.

FRUIT/SEED: Nutlets 2–4 mm across.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Foodplant of Plumed Whistling Duck *Dendrocygna eytoni*, Pacific Black Duck *Anas superciliosa* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC ST SWP; Qld, Vic., Tas., S.A., W.A., cosmop.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC:** Sydney Botanic Gardens (1968, 1977), Rooty Hill (1988), Kurnell (1965).

Habitat

HABITAT: Wetlands, ponds.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION:

SUBSTRATE: Saline to slightly saline stationary water to 4 m deep.

EXPOSURE:

Conservation

Conservation status unknown.

POTAMOGETONACEAE

Potamogeton perfoliatus

Clasped Pondweed

Life history

GROWTH FORM: Submerged rhizomatous aquatic perennial herb, with trailing stems and producing turions.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Emergent dense spike of flowers, February–April.

FRUIT/SEED: Nutlets 2–3 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 SWP; Qld, Vic., Tas., cosmop.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Colo Gorge, Wisemans Ferry, Yarramundi Lagoon, Nepean River, Wollondilly River. **CT:** Sofala, Coxs River.

Habitat

HABITAT: Streams and rivers.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 700–800 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Aquatic vegetation e.g. with *Ranunculus*, *Myriophyllum*.

SUBSTRATE: Gently to strongly flowing fresh waters from a few cm to 2.5 m deep, on sandy or mud bottoms (Aston 1977), salt-tolerant.

EXPOSURE:

Conservation

Conservation status unknown.

POTAMOGETONACEAE

Potamogeton tricarlinatus

Floating Pondweed

Life history

GROWTH FORM: Rhizomatous aquatic herb, with stems to 4 m long.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: In a dense, emergent spike to 5 cm long, September–April.

FRUIT/SEED: Nutlets 2–4 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Germination in autumn–winter in Northern Tablelands (Britton & Brock 1994).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS SWS NWP SWP NFWP; Qld, Vic., Tas., N.T., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Howes Valley, Terrigal, Tuggerah, Galston, Richmond, Luddenham, Mount Annan, Wallacia. **CT:** Mittagong, Wingecarribbee Swamp, Paddys River.

Habitat

HABITAT: Rivers, creeks, wetland, dams.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 700–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Typha*, montane peatland e.g. with *Isacne globosa*, *Triglochin procera*, *Lilaeopsis polyantha*, *Carex*.

SUBSTRATE: Slowly flowing fresh water to 3 m deep, on muddy bottoms.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP.

POTAMOGETONACEAE

Ruppia maritima

Life history

GROWTH FORM: Submerged perennial herb, with rhizomes and stems to 8 cm long.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Flowers pollinated below the water surface, spring–autumn.

FRUIT/SEED: Black drupelet, flask-shaped 2–4 mm long, maturing below the water surface.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Tubers and seeds eaten by Australian Shelduck *Tadorna tadornoides* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SWP; Qld, Vic., N.T., S.A., W.A., cosmop.

DISTRIBUTION SYDNEY AREA: Parramatta River.

SELECT LOCATIONS: **CC:** Homebush Bay, Parramatta.

Habitat

HABITAT: Estuarine flats.

ALTITUDE: Below sea level. ANNUAL RAINFALL: n.a.

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Brackish to strongly saline water.

EXPOSURE:

Conservation

Only recorded for the Sydney area in the Parramatta River (1881, 1995).

Conservation status unknown.

POTAMOGETONACEAE

Ruppia megacarpa

Life history

GROWTH FORM: Surface flowering submerged aquatic perennial with slender rhizomes and stems to 2 m long.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD: More than 6 months (Van Viersen et al. 1982).

FLOWERS: Inflorescence on a stem to about 1 m long, warmer months. Pollen dispersed in floating clumps at water surface (Van Viersen et al. 1982).

FRUIT/SEED: Brown to black drupelet, 3–4 mm long. Fruits develop underwater (Van Viersen et al. 1982).

DISPERSAL, ESTABLISHMENT & GROWTH: Plants develop very slowly (Van Viersen et al. 1982).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC ST SWP; Vic., S.A., W.A., N.Z.

DISTRIBUTION SYDNEY AREA: Coastal, estuarine.

SELECT LOCATIONS: **CC:** Munmorah, Budgewoi Lake, Avoca Beach, Port Hacking, Lake Illawarra.

Habitat

HABITAT: Coastal lagoons, estuaries, inland lakes.
 ALTITUDE: Below sea level ANNUAL RAINFALL: not applicable
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION:
 SUBSTRATE: Brackish to strongly saline shallow water over grey silty mud.
 EXPOSURE:

Conservation

Conservation status unknown.

POTAMOGETONACEAE

Ruppia polycarpa (*Ruppia spiralis*)**Life history**

GROWTH FORM: Surface-flowering submerged aquatic perennial, with rhizomes and stems to 40 cm long.
 VEGETATIVE SPREAD: Rhizomatous.
 LONGEVITY:
 PRIMARY JUVENILE PERIOD:
 FLOWERS: 4–16, spring–autumn.
 FRUIT/SEED: Black drupelet 2–3 mm long.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:
 INTERACTION WITH OTHER ORGANISMS: Foodplant of Black Swan *Cygnus atratus*, Australian Shelduck *Tadorna tadornoides*, *Anas gibberifrons*, Chesnut Teal *Anas castanea*, and Freckled Duck *Stictonetta nervosa* (Barker & Vestjens 1989,1990).

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC SC; Vic, Tas, S.A., W.A., N.Z.
 DISTRIBUTION SYDNEY AREA: Coastal lagoons.
 SELECT LOCATIONS: **CC:** Avoca Lagoon, Narrabeen Lake, Dee Why Lagoon, Corrimal.

Habitat

HABITAT: Coastal lagoons, estuaries, inland lakes.
 ALTITUDE: Below sea level. ANNUAL RAINFALL: not applicable
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION:
 SUBSTRATE: Brackish to strongly saline water over muddy alluvium.
 EXPOSURE:

Conservation

Conservation status unknown.

RESTIONACEAE

Baloskion australe (*Restio australis*)**Life history**

GROWTH FORM: Perennial herb, with long creeping rhizome and flowering stems 40–100 cm high.
 VEGETATIVE SPREAD: Rhizomatous.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Separate male and female flowers on different plants, at any time.
 FRUIT/SEED: Capsule. Seed maturation 10–12 months (Meney & Pate 1999).
 DISPERSAL, ESTABLISHMENT & GROWTH: Fruit probably wind-dispersed (B. Briggs pers. comm.).
 FIRE RESPONSE: Resprouts (B. Briggs pers. comm.).
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CT ST; Vic., Tas.
 DISTRIBUTION SYDNEY AREA: Upper Blue Mountains.
 SELECT LOCATIONS: **CT:** Running Stream, Mt Cameron, Farmers Creek, Newnes SF, Clarence, Mt Wilson, Blackheath, Katoomba, Narrow Neck, Kanangra, Boyd River, Mt Werong, Wingecarribee Swamp.

Habitat

HABITAT: Swamps.
 ALTITUDE: 600–1200 m ANNUAL RAINFALL: 900–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent–occasional.
 VEGETATION: Shrub swamp e.g. with *Leptospermum* spp., *Xyris gracilis*, *Baumea* spp., *Gahnia* spp.
 SUBSTRATE: Wet peaty, sandy or gravelly soil on sandstone, granite, low nutrient, permanently moist.
 EXPOSURE:

Conservation

Running Stream north of Capertee is northern geographical limit. Conservation status unknown.

RESTIONACEAE

Baloskion fimbriatum (*Restio fimbriatus*)**Life history**

GROWTH FORM: Perennial herb, with shortly creeping rhizome and flowering stems 20–85 cm high.
 VEGETATIVE SPREAD: Rhizomatous.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Separate male and female flowers on different plants.
 FRUIT/SEED: Capsule. Seed maturation 6–8 months (Meney & Pate 1999).
 DISPERSAL, ESTABLISHMENT & GROWTH: Fruit probably wind-dispersed (B. Briggs pers. comm.).
 FIRE RESPONSE: Resprouts (B. Briggs pers. comm., Meney & Pate 2004).
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld.
 DISTRIBUTION SYDNEY AREA: Upper Blue Mountains, Southern Highlands.
 SELECT LOCATIONS: **CC:** Mellong Swamp. **CT:** Mt Coricudgy, Dunns Swamp, Blackheath, Katoomba, Wentworth Falls, Jenolan SF, Wanganderry, Hill Top, Mt Jellore, Fitzroy Falls, Paddys River, Penrose.

Habitat

HABITAT: Swamps.
 ALTITUDE: 300–1000 m ANNUAL RAINFALL: 900–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: Sedge swamp e.g. with *Lepidosperma limicola*, *Gleichenia dicarpa*, *Gymnoschoenus sphaerocephalus*; shrub swamp e.g. with *Banksia spinulosa*, *Leptospermum continentale*, *Epodisma minus*, *Epacris microphylla*, *Gleichenia*.
 SUBSTRATE: Deep sandy soils, on sandstone, low nutrients, wet, poorly-drained.
 EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP, Kanangra Boyd NP.

RESTIONACEAE

Baloskion gracile (*Restio gracilis*)**Life history**

GROWTH FORM: Perennial herb, tufted or with creeping rhizome and flowering stems 35–100 cm high.
 VEGETATIVE SPREAD: Rhizomatous.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Separate male and female flowers on different plants, November–January.
 FRUIT/SEED: Capsule. Seed maturation 6–8 months (Meney & Pate 1999).
 DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.). Fruit probably wind-dispersed (B. Briggs pers. comm.).
 FIRE RESPONSE: Resprouts (D. Keith, B. Briggs pers. comm.).
 INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT.

DISTRIBUTION SYDNEY AREA: Coast, Southern Highlands.

SELECT LOCATIONS: **CC:** Woy Woy, Salvation Creek, Rose Bay, Centennial Park, La Perouse, Woronora River, Waterfall, Thirlmere, Maddens Plains, Bulli Lookout, Mt Keira, Cambewarra Range.

CT: Hill Top, Carrington Falls, Penrose.

Habitat

HABITAT: Swamps, creeks.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Sedgeland e.g. with *Lepyrodia scariosa*, *Schoenus* spp. *Juncus* spp., *Xyris* spp., *Banksia oblongifolia*, *Banksia robur*.

SUBSTRATE: Deep sandy or peaty soils, on sandstone, low nutrients, poorly-drained, permanently moist.

EXPOSURE:

Conservation

Woy Woy is northern geographical limit. Conservation status unknown. Reported in Ku-ring-gai Chase NP, Royal NP.

RESTIONACEAE

Baloskion longipes (*Restio longipes*)**Life history**

GROWTH FORM: Perennial herb, tufted or with shortly creeping rhizome; flowering stems 90–150 cm high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Narrow inflorescence up to 25 cm long, February–April.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Fruit probably wind-dispersed (B. Briggs pers. comm.).

FIRE RESPONSE: Resprouts (Meney & Pate 1999).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CT ST.

DISTRIBUTION SYDNEY AREA: Boyd Plateau, Southern Highlands.

SELECT LOCATIONS: **CT:** Boyd Plateau, Mt Werong, Penrose.

Habitat

HABITAT: Swamps, depressions.

ALTITUDE: 700–1200 m ANNUAL RAINFALL: 1000–1200 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION: Hummocky sedgeland e.g. with *Restio* spp., *Empodisma minus*, *Xyris ustulata*; shrub swamp e.g. with *Leptospermum juniperinum*, *Leptospermum lanigerum*.

SUBSTRATE: Sandy to clayey alluvium over sandstone, low nutrients, permanently moist.

EXPOSURE:

Conservation

Boyd Plateau is northern geographical limit. Conservation status unknown. Reported in Kanangra Boyd NP.

RESTIONACEAE

Baloskion pallens (*Restio pallens*)**Life history**

GROWTH FORM: Perennial herb, with shortly creeping rhizome; flowering stems 50–100 cm high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS:

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Fruit probably wind-dispersed (B. Briggs pers. comm.).

FIRE RESPONSE: Resprouts from base (Benson 1981, Meney & Pate 1999).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Agnes Banks, Wyong.

SELECT LOCATIONS: **CC:** Doyalson, Wyong, Agnes Banks.

Habitat

HABITAT: Swampy places.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Eucalyptus parramattensis*, *Lepyrodia scariosa*, *Banksia oblongifolia*, *Kunzea capitata*, *Trachymene incisa*, *Schoenus brevifolius*, *Pimelea linifolia*.

SUBSTRATE: Deep sandy soil, low nutrients, periodically moist.

EXPOSURE:

Conservation

Very restricted occurrence, Agnes Banks is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

RESTIONACEAE

Baloskion tetraphyllum subsp. *meiostachyum*

(*Restio tetraphyllum* subsp. *meiostachyus*)

Life history

GROWTH FORM: Perennial herb, with shortly creeping rhizome to 10 mm diam. and flowering stems 50–160 cm high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: October–January.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Fruit probably wind-dispersed (B. Briggs pers. comm.). Vigorous coloniser after disturbance (Meney et al. 1999).

FIRE RESPONSE: Resprouted at base or below (Fox 1988, B. Briggs pers. comm.), after high intensity fire (1/1994 at Narrabeen, P Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Toukley, Tuggerah, Umina, Mt Katandra, Mooney Mooney Creek, America Bay Creek, Narrabeen, Dee Why Lagoon, Centennial Park, La Perouse, Botany, Ramsgate, Kurnell, Bundeena, O'Hares Creek, Berry.

Habitat

HABITAT: Creekbanks, swampy sand.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca ericifolia*; riparian scrub e.g. with *Lomatia myricoides*, *Tristaniopsis laurina*, *Leptospermum*; sedge swamp e.g. with *Restio complanatus*, *Baumea* spp., *Chorizandra*, *Hakea teretifolia*, *Banksia robur*.

SUBSTRATE: Deep sandy soils on alluvial sand, sandstone, low nutrients, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Botany Bay NP, Royal NP.

RESTIONACEAE

Chordifex dimorphus*(Guringalia dimorpha, Restio dimorphus)***Life history**

GROWTH FORM: Perennial herb, with shortly creeping rhizome; flowering stems 30–100 cm high.

VEGETATIVE SPREAD: Rhizomatous (Meney & Pate (1999).

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, September–March, peak September.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, adapted for ant-dispersal (Westoby et al. 1990).

FIRE RESPONSE: Killed after high intensity fire (1/1994 at Narrabeen, P. Kubiak pers. comm., Meney & Pate 1999).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC.

DISTRIBUTION SYDNEY AREA: Coast, Broken Bay to Cataract.

SELECT LOCATIONS: **CC:** Cowan, Belrose, Curl Curl, Manly, Bondi, Centennial Park, Leumeah, Marley, Waterfall, O'Hares Creek, Cataract Dam.**Habitat**

HABITAT: Exposed headlands, slopes, ridges.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Corymbia gummifera*, *Banksia serata*, *Angophora costata*, *Eucalyptus piperita*; swampy heath e.g. with *Lepyrodia scariosa*, *Banksia oblongifolia*, *Banksia ericifolia*.

SUBSTRATE: Shallow soils on sandstone, low nutrients, well-drained or seasonally moist sites.

EXPOSURE:

Conservation

Local endemic species, conservation status unknown. Reported in Royal NP.

RESTIONACEAE

Chordifex fastigiatus*(Saropsis fastigata, Restio fastigiatus)***Life history**

GROWTH FORM: Perennial herb with shortly creeping rhizome and flowering stems 30–100 cm high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on different plants, August–October.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, adapted for ant-dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouts (D. Keith pers. comm.), killed after high intensity fire (1/1994 at Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST; Qld.

DISTRIBUTION SYDNEY AREA: Coast and Upper Blue Mountains.

SELECT LOCATIONS: **CC:** Somersby, Woy, Woy, Berowra, Hornsby, McCarrs Creek, Mona Vale, Terrey Hills, Balgowlah, North Head, Centennial Park, Cronulla, Waterfall, Garie Trig, Linden, Campbelltown, West Dapto. **CT:** Gaspers Mountain, Blackheath, Mt Wilson, Barren Grounds.**Habitat**

HABITAT: Seasonally moist sandy soils.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Wet heath e.g. with *Hakea teretifolia*, *Epacris microphylla*, *Drosera*, *Banksia oblongifolia*, *Lepyrodia scariosa*.

SUBSTRATE: Shallow sandy soils over sandstone, low nutrients, often poorly drained, moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

RESTIONACEAE

Empodisma minus**Life history**

GROWTH FORM: Perennial, tufted herb, with ascending rhizome; flowering stems 15–200 cm long, green or bluish green.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants.

FRUIT/SEED: Smooth nut 2 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT C TST; Qld, Vic., Tas., S.A., N.Z.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Berowra, Hornsby, Manly Dam, Drummoyne, La Perouse, Jibbon Lagoon, Waterfall, Bulli Pass, Mt Keira, Bomaderry. **CT:** Running Stream, Mt Coricudgy, Newnes SF, Blackheath, Narrow Neck, Wentworth Falls, Fitzroy Falls, Carrington Falls, Barrengarry Mountain.**Habitat**

HABITAT: Swampy places, creekbanks, wet cliffs.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Swamps e.g. with *Lepyrodia scariosa*, *Gymnoschoenus sphaerocarpa*, *Leptospermum lanigerum*, *Lepidosperma limicola*, *Baeckea linifolia*, *Grevillea acanthifolia*.

SUBSTRATE: Sandy peaty soil on sandstone, low nutrients, permanently moist.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP, Royal NP.

RESTIONACEAE

Eurychorda complanata (*Restio complanatus*)**Life history**

GROWTH FORM: Rhizomatous perennial herb with broad flattened glaucous stems 20–120 cm high.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants.

FRUIT/SEED: Capsule.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.), vigorous coloniser after disturbance (Meney & Pate 1999).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.), apparently killed after high intensity fire (1/1994 at Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC CT; Qld, Vic., Tas.

DISTRIBUTION SYDNEY AREA: Mainly coast, Southern Highlands.

SELECT LOCATIONS: **CC:** Somersby, Terrey Hills, McCarrs Creek, Manly Dam, North Head, Rose Bay, Bondi, Centennial Park, La Perouse, Cape Banks, Kogarah, Kurnell, Mt Ousely, Maddens Plains, Cambewarra Pass. **CT:** Newnes Junction, Carrington Falls, Penrose,

Habitat

HABITAT: Swamps, depressions, hillsides.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 1100–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Heath e.g. with *Banksia ericifolia*, *Hakea teretifolia*; sedgeland e.g. with *Baumea* spp., *Chorizandra*, *Viminaria juncea*, *Banksia robur*.

SUBSTRATE: Sandy or peaty soil on sandstone, low nutrients, poorly drained.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Ku-ring-gai Chase NP, Botany Bay NP.

RESTIONACEAE

Hypolaena fastigiata

Life history

GROWTH FORM: Perennial herb, with creeping or ascending rhizome; flowering stems 20–65 cm high.

VEGETATIVE SPREAD: Widely spreading rhizomes (B. Briggs pers. comm.).

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: August–September.

FRUIT/SEED: Nut 4 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fruit (B. Briggs pers. comm.). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts (Benson 1981, Meney & Pate 1999).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly Coast, Hawkesbury River to Bulli.

SELECT LOCATIONS: **CC:** Judge Dowling Range, Agnes Banks, Cowan, Curl Curl, Manly, North Head, Centennial Park, La Perouse, Kogarah, Audley, Marley.

Habitat

HABITAT: Ridges.

ALTITUDE: 0–300 m **ANNUAL RAINFALL:** 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Heath e.g. with *Melaleuca nodosa*, *Melaleuca armillaris*, *Allocasuarina distyla*, *Angophora hispida*; woodland e.g. with *Eucalyptus sclerophylla*, *Angophora bakeri*, *Eucalyptus haemastoma*, *Corymbia gummifera*.

SUBSTRATE: Sandy soil, sometimes with lateritic gravel on sandstone on dune sand, low nutrients, intermittently damp or fairly dry.

EXPOSURE:

Conservation

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

RESTIONACEAE

Leptocarpus tenax

Life history

GROWTH FORM: Perennial herb, with shortly creeping rhizome; flowering stems 50–130 cm high, greyish green.

VEGETATIVE SPREAD: Creeping, branching rhizome.

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, September–November.

FRUIT/SEED: Nut 1–3 mm long, November–March.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld, Vic., Tas., S.A., W.A.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: **CC:** Mellong Range, Agnes Banks, Hornsby, Cheltenham, Curl Curl, Centennial Park, Malabar, La Perouse, Cronulla, Bundeena, Budderoo Creek, Bulli Lookout. **CT:** Wentworth Falls, Mt Murray.

Habitat

HABITAT: Swampy areas.

ALTITUDE: 0–1000 m **ANNUAL RAINFALL:** 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Wet heath e.g. with *Banksia robur*, *Banksia oblongiolia*, *Baeckea imbricata*, *Xanthorrhoea*; sedgeland e.g. with *Empodisma minus*, *Chorizandra species*, *Schoenus species*; low woodland e.g. with *Eucalyptus parramattensis*.

SUBSTRATE: Sandy soils on sandstone, sand, low nutrients, permanently moist.

EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Botany Bay NP, Royal NP.

RESTIONACEAE

Lepyrodia anarthria

Life history

GROWTH FORM: Perennial herb, densely tufted or with shortly creeping rhizome; flowering stems 30–80 cm high.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. com.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate stems, August–May, peak March.

FRUIT/SEED: Capsule 1–2 mm long, September–November.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.). Rhizomes contain large reserves of starch (Pate et al. 1995).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC NT CT ST; Qld, Vic., N.T.

DISTRIBUTION SYDNEY AREA: Mainly Upper Blue Mountains, Southern Highlands.

SELECT LOCATIONS: **CC:** Centennial Park, Malabar. **CT:** Clarence, Blackheath, Mt Werong, Hill Top, Joadja Creek, Wingecarribee Swamp, Wingello.

Habitat

HABITAT: In or near swamps.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Wet heath e.g. with *Eucalyptus stricta*, *Banksia robur*, *Sprengelia incarnata*, *Restio australis*, *Lepidosperma limicola*; swamp e.g. with *Melaleuca quinquenervia*, *Leptospermum juniperinum*; montane peatland.

SUBSTRATE: Wet or damp peaty soils on sandstone, quartzite, dune sand, low nutrients, permanently moist.

EXPOSURE:

Conservation

Conservation status unknown. Rare on the coast.

RESTIONACEAE

*Lepyrodia muelleri***Life history**

GROWTH FORM: Perennial herb, tufted or with shortly creeping rhizome and flowering stems 40–75 cm high.

VEGETATIVE SPREAD: Creeping rhizome.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on same plants.

FRUIT/SEED: Capsule 2 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts (Meney & Pate 1999).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: CC: Mellong Range, Londonderry, Mulgoa, East Hills, Centennial Park, La Perouse, Jibbon Lagoon, Marley, Thirlmere, Bargo, Hill Top.

Habitat

HABITAT: Wet situations, swamp margins.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Woodland e.g. with *Eucalyptus fibrosa*, *Angophora bakeri*, *Eucalyptus parramattensis*; sedgeland e.g. with *Baumea juncea*, *Baumea articulata*, *Empodisma minus*, *Lepyrodia scariosa*.

SUBSTRATE: Sandy or peaty soil on Tertiary alluvium, sandstone, low nutrients, permanently moist, sometimes slightly brackish, wetter situations than the more common *Lepyrodia scariosa* (Harden 1993).

EXPOSURE:

Conservation

Conservation status unknown. Reported in Royal NP.

RESTIONACEAE

Lepyrodia scariosa (group)**Life history**

GROWTH FORM: Perennial herb, usually tufted or with rhizome shortly creeping and flowering stems 35–90 cm high, with loose, open sheaths.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on different plants, August–January. Honeybees *Apis mellifera* gather pollen (P. Kubiak pers. comm.).

FRUIT/SEED: Capsule 2 mm long, December–March.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, flowering more abundant after fire, secondary juvenile period 1 year (D. Keith pers. comm.). Rhizomes contain large reserves of starch (Pate et al. 1995).

INTERACTION WITH OTHER ORGANISMS: Sometimes heavily cropped by rabbits (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: CC: Mellong Range, Warah Trig, Springwood, Agnes Banks, Berowra, Hornsby, Mona Vale, North Head, Gladesville, Rose Bay, Centennial Park, Oatley, La Perouse, Towra Point, Warumbul, Bundeena, Loftus, Kentlyn, Cambewarra Range. CT: Barren Grounds.

Habitat

HABITAT: Plateaus, creeks, seepage areas.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent to occasional.

VEGETATION: Heath e.g. with *Hakea gibbosa*, *Banksia ericifolia*, *Leptospermum trinervium*; woodland e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *Angophora costata*; sedgeland with *Leptocarpus tenax*, *Hypolaena fastigata*, *Restio dimorphus*.

SUBSTRATE: Sandy or peaty soil over sandstone, sand, low nutrients, permanently damp.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Brisbane Water NP, Marramarra NP, Royal NP, Heathcote NP, Barren Grounds NR.

RESTIONACEAE

Sporadanthus gracilis (*Lepyrodia gracilis*)**Life history**

GROWTH FORM: Perennial herb with flowering stems 30–150 cm high and shortly creeping rhizome.

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Male and female flowers on separate plants, March–September.

FRUIT/SEED: Capsule 2–3 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts (D. Keith pers. comm.). Rhizomes contain large reserves of starch (Pate et al. 1995).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT ST.

DISTRIBUTION SYDNEY AREA: Coast, Upper Blue Mountains.

SELECT LOCATIONS: CC: Bellevue Hill, Centennial Park, Malabar, La Perouse, Heathcote, Helensburgh, Appin. CT: Blackheath, Wentworth Falls, Bowral.

Habitat

HABITAT: Swamp margins, creekbanks, cliff faces.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Sedgeland e.g. with *Lepyrodia scariosa*, *Empodisma minus*, *Banksia robur*, *Gymnoschoenus sphaerocephalus*.

SUBSTRATE: Sandy soil on sandstone, sand, low nutrients, permanently moist.

EXPOSURE:

Conservation

Sydney is northern geographical limit. Conservation status unknown.

RIPOGONACEAE

Ripogonum album

White Supplejack

Life history

GROWTH FORM: Stout climber with stems to 15 m long, prickly, sometimes shrub-like when young; leaves thick, stiff, opposite.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: September–October.

FRUIT/SEED: Black berry 6–15 mm diam., with 1 to a few seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Coast.

SELECT LOCATIONS: **CC:** Ourimbah, Springwood, Parramatta, Waterfall, Bola Creek, Mt Keira, Albion Park, Minnamurra Falls.

Habitat

HABITAT: Rainforest.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Rainforest e.g. with *Sloanea woollsii*, *Archontophoenix cunninghamiana*, *Doryphora sassafras*, *Ceratopetalum apetalum*.

SUBSTRATE: Clay soil on shales, volcanic necks, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown.

RIPOGONACEAE

Ripogonum fawcettianum

Small Supplejack

Life history

GROWTH FORM: Small climber with stems to 4 m long, sometimes shrub-like, sparsely prickly.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: November–February.

FRUIT/SEED: Black berry 8–12 mm diam., with 1 to a few seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Gosford–Wyong area.

SELECT LOCATIONS: **CC:** Morisset, Ourimbah, Matcham, Kincumber, Bouddi.

Habitat

HABITAT: Rainforest.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Gully rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*, *Cryptocarya glaucescens*; moist eucalypt forest e.g. with *Eucalyptus saligna*, *E. paniculata*, *Angophora floribunda*.

SUBSTRATE: Clay soil on shale, basalt, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Gosford is southern geographical limit. Reported in Bouddi NP.

SMILACACEAE

Smilax australis

Sarsaparilla

Life history

GROWTH FORM: Climber with stems to 8 m long, usually prickly, often forming dense thickets; leaves 5-veined, leathery, upper and lower surface similar colour, tendrils to 20 cm long.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: All year but mainly spring–summer, separate male and female flowers on different plants.

FRUIT/SEED: Shiny, black berry 5–8 mm diam., with 1–2 seeds, mature summer, probably bird-dispersed.

DISPERSAL, ESTABLISHMENT & GROWTH: Both vertebrate and ant-adapted for dispersal (Westoby et al. 1990, Rice & Westoby 1981).

FIRE RESPONSE: Stem killed, resprouts at base or below (Fox 1988), vigorous regrowth after high-intensity fire (1/1994 at Narrabeen 1994), flowering within 9 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Sweet black fruit eaten when ripe by Aboriginal people, woody stems used as fire sticks to ignite fire when rubbed together, extract from leaves and bark used medicinally (Wightman & Andrews 1991).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST CWS; LHI, Qld, Vic., N.T.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** North Entrance, Ourimbah, Mooney Mooney, Kurrajong Heights, Narrabeen, Eastwood, Rookwood, Otford, Shellharbour, Cambewarra. **CT:** Coricudgy, Wentworth Falls, Robertson.

Habitat

HABITAT: Creek banks, open-forest.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Rainforest e.g. with *Doryphora sassafras*, *Ceratopetalum apetalum*; open-forest e.g. with *Eucalyptus saligna*; woodland e.g. with *Eucalyptus punctata*.

SUBSTRATE: Clay soil on shales, sandy loam on sandstone, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP, Bouddi NP, Brisbane Water NP, Marramorra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Robertson NR.

SMILACACEAE

Smilax glycyphylla

Sweet Sarsaparilla

Life history

GROWTH FORM: Climber with stems to 5 m long; leaves 3-veined, lower surface glaucous, tendrils to 8 cm long.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on different plants, October–March, peak December. Many tiny insects inside male flowers, probably thrips (P. Kubiak pers. comm.).

FRUIT/SEED: Shiny, black berry, 5–8 mm diam., with 1 seed.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: fruit, dispersed by Pied Currawong *Strepera graculina*, with maximum number of seed per pellet 54, average 10 (Buchanan 1989a) also ant-adapted for dispersal (Rice & Westoby 1981).

FIRE RESPONSE: Resprouted at base after high-intensity fire (1/1994 at Narrabeen), secondary juvenile period 12 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Fruit reported from pellets of Currawongs (Buchanan 1989a). Sweet leaves used as a substitute for sarsaparilla (Maiden & Campbell 1896). Apparently eaten by rabbits *Oryctolagus cuniculus*; leaves with tracks of leaf miners (P. Kubiak pers. comm.).

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC NT; Qld.
 DISTRIBUTION SYDNEY AREA: Widespread on coast.
 SELECT LOCATIONS: **CC:** Upper Colo, Kariong, Bowen Mountain, Springwood, Berowra, Barrenjoey, Manly, Mosman, La Perouse, Oatley, Kurnell, Waterfall, Macquarie Pass.

Habitat

HABITAT: Valleys, creeks.
 ALTITUDE: 0–600 m ANNUAL RAINFALL: 900–1400 mm
 TYPICAL LOCAL ABUNDANCE: Frequent–occasional.
 VEGETATION: Rainforest e.g. with *Ceratopetalum apetalum*, *Acmena smithii*; open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*.
 SUBSTRATE: Sandy soil on sandstone, alluvium, low nutrients, well-drained.
 EXPOSURE:

Conservation

Conservation status unknown. Reported in Blue Mountains NP.

SPARGANIACEAE

Sparganium subglobosum* (*Sparganium antipodum*)*Life history**

GROWTH FORM: Aquatic herb, erect rhizomatous emergent perennial herb to 1 m high.
 VEGETATIVE SPREAD: Rhizomatous spread.
 LONGEVITY: Perennial
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Separate male and female flowers on the same plant, November–April, peak January.
 FRUIT/SEED: Indehiscent fruit 4–7 mm long, crowded, with a drupaceous pericarp, January–April, peak January. Seed 4 mm diam.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE: Not likely to be burnt, probably resprouts.
 INTERACTION WITH OTHER ORGANISMS: Significant food source for birds (Sainty & Jacobs 1981).

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC SC NT CT ST SWS; Qld, Vic., N.Z.
 DISTRIBUTION SYDNEY AREA: Widespread on Coast.
 SELECT LOCATIONS: **CC:** Watagan Creek, Roberts Creek (Colo area), Little Cattai Creek, Longneck Lagoon, Eastlakes, Casula, Elderslie, Shoalhaven Head. **CT:** Wingecarribee Swamp, Tallong.

Habitat

HABITAT: Still or slow flowing water less than 1 m deep and on the margins of creeks, rivers, freshwater lagoons or swamps.
 ALTITUDE: 0–700 m ANNUAL RAINFALL: 800–1600 mm
 TYPICAL LOCAL ABUNDANCE: Frequent.
 VEGETATION: Sedgeland with *Eleocharis sphacelata*, *Marsilea mutica*, *Myriophyllum*.
 SUBSTRATE: Sandy to peaty sediments on alluvium, basalt/shale medium nutrients, permanently impeded drainage. Apparently can grow equally well on sand or mud. Water table permanently high, moisture supply continuous, fresh.
 EXPOSURE: Full sun.

Conservation

Localised occurrences, not conserved. Vulnerable in Western Sydney (James et al. 1999).

THISMIACEAE (BURMANNIACEAE)

***Thismia clavarioides* sp. nov.**

Fairy Lantern

Life history

GROWTH FORM: Saprophytic herb without chlorophyll and leaves reduced to scales; rhizomes fleshy, thin, 2 mm diam.

VEGETATIVE SPREAD: Creeping rhizome.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Solitary in spring, often half-buried in leaf litter, possibly pollinated by flies (Thiele & Jordan 2002).

FRUIT/SEED: Fleshy, whitish cup-shaped capsule 6 mm diam., with golden brown seeds 0.3 × 0.25 mm (Thiele & Jordan 2002).

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: CT.
 DISTRIBUTION SYDNEY AREA: Bundanoon.
 SELECT LOCATIONS: **CT:** Bundanoon.

Habitat

HABITAT: Leaf litter, rocks in rainforest.
 ALTITUDE: 500 m ANNUAL RAINFALL: 1100 mm
 TYPICAL LOCAL ABUNDANCE: Rare.
 VEGETATION: Rainforest e.g. with *Ceratopetalum apetalum*, *Acmena smithii*, *Backhousia myrtifolia*, *Eucryphia moorei*, *Tristaniopsis laurina* and various ferns (Thiele & Jordan 2002).
 SUBSTRATE: Humus-rich colluvial soil and leaf litter over Hawkesbury Sandstone (Thiele & Jordan 2002), medium nutrients.
 EXPOSURE: Sheltered, full shade.

Conservation

Localised rare endemic species, known from only two very small patches, possibly a single clone, in a small area in Morton NP near Bundanoon (recommended ROTAP coding 2 Kcit (Thiele & Jordan 2002).

TYPHACEAE

Typha domingensis

Narrow-leaved Cumbungi

Life history

GROWTH FORM: Robust, emergent monoecious aquatic herb to 4 m high, with creeping rhizome. Stems and leaves die down in autumn and plant resprouts annually from rhizomes (B. Briggs pers. comm.).
 VEGETATIVE SPREAD: Rhizomatous.
 LONGEVITY: Indefinite.
 PRIMARY JUVENILE PERIOD:
 FLOWERS: Separate male and female flowers on the same plant.
 FRUIT/SEED: 1-seeded fruit.
 DISPERSAL, ESTABLISHMENT & GROWTH:
 FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Leaves and stems eaten by Black Swan *Cygnus atratus* and foodplant of Freckled Duck *Stictonetta nervosa* (Barker & Vestjens 1989, 1990). Aboriginal people extracted starch from stems for food; they used the fibres for twine (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.
 BOTANICAL SUBREGIONS: NC CC ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., warm-temp. & trop. regions.
 DISTRIBUTION SYDNEY AREA:
 SELECT LOCATIONS: **CC:** Ku-ring-gai Chase, Windsor, Oakdale, Doonside, Shellharbour, Mt Coolangatta.

Habitat

HABITAT: Swamps, margins of lakes and streams.
 ALTITUDE: 0–200 m ANNUAL RAINFALL: 700–1200 mm
 TYPICAL LOCAL ABUNDANCE:
 VEGETATION: Sedgeland e.g. with *Juncus*.
 SUBSTRATE: Clay soils on shale, medium nutrients. Recorded on saline sites in western NSW (Semple 1993).
 EXPOSURE:

Conservation

Vulnerable in Western Sydney (James et al. 1999).

TYPHACEAE

Typha latifolia ***Life history**

GROWTH FORM: Robust, emergent monoecious aquatic perennial to 3 m high; rhizomes 20 mm diam.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on the same plant.

FRUIT/SEED: 1-seeded fruit.

DISPERSAL, ESTABLISHMENT & GROWTH: May spread rapidly under appropriate conditions.

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: The floss was used overseas for stuffing ship mattresses, as a binding material in mortar and emergency absorption material in surgery (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Exotic, native to temperate areas of N Hemisphere.

BOTANICAL SUBREGIONS: CC; Vic., Tas.

DISTRIBUTION SYDNEY AREA: Faulconbridge.

SELECT LOCATIONS: CC: Faulconbridge (1977).

Habitat

HABITAT: Swamps, margins of lakes.

ALTITUDE: 500 m ANNUAL RAINFALL: 1000 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE:

EXPOSURE:

Conservation

Only record for Sydney area is Faulconbridge in 1977 in a railway waterhole. Serious weed of irrigation systems in Victoria (Harden 1993).

TYPHACEAE

Typha orientalis

Broadleaf Cumbungi, Reed Mace

Life history

GROWTH FORM: Erect, rhizomatous aquatic herb to 4 m. Stems and leaves die down in autumn and plant resprouts annually from rhizomes (B. Briggs pers. comm.).

VEGETATIVE SPREAD: Extensive rhizomatous spread — measured to extend over 8 square metres in 6 months.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD:

FLOWERS: November–May.

FRUIT/SEED: Small, one-seeded follicle surrounded by silky hairs. Spikes with up to 200 000 seeds, with high percentage viability (Sainty & Jacobs 1981).

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, water and wind dispersed over large distances. Germination in all seasons (in Northern Tablelands, Britton & Brock 1994). Growth rate quick. Coloniser species. Evaporation of water from swamps may be reduced by scattered growth of *Typha* spp., as the tall plants shelter the water surface from wind and increase humidity near the water surface; grazing and cutting are useful alternatives to herbicide for control, cutting below the water line in autumn will effectively reduce the size of stands (Sainty & Jacobs 1981). FIRE RESPONSE: Probably resprouted after high intensity fire (1/1994 at Lane Cove), secondary juvenile period about 18 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Leaves and stems eaten by Black Swan *Cygnus atratus* and foodplant of Freckled Duck *Stictonetta nervosa* (Barker & Vestjens 1989, 1990). Aboriginal people extracted starch from stems for food; they used the fibre for twine (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., N.T., S.A., W.A., NZ, Malesia.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Woy Woy, Richmond, Avalon, La Perouse, Cooks River, Faulconbridge, Casula, Menangle, Austinmer, Nowra. CT: Capertee, Bathurst, Orange, Wingecarribee Swamp.

Habitat

HABITAT: Stationary or slow-flowing water to 2 m deep, ditches, ponds, creeks.

ALTITUDE: 0–900 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–dominant.

VEGETATION: Emergent sedgeland e.g. with *Phragmites australis*, *Carex*, *Cyperus*, *Ludwigia peploides*.

SUBSTRATE: Alluvial silt and clay soils from Wianamatta Shale, also peat (P. Kodela pers. comm.), medium nutrients. Water table permanently high, moisture supply continuous, fresh or brackish. Recorded on saline sites in western NSW (Semple 1993).

EXPOSURE: Full sun.

Conservation

Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. *Typha* spp. may be useful to extract pollutants from waste or drainage water (Sainty & Jacobs 1981).

UVULARIACEAE (LILIACEAE)

*Schelhammera undulata***Life history**

GROWTH FORM: Prostrate or erect herb to 20 cm high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Pink to mauve, September–November.

FRUIT/SEED: Wrinkled, ovoid capsule 5–8 mm diam., with a few yellow or brown seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: Ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).

FIRE RESPONSE: Resprouted from root base, flowering May, 4 months after high-intensity fire (1/1994 at Narrabeen).

Secondary juvenile period about 11 months (at Lane Cove, Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic.

DISTRIBUTION SYDNEY AREA: Mainly coastal.

SELECT LOCATIONS: CC: Gosford, Calga, Cowan, Narrabeen, Lindfield, Manly, Rose Bay, Otford, Austinmer, Bulli Pass, Wanganderry.

Habitat

HABITAT: Moist sheltered sites.

ALTITUDE: 0–500 m ANNUAL RAINFALL: 900–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Syncarpia glomulifera*, *Eucalyptus deanei*, *E. punctata*; rainforest e.g. with *Ceratopetalum apetalum*, *Acmena smithii*, *Backhousia myrtifolia*.

SUBSTRATE: Sandy clay soils on shale, sandstone, volcanics, basalt, medium nutrients.

EXPOSURE:

Conservation

Conservation status unknown. Reported in Garigal NP, Royal NP.

XANTHORRHOEACEAE

Xanthorrhoea arborea

Grass Tree

Life history

GROWTH FORM: Perennial plant, with woody trunk usually 1–2 m high, with 1 to many crowns.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 1–1.5 m long, on a woody stem 1.5–2 m long. Clustered bisexual flowers with copious nectar, surrounded by dark brown packing bracts, January–April. Fire not required to stimulate flowering (July 1997, Pittwater, without fire). Synchronous flowering (D.H.B.). Rainbow Lorikeets feed on nectar, native bees gather pollen, Honeybees gather pollen and feed on nectar, flies feed on pollen and nectar (P. Kubiak pers. comm.).

FRUIT/SEED: Capsule with 1–2 seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouted from apex of caudex, no flowering induced by high-intensity fire (1/1994 at Narrabeen).

Secondary juvenile period about 2 years (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995).Leaf tips of mature plants apparently eaten by rabbits *Oryctolagus cuniculus* (P. Kubiak pers. comm.). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: CC: Brooklyn, Maroota, Linden, Glenbrook, Rose Bay, Kurnell, Loftus. CT: Mt Coricudgy, Tayan Peak, Mt Irvine.

Habitat

HABITAT: Hillslopes, ridges.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Angophora costata*, *Eucalyptus crebra*, *E. piperita*; heath e.g. with *Banksia ericifolia*, *Eucalyptus obstans*.

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

EXPOSURE: Full sun to light shade.

Conservation

Local endemic species with geographical range from Rylstone district in the north to just south of Sydney (Harden 1993). Conservation status unknown.

XANTHORRHOEACEAE

Xanthorrhoea concava**Life history**

GROWTH FORM: Perennial plant, trunk absent, stem branched below ground; crowns 1 to many, each a loosely erect tuft.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.5–0.9 m long, on a woody stem 0.5–2.5 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, October–December, peak December.

FRUIT/SEED: Capsule with 1–2 seeds, January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995).

Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST.

DISTRIBUTION SYDNEY AREA: Coast and Southern Highlands.

SELECT LOCATIONS: CC: Pennant Hills, Baulkham Hills, Rookwood, Ingleburn, Douglas Park, Tahmoor. CT: Mt Colong, Hill Top, Mittagong, Tolwong.

Habitat

HABITAT: Hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 700–1600 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Moist open-forest e.g. with *Eucalyptus smithii*, *E. sieberi*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus punctata*, *E. agglomerata*.

SUBSTRATE: Gravelly clay soils on sandstone, often in seasonally water-logged sites, low nutrients.

EXPOSURE:

Conservation

Pennant Hills to Wahroonga is northern geographical limit. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

XANTHORRHOEACEAE

Xanthorrhoea fulva**Life history**GROWTH FORM: Perennial, trunk absent; stem branched below ground, with 1 to many crowns, each a stiff erect tuft. Hybridizes with *X. glauca* (Harden 1993).

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.1–0.6 m long, on a woody stem 0.2–1.6 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, August–October.

FRUIT/SEED: Capsule with 1–2 seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).**Distribution**

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA:

SELECT LOCATIONS: CC: Putty, Morisset, Wyong–Warnervale.

CT: Barren Grounds.

Habitat

HABITAT:

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1200–1600 mm

TYPICAL LOCAL ABUNDANCE: Rare.

VEGETATION:

SUBSTRATE: Sandy–peaty soils, periodically water-logged, low nutrients.

EXPOSURE:

Conservation

Wyong is main southern geographical limit with outlying population including Barren Grounds. Uncommon in Sydney area, conservation status unknown.

XANTHORRHOACEAE

Xanthorrhoea glauca subsp. *angustifolia***Life history**

GROWTH FORM: Trunk 1–5 m high, branched or single, with 1 to many crowns.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 1–1.6 m long, on a woody stem 0.5–1 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, September–December.

FRUIT/SEED: Capsule with 1–2 seeds, January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NT CT ST NWS CWS SWS NWP SWP.

DISTRIBUTION SYDNEY AREA: Mainly western Blue Mountains.

SELECT LOCATIONS: **CC**: Wyong. **CT**: The Forge/Macquarie River, Mt Armour, Abercrombie Caves, Yerranderie, Wombeyan Caves.

Habitat

HABITAT: Ridgetops.

ALTITUDE: 200–900 m ANNUAL RAINFALL: 600–900 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Woodland e.g. with *Acacia clunies-rossii*.

SUBSTRATE: Gravelly clay soils on rocky limestone, trachyte and gravelly slopes (Harden 1993).

EXPOSURE:

Conservation

Conservation status unknown.

XANTHORRHOACEAE

*Xanthorrhoea johnsonii***Life history**

GROWTH FORM: Trunk 0.1–5 m high, usually with only one stem and crown.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.2–1.2 m long, on a woody stem to 1.9 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, April–December.

FRUIT/SEED: Capsule with 1–2 seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NT NWS CWS NWP; Qld.

DISTRIBUTION SYDNEY AREA: Sporadic.

SELECT LOCATIONS: **CC**: Howes Valley, Wyoming.

Habitat

HABITAT: Steep slopes and ridges.

ALTITUDE: 0–300 m ANNUAL RAINFALL: 800–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest; heath.

SUBSTRATE: Sandy soils, well-drained, low nutrients.

EXPOSURE:

Conservation

Howes Valley is southern geographical limit, with outlying record for Wyoming.

XANTHORRHOACEAE

Xanthorrhoea latifolia subsp. *latifolia***Life history**

GROWTH FORM: Trunk absent or up to 32 m high, branched or single, with 1–4 crowns.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.5–1.2 m long, on a woody stem to 1–2.1 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, July–November.

FRUIT/SEED: Capsule with 1–2 seeds, September–November.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Wyong–Lake Macquarie area.

SELECT LOCATIONS: **CC**: Doyalson, Swansea, Kanwal, Wyong.

Habitat

HABITAT: Ridges, slopes.

ALTITUDE: 0–400 m ANNUAL RAINFALL: 1100–1200 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Eucalyptus haemastoma*.

SUBSTRATE: Sandy or gravelly clay soil on sandstone, sand hills, low nutrient, well-drained.

EXPOSURE:

Conservation

Wyong is the southern geographical limit, conservation status unknown.

XANTHORRHOACEAE

*Xanthorrhoea macronema***Life history**

GROWTH FORM: Perennial plant, trunk absent; stem sometimes branched below ground, with 1 to many crowns.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.05–0.13 m long, on a woody stem to 1–1.6 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, July–January, peak December.

FRUIT/SEED: Capsule with 1–2 seeds.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Coastal, Munmorah to Helensburgh.

SELECT LOCATIONS: **CC:** Fraser Park, Ourimbah SF, Bateau Bay, Maitland Bay, Lilyvale to Burning Palms, Helensburgh.

Habitat

HABITAT: Hillslopes.

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Open-forest e.g. with *Corymbia maculata*, *Corymbia gummifera*.

SUBSTRATE: Sandy to clay soils on sandstone, low nutrients.

EXPOSURE:

Conservation

Helensburgh is southern geographical limit. Conservation status unknown.

XANTHORRHOACEAE

Xanthorrhoea malacophylla

Life history

GROWTH FORM: Tall trunk usually 2–6 m high, stem branched or sometimes single, with 1–10 crowns; leaves more or less bright green, unusually spongy and soft.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.6–1.6 m long, on a woody stem to 1.3–1.8 m long. Clustered bisexual flowers, with copious nectar, surrounded by dark brown packing bracts, September–November.

FRUIT/SEED: Capsule with 1–2 seeds.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC.

DISTRIBUTION SYDNEY AREA: Coastal ranges, Wyong.

SELECT LOCATIONS: **CC:** Brunkerville, Yarramalong.

Habitat

HABITAT: Steep rocky hillsides.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Eucalypt open-forest.

SUBSTRATE:

EXPOSURE:

Conservation

Yarramalong is southern geographical limit, conservation status unknown.

XANTHORRHOACEAE

Xanthorrhoea media

Life history

GROWTH FORM: Trunk absent or up to 0.6 m high, usually with only one stem and crown.

VEGETATIVE SPREAD: No.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.35–0.9 m long, on a woody stem to 1–1.8 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, August–May, peak April. Flowers abundantly only after fire (Keith 1996). Native bees gathered pollen and fed on nectar, flies fed on nectar and pollen, beetle fed on nectar, pollen gathered by honeybees (P. Kubiak pers. comm.).

FRUIT/SEED: Capsule with 1–2 seeds, at any time.

DISPERSAL, ESTABLISHMENT & GROWTH: No special morphology for dispersal (Westoby et al. 1990).

FIRE RESPONSE: Resprouted after high intensity fire (1/1994 at Lane Cove, Narrabeen), secondary juvenile period about 15 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Sometimes small plants eaten by rabbits (P. Kubiak pers. comm.). Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Colo Heights, Kulnura, Central Mangrove, Mt Penang, Blaxlands Ridge, Hornsby Heights, Cheltenham, Parramatta, Como, Heathcote, Hill Top. **CT:** Blackheath, Kings Tableland,

Habitat

HABITAT: Drier, more exposed ridges and hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 900–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open-forest e.g. with *Corymbia gummifera*, *Eucalyptus punctata*, *Banksia serrata*.

SUBSTRATE: Clay to gravelly loam on sandstone, low nutrients.

EXPOSURE: Full sun to light shade.

Conservation

Local endemic species, conservation status unknown.

XANTHORRHOACEAE

Xanthorrhoea minor subsp. *minor*

Life history

GROWTH FORM: Trunk absent, stem branched below ground, with many crowns; variable species. Sometimes confused with depauperate plants of *X. media*, *X. fulva* (Harden 1993).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Inflorescence cylindrical 0.05–0.12 m long, on a woody stem to 0.3–0.6 m long. Clustered bisexual flowers, with copious nectar, surrounded by packing bracts, October–November.

FRUIT/SEED: Capsule with 1–2 seeds, often distinctively curved, January.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE: Resprouts from apex of caudex.

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; trunk a source of resin for Europeans and Aboriginal people (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Mainly western Sydney.

SELECT LOCATIONS: **CC:** Castlereagh, Agnes Banks, Berkshire Park, Glenbrook, Mulgoa, Parramatta, Gladesville, Liverpool, East Hills, Panania, Macquarie Fields.

Habitat

HABITAT: Heath, swamps.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 800–1100 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Woodland e.g. with *Angophora bakeri*, *Eucalyptus parramattensis*.

SUBSTRATE: Clay soils on Tertiary alluvium, sandstone, low nutrients, poorly-drained, periodically water-logged.

EXPOSURE:

Conservation

Local endemic species confined mainly to western Sydney. Reported in Castlereagh NR.

XANTHORRHOACEAE

Xanthorrhoea resinifera (*Xanthorrhoea resinosa*)**Life history**

GROWTH FORM: Trunk absent or to 0.6 m high, stem usually simple, leaves glaucous.

VEGETATIVE SPREAD: No.

LONGEVITY: More than 60 years (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD: More than 21 years (Keith 1996).

FLOWERS: Inflorescence cylindrical, dark brown, velvety 0.6–1.2 m long, on a woody stem to 0.7–1.5 m long. Clustered bisexual flowers, with copious nectar, surrounded by dark brown packing bracts, May–December, peak September. Flowers abundantly only after fire (Keith 1996).

FRUIT/SEED: Capsule with 1–2 seeds, often distinctively curved, September–May.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, no special morphology for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (Keith 1996). Flowering about 11 months after high intensity fire (1/1994 at Lane Cove, Narrabeen, P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS: Blossoms of *Xanthorrhoea* species eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Aboriginal people collected nectar for food; dry flower stalks used in fishing spears and for fire-making; yellow resin from trunk used on furniture, as incense in churches, for soap-making, and a source of picric acid (Cribb & Cribb 1982).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT; Vic.

DISTRIBUTION SYDNEY AREA: Blue Mountains and coast.

SELECT LOCATIONS: **CC:** Catherine Hill Bay, Kariong, Agnes Banks, Terrey Hills, Frenchs Forest, Centennial Park, Pagewood, Padstow, La Perouse, Audley, Heathcote, Coalcliff. **CT:** Mt Irvine, Clarence, Blackheath, Katoomba, Megalong Valley, Carrington Falls.

Habitat

HABITAT: Ridges, plateaus.

ALTITUDE: 0–1200 m ANNUAL RAINFALL: 800–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Heath e.g. with *Monotoca elliptica*, *Hypolaena fastigiata*; low eucalypt woodland e.g. with *Eucalyptus stricta*, *E. sclerophylla*, *E. sieberi*.

SUBSTRATE: Sandy soils on sandstone, sand, seasonally wet sites, low nutrients.

EXPOSURE:

Conservation

Catherine Hill Bay is northern geographical limit. Conservation status elsewhere unknown. Reported in Ku-ring-gai Chase NP, Garigal NP, Royal NP.

XYRIDACEAE

Xyris bracteata (*Xyris gracillis* subsp. *laxa*)**Life history**

GROWTH FORM: Tufted, erect, robust perennial herb.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, ephemeral, lasting only a few hours before shrivelling up (Conn & Doust 1997), December.

FRUIT/SEED: Capsule 3–4 mm long, with brown seeds 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC SC CT ST.

DISTRIBUTION SYDNEY AREA: **CC:** Somersby, Kariong, Cowan, West Head, Castlecove, Kogarah, Oatley, Marley Beach, Flat Rock Creek (RNP), Sublime Point, Darkes Forest. **CT:** Barren Grounds.

SELECT LOCATIONS: Mainly coastal.

Habitat

HABITAT: Drainage channels, swampy depressions, near creeks.

ALTITUDE: 0–600 m ANNUAL RAINFALL: 1200–600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Dry or wet heath e.g. with *Banksia serrata*, *Lambertia formosa*; open-woodland with heath understorey e.g. with *Corymbia gummifera*, *Banksia oblongifolia*, *Gymnoschoenus sphaerocephalus*, *Banksia robur*.

SUBSTRATE: Sandy soils, occasionally with gravel or silt over sandstone (Conn & Doust 1997), low nutrients, continually moist.

EXPOSURE:

Conservation

Usually locally frequent and so is not regarded as endangered or vulnerable (Conn & Doust 1997). Reported in Ku-ring-gai Chase NP, Royal NP, Barren Grounds NR.

XYRIDACEAE

*Xyris complanata***Life history**

GROWTH FORM: Robust perennial herb, with many stems; leaves and stems blue-green. Distinguished by flat strap-shaped leaves, with thickened differentiated margins (Conn & Doust 1994).

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, December–February, peak January; flowers usually remain open from 10 am to 4 pm; old flowers may remain for a second day (Doust & Conn 1994).

FRUIT/SEED: Capsule 2–4 mm long, with reddish-brown, egg-shaped small seeds less than 0.5 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC NWS CWS; Qld, W.A., N.T.

DISTRIBUTION SYDNEY AREA: Mainly coastal, north from Bundeena.

SELECT LOCATIONS: **CC:** Howes Valley, Gibba Swamp, Agnes Banks, Cowan, Narrabeen, Cape Solander, Bundeena. **CT:** Dunns Swamp.

Habitat

HABITAT: Moist depressions, drainage lines, roadsides, near streams (Doust & Conn 1994).

ALTITUDE: 0–650 m ANNUAL RAINFALL: 700–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Open woodlands e.g. with *Eucalyptus*, *Melaleuca*, *Acacia*; low *Melaleuca* woodland e.g. with *Banksia*, *Livistona* and groundlayer of grasses, sedges and other herbs; low heath of *Banksia oblongifolia* (Conn & Doust 1994).

SUBSTRATE: Sandy, loamy or rarely clayey soils, sometimes with ironstone gravel, on sandstone or siltstone (Conn & Doust 1994).

EXPOSURE:

Conservation

Not regarded as threatened or endangered (Conn & Doust 1994). Bundeena is southern geographical limit.

XYRIDACEAE

Xyris gracilis (*Xyris gracillis* subsp. *gracillis*)

Slender Yellow-eye

Life history

GROWTH FORM: Slender to robust erect tufted herb to 60 cm

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, November–March, flowering throughout the day (Conn & Doust 1997).

FRUIT/SEED: Capsule 3–4 mm long, with seeds 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts from base, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT; Qld, Vic.

DISTRIBUTION SYDNEY AREA: Widespread.

SELECT LOCATIONS: **CC:** Kariong, Bilpin, Cowan, West Head, Londonderry, Long Bay, Flat Rock Creek, Waterfall, Darques Forest.**CT:** Bell, Blackheath, Wentworth Falls, Katoomba, Fitzroy Falls, Robertson, Barren Grounds, Wingello.**Habitat**

HABITAT: Margins of swamps.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 800–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Open heath; wetter sites in dry sclerophyll forest with heath vegetation e.g. with *Banksia ericifolia*, *Goodenia*, *Thysanotus*, *Mitrasacme*, sedges, *Drosera* and *Bauera* (Conn & Doust 1997).

SUBSTRATE: Silty or peaty soils on sandstone, low nutrients, moist (Conn & Doust 1997).

EXPOSURE:

Conservation

Usually locally frequent, although sometimes occasional, not regarded as endangered or vulnerable (Conn & Doust 1997). Conserved in Western Sydney (James et al. 1999). Reported in Barren Grounds NR, Ku-ring-gai Chase NP, Royal NP.

XYRIDACEAE

Xyris juncea**Life history**

GROWTH FORM: Slender perennial herb with few stems; leaves and stems green or reddish-green

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, usually December–April, flowering apparently stimulated by fire, flowering rare in absence of fire; individual flowers open for a few hours on one day only, 11 am to 2 or 3 pm (Doust & Conn 1994).

FRUIT/SEED: Capsule 2–4 mm long, with golden-brown seeds to 0.5 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.). Fire appears to stimulate flowering (Doust & Conn 1994).

Flowered within 2 months of January fire (West Head, KCNP). Secondary juvenile period about 8 months after high intensity fire (1/1994 at Narrabeen, P. Kubiak 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:** Colo Heights, Kariong, Bilpin, Linden, West Head, Bondi, Picnic Point, Como, Flat Rock Creek, Wattamolla, Darques Forest, Maddens Plains. **CT:** Blackheath.**Habitat**

HABITAT: Moist depressions, drainage lines, near streams.

ALTITUDE: 0–1100 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Chorizandra sphaerocephala*; heath e.g. with *Banksia oblongifolia*, *Angophora hispida*.

SUBSTRATE: Sandy grey to black soil, often humus-rich, damp to wet, usually over sandstone (Doust & Conn 1994), low nutrients, usually permanently moist.

EXPOSURE:

Conservation

Although uncommon, it occasionally occurs in large localised patches and has a wide distribution; it is not considered to be threatened or endangered (Conn & Doust 1994), though its swampy habitats are vulnerable to drainage changes and disturbance. Reported in Royal NP.

XYRIDACEAE

Xyris operculata**Life history**

GROWTH FORM: Slender to robust erect, tufted herb

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, September–January, peak December, throughout the day, with flowers lasting more than one day (Conn & Doust 1997).

FRUIT/SEED: Capsule 4 mm long, with seeds 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC NT CT ST; Qld, Vic., Tas., S.A.

DISTRIBUTION SYDNEY AREA: Coast and Southern Highlands.

SELECT LOCATIONS: **CC:** Bateau Bay, Somersby, Kariong, Dee Why Lagoon, Manly, Centennial Park, La Perouse, Cape Solander, Flat Rock Creek, Waterfall, Darques Forest, Maddens Plains, Mt Kembla, Budderoo Creek, Barranggarry Mountain. **CT:** Wingecarribbee Swamp, Barren Grounds.**Habitat**

HABITAT: Swamps, creekbanks, rock shelves.

ALTITUDE: 0–700 m ANNUAL RAINFALL: 1200–1700 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Xyris ustulata*, *Banksia robur*; wet heath e.g. with *Banksia oblongifolia*, *Hakea teretifolia*.

SUBSTRATE: Peaty or silty sandy soils over sandstone or quartzite-rich substrates, low nutrients, permanently moist, damp to waterlogged.

EXPOSURE:

Conservation

Widespread, usually locally common, not regarded as endangered or vulnerable (Conn & Doust 1997), though vulnerable to drainage changes and disturbance. Reported in Royal NP, Barren Grounds NR.

XYRIDACEAE

Xyris ustulata**Life history**

GROWTH FORM: Robust, erect tufted herb

VEGETATIVE SPREAD:

LONGEVITY: Indefinite (D. Keith pers. comm.).

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, September–February, peak November–December, flowering throughout the day, with flowers lasting more than 1 day (Conn & Doust 1997).

FRUIT/SEED: Capsule 3–4 mm long, with seeds 1 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Recruitment mainly after fire (D. Keith pers. comm.).

FIRE RESPONSE: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: CC CT.

DISTRIBUTION SYDNEY AREA: Blue Mountains and Woronora Plateau.

SELECT LOCATIONS: **CC:** Linden, Darkes Forest, Bulli Pass, Budderoo Creek. **CT:** Mt Coricudgy, Running Stream, Mt Cameron, Mount Tomah, Blackheath, Katoomba, Wentworth Falls, Boyd Plateau, Hill Top, Fitzroy Falls.

Habitat

HABITAT: Peaty swamps and permanent seepages, hillsides.

ALTITUDE: 0–1000 m ANNUAL RAINFALL: 1000–1600 mm

TYPICAL LOCAL ABUNDANCE: Frequent–occasional.

VEGETATION: Sedgeland e.g. with *Lepidosperma*, *Baeckea linifolia*, *Xyris operculata*, *Leptospermum*; wet heath e.g. with *Banksia robur*.

SUBSTRATE: Peat or peaty soils on sandstone, low nutrients, permanently wet.

EXPOSURE:

Conservation

Local endemic species, not regarded as endangered or vulnerable (Conn & Doust 1997), though vulnerable to drainage changes and disturbance. Reported in Blue Mountains NP, Kanangra Boyd NP, Barren Grounds NR.

ZINGIBERACEAE

Alpinia arundelliana

Life history

GROWTH FORM: Perennial herb to 2 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Rose-red, November–January.

FRUIT/SEED: Dark blue-black capsule 10 mm diam.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Gosford–Wyong area.

SELECT LOCATIONS: **CC:** Martinsville, Yarramalong, Matcham.

Habitat

HABITAT: Gullies.

ALTITUDE: 0–200 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE: Occasional.

VEGETATION: Gully rainforest e.g. with *Ceratopetalum apetalum*, *Glochidion ferdinandi*, *Archontophoenix cunninghamiana*.

SUBSTRATE: Clay soils on shales, alluvium, medium to high nutrients.

EXPOSURE:

Conservation

Gosford is southern geographical limit, conservation status unknown.

ZINGIBERACEAE

Alpinia caerulea

Life history

GROWTH FORM: Perennial herb to 3 m high.

VEGETATIVE SPREAD:

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Yellow, spring.

FRUIT/SEED: Blue capsule 10 mm diam.

DISPERSAL, ESTABLISHMENT & GROWTH:

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Gosford area.

SELECT LOCATIONS: **CC:** Woy Woy (1905).

Habitat

HABITAT:

ALTITUDE: 0–100 m ANNUAL RAINFALL: 1200 mm

TYPICAL LOCAL ABUNDANCE:

VEGETATION: Coastal rainforest

SUBSTRATE:

EXPOSURE:

Conservation

Rare, only record for Sydney area is from Woy Woy (its southern geographical limit) in 1905. Conservation status unknown.

ZINGIBERACEAE

Hedychium gardnerianum *

Ginger Lily

Life history

GROWTH FORM: Perennial herb to 2.5 m high, with stout fleshy stem and thick fleshy rhizome to 1 m long or more, close to soil surface.

VEGETATIVE SPREAD: Extensive rhizome system.

LONGEVITY: Indefinite.

PRIMARY JUVENILE PERIOD: Less than 5 years.

FLOWERS: Yellow–orange in a large spike, January–May, peak March.

FRUIT/SEED: Capsule, seeds with a red, fleshy appendage.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, bird-dispersed.

Fruit reported from pellets of Currawongs (Buchanan 1989a) and Bulbuls (Herb. note). Vegetative dispersal by pieces of rhizome e.g. in garden refuse.

FIRE RESPONSE: Resprouted after high intensity fire (1/1994 at Lane Cove), secondary juvenile period about 22 months (P. Kubiak pers. comm.).

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Exotic, native to India, introduced as ornamental by 1900.

BOTANICAL SUBREGIONS: NC CC; Qld.

DISTRIBUTION SYDNEY AREA: Sydney suburbs and Illawarra.

SELECT LOCATIONS: **CC:** Hornsby (1967), Wahroonga (1973), Beecroft (1975), Naremburn (1965), Bradleys Head (1966), Glenfield (1973), Mt Keira.

Habitat

HABITAT: Damp areas, especially along creeks but can grow in drier sites (M. Clarke pers. comm.).

ALTITUDE: 0–400 m ANNUAL RAINFALL: 750–1400 mm

TYPICAL LOCAL ABUNDANCE: Frequent.

VEGETATION: Moist open-forest e.g. with *Eucalyptus pilularis*, *Syncarpia glomulifera*, *Angophora costata*.

SUBSTRATE: Rich, well-drained, moist, composted soils (M. Clarke pers. comm.).

EXPOSURE: Sheltered, shady areas.

Conservation

Introduced as garden plant by 1900 and reported naturalised and spreading into urban bushland, in 1960s. Established in moist places, spreading locally by rhizomes and seed. Control by digging out rhizomes.

ZOSTERACEAE

Heterozostera tasmanica

Eel Grass

Life history

GROWTH FORM: Submerged, rhizomatous, perennial seagrass with erect stems to 30 cm high.

VEGETATIVE SPREAD: Rhizomatous spread.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on same plant, warmer months.

FRUIT/SEED: Seeds 4 mm long, egg-shaped

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seed, dispersed by dropping from floating inflorescences at maturity. Stems and inflorescences growing in spring and summer, deciduous in winter (Harden 1993).

FIRE RESPONSE:

INTERACTION WITH OTHER ORGANISMS:

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; Vic., Tas., S.A., Chile.

DISTRIBUTION SYDNEY AREA: Coastal estuaries.

SELECT LOCATIONS: **CC:** Pittwater, Narrabeen Lagoon, Manly.

Habitat

HABITAT: Marine or estuarine, rarely exposed at low tide.

ALTITUDE: Below low tide level. ANNUAL RAINFALL: not applicable

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Submerged marine or estuarine habitats, rarely exposed at low tide (Harden 1993).

EXPOSURE:

Conservation

South from Port Stephens, uncommon, conservation status unknown.

ZOSTERACEAE

Zostera capricorni

Eel Grass

Life history

GROWTH FORM: Monoecious, submerged, rhizomatous, perennial seagrass with flowering stems to 50 cm long.

VEGETATIVE SPREAD: Rhizomatous.

LONGEVITY:

PRIMARY JUVENILE PERIOD:

FLOWERS: Separate male and female flowers on same plant, in warmer months, pollen dispersed passively through water movement.

FRUIT/SEED: Seeds elliptic, 2 mm long.

DISPERSAL, ESTABLISHMENT & GROWTH: Diaspore: seeds shed from floating inflorescence. Early seed set in *Zostera marina* in Europe was 22% lower in isolated vegetation patches compared to continuous eelgrass meadow (>50 m²) (Reusch 2003).

FIRE RESPONSE: Not burnt.

INTERACTION WITH OTHER ORGANISMS: Eaten by larvae of moth *Nymphula nitens* (Common 1990). Provides important habitat for fish (Middleton et al. 1984).

Distribution

STATUS/ORIGIN: Native.

BOTANICAL SUBREGIONS: NC CC SC; LHI, Qld, Vic., N.Z.

DISTRIBUTION SYDNEY AREA: Coastal estuaries.

SELECT LOCATIONS: **CC:** Terrigal Lake, Tuggerah Lakes, Pittwater, Long Reef, Sailors Bay/Northbridge, Manly, Balmoral, La Perouse, Quibray Bay, Kogarah Bay, Sans Souci, Port Hacking, Woronora River, Lake Illawarra, Shoalhaven River.

Habitat

HABITAT: Marine or estuarine, often exposed at low tide.

ALTITUDE: Below tide level. ANNUAL RAINFALL: n.a.

TYPICAL LOCAL ABUNDANCE:

VEGETATION:

SUBSTRATE: Submerged marine or estuarine habitats, often exposed at low tide.

EXPOSURE:

Conservation

Index to ecology of Sydney plant species 8

Scientific names are in bold type and synonyms are in italics. Family names are in upper case. Common names are in roman type. Exotic species are indicated by an asterisk following the botanical name.

A

- Acianthus**
amplexicaulis 33
apprimus 33
caudatus 33
collinus 34
exsertus 34
fornicatus 34
pusillus 34
reniformis 51
- Adenochilus**
nortonii 35
- Agropyron**
repens * 142
scabrum 142
- Agrostis**
aemula 153
bettyae 96
billardieri 154
capillaris * 96
gigantea * 96
semiverticillata 97
stolonifera * 97
tenuis * 96
venusta 97
viridis * 97
- Agrostis**
avenacea var. *avencacea* 154
 sp. *A sensu* 96
- Aira**
caryophyllea * 97
cupaniana * 98
elegans 98
elegantissima * 98
praecox * 98
provincialis * 98
- Alopecurus**
agrestis 99
myosuroides * 99
pratensis * 99
- Alpinia**
arundelliana 203
caerulea 203
- Ammophila**
arenaria * 99
- Amphibromus**
neesii 99
nervosus 99
pithogastrus 100
 sp. *A* 100
- Amphipogon**
strictus var. *strictus* 100
- Ancistrachne**
maidenii 100
- Andropogon**
virginicus * 100
- Anisopogon**
avenaceus 101
- Annual Cat's Tail 177

- Anthoxanthum**
odoratum * 101
- Aristida**
behriana 101
benthamii var. *spinulifera* 101
calycina var. *calycina* 102
echinata 103
jerichoensis var. *jerichoensis* 102
jerichoensis var. *subspinulifera* 102
personata 103
ramosa var. *ramosa* 102
ramosa var. *scaberula* 103
ramosa var. *speciosa* 103
vagans 103
warburgii 104
- Arrhenatherum**
elatus var. *bulbosum* * 104
elatus var. *elatus* * 104
- Arthrochilus**
huntianus 35
irritabilis 35
prolixus 35
- Arundinella**
nepalensis 104
- Arundo**
donax * 105
- Austrodanthonia**
auriculata 105
bipartita 105
caespitosa 105
carphoides 106
eriantha 106
laevis 106
linkii 106
monticola 107
penicillata 107
pilosa 107
racemosa 108
richardsonii 108
setacea 108
tenuior 108
- Austrofestuca**
eriopoda 109
hookeriana 109
littoralis 109
- Austrostipa**
aristiglumis 110
bigeniculata 110
densiflora 110
elegantissima 110
mollis 110
nitida 111
nodosa 111
pubescens 111
ramosissima 111
rudis subsp. *nervosa* 112
rudis subsp. *rudis* 112
scabra subsp. *falcata* 112
scabra subsp. *scabra* 113
semibarbata 113

- setacea* 113
verticillata 113

- Avena**
barbata * 114
fatua * 114
ludoviciana * 114
sativa * 114
sterilis * 115
- Axonopus**
affinis * 115
fissifolius * 115

B

- Baloskion**
australe 190
fimbriatum 190
gracile 190
longipes 191
pallens 191
tetraphyllum subsp.
meiostachyum 191
- Bamboo**
 Black 172
 Fishpole 171
- Barbgrass**
 Common 150
- Barley**
 Two Row 151
- Beardgrass**
 Perennial 176
- Bent**
 Browntop 96
 Creeping 97
 Graceful 97
 Redtop 96
 Water 97
- Blowngrass**
 Blowngrass 153
 Coast 154
- Bluegrass**
 Canada 173
 Kentucky 175
 Pitted 115
 Queensland 132
- Bothriochloa**
ambigua 116
biloba 115
decipiens 115
macra 116
Brachiaria piligera 186
- Brachyachne**
convergens 116
- Brachypodium**
distachyon * 116
- Briza**
maxima * 116
minor * 117
subaristata * 117
- Brome**
 Drooping 120
 False 116

- Giant 118
 Madrid 119
 Red 120
 Rye 120
 Sand 117
 Smooth 119
 Soft 119
 Sterile 120
- Bromus**
alopecurioides 117
alopecurus * 117
arenarius 117
brevis * 118
catharticus * 118
diandrus * 118
hordeaceus * 119
madritensis * 119
molliformis * 119
racemosus * 119
rubens * 120
secalinus * 120
sterilis * 120
tectorum * 120
unioloides 118
- Broomsedge 100
- Bulbophyllum**
crassulifolium 36
elisae 36
exiguum 36
minutissimum 36
shepherdii 36
- BURMANNIACEAE** 196
- Burnettia**
cuneata 37
- Burrgrass
 Hillside 121
 Small 184
 Spiny 122
- C**
- Caladenia**
alata 37
alba var. *picta* 41
alba 38
angustata 40
australis 37
caerulea 50
capitellata 37
carnea 38
carnea 39
catenata 38
clavigera 38
congesta 38
cucullata 39
curtisepala 39
dimorpha 39
filamentosa 39
filamentosa var. *tentaculata* 37
fitzgeraldii 40
fuscata 40
gracilis 40
hillmanii 40
holmesii 37
iridescens 41
phaeoclavia 41
picta 41
quadrifaria 41
- reticulata* 37
 sp. *B* 40
 sp. *C* 41
tessellata 42
testacea 42
- Caladenia**
 Black Tongue 38
 Blue 50
 Blue Fairy 50
 Bronze 41
 Honey 42
 Hooded 39
 Musky 40
 Parson-in-the-pulpit 50
 White 38
- Calanthe**
triplicata 42
- Caleana**
major 42
minor 68
- Calochilus**
campestris 43
gracillimus 43
imberbis 44
paludosus 43
robertsonii 44
saprophyticus 43
- Capillipedium**
parviflorum 121
spicigerum 121
- Catapodium**
rigidum * 121
- Cenchrus**
australis 121
caliculatus 121
echinatus * 122
incertus * 122
longispinus * 122
- Chiloglottis**
chlorantha 44
diphylla 44
formicifera 44
palachila 45
reflexa 45
seminuda 45
sylvestris 46
trapeziformis 46
trilabra 46
- Chionochloa**
pallida 122
- Chloris**
acicularis 143
divaricata var. *divaricata* 123
gayana * 123
truncata 123
ventricosa 124
virgata * 124
- Chloris**
 Slender 123
 Tall 124
- Chordifex**
dimorphus 192
fastigiatus 192
- Cleistochloa**
rigida 124
- Cocksfoot 127
- Coix**
lachryma-jobi * 124
- Common Reed 171
- Cortaderia**
selloana * 125
- Corybas**
aconitiflorus 46
barbarae 47
fimbriatus 47
fordhamii 47
hispidus 48
pruinosis 48
undulatus 48
unguiculatus 48
- Couch
 Common Native 116
 Couch 125
 English 142
 Marine 183
 Prickly 187
 Queensland Blue 135
 Salt-water 167
 Sand 183
 Water 166
- Crested Dog's Tail 126
- Cryptanthemis*
slateri 85
- Cryptostylis**
erecta 49
hunteriana 49
leptochila 49
subulata 50
- Cumbungi
 Broadleaf 197
 Narrow-leaved 196
- Cyanicula**
caerulea 50
- Cymbidium**
suave 50
- Cymbopogon**
refractus 125
- Cynodon**
dactylon 125
hirsutus 126
incompletus * 126
transvaalensis * 126
- Cynosurus**
cristatus * 126
echinatus * 126
- Cyrtostylis**
reniformis 51
- D**
- Dactylis**
glomerata * 127
- Dactyloctenium**
australe * 127
radulans 127
- Daddy Long-legs 39
- Danthonia**
auriculata 105
caespitosum 105
eriantha 106
laevis 106
linkii var. *fulva* 106
linkii var. *linkii* 105

- longifolia** 127
monticola 107
pallida 122
paradoxa 172
penicillata 107
pilosa 107
racemosa 108
richardsonii 108
semiannularis 128
setacea 108
tenuior 108
vickeryi 172
Darnel 157
Dendrobium
aemulum 91
cucumerinum 56
fairfaxii 57
gracilicaule 87
linguiforme 57
melaleucaphilum 87
pugioniforme 57
schoeninum 51
speciosum 87
striolatum 57
tarberi 88
teretifolium 58
tetragonum 87
Deyeuxia
angustifolia 128
appressa 128
brachyathera 128
decipiens 129
gunniana 129
imbricata 129
innominata 129
mckiei 129
mesathera 130
microseta 130
monticola var. *monticola* 130
nudiflora 130
parviseta var. *boormanii* 131
parviseta var. *parviseta* 131
quadriseta 131
scaberula 131
sp. D aff. *parviseta* 129
Dianella
caerulea var. *asserata* 92
caerulea var. *caerulea* 92
caerulea var. *cinerascens* 92
caerulea var. *producta* 92
caerulea var. *protensa* 93
caerulea var. *vannata* 93
congesta 93
crinoides 93
laevis 94
longifolia var. *longifolia* 94
longifolia var. *stenophylla* 94
prunina 94
revoluta var. *revoluta* 94
tasmanica 95
Dichanthium
affine 132
sericeum subsp. *sericeum* 132
Dichelachne
crinita 132
hirtella 132
inaequiglumis 132
micrantha 133
parva 133
rara 133
sciurea 133
siberiana 134
Digitaria
adscendens * 135
aequiglumis * 134
breviglumis 134
brownii 134
ciliaris * 135
didactyla 135
diffusa 135
diminuta 134
divaricatissima 135
ischaemum * 136
longiflora 136
parviflora 136
propinqua 136
ramularis 136
sanguinalis * 137
violascens * 137
Dimorphochloa
rigida 124
Diplachne
uninervia * 137
Dipodium
hamiltonianum 51
punctatum 51
roseum 52
variegatum 52
Diuris
aequalis 52
alba 52
aurea 53
bracteata 53
brevissima 53
chryseopsis 53
dendrobioides 54
lanceolata 54
latifolia 56
maculata 54
maculata var. *concolor* 52
maculosissima 55
pardina 55
pedunculata 55
platichila 55
praecox 55
punctata var. *alba* 52
punctata var. *minor* 54
punctata var. *punctata* 56
sulphurea 56
Dockrillia
cucumerina 56
fairfaxii 57
linguiformis 57
pugioniformis 57
schoenina 51
striolata 57
teretifolia 58
Dryopoa
dives 137
Duck Weed 26
E
Echinochloa
colona 138
crus-galli * 138
crus-pavonis * 138
escentula * 138
frumentacea * 139
telmatophila 139
utilis 138
Echinopogon
caespitosus var. *caespitosus* 139
cheelii 139
ovatus 140
Ehrharta
calycina * 140
erecta * 140
longiflora * 141
villosa * 141
Eichhornia
crassipes* 187
Eleusine
indica * 141
radulans 127
tristachya * 141
Elymus
repens * 142
scaber var. *scaber* 142
Elytrigia
repens * 142
Empodisma
minus 192
Enneapogon
gracilis 142
nigricans 142
Enteropogon
acicularis 143
Entolasia
marginata 143
stricta 143
whiteana 144
Eragrostis
benthamii 144
brownii 144
cilianensis * 144
curvula * 145
elongata 145
leptostachya 145
mexicana * 146
molybdea 146
neomexicana * 146
parviflora 146
philippica 144
pilosa * 146
sororia 147
tenuifolia * 147
trachycarpa 147
Eriachne
glabrata 147
Eriochilus
autumnalis 58
cucullatus 58
Eriochloa
procera 148
pseudoacrotricha 148
Erythrorchis
cassythoides 59

- Eulalia 158
Eurychorda
complanata 192
Eustrephus
latifolius 32
- F**
- Feathertop 168
 Fescue
 Beach 109
 Graceful 148
 Hooker's 109
 Meadow 149
 Rat's Tail 186
 Red 149
 Rigid 121
 Snow 109
 Squirrel Tail 186
 Tall 148
Festuca
arundinacea 148
asperula 148
bromoides 186
elatior * 148
eriopoda 109
hookeriana 109
littoralis 109
myuros 186
pratensis * 149
rubra subsp. rubra * 149
 Fog
 Creeping 151
 Yorkshire 151
 Foxtail
 Meadow 99
 Slender 99
 Frogsmouth 91
- G**
- Galeola cassythoides* 59
Gastridium
phleoides * 149
Gastrodia
entomogama 59
procera 59
sesamoides 59
Geitonoplesium
cymosum 32
Genoplesium
apostasioides 59
archeri 60
baueri 60
citriodorum 60
despectans 60
eriochilum 61
filiforme 61
fimbriatum 61
insignis 62
morinum 62
nudiscapum 62
nudum 62
plumosum 63
pumilum 63
rufum 63
ruppii 64
sagittiferum 64
- simulans** 64
woollsii 64
 Giant Reed 105
Glossodia
major 65
minor 65
Glyceria
australis 149
declinata * 150
maxima * 150
 Goldentop 154
 Grass
 African Feather 168
 Annual Beard 176
 Awnless Barnyard 138
 Bahia 166
 Barbed Wire 125
 Barnyard 138
 Bermuda 125
 Blady 152
 Bristle-tail 177
 Buffalo 183
 Button 127
 Canary 170
 Chilean Needle 158
 Coast Barb 163
 Coolatai 152
 Corkscrew 113
 Crab 141
 Crowsfoot 141
 Durban 127
 Early Spring 148
 Eel 204
 Elastic 147
 Fairy 182
 Feathertop Rhodes 124
 Finger 127
 Florida 126
 Forest Hedgehog 140
 Fountain 168
 Giant Mountain 137
 Giant Panic 160
 Goose 141
 Green Pigeon 180
 Greybeard 100
 Guinea 162
 Hair's Tail 154
 Indian Cupscale 178
 Johnson 180
 Kangaroo 184
 Kikuyu 167
 Lesser Canary 170
 Liverseed 185
 Lobed Wallaby 105
 Long-flowered Hedgehog 139
 Long-leaved Wallaby 127
 Marram 99
 Meadow Rice 158
 Mediterranean Barley 152
 Molasses 157
 Mossman River 122
 Narrow-leafed Carpet 115
 Northern Barley 151
 Oat Spear 101
 Pale Pigeon 179
 Palm 179
 Pampas 125
- Paradoxa 170
 Parramatta 181, 182
 Plains 110
 Porcupine 185
 Prairie 118
 Quaking 116
 Quick or Twitch 142
 Red 115, 116
 Red Leg 116
 Red Natal 157
 Redanther Wallaby 122
 Redleg 115
 Reed Canary 169
 Rhodes 123
 Ribbon 170
 Ringed Wallaby 105
 Scented-top 121
 Shivery 117
 Short-hair Plume 133
 Silvertop Wallaby 122
 Slender Pigeon 179
 Slender Wallaby 107
 Small-flowered Wallaby 108
 Smooth-flowered Wallaby 107
 South African Pigeon 179
 South American Barnyard 138
 Spider 116
 Spring 148
 Stout Bamboo 111
 Summer 135, 137
 Swamp Barnyard 139
 Sweet Vernal 101
 Tasmanian Wallaby 128
 Tufted Hedgehog 139
 Umbrella 135
 Urochloa 185
 Vasey 167
 Wallaby 105, 106, 107, 108, 172
 Wanderrrie 147
 Warrego 165
 Weeping 158
 Whisky 100
 Whorled Pigeon 180
 Windmill 123
 Winter 173
 Wire 101, 102
 Yakka 182
 Grass Tree 198
 Green Comb, 37
 Greenhood
 Bearded 81
 Blunt 75
 Botany Bay Bearded 74
 Cobra 77
 Illawarra 77
 King 73
 Long-tailed 84
 Midget 79
 Nodding 79
 Pointed 72
 Prawn 81
 Rainforest 78
 Sickle 77
 Snake Tongue 80
 Summer 76
 Swan 75
 Sydney Plains 83
 Tall 79

Tiny 80
Trim 75
Guringalia dimorpha 192

H**Hainardia**

cylindrica * 150

Hairgrass

Delicate 98
Early 98
False 169
Silvery 97, 98

Hairy Armgrass 186

Hairy Spinifex 181

Hedychium

gardnerianum * 203

Hemarthria

compressa 150
uncinata var. *uncinata* 150

Heterozostera

tasmanica 204

Holcus

lanatus * 151
mollis * 151

Hordeum

distichon * 151
glaucum * 151
hystrix * 152
leporinum * 152

Hyparrhenia

hirta 152

Hypolaena

fastigiata 193

I**Imperata**

cylindrica var. *major* 152

Isachne

australis 153
globosa 153

Ischaemum

australe var. *australe* 153

J

Japanese Millet 138

Job's Tears 124

L**Lachnagrostis**

aemula 153
billardierei subsp. *billardierei* 154
filiformis 154

Lagurus

ovatus * 154

Lamarckia

aurea * 154

Leersia

hexandra 155

Lemna

disperma 26
oligorhiza var. *oligorhiza* 26
oligorhiza var. *pleiorrhiza* 26

LEMNACEAE 26, 27

Leptocarpus

tenax 193

Leptochloa

ciliolata 155
peacockii 155

Lepyrodia

anarthria 193
gracilis 194
muelleri 194
scariosa 194

LILIACEAE 27, 92–96, 197

Lilium

formosanum * 27

Lily

Formosan 27
Ginger Lily 203
Scrambling 32

Liparis

coelogynoides 65
reflexa 66

Lolium

loliaceum * 155
multiflorum * 156
perenne * 156
rigidum * 156
temulentum * 157

Lomandra

brevis 27
confertifolia subsp. *pallida* 27
confertifolia subsp. *rubiginosa* 28
cylindrica 28
filiformis subsp. *coriacea* 28
filiformis subsp. *filiformis* 29
filiformis subsp. *flavior* 29
fluviatilis 29
glauca 29
gracilis 30
longifolia 30
micrantha subsp. *tuberculata* 30
montana 31
multiflora 31
obliqua 31

LOMANDRACEAE 27–31

Lovegrass

African 145
Brown's 144
Clustered 145
Mexican 146
Paddock 145
Soft 146
Weeping 146

LUZURIAGACEAE 32

Lyperanthus

nigricans 84
suaveolens 66

M**Mat-rush**

Many-flowered 31
Pale 29
Small-flowered 30
Spiny-headed 30

Matgrass 150

Melinis

minutiflora * 157
repens * 157

Microlaena

stipoides var. *brevisetata* 157
stipoides var. *stipoides* 158

Microstegium

nudum 158

Microtis

angusii 66
bipulvinaris 66
parviflora 66
rara 67
unifolia 67

Millet

Ditch 166
Foxtail 178
Native 161
Siberian 139
Swamp 153

Miscanthus

sinensis * 158

Monerma cylindrica 150

Mudgrass

Slender 177
Spiny 177

N

NAJADACEAE 32

Najas

browniana 32
tenuifolia 32

Nassella

neesiana * 158
trichotoma * 159

Needle Grass

Chilean 158
Purple 185

Niggerheads 142

Nitgrass 149

Notochloe

microdon 159

Notodanthonia 106

longifolia 127

monticola 107

racemosa 108

semiannularis 128

tenuior 108

O**Oat**

Bearded 114
Oat 115

Oatgrass

Bulbous 104
False 104

Oats

Ludo Wild 114
Oats 114
Wild 114

Onion Twitch 104

Oplismenus

aemulus 159
imbecillis 160

Orchid

Ant 44
Banded Helmet 47
Bristly Helmet 48
Broad-lipped Leek 71
Buttercup Doubletail 52
Butterfly 85
Christmas 42

Cinnamon Bells 59
 Clubbed Spider 38
 Copper Beard 43
 Cucumber 56
 Dagger 57
 Dense Midge 62
 Dotted Sun 89
 Elbow 35
 Fairy 37
 Fringed Helmet 47
 Fringed Spider 37
 Gnat 34, 51
 Golden Moths 54
 Green Beaks 85
 Green Midge 63
 Green Rock 85
 Horned 67
 Hornet 56
 Ironbark 91
 Ladies' Tresses 86
 Large Duck 42
 Large Tongue 50
 Large Veined Sun 91
 Late Beard 43
 Leafless Tongue 49
 Leopard 55
 Little Dumpies 84
 Lizard 37
 Maroonhood 81
 Marsh Leek 71
 Mayfly 33
 Mosquito 34
 Naked Sun 88
 Orange Blossum 86
 Pencil 51
 Piano 69
 Pineapple 36
 Pink Sun 88
 Plain Sun 90
 Potato 59
 Purple Donkey 56
 Purplish Beard 44
 Rat's Tail 57, 58
 Red Beard 43
 Red Midge 63
 Rogers Scented Leek 70
 Ruddyhood 82
 Rusty Hood 83
 Scented Onion 67
 Sharp Midge 60
 Short-lipped Leek 69
 Slaty Leek 70
 Slender Beard 43
 Slender Onion 66
 Slender Sun 90
 Small Duck 68
 Small Helmet 48
 Small Snake 53, 55
 Small Spider 38
 Small Tongue 49
 Small Waxlip 65
 Snake 50, 54
 Southern Leek 69
 Spider 40, 87
 Spotted Doubletail 54
 Spurred Helmet 46

Streaked Leek 71
 Sun 90
 Sweet Leek 70
 Tailed Helmet 48
 Tall Leek 69
 Tall Sun 90
 Tallong Midge 63
 Tangle 68
 Tartan Tongue 49
 Thick Lip Spider 42
 Tiger 56
 Tiny Midge 62
 Tiny Sun 88
 Toothed Helmet 48
 Tree Spider 87
 Underground 85
 Veined Sun 88
 Waxlip 65
 Wheat-leaved 36
 White Feather 91

ORCHIDACEAE 33–91

Orthoceras
strictum 67

Ottochloa
gracillima 160

P

Panic
 Black-seeded 160
 Blue 160
 Bordered 143
 Dwarf 163
 Green 162
 Pygmy 163
 Slender 165
 Two Colour 163
 White Water 162
 Wiry 143

Panicum
antidotale * 160
bisulcatum 160
capillare var. *capillare* * 161
decompositum 161
effusum 161
fulgidum 163
gilvum * 161
indicum 178
laevifolium var. *contractum* 161
laevifolium var. *laevifolium* * 163
maximum var. *maximum* * 162
maximum var. *trichoglume* * 162
obseptum 162
pygmaeum 163
schinzii * 163
simile 163

Papillilabium
beckleri 68

Paracaleana
minor 68

Parapholis
incurva * 163

Paspalidium
albovillosum 164
aversum 164
criniforme 164
distans 164
gracile 165

jubiflorum 165
radiatum 164

Paspalum 165
dilatatum * 165
distichum 166
distichum 167
notatum * 166
orbiculare 166
paspalodes 166
quadrifarum * 166
urvillei * 167
vaginatum 167

Paspalum
 Tussock 166

Pennisetum
alopecuroides 167
clandestinum * 167
macrourum * 168
setaceum * 168
villosum * 168

Pentaschistis
airoides * 169

Phalaris 169
angusta * 169
aquatica * 169
arundinacea var. *arundinacea* * 169
arundinacea var. *picta* * 170
canariensis * 170
minor * 170
paradoxa * 170

PHILESIACEAE 32

PHILYDRACEAE 91

Philydrum
lanuginosum 91

Phleum
pratense * 171

PHORMIACEAE 92–96

Phragmites
australis 171
communis 171

Phyllostachys
aurea * 171
nigra * 172

Pink Fairy 38
 Pink Fingers 38
 Pixie Caps 34

Plectorrhiza
tridentata 68

Plinthanthesis
paradoxa 172
urvillei 172

Poa
affinis 172
annua * 173
caespitosa var. *affinis* 172
cheelii 173
compressa * 173
induta 174
labillardierei 174
meionectes 174
poiformis 174
pratensis * 175
queenslandica 175
sieberiana var. *cyanophylla* 175
sieberiana var. *sieberiana* 175
tenera 176
trivialis * 176

- Poa
 Annual Poa 173
 Bulbous Poa 173
- POACEAE 96–187
- Polyogon**
littoralis * 176
monspeiliensis * 176
- Pondweed
 Clasped 189
 Curly 188
 Floating 189
 Sago 188
- PONTEDERIACEAE 187
- Posidonia**
australis 187
- POSIDONIACEAE 187
- Potamogeton**
crispus 188
javanicus 188
ochreatus 188
pectinatus 188
perfoliatus 189
tricarinatus 189
- POTAMOGETONACEAE 188–190
- Prasophyllum**
affine 68
anomalum 59
apostasioides 59
appendiculatum 69
archeri 60
australe 69
bowdeniae 59
brevilabre 69
despectans 60
elatum 69
eriochilum 61
flavum 70
fuscum 70
morrisii var. *intermedium* 64
nudiscapum 62
nudum 62
odoratum 70
pallens 71
patens 71
plumosum 63
pumilum 63
rogersii 71
rufum 63
sagittiferum 64
striatum 71
uroglossum 72
woollsii 64
- Pseudoraphis**
paradoxa 177
spinescens 177
- Psilurus**
incurvus * 177
- Pterostylis**
aciculiformis 72
acuminata 72
aestiva 72
alata 73
alveata 73
baptistii 73
barbata 81
bicolor 74
Botany Bay Bearded Greenhood 74
- ceriflora* 77
coccina 74
concinna 75
curta 75
cycnocephala 75
daintreana 75
decurva 76
erecta 76
fischii 76
furcata 77
gibbosa 77
grandiflora 77
hildae 78
hispidula 78
laxa 78
longifolia 79
longipetala 79
mutica 79
nutans 79
obtusa 80
ophioglossa 80
parviflora 80
pedoglossa 81
pedunculata 81
plumosa 81
pulchella 82
pusilla 82
pusilla var. *prominens* 83
reflexa 82
revoluta 83
revoluta 83
rufa 83
saxicola 83
 sp. 15 74
 sp. B 83
 sp. E 83
truncata 84
tunstallii 84
woollsii 84
- Pygrass 141
- Pyrochoris**
nigricans 84
- R**
- Reed Mace 197
 Reedgrass 104
- Restio*
australis 190
complanatus 192
dimorphus 192
fastigiatus 192
fimbriatus 190
gracilis 190
longipes 191
pallens 191
tetraphyllus subsp. *meiostachyus* 191
- RESTIONACEAE 190–194
- Rhizanthella**
slateri 85
- Rhynchelytrum repens* 157
- Rimacola**
elliptica 85
- RIPOGONACEAE 194, 195
- Ripogonum**
album 194
fawcettianum 195
- Rock Lily 87, 88
- Rostraria**
cristata * 177
- Rottboellia**
cochinchinensis * 178
exaltata 178
- Rough Dog's Tail 126
 Rough Meadowgrass 176
- Ruppia**
maritima 189
megacarpa 189
polycarpa 190
spiralis 190
- Rye
 Cereal Rye 178
- Ryecorn 178
- Ryegrass
 Italian 156
 Perennial 156
 Stiff 155
 Wimmera 156
- Rytidosperma*
carphoides 106
monticolum 107
racemosum 108
tenuis 108
- S**
- Sacciolepis**
indica 178
- Sarcochilus**
australis 85
falcatus 86
hillii 86
olivaceus 86
- Saropsis fastigata* 192
- Sarsaparilla 195
- Schelhammera**
undulata 197
- Seagrass 187
- Secale**
cereale * 178
- Setaria** 179
geniculata var. *pauciseta* 179
glauca 179
gracilis 179
italica * 178
palmifolia * 179
parviflora * 179
pumila * 179
sphacelata * 179
verticillata * 180
viridis * 180
- Slender Nineawn 142
 Slender Yellow-eye 202
- SMILACACEAE 195
- Smilax**
australis 195
glyciphylla 195
- Snowgrass 175
- Sorghum**
bicolor subsp. *drummondii* * 180
halepense * 180
leiocladum 181
sudanense 180
- Sorghum
 Cultivated Sorghum 180
 Wild Sorghum 181

SPARGANIACEAE 196

Sparganium

- antipodum* 196
- subglobosum 196**

Speargrass 112, 113

- Feather 110
- Threawn 103

Spinifex

- hirsutus* 181
- sericeus 181**

Spiranthes

- sinensis subsp. australis 86**

Spiranthes australis 86

Spirodela

- polyrhiza 26**
- punctata 26**
- pusilla* 26

Sporadanthus

- gracilis 194**

Sporobolus

- africanus * 181**
- caroli 182**
- creber 182**
- elongatus 182**
- fertilis * 182**
- indicus* var. *capensis* 181
- indicus* var. *major* * 182
- virginicus var. minor 183**
- virginicus var. virginicus 183**

Stenotaphrum

- secundatum * 183**

Stinkgrass 144

Stipa

- aristiglumis* 110
- bigeniculata* 110
- densiflora* 110
- elegantissima* 110
- falcata* 112
- mollis* 110
- neesiana* 158
- nitida* 111
- nodosa* 111
- pubescens* 111
- ramosissima* 111
- rudis* subsp. *rudis* 112
- rudis* subsp. *nervosa* 112
- semibarbata* 113
- setacea* 113
- verticillata* 113

Stypandra

- glauca 95**

Stypandra

- caespitosa* 95
- umbellata* 96

Supplejack

- Small 195
- White 194

Swamp Ricegrass 155

Sweet Sarsaparilla 195

Sweetgrass

- Australian 149
- Reed 150
- Sweetgrass 150

T**Tetrabaculum**

- melaleucaphilum 87**
- tetragonum 87**

Tetrarrhena

- juncea 183**
- turfosa 184**

Thelionema

- caespitosum 95**
- umbellatum 96**

Thelychiton

- gracilicaulis 87**
- speciosus 87**
- tarberi 88**

Thelymitra

- carnea 88**
- circumsepta 88**
- cyanea 88**
- erosa 89**
- ixioides** var. **ixioides 89**
- malvina 89**
- media** var. **media 90**
- merraniae 90**
- nuda 90**
- pauciflora 90**
- pulchella* 89
- retecta* 88
- subsp. *alpicola* 89
- venosa 91**

Themeda

- australis 184**

Thin-leaved Naiad 32

Thismia

- clavarioides** sp. nov. **196**

THISMIACEAE 196

Timothy 171

Tragus

- australianus 184**

Triodia

- scariosa** subsp. **scariosa 185**

Triraphis

- mollis 185**

Triticum

- aestivum * 185**

Tropilis

- aemula 91**

Tussock

- Serrated 159
- Yass 159
- Tussock 174

Typha

- domingensis 196**
- latifolia * 197**
- orientalis 197**

TYPHACEAE 196, 197

U**Urochloa**

- panicoides * 185**
- piligera 186**

UVULARIACEAE 197

V

Veldtgrass

- Annual 141
- Panic 140
- Perennial 140

Vulpia

- bromoides * 186**
- megalura* 186
- muralis * 186**
- myuros * 186**

W

Water Hyacinth 187

Waternymph 32

Wheat 185

Wheatgrass

Common 142

White Fingers 38

White Foxtail 168

Wiregrass

Bunch 101

Jericho 102

Wiry Ricegrass 183

Witchgrass 161

Wolffia

- angusta 26**
- australiana 27**

Wombat Berry 32

X**Xanthorrhoea**

- arborea 198**
- concava 198**
- fulva 198**
- glauca** subsp. **angustifolia 199**
- johnsonii 199**
- latifolia** subsp. **latifolia 199**
- macronema 199**
- malacophylla 200**
- media 200**
- minor** subsp. **minor 200**
- resinifera 201**
- resinosa* 201

XANTHORRHOEACEAE 198–201

XYRIDACEAE 201, 202

Xyris

- bracteata 201**
- complanata 201**
- gracilis 202**
- gracillis* subsp. *gracillis* 202
- gracillis* subsp. *laxa* 201
- juncea 202**
- operculata 202**
- ustulata 202**

Z

ZINGIBERACEAE 203

Zostera

- capricorni 204**

ZOSTERACEAE 204

Zoysia

- macrantha 187**