

Ecology of Sydney plant species

Part 9 Monocotyledon families Agavaceae to Juncaginaceae

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Benson, Doug and McDougall, Lyn (National Herbarium of New South Wales, Royal Botanic Gardens and Domain Trust, Sydney, Australia 2000) 2002. Email: doug.benson@rbgsyd.nsw.gov.au) 2002. Ecology of Sydney plant species: Part 9 Monocotyledon families Agavaceae to Juncaginaceae. Cunninghamia 7(4) 695–930. Ecological data in tabular form are provided on 361 plant species of the families Agavaceae to Juncaginaceae, 260 native and 101 exotics, occurring in the Sydney region, defined by the Central Coast and Central Tablelands botanical subdivisions of New South Wales (approximately bounded by Lake Macquarie, Orange, Crookwell and Nowra). Relevant Local Government Areas are Auburn, Ashfield, Bankstown, Bathurst, Baulkham Hills, Blacktown, Blayney, Blue Mountains, Botany, Burwood, Cabonne, Camden, Campbelltown, Canterbury, Cessnock, Concord, Crookwell, Drummoyne, Evans, Fairfield, Greater Lithgow, Gosford, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kiama, Kogarah, Ku-Ring-Gai, Lake Macquarie, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, Mulwaree, North Sydney, Oberon, Orange, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Rylstone, Shellharbour, Shoalhaven, Singleton, South Sydney, Strathfield, Sutherland, Sydney City, Warringah, Waverley, Willoughby, Wingecarribee, Wollondilly, Wollongong, Woollahra and Wyong. The study area falls within the Sydney Basin IBRA Bioregion.

Families are: Agavaceae, Alismataceae, Alliaceae, Alstroemeriaceae, Amarylidaceae, Anthericaceae, Aponogetonaceae, Araceae, Arecaceae, Asparagaceae, Asphodelaceae, Asteliaceae, Blandfordiaceae, Burmanniaceae, Cannaceae, Centrolepidaceae, Colchicaceae, Commelinaceae, Cyperaceae, Dioscoreaceae, Doryanthaceae, Eriocaulaceae, Flagellariaceae, Haemodoraceae, Hyacinthaceae, Hydrocharitaceae, Hypoxidaceae, Iridaceae, Juncaceae, Juncaginaceae.

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

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

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

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

Conservation: Conservation status.

Introduction

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

Part 9 of the *Ecology of Sydney plant species* covers the Monocotyledon families alphabetically from Agavaceae to Juncaginaceae. Part 10, Monocotyledon families Lemnaceae to Zosteraceae 2003, Part 11, Monocotyledon family Poaceae 2004.

Methods

Part 9 follows the format used in Parts 1–8 (Benson & McDougall 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001). The Sydney region is defined as the Central Coast and Central Tablelands botanical subdivisions (i.e. approximately bounded by Lake Macquarie, Orange, Crookwell and Nowra) (Fig. 1). This is the area broadly covered by *Flora of the Sydney Region* (Carolin & Tindale 1993), with the exception that the Hunter Valley is not included here since it lies within the North Coast and Central Western Slopes subdivisions. Relevant Local Government Areas are Auburn, Ashfield, Bankstown, Bathurst, Baulkham Hills, Blacktown, Blayney, Blue Mountains, Botany, Burwood, Cabonne, Camden, Campbelltown, Canterbury, Cessnock, Concord, Crookwell, Drummoyne, Evans, Fairfield, Greater Lithgow, Gosford, Hawkesbury, Holroyd, Hornsby, Hunters Hill, Hurstville, Kiama, Kogarah, Ku-ring-gai, Lake Macquarie, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, Mulwaree, North Sydney, Oberon, Orange, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, Rylstone, Shellharbour, Shoalhaven, Singleton, South Sydney, Strathfield, Sutherland, Sydney City, Warringah, Waverley, Willoughby, Wingecarribee, Wollondilly, Wollongong, Woollahra and Wyong. The study area falls within the Sydney Basin IBRA bioregion (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
- Part 11: Monocotyledon family Poaceae

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

Part 10, Monocotyledon families Lemnaceae to Zosteraceae, is planned for publication in 2003, and any information that readers would like included should be sent to the authors by 30 June 2003.

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

Information categories

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

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

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

Botanical nomenclature

Family/Genus/Species: Names currently recognised at the National Herbarium of NSW and mostly as used in *Flora of New South Wales* 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 9

Part 9 covers 361 plant species of the monocotyledon families Agavaceae to Juncaginaceae, 260 native and 101 naturalised exotics.

Plant families in this part are Agavaceae, Alismataceae, Alliaceae, Alstroemeriaceae, Amaryllidaceae, Anthericaceae, Aponogetonaceae, Araceae, Arecaceae, Asparagaceae, Asphodelaceae, Asteliaceae, Blandfordiaceae, Burmanniaceae, Cannaceae, Centrolepidaceae, Colchicaceae, Commelinaceae, Cyperaceae, Dioscoreaceae, Doryanthaceae, Eriocaulaceae, Flagellariaceae, Haemodoraceae, Hyacinthaceae, Hydrocharitaceae, Hypoxidaceae, Iridaceae, Juncaceae, Juncaginaceae. Very little ecological work has been done on these groups.

Excluded from this work are a number of exotic species that do not appear to be truly naturalised in the Sydney region (*Agave americana*, *Allium neopolitanum*, *Allium oleraceum*, *Aloe maculata*, *Amaryllis belladonna*, *Anomatheca laxa*, *Callisia fragrans*, *Cyperus bowmannii*, *Cyperus papyrus*, *Ipheion uniflorum*, *Ixia polyotachya*, *Leucojum aestivum*, *Moraea miniata*, *Narcissus pseudonarcissus*, *Ornithogalum longibracteatum*, *Ornithogalum umbellatum*).

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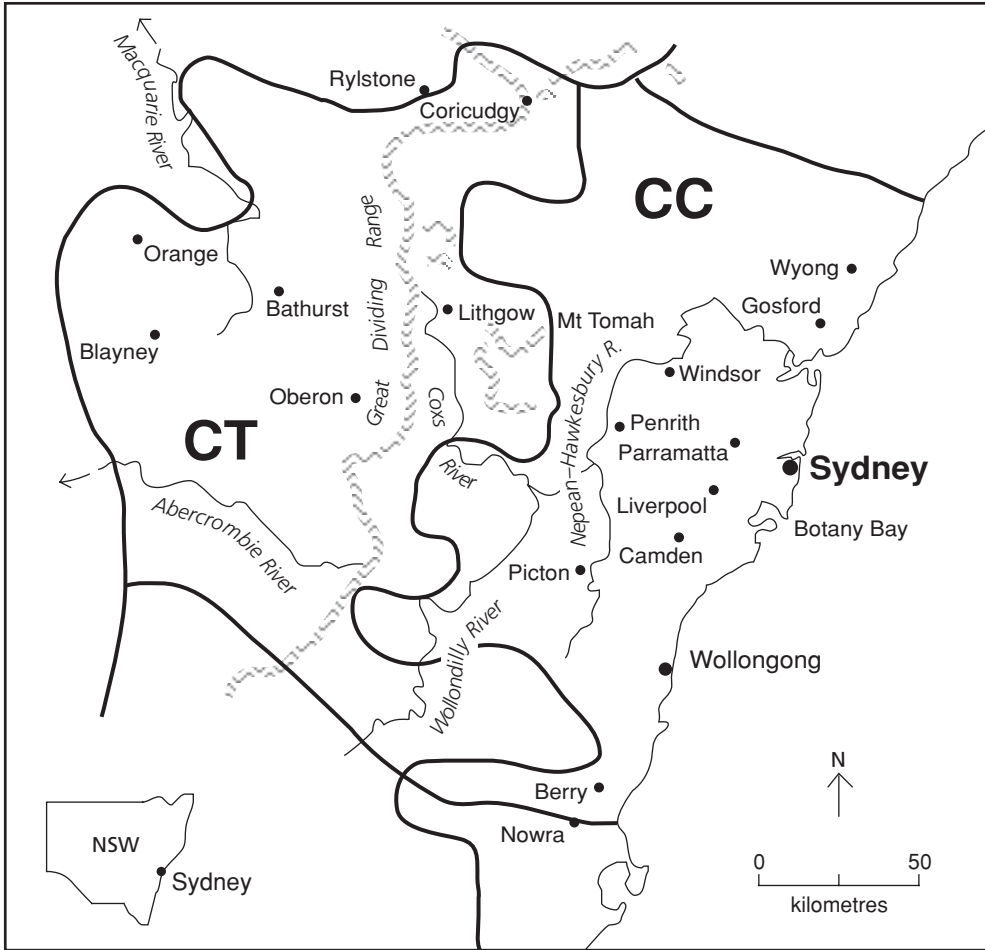
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Map of the Sydney region

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

Monocotyledon families Agavaceae to Juncaginaceae

Furcraea foetida *

AGAVACEAE

Mauritius Hemp

Life history

Growth form: Shrubby plant, with tufted succulent leaves and stem to 50 cm high.

Vegetative spread: Spread by bulbils.

Longevity:

Primary juvenile period:

Flowers: Whitish-greenish, autumn.

Fruit/seed: Capsule with flattened seeds, although fruit not formed here in NSW.

Dispersal, establishment & growth: Vegetative dispersal by bulbils which develop on flowering branches after flowers have fallen.

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: NC CC; LHI, Qld, W.A.

Distribution Sydney area: Sydney Harbour.

Select locations: CC: Bradleys Head (1965).

Habitat

Habitat:

Altitude: 0–50 m

Annual rainfall: 1200 mm

Typical local abundance: Occasional.

Vegetation: Eucalypt woodland.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Naturalised in bushland around foreshores of Sydney Harbour, particularly Mosman (Harden 1993), crowding out native species.

Alisma plantago-aquatica**ALISMATACEAE**

Water Plantain

Life history**Growth form:** Erect emergent aquatic perennial to 1.5 m tall.**Vegetative spread:** No.**Longevity:** Probably short.**Primary juvenile period:****Flowers:** Flowers December–April after rapid vegetative growth in spring. Flowers open for one day then shrivel. Insect-pollinated (Cook 1990).**Fruit/seed:** Head of one-seeded nutlet which fall singly on maturity, December–April. Seed size 0.7 mm, weight 0.33 mg (Shiple & Parent 1991).**Dispersal, establishment & growth:** Diaspore: nutlet, buoyant for some time to aid dispersal by water. Seeds germinate readily in moist soil (Sainty & Jacobs, 1981). Germination 2% within 30 days in North America (Shiple & Parent 1991). Rapid growth in spring. Coloniser.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT ST SWS SWP; Vic., Eur.**Distribution Sydney area:** Cumberland Plain, Illawarra, Western Blue Mtns.**Select locations:** CC: Maroota, Longneck Lagoon, Richmond, Glenbrook Creek, Casula, Albion Pk, Gerringong. CT: Abercrombie River, Wombeyan Caves.**Habitat****Habitat:** Coast, beside creeks, lakes & swamps in water to 50 cm deep. Also in drying mud.**Altitude:** 0–800 m **Annual rainfall:** 800–1200 mm.**Typical local abundance:** Occasional.**Vegetation:** Wetland species e.g. with *Paspalum distichum*.**Substrate:** Alluvium, medium nutrients, seedlings establish in moist soil but adults survive in water up to 50 cm deep. Also persists in drying mud.**Exposure:** Full sun.**Conservation****Conservation:** Widespread but not common. Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.***Damasonium minus*****ALISMATACEAE**

Star-fruit

Life history**Growth form:** Erect emergent aquatic herb to 1 m high.**Vegetative spread:** No.**Longevity:** Annual or short-lived perennial.**Primary juvenile period:** Probably less than 1 year.**Flowers:** November–December (SW NSW).**Fruit/seed:** Fruit any time of year. Fruiting carpels eventually fall singly.**Dispersal, establishment & growth:** Diaspore: seed; no specialised appendage on dispersal unit. Germination in glasshouse summer and autumn (Britton & Brock 1994).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CWS SWS NWP; Qld, Vic., Tas., N.T., S.A., W.A.**Distribution Sydney area:** Western Sydney.**Select locations:** CC: Richmond, Glenfield, Casula, Erskine Park, Camden, Menangle.

Habitat

Habitat: Wet pastures and margins of ponds.

Altitude: 0–200 m **Annual rainfall:** 800–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Emergent wetland vegetation e.g. *Juncus*, *Typha*, *Persicaria*.

Substrate: Stationary or slowly flowing ephemeral or permanent fresh water up to 30 cm deep over mud, generally derived from Wianamatta Shale, medium nutrients. Water table mostly high, fresh.

Exposure: No shade.

Conservation

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

***Sagittaria platyphylla* *** (*S. graminea* subsp. *platyphylla*)**ALISMATACEAE**

Sagittaria

Life history

Growth form: Emergent, rhizomatous aquatic perennial herb, with root tubers to 4 cm long.

Vegetative spread: Rhizomes, floating mats will take root in suitable locations (Sainty & Jacobs 1981).

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, mostly separate male and female flowers, January to late autumn.

Fruit/seed: Head of nutlets. Fruit in autumn or early winter (Sainty & Jacobs 1981, Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Diaspore: seed, but dispersal is mainly vegetative by rhizomes, tubers and floating mats; seeds germinate in spring, with rhizomes appearing about one month later; optimum growth temperature 24°C; tuber and rhizome formation appears to be controlled by intensity and quality of light (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: Ducks eat tubers and seeds, which are believed to be viable when excreted (Parsons & Cuthbertson 1992).

Distribution

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

Botanical subregions: CC ST SWP; Qld, Vic., S.A., W.A.

Distribution Sydney area: Sydney suburban area.

Select locations: CC: East lakes (1990), Picnic Point (1985), Turrella (1988).

Habitat

Habitat: Creeks, ponds.

Altitude: 0–50 m **Annual rainfall:** 1000–1200 mm

Typical local abundance: Occasional.

Vegetation:

Substrate: Shallow water over alluvium and sand.

Exposure:

Conservation

Conservation: Widely cultivated as ornamental (Sainty & Jacobs 1981). Widespread around Sydney. Probably likely to spread.

***Agapanthus praecox* subsp. *orientalis* ***

ALLIACEAE

Life history

Growth form: Clump-forming perennial herb with broad, almost evergreen, dark green leaves (Readers Digest 1992).

Vegetative spread: Yes.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Blue, summer.

Fruit/seed: Capsule.

Dispersal, establishment & growth: Diaspore: seed, and spread vegetatively from root fragments in dumped garden refuse (J. Hosking pers. comm.).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa, introduced as ornamental (J. Hosking pers. comm.).

Botanical subregions: CT; Vic., W.A.

Distribution Sydney area: Blue Mountains.

Select locations: CT: Katoomba.

Habitat

Habitat:

Altitude: 800–1000 m **Annual rainfall:** 1200–1400 mm

Typical local abundance:

Vegetation: Eucalypt woodland.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure: Full sun.

Conservation

Conservation: Spreading below plantings at Three Sisters, Katoomba, and reported spreading in other areas of Blue Mountains (J. Hosking pers. comm., 2002).

***Allium ampeloprasum* ***

ALLIACEAE

Great-head Garlic

Life history

Growth form: Erect herb to 110 cm high, with a bulb 10–35 mm diam.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to pink, summer.

Fruit/seed: Capsule 4 mm long, with 3–6 seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Widely eaten and used medicinally (Harden 1993).

Distribution

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

Botanical subregions: CC CT; Vic., S.A., W.A.

Distribution Sydney area:

Select locations: CC: Cheltenham (1950). CT: Orange (1970).

Habitat

Habitat: Railway lines, old cultivation sites, drainage channels.

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

Typical local abundance: Occasional.

Vegetation:

Substrate: Alluvium and agricultural areas.

Exposure:

Conservation

Conservation: Widely cultivated. Infrequently naturalised and probably not likely to invade bushland.

Allium triquetrum *

ALLIACEAE

Three-cornered Garlic, Angled Onion

Life history

Growth form: Erect herb 18–40 cm high, with bulb 7–15 mm diam. and bulblets. Crushed leaves have strong onion smell.

Vegetative spread: By bulblets.

Longevity: Indefinite.

Primary juvenile period:

Flowers: White to pink, August–November.

Fruit/seed: Capsule 6–7 mm long.

Dispersal, establishment & growth: Vegetative spread by bulblets, possibly dispersed by water, also dispersed in garden waste.

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: NC CC NWS CWS SWS SWP; Qld, Vic., Tas, S.A., W.A.

Distribution Sydney area: Suburban areas.

Select locations: CC: Lindfield, Northbridge (1952), Mosman, South Coogee, Bondi, Leura (JH).

Habitat

Habitat: Headlands, along creeks, shady slopes.

Altitude: 0–1000 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Weedy sites often associated with old gardens.

Substrate: Sandy soil, low nutrients.

Exposure: Mid to light shade.

Conservation

Conservation: Commonly cultivated. Invasive along creeks. Widespread in southern Australia (Parsons & Cuthbertson 1992).

***Nothoscordum borbonicum* *** (*N. inodorum*, *N. gracile*)

ALLIACEAE

Onion Weed

Life history

Growth form: Erect herb 45–105 cm high, with contractile roots pulling aging individuals deeper into soil.

Vegetative spread: Numerous bulblets arising from main bulb, easily dislodged enabling vegetative spread.

Longevity:

Primary juvenile period: Probably 2–3 years.

Flowers: White, September–December. Flowers visited by Honeybees *Apis mellifera* and Hoverfly (Syrphidae) (P. Kubiak pers. comm.).

Fruit/seed: Capsule 7–8 mm long, with black seed 0.5 mm diam.

Dispersal, establishment & growth: Diaspore: seed, rolls easily into crevices etc., also dispersed by bulblets.

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), fruiting in 18 weeks (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S. America.

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

Distribution Sydney area: Widespread in suburban areas.

Select locations: CC: Flemington Saleyards (1969).

Habitat

Habitat: Gardens, river edges, estuarine flats.

Altitude: 0–200 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Frequent.

Vegetation: Weedy areas.

Substrate: Clay soils on shale, alluvium, also on sandstone, often damp sites e.g. floodplain soils.

Exposure: Full sun to mid-shade.

Conservation

Conservation: Widespread and common weed in gardens, difficult to eradicate as the bulblets are easily dislodged.

***Alstroemeria pulchella* *** (*A. psittacina*)

ALSTROEMERIACEAE

Parrot Alstroemeria

Life history

Growth form: Herb with many simple leafy stems to 1 m long, arising annually from rhizome, also has tuberous rootstock.

Vegetative spread: By rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: November–May. Honeybees feed on nectar (P. Kubiak pers. comm.).

Fruit/seed: Ribbed capsule 10–15 mm diam., with numerous reddish brown seeds 3 mm diam.

Dispersal, establishment & growth: Not clear if seed is fertile; main spread is by rhizome.

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove), fruiting in less than 1 year (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to C & S America, introduced as ornamental.

Botanical subregions: NC CC; Qld, W.A.

Distribution Sydney area: Suburban areas.

Select locations: CC: Kangaroo Point (1950), Clifton Gardens (1997), Woollahra (1983).

Habitat

Habitat: Shady sites, old gardens.

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

Typical local abundance: Frequent.

Vegetation: Spreading into eucalypt woodland e.g. with *Angophora costata*, *Corymbia gummifera*.

Substrate: Sandy soil on sandstone, low nutrients.

Exposure: Mid shade.

Conservation

Conservation: Cultivated as ornamental. Sometimes naturalised in shady sites in coastal districts as escapees from gardens or rubbish dumping.

Crinum pedunculatum**AMARYLLIDACEAE**

Swamp Lily, River Lily

Life history

Growth form: Herbaceous plant 50 cm high, with fleshy, linear, dark green basal leaves and spidery flowers (Smith 1999). This species is perhaps conspecific with *Crinum asiaticum*, a complex needing further study (Du Puy & Telford 1993).

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, scented, summer. Insect-pollinated (Cook 1990).

Fruit/seed: Seeds are spongy in texture, silvery or green, 25–40 mm diam., with long viability (Smith 1999), surrounded by corky skin which is impervious to water (Carolin & Clarke 1988).

Dispersal, establishment & growth: Diaspore: seeds, flushed by flood rains from swampy places to beach areas where they are often found beginning to germinate, but damp conditions are needed for root development (Smith 1999).

Fire response:

Interaction with other organisms: Bulb is edible after cooking (Smith 1999).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; LHI, Qld, N.T., N.G., Keeling Is, N. Cal, Fiji, Timor.

Distribution Sydney area: Coast.

Select locations: CC: Port Jackson, Minnamurra River.

Habitat

Habitat: Coastal swamps, along streams, beaches.

Altitude: 0–100 m **Annual rainfall:** 1200–1600 mm

Typical local abundance: Occasional.

Vegetation: Strandline vegetation, estuarine.

Substrate: Sandy soils on sandy alluvium, low nutrients. On sand dunes along seepage lines (Carolin & Clarke 1988).

Exposure:

Conservation

Conservation: Conservation status unknown, Jervis Bay is southern geographical limit. Frequently cultivated.

Zephyranthes candida *

AMARYLLIDACEAE

White Rain Lily

Life history**Growth form:** Perennial herb with basal leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, tinged with pink, March.**Fruit/seed:** Capsule 10 mm diam., with flat D-shaped black seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America. Introduced as ornamental.**Botanical subregions:** NC CC ?NWS; Qld. native to S America**Distribution Sydney area:****Select locations:** CC: Marayong (1972), Albion Park (1964), Berry (1990).**Habitat****Habitat:** Cultivated land, cemeteries.**Altitude:** 0–200 m**Annual rainfall:** 800–1400 mm**Typical local abundance:****Vegetation:** Grassland.**Substrate:** Clay soils.**Exposure:****Conservation****Conservation:** Cultivated, occasionally reported naturalised in disturbed situations (Harden 1993).**Alania endlicheri**

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Rhizomatous perennial herb rooting at nodes, with flowering stems 30 cm high; leaves narrow, to 12 cm long, densely crowded along stems.**Vegetative spread:****Longevity:** Indefinite.**Primary juvenile period:****Flowers:** White, November–January.**Fruit/seed:** Capsule 2.5–3 mm., with ovoid, smooth, black fine seeds, November–May.**Dispersal, establishment & growth:** Diaspore: seed, probably wind-dispersed.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC CT.**Distribution Sydney area:** Blue Mountains–Watagans.**Select locations:** CC: Watagan Mountains, Brisbane Water NP, Linden. CT: Mt Coricudgy, Kurrajong Heights, Bilpin, Mount Tomah, Wentworth Falls, Lawson, Woodford.**Habitat****Habitat:** Rock faces, clifftops.**Altitude:** 0–1000 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Cliffline vegetation e.g. with *Dracophyllum secundum*, *Epacris crassifolia*; associated with rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*; moist eucalypt open-forest.**Substrate:** Cracks in moist sandstone rock faces, low nutrients.**Exposure:** Mid-shade.**Conservation****Conservation:** Rare in Watagans and Gosford area but more common in Blue Mountains. Conservation status unknown. Reported in Brisbane Water NP.

Arthropodium milleflorum

ANTHERICACEAE (LILIACEAE)

*(Arthropodium paniculatum)***Life history****Growth form:** Perennial herb, with tubers 2–3 cm long; leaves long, narrow and usually glaucous.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** White to pale blue to pink, October–March.**Fruit/seed:** Capsule 4–5 mm diam., with black seeds, October–May.**Dispersal, establishment & growth:** Diaspore mobile (McIntyre et al. 1995), no special morphology (Westoby et al. 1990).**Fire response:****Interaction with other organisms:** Palatable to rabbits (Leigh et al. 1987).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS ?NWP ?SWP; ?Qld, Vic., Tas., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Mooney Mooney, St Albans, Pitt Town, Berowra, Barrenjoey, Bayview, Glenbrook, Faulconbridge, Quakers Hill, Rookwood, Oatley, Kogarah, Macquarie Fields, Mount Annan. CT: Jenolan Caves, Kowmung River, Wingello (1899).**Habitat****Habitat:** Hillsides, slopes, creekbanks.**Altitude:** 0–1000 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus dives*, *E. fastigata*; woodland e.g. with *Eucalyptus crebra*, *E. tereticornis*, *E. moluccana*; semi-rainforest.**Substrate:** Clay to sandy soils on shale, sandstone, volcanic necks, low to medium nutrients, well-drained.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Reported in Kanangra Boyd NP.

Arthropodium minus

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Perennial herb, with sessile tubers 2 cm long; leaves long and narrow.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** White to purple, September–December.**Fruit/seed:** Capsule 4 mm diam., with black seeds. Seed weight: 960 seeds per gram (Morgan & Lunt 1994). Mature January–February.**Dispersal, establishment & growth:** Examination showed 98% seeds viable, but in experiment, germination was very low in conditions of light and dark with both constant and alternating temperature (Morgan & Lunt 1994). Germination after storage 2–3 months takes approx. 35 days, with about 32 seedlings per gram seed; high temperatures inhibit germination (Greening Australia 1996b).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Western Sydney, Orange–Rylstone.**Select locations:** CC: Scheyville, Camden, Wongawilli. CT: Rylstone, Coricudgy.**Habitat****Habitat:****Altitude:** 0–1000 m **Annual rainfall:** 600–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest to woodland e.g. with *Eucalyptus saligna*, *E. pilularis*, *E. crebra*, *E. tereticornis*, *E. moluccana*, *E. melliodora*, *E. albens*.**Substrate:** Clay soil on shale, basalt, medium nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.***Caesia alpina* (*Chlorophytum alpinum*)**

ANTHERICACEAE (LILIACEAE)

Alpine Grass-lily

Life history**Growth form:** Tufted perennial herb, with branched rhizome and fleshy-fibrous roots.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Greenish white, December.**Fruit/seed:** Lobed capsule 6 mm diam., with black seeds 2 mm diam., December.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NT CT ST; Vic., Tas.**Distribution Sydney area:** Southern Highlands.**Select locations:** CT: Wingecarribee Swamp

Habitat**Habitat:** Edge of montane peatland.**Altitude:** 700 m **Annual rainfall:** 1600 mm**Typical local abundance:** Rare.**Vegetation:** Sedgeland e.g. with *Leptospermum obovatum*, *Pultenaea divaricata*.**Substrate:** Probably clay soils on alluvium, medium nutrients, moist.**Exposure:****Conservation****Conservation:** Rare, only recorded at one site in Sydney area.***Caesia parviflora* var. *minor*****ANTHERICACEAE (LILIACEAE)****Life history****Growth form:** Tufted, perennial herb, less than 20 cm high, with rhizome and clustered fleshy or tuberous roots.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White mainly, also blue or purple, January.**Fruit/seed:** 3-lobed capsule to 5 mm diam., with black seeds 2 mm diam., January.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CT CWS; Vic., Tas.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Mt Wilson.**Habitat****Habitat:****Altitude:** 1100 m **Annual rainfall:** 1400 mm**Typical local abundance:****Vegetation:****Substrate:** Probably sandstone soil.**Exposure:****Conservation****Conservation:** Rare, only one record for area, Mt Wilson to Bell in 1904. Listed as Endangered (Schedule I) NSW *Threatened Species Conservation Act 1995*.

Caesia parviflora* var. *parviflora

ANTHERICACEAE (LILIACEAE)

Life history

Growth form: Tufted, perennial herb, usually more than 20 cm high, with rhizome and clustered fleshy or tuberous roots.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to pale pink or blue, October–January. Flowers appear to close in the morning, open in the afternoon and close in late afternoon to re-open the next day; probably pollinated by native bees and possibly flies (Diptera) (P. Kubiak pers. comm.).

Fruit/seed: 3-lobed capsule 5 mm diam., with black seeds 2 mm diam., December–January.

Dispersal, establishment & growth: Diaspore: seed with ant-adapted food body for dispersal (Westoby et al. 1990).

Fire response: Resprouts, secondary juvenile period 1 year; recruitment mainly after fire (D. Keith pers. comm.).

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

Distribution

Status/origin: Native.

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

Distribution Sydney area:

Select locations: CC: Putty, Bowen Mountain, Pitt Town, Cheltenham, Dee Why, Manly, Maddens Plains, Yallah, Carrington Falls, Nowra. CT: Springwood, Bindook.

Habitat

Habitat: Ridges, slopes.

Altitude: 0–700 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *E. piperita*, *Corymbia gummifera*, *E. sclerophylla*.

Substrate: Sandy soil on sandstone, occasionally on clay soils, low–medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

***Caesia parviflora* var. *vittata* (*C. vittata*)**

ANTHERICACEAE (LILIACEAE)

Life history

Growth form: Tufted, perennial herb, usually more than 20 cm high, with rhizome and clustered fleshy or tuberous roots.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Blue, October–November, February–April.

Fruit/seed: 3-lobed capsule to 5 mm diam., with black seeds 2 mm diam. Myrmecochore (Rice & Westoby 1981), December, February–March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area:

Select locations: CC: Glen Davis, Kedumba, Wyong, Somersby, Pitt Town, Barrenjoey, Belrose, Dee Why, Mount Annan. CT: Bathurst.

Habitat

Habitat: Hillsides, ridges.

Altitude: 0–600 m

Annual rainfall: 600–1200 mm

Typical local abundance: Occasional–frequent.

Vegetation: Woodland e.g. with *Eucalyptus crebra*, *E. tereticornis*, *E. moluccana*, *E. sclerophylla*, *Angophora bakeri*, *Corymbia gummifera*, *Banksia serrata*; scrub e.g. with *Angophora hispida*, *Leptospermum trinervium*, *Banksia ericifolia*; *Melaleuca* swamp.

Substrate: Clay to sandy soils on shale, sandstone, low to medium nutrients, well-drained to periodically moist.

Exposure:

Conservation

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

***Chlorophytum comosum* *** (*Anthericum comosum*)

ANTHERICACEAE (LILIACEAE)

Spider Plant

Life history

Growth form: Tufted perennial herb to 60 cm high, with tuberous roots 5–10 cm long.

Vegetative spread: Leafy plantlets at top of drooping inflorescences take root when in contact with soil.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Green or white, summer. Honeybee *Apis mellifera* gathered pollen (P. Kubiak pers. comm.).

Fruit/seed: 3-lobed capsule 4–10 mm long, with flattish brown or black seeds.

Dispersal, establishment & growth: Local vegetative spread is by plantlets. The importance of seed dispersal and establishment is not known.

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove), with immature fruit in 16 weeks (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

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

Botanical subregions: CC; LHI, Qld.

Distribution Sydney area:

Select locations: CC: Beecroft (1952), Clifton Gardens (1997), Naremburn (1965), Parramatta (1951).

Habitat

Habitat: Gullies, creeks.

Altitude: 0–100 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent.

Vegetation: Moist forest e.g. *Eucalyptus pilularis*, *Angophora costata*, *Syncarpia glomulifera*.

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

Exposure:

Conservation

Conservation: Widely cultivated, occasionally naturalised near suburban areas, probably from garden escapes or rubbish dumping. Reported in Sydney Harbour NP.

Dichopogon fimbriatus (*Arthropodium fimbriatum*)

ANTHERICACEAE (LILIACEAE)

Nodding Chocolate Lily

Life history**Growth form:** Erect herb to 1 m high, with fibrous roots to 9 cm ending in spindle-shaped tubers; leaves long and narrow.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Purplish, September–February.**Fruit/seed:** Capsule 5–7 mm long, with black seeds.**Dispersal, establishment & growth:** No particular mechanism for dispersal (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., S.A., W.A.**Distribution Sydney area:** Mainly western Sydney.**Select locations:** CC: Agnes Banks, Scheyville, Quakers Hill, Mount Annan. CT: Wingello.**Habitat****Habitat:** Grassy woodland.**Altitude:** 0–800 m**Annual rainfall:** 700–800 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. sclerophylla*, *E. moluccana*.**Substrate:** Sandy to clayey soils on Tertiary alluvium, Wianamatta Shale, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Only record for Central Tablelands is Wingello in 1899.***Dichopogon strictus*** (*Arthropodium strictum*)

ANTHERICACEAE (LILIACEAE)

Chocolate Lily

Life history**Growth form:** Erect herb to 1 m high, with fibrous roots to 9 cm long, ending in spindle-like tubers; one flower per node.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Purple, August–January.**Fruit/seed:** Mature January–February;**Dispersal, establishment & growth:** Germination after storage 2–3 months takes approx. 71 days, with about 354 seedlings per gram seed; high temperatures inhibit germination (Greening Australia 1996b).**Fire response:****Interaction with other organisms:** Tubers eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** CC NT CT ST NWS CWS SWS NFWP SFWP; Qld, Vic., S.A., N.G.**Distribution Sydney area:** Bathurst area.**Select locations:** CC: St Marys (1887). CT: Bathurst Plains (1822), O'Connell (1995).**Habitat****Habitat:****Altitude:** 700–800 m**Annual rainfall:** 600–700 mm**Typical local abundance:****Vegetation:** Open-forest.**Substrate:** Shallow skeletal soil.**Exposure:****Conservation****Conservation:** Rare in Bathurst area. Vulnerable in Western Sydney (James et al. 1999).

Laxmannia compacta

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Spreading, stoloniferous herb to 10 cm high, with narrow leaves in tufts along stems.**Vegetative spread:** Stoloniferous.**Longevity:****Primary juvenile period:****Flowers:** White–pink, opening at night, August–November.**Fruit/seed:** Capsule 2–3 mm diam., with 3–12 dull black seeds.**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:** Sporadic.**Select locations:** CC: Cheltenham (1954), Willmot (1987).**Habitat****Habitat:****Altitude:** 0–300 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Eucalyptus fibrosa*, *Allocasuarina littoralis*.**Substrate:** Clay loam on Tertiary alluvium, shale, low nutrients.**Exposure:****Conservation****Conservation:** Rare, only 2 records for Sydney area.***Laxmannia gracilis***

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Erect, tufted, rhizomatous herb to 40 cm high, with stilt-like and fibrous roots.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pink–white, opening at night, October–March, peak November.**Fruit/seed:** Capsule 3 mm diam., with 3–12 dull black seeds, October–March.**Dispersal, establishment & growth:****Fire response:** Probably resprouts.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS NWP; Qld, Vic., S.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Putty, Morisset, Colo Heights, Pitt Town, St Marys, Wisemans Ferry, Barrenjoey, Hornsby, Church Point, Lane Cove, Kogarah, Rookwood, Springwood, Tahmoor, Bomaderry. CT: Mt Boonbourwa, Cargo, Newnes Plateau, Mt Victoria, Katoomba, Barbers Creek, Taralga.**Habitat****Habitat:** Ridges, gentle slopes.**Altitude:** 0–1000 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. sclerophylla*, *Angophora bakeri*, *Melaleuca decora*, *Melaleuca nodosa*; open-forest e.g. with *Eucalyptus dives*, *E. macrorrhyncha*, *Acacia falciformis*.**Substrate:** Soil from granite or sandstone, clay soil on shale, Tertiary alluvium, sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Wollemi NP, Brisbane Water NP, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Royal NP.

Sowerbaea juncea

ANTHERICACEAE (LILIACEAE)

Rush Lily, Vanilla Plant

Life history**Growth form:** Tufted perennial herb, with fibrous roots.**Vegetative spread:** No.**Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** Lavender–pink–white, July–December, peak October.**Fruit/seed:** Capsule 2–3 mm diam., with brown to black seeds, October–January.**Dispersal, establishment & growth:** No special morphology for dispersal (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts from base, flowers next spring. Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.), flowering in 32 weeks after high intensity fire 1994 (at Narrabeen, P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS SWS; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Widespread, mainly on coast.**Select locations:** CC: Cooranbong, Somersby, Berowra, Rose Bay, Long Bay, Cape Solander, Warumbul Road Royal NP. CT: Clarence, Lithgow, Mt Wilson, Blackheath, Mittagong, Carrington Falls, Wingecarribee Swamp, Penrose State Forest.**Habitat****Habitat:** Wet heath.**Altitude:** 0–1100 m **Annual rainfall:** 1100–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath e.g. with *Banksia ericifolia*; scrubby woodland e.g. with *Eucalyptus sieberi*, *E. piperita*, *E. stricta*; sedgeland e.g. with *Restio*, *Xyris*, *Gahnia*.**Substrate:** Shallow soils on sandstone, intermittently waterlogged soils, low nutrients.**Exposure:** Full sun.**Conservation****Conservation:** Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Ku-ring-gai Chase NP, Garigal NP, Royal NP.***Thysanotus juncifolius***

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Herb with small rhizome and fibrous roots, leaves withering before flowering.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Mauve to blue, September–March, peak January.**Fruit/seed:** Capsule 4 mm diam., with black seeds, December–March.**Dispersal, establishment & growth:** Ant-adapted food body for dispersal (Westoby et al. 1990).**Fire response:** Resprouts, seedlings established (at Bundeena, Herb. note), flowering 17 weeks after high intensity fire 1994 (at Narrabeen, P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Vic., S.A.**Distribution Sydney area:** Coast and Upper Blue Mountains.**Select locations:** CC: Peats Ridge, Belrose, Oatley, Stanwell Park. CT: Bilpin, Mt Wilson, Katoomba, Robertson.

Habitat

Habitat: Swampy situations.

Altitude: 0–1000 m **Annual rainfall:** 1100–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Banksia ericifolia*, *Banksia oblongifolia*, *Xyris*, *Anisopogon avenaceus*, *Lepidosperma laterale*; woodland e.g. with *Angophora bakeri*, *Corymbia gummifera*, *Angophora hispida*.

Substrate: Peaty sand to sandy soil over sandstone, periodically wet, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Thysanotus patersonii

ANTHERICACEAE (LILIACEAE)

Twining Fringe-lily

Life history

Growth form: Twining or prostrate herb, roots tuberous 1–5 cm long, leaves annual.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Mauve to blue, September–November.

Fruit/seed: Capsule 3–4 mm diam., with black seeds, mature summer.

Dispersal, establishment & growth: Diaspore: seed, germination takes 28–42 days, with high germination rate (Greening Australia 1996b). New tubers develop annually during growing season (Bindon 1996).

Fire response:

Interaction with other organisms: Tuberous roots eaten by Aboriginal people (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: SC CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A.

Distribution Sydney area: Bathurst–Carcoar.

Select locations: CT: Carcoar Cemetery (1991), Bathurst (1986), Mt York (1985).

Habitat

Habitat:

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

Typical local abundance: Rare.

Vegetation: Woodland e.g. with *Eucalyptus albens*, *E. polyanthemos*, *E. macrorrhyncha*, *E. goniocalyx*, *E. blakelyi*.

Substrate: Clay soil on diorite.

Exposure:

Conservation

Conservation: Rare, only three records in the area, including undisturbed woodland near cemetery (Carcoar).

Thysanotus tuberosus* subsp. *tuberosus

ANTHERICACEAE (LILIACEAE)

Common Fringe-lily

Life history**Growth form:** Erect herb with rhizome and tubers 1–3 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Mauve to blue, November–February.**Fruit/seed:** Capsule 3–7 mm diam., with black seeds. Mature summer (Greening Australia 1996b).**Dispersal, establishment & growth:** Ant-adapted food body for dispersal (Westoby et al. 1990). Germination approx. 28–42 days, with high germination rate (Greening Australia 1996b).**Fire response:** Stems killed, resprouts from base, flowers immediately after fire. Secondary juvenile period 1 year.**Interaction with other organisms:** Tuberos roots eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., S.A.**Distribution Sydney area:****Select locations:** CC: Llandillo, Pennant Hills, Willmot, Clyde, Mortdale, Kurnell, Casula, Thirlmere, Yerrinbool, Bomaderry, W Cambewarra. CT: Clarence, Jenolan Caves, Mittagong, Bundanoon, Penrose SF.**Habitat****Habitat:** Heath, woodland.**Altitude:** 0–1100 m **Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Eucalypt woodland e.g. with *Eucalyptus tereticornis*, *E. sideroxylon*, *Melaleuca* species; tall heath e.g. with *Banksia integrifolia*.**Substrate:** Clay loam to peaty sandy loam on alluvium, sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Botany Bay NP.***Thysanotus virgatus***

ANTHERICACEAE (LILIACEAE)

Life history**Growth form:** Leafless herb 30–40 cm high, with small rhizomes and fibrous roots; it may be inconspicuous when not flowering (D. Keith pers. comm.).**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale purple, November–January.**Fruit/seed:** Capsule 3–4 mm diam., with black seeds, November–January.**Dispersal, establishment & growth:****Fire response:** Resprouts, flowering within one year of fire (D. Keith pers. comm.).

Resprouts from base, seedlings (at Bundeena, Herb. note).

Interaction with other organisms:**Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Sutherland to Mt Keira (Harden 1993).**Select locations:** CC: Heathcote, Mt Keira.

Habitat**Habitat:****Altitude:** 0–100 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-forest e.g. with *Corymbia gummifera*, *Angophora costata*, *Eucalyptus sieberi*; heath e.g. with *Angophora hispida*, *Banksia serrata*.**Substrate:** Sandy soils, sometimes with ironstone gravels, poorly-drained, low nutrients.**Exposure:****Conservation****Conservation:** Local endemic species, coded 3RC- on national rare species list (Briggs & Leigh 1996). Reported in Royal NP, Heathcote NP but there is no information about abundance there; further investigation required to establish the range of the species (D. Keith pers. comm.).***Tricoryne elatior*****ANTHERICACEAE (LILIACEAE)****Life history****Growth form:** Wiry herb 10–40 cm high, occasionally to 1 m high, with very narrow leaves, fibrous roots.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Yellow, October–March.**Fruit/seed:** Dry fruit of 1–3 segments 3–6 mm long, with 1 black seed per segment. Mature January–February (Greening Australia 1996b). Viability of fresh seed 76% (Vigilante et al. 1998).**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995). Soil-stored seedbank (Fox 1988). Smoking seed has no effect on germination (Greening Australia 1996c).**Fire response:** Resprouts (Vigilante et al. (1998).**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 but mainly Western Sydney.**Select locations:** CC: Putty, Morisset, Glenbrook, Pitt Town, Vineyard, Barrenjoey, Dee Why.**Habitat****Habitat:** Hillsides, slopes.**Altitude:** 0–1000 m **Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent.**Vegetation:** Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra* and grassy understorey.**Substrate:** Mainly clay, occasionally sandy soils on shale, Tertiary alluvium, medium nutrients, well-drained.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Tricoryne simplex**ANTHERICACEAE (LILIACEAE)****Life history**

Growth form: Herb to 30 cm high, with fibrous roots.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, August–December. Flowers open in the morning and close in the afternoon; probably pollinated by native bees and possibly also by flies (Diptera); one small butterfly briefly visited a flower (P. Kubiak pers. comm.).

Fruit/seed: Dry fruit of 1–3 segments 4 mm long, with 1 black seed per segment.

Dispersal, establishment & growth:

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove), fruiting within 11 months (P. Kubiak pers. comm.).

Interaction with other organisms: Some plants eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC.

Distribution Sydney area: Mainly coastal areas.

Select locations: CC: Morisset, Wisemans Ferry, Asquith, Hornsby, Cheltenham, Picton Lakes.

Habitat

Habitat: Ridges.

Altitude: 0–300 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Angophora costata*, *Corymbia gummifera*, *Eucalyptus piperita*.

Substrate: Sandy soils from sandstone, sometimes with shale influence, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Aponogeton distachyos* **APONOGETONACEAE**

Cape Pond Lily

Life history

Growth form: Tuberos aquatic perennial herb.

Vegetative spread: Yes.

Longevity:

Primary juvenile period:

Flowers: White, late winter.

Fruit/seed: Dry fruit 10 mm long, with 1–several seeds.

Dispersal, establishment & growth: Water dispersal (Carr et al. 1992).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: CC SWP; Vic., Tas., S.A.

Distribution Sydney area:

Select locations: CC: Rydalmere (1975).

Habitat

Habitat: Creek.

Altitude: 0–100 m

Annual rainfall: 1000–1200 mm

Typical local abundance: Rare.

Vegetation:

Substrate: Mud along stagnant creek.

Exposure:

Conservation

Conservation: Only one record for Sydney area. Minor weed of small water bodies (Harden 1993).

Alocasia brisbanensis (conf. *A. macrorrhizos*)

ARACEAE

Cunjevoi, Spoon Lily

Life history**Growth form:** Large herb, erect to decumbent, 1–1.8 m high, with large trinangular-shaped leaves.**Vegetative spread:** Subterranean bulbils (A. Hay pers. comm.).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Inflorescence functions as a 'flower' (A. Hay pers. comm.), mostly early summer.**Fruit/seed:** Berry 8–15 mm long, red when ripe, with several seeds, April.**Dispersal, establishment & growth:** Diaspore: seed, bird-dispersed (A. Hay pers. comm.).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld, W.A.**Distribution Sydney area:** Coastal districts.**Select locations:** CC: Botany, Albion Park, Kiama.**Habitat****Habitat:** Creekbanks.**Altitude:** 0–200 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:** Rainforest.**Substrate:** Alluvial soil, high nutrients.**Exposure:****Conservation****Conservation:** Illawarra is southern geographical limit, record from Botany was from old market garden in 1957.***Arum italicum* ***

ARACEAE

Italian Arum

Life history**Growth form:** Deciduous perennial herb, with triangular-shaped leaves.**Vegetative spread:** Local spread by rhizome.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Inflorescence functions as a 'flower' (A. Hay pers. comm.), early spring.**Fruit/seed:** Berry 10 mm long, with several seeds.**Dispersal, establishment & growth:** Diaspore: seed, bird-dispersed (A. Hay pers. comm.), rhizomes probably dispersed in garden refuse.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe. Widely cultivated as ornamental.**Botanical subregions:** CC CT; Vic., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Kincumber (1950). CT: Orange (1978).**Habitat****Habitat:****Altitude:** 0–1000 m**Annual rainfall:** 800–1200 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Widely cultivated for the ornamental leaves and infructescences. Reported locally naturalised in the Wyong and Orange districts (Harden 1993), though these may be old garden remains.

***Colocasia esculenta* ***

ARACEAE

Taro

Life history**Growth form:** Robust, tuberous, rhizomatous herb to 1 m high, with triangular-shaped leaves.**Vegetative spread:** Stolons, about 100 cm long (EWAN).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Inflorescence functions as a 'flower' (A. Hay pers. comm.), summer.**Fruit/seed:** Berry 3–5 mm long, with a distinctive odour (A. Hay pers. comm.), with many seeds. Seeds uncommon and of low viability (EWAN).**Dispersal, establishment & growth:** Diaspore: seed (mammal-dispersed in Malesia, A. Hay pers. comm.), mainly vegetative dispersal by fragments of stolons and cormules (EWAN).**Fire response:** Probably resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen, P. Kubiak pers. comm.).**Interaction with other organisms:** Cultivated for more than 6000 years (EWAN), leaves and tubers eaten widely, but only after cleaning and cooking (Cribb & Cribb 1984), but not the feral forms (A. Hay pers. comm.). Allelopathic, can inhibit growth of other plants; contains calcium oxalate crystals, which can cause a mild sting or severe rash (EWAN).**Distribution****Status/origin:** Exotic, although native to Qld, N.T., W.A., Indomalesia to Japan and Pacific Is.

Introduced as ornamental.

Botanical subregions: *NC *CC; *LHI, Qld, N.T., W.A.**Distribution Sydney area:** Wyong area.**Select locations:** CC: Wyong Creek (1950).**Habitat****Habitat:** Creeks, marshy places.**Altitude:** 0–100 m **Annual rainfall:** 1200 mm**Typical local abundance:** Frequent–dominant.**Vegetation:****Substrate:** Organically rich soils, slightly acid, tolerates permanent inundation (EWAN).**Exposure:** Full sun to dense shade (EWAN).**Conservation****Conservation:** Cultivated as ornamental and foodplant, only naturalised record is for Wyong Creek, cultivated at Point Clare. Capable of becoming a serious weed of wetlands, forming dense stands, displacing native plant species; physical removal of whole plant is the most effective control measure (EWAN).***Gymnostachys anceps* (*G. gigantea*)**

ARACEAE

Settlers Flax

Life history**Growth form:** Perennial herb with creeping rhizome, leaves erect, linear to 1.5 m long, inflorescence to 3 m high.**Vegetative spread:** By creeping rhizome.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Bisexual, no spathe, inflorescence not integrated into a functional 'flower' (A. Hay pers. comm.), September–January.**Fruit/seed:** Blue-black berry 10–15 mm long, with thin fleshy coat over single seed, mature July 97 (DHB).**Dispersal, establishment & growth:** Diaspore: vertebrate-dispersed fleshy fruit (Westoby et al. 1990).**Fire response:** Resprouted after high intensity fire 1994 (at Narrabeen), fruiting in 9 months (P. Kubiak pers. comm.).**Interaction with other organisms:** Tested negative for alkaloids (Collins et al. 1990).

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT; Qld.**Distribution Sydney area:****Select locations:** CC: Wyong, Somersby, Mooney Mooney, West Head, Otford, Stanwell Park, Albion Park, Bulli Pass. CT: Mt Wilson, Bilpin, Robertson, Fitzroy Falls.**Habitat****Habitat:** Rainforest.**Altitude:** 0–1000 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Gully forest e.g. with *Livistona australis*, *Ceratopetalum apetalum*, and ground ferns e.g. *Pellaea falcata*, *Calochlaena dubia* (Gosford area), mixed warm temperate/cool temperate rainforest (Robertson area) e.g. with *Doryphora sassafras*.**Substrate:** Clay soils on basalt, Narabeen shales, high nutrients, well-drained.**Exposure:** Medium shade.**Conservation****Conservation:** Conservation status unknown, though many rainforest sites affected by weed invasion. Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Royal NP, Robertson NR.***Pistia stratiotes* *****ARACEAE**

Water Lettuce

Life history**Growth form:** Free-floating, perennial aquatic herb, with stolons to 60 cm long (Parsons & Cuthbertson 1992).**Vegetative spread:** Stoloniferous.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** At any time of year.**Fruit/seed:** Greenish berry 6–10 mm long. Seed 2 mm long, 4–15 per fruit, with wrinkled seedcoat, oblong, flattened at apex and containing an air chamber (Parsons & Cuthbertson 1992).**Dispersal, establishment & growth:** Diaspore: seed, water-dispersed; vegetative dispersal of daughter plants that form on stolons and through aquarium trade (Parsons & Cuthbertson 1992).**Fire response:****Interaction with other organisms:** Provides shelter and breeding site for disease-carrying mosquitoes *Anopheles* species and *Mansonia* species, whose larvae obtain oxygen directly from the roots so do not need to surface to breathe (Parsons & Cuthbertson 1992).**Distribution****Status/origin:** Exotic, native to northern Australia and pantropic regions.**Botanical subregions:** NC CC; Qld, N.T. native to northern Australia & pantropical regions.**Distribution Sydney area:** Centennial Park.**Select locations:** CC: Centennial Park (1974).**Habitat****Habitat:** Lakes, water bodies.**Altitude:** 0–100 m**Annual rainfall:** 1200 mm**Typical local abundance:****Vegetation:****Substrate:** Open still or slowly-moving water.**Exposure:****Conservation****Conservation:** Declared noxious weed in NSW, though only Sydney area record is for Centennial Park in 1974.

Typhonium brownii

ARACEAE

Life history**Growth form:** Perennial herb.**Vegetative spread:** Proliferation from cormils (A. Hay pers. comm.).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** April. Inflorescence functions as a 'flower' (A. Hay pers. comm.). Pollinated by dung beetles (Monteith 1986).**Fruit/seed:** Reddish berry 10 mm diam., with one seed.**Dispersal, establishment & growth:** Diaspore: seed, and vegetatively by cormils (A. Hay pers. comm.).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT CWS; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Culoul Range, Windsor, Nepean River, Menangle. CT: Capertee Valley (1913).**Habitat****Habitat:** Sheltered gullies, along creek banks.**Altitude:** 0–720 m **Annual rainfall:** 700–900 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist open-forest e.g. with *Syncarpia glomulifera*, *Eucalyptus saligna*; rainforest margins.**Substrate:** Clay soil on basalt, high nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown.***Typhonium eliosurum***

ARACEAE

Life history**Growth form:** Perennial herb, facultatively deciduous (A. Hay pers. comm.), to 50 cm high, with 3-lobed leaves, with tuberous rhizome.**Vegetative spread:****Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Inflorescence functions as a 'flower' (A. Hay pers. comm.), late spring–early summer.**Fruit/seed:** Reddish berry 10 mm diam., with one seed.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC.**Distribution Sydney area:** Coastal, Wyong to Nowra.**Select locations:** CC: Patonga, Royal NP, Stanwell Park, Calderwood Park, Shellharbour, Cambewarra, Mt Coolangatta.**Habitat****Habitat:** Moist locations, often rainforest (Mills 1988).**Altitude:** 0–300 m **Annual rainfall:** 1200–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Rainforest margins e.g. with *Cassine australis*, *Acmena smithii*, *Banksia integrifolia*.**Substrate:** Clay loam on shale, basalt, alluvium, medium to high nutrients.**Exposure:****Conservation****Conservation:** Coded 3RC- on national rare species list (Briggs & Leigh 1996). Reported in Royal NP.

Zantedeschia aethiopica *

ARACEAE

Arum Lily, Pig Lily

Life history

Growth form: Robust clump-forming perennial herb, with triangular-shaped leaves, with rhizome. Top growth dies back over summer (EWAN).

Vegetative spread: Rhizomatous, less than 300 mm per year (EWAN).

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, small, within a large showy, funnel-shaped bract (Parsons & Cuthbertson 1992), mostly spring.

Fruit/seed: Orange fleshy fruit 10 mm long, with a few seeds. Seeds yellow-brown, 3 mm diam. (Parsons & Cuthbertson 1992). Large amounts of seed produced; seed viability 4 months (EWAN).

Dispersal, establishment & growth: Diaspore: Birds attracted to succulent berries disperse seed, also spread by foxes, stock and flowing water; rhizomes dispersed by dumping of garden waste (EWAN). Seed, germinates in late autumn to winter, best with fluctuating temperatures 15°C and 20°C; growth is slow at first as fleshy rootstock and rhizomes develop (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: All parts of the plant are toxic, with reported fatalities of cattle and children (Parsons & Cuthbertson 1992).

Distribution

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

Botanical subregions: CC SC; Vic., Tas., S.A., WA.

Distribution Sydney area: Sporadic, coastal.

Select locations: CC: Lisarow (1975), Devlins Creek (1957), Port Hacking (1953), Upper Kangaroo Valley (1973).

Habitat

Habitat: Swampy creeks, riverbanks.

Altitude: 0–400 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Occasional.

Vegetation: Estuarine swamps e.g. with *Melaleuca linariifolia*, *Eucalyptus robusta*.

Substrate: Clay soil on alluvium, medium nutrients.

Exposure: Mid shade.

Conservation

Conservation: Commonly cultivated, persisting around habitations or occasionally naturalised in open or semi-shaded marshy places south from Gosford (Harden 1993).

Archontophoenix cunninghamiana

ARECACEAE

Bangalow Palm

Life history**Growth form:** Tree to 25 m high, with pinnately divided leaves.**Vegetative spread:** No.**Longevity:** Up to 100 years, juvenile growth to 4 m high trunk in 15 years (DBH, in cultivation).**Primary juvenile period:** 5–8 years (in cultivation).**Flowers:** Pink to lilac, male and female flowers separate on same plant, autumn.**Fruit/seed:** Red fleshy fruit 13–15 mm diam., waxy, single seed 8–10 mm diam. covered with fibres, December–May, (Floyd 1989).**Dispersal, establishment & growth:** Diaspore: seed, gravity-dispersed, bird-dispersed. No dormancy, short-lived seeds viable for 8–16 weeks (Langkamp 1987).**Fire response:** Probably killed.**Interaction with other organisms:** Flowers eaten by Rainbow Lorikeet *Trichoglossus haematodus* (Lepschi 1993). Fruit eaten by Brown Cuckoo-Dove, Crimson Rosella, Green Catbird, Lewin's Honeyeater, Pied Currawong, Rose-crowned Fruit Dove, Satin Bowerbird, Topknot Pidgeon, Wompoo Fruit-Dove, White-headed Pigeon (Floyd 1989). Fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Food plant of butterfly larvae *Telicota ancilla ancilla* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld.**Distribution Sydney area:** Coast and coastal ranges.**Select locations:** CC: Ourimbah, Matcham, Illawarra.**Habitat****Habitat:** Creekbanks, alluvial flats.**Altitude:** 0–300 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Gully rainforest e.g. with *Ceratopetalum apetalum*, *Glochidion ferdinandi*, *Smilax australis*, *Cissus hypoglauca*, *Ripogonum fawcettianum*.**Substrate:** Clay soils on shales, basalt, alluvium, high–medium nutrients.**Exposure:****Conservation****Conservation:** Cultivated as ornamental, conservation status unknown.**Livistona australis**

ARECACEAE

Cabbage Palm, Cabbage Tree Palm, Fan Palm

Life history**Growth form:** Tree to 30 m high; palmately divided leaves with spines.**Vegetative spread:** No.**Longevity:** 100–200 years (at least 155 years, juvenile growth to 0.5 m high trunk in 15–20 years (DBH, in cultivation), mature growth estimated at 1 m in 6 years (Orscheg & Parsons 1996).**Primary juvenile period:** Greater than 20 years.**Flowers:** Cream–yellow, summer. Time between successive flowering may be more than 2 years (Orscheg & Parsons 1996).**Fruit/seed:** Fleshy fruit, red turning black, with one seed. Interval between flowering and fruit fall may be 18 months; mature March–April (Orscheg & Parsons 1996).**Dispersal, establishment & growth:** Diaspore: short-lived seeds 4–16 weeks (Langkamp 1987). Dispersal: gravity-dispersed, bird-dispersed. Most dispersal by gravity (Orscheg & Parsons 1996). Seed germinates in 1–3 months (Floyd 1989), seed age strongly affects viability, seed to 2 months old gave 7–11% germination at 20–25°C, seed 16 months old gave 5% germination; seed shed in autumn may not germinate until higher temperatures in spring; once food reserves in seeds are exhausted, seedlings may be out-competed by e.g. *Calochlaena dubia* (Orscheg & Parsons 1996).**Fire response:** Resprouts, leaves continue to grow on adult plants after fire (LMCD). 1–2 leaf seedlings killed but most seedlings and juveniles at the 4-leaf stage (2–3 years old) or older survived by resprouting after wildfire (at Royal NP, 1994) (Orscheg & Parsons 1996).**Interaction with other organisms:** Fruit eaten by Pied Currawong, Topknot Pigeon, White-headed Pigeon (Floyd 1989). Blossoms and fruit eaten by Grey-headed Flying Fox *Pteropus poliocephalus* (Eby 1995). Food plant of butterfly larvae *Telicota ancilla ancilla* (Common & Waterhouse 1981). Possible

predation of seedlings by Bush Rat *Rattus fuscipes* and fruit by Bush Rat or Common Brush-tailed Possum *Trichosurus vulpecula* (Orscheg & Parsons 1996).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld, Vic.

Distribution Sydney area: Widespread in coastal areas.

Select locations: CC: Mooney Mooney, Pearl Beach, Bayview, Port Jackson, Kurnell, Bola Creek, Garie Beach, Grose River, Mt Cambewarra, Upper Kangaroo Valley.

Habitat

Habitat: Creeks, swampy places.

Altitude: 0–200 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Frequent.

Vegetation: Moist sclerophyll forest e.g. with *Eucalyptus saligna*, *E. pilularis*, *Syncarpia glomulifera*; rainforest margins.

Substrate: Clay soils on shales, alluvium, medium nutrients, sometimes poorly-drained.

Exposure: Full sun to light shade.

Conservation

Conservation: Common on the southern foreshores of Sydney Harbour in 1788 and used by the settlers for building huts. Conservation status unknown. Reported in Bouddi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP.

Asparagus aethiopicus***ASPARAGACEAE (LILIACEAE)**

(*Protasparagus aethiopicus*, *P. densiflorus*, *Asparagus densiflorus*)

Asparagus Fern, Sprengeri Fern

Life history

Growth form: Perennial herb with spiny, sprawling stems to 2 m long; leaves bract-like scales, cladodes narrow to 2.5 cm long; fibrous and tuberous roots (tubers are not reproductive).

Vegetative spread: Forms thick mat of rhizomes.

Longevity:

Primary juvenile period:

Flowers: White to pinkish, spring–autumn (J. Hosking pers. comm.). Probably pollinated by Honeybees *Apis mellifera* and possibly native bees (P. Kubiak pers. comm.).

Fruit/seed: Red berry, late winter–early spring.

Dispersal, establishment & growth: Diaspore: fruit, bird-dispersed, with large amount of seed seen at the base of trees. Seed viable for 5 years in soil (M. Clarke pers. comm.).

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 1 year (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

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

Botanical subregions: NC CC SC ?SWS; LHI, Qld, S.A., W.A.

Distribution Sydney area: Mainly coastal.

Select locations: CC: Patonga, Commodore Heights (1951), Northbridge (1953), Beecroft, Manly, Balmoral, Boronia Park, Bellevue Hill (1954), Oatley.

Habitat

Habitat: Rock crevices, stream banks, sand dunes.

Altitude: 0–200 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Coastal heath e.g. with *Westringia fruticosa*; scrub e.g. with *Pittosporum undulatum*; coastal sand dunes to open-woodland e.g. with *Angophora costata*, *Corymbia gummifera*.

Substrate: Sandy or skeletal soils, mainly on Hawkesbury Sandstone, low–medium nutrients, well-drained fertile soils (M. Clarke pers. comm.).

Exposure: Light to medium shade.

Conservation

Conservation: Cultivated as ornamental. Extensively naturalised along the coast, and a serious weed in bushland (Harden 1993). Appears to be particularly establishing on harbour and estuary foreshores. Control by removal of fruit and rhizomes; where extensive mats have formed, use a mattock to loosen the rhizomatous mat, rolling up like a carpet.

***Asparagus asparagoides* *** (*Myrsiphyllum asparagoides*) **ASPARAGACEAE (LILIACEAE)**

Florist's Smilax

Life history

Growth form: Climbing herb with stems to 3 m long, with rhizome and clustered masses of tuberous roots; leaves scale-like, leaf-like cladodes to 4 cm long.

Vegetative spread: By rhizomes.

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, July–September.

Fruit/seed: Red berry 5–19 mm diam., with 1–many seeds. Fruits mostly ripen in spring (J. Hosking pers. comm.). Mature fruit can remain on plant for several months, (M. Clarke pers. comm.). Seeds germinate readily at temperatures between 10°–20°C (NRE 1999).

Dispersal, establishment & growth: Diaspore: fruit, bird-dispersed (M. Clarke pers. comm.). Seed spread in mud adhering to animals and machinery; vehicles can spread seeds and roots (NRE 1999). Seeds probably viable for 4–5 years in soil, germinates easily; stems die back in hot dry periods (M. Clarke pers. comm.).

Fire response: Resprouts rapidly after wildfire (NRE 1999), fruiting in less than 1 year (P. Kubiak pers. comm.).

Interaction with other organisms: A cicadellid leafhopper *Zygina* sp. that sucks cell content from cladodes and a rust fungus *Puccinia myrsiphylla* have been released for biological control (J. Hosking pers. comm.).

Distribution

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

Botanical subregions: NC CC SC NWS CWS SWS SWP; LHI, Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Mainly western Sydney.

Select locations: CC: North Richmond, Pymble, Cheltenham (1949), Lugarno (1953), Liverpool, Nepean River Cobbitty (1951), Douglas Park.

Habitat

Habitat: River banks.

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

Typical local abundance: Frequent.

Vegetation: Riverflat forest e.g. with *Casuarina glauca*, *Casuarina cunninghamiana*; Cumberland Plain Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*.

Substrate: Clay soils on shale, alluvium, medium nutrients, well-drained.

Exposure: Full sun to light shade.

Conservation

Conservation: Serious bushland weed particularly in western Sydney. Canopy smothers other vegetation, and masses of underground rhizomes and tubers form thick mats. Control by removal of fruit and rhizomes (M. Clarke pers. comm.).

Asparagus officinalis* **ASPARAGACEAE (LILIACEAE)**

Asparagus

Life history

Growth form: Erect, perennial herb 0.5–1.5 m high, with scale-like leaves and narrow cladodes to 2.5 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Greenish white, spring–summer.

Fruit/seed: Red berry with 3–6 shiny black seeds, until June.

Dispersal, establishment & growth: Diaspore: berry. Bird and possibly animal-dispersed (Carr et al. 1992).

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove), fruiting within 5 months (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe, N Africa and W Asia. Introduced as food plant.

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

Distribution Sydney area: Suburban areas.

Select locations: CC: Mangrove Mountain (1995), Woy Woy (1922), Cheltenham (1946), Gordon (1914), Casula (1964). CT: Bathurst (1987).

Habitat

Habitat: Roadsides and weedy areas.

Altitude: 0–800 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Occasional.

Vegetation: Weedy areas.

Substrate: Clay soil.

Exposure:

Conservation

Conservation: Commonly cultivated for its edible stems. Occasionally naturalised near cultivation.

***Asparagus plumosus* *** (*Protasparagus plumosus*)**ASPARGACEAE** (LILIACEAE)

Climbing Asparagus Fern

Life history

Growth form: Vine with wiry climbing stems to c. 5 m long and spines; leaves bract-like scales, cladodes to 7 mm long.

Vegetative spread: New shoots form along rhizomes in spring (Parsons & Cuthbertson 1992).

Longevity:

Primary juvenile period:

Flowers: Greenish to white, February–June.

Fruit/seed: Black berry 5 mm diam., summer until June. Fruiting material collected 1/10/02 (J. Hosking pers. comm.).

Dispersal, establishment & growth: Diaspore: fruit, bird-dispersed. Also probably dispersed by bats (J. Hosking pers. comm.).

Fire response:

Interaction with other organisms: Foodplant of Silvereye *Zosterops lateralis* (Barker & Vestjens 1989,1990).

Distribution

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

Botanical subregions: NC CC ?SWS; LHI, Qld, Vic., S.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Mackerel Beach (1997), Epping (1950), Jibbon Beach (1963).

Habitat

Habitat: Coastal estuaries, foreshores.

Altitude: 0–200 m **Annual rainfall:** 1200–1400 mm

Typical local abundance:

Vegetation: Swamp forest e.g. with *Casuarina glauca*; open-forest e.g. with *Eucalyptus pilularis*.

Substrate: Sandy soil on dune sand, clay soil on shale, low–medium nutrients.

Exposure:

Conservation

Conservation: Cultivated as ornamental. Occasionally naturalised in Sydney area but more extensive on North Coast.

Asparagus scandens (*Myrsiphyllum scandens*)

ASPARAGACEAE (LILIACEAE)

Asparagus Fern

Life history

Growth form: Climber with scrambling stems to about 2 m long, with scale-like leaves and narrow leaf-like cladodes to 1.5 cm long.

Vegetative spread: Tubers can form mats (EWAN).

Longevity:

Primary juvenile period:

Flowers: White to pinkish, winter–early spring.

Fruit/seed: Red berry 5–7 mm diam., with one black shiny seed, mature until summer.

Dispersal, establishment & growth: Diaspore: fruit, bird-dispersed. Vegetative spread from tubers in garden waste (EWAN).

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

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

Botanical subregions: CC; Vic.

Distribution Sydney area: Sydney suburbs.

Select locations: CC: Greys Point (1998), Wahroonga (1973), Lindfield (1982), Cheltenham (1979), Ashton Park Mosman (1965).

Habitat

Habitat: Moist gullies.

Altitude: 0–100 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Open forest e.g. with *Eucalyptus saligna*, *E. pilularis*.

Substrate: Clay soil on shale, medium nutrients, well-drained.

Exposure:

Conservation

Conservation: Cultivated as ornamental. Occasionally naturalised in urban bushland since 1970. Potential spread unknown.

Asparagus virgatus (*Protasparagus virgatus*)

ASPARAGACEAE (LILIACEAE)

Asparagus Fern

Life history

Growth form: Erect herb or shrub 0.4–0.8 m high, with scale-like leaves, no spines.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Greenish white, spring–summer.

Fruit/seed: Orange berry 4–6 mm diam, with one seed, at any time of year.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: CC; Qld.

Distribution Sydney area:

Select locations: CC: Colyton (1984).

Habitat

Habitat:

Altitude: 0–200 m

Annual rainfall: 800 mm

Typical local abundance:

Vegetation: Weedy area.

Substrate:

Exposure:

Conservation

Conservation: Cultivated as ornamental. Rarely recorded naturalised, only record is Colyton.

***Asphodelus fistulosus* ***

ASPHODELACEAE (LILIACEAE)

Onion-weed, Asphodel, Wild Onion

Life history

Growth form: Erect herb with flowering stem 20–80 cm high. Root long and fibrous, yellow, no taproot (Parsons & Cuthbertson 1992).

Vegetative spread:

Longevity: Annual or biennial or short-lived perennial (Parsons & Cuthbertson 1992).

Primary juvenile period:

Flowers: White or pale pink with red-brown stripe, August–November.

Fruit/seed: Brown capsule 4–6 mm diam., with 1–2 brown or black wrinkled seeds 3–4 mm long (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Diaspore: seed. Animal, water and wind-dispersed (Carr et al. 1992), dispersed on vehicles, machinery, animals, wool, clothing; germination at any time of year but mainly late summer and autumn; establishes most easily in disturbed areas (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: Not eaten by stock; the fungus *Fusarium* destroys the roots; fungus *Puccinia barbeyi* may be a possible control agent (Parsons & Cuthbertson 1992).

Distribution

Status/origin: Exotic, native to Native of S Europe east to India.

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

Distribution Sydney area: Sporadic.

Select locations: CC: Richmond (1987), Milson Island (1912), Shellharbour (1949). CT: Bathurst (1939).

Habitat

Habitat: Cemeteries, gardens.

Altitude: 0–800 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent.

Vegetation:

Substrate: Particularly common on limestone (J. Hosking pers. comm.). Grows well on sandy alkaline soils; able to withstand drought (Parsons & Cuthbertson 1992).

Exposure: Full sun.

Conservation

Conservation: Declared noxious weed in some shires of NSW (Harden 1993). Control by cultivation or hand removal (Parsons & Cuthbertson 1992).

Bulbine bulbosa (*Bulbinopsis bulbosa*)

ASPHODELACEAE (LILIACEAE)

Native Leek, Bulbine Lily, Golden Lily

Life history**Growth form:** Perennial herb to 75 cm high, with thick roots, often with a bulb.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Yellow, with brown stripe, fragrant, September–January, peak October.**Fruit/seed:** Capsule 3–6 mm long; seeds brown to almost black 0.8–2 mm long. Mature December–January (Greening Australia 1996b).**Dispersal, establishment & growth:** Diaspore: seed, germination after storage 2–3 months takes approx. 35 days, with about 165 seedlings per gram seed; high temperatures inhibit germination (Greening Australia 1996b).**Fire response:****Interaction with other organisms:** Palatable to rabbits (Leigh et al. 1987). Suspected of causing illness and death in cattle, horses and sheep (Harden 1993). Bulb reported eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., W.A.**Distribution Sydney area:** Cumberland Plain, Bathurst–Orange area.**Select locations:** CC: Bilpin, Scheyville, Marayong, St Marys. CT: Rylstone, Sunny Corner, Oberon, Jenolan Caves, Wombeyan Caves.**Habitat****Habitat:** Damp places.**Altitude:** 0–1000 m **Annual rainfall:** 700–900 mm**Typical local abundance:** Frequent.**Vegetation:** Woodland e.g. with *Eucalyptus moluccana*, *E. crebra*, *E. macrorrhyncha*, *Bursaria spinosa*; grassland.**Substrate:** Clay soils on Wianamatta Shale, basalt, conglomerate, low–high nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation elsewhere unknown.***Bulbine glauca*** (*B. semibarbata*)

ASPHODELACEAE (LILIACEAE)

Bulbine Lily, Rock Lily

Life history**Growth form:** Perennial tufted herb to 110 cm high, with thick roots, sometimes with a short rhizome.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** Yellow, with red-brown stripe, October–December.**Fruit/seed:** Capsule 3–6 mm long, with seeds to 3 mm long. Mature December–January (Greening Australia 1996b).**Dispersal, establishment & growth:** Diaspore: seed, germination after storage 2–3 months takes approx. 35 days, with about 165 seedlings per gram of seed; high temperatures inhibit germination (Greening Australia 1996b).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** SC ?NT ?CT ST; Vic.**Distribution Sydney area:** Orange area.**Select locations:** CT: Junction Reefs, Belubula River (1991).

Habitat**Habitat:** In crevices on cliffs.**Altitude:** 550 m**Annual rainfall:** 800 mm**Typical local abundance:** Frequent.**Vegetation:****Substrate:** Cliffs of slaty metamorphic rocks near river.**Exposure:**

Conservation**Conservation:** Rare, only Sydney area record is from Belubula River.***Bulbine semibarbata*** (*Bulbinopsis semibarbata*)**ASPHODELACEAE** (LILIACEAE)

Native Leek, Wild Onion, Leek Lily

Life history**Growth form:** Herb to 50 cm high, with fibrous roots.**Vegetative spread:****Longevity:** Usually less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Yellow, with red-brown stripe, July–January.**Fruit/seed:** Capsule 2–5 mm long, with seeds 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld,

Vic., S.A., W.A.

Distribution Sydney area: Sporadic.**Select locations:** CC: Kiama (1899) Wallerawang (1917).

Habitat**Habitat:****Altitude:** 0–1000 m**Annual rainfall:** 900–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:**

Conservation**Conservation:** Rare, no recent records.

***Kniphofia uvaria* *** (*Kniphofia aloides*)

ASPHODELACEAE (LILIACEAE)

Red Hot Poker

Life history**Growth form:** Perennial herb, with basal leaves and thick rhizome; flowering parts to 1.5 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Orange-red to yellow-green, February.**Fruit/seed:** Capsule 7–14 mm diam.,**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa. Introduced as ornamental.**Botanical subregions:** CT ST.**Distribution Sydney area:****Select locations:** CT: Wentworth Falls (1992).**Habitat****Habitat:** Swampy sites.**Altitude:** 1000 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Rare.**Vegetation:** Sedge swamp.**Substrate:** Peaty moist soil over sandstone, poorly-drained, low nutrients.**Exposure:****Conservation****Conservation:** Widely cultivated as ornamental. Occasionally naturalised or persisting near old habitations in Upper Blue Mountains.***Trachyandra divaricata* ***

ASPHODELACEAE (LILIACEAE)

Strapweed

Life history**Growth form:** Erect, tufted perennial herb to 70 cm high, with vertical rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, with a brown central stripe and gold toward the base, July–January.**Fruit/seed:** Brown–black capsule 3–10 mm long, with 3–22 (average 11) red-brown to black seeds 1–2 mm long. About 200 fruits per plant with about 2000 seeds (Heyligers 1999).**Dispersal, establishment & growth:** Diaspore: 'crown' of tangled, fruiting, hollow stems, wind-dispersed ('tumbleweed') and buoyant in seawater, may stay afloat for several weeks, but small seeds, once released, may sink within minutes, viable for up to 8 months in seawater (Heyligers 1999).**Fire response:****Interaction with other organisms:** Plants are toxic to animals, particularly horses (J. Hosking pers. comm.).**Distribution****Status/origin:** Exotic, native to S Africa. Possibly introduced from Western Australia as contaminant of *Acacia saligna* seed in planting stock used in dune restoration work (Heyligers 1999).**Botanical subregions:** NC CC; S.A., W.A.**Distribution Sydney area:** Coast, Port Stephens to Kiama.**Select locations:** CC: Wamberal Beach (1985), Maroubra (1975), Killalea Beach (1996), Fairy Meadow (1968).

Habitat

Habitat: Sand dunes, particularly rehabilitated dune areas.

Altitude: 0–20 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassland e.g. with *Spinifex hirsutus*.

Substrate: Beach sand dunes.

Exposure: Full sun.

Conservation

Conservation: First recorded in 1968 near Wollongong. Naturalised on coastal sand dunes from Port Stephens to Wollongong area (Harden 1993), with potential to spread further (Heyligers 1999).

Cordyline stricta

ASTELIACEAE (AGAVACEAE)

Narrow-leaved Palm Lily

Life history

Growth form: Shrub to 5 m high, sometimes sprawling and branched towards the base, with narrow leaves.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bluish, November.

Fruit/seed: Purple to black berry 10–15 mm long, with black seeds, March–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT; Qld.

Distribution Sydney area: Lower Blue Mountains.

Select locations: CC: Wheeny Creek, Mountain Lagoon, Bilpin.

Habitat

Habitat: Gullies, steep hillsides.

Altitude: 0–300 m **Annual rainfall:** 1000–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Rainforest.

Substrate: Clay soil on basalt, high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Bilpin is southern geographical limit.

Blandfordia cunninghamii**BLANDFORDIACEAE (LILIACEAE)****Life history**

Growth form: Tufted perennial herb, with leaves to 100 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Bell-shaped, red with yellow lobes, November–March, peak January, through few plants flowering in some seasons (Porter 1992).

Fruit/seed: Capsule to 9 cm long, with numerous hairy seeds, January.

Dispersal, establishment & growth: Diaspore: seed

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT.

Distribution Sydney area: Blue Mountains, Illawarra.

Select locations: CC: Wedderburn (Keith 1994), Mt Kembla, Bargo River. CT: Mt Tomah, Mt Wilson, Blackheath, Leura, Wentworth Falls.

Habitat

Habitat: Sandstone cliff edges.

Altitude: 200–1000 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Moist cliff edges e.g. with *Gleichenia*, *Blechnum*, *Gahnia*, *Daviesia mimosoides*. Moist habitats, particularly damp rock faces e.g. with *Acacia elata*, *Callicoma serratifolia*, *Leptospermum polygalifolium*, *Stylidium productum*, *Dianella caerulea*, *Epacris pulchella*, *Gonocarpus teucroides*, *Styphelia triflora* (Porters 1992).

Substrate: Shallow peaty soils over sandstone, low nutrients, poorly-drained. Higher proportion of silt and clay at sites where *B. cunninghamii* occurs (Porters 1992).

Exposure:

Conservation

Conservation: Restricted local endemic, coded 3RCi on national rare species list (Briggs & Leigh 1996). Population sizes range from 1–300 plants (Porter 1992). Reported in Blue Mountains NP.

Blandfordia grandiflora**BLANDFORDIACEAE (LILIACEAE)****Life history**

Growth form: Tufted perennial herb, with leaves to 70 cm long. Other forms, possibly hybrids approaching *B. nobilis* sometimes found in southern parts of its range (Harden 1993). Distinction between *B. grandiflora* and *B. cunninghamii* is based on vegetative rather than floral attributes and is made difficult by phenotypic response of *B. cunninghamii* plants to light intensity (Porter et al. 1992).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Red with yellow tips, November–February, peak December. Flowers visited by honey eaters which favoured plants with most flowers; these plants achieve higher amounts of self-pollination and cross-pollination (Paton 1982).

Fruit/seed: Capsule 6 cm long, with numerous hairy seeds, December.

Dispersal, establishment & growth:

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT CT; Qld.

Distribution Sydney area: Coast and Tablelands.

Select locations: CC: Mangrove Mountain, Wyong, Somersby, Calga, Mt White, Bilpin, Woodford. CT: Lawson.

Habitat

Habitat: Rock shelves, slopes, ridges.

Altitude: 0–900 m **Annual rainfall:** 1100–1200 mm

Typical local abundance: Frequent.

Vegetation: Open-forest and woodland.

Substrate: Damp sandy or peaty soils over sandstone, low nutrients, poorly drained.

Exposure:

Conservation

Conservation: Lawson is southern geographical limit. Conservation status unknown.

Blandfordia nobilis

BLANDFORDIACEAE (LILIACEAE)

Life history

Growth form: Erect perennial herb. Woody underground bulb 2 cm long with ?contractile roots. Moderately variable with extremes approaching *B. grandiflora* in the northern parts of its range, suggesting that the species may hybridize (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period: Plants take 5 years to flower and then flower sporadically (Lyn Parry, newspaper cutting).

Flowers: Red with yellow lobes, September–February, peak December–January.

Fruit/seed:

Dispersal, establishment & growth: Diaspore: seed, no special morphology for dispersal (Westoby et al. 1990).

Fire response: Foliage killed. Resprouts, plants often respond by flowering and seeding 1 year after fire (D. Keith pers. comm.), apparently increased flowering after high intensity fire 1994 (P. Kubiak pers. comm.).

Interaction with other organisms: Leaves frequently eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT ST.

Distribution Sydney area: Mainly coast.

Select locations: CC: Mt White, Gosford, Springwood, Mt Colah, Pennant Hills, Belrose, Beacon Hill, Kurnell, Arncliffe (1886), Como, Kentlyn, Kiama, Barren Grounds. CT: Robertson, Carrington Falls.

Habitat

Habitat: Damp places, swamps.

Altitude: 0–600 m **Annual rainfall:** 1200–1800 mm

Typical local abundance: Frequent.

Vegetation: Wet heath, sedgeland e.g. with *Schoenus brevifolius*, *Drosera*.

Substrate: Shallow sandy soil on sandstone, low nutrients, moist.

Exposure: Full sun.

Conservation

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

Burmannia disticha**BURMANNIACEAE****Life history****Growth form:** Erect herb to 70 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Tubular, blue with yellow bands, at any time of year.**Fruit/seed:** Capsule 6–20 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT; Qld, Asia.**Distribution Sydney area:** Coast.**Select locations:** CC: Gosford (1927).**Habitat****Habitat:** Swamps, wetlands.**Altitude:** 0–50 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:** Shady sites.**Conservation****Conservation:** Rare, Gosford is southern geographical limit, last recorded 1927.**Canna indica *****CANNACEAE**

Canna

Life history**Growth form:** Erect, glabrous herb to 2 m high, with rhizomes.**Vegetative spread:** Locally by rhizomes.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** Red to yellow, spring–summer.**Fruit/seed:** Hard capsule 2–3 cm long, with black seeds.**Dispersal, establishment & growth:** Dispersed in garden waste.**Fire response:** Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering in 38 weeks (P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America. Introduced as ornamental.**Botanical subregions:** NC CC SC CT; Qld.**Distribution Sydney area:****Select locations:** CC: Matcham (1991), Manly Vale (1982), Woollooware Bay (1976), Campbelltown (1967), Macquarie Pass (1951), Barren Grounds (1954).**Habitat****Habitat:** Disturbed areas, creeks, near habitation.**Altitude:** 0–200 m**Annual rainfall:** 200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Wetlands e.g. with *Typha*; edge of *Ceratopetalum apetalum*, *Casuarina glauca* swamp; gully rainforest e.g. with *Glochidion ferdinandi*, *Archontophoenix cunninghamiana*, *Smilax australis*.**Substrate:** Sandy soils on alluvium, clay soils on shale, low–medium nutrients, poorly-drained.**Exposure:****Conservation****Conservation:** Often cultivated as ornamental; naturalised in disturbed land and along creeks, mostly near habitation, north from Macquarie Pass.

Centrolepis fascicularis

CENTROLEPIDACEAE

Life history

Growth form: Perennial herb forming dense cushions 3–20 cm diam.**Vegetative spread:****Longevity:** Perennial.**Primary juvenile period:****Flowers:** November–February.**Fruit/seed:** Dehiscent, 1-seeded follicle. Seed germinates without treatment (G. Knox pers. comm.).**Dispersal, establishment & growth:** Diaspore: seed.**Fire response:****Interaction with other organisms:**

Distribution

Status/origin: Native.**Botanical subregions:** NC CC SC NT CT ST; Qld, Vic., Tas., S.A., ?*W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Howes Valley, Killcare, Manly, Leumeah, Botany (1888), La Perouse, Kurnell, Loddon Falls. CT: Ilford, Blackheath, Wentworth Falls, Barrengarry Mountain, Hanging Rock Swamp, Penrose.

Habitat

Habitat: Heathland, bogs, wet rocky riverbanks.**Altitude:** 0–1000 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Wet heath e.g. with *Gleichenia*, *Sphagnum*, *Blechnum nudum*, *Empodisma*, *Drosera*; margins of hanging swamp; woodland e.g. with *Eucalyptus piperita*, *Gleichenia microphylla*.**Substrate:** Moist, peaty soil over sandstone, permanently moist, low nutrients.**Exposure:**

Conservation

Conservation: Conservation status unknown.***Centrolepis strigosa* subsp. *strigosa***

CENTROLEPIDACEAE

Life history

Growth form: Tufted herb to 10 cm high.**Vegetative spread:** No.**Longevity:** Short-lived annual (G. Knox pers. comm.).**Primary juvenile period:** 11 months (P. Kubiak pers. comm.).**Flowers:** September–December.**Fruit/seed:** Dehiscent, 1-seeded follicle. Seed germinates without treatment (G. Knox pers. comm.).**Dispersal, establishment & growth:****Fire response:** Probably killed after high intensity fire 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 NWP SWP; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Agnes Banks, Cheltenham, Gladsville, Rose Bay (1901), Malabar, Kurnell, Leumeah, Bomaderry. CT: Bathurst, Little Hartley, Yerranderie, Mittagong, Marulan.

Habitat

Habitat: Creekbanks, rock ledges, pavements.**Altitude:** 0–700 m **Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus paramattensis*, *Angophora bakeri*; moist scrub e.g. with *Kunzea ambigua*, *Melaleuca nodosa*; often associated with moss beds, sedgeland.**Substrate:** Shallow sandy soil on sandstone, dune sand, Tertiary alluvium, granite, periodically moist, low nutrients.**Exposure:**

Conservation

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

Burchardia umbellata

COLCHICACEAE (LILIACEAE)

Milkmaids

Life history

Growth form: Perennial herb, with tuberous roots, one or two basal leaves and narrow leaves to 60 cm long; flower stalk 10–65 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, occasionally tinged with pink. Flowers visited by more than one species of fly (Diptera) and tiny beetles (Coleoptera) (P. Kubiak pers. comm.).

Fruit/seed: Capsule 10–15 cm long, with brown seeds. Mature December–January (Greening Australia 1996b). Viability of fresh seed 93%, after 1 year storage 28% (Vigilante et al. (1998).

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.). Germination after storage 2–3 months takes approx. 71 days, with about 572 seedlings per gram seed; sow seed in autumn, higher germination rate if seed is smoked (Greening Australia 1996b).

Fire response: Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).

Interaction with other organisms: Leaves possibly eaten by rabbits (P. Kubiak pers. comm.). Tuberous roots reported eaten by Aboriginal people (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Doyalson, Somersby, Richmond, Berkshire Park, Hornsby, Wahroonga, Beacon Hill, Frenchs Forest, Concord, Helensburgh, Fitzroy Falls. CT: Orange, Carcoar, Barbers Creek (1898).

Habitat

Habitat: Swamps, heath.

Altitude: 0–900 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent.

Vegetation: Wet heath e.g. with *Geichenia dicarpa*, *Lepyrodia scariosa*, *Banksia oblongifolia*, *Eucalyptus haemastoma*, *Kunzea ambigua*, *Melaleuca nodosa*.

Substrate: Sandy clay soils on sandstone, Tertiary alluvium, shales, low nutrients, periodically moist.

Exposure:

Conservation

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

Gloriosa superba *

COLCHICACEAE (LILIACEAE)

Glory Lily

Life history

Growth form: Herb with climbing stems 2–4 m long, glabrous.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, orange or red, October–May.

Fruit/seed: Capsule 4–10 mm long, with red seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: NC CC; LHI, Qld.

Distribution Sydney area:

Select locations: CC: Mosman (1989).

Habitat

Habitat:
Altitude: 0–50 m **Annual rainfall:** 1200 mm
Typical local abundance:
Vegetation:
Substrate:
Exposure:

Conservation

Conservation: Widely cultivated as ornamental, occasionally naturalised, with only 1 record for Sydney area. However, a major weed in coastal vegetation on the North Coast (Jeff Thomas pers. comm., J. Hosking pers. comm.).

Wurmbea biglandulosa (incl. in *Anguillaria dioica*)

COLCHICACEAE (LILIACEAE)

Life history

Growth form: Perennial herb to 30 cm high, with corm.
Vegetative spread: No (McIntyre et al. 1995).
Longevity:
Primary juvenile period:
Flowers: White, September–October.
Fruit/seed: Capsule with brown seeds, October.
Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995).
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Native.
Botanical subregions: NC CC SC NT ST NWS CWS SWS NWP; Qld, Vic.
Distribution Sydney area: Western Sydney.
Select locations: CC: Werrington, Penrith, St Marys, Parramatta (1881).

Habitat

Habitat: Disturbed grassy places, creekbanks, rocky ridges.
Altitude: 0–50 m **Annual rainfall:** 700–900 mm
Typical local abundance: Frequent–occasional.
Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *Bursaria spinosa*, *Themeda australis*.
Substrate: Clay soil on Wianamatta Shale, medium nutrients, well-drained.
Exposure:

Conservation

Conservation: Rare. Vulnerable in Western Sydney (James et al. 1999).

Wurmbea dioica (*Anguillaria dioica*)

COLCHICACEAE (LILIACEAE)

Early Nancy

Life history**Growth form:** Perennial herb to 30 cm high, with corm.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** White, September–October.**Fruit/seed:** Capsule 5–10 mm long, with brown seeds. Mature summer (Greening Australia 1996b).**Dispersal, establishment & growth:** Germination takes approx. 35 days, with high germination rate; sow seed in autumn (Greening Australia 1996b).**Fire response:****Interaction with other organisms:** Small bulb reported eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., S.A.**Distribution Sydney area:****Select locations:** CC: Glen Davis, Marayong, Plumpton, St Marys, Parramatta, Homebush.

CT: Bathurst, Georges Plains.

Habitat**Habitat:** Inland sand dunes, loam flats.**Altitude:** 0–800 m**Annual rainfall:** 700–900 mm**Typical local abundance:****Vegetation:** Woodland e.g. with *Eucalyptus moluccana*, *Bursaria spinosa*, *Themeda australis*.**Substrate:** Clay soils on shale.**Exposure:****Conservation****Conservation:** Rarely recorded in Bathurst area, last record 1964.***Aneilema acuminatum***

COMMELINACEAE

Life history**Growth form:** Weak, slender, perennial herb to 40 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, November–December. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).**Fruit/seed:** Flattened capsule 4 mm long, with pale grey 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 NT CWS; Qld.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Yarramalong, Mt Kembla.**Habitat****Habitat:** Moist gullies.**Altitude:** 0–300 m**Annual rainfall:** 1100–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Rainforest e.g. with *Toona ciliata*, *Cryptocarya microneura*, *Acronychia oblongifolia*.**Substrate:** Clay soils on shale.**Exposure:****Conservation****Conservation:** Rare, conservation status unknown.

Aneilema biflorum

COMMELINACEAE

Life history

Growth form: Weak, prostrate to ascending perennial herb to 20 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White, December–March. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).

Fruit/seed: Flattened capsule 4 mm long, with pale grey 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: Grose River, Menangle Creek, Mt Keira, Kiama, Cobbitty, Razorback.

Habitat

Habitat: Damp, shaded places, creekbanks.

Altitude: 0–400 m

Annual rainfall: 800–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Dry rainforest e.g. with *Streblus brunonianus*, *Maclura cochinchinensis*.

Substrate: Clay soil on shales, medium nutrients.

Exposure:

Conservation

Conservation: Regionally rare in Illawarra region (Mills 1988). Conservation status elsewhere unknown. Reported in Royal NP.

***Commelina africana* ***

COMMELINACEAE

Life history

Growth form: Perennial herb with woody rootstock and prostrate or ascending stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, December–February. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).

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

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa (Ghana–S Africa).

Botanical subregions: CC.

Distribution Sydney area:

Select locations: CC: Berry Island (1992), Greenwich (1983).

Habitat

Habitat:

Altitude: 0–50 m

Annual rainfall: 1200 mm

Typical local abundance: Occasional.

Vegetation: Eucalyptus woodland e.g. with *Kunzea ambigua*.

Substrate: Sandy soil on sandstone.

Exposure:

Conservation

Conservation: Garden escape, locally naturalised in the Greenwich area and Berry Island in eucalypt woodland, ability to spread unknown.

Commelina cyanea**COMMELINACEAE**

Native Wandering Jew

Life history**Growth form:** Weak, procumbent, spreading herb, with stolons and fleshy roots at nodes.**Vegetative spread:** Roots at nodes, able to spread several metres in a season but then dies back.**Longevity:** Indefinite.**Primary juvenile period:** 6 months.**Flowers:** Blue, November–April. In summer, flowers open in the morning and close by mid-afternoon; probably pollinated by native bees and Honeybees *Apis mellifera* and possibly flies (P. Kubiak pers. comm.). Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).**Fruit/seed:** Dry capsule, with 5 dull brown or black seeds 2–3 mm long.**Dispersal, establishment & growth:** Diaspore: seed. Main growth period Summer, may die off in winter to resprout in Spring from stem remnants or possibly seeds. Growth rate quick. Coloniser of open areas.**Fire response:** Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering in 3 months (P. Kubiak pers. comm.).**Interaction with other organisms:** Eaten by rabbits (P. Kubiak pers. comm.). Young shoots can be used as a cooked green vegetable, boiled and served with butter and salt (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT NWS CWS NWP; LHI, Qld.**Distribution Sydney area:** Coast and adjacent plateaus.**Select locations:** CC: Howes Valley, Richmond, Glenbrook, Beecroft, Nielsen Park, Kurnell, Kogarah, Campbelltown, Razorback, Kowmung, Bulli, Kangaroo Valley.**Habitat****Habitat:** Moist places, creek banks, disturbed areas.**Altitude:** 0–400 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus botryoides*; woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; spreads in open areas with adequate moisture.**Substrate:** Loamy to clay soils on sandstone, shale, volcanic necks, medium to high nutrients. Possibly somewhat salt-tolerant.**Exposure:** Shade to full sun.**Conservation****Conservation:** Probably adequately conserved. Species survives well even in small, often weedy reserves. Reported in Blue Mountains NP, Bouddi NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.***Murdannia graminea*****COMMELINACEAE****Life history****Growth form:** Erect, perennial herb 10–60 cm high, with tuberous roots.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Blue or purplish, rarely white, December–February. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).**Fruit/seed:** 3-valved capsule 6–10 mm long, with 12–15 greyish to dark brown seeds, matures summer. Seed weight 0.0011 g (Peter Lister pers. comm.).**Dispersal, establishment & growth:** Diaspore: seed. No particular morphology for dispersal (McIntyre et al. 1995). Germination rapid, non-dormant fraction 44 % (Peter Lister pers. comm.).**Fire response:****Interaction with other organisms:** Edible tuberous roots (Cribb & Cribb 1984).

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC NT NWS CWS NWP; Qld, N.T., W.A.**Distribution Sydney area:** Mainly Richmond.**Select locations:** CC: Richmond, Agnes Banks, Cowan (1921).**Habitat****Habitat:** Sandy soil liable to flooding.**Altitude:** 0–50 m **Annual rainfall:** 800–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus tereticornis*, grassy understorey.**Substrate:** Sandy soil from Tertiary alluvium, low nutrients. Water table mostly low, moisture supply intermittent, fresh.**Exposure:** 40–60% projective foliage cover (P. Lister pers. comm.).**Conservation****Conservation:** Rare, vulnerable in Western Sydney (James et al. 1999). Not adequately conserved, recorded in Richmond area (1902, 1964, 1993), collected once at Cowan in 1921.***Pollia crispata*****COMMELINACEAE****Life history****Growth form:** Perennial herb, with ascending stems to 1 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or sometimes blue, October–March. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).**Fruit/seed:** Nut 5–6 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC CT; Qld.**Distribution Sydney area:** Coast.**Select locations:** CC: Wyong, Mt Keira, Otford, Albion Park, Bulli, Minnamurra Falls, Cambewarra Range. CT: Belmore Falls.**Habitat****Habitat:** Wet places along creeks.**Altitude:** 0–600 m **Annual rainfall:** 1200–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Rainforest e.g. with *Doryphora sassafras*, *Cryptocarya* sp., *Livistona australis*, or margins of rainforest.**Substrate:** Clay soils on alluvium, basalt, medium to high nutrients.**Exposure:****Conservation****Conservation:** Cambewarra Range is southern geographical limit. Conservation status unknown.

***Tradescantia fluminensis* *** (*T. albiflora*)

COMMELINACEAE

Wandering Jew

Life history

Growth form: Weak, procumbent, succulent herb, with fine roots at nodes; similar to *Commelina* but leaves and stems more fleshy.

Vegetative spread: Stem breaks easily at nodes, then roots and grows rapidly (Buchanan 1981).

Longevity: Perennial.

Primary juvenile period:

Flowers: White, October–January. Flowering may be suppressed in heavily shaded areas; probably pollinated by Honeybees *Apis mellifera* and Hoverflies (Syrphidae) and possibly by small native bees (P. Kubiak pers. comm.). Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).

Fruit/seed: Papery capsule.

Dispersal, establishment & growth: Mainly dispersed by stem fragments.

Fire response: Fleshy nature makes it difficult to burn. Resprouted after high intensity fire in 1994 (at Lane Cove), with peak flowering in 3 years (P. Kubiak pers. comm.).

Interaction with other organisms: Shoots eaten by rabbits (P. Kubiak pers. comm.). Provides sheltered, moist habitat for Paralysis Tick *Ixodes holocyclus* (B. Conroy pers. comm.).

Distribution

Status/origin: Exotic, native to S America. Garden escape.

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

Distribution Sydney area: Common weed in shaded and disturbed sites around Sydney

Select locations: CC: Yarramalong, Pennant Hills, Milperra, Bowens Creek, Shellharbour, Kangaroo Valley. CT: Katoomba.

Habitat

Habitat: Creeks and drainage lines, moist disturbed sites.

Altitude: 0–1000 m **Annual rainfall:** 900–1600 mm

Typical local abundance: Frequent.

Vegetation: Forest and woodland, edge of rainforest e.g. with *Doryphora sassafras*, *Ceratopetalum apetalum*.

Substrate: Higher nutrient soils, alluvium, shale, or enriched sandstone.

Exposure: Full sun–deep shade.

Conservation

Conservation: Widely naturalised on creek banks and in shaded places. Troublesome weed capable of choking out low-growing native species. Prevents germination of native species (Standish et al. 2001).

***Tradescantia zebrina* *** (*Zebrina pendula*)

COMMELINACEAE

Zebrina

Life history

Growth form: Creeping, succulent herb, with branching stems rooting at the nodes.

Vegetative spread: Stoloniiferous.

Longevity:

Primary juvenile period:

Flowers: Pink to purplish, February and August. Flowers of Commelinaceae species are short-lived and lack nectar, providing only pollen as a reward for the insect pollinators (Faden 2000).

Fruit/seed:

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Mexico and C America. Introduced as ornamental.

Botanical subregions: NC CC; LHI, Qld.

Distribution Sydney area: Sporadic.

Select locations: CC: Minnamurra Falls (1953).

Habitat**Habitat:** Rainforest.**Altitude:** 0–300 m**Annual rainfall:** 1600 mm**Typical local abundance:** Frequent.**Vegetation:** Rainforest.**Substrate:** Clay soils on shale, alluvium.**Exposure:**

Conservation**Conservation:** Cultivated as ornamental, occasionally locally naturalised e.g. at Minnamurra Falls.***Abildgaardia ovata* (*Fimbristylis ovata*)****CYPERACEAE**

Life history**Growth form:** Tufted, glabrous perennial herb, with a very short rhizome, forming tussocks; flowering stems 6–40 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Nut 2–3 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC: Qld, N.T., pantrop.**Distribution Sydney area:** Coastline.**Select locations:** CC: Barrenjoey (1972), Austinmer (1965).

Habitat**Habitat:** Coastal headlands.**Altitude:** 0–50 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Coastal headland grassland e.g. with *Themeda australis*, *Lomandra longifolia*.**Substrate:** Clayey soils on shales or sandstones, medium nutrients.**Exposure:** Exposed sites.

Conservation**Conservation:** Not common in NSW, Austinmer is southern geographical limit. Conservation status unknown.

Baumea acuta

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb, with long creeping rhizome; flowering stems 15–35 cm high.

Vegetative spread:

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

Primary juvenile period:

Flowers: September–February, peak October.

Fruit/seed:

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 ST; Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Mainly coastal.

Select locations: CC: Mellong Swamp, Agnes Banks, West Head (Salvation Track), Centennial Park, La Perouse, Kogarah, Picnic Point, Loftus, Hill Top, Barren Grounds.

Habitat

Habitat: Swamps and damp heath.

Altitude: 0–500 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Cyathochaeta diandra*, *Ptilantherium deustum*, *Schoenus paludosus*; low woodland e.g. with *Eucalyptus parramattensis*.

Substrate: Sandy soils, low nutrients, poorly-drained.

Exposure:

Conservation

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

Baumea arthropphylla

CYPERACEAE

Life history

Growth form: Perennial herb with long creeping rhizome; flowering stems 30–100 cm high. Often confused with *B. rubiginosa* but the nuts differ (Harden 1993).

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: July–January, peak December.

Fruit/seed: Nut 2–3 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Plays an important role in transfer of methane from sediments to the atmosphere (Muller et al. 1994).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Sporadic.

Select locations: CC: Porters Creek, Wyong, Dee Why Lagoon, La Perouse, Kurnell, Thirlmere.

Habitat

Habitat: Swamps.

Altitude: 0–200 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional–frequent.

Vegetation: Sedgeland e.g. with *Baumea articulata*, *Baumea teretifolia*; *Melaleuca* scrub e.g. with *Callistemon citrinus*.

Substrate: Sandy soils, with periodic standing water, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Baumea articulata (*Cladium articulatum*)

CYPERACEAE

Jointed Twig-rush

Life history**Growth form:** Perennial herb, with stout rhizome; flowering stems 90–200 cm high.**Vegetative spread:** Spreading rhizomes.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:****Fruit/seed:** Nut 2–3 mm long.**Dispersal, establishment & growth:** Germination of seed stimulated by smoke (Greening Australia 1996).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS; Qld, Vic., Tas., S.A., W.A., N.Z., N.G., N. Cal., Vanuatu.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Morisset, Budgewoi, Wyong, Umina, Manly Dam, Cooks River, Towra Point, Kurnell, Liverpool, Wollongong, Thirlmere Lakes. CT: Fitzroy Falls.**Habitat****Habitat:** Standing water of lagoons, swamps and streams.**Altitude:** 0–700 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** *Melaleuca* swamp e.g. with *Melaleuca quinquenervia*; sedgeland e.g. with *Schoenus brevifolius*, *Leptocarpus tenax*, *Blechnum indicum*, *Calochlaena dubia*.**Substrate:** Sandy soils with standing water or permanently moist, low nutrients, fresh.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Only record for CT, at Fitzroy Falls, is in rocklined drain, distributed by construction works (Herb. note). Reported in Garigal NP, Royal NP.

Baumea gunnii (*Cladium gunnii*)

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb, with short rhizome; flowering stems 20–100 cm high.

Vegetative spread: Spreading rhizomes.

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

Primary juvenile period:

Flowers: November–June.

Fruit/seed: Nut 3–4 mm long.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts (D. Keith pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS; Qld, Vic., Tas., S.A., N.G., N Cal.

Distribution Sydney area: Coast and Boyd Plateau.

Select locations: CC: Centennial Park, La Perouse, Kurnell, Kogarah Bay, Appin.

CT: Hampton, Boyd Plateau, Jenolan Caves.

Habitat

Habitat: Swamps and near watercourses.

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

Typical local abundance: Occasional.

Vegetation: Wet heath e.g. with *Banksia robur*, *Gleichenia dicarpa*, *Chorizandra cymbaria*, *Hakea teretifolia*; sedgeland e.g. with *Carex appressa*, *Xyris ustulata*, *Empodisma minus*, *Baumea rubiginosa*; swamp e.g. with *Baumea juncea*, *Blechnum indicum*, *Phragmites australis*.

Substrate: Sandy soils, low nutrients, poorly-drained.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Baumea johnsonii

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb, with short rhizome; flowering stems 30–140 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: July–March.

Fruit/seed: Nut 3–4 mm long, August–April.

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: Mt Irvine, Carrington Falls. CT: Mt Wilson, Blackheath, Wentworth Falls, Linden.

Habitat

Habitat: Damp areas below sandstone cliffs, moist cliff faces.

Altitude: 500–1000 m **Annual rainfall:** 1100–1400 mm

Typical local abundance: Occasional.

Vegetation: Cliff-face vegetation e.g. with *Empodisma minus*, *Gleichenia rupestris*, *Dracophyllum secundum*; sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Schoenus melanostachys*, *Gleichenia microphylla*.

Substrate: Sandstone, cliffs and overhangs, with low nutrients, permanent moisture.

Exposure: Sheltered positions.

Conservation

Conservation: Local endemic species restricted to Upper Blue Mountains and Carrington Falls area. Conservation status unknown. Reported in Blue Mountains NP.

Baumea juncea (*Cladium junceum*)

CYPERACEAE

Life history

Growth form: Slender perennial herb with long creeping rhizome; flowering stems to 90 cm high, leaves basal and cauline.

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: October–January.

Fruit/seed: Nut 3 mm long, October–March.

Dispersal, establishment & growth:

Fire response: Resprouts from rhizome (Herb. record), mature in about 1 year (P. Kubiak pers. comm).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT; LHI, Qld, Vic., Tas., S.A., W.A., ?NI, N.Z., N. Cal.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Morisset, Budgewoi, Crosslands, Narrabeen, Manly, La Perouse, Kurnell, Kogarah Bay, Casula, Austinmer, Tahmoor.

Habitat

Habitat: Fresh to brackish swamps.

Altitude: 0–300 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Estuarine sedgeland with *Juncus kraussii*, or landward with *Sporobolus virginicus*, *Phragmites communis*, or under *Casuarina glauca* (Clarke & Hannon 1967) or with *Melaleuca quinquenervia*; freshwater swamp e.g. with *Baumea rubiginosa*; wet heath e.g. with *Banksia ericifolia*, *Eurychorda complanata* (*Restio complanatus*).

Substrate: Brackish or saline swamps with sandy to silty soils, low nutrients.

Exposure: Full sun to light shade

Conservation

Conservation: Conservation status unknown. Reported in Brisbane Water NP, Marramara NP, Muogamarra NR, Garigal NP, Lane Cove NP, Sydney Harbour NP, Royal NP.

Baumea muelleri (*Cladium muelleri*)

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb, with short rhizome; flowering stems 10–60 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October.

Fruit/seed: Dark brown to blackish nut 3–4 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Coastal.

Select locations: CC: Mona Vale (1977).

Habitat

Habitat: Wet areas.

Altitude: 0–50 m

Annual rainfall: 1200 mm

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Gahnia erythrocarpa*, *Gahnia sieberiana*, *Baumea nuda*.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Southern geographical limit is Oxford Falls (Harden 1993). Conservation status unknown.

Baumea nuda (*Schoenus nudus*)

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb with short rhizome; flowering stems to 40 cm high, with basal leaves to twice as long as flowering stems.

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers:

Fruit/seed: Nut 2 mm long.

Dispersal, establishment & growth:

Fire response: Resprouts from rhizome.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT; Qld.

Distribution Sydney area: Coast and Upper Blue Mountains.

Select locations: CC: West Head (Salvation Loop Track), Cheltenham, South Turrumurra, La Perouse, Campbelltown, Waterfall, Mt Keira. CT: Clarence, Blackheath, Wentworth Falls, Lawson

Habitat

Habitat: In swamps or along streams.

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

Typical local abundance: Frequent–occasional.

Vegetation: Wet heath e.g. with *Sprengelia incarnata*, *Epacris obtusifolia*, *Leptocarpus tenax*, *Lepyrodia scariosa*; creekside vegetation e.g. with *Restio complanatus*, *Callistemon citrinus*, *Baeckea linifolia*; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*.

Substrate: Sandy soil on sandstone, low nutrients, periodically wet.

Exposure:

Conservation

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

Baumea planifolia

CYPERACEAE

Life history

Growth form: Perennial herb, with stems to 1.2 m high; long creeping rhizome.

Vegetative spread: Long-creeping rhizomes.

Longevity: Indefinite.

Primary juvenile period:

Flowers: August–December.

Fruit/seed: Nut to 2 mm long, August–December.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Sporadic.

Select locations: CC: Bowens Creek, Silverdale, Tahmoor. CT: Dunns Swamp.

Habitat

Habitat: Swamps, near streams.

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

Typical local abundance: Frequent–occasional.

Vegetation: Shrubby swamp e.g. with *Leptospermum polygalifolium*, *Leptospermum obovatum*, *Baumea rubiginosa*, *Gleichenia*.

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

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Wollemi NP.

Baumea rubiginosa**CYPERACEAE****Life history**

Growth form: Perennial herb, with stems to 110 cm high; short stout rhizome.

Vegetative spread:

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

Primary juvenile period:

Flowers: July–April. Flowers abundantly only after fire (Keith 1996).

Fruit/seed: November–April.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts, secondary juvenile period 2 years (D. Keith pers. comm.), flowering in 10 months (at Lane Cove and Narrabeen, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Morisset, Woy Woy, Porters Creek, Dural, St Ives, Centennial Park, Kurnell, East Lakes, Kogarah, Loftus, Darkes Forest, Carrington Falls. CT: Coricudgy, Clarence, Katoomba, Wingecarribee Swamp, Mittagong, Barbers Creek.

Habitat

Habitat: Swamps, creeks.

Altitude: 0–1200 m

Annual rainfall: 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Sedge swamp e.g. with *Baumea articulata*, *Schoenus brevifolius*, *Gleichenia dicarpa*, *Banksia robur*; upland shrubswamp e.g. with *Xyris ustulata*, *Gymnoschoenus sphaerocephalus*, *Grevillea acanthifolia*, *Empodisma minus*; sedgeland e.g. with *Eleocharis sphacelata*, *Baumea arthropphylla*; swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca ericifolia*; saltmarsh e.g. with *Phragmites australis*, *Casuarina glauca*.

Substrate: Sandy, peaty soil, low nutrients, poorly-drained.

Exposure:

Conservation

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

Baumea teretifolia (*Cladium teretifolium*)

CYPERACEAE

Life history**Growth form:** Perennial herb, with stems to 1 m high.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** July–December. Flowers abundantly only after fire (Keith 1996).**Fruit/seed:** Nut 2 mm long, October–April.**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; Qld, N.Z., N.G.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Morisset, Porters Creek, Somersby, Centennial Park, La Perouse, Kurnell, Jibbon, Thirlmere Lakes, Maddens Plains, Barren Grounds NR. CT: Robertson.**Habitat****Habitat:** Swamp, damp places.**Altitude:** 0–700 m**Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Sedge swamp e.g. with *Chorizandra sphaerocephala*, *Empodisma minus*, *Gleichenia dicarpa*, *Schoenus brevifolius*, *Gymnoschoenus sphaerocephalus*; swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca ericifolia*.**Substrate:** Sandy, peaty soils, low nutrients, poorly-drained. Colonises low pH (2.5–6.5) acid sulphate estuarine soils in the Wyong area (Payne 1992).**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Royal NP, Barren Grounds NR.**Baumea tetragona**

CYPERACEAE

Life history**Growth form:** Perennial herb, with stems to 1 m high; long rhizome.**Vegetative spread:** Spreading rhizomes.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:****Fruit/seed:** Nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC NT CT; Qld, Vic., Tas., S.A.**Distribution Sydney area:****Select locations:** CC: Bargo (1966). CT: Dunns Swamp (1997), Mt Wilson (1907).**Habitat****Habitat:** Swamps, creekbeds.**Altitude:** 400–1000 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Swamp e.g. with *Baumea rubiginosa*, *Eleocharis sphacelata*, *Carex appressa*, *Eucalyptus camphora*, *Leptospermum polygalifolium*.**Substrate:** Sandy alluvium, low nutrients, permanently wet.**Exposure:****Conservation****Conservation:** Rare, conservation status unknown. Reported in Wollemi NP.

Bolboschoenus caldwellii (*Scirpus caldwellii*)

CYPERACEAE

Life history**Growth form:** Perennial herb, with stems usually to 90 cm; rhizomatous.**Vegetative spread:** Spreading rhizomes.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** February–October.**Fruit/seed:** Nut 4 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., N.Z.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Toongabbie, East Hills, Port Botany, Kurnell, Woolooware Bay, Camden. CT: Glen Davis.**Habitat****Habitat:** Estuarine swamps, drains, creeklines.**Altitude:** 0–300 m **Annual rainfall:** 600–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Estuarine sedgeland e.g. with *Juncus kraussii*, *Melaleuca ericifolia*, *Melaleuca linariifolia*, *Typha*; riverflat forest e.g. with *Eucalyptus tereticornis*, *Casuarina glauca*, *Melaleuca nodosa*, *Melaleuca styphelioides*.**Substrate:** Clay soil on shale, medium nutrients, periodically wet, saline–brackish. Recorded on saline sites in western NSW (Semple 1993).**Exposure:****Conservation****Conservation:** Conservation status unknown.***Bolboschoenus fluviatilis*** (*Scirpus fluviatilis*)

CYPERACEAE

Life history**Growth form:** Perennial herb with stems to 2 m high; rhizomatous.**Vegetative spread:** Creeping rhizome.**Longevity:** Probably indefinite.**Primary juvenile period:****Flowers:** November–December.**Fruit/seed:** Nut 4 mm long, August–March.**Dispersal, establishment & growth:** Growth rate quick. Coloniser.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC ST NWS NWP SWP; Qld, Vic., N.Z., Asia, N. Amer.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Windsor (DHB), Richmond (DHB), Berkshire Park, Riverstone (1909), Centennial Park, Dapto (1972).**Habitat****Habitat:** Swamps, creekbed.**Altitude:** 0–1000 m **Annual rainfall:** 700–900 mm**Typical local abundance:** Frequent.**Vegetation:** Sedgeland e.g. *Phragmites australis*.**Substrate:** Clay soils on alluvium, medium nutrients. Water table mostly high, moisture supply intermittent, fresh.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Bolboschoenus medianus (*Scirpus medianus*)

CYPERACEAE

Life history**Growth form:** Perennial herb with solitary stems 70–150 cm high, arising along rhizomes.**Vegetative spread:** Rhizomatous spread.**Longevity:****Primary juvenile period:****Flowers:** April.**Fruit/seed:** Nut 4 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC NT ST CWS NWP SWP NFWP SFWP; Vic., Tas., S.A., N.Z.**Distribution Sydney area:** Glen Davis.**Select locations:** CC: Glen Davis.

Habitat**Habitat:** Creekbed.**Altitude:** 0–100 m **Annual rainfall:** 600 mm**Typical local abundance:** Abundant.**Vegetation:** Riparian vegetation e.g. with *Casuarina cunninghamiana*, *Schoenoplectus validus*, *Typha orientalis*.**Substrate:** Sandy alluvium.**Exposure:**

Conservation**Conservation:** Only one record, Glen Davis (1994).***Bulbostylis barbata***

CYPERACEAE

Life history**Growth form:** Slender, tufted herb, with stems to 30 cm high.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** June.**Fruit/seed:** Nut less than 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC NT NWS CWS NWP SWP NFWP; Qld, N.T., S.A., W.A., Old World trop., & U.S.A.**Distribution Sydney area:** Agnes Banks.**Select locations:** CC: Agnes Banks (1975).

Habitat**Habitat:****Altitude:** 0–100 m **Annual rainfall:** 700–800 mm**Typical local abundance:****Vegetation:****Substrate:** Sandy soil, low nutrients.**Exposure:**

Conservation**Conservation:** Only one record for Sydney area (at Agnes Banks 1975) and now probably extinct there as a result of sand extraction.

Bulbostylis densa

CYPERACEAE

Life history**Growth form:** Slender, tufted annual herb, with flowering stems 5–40 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT; LHI, Qld, Asia & tropical Africa.**Distribution Sydney area:** Wyee.**Select locations:** CC: Wyee (1993).**Habitat****Habitat:** Rocky hillsides or streams.**Altitude:** 0–100 m **Annual rainfall:** 1100 mm**Typical local abundance:** Rare.**Vegetation:** Roadside vegetation e.g. with *Chloris gayana*.**Substrate:** Sandy loam.**Exposure:****Conservation****Conservation:** Wyee is southern geographical limit and the only record for Sydney area.***Carex appressa***

CYPERACEAE

Life history**Growth form:** Herb, with stems 40–120 cm high; rhizome short with densely tufted shoots.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** September–December.**Fruit/seed:** Nut within membranous sack, December–January.**Dispersal, establishment & growth:** Diaspore: fruit, no special dispersal morphology (Westoby et al. 1990). Seeds germinate easily with no special treatment (A. Lewis pers. comm.).**Fire response:****Interaction with other organisms:** Food plant of butterfly larvae *Hesperilla ornata ornata*, *Heteronympha cordace cordace* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic., Tas., S.A., W.A., N.G., N.Z., N. Cal.**Distribution Sydney area:** Widespread.**Select locations:** CC: Colo River, Narara Creek, Grose Vale, Shane Park, Towra Point, Glenbrook, Manly, Kogarah (1893), Doonside, Otford, Cambewarra. CT: Mt Wilson, Mt Werong, Oberon, Boyd Plateau, Hill Top, Wingecarribee Swamp, Wingello.**Habitat****Habitat:** Wetlands, creekbanks.**Altitude:** 0–1200 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Floodplain swamp e.g. with *Juncus usitatus*, *Elaeocharis sphacelata*, *Melaleuca linariifolia*, moist eucalypt forest e.g. with *Eucalyptus deanei*, *E. tereticornis*, *E. amplifolia*, *Casuarina glauca* and montane swamps e.g. with *Leptospermum obovatum*, *Restio australis*.**Substrate:** Clay loam on shale, rocky stream beds, alluvial, and organic sediments on granite, low to medium nutrients. Recorded on saline sites in western NSW (Semple 1993).**Exposure:** Full sun–mid-shade.**Conservation****Conservation:** Conservation status unknown.

Carex bichenoviana

CYPERACEAE

Life history

Growth form: Loosely tufted herb, with long rhizome; stems to 40 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Male and female flowers usually on same plant, with one flower in each spikelet.

Fruit/seed: Nut.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Not readily eaten by stock (Herb. note).

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST NWS CWS SWS SWP; Vic., Tas., S.A.

Distribution Sydney area: Bathurst area.

Select locations: CT: Bathurst (1995), Evans Plains (1996), Carcoar (1966).

Habitat

Habitat: Creekbanks.

Altitude: 800 m

Annual rainfall: 700 mm

Typical local abundance: Frequent.

Vegetation: Exotic grasses.

Substrate: Sandy to silty soils on alluvium.

Exposure:

Conservation

Conservation: Few collections, appears to be rare.

Carex breviculmis

CYPERACEAE

Life history

Growth form: Densely tufted perennial herb with short rhizome; leaves to 35 cm high and flowering stems usually 3–10 cm long.

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

Longevity:

Primary juvenile period:

Flowers: September–October.

Fruit/seed: Triangular nut, September–December.

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 SC NT CT ST NWS CWS SWS; LHI, Qld, Vic., Tas., Asia & Pacific.

Distribution Sydney area: Widespread.

Select locations: CC: Vineyard, Middle Head, Otford, Campbelltown, Picton, Albion Park, Berry. CT: Mt Coricudgy, Mt Canobolas, Georges Plains, Oberon, Mount Tomah.

Habitat

Habitat: Ridges, hillsides.

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Rare.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *Angophora costata*, *Eucalyptus blakelyi*; open-forest e.g. with *Eucalyptus viminalis*.

Substrate: Clay soils on shale, basalt, medium to high nutrients, well-drained.

Exposure:

Conservation

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

Carex brunnea (*C. hattoriana*)

CYPERACEAE

Life history

Growth form: Densely tufted herb, with short rhizome; stems to 80 cm, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: January–April.

Fruit/seed: Nut, January–April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Hesperilla ornata ornata* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; LHI, Qld.

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Waterfall, Mt Keira, Minnamurra Falls, Jamberoo. CT: Govetts Leap, Wentworth Falls, Macquarie Falls.

Habitat

Habitat: Creeks, gullies.

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

Typical local abundance: Frequent–occasional.

Vegetation: Rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*, *Acmena smithii*, *Gahnia* species.

Substrate: Clay to loam soil, medium to low nutrients, moist conditions.

Exposure: Shaded.

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Carex declinata

CYPERACEAE

Life history

Growth form: Densely tufted herb, with short rhizome; stems to 120 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: March.

Fruit/seed: Nut, March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area: Sporadic.

Select locations: CC: Werong Beach (1978), Razorback (1976, 1986), Albion Park (1948).

Habitat

Habitat: Gullies.

Altitude: 0–300 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Rare.

Vegetation: Moist eucalypt rainforest e.g. with *Eucalyptus botryoides*; rainforest margins.

Substrate: Clay soils on shale, medium nutrients.

Exposure:

Conservation

Conservation: Rare, known from only a few localities in Sydney area. Reported in Royal NP.

Carex echinata

CYPERACEAE

Star Sedge

Life history

Growth form: Densely tufted herb, with very short rhizome; stems usually to 30 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: January.

Fruit/seed: Nut, January.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic., N.G., N.Z., N Hemi.

Distribution Sydney area: Clarence.

Select locations: CT: Clarence (1961, 1995).

Habitat

Habitat: Swamp.

Altitude: 1000 m

Annual rainfall: 1100 mm

Typical local abundance: Occasional.

Vegetation: Shrub swamp e.g. with *Leptospermum obovatum*, *Leptospermum juniperinum*, *Gahnia grandis*, *Restio australis*.

Substrate: Peaty soil over sandstone, low nutrients, permanently wet.

Exposure:

Conservation

Conservation: Rare, conservation status unknown, species refound in 1995 after about 30 years at only known CT locality.

Carex fascicularis

CYPERACEAE

Tassel Sedge

Life history

Growth form: Densely tufted herb, with short rhizome; stems to 1 m long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut.

Dispersal, establishment & growth:

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., W.A., N.G., N.Z.

Distribution Sydney area: Widespread.

Select locations: CC: Cooranbong, Windsor, Cheltenham, Kogarah, Douglas Park. CT: Jenolan Caves, Wombeyan Caves, Wingecarribee Swamp, Wildes Meadow.

Habitat

Habitat: Swampy areas, creekbanks.

Altitude: 0–800 m

Annual rainfall: 800–1400 mm

Typical local abundance: Occasional.

Vegetation: Sedgeland e.g. with *Eleocharis sphacelata*, *Villarsia reniformis*, *Myriophyllum variifolium*, *Lythrum salicaria*, *Lycopsis australis*.

Substrate: Clay soils on alluvium, medium nutrients, poorly drained.

Exposure:

Conservation

Conservation: Conservation status unknown.

Carex gaudichaudiana

CYPERACEAE

Life history

Growth form: Tufted herb, with long rhizome; stems to 90 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread: Long spreading rhizomes.

Longevity: Indefinite.

Primary juvenile period:

Flowers: September–April.

Fruit/seed: Nut.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Taractrocer a papyria papyria* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS SWS; Qld, Vic., Tas., N.G., N.Z., Asia.

Distribution Sydney area: Widespread.

Select locations: CC: Putty, Porters Creek, Maraylya, Casula, Menangle Park, Minnamurra River. CT: Dunns Swamp, Mt Canobolas, Lawson, Kanangra Walls, Boyd Plateau, Mt Werong, Wingecarribee Swamp.

Habitat

Habitat: Swamps, creek banks.

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

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Eleocharis acuta*, *Restio australis*, *Carex appressa*, *Eleocharis sphacelata*, *Chorizandra cymbaria*.

Substrate: Sandy to peaty substrates, periodic open-water, medium nutrients, permanently wet.

Exposure:

Conservation

Conservation: Conservation status unknown.

Carex incomitata

CYPERACEAE

Life history

Growth form: Loosely tufted herb, with short rhizome; stems 90 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November.

Fruit/seed: Nut, November.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Western Blue Mountains.

Select locations: CT: Mt Cameron, Jenolan Caves, Hampton, Gibraltar Rocks, Abercrombie Caves.

Habitat

Habitat: Creeks, gullies, grassy sites.

Altitude: 600–1000 m **Annual rainfall:** 900–1100 mm

Typical local abundance: Rare–occasional.

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

Substrate: Sandy loam on granite, basalt, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Carex inversa

CYPERACEAE

Life history

Growth form: Perennial herb with long rhizome; flowering stems 10–50 cm high, with shorter leaves.

Vegetative spread: Yes (McIntyre et al. 1995).

Longevity: Indefinite.

Primary juvenile period:

Flowers: September–May, peak March.

Fruit/seed: Triangular nut, September–May.

Dispersal, establishment & growth: Mechanism for dispersal undefined (McIntyre et al. 1995).

Fire response: Possibly resprouted after high intensity fire 1994 (at Lane Cove), flowering in 4 months (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.

Distribution Sydney area: Widespread.

Select locations: CC: Hornsby, Cheltenham, Homebush, Oatley, Penrith, Liverpool, Casula, Campbelltown, Razorback, Berry. CT: Kelgoola, Orange, Glanmire, Hartley, Mt Wilson, Wombeyan Caves.

Habitat

Habitat: Grassy woodland, creeks.

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

Typical local abundance: Frequent–occasional.

Vegetation: Grassy woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *E. pauciflora*, *E. rubida*; grassland.

Substrate: Clay soils on shale, granite, volcanics, medium to high nutrients, well-drained. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

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

Carex iynx

CYPERACEAE

Life history

Growth form: Densely tufted herb, with short rhizome; stems 1 m long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: April, November.

Fruit/seed: Nut.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Tablelands.

Select locations: CT: Oberon, Kanangra Boyd, Blayney.

Habitat

Habitat: Creekbanks, edge of floodplain.

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

Typical local abundance: Occasional.

Vegetation: Grassland e.g. with *Carex appressa*, *Baumea gunnii*, *Juncus australis*, *Poa*.

Substrate: Clay soil on alluvium, medium nutrients.

Exposure:

Conservation

Conservation: Oberon is northern geographical limit, conservation status unknown. Reported in Kanangra Boyd NP.

Carex klaphakei**CYPERACEAE****Life history**

Growth form: Perennial herb, with long rhizome; slender stems to 160 cm long, triangular in cross section, with leaves mostly basal. Grossly resembles introduced species *C. divisa*, which has larger inflorescences and is not as slender (Wilson 1996).

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: April.

Fruit/seed: Nut 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CT.

Distribution Sydney area: Tablelands.

Select locations: CT: Blackheath, Mt Werong, Penrose.

Habitat

Habitat: Swamps.

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

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Empodisma minus*, *Gleichenia dicarpa*, *Eleocharis gracilis*, *Juncus falcatus*, *Restio australis*, *Carex gaudichaudiana*.

Substrate: Peaty sand on sandstone, low nutrients, permanently moist.

Exposure:

Conservation

Conservation: Local endemic species, known only from Blackheath, Mt Werong, Penrose, listed as Endangered (Schedule 1) NSW Threatened Species Conservation Act 1995. Part of a population is in Kanangra-Boyd NP. Reported in Blue Mountains NP.

Carex loboilepis

CYPERACEAE

Life history

Growth form: Loosely tufted herb, with short rhizome; stems to 90 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: April.

Fruit/seed: Nut.

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: Mt Wilson, Boyd River, Mt Werong.

Habitat

Habitat: Swamps, creekbanks.

Altitude: 1200 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Baumea rubiginosa*, *Carex inversa*, *Carex appressa*.

Substrate: Sandy soil, or alluvium, low nutrients, permanently wet.

Exposure:

Conservation

Conservation: Boyd Plateau is southern geographical limit. Reported in Kanangra Boyd NP.

Carex longibrachiata

CYPERACEAE

Life history

Growth form: Densely tufted herb, with short rhizome; stems to 80 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–December.

Fruit/seed: Nut, October–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Grose Vale, Northmead, Glenbrook, Wongawilli, Kiama, Kangaroo Valley, Nowra. CT: Mt Canobolas.

Habitat

Habitat: Low-lying areas, creeks, gullies.

Altitude: 0–1500 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *Melaleuca linariifolia*; open-forest e.g. with *Eucalyptus pauciflora*.

Substrate: Sandy to clay soil on alluvium, shale, siltstone, volcanics, medium nutrients.

Exposure:

Conservation

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

Carex maculata (*C. neurochlamys*)

CYPERACEAE

Life history

Growth form: Densely tufted, perennial herb with short rhizome; stems usually to 40 cm high, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut, December–March (limited data).

Dispersal, establishment & growth: Diaspore:

Dispersal: no special morphology (Westoby et al. 1990).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Wyong area, Lower Blue Mountains.

Select locations: CC: Watagan SF, Martinsville, Ourimbah Creek, North Richmond, Bowen Mountain, Springwood.

Habitat

Habitat: Creeks and gullies.

Altitude: 0–300 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist eucalypt forest e.g. with *Eucalyptus punctata*, *Angophora floribunda*, *Eucalyptus globoidea*; gully rainforest e.g. with *Ceratopetalum apetalum*, *Tristaniopsis laurina*, *Backhousia myrtifolia*.

Substrate: Sandy to loamy soil on Narrabeen Group, Hawkesbury sandstone, medium nutrients. Water table mostly high, moisture supply intermittent, fresh.

Exposure: Sheltered situations; mid shade.

Conservation

Conservation: Southern limit Springwood. Conservation status unknown.

Carex ovalis *

CYPERACEAE

Life history

Growth form: Densely tufted herb, with short rhizome; stems usually to 60 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut, January.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe.

Botanical subregions: CT; Vic., Tas.

Distribution Sydney area: Southern Highland.

Select locations: CT: Robertson (1996), Wildes Meadow (1993).

Habitat

Habitat: Damp sites, streams, channels.

Altitude: 600–800 m

Annual rainfall: 1600 mm

Typical local abundance: Rare.

Vegetation: Riparian vegetation e.g. with *Juncus*.

Substrate: Alluvium, partially inundated, medium nutrients.

Exposure:

Conservation

Conservation: Naturalised near Robertson (Harden 1993), ability to spread further is unknown.

Carex polyantha

CYPERACEAE

Life history

Growth form: Densely tufted herb, with long rhizome; stems to 80 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread: Adventitious rhizomes spread locally to form clumps (Herb. note).

Longevity: Indefinite.

Primary juvenile period:

Flowers:

Fruit/seed: Nut.

Dispersal, establishment & growth: Mechanism for dispersal undefined (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread but sporadic.

Select locations: CC: Bendeela. CT: Hartley, Church Creek, Yerranderie.

Habitat

Habitat: Swamps, creekbanks.

Altitude: 0–700 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Riparian vegetation e.g. with *Casuarina cunninghamiana*, *Eucalyptus viminalis*, *E. stellulata*.

Substrate: Sandy alluvium, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Carex pumila

CYPERACEAE

Life history

Growth form: Loosely tufted herb, with very long rhizome; leaves longer than stems, triangular in cross section, with leaves mostly basal.

Vegetative spread: Long, creeping rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: October.

Fruit/seed: Nut, October–March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC ST; LHI, Qld, Vic., Tas., S.A., S America, Asia, N.Z.

Distribution Sydney area: Shoreline.

Select locations: CC: Budgewoi, Narrabeen, Bondi (1915), Maroubra, La Perouse, Kurnell, Padstow, Otford, Shellharbour, Gerringong.

Habitat

Habitat: Coastal sand dunes, behind beaches.

Altitude: 0–50 m **Annual rainfall:** 1200–1600 mm

Typical local abundance: Frequent.

Vegetation: Fore-dune vegetation e.g. with *Spinifex hirsutus*, *Trachyandra*; edge of *Melaleuca quinquenervia* swamp.

Substrate: Sandy soil on dunes, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Botany Bay NP, Georges River NP.

Carex tereticaulis

CYPERACEAE

Life history

Growth form: Densely tufted herb, with thick rhizome; stems to 120 cm long, triangular in cross section, with leaves mostly basal.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC NT ST SWS SWP; Vic., Tas., S.A., W.A.

Distribution Sydney area: Kogarah.

Select locations: CC: Kogarah (1893), Arncliffe (1893).

Habitat

Habitat: Low-lying, seasonally inundated areas.

Altitude: 0–100 m

Annual rainfall: 1000–1100 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Recorded only from Kogarah Swamp and Arncliffe in 1893, now probably extinct in Sydney area.

Caustis flexuosa

CYPERACEAE

Curly Wig

Life history

Growth form: Rhizomatous perennial herb, with short rhizome; stems to 90 cm high, with leaves reduced to sheaths along, and at base of stems.

Vegetative spread: No.

Longevity:

Primary juvenile period: 2 years (P. Kubiak pers. comm.).

Flowers: Flowers in spikelets.

Fruit/seed: Nut 5 mm long.

Dispersal, establishment & growth: Diaspore: nut. Seedlings may be common after fire. No special morphology (Westoby et al. 1990).

Fire response: Killed and reestablished from soil-stored seed in coastal areas (e.g. at Leura Swamp (DHB 1985).

Interaction with other organisms: Shoot damage by rabbits but not eaten (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Culoul Range, Wheeny Creek, Gosford, West Head, Berowra, Springwood, Glenbrook, Hornsby, Manly, Five Dock (1883), Rose Bay (1900), Oatley, Woronora River, Avon Dam. CT: Currant Mountain Gap, Gaspers Mountain, Glen Davis, Mt Wilson, Blackheath, Katoomba, Mittagong, Bundanoon, Tallong.

Habitat

Habitat: Ridges, hillsides, rocky outcrops.

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

Typical local abundance: Frequent–occasional.

Vegetation: Open forest e.g. with *Eucalyptus sieberi*, *E. piperita*, *Corymbia eximia*, *Banksia serrata*, *Eucalyptus sparsifolia*, *Angophora costata*; heath e.g. with *Banksia ericifolia*, *Banksia oblongifolia*.

Substrate: Sandy soils from sandstone, granite, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Wollemi NP, Blue Mountains NP, Brisbane Water NP, Marramorra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP, Royal NP, Morton NP, Budderoo NP.

Caustis pentandra

CYPERACEAE

Life history

Growth form: Perennial herb, with short stout rhizome; stems to 60 cm high, with leaves reduced to sheaths along, and at base of stems.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Flowers in spikelets, October.

Fruit/seed: Nut 4–8 mm long.

Dispersal, establishment & growth: Diaspore: nut. No special morphology for dispersal (Westoby et al. 1990).

Fire response: Killed (at Leura Swamp DHB 1985), after high intensity fire 1994 (at Lane Cove and Narrabeen, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread

Select locations: CC: Warrah, West Head, Dural, Manly, La Perouse, Woronora River, Loftus, Waterfall, Woolwash, Bulli Pass. CT: Mt Baker, Glen Davis, Blackheath, Woodford.

Habitat

Habitat: Ridges, rock outcrops.

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

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Banksia ericifolia*, *Allocasuarina distyla*, *Banksia aemula*; low woodland e.g. with *Corymbia gummifera*, *Banksia serrata*, *Caustis flexuosa*.

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

Exposure:

Conservation

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

Caustis recurvata* var. *hirsuta**CYPERACEAE****Life history**

Growth form: Perennial herb, with short rhizome; stems to 70 cm high, with leaves reduced to sheaths along, and at base of stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Flowers in spikelets, July–September.

Fruit/seed: Nut 5 mm long.

Dispersal, establishment & growth: Diaspore: nut.

Fire response: Killed by fire (T. Auld pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC.

Distribution Sydney area: Port Jackson to Garie.

Select locations: CC: Centennial Park, Garie, Warumbul, Wattamolla.

Habitat

Habitat: Ridges, plateaus.

Altitude: 0–200 m **Annual rainfall:** 1200–1600 mm

Typical local abundance: Frequent.

Vegetation: Coastal heath e.g. with *Banksia serrata*, *Banksia ericifolia*, *Darwinia fascicularis*, *Caustis pentandra*, *Lambertia formosa*, *Allocasuarina distyla*.

Substrate: Sandy clay on sandstone, sometimes with ironstone, low nutrients.

Exposure:

Conservation

Conservation: Local endemic, restricted to Audley–Wattamolla, old record Centennial Park (1894) but now extinct there. Locally common in Royal NP (T. Auld pers. comm.).

Caustis recurvata* var. *recurvata**CYPERACEAE****Life history**

Growth form: Perennial herb, with short rhizome; stems to 70 cm high, with leaves reduced to sheaths along, and at base of stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Flowers in spikelets.

Fruit/seed: Nut 5 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Qld.

Distribution Sydney area: Mainly Blue Mountains.

Select locations: CC: Randwick, Ramsgate. CT: Currant Mountain Gap, Clarence, Blackheath.

Habitat

Habitat:

Altitude: 0–1000 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent.

Vegetation: Heath e.g. with *Allocasuarina nana*, *Lepidosperma flexuosum*; open-forest e.g. with *Eucalyptus sieberi*, *E. macrorhyncha*.

Substrate: Deep sandy soils on sandstone, low nutrients, well-drained.

Exposure:

Conservation

Conservation: Most collections are from Blue Mountains area with only 3 old collections from the coast (Randwick 1884, National Park 1902, Ramsgate 1950); it may be extinct on the coast now.

Chorizandra cymbaria**CYPERACEAE****Life history**

Growth form: Perennial herb, with tough, slender rhizome; stems to 1 m high, with basal leaves.

Vegetative spread:

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

Primary juvenile period:

Flowers: September–April. Flowers abundantly only after fire (Keith 1996).

Fruit/seed: Nut 4 mm long.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts (D. Keith pers. comm.), flowering within one month in swampy area at Royal National Park (DHB 2/94), fruiting within 11 months (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT; Qld, Vic., Tas., W.A., N Cal.

Distribution Sydney area:

Select locations: CC: Porters Creek, Wyong, Agnes Banks, Hornsby, Marsfield, Little Bay, Holsworthy, Bola Creek, Darkes Forest, Tahmoor, Mt Keira. CT: Wentworth Falls, Kangaloon, Robertson.

Habitat**Habitat:** Swampy places.**Altitude:** 0–700 m**Annual rainfall:** 1000–1800 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** swamps e.g. with *Melaleuca thymifolia*, *Eleocharis sphacelata*, *Schoenus brevifolius*; heath e.g. with *Banksia ericifolia*, *Baeckea imbricata*, *Hakea teretifolia*; montane peatland e.g. with *Sphagnum*, *Carex*, *Phragmites*.**Substrate:** Sandy to peaty alluvium, low nutrients, periodically inundated.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Brisbane Water NP, Garigal NP, Royal NP.***Chorizandra sphaerocephala*****CYPERACEAE****Life history****Growth form:** Perennial herb, with tough rhizome; stems to 110 cm high, with basal leaves.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** Flowers at any time, though abundantly only after fire (Keith 1996).**Fruit/seed:** Nut 2 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.), fruiting in 8 months after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT; Qld, Vic.**Distribution Sydney area:** Coast and Southern Highlands.**Select locations:** CC: Manly, Centennial Park, La Perouse, Maddens Plains, Darkes Forest, Scarborough. CT: Hazelbrook, Hill Top, Kangaloon, Robertson, Fitzroy Falls, Budderoo.**Habitat****Habitat:** Swamps.**Altitude:** 0–700 m**Annual rainfall:** 1000–1800 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Sedge swamp e.g. with *Gymnoschoenus sphaerocephalus*, *Lepidosperma limicola*, *Lepidosperma longitudinale*; shrub swamp e.g. with *Banksia robur*, *Banksia ericifolia*, *Hakea teretifolia*.**Substrate:** Sandy and peaty silt, low nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Brisbane Water NP.

Cladium procerum

CYPERACEAE

Life history**Growth form:** Rhizomatous, perennial herb, with hollow stems to 2.5 m high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–April.**Fruit/seed:** Nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., S.A., N.T., N Cal.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Swansea, Pearl Beach, Webbs Creek, Oatley Bay, Kurnell, Marley Lagoon, Casula, Liverpool.**Habitat****Habitat:** Coastal swamps, margins of lakes.**Altitude:** 0–20 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Sedge swamp e.g. with *Eleocharis sphacelata*, *Baumea articulata*, *Baumea juncea*, *Phragmites australis*, *Juncus kraussii*; edge of mangroves.**Substrate:** Sandy to muddy alluvium, low to medium nutrients, permanently moist, often brackish.**Exposure:****Conservation****Conservation:** Not common now because of scarcity of habitat (K. Wilson pers. comm.)

Conservation status unknown.

Cyathochaeta diandra

CYPERACEAE

Life history**Growth form:** Rhizomatous, tuft-forming perennial herb, with stems to 60 cm high.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** October–December. Flowers abundantly only after fire (Keith 1996).**Fruit/seed:** Nut 7 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 e.g. at Agnes Banks (Benson 1981), secondary juvenile period 1 year (D. Keith pers. comm.).**Interaction with other organisms:** Eaten by rabbits (P. Kubiak pers. comm.).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Mellong Range, Morisset, Springwood, Cowan, Cheltenham, Beacon Hill, Centennial Park, La Perouse, Campbelltown, Maddens Plains, Hill Top, Thirlmere.

CT: Hazelbrook.

Habitat

Habitat: Ridges, sandy flats.

Altitude: 0–700 m **Annual rainfall:** 900–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Corymbia gummifera*, *Corymbia eximia*, *Angophora costata*, *Eucalyptus agglomerata*, *Angophora bakeri*, *Eucalyptus fibrosa*, *E. parramattensis*; heath e.g. with *Caustis pentandra*, *Ptilothrix deusta*.

Substrate: Sandy to loamy soils on sandstone, sometimes with lateritic influence, low to medium nutrients.

Exposure:

Conservation

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

Cyperus aggregatus* * (*C. flavus*)*CYPERACEAE****Life history**

Growth form: Small tufted perennial herb, with short, thick rhizome; stems to 60 cm high, leaves mostly shorter than stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut 2 mm long, February–April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America (Mexico to Argentina).

Botanical subregions: NC CC NWS CWS; Qld.

Distribution Sydney area: Mainly suburban areas.

Select locations: CC: Cheltenham (1947), Burwood, Carlton, Emu Plains, Kurnell, Linden, Camden.

Habitat

Habitat: Lawns, grazed paddocks, embankments.

Altitude: 0–200 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassy/weedy areas e.g. with *Cyperus polystachyos*, *Carex appressa*; scrub e.g. with *Banksia serrata*, *Eucalyptus sclerophylla* (at Agnes Banks).

Substrate: Sandy soils on sandy alluvium, dune sand, low nutrients.

Exposure:

Conservation

Conservation: Weed of disturbed sites, naturalised for over 50 years.

Cyperus albostriatus *

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with short thick rhizome; stems to 60 cm high, with distinctive bracts and leaves.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: October–November.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth:

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering in 26 weeks (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

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

Botanical subregions: CC SC; Qld.

Distribution Sydney area:

Select locations: CC: Patonga (1975), Lane Cove, Mosman (1979), Centennial Park (1973), Bankstown.

Habitat

Habitat: Stream banks, urban bushland.

Altitude: 0–100 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Occasional.

Vegetation:

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

Exposure:

Conservation

Conservation: Reported at Patonga in 1975 to be possibly persisting from old habitation but now covering considerable area and apparently spreading. Reported in bushland near gardens in Lane Cove (1987–90) spreading by rhizome. Potential for spread unknown.

Cyperus brevifolius * (*Kyllinga brevifolia*)

CYPERACEAE

Mullumbimy Couch

Life history

Growth form: Slender perennial herb, with long slender rhizome; stems to 40 cm high, with leaves shorter than stems.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: December–March.

Fruit/seed: Nut 1 mm long, December–March.

Dispersal, establishment & growth: Dispersed in mud on cars (Wace 1977).

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 10 weeks (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to tropical regions.

Botanical subregions: NC CC SC NWS CWS SWP; LHI, Qld, Vic., N.T., S.A., W.A.

Distribution Sydney area:

Select locations: CC: Lake Macquarie, Spencer, Beecroft, Centennial Park, Balmain, Liverpool, Macquarie Fields, Yellow Rock, Cobbitty, Kiama, Cambewarra.

Habitat

Habitat: Lawns and disturbed areas, riverbanks.
Altitude: 0–200 m **Annual rainfall:** 700–1400 mm
Typical local abundance: Frequent–occasional.
Vegetation: Lawns, woodland e.g. with *Rumex brownii*, *Geranium homeanum*.
Substrate: Clay soils on shale, alluvium, moist sites.
Exposure:

Conservation

Conservation: Regarded as exotic weed in lawns and disturbed situations, though collected by Robert Brown at Port Jackson in 1802–5.

Cyperus compressus* **CYPERACEAE****Life history**

Growth form: Tufted herb, with reddish roots; stems to 35 cm high, leaves similar length to stems.
Vegetative spread: No.
Longevity: Less than 1 year.
Primary juvenile period: Less than 1 year.
Flowers:
Fruit/seed: Nut dark brown to black 1–2 mm long.
Dispersal, establishment & growth:
Fire response:
Interaction with other organisms:

Distribution

Status/origin: Exotic, native to tropical and warm temperate regions.
Botanical subregions: NC CC; Qld, N.T., W.A.
Distribution Sydney area:
Select locations: CC: Pymont (1973).

Habitat

Habitat: Footpath.
Altitude: 0–50 m **Annual rainfall:** 1200 mm
Typical local abundance:
Vegetation:
Substrate:
Exposure:

Conservation

Conservation: Only one record for Sydney area. Probably not truly naturalised in the area.

Cyperus concinnus

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with very short rhizome; stems to 65 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: January.

Fruit/seed: Nut less than 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CT ?ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., N.T.

Distribution Sydney area: Capertee area.

Select locations: CT: Capertee (1975).

Habitat

Habitat: Seasonally wet sites, creeks.

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

Typical local abundance: Rare.

Vegetation:

Substrate: Alluvium along creeks.

Exposure:

Conservation

Conservation: Only one record for the area, conservation status unknown.

Cyperus congestus * (*Mariscus congestus*)

CYPERACEAE

Dense Flatsedge

Life history

Growth form: Tufted perennial herb, often annual, with very short thick rhizome; stems to 60 cm high, with leaves shorter or longer than stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut dark brown to black less than 1 mm long, May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: CC SC NT NWS; Vic., Tas., S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Lake Macquarie, Tuggerah Lake (1903), Somersby, Dennistone, Ryde, Randwick (1884), Kurnell, Woodford, Campbelltown, Picton, Foxground.

Habitat

Habitat: Roadsides, damp ground, drains.

Altitude: 0–300 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Estuarine flats e.g. with *Juncus kraussii*, *Isolepis nodosus*; roadside vegetation e.g. with *Juncus planifolius*, *Cyperus flavescens*.

Substrate: Clayey alluvium soils, moist, sometimes brackish.

Exposure:

Conservation

Conservation: Naturalised for over a century, widespread.

Cyperus cyperoides

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with short rhizome; stems to 75 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** March.**Fruit/seed:** Nut brown, triangular in cross section, 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NWS; Qld, N.G., Asia, Afr, ?W Indes.**Distribution Sydney area:****Select locations:** CC: Werong Beach (1978).**Habitat****Habitat:** Along track.**Altitude:** 0–50 m **Annual rainfall:** 1600 mm**Typical local abundance:** Occasional.**Vegetation:** Moist open-forest e.g. with *Eucalyptus botryoides*.**Substrate:****Exposure:****Conservation****Conservation:** Werong Beach, Royal National Park is southern geographical limit and only one record for Sydney area. Conservation status unknown.***Cyperus difformis***

CYPERACEAE

Dirty Dora

Life history**Growth form:** Tufted herb, with reddish roots; stems to 50 cm high, with leaves similar in length to stems.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** April.**Fruit/seed:** Nut triangular, less than 1 mm long, April–June.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., N.T., S.A., W.A., pantrop.**Distribution Sydney area:** Mainly western Sydney.**Select locations:** CC: Richmond, Penrith, Doonside, Yennora, Liverpool, The Oaks, Narellan, Menangle Park. CT: Rylstone, Glen Davis.**Habitat****Habitat:** Seasonally wet places.**Altitude:** 0–800 m **Annual rainfall:** 700–1000 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus amplifolia*, *Melaleuca decora*.**Substrate:** Clay soils on shale, alluvium.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Common in wet areas in inland Australia and in rice crops (K. Wilson pers. comm.).

Cyperus dubius* **CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with short rhizome; flowering stems 10–45 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Spring–summer.

Fruit/seed: Dark brown nut 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Africa & Asia.

Botanical subregions: NC CC.

Distribution Sydney area: Chatswood.

Select locations: CC: Chatswood (1996).

Habitat

Habitat: Disturbed areas.

Altitude: 0–200 m

Annual rainfall: 1200 mm

Typical local abundance:

Vegetation:

Substrate: Sandy soil.

Exposure:

Conservation

Conservation: Only one record for Sydney area, at West Chatswood in 1996. Not known whether it is naturalised there or whether it is spreading.

Cyperus eglobosus**CYPERACEAE****Life history**

Growth form: Small, tufted perennial herb, occasionally proliferating; stems to 50 cm high, with leaves shorter than stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut dark yellow-brown, 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area: Coastal.

Select locations: CC: Budgewoi, Bass Point, Minnamurra River.

Habitat

Habitat: Coastal dunes.

Altitude: 0–20 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Rare.

Vegetation: Coastal dune scrub e.g. with *Leptospermum laevigatum*, *Guioa semiglauca*, *Banksia integrifolia*, *Acacia sophorae*.

Substrate: Deep sandy soil on dunes, low nutrients.

Exposure:

Conservation

Conservation: Localised, conservation status unknown.

Cyperus enervis**CYPERACEAE****Life history**

Growth form: Small densely tufted perennial herb; stems to 50 cm high, with leaves usually shorter than stems.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: February.

Fruit/seed: Nut triangular, red-brown, more than 1 mm long, April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Coastal.

Select locations: CC: Wyong (1903), Tuggerah (1901), Werrong Beach, Balgownie.

Habitat

Habitat: Near rainforest.

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

Typical local abundance: Rare.

Vegetation: Open-forest near rainforest e.g. with *Eucalyptus botryoides*, *E. paniculata*, *Livistona australis*, *Streblus brunonianus*, *Ehretia acuminata*.

Substrate: Clay soil on shale, medium nutrients.

Exposure:

Conservation

Conservation: Rare, Wollongong is southern geographical limit.

Cyperus eragrostis *

CYPERACEAE

Umbrella Sedge

Life history

Growth form: Tufted perennial to 1 m high with short thick woody rhizome; flowering stems triangular, 25–90 cm high, with leaves as long or shorter. Extensive system of coarse fibrous roots beneath perennial rootstock or rhizome, with new aerial growth produced each year (Parsons & Cuthbertson 1992).

Vegetative spread: No.

Longevity: Persistent once established (Parsons & Cuthbertson 1992).

Primary juvenile period:

Flowers: October–March (J. Hosking pers. comm.).

Fruit/seed: Triangular nut 1 mm long, January–March.

Dispersal, establishment & growth: Dispersal unspecialised, wind and water; also animal-dispersed (Carr et al. 1992), dispersed in mud on cars (Wace 1977).

Germinates and grows readily in a range of conditions.

Fire response: Resprouted after high intensity fire (at Lane Cove 1994), fruiting in 19 weeks (P. Kubiak pers. comm.).

Interaction with other organisms: Grazed sparingly by stock, competes with pasture, restricts water flow in channels and drains (Parsons & Cuthbertson 1992).

Distribution

Status/origin: Exotic, native to N & S America. Introduced to Australia before 1860 (Parsons & Cuthbertson 1992).

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

Distribution Sydney area: Coast, Cumberland Plain to Mittagong, Bathurst.

Select locations: CC: Morisset, Wyong Creek, Eastwood, Northbridge (1950), Eastlakes, Birrong (1946), Windsor, Penrith, Campbelltown, Jamberoo. CT: Bathurst (1964), Mittagong.

Habitat

Habitat: Roadside gutters and pools, rocky creeks, disturbed sandy sites.

Altitude: 0–800 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Seasonal and semi permanent wetland vegetation, weed dominated disturbed sites, garden weeds.

Substrate: Substrate alluvial silts and sands. Soil very fertile–fertile–infertile. Water table mostly high, continuous or intermittent moisture supply, fresh.

Exposure: Full sun.

Conservation

Conservation: A potential threat to native wetland species. First reported for the Sydney area in 1946 at Birrong this species spread vigorously in the 1960's and 70's to a range of natural and disturbed habitats. It is still spreading and probably consolidating its populations in many areas. Sites particularly at risk are seasonal and semi-permanent wetlands where it will probably outcompete and dominate smaller growing native species and change the appearance of native wetland areas.

Cyperus esculentus *

CYPERACEAE

Yellow Nutgrass

Life history

Growth form: Perennial herb, with slender rhizomes forming yellow-rown round to ovoid tubers 10 mm diam; stems to 70 cm high, with leaves longer or shorter than stems.

Vegetative spread: Spread by tubers.

Longevity: Indefinite.

Primary juvenile period:

Flowers: February–June.

Fruit/seed: Nut triangular, grey-brown, less than 2 mm long. Weight 0.13 mg, germination 27% within 30 days (Shipley & Parent 1991).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Tubers sometimes eaten as 'Chufa' or 'Tiger Nuts' (Harden 1993), cultivated and weedy forms are recognised (de Vries 1991).

Distribution

Status/origin: Exotic, cosmopolitan but probably native to Mediterranean region and Africa.

Botanical subregions: NC CC NWS; Qld, cosmop.

Distribution Sydney area: Sydney suburbs, Kulnura area.

Select locations: CC: Kulnura (1988), Calga, Bayview, Terrey Hills, Northbridge (1973), East Cremorne (1984), Kurnell.

Habitat

Habitat: Disturbed moist sites, roadsides.

Altitude: 0–200 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Occasional.

Vegetation: Weedy areas e.g. with *Pennisetum clandestinum*, *Foeniculum vulgare*, *Acetosa saggitata*, *Bidens pilosa*.

Substrate: Sandy clay and alluvium, and fill, possibly in brackish conditions.

Exposure:

Conservation

Conservation: Rarely naturalised but a serious weed of tropical and subtropical cultivation in other parts of the world. Tubers are spread by farm machinery. Potential to spread in Sydney area is unknown.

Cyperus exaltatus**CYPERACEAE****Life history**

Growth form: Stout, tussock-forming perennial herb, with short woody rhizome; stems triangular, to 1.8 m high, with leaves at least as long as stems.

Vegetative spread: Rhizomatous spread to form extensive stands.

Longevity: Indefinite.

Primary juvenile period:

Flowers:

Fruit/seed: Nut triangular, yellow-brown, less than 1 mm long, February–March.

Dispersal, establishment & growth: Appears to be a coloniser species but does not appear to establish readily from seed. Forms narrow zone around edge of Longneck Lagoon in permanent water 10–20 cm deep but does not extend beyond margin.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A., Africa, Asia, ? S. America.

Distribution Sydney area: Hawkesbury–Nepean floodplain wetlands.

Select locations: CC: Longneck Lagoon, South Creek (1888), St Marys, Regentville, Werrington. CT: Ophir.

Habitat

Habitat: Banks of streams and lagoons, shallow water.

Altitude: 0–800 m

Annual rainfall: 700–800 mm

Typical local abundance: Frequent–occasional.

Vegetation: Semi-permanent, emergent wetland vegetation.

Substrate: Alluvial silts and sand, medium to high nutrients, permanently wet.

Exposure: Full sun.

Conservation

Conservation: Recorded from a few Hawkesbury wetland areas only, with a recent (1994) record from Orange.

Cyperus flaccidus

CYPERACEAE

Life history**Growth form:** Small tufted annual herb, with stems 2–20 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** February–April.**Fruit/seed:** Nut 0.5 mm long, January–May.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT NWP SWP; Qld, Vic., N.T., S.A., W.A., Japan, Korea.**Distribution Sydney area:** Western Sydney.**Select locations:** CC: Lower Portland, Richmond, Woodford, Valley Heights, Doonside, Ingleburn, The Oaks, Campbelltown, Menangle Park.**Habitat****Habitat:** Wet places, damp depressions, margins of ephemeral pools.**Altitude:** 0–550 m **Annual rainfall:** 700–1000 mm**Typical local abundance:** Frequent.**Vegetation:** Sedgeland e.g. with *Juncus usitatus*, *Cyperus sanguinolentus*, *Eleocharis stricta*, *Paspalum distichum*, *Myriophyllum latifolium*.**Substrate:** Drying mud and silt, medium nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Common annual in tropical Australia (K. Wilson pers. comm.).**Cyperus flavescens** * (*Pycurus flavescens*)

CYPERACEAE

Life history**Growth form:** Tufted annual, with stems 5–30 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:****Fruit/seed:** Dark brown nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to temperate & tropical regions.**Botanical subregions:** NC CC NT NWS; Qld, N.T.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Howes Valley (1994), Morisset (1993), Somersby (1974), Manly Dam (1988), Bulli Pass (1995).**Habitat****Habitat:** Disturbed, damp situations, creeks.**Altitude:** 0–400 m **Annual rainfall:** 900–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Moist disturbed sites e.g. with *Juncus articulatus*, *Juncus planifolius* and introduced grasses and sedges.**Substrate:** Sandy soil, permanently moist.**Exposure:****Conservation****Conservation:** Recently recorded (1974), ability to spread unknown.

Cyperus flavidus (*Pycreus flavidus*)

CYPERACEAE

Life history**Growth form:** Tufted annual or perennial herb, with smooth stems 5–60 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January–April.**Fruit/seed:** Nut 1.2 mm long, dark brown to black.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CT ST NWS SWS; Qld, Vic., Old World, trop, subtrop.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Brooklyn, Regentville. CT: Nashdale, Mt Canobolas.**Habitat****Habitat:** Swampy areas, riverbanks, roadside drains.**Altitude:** 0–800 m **Annual rainfall:** 800–1200 mm**Typical local abundance:** Frequent.**Vegetation:** With *Eleocharis gracilis*, *Juncus fockei*, *Geranium solanderi*, *Eucalyptus bridgesiana*.**Substrate:** Clay soil, moist.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.***Cyperus fulvus*** (*Mariscus fulvus*)

CYPERACEAE

Life history**Growth form:** Slender, tufted perennial herb, with stems 25–50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January.**Fruit/seed:** Yellow-brown nut 2 mm long, March–April.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT NWS CWS NWP SWP NFWP; Qld, Vic., N.G.**Distribution Sydney area:** Widespread.**Select locations:** CC: Mt Wareng, Agnes Banks, Casula, Menangle, Goodmans Ford.

CT: Currant Mountain Gap, Jenolan Caves.

Habitat**Habitat:** Open slopes, hillsides.**Altitude:** 0–900 m **Annual rainfall:** 800–1000 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Grassy woodland e.g. with *Eucalyptus botryoides*, *E. tereticornis*, *E. albens*, *Allocasuarina verticillata*, *Pteridium esculentum*.**Substrate:** Sandy to stony clay soil on shale, basalt, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

Cyperus gracilis

CYPERACEAE

Life history

Growth form: Small, densely tufted perennial herb; flowering stems 10–40 cm high, with very narrow, shorter leaves.

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

Longevity: Less than 5 years.

Primary juvenile period: Less than 1 year.

Flowers: September–December.

Fruit/seed: Triangular nut, January–April.

Dispersal, establishment & growth: Means of dispersal undefined (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT NWS CWS NWP SWP; Qld, Vic., N.I., N. Cal.

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Lower Portland, Eastwood, Willoughby, Bankstown, Bass Hill, Blackett, Nortons Basin, Razorback, Mount Annan, Stanwell Park. CT: Capertee Valley, Glen Davis, Kowmung River, Mittagong.

Habitat

Habitat: Hillsides, flats.

Altitude: 0–600 m

Annual rainfall: 700–1200 mm

Typical local abundance: Frequent.

Vegetation: Open woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. albens*, *E. melliodora*, *E. amplifolia*, *Angophora floribunda*; grassland.

Substrate: Clay soil on shale, volcanics, metasediments, medium to high nutrients

Exposure:

Conservation

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

Cyperus gunnii subsp. **gunnii** (*Mariscus gunnii*)

CYPERACEAE

Life history

Growth form: Tall, tufted perennial herb with short thick rhizome. Culms to 150 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–December.

Fruit/seed: Triangular nut.

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 ?SFWP; Qld, Vic., Tas., S.A.

Distribution Sydney area: Western Sydney.

Select locations: CC: Doonside, Como, Minto, Casula, Campbelltown, Menangle.

Habitat

Habitat: Swamp margins, creeks.

Altitude: 0–200 m

Annual rainfall: 700–1000 mm

Typical local abundance: Occasional.

Vegetation: Margin of swamps e.g. with *Carex appressa*, *Glyceria australis*, *Ranunculus inundatus*, *Triglochin procera*; woodland e.g. with *Eucalyptus amplifolia*, *E. tereticornis*, *Casuarina glauca*.

Substrate: Clay soil on shale, alluvium, medium nutrients, periodically wet.

Exposure:

Conservation

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

Cyperus gymnocaulos

CYPERACEAE

Life history**Growth form:** Tussock-forming perennial herb, with short thick rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic in CC but native to other parts of Australia, introduced to Sydney area from western NSW.**Botanical subregions:** *CC SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.**Distribution Sydney area:** Flemington.**Select locations:** CC: Flemington (1968).**Habitat****Habitat:** Saleyards.**Altitude:** 0–100 m **Annual rainfall:** 900 mm**Typical local abundance:** Rare.**Vegetation:** Disturbed sites.**Substrate:** Clay soils.**Exposure:****Conservation****Conservation:** Only record for Sydney is for single isolated clump at Flemington Saleyards in 1968 and the species is likely to have been introduced from western NSW with stock. It is now probably extinct at Flemington.***Cyperus haspan* subsp. *haspan***

CYPERACEAE

Life history**Growth form:** Slender, tufted perennial herb to 40 cm high, with short rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January–June.**Fruit/seed:** Whitish to pale yellow-brown nut.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NWP; Qld.**Distribution Sydney area:** Mainly Western Sydney.**Select locations:** CC: Wyong, Bowen Mountain, Agnes Banks, Londonderry, Bayview, Prestons, Chatham Village.**Habitat****Habitat:** Moist, disturbed sites.**Altitude:** 0–400 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Angophora bakeri*, *Eucalyptus parramattensis*, *E. sclerophylla*; open-forest e.g. with *Corymbia gummifera*, *Eucalyptus piperita*, *Angophora costata*; swamp e.g. with *Melaleuca quinquenervia*.**Substrate:** Clay soils on shale, Tertiary alluvium, sandy alluvium, low nutrients, periodically wet.**Exposure:****Conservation****Conservation:** Chatham Village–Prestons is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999), conservation status elsewhere unknown.

Cyperus imbecillis

CYPERACEAE

Life history**Growth form:** Small tufted perennial herb.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** December–May.**Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CWS; Qld.**Distribution Sydney area:** Coast.**Select locations:** CC: Drews Creek, Bilpin, Wahroonga, Dennistone, Lane Cove, Bankstown, Bola Creek, Stanwell Park, Razorback, Foxground, Bass Point, Berry.**Habitat****Habitat:** Moist, shady areas.**Altitude:** 0–300 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Rainforest e.g. with *Streblus brunonianus*, *Cassine australis*; open-forest e.g. with *Eucalyptus saligna*, *E. pilularis*.**Substrate:** Clay soil on shale, basalt, medium to high nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Reported in Yengo NP, Royal NP.**Cyperus involucratus** * (*C. alternifolius* subsp. *flabelliformis*)

CYPERACEAE

Umbrella Sedge

Life history**Growth form:** Tall herb, with leaves reduced to sheaths; inflorescence large, with numerous conspicuous bracts.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:****Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Africa. Introduced as ornamental.**Botanical subregions:** CC; LHI, Qld, N.T., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Parsley Bay (1990), Dawes Point (1996).**Habitat****Habitat:** Near creek.**Altitude:** 0–200 m**Annual rainfall:** 1200 mm**Typical local abundance:** Occasional.**Vegetation:** Disturbed bush.**Substrate:****Exposure:****Conservation****Conservation:** Widely cultivated, with a couple of records in disturbed bushland near urban areas. Problem weed in New Caledonia, with potential to spread from Sydney, north along the coast (K. Wilson pers. comm.).

Cyperus iria

CYPERACEAE

Rice Flatsedge

Life history**Growth form:** Tufted annual herb, with reddish roots.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:****Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic in CC but native to more northern and inland parts of Australia.**Botanical subregions:** NC *CC NWP SWP NFWP; Qld, N.T., S.A., W.A., Malesia, Asia, Afr.**Distribution Sydney area:** Liverpool.**Select locations:** CC: Warwick Farm (1993).**Habitat****Habitat:** Creeks.**Altitude:** 0–100 m **Annual rainfall:** 800 mm**Typical local abundance:** Rare.**Vegetation:** Low open-forest e.g. *Casuarina glauca* with understorey including *Carex appressa*.**Substrate:** Sandy clay soil on alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Only one record of one plant, recorded for Cabramatta Creek in 1993 and regarded as introduced.**Cyperus laevigatus**

CYPERACEAE

Life history**Growth form:** Perennial herb, with long thick rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January–May.**Fruit/seed:** Dark yellow-brown nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NWP NFWP; Qld, Vic., N.T., S.A., W.A., Asia, Afr., Eur., Amer.**Distribution Sydney area:** Coastal estuaries.**Select locations:** CC: Narrabeen, Curl Curl, Woolooware Bay, Kurnell, Port Hacking, Stanwell Park, Lake Illawarra, Shoalhaven River.**Habitat****Habitat:** Foreshores, behind mangroves, lagoons.**Altitude:** 0–150 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–rare.**Vegetation:** Saltmarsh e.g. with *Juncus kraussii*, *Samolus repens*; brackish swamp margins e.g. with *Isolepis nodosa*, *I. cernua*.**Substrate:** Intertidal mudflats, sandy alluvium, medium nutrients, periodically flooded, saline–brackish.**Exposure:****Conservation****Conservation:** Threatened because of habitat degradation (K. Wilson pers. comm.).

Cyperus laevis

CYPERACEAE

Life history

Growth form: Small, tufted perennial herb, sometimes proliferating; culms 15–55 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November–July, peak March.

Fruit/seed: Dark red-brown nut 1 mm long, November–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CWS; Qld.

Distribution Sydney area: Coast.

Select locations: CC: Wondabyne, Barrenjoey, Hornsby, Beecroft, Towra Point, Bankstown, Nortons Basin, Hayes Crossing, Elderslie, Woronora River, Stanwell Park, Minnamurra, Mt Coolangatta.

Habitat

Habitat: Hillsides.

Altitude: 0–200 m

Annual rainfall: 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus saligna*, *Angophora floribunda*, *Corymbia maculata*, *E. tereticornis*; dry rainforest e.g. with *Cassine australis*, *Streblus brunonianus*, *Diospyros australis*.

Substrate: Clay soils on shale, volcanic necks, latite, alluvium, medium nutrients.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Reported in Blue Mountains NP, Brisbane Water NP, Dharug NP, Ku-ring-gai Chase NP, Sydney Harbour NP, Royal NP.

Cyperus leiocaulon (*Mariscus laevis*)

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with stems swollen at base, 20–40 cm high and very short thick rhizome.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Brown to blackish nut 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NWS NWP; Qld.

Distribution Sydney area: Sporadic.

Select locations: CC: Wisemans Ferry, Woy Woy, Agnes Banks, Auburn, Casula, Elderslie, Menangle Park.

Habitat

Habitat: Sand deposits, beaches, riverflats.

Altitude: 0–100 m

Annual rainfall: 700–1200 mm

Typical local abundance: Occasional–frequent.

Vegetation: Open-forest e.g. with *Eucalyptus botryoides*, *Banksia serrata*, *Eucalyptus sclerophylla*, *E. fibrosa*, *Melaleuca decora*.

Substrate: Sandy, less commonly clayey soil, on dunes, alluvium, shale.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere not known.

Cyperus lhotskyanus

CYPERACEAE

Life history

Growth form: Slender perennial herb, with stems 20–60 cm high and longish rhizome.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Yellow-brown nut 2 mm 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; Vic., S.A.

Distribution Sydney area: Tablelands.

Select locations: CC: Newnes. CT: Kelso, Bathurst, Orange, Bullio.

Habitat

Habitat: Stream banks, floodways.

Altitude: 500–800 m **Annual rainfall:** 700–900 mm

Typical local abundance: Rare.

Vegetation: Creekbank vegetation e.g. with *Juncus subglaucus*, *Schoenus validus*; swamp e.g. with *Cyperus sphaeroideus*.

Substrate: Sandy soils on alluvium, granite, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Cyperus lucidus

CYPERACEAE

Life history

Growth form: Robust, tussock-forming perennial herb, with stems 30–150 cm high and short thick rhizome.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–January.

Fruit/seed: Dark grey-brown to blackish nut 3 mm long, December–January.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area:

Select locations: CC: Morisset, Putty, Kurrajong, Centennial Park, Milperra, Menangle, Douglas Park. CT: Rylstone, Colong Swamp, Morgan Swamp (Avon Dam), Mittagong, Long Swamp (Kodala 1992).

Habitat

Habitat: Swampy areas, stream banks.

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

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Eucalyptus elata*, *Melaleuca linariifolia*, *Carex longibracteata*, *Viola hederacea*, *Dichondra repens*.

Substrate: Sandy to loamy alluvium, low to medium nutrients, periodically inundated.

Exposure:

Conservation

Conservation: Many old records, fewer recent ones. Vulnerable in Western Sydney (James et al. 1999). Vulnerable because of habitat changes in swampy coastal areas (K. Wilson pers. comm.).

Cyperus mirus

CYPERACEAE

Life history**Growth form:** Small, densely tufted perennial herb, with stems to 50 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Black, cross-barred, striate nut is different from other nuts in *Cyperus*, January–April.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: Mt Colah, Roseville, RBG (1966), Domain (1903), Emu Plains, Strathfield, Sutherland.**Habitat****Habitat:** Moist shady places.**Altitude:** 0–100 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Rare.**Vegetation:** Riverflat forest, lawns.**Substrate:** Clay soils on shale, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** Recorded in lawns and gardens, conservation status unknown.**Cyperus odoratus**

CYPERACEAE

Life history**Growth form:** Tufted annual or perennial herb, with stems 20–120 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** February–May.**Fruit/seed:** Brown nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld, pantrop regions.**Distribution Sydney area:** Wyong area, Nowra.**Select locations:** CC: Wollombi, Lake Munmorah, Wyong, Coomonderry Swamp.**Habitat****Habitat:** Creek banks, swamp margins.**Altitude:** 0–50 m **Annual rainfall:** 1000–1200 mm**Typical local abundance:** Frequent–rare.**Vegetation:** Swamp margins and floating islands e.g. with *Typha orientalis*, *Pericaria lapathifolia*, *Carex appressa*, *Schoenoplectus mucronatus*, *Melaleuca decora*.**Substrate:** Clay soils on alluvium, medium nutrients, periodically wet, fresh.**Exposure:****Conservation****Conservation:** Rare, Coomonderry Swamp is southern geographical limit.

Cyperus polystachyos (*Pycreus polystachyos*)

CYPERACEAE

Life history

Growth form: Tufted annual or perennial, with short rhizome; stems 10–60 cm high, with leaves shorter.

Vegetative spread:

Longevity: Probably short-lived, less than 5 years.

Primary juvenile period:

Flowers:

Fruit/seed: Red-brown to blackish nut 1 mm long, January–March.

Dispersal, establishment & growth:

Fire response: Possibly resprouted after high intensity fire 1994 (at Lane Cove), flowering in 10 weeks (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native. Possibly introduced in Sydney region (K. Wilson pers. comm.).

Botanical subregions: NC CC SC NWS CWS; LHI, Qld, Vic., N.T., W.A., pantrop.

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Lower Portland, Agnes Banks, Barrenjoey, Towlers Bay, Cheltenham, Manly, Nielsen Park, Centennial Park, Cooks River, Towra Point, La Perouse, Kurnell, Woronora River, Lake Illawarra, Berry.

Habitat

Habitat: Wetlands, headlands, roadsides.

Altitude: 0–200 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Various; headland grassland e.g. with *Themeda australis*; wet places e.g. with *Juncus articulatus*, *Cyperus congestus*, *Isolepis nodosa*.

Substrate: Clayey to sandy soil on alluvium, shale, dune sand, medium nutrients, permanently moist, sometimes brackish.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Reported in Sydney Harbour NP.

Cyperus procerus

CYPERACEAE

Life history

Growth form: Perennial herb, with long rhizome; stems 70–120 cm high.

Vegetative spread: Yes, spreading rhizomes initiate new plants.

Longevity:

Primary juvenile period:

Flowers: March–April.

Fruit/seed: Blackish brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., Asia.

Distribution Sydney area: St Marys.

Select locations: CC: St Marys (1990), Ropes Creek (1992).

Habitat

Habitat: Swamps.

Altitude: 0–50 m

Annual rainfall: 800 mm

Typical local abundance: Frequent.

Vegetation: Swamp e.g. with *Eleocharis pusilla*, *E. sphacelata*, *Schoenoplectus validus*, *Nymphoides geminata*.

Substrate: Clay soil on alluvium, with periodically standing water, low nutrients.

Exposure:

Conservation

Conservation: Rare in Sydney area (Harden 1993). Outlier population and southern geographical limit is St Marys. Vulnerable in Western Sydney (James et al. 1999).

***Cyperus reflexus* ***

CYPERACEAE

Flatsedge

Life history**Growth form:** Slender perennial herb, with short thick rhizome; stems 20–50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–March.**Fruit/seed:** Grey-brown nut 1 mm long, November–March.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N and S America.**Botanical subregions:** CC CT; Vic.**Distribution Sydney area:** Sydney suburban areas.**Select locations:** CC: Annangrove, St Ives, Oxford Falls, North Ryde, Rooty Hill, Picnic Point, Parramatta (1959), CT: Woodford (1974, 1976, 1999).**Habitat****Habitat:** Margins of bushland, disturbed sites, drains.**Altitude:** 0–500 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Roadside vegetation e.g. with *Paspalum dilatatum*, *Coreopsis lanceolata*, *Conyza albida*.**Substrate:** Sandy to clay soils on alluvium, periodically moist, medium nutrients.**Exposure:****Conservation****Conservation:** Extent of potential spread unknown.***Cyperus rigens* ***

CYPERACEAE

Life history**Growth form:** Perennial herb, with short thick rhizome; stems 50–100 cm high.**Vegetative spread:** Probably by rhizomes (K. Wilson pers. comm.).**Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Dark red-brown nut 1 mm long, March–May.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** CC CT.**Distribution Sydney area:** Blue Mountains.**Select locations:** CC: Glenbrook (1973). CT: Blackheath, Lawson (1967), Wentworth Falls (1972), Woodford (1972).**Habitat****Habitat:** Roadsides, gutters.**Altitude:** 200–1000 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** e.g. with *Cyperus reflexus*, *C. congestus*, *C. eragrostis*, *Juncus continuus*, *J. planifolius*.**Substrate:** Sandy soils, moist.**Exposure:****Conservation****Conservation:** Naturalised in Blue Mountains since 1960s, rate of spread unknown.

Cyperus rotundus* **CYPERACEAE**

Nutgrass

Life history

Growth form: Perennial herb, with stems 15–60 cm high; rhizomes form egg-shaped tubers 5–10 mm diam.

Deep extensive root system of roots, rhizomes, tubers and basal bulbs; chains of up to 15 tubers, but growth from one tuber in the chain inhibits growth from others (Parsons & Cuthbertson 1992).

Vegetative spread: Growth of rhizome and tuber extends boundary of patch by more than 1 metre per year (Parsons & Cuthbertson 1992).

Longevity: Indefinite.

Primary juvenile period:

Flowers: January–June, peak March.

Fruit/seed: Dark grey-brown nut 1 mm long. Very little viable seed produced, germinates poorly and very few seedlings survive (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Mainly vegetative spread by tubers; 6–10 buds on each tuber, each of which may produce a new plant when tuber is detached e.g. by cultivation (Parsons & Cuthbertson 1992). Dispersed by flood waters, in potted plants (J. Hosking pers. comm.) and in mud on cars (Wace 1977). Photosynthetic pathway C4, giving it a competitive advantage over many other plants (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: Allelopathic, with exudate from roots and leachate from dried plants inhibiting growth of other plants; important use in Indian and Chinese medicine; tubers consumed by Aboriginal people in northern and central Australia (Parsons & Cuthbertson 1992), used by American Indians as cereal (Murphy 1990).

Distribution

Status/origin: Exotic, now pantropical, possibly native to Asia., although exact native range is obscure (J. Hosking pers. comm.).

Botanical subregions: NC CC SC ST NWS CWS SWS NWP; LHI, Qld, Vic., N.T., S.A., W.A.

Distribution Sydney area: Suburban areas.

Select locations: CC: Richmond (1923), Dural, Willoughby, Rose Bay (1894), Centennial Park (1899), Annandale, Kogarah (1901), Menangle, Bomaderry.

Habitat

Habitat: Disturbed areas around habitation, paddocks, wet places.

Altitude: 0–200 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Disturbed sites e.g. with *Cyperus laevis*, *C. polystachyos*, garden weeds.

Substrate: Sandy to clay soils. Susceptible to flooding (Parsons & Cuthbertson 1992).

Exposure: Can withstand conditions of high temperature and low light (Parsons & Cuthbertson 1992).

Conservation

Conservation: Weed in disturbed situations, cultivated paddocks, gardens, naturalised for over a century.

Cyperus sanguinolentus (*Pycrus sanguinolentus*)

CYPERACEAE

Life history

Growth form: Tufted annual or perennial herb, with stems 5–80 cm high, leaves equal or shorter.

Vegetative spread:

Longevity: Annual or perennial.

Primary juvenile period:

Flowers: April.

Fruit/seed: Brown to blackish nut 1 mm long.

Dispersal, establishment & growth: Dispersed in mud on cars (Wace 1977). Germination in all seasons in Northern Tablelands (Britton & Brock 1994).

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., ?N.T., S.A., W.A., Malesia, Asia, Africa.

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Springwood, Byrnes Gap, Kowmung River, Cheltenham, Doonside, Orchard Hills, Centennial Park, Parramatta, Kogarah, Nortons Basin, Waterfall, Berry. CT: Orange, Clarence, Blackheath, Leura, Kangaloon, Bundanoon.

Habitat

Habitat: Swamps, stream banks, roadsides.

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

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Eleocharis acuta*, *Philydrum lanuginosum*; roadside ditches e.g. with *Cyperus eragrostis*, *C. difformis*; riverflat forest e.g. with *Casuarina glauca*, *E. tereticornis*, *Angophora subvelutina*.

Substrate: Clay to silty soils on alluvium, medium nutrients, moist. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

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

Cyperus sesquiflorus * (*Kyllinga odorata*)

CYPERACEAE

Kyllinga Weed

Life history

Growth form: Annual or perennial herb, with short rhizome; stems 5–40 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November–May.

Fruit/seed: Black nut 1 mm long, November–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Exotic, native to tropical regions.

Botanical subregions: NC CC NT; Qld, N.T.

Distribution Sydney area: Mainly Sydney suburban area.

Select locations: CC: Mellong Range, Wisemans Ferry (1908), Linden, Cheltenham, Mosman Bay (1884), Centennial Park (1897), Cooks River (1911), Casula, Waterfall.

Habitat

Habitat: Pastures, lawns, disturbed sites.

Altitude: 0–500 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: e.g. with *Cyperus flaccidus*, *C. sanguinolentus*, *Fimbristylis dichotoma*, *Paspalum dilatatum*, *Bidens pilosa*.

Substrate: Sandy soil, often damp.

Exposure:

Conservation

Conservation: Naturalised for over a century.

Cyperus sphaeroideus* (*Kyllinga intermedia*)*CYPERACEAE****Life history**

Growth form: Slender perennial herb, with long slender rhizome; stems triangular to 50 cm high.

Vegetative spread: Yes (McIntyre et al. 1995), creeping rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: January–April, peak March.

Fruit/seed: Pale brown nut 1 mm long.

Dispersal, establishment & growth: Means of dispersal undefined (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; Qld, Vic.

Distribution Sydney area: Sporadic.

Select locations: CC: Wisemans Ferry. CT: Currant Mountain Gap, Molong Creek, Lidsdale, Wyagden, Wingecarribee Swamp, Joadja, Bundanoon.

Habitat

Habitat: Creekbanks, wet places.

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

Typical local abundance: Frequent–occasional.

Vegetation: Swamp margins e.g. with *Schoenus apogon*, *Juncus fockei*.

Substrate: Peaty soils on alluvium, granite, low nutrients, periodically moist.

Exposure:

Conservation

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

***Cyperus tenellus* ***

CYPERACEAE

Tiny Flatsedge

Life history

Growth form: Dwarf tufted annual herb, with stems 1–8 cm high; thread-like leaves shorter than stems.

Vegetative spread: No.

Longevity: Less than a year.

Primary juvenile period: Less than a year.

Flowers:

Fruit/seed: Brown nut 1 mm long, October–November.

Dispersal, establishment & growth: Animal, water, and possibly wind-dispersed (Carr et al. 1992).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: CC SC CT SWS SWP; Qld, Vic., Tas., S.A., W.A.

Distribution Sydney area: Mainly Sydney suburban area.

Select locations: CC: Wyong Creek, Narrabeen, Parramatta (1900), Gladesville (1914), Centennial Park (1900), Cooks River (1909), Kogarah (1893), Glenfield, Waterfall, Menangle Park.

CT: Megalong Valley.

Habitat

Habitat: Damp, disturbed areas.

Altitude: 0–700 m

Annual rainfall: 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus parramattensis*, *Melaleuca decora*; heath e.g. with *Acacia sophorae*, *Melaleuca nodosa*, *Banksia ericifolia*; grassland.

Substrate: Sandy to silty soil on alluvium, sandstone. Moist sites (J. Hosking pers. comm.).

Exposure:

Conservation

Conservation: Naturalised near habitation for over a century.

***Cyperus teneristolon* ***

CYPERACEAE

Life history

Growth form: Herb with stems to 80 cm high (J. Hosking pers. comm.).

Vegetative spread: By stolons and rhizomes.

Longevity:

Primary juvenile period:

Flowers: March.

Fruit/seed:

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to eastern and southern Africa.

Botanical subregions: CT.

Distribution Sydney area: Katoomba.

Select locations: CT: Minnehaha Falls (2000), Yosemite Creek (2001).

Habitat

Habitat: Picnic area.

Altitude: 1000 m

Annual rainfall: 1400 mm

Typical local abundance: Frequent.

Vegetation:

Substrate: Sandy soil over sandstone, moist areas (J. Hosking pers. comm.).

Exposure:

Conservation

Conservation: Recently recorded as locally established at Katoomba from Blue Mountains Refuse Tip, downstream along Yosemite Creek for a few kilometres (J. Hosking pers. comm.).

Cyperus tetraphyllus

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with short rhizome; stems to 50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Spikelets dark brown to black, March.**Fruit/seed:** Yellowish nut 1 mm long.**Dispersal, establishment & growth:** Diaspore: nut, no special morphology for dispersal (Westoby et al. 1990).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT CWS; Qld.**Distribution Sydney area:** Coast.**Select locations:** CC: Wahroonga, Eastwood, Lilyvale, Belambi Creek, Austinmer, Albion Park, Minnamurra Falls, Kangaroo Valley, Mt Coolangatta.**Habitat****Habitat:** Creekbanks.**Altitude:** 0–300 m**Annual rainfall:** 1200–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Rainforest e.g. with *Streblus brunonianus*, *Cassine australis*, *Diospyros australis*; moist eucalypt forest e.g. with *Eucalyptus pilularis*, *E. quadrangulata*, *Syncarpia glomulifera*.**Substrate:** Clay soils on shale, alluvium, medium–high nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown.***Cyperus trinervis***

CYPERACEAE

Life history**Growth form:** Small tufted perennial herb, with stems and leaves 15–50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** December–May, peak March.**Fruit/seed:** Dark brown nut 1 mm long, December–April.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT NWS; Qld.**Distribution Sydney area:** Coast.**Select locations:** CC: Glenbrook, Eastwood, Doonside, Fairfield, Ingleburn, Port Hacking, Douglas Park, Albion Park, Kiama.**Habitat****Habitat:** Creekbanks.**Altitude:** 0–200 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Rainforest, riparian forest.**Substrate:** Sandy soil on alluvium, volcanic necks, moist, medium nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999).

Cyperus vaginatus

CYPERACEAE

Life history

Growth form: Tussock-forming perennial herb, occasionally proliferating, with short, thick rhizome; stems to 100 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Grey-brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Capertee Valley.

Select locations: CC: Crown Creek (1966).

Habitat

Habitat: Along creeks.

Altitude: 100–300 m **Annual rainfall:** 600 mm

Typical local abundance: Rare.

Vegetation:

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

Exposure:

Conservation

Conservation: Rare, only one recent record from Capertee Valley, at Crown Creek in 1966.

***Cyperus vorsteri* ***

CYPERACEAE

Life history

Growth form: Robust tufted perennial herb, with short thick rhizome; stems 50–150 cm high.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Dark yellow-brown nut 2 mm long.

Dispersal, establishment & growth: Diaspore: seed.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: CC; W.A.

Distribution Sydney area: Sydney suburbs.

Select locations: CC: Marramarra Creek (1998), Dee Why (2000), Mosman (1994), Parsley Bay (1995), Lugarno (1995).

Habitat

Habitat: Disturbed areas, suburban parks, drains.

Altitude: 0–200 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Woodland e.g. with *Angophora costata*, *Angophora floribunda*, *Eucalyptus pilularis*.

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

Exposure:

Conservation

Conservation: Apparently recently naturalised and spreading in suburban bushland e.g. at Mosman.

Eleocharis acuta**CYPERACEAE****Life history**

Growth form: Perennial herb; stems usually 10–60 cm high, produced along a linear rhizome but occasionally tufted (Sainty & Jacobs 1981).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–March.

Fruit/seed: Yellow to brown nut 2 mm long.

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: NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., N.T. S.A. W.A., N.Z., N.G.

Distribution Sydney area: Widespread.

Select locations: CC: Centennial Park, Oatley, Casula, Menangle Park, Coomonderry Swamp. CT: Rylstone, Mt Canobolas, Clarence, Hartley, Bowral, Taralga.

Habitat

Habitat: Margins of swamps, depressions.

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

Typical local abundance: Rare–occasional.

Vegetation: Swamp margins e.g. with *Eleocharis minuta*, *Ranunculus inundata*.

Substrate: Sandy alluvium, low nutrients, permanently wet. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Conservation status not known.

Eleocharis atricha**CYPERACEAE****Life history**

Growth form: Slender tufted perennial herb, with stems 3–40 cm high and slender rhizomes bearing tubers.

Vegetative spread: Probably rhizomatous spread.

Longevity:

Primary juvenile period:

Flowers: January–May.

Fruit/seed: Straw-coloured nut 1 mm long, though spikelets frequently fail to develop fruit (Herb. note).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC NT CT ST SWS; Qld, Vic., N.T., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Moorebank, Glenfield, Menangle Park, Thirlmere. CT: Mt Canobolas, Hill Top, Moss Vale, Penrose.

Habitat

Habitat: Moist situations, permanent and ephemeral swamps, drainage lines.

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

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Lepyrodiopsis anarthria*, *Gonocarpus micranthus*, *Baumea rubiginosa*; scrub e.g. with *Melaleuca nodosa*, *Melaleuca decora*; woodland e.g. with *Eucalyptus dalrympleana*, *E. bridgesiana*.

Substrate: Sandy clay loam on sediments, shales, low to medium nutrients, moist, periodically inundated.

Exposure:

Conservation

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

Eleocharis cylindrostachys**CYPERACEAE****Life history**

Growth form: Perennial herb with very short rhizome; flowering stems 30–50 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–April.

Fruit/seed: Biconvex nut, February–April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT NWS NWP; Qld.

Distribution Sydney area: Mainly Western Sydney.

Select locations: CC: Martinsville, St Marys, Toongabbie, Orchard Hills, Doonside, Glenfield, Mount Annan, Wedderburn.

Habitat

Habitat: Moist places, margins of wetland, ponds, creeks.

Altitude: 0–200 m **Annual rainfall:** 700–1200 mm

Typical local abundance: Occasional.

Vegetation: Swamp woodland e.g. with *Melaleuca decora*, *Casuarina glauca*, *Eucalyptus tereticornis*; seageland e.g. with *Schoenoplectus mucronatus*, *Isolepis inundata*.

Substrate: Clay soils on shale, Tertiary alluvium, medium nutrients, permanently moist, periodically inundated.

Exposure:

Conservation

Conservation: Wedderburn is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999).

Eleocharis dietrichiana**CYPERACEAE****Life history**

Growth form: Slender perennial herb with short rhizome; stems to 30 cm high with partial transverse septa.

Vegetative spread: By rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: September–March.

Fruit/seed: Brown nut 1 mm long, seeds 1 mm long, March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT; Qld.

Distribution Sydney area: Mainly western Sydney.

Select locations: CC: Wyong, Doonside, Penrith, Glenbrook Lagoon, Centennial Park, Liverpool, Glenfield, Narellan.

Habitat

Habitat: Wetland margins, ephemeral creeks.

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

Typical local abundance: Occasional.

Vegetation: Sedgeland e.g. *Paspalum distichum*, *Marsilea mutica*, *Carex appressa*, *Eleocharis* species.

Substrate: Clay soils on alluvium, medium nutrients, water table mostly high, moisture supply intermittent, fresh.

Exposure: Full sun.

Conservation

Conservation: Narellan is southern geographical limit. Vulnerable in Western Sydney (James et al. 1999).

Eleocharis equisetina

CYPERACEAE

Life history

Growth form: Tufted perennial herb with slender rhizomes; stems terete, to 1 m high, transversely septate.

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: July–December.

Fruit/seed: Nut 2 mm long, December–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Foodplant of Pacific Black Duck *Anas superciliosa*, seed eaten by Plumed Whistling Duck *Dendrocygna etoni* (Barker & Vestjens 1989,1990). Forms part of habitat for waterfowl (Sainty & Jacobs 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld, Malesia, Asia, Madagascar.

Distribution Sydney area: Sporadic.

Select locations: CC: Wyong, Lower Portland, Mulgoa, Berry.

Habitat

Habitat: Swamps, lagoons in water to 0.5 m deep (Sainty & Jacobs 1981).

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

Typical local abundance: Frequent.

Vegetation: Estuarine wetland e.g. with *Melaleuca quinquenervia*, *Casuarina glauca*, *Eleocharis sphacelata*, *Juncus usitatus*.

Substrate: Clay soils on alluvium, medium nutrients, water table mostly high, brackish–fresh.

Exposure:

Conservation

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

Eleocharis gracilis

CYPERACEAE

Life history

Growth form: Slender perennial herb, with short creeping rhizome; stems tufted or solitary 20–50 cm high.

Vegetative spread: Yes.

Longevity:

Primary juvenile period:

Flowers: November–February.

Fruit/seed: Golden brown nut 1 mm long, November–March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Morisset, Bowen Mountain, Narrabeen, Cheltenham, Kogarah, Kurnell, Cronulla, Leumeah, Yerranderie, Hill Top. CT: Rylstone, Clarence, Katoomba, Wheengee-whungee Swamp, Mittagong, Kangaloon.

Habitat

Habitat: Seasonally wet situations, creeks.

Altitude: 0–1200 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Swamp e.g. with *Glyceria australis*, *Myriophyllum simulans*, *Stellaria angustifolia*; *Leptospermum* swamp e.g. with *Leptospermum myrtifolium*, *Carex appressa*, *Carex gaudichaudiana*, *Empodisma*; riparian vegetation e.g. with *Lomandra longifolia*, *Libertia paniculata*, *Carex appressa*.

Substrate: Sandy to clayey alluvial soil, low–medium nutrients, permanently wet.

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999), conservation elsewhere unknown. Reported in Muogamarra NR, Garigal NP, Kanangra Boyd NP.

Eleocharis macbarronii**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with small egg-shaped tubers; stems 25–75 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Dark brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC NWP SWP; Qld, Vic.

Distribution Sydney area: Richmond.

Select locations: CC: Richmond (1910).

Habitat

Habitat: Seasonally wet situations.

Altitude: 0–50 m **Annual rainfall:** 800 mm

Typical local abundance:

Vegetation:

Substrate: Clayey soil on alluvium.

Exposure:

Conservation

Conservation: Rare, only Sydney area record is for Richmond in 1910.

***Eleocharis minuta* ***

CYPERACEAE

Variable Spikerush

Life history

Growth form: Perennial herb, sometimes with short stolons or rhizomes; stems usually tufted 5–20 cm long.

Vegetative spread:

Longevity:

Primary juvenile period: Less than one year.

Flowers: February–June.

Fruit/seed: Pale green to dark greenish brown nut 1 mm long, December–June.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Africa.

Botanical subregions: NC CC SC; Qld, Vic.

Distribution Sydney area: Coast.

Select locations: CC: Morisset, Porters Creek, Agnes Banks, Narrabeen (1909), Centennial Park (1899), Padstow, Menangle Park, Coomonderry Swamp, Berry.

Habitat

Habitat: Swamps, sandy shores of coastal lakes.

Altitude: 0–50 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Isolepis inundata*, *Chorizandra cymbaria*, *Baumea teretifolia*, *Fimbristylis dichotoma*.

Substrate: Sandy to clayey silt on alluvium, sand, low nutrients, permanently moist.

Exposure:

Conservation

Conservation: Naturalised for nearly a century.

***Eleocharis pachycarpa* ***

CYPERACEAE

Life history

Growth form: Small tufted perennial herb, with short rhizome; stems to 20 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Pale yellow-brown nut 1 mm diam.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Chile.

Botanical subregions: CC.

Distribution Sydney area: Centennial Park.

Select locations: CC: Centennial Park (1900, 1908, 1929, 1965, 1975).

Habitat

Habitat: Moist situations.

Altitude: 0–50 m

Annual rainfall: 1200 mm

Typical local abundance: Rare.

Vegetation: Swamp woodland e.g. with *Melaleuca quinquenervia*, *Lepyrodia anarthria*, *Baumea acuta*, *Schoenus apogon*.

Substrate: Peaty soil.

Exposure:

Conservation

Conservation: Recorded at Centennial Park at various times (1900–1975), and though persisting there does not seem to have spread beyond.

Eleocharis pallens

CYPERACEAE

Pale Spikerush

Life history

Growth form: Tufted perennial herb, with very short rhizome, to 50 cm high; a unique glistening reticulate cell-pattern between the longitudinal ridges of the stem is visible with hand lens (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November.

Fruit/seed: Brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic CC, but native in other regions of Australia.

Botanical subregions: *CC NT NWS CWS SWS NWP SWP NFWP SFWP; Qld, Vic., N.T., S.A., W.A.

Distribution Sydney area: Orange area.

Select locations: CC: Rooty Hill. CT: Belubula River-Junction Reefs.

Habitat

Habitat: Seasonally wet situations, floodways.

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

Typical local abundance:

Vegetation: Riparian vegetation e.g. with *Eucalyptus camaldulensis*, *Eucalyptus bridgesiana*.

Substrate: Sandy riverine alluvium.

Exposure:

Conservation

Conservation: Native west of the Great Divide, recorded at Rooty Hill in 1965 but may have been introduced from the west by trains.

***Eleocharis parvula* ***

CYPERACEAE

Life history

Growth form: Erect, tufted sedge to 4 cm high, forming grass-like ground cover.

Vegetative spread: Probably, it has minute tubers (K. Wilson pers. comm.).

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe, N–S America, N Africa, ?Asia.

Botanical subregions: CC; Europe, N–S America, N Africa, ?Asia.

Distribution Sydney area: Coastal estuaries.

Select locations: CC: Chipping Norton Lake (1993), Salt Pan Creek, Revesby (1996), Killalea Lagoon (1994).

Habitat

Habitat: Estuarine mudflats.

Altitude: 0–20 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Juncus kraussii*, *Triglochin striata*, *Mimulus repens*, often near mangroves.

Substrate: Sandy to muddy alluvium, below high tide level, or with receding water levels, saline to brackish, medium nutrients.

Exposure:

Conservation

Conservation: Recently recorded (1993–1996).

Eleocharis philippinensis

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with slender rhizomes; stems 25–50 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Straw-coloured to dark brown nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC; Qld, W.A., Malesia, N.Cal.**Distribution Sydney area:** Castlereagh area.**Select locations:** CC: Londonderry.**Habitat****Habitat:** Swampy areas.**Altitude:** 50 m**Annual rainfall:** 800 mm**Typical local abundance:** Frequent.**Vegetation:** Low open-forest.**Substrate:** Sandy soil on Tertiary alluvium, low nutrients.**Exposure:****Conservation****Conservation:** Southern geographical limit and only record for Sydney area is for Castlereagh Nature Reserve, collected from 'artificial low-lying area' in 1992.***Eleocharis pusilla***

CYPERACEAE

Life history**Growth form:** Small tufted perennial herb with slender rhizome; fine stems, usually 2–15 cm high.**Vegetative spread:** Rhizomatous spread.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** October–March.**Fruit/seed:** Nut 1 mm long.**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:** NC CC SC NT CT ST NWS CWS SWS NWP SWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., N.Z.**Distribution Sydney area:** Western Sydney, Bathurst/Orange.**Select locations:** CC: Richmond, Shane Park, Greystanes Creek, Glenfield, Narellan.

CT: Orange, Glanmire, Wombeyan Caves.

Habitat**Habitat:** Creeks and swampy areas.**Altitude:** 0–1000 m**Annual rainfall:** 700–1000 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Sedgeland e.g. with *Marsilea*, *Juncus*, *Ranunculus*, *Carex*.**Substrate:** Clay soil on shale, alluvium, low to medium nutrients, permanently moist, fresh.**Exposure:** Full sun.**Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown.

Eleocharis sphacelata

CYPERACEAE

Tall Spike Rush

Life history

Growth form: Aquatic perennial herb, rhizomatous, leafless to 2 m high. Flowering stems extend to 1 m above water (Sorrell & Boon 1994).

Vegetative spread: Spreads extensively by rhizome in water to 2 m deep (Sainty & Jacobs 1981).

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, October–December.

Fruit/seed: Nut 2.5 mm long, October–June.

Dispersal, establishment & growth: Diaspore: seed, rhizome fragments. Germination in winter, spring, summer in Northern Tablelands (Britton & Brock 1994). Growth rate quick. Releases methane from wetland sediments (Sorrell & Boon 1994).

Fire response:

Interaction with other organisms: Roots of *E. sphacelata* significantly oxidize anaerobic sediments in their vicinity (Sorrell 1994).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST SWS NWP SWP SFWP; Qld, Vic., Tas., N.T., S.A., W.A., N.G.

Distribution Sydney area: Widespread.

Select locations: CC: Mellong, Wyong, Umina, Richmond, Shane Park, Manly Dam, Kogarah, Botany, Glenfield, Narellan, Albion Park. CT: Cudgegong River, Bathurst, Blackheath, Woodford, Moss Vale.

Habitat

Habitat: Swamps, wetlands.

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

Typical local abundance: Frequent–dominant.

Vegetation: Sedgeland e.g. with *Phragmites communis*, *Macherina articulata*, *Isolepis prolifer*, *Triglochin*, *Myriophyllum*.

Substrate: Sandy to clayey alluvium, low to medium nutrients, permanently moist, watertable high, fresh. Grows mainly in standing water to 2 m deep (Sainty & Jacobs 1981).

Exposure: Full sun.

Conservation

Conservation: Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Brisbane Water NP, Garigal NP.

Fimbristylis dichotoma

CYPERACEAE

Life history

Growth form: Tufted perennial herb with very short rhizome; flowering stems compressed, usually 10–75 cm high and much shorter leaves. Variable species with several forms.

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

Longevity:

Primary juvenile period:

Flowers: January–May.

Fruit/seed: Biconvex nut.

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

Fire response: Possibly resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 18 months (P. Kubiak pers. comm.).

Interaction with other organisms: Seed eaten by Straw-necked Ibis and Plumed Whistling Duck *Dendrocygna eytoni* (Barker & Vestjens 1989,1990). Eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT NWS CWS NWP SWP NFWP SFWP; Qld, N.T., S. A., W.A., trop & subtrop regions.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Calga, Spencer, Pitt Town, Dennistone, North Head, Northbridge, Centennial Park, Homebush, Wongawilli.

Habitat

Habitat: Wetland.

Altitude: 0–200 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. sclerophylla*, *E. moluccana* with grassy understorey; wetland margins e.g. with *Baumea rubiginosa*, *Gahnia sieberiana*.

Substrate: Clay soil on shale, alluvium, sandstone, medium nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

Fimbristylis ferruginea

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with very short rhizome; stems 20–80 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., S.A., W.A., pantrop.

Distribution Sydney area: Coast.

Select locations: CC: Tuggerah Lake, Gosford, Botany Bay, Kurnell, Cronulla.

Habitat

Habitat: Foreshores, lake margins.

Altitude: 0–20 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Saltmarsh e.g. with *Juncus kraussii*, *Isolepis nodosus*.

Substrate: Clayey alluvium, saline to brackish.

Exposure:

Conservation

Conservation: Port Hacking is southern geographical limit, most recent record 1977. Conservation status unknown.

Fimbristylis nutans

CYPERACEAE

Life history

Growth form: Slender, densely tufted perennial herb, with very short rhizome; stems 15–40 cm high, sometimes taller.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., W.A., Malasia, Asia.

Distribution Sydney area: Doonside.

Select locations: CC: Doonside (1968).

Habitat

Habitat: Around swamps, on moist flats.

Altitude: 0–200 m **Annual rainfall:** 900 mm

Typical local abundance: Recorded with *Rumex crispus*, *Cyperus eragrostis*, *Juncus usitatus*.

Vegetation:

Substrate: Clay soil, medium nutrients, periodically inundated.

Exposure:

Conservation

Conservation: Southern geographical limit and only record for Sydney area is the collection from Doonside near Eastern Creek in 1968. Vulnerable in Western Sydney (James et al. 1999).

Fimbristylis velata

CYPERACEAE

Life history

Growth form: Small densely tufted annual, with stems 5–25 cm high.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: January.

Fruit/seed: Straw-coloured nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NWP SWP; Qld, Vic., N.T., S.A., W.A., Malasia, Asia.

Distribution Sydney area: Coast.

Select locations: CC: Pitt Town, Lindfield, Centennial Park, Bondi, Mascot, Camden, Cataract Dam, Pt Kembla.

Habitat

Habitat: Moist areas, lagoon margins, ephemeral watercourses.

Altitude: 0–300 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Occasional.

Vegetation: Wetland margins e.g. with *Juncus* species, *Myriophyllum*, *Marsilea mutica*.

Substrate: Sandy soil on sand, sandstone, low nutrients, moist.

Exposure:

Conservation

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

Fuirena ciliaris**CYPERACEAE****Life history**

Growth form: Slender, tufted herb, with flowering stems 40–65 cm high.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers:

Fruit/seed: Brown nut 1 mm long, May.

Dispersal, establishment & growth:

Fire response: Probably killed.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., W.A., trop. Africa, Asia.

Distribution Sydney area: Moorebank.

Select locations: CC: Chatham Village.

Habitat

Habitat: Moist situations, swampy flats.

Altitude: 0–100 m **Annual rainfall:** 900 mm

Typical local abundance: Occasional.

Vegetation: Edge of swamp in scrub e.g. with *Melaleuca nodosa*, *Melaleuca decora*, *Melaleuca erubescens*.

Substrate: Clay soil, low nutrients, periodically wet.

Exposure:

Conservation

Conservation: Only record for area is Moorebank in 1992.

Gahnia aspera**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with stems 15–65 cm high; leaves flat, scabrous, longer than inflorescence.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: February–May.

Fruit/seed: Mature October–February (L. Parkinson pers. comm.).

Dispersal, establishment & growth: No special morphology for dispersal (Westoby et al. 1990).

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Hesperilla ornata ornata* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Ourimbah, Mountain Lagoon, West Head, Lane Cove, Kogarah, Botany Bay, Casula, Albion Park, Mt Ousley, Capertee River. CT: Mt Victoria, Wombeyan Caves, Mittagong.

Habitat

Habitat: Hillsides, creekbanks.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Edge of rainforest e.g. with *Guioa semiglauca*; open-forest e.g. with *Eucalyptus saligna*, *E. deanei*, *E. acmenoides*; woodland e.g. with *Eucalyptus melliodora*; riverine forest e.g. with *Casuarina cunningghamiana*, *Eucalyptus amplifolia*.

Substrate: Clay to sandy soils on shale, basalt, sandstone, alluvium, low to high nutrients, periodically moist.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP.

Gahnia clarkei**CYPERACEAE****Life history**

Growth form: Tall tussock-forming perennial herb, with stout stems 80–200 cm high.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: Flowerheads pendulous and cascading (Romanowski 1998).

Fruit/seed: Shiny, orange–red nut 3 mm long, at any time, peak March.

Dispersal, establishment & growth: Viability of fresh seed nil (Vigilante et al. (1998).

Fire response: New leaves within a month growing from stout, burnt culms (Salvation Creek Jan. 1994). Resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 3 years (P. Kubiak pers. comm.).

Interaction with other organisms: Food plant of butterfly larvae *Hesperilla picta* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Glen Davis, Wyong, Calga, Asquith, Canoelands, Sackville Reach, Cheltenham, Gladesville, Manly, Mosman, Centennial Park, Woronora Dam, Port Hacking River, Darkes Forest, Elderslie, Cambewarra Range. CT: Nullo Mountain, Bowen Creek, Wentworth Falls, Lawson, Colo Vale.

Habitat

Habitat: Creekbanks, near swampy areas, gullies.

Altitude: 0–900 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus globoidea*; swamp e.g. with *Melaleuca*.

Substrate: Sandy soil on sandstone, alluvium, low nutrients. Colonises low pH (2.5–6.5) acid sulphate estuarine soils in the Wyong area (Payne 1992).

Exposure:

Conservation

Conservation: Reoprted in Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP, Royal NP.

Gahnia erythrocarpa

CYPERACEAE

Life history**Growth form:** Tufted perennial, with stout stems 50–150 cm high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** November–December.**Fruit/seed:** Nut egg-shaped, 5 mm long, shining, dark red-brown, December–June.**Dispersal, establishment & growth:** No special morphology for dispersal (Westoby et al. 1990).**Fire response:** Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering in 2 years (P. Kubiak pers. comm.).**Interaction with other organisms:** Food plant of butterfly larvae *Hesperilla donnyssa donnyssa*, *H. ornata ornata* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** CC.**Distribution Sydney area:** Coastal Sydney, Berowra to Waterfall.**Select locations:** CC: Berowra, West Head, Pennant Hills, Gladesville, Middle Harbour, Long Bay, Heathcote, Waterfall.**Habitat****Habitat:** Hillsides, along creeks.**Altitude:** 0–300 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Rare–occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus pilularis*, *E. piperita*; riparian forest e.g. with *Ceratopetalum apetalum*, *Tristaniopsis laurina*.**Substrate:** Sandy soils on sandstone, alluvium, low nutrients, periodically moist.**Exposure:****Conservation****Conservation:** Local endemic species with relatively few recent collections.

Conservation status unknown. Reported in Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP.

Gahnia filifolia

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with slender stems 20–45 cm high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** August–January, peak October.**Fruit/seed:** Dark brown nut 3 mm long, March–April.**Dispersal, establishment & growth:****Fire response:** Resprouts.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT ST.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Clarence, Katoomba, Mt Wilson, Lawson, Kanangra Walls, Mt Werong.**Habitat****Habitat:** Dry hillsides.**Altitude:** 800–1200 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Open-woodland e.g. with *Eucalyptus piperita*; low scrub e.g. with *Eucalyptus stricta*.**Substrate:** Sandy, sometimes clayey soils on sandstones, quartzite, low nutrients, sometimes moist.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Gahnia filum

CYPERACEAE

Life history**Growth form:** Tussock-forming perennial herb, with stems 60–110 cm high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** April–September.**Fruit/seed:** Dark brown nut 6 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC; Vic., Tas., S.A.**Distribution Sydney area:** Georges River estuary.**Select locations:** CC: Mill Creek, Little Salt Pan Creek.**Habitat****Habitat:** Saltmarsh or brackish water.**Altitude:** 0–10 m **Annual rainfall:** 900–1000 mm**Typical local abundance:** Rare.**Vegetation:** Upper saltmarsh e.g. with *Juncus kraussii*, *Sarcocornia quinqueflora*, *Suaeda australis*, *Phragmites australis*.**Substrate:** Sandy sediment, medium nutrients, periodically inundated, saline to brackish.**Exposure:****Conservation****Conservation:** Known only from a couple of locations each with very few plants in the Georges River estuary, its northern geographical limit. Conservation status unknown.***Gahnia grandis***

CYPERACEAE

Life history**Growth form:** Large tussock-forming perennial herb, with stout stems 100–250 cm high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** January–May.**Fruit/seed:** Shiny red-brown to dark brown nut 4 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT; Vic., Tas.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Clarence, Katoomba, Blackheath.**Habitat****Habitat:** Damp places, swamps, wet cliff faces.**Altitude:** 1000–1100 m **Annual rainfall:** 1100–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Xyris ustulata*, *Grevillea acanthifolia*, *Empodisma minus*.**Substrate:** Sandy soil on sandstone, low nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Clarence is northern geographical limit. Conservation status unknown. Reported in Blue Mountains NP.

Gahnia melanocarpa

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with stout stems 80–120 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Shiny dark brown to black nut 3 mm long. Mature at any time.**Dispersal, establishment & growth:** No special morphology for dispersal (Westoby et al. 1990).**Fire response:** Resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 2.5 years (P. Kubiak pers. comm.).**Interaction with other organisms:** Food plant of butterfly larvae *Hesperilla mastersi mastersi*, *H. ornata ornata* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST CWS; Qld, Vic.**Distribution Sydney area:** Coast and Blue Mountains.**Select locations:** CC: Culoul Range, Grose Vale, Ourimbah, Wamberal, Mooney Mooney Creek, Maitland Bay, Lane Cove, Oatley Bay, Palm Creek, Waterfall, Stanwell Park, Kangaroo Valley, Mt Moollattoo, Berry. CT: Blackheath, Cedar Gap, Mt Werong.**Habitat****Habitat:** Creek, low slopes.**Altitude:** 0–1100 m**Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist open-forest e.g. with *Eucalyptus pilularis*, *Syncarpia glomulifera*, *Eucalyptus sieberi*, *E. radiata*, *E. dalrympleana*, *E. deanei*, *E. saligna*, *E. acmenoides*; gallery rainforest e.g. with *Ceratopetalum apetalum*, *Doryphora sassafras*, *Acmena smithii*.**Substrate:** Loamy soils on shales, sandy alluvium, low–medium nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Bouddi NP, Royal NP, Blue Mountains NP.**Gahnia microstachya**

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with slender stems 20–45 cm high.**Vegetative spread:** No.**Longevity:****Primary juvenile period:****Flowers:** March–May.**Fruit/seed:** Dark grey-brown nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Food plant of butterfly larvae *Hesperilla ctypsargyra ctypsargyra* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** CC SC NT CT ?ST CWS; Vic., Tas.**Distribution Sydney area:** Mainly Upper Blue Mountains.**Select locations:** CC: Cowan, Mulgoa, Audley. CT: Gaspers Mountain, Clarence, Blackheath, Mt Banks, Wentworth Falls, Mt Jellore, Carrington Falls.

Habitat

Habitat: Dryish situations, hillsides, gullies.

Altitude: 0–1100 m **Annual rainfall:** 900–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *E. piperita*, *Angophora costata*, *Eucalyptus radiata*, *E. sclerophylla*; woodland e.g. with *Corymbia gummifera*, *Corymbia eximia*.

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

Exposure:

Conservation

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

Gahnia radula**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with stout stems 50–100 cm high.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Shiny nut 2 mm long.

Dispersal, establishment & growth:

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering in 22 months (P. Kubiak pers. comm.).

Interaction with other organisms: Food plant of butterfly larvae *Hesperilla ornata ornata* (Common & Waterhouse 1981). Used by early settlers

Distribution

Status/origin: Native.

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

Distribution Sydney area: Mainly coast.

Select locations: CC: Charlestown, Wyee, Wondabyne, West Head, Bilgola, Frenchs Forest, Pt Hacking, O'Hares Creek, Bargo, Hill Top. CT: Mittagong.

Habitat

Habitat: Hillsides.

Altitude: 0–600 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus agglomerata*; woodland e.g. with *Corymbia gummifera*; coastal headland scrub e.g. with *Westringia fruticosa*, *Allocasuarina distyla*.

Substrate: Sandy soil on sandstone, volcanics, low to medium nutrients

Exposure:

Conservation

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

Gahnia sieberiana**CYPERACEAE****Life history**

Growth form: Tall tussock-forming perennial herb, with stems 100–200 cm high.

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: Relatively narrow, elongated flowerheads (Romanowski 1998).

Fruit/seed: Shiny, red to orange nut 4 mm long, January–September. Recruitment mainly after fire (D. Keith pers. comm.).

Dispersal, establishment & growth: Germination of seed from regurgitated Currawong pellet (J. Dark, Gumnuts 47) germination of *Gahnia* seed after 1–2 weeks soaking in Coca Cola (C. Peters, Gumnuts 47).

Fire response: Resprouts, recondary juvenile period 3 years (D. Keith pers. comm.).

New leaves within one month from burnt bases (Salvation Creek 2.1994 LMcD).

Interaction with other organisms: Foodplant of butterfly larvae *Tisiphone abeona abeona*, *Hesperilla idothea idothea*, *H. ornata ornata* and *Toxidia peron* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST; Qld, Vic., S.A., N.G., N.Cal.

Distribution Sydney area: Widespread.

Select locations: CC: West Head, Centennial Park, Towra Point, Darkes Forest, Barren Grounds NR, Fitzroy Falls, Berry. CT: Ilford, Currant Mountain Gap, Wolgan Gap, Clarence, Mount Tomah, Little Hartley, Katoomba, Wentworth Falls, Blackheath, Jenolan SF, Wombeyan Caves, Robertson, Moss Vale, Bundanoon.

Habitat

Habitat: Creek banks, hillsides.

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

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus sieberi*, *E. radiata*, *E. piperita*, *Corymbia gummifera*, *Eucalyptus obliqua*, *E. cypellocarpa*; cliff vegetation e.g. with *Gleichenia rupestris*, *Dracophyllum secundum*.

Substrate: Clay to sandy soils on shale, sandstone, low to medium nutrients, moist.

Exposure:

Conservation

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

Gahnia subaequiglumis**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with stems 30–60 cm high.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Shiny red nut 4 mm long, February–June.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC ST; Qld, Vic., S.A., N.G., N.Cal.

Distribution Sydney area: Mainly in Upper Blue Mountains.

Select locations: CC: Waterfall (1895). CT: Wolgan Gap, Clarence, Mt Werong, Boyd Crossing, Wombeyan Caves, Moss Vale (1886).

Habitat

Habitat: Swamp margins, open grassy areas.

Altitude: 0–1200 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Woodland e.g. with *Eucalyptus pauciflora*, *E. dalrympleana*, *E. dives*, *E. viminalis*; sedge swamp e.g. with *Leptospermum*, *Empodisma*, *Xyris*.

Substrate: Peaty to sandy soils on sandstone.

Exposure:

Conservation

Conservation: Conservation status unknown, now found mainly in Upper Blue Mountains.

Reported in Kanangra Boyd NP. Recorded from the coast at Waterfall in 1895, 1896, though not reported since.

Gymnoschoenus sphaerocephalus**CYPERACEAE****Life history**

Growth form: Large, tussock-forming perennial herb, with stems about 1 m high.

A different form in the Clarence–Newnes area of Blue Mountains is not recognised as a separate species (Harden 1993).

Vegetative spread: No.

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

Primary juvenile period:

Flowers: October–May.

Fruit/seed: Nut 3 mm long, with shiny pale red-brown inner nut 2 mm long, October–January.

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; Vic., Tas., S.A.

Distribution Sydney area: Widespread.

Select locations: CC: Narrabeen, North Head, Centennial Park, La Perouse, Darkes Forest, Mt Keira. CT: Mt Coricudgy, Newnes Plateau, Katoomba, Carrington Falls, Fitzroy Falls, Robertson.

Habitat

Habitat: Permanent swamps, wet slopes.

Altitude: 0–1100 m **Annual rainfall:** 1000–1800 mm

Typical local abundance: Frequent.

Vegetation: Sedge swamp e.g. with *Lepidosperma limicola*, *Banksia robur*, *Xyris* species, *Gleichenia dicarpa*.

Substrate: Sandy to peaty soil on deep sand, sandstone, low nutrients, permanently wet.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Isolepis cernua (*Scirpus cernuus*)

CYPERACEAE

Nodding Club-rush

Life history

Growth form: Small tufted or clump-forming, rhizomatous perennial herb, with stems to 20 cm high. A variable species including several forms over its world range (Harden 1993).

Vegetative spread: Rhizomatous.

Longevity:

Primary juvenile period:

Flowers: October–January.

Fruit/seed: Yellow-brown to dark grey-brown nut 1 mm long, October–March.

Dispersal, establishment & growth: Coloniser species.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST CWS SWS; Qld, Vic., Tas., S.A., W.A., almost cosmopolitan.

Distribution Sydney area: Mainly coastal.

Select locations: CC: Norah Head, Duck River, La Perouse, Kogarah Bay, Kurnell, Cronulla, Casula, Five Islands, Albion Park, Coomonderry Swamp. CT: Hartley, Abercrombie Caves.

Habitat

Habitat: Moist places, beaches, creekbanks, coastal cliffs.

Altitude: 0–1000 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Foreshores e.g. with *Juncus kraussii*, *Isolepis nodosa*, *Casuarina glauca*; cliff bases e.g. with *Samolus repens*, *Lobelia alata*; riparian vegetation e.g. with *Casuarina cunninghamiana*, *Carex inversa*.

Substrate: Sandy soils on sandstone, beach sand, granite, low–medium nutrients, saline to fresh.

Exposure:

Conservation

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

Isolepis crassiuscula

CYPERACEAE

Life history

Growth form: Aquatic perennial herb, with submerged, creeping stems rooting at nodes or erect and tufted on land.

Vegetative spread: Rhizomatous.

Longevity:

Primary juvenile period:

Flowers: January–February.

Fruit/seed: Shiny, grey-brown nut 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Qld, Vic., Tas., N.G., N.Z., Japan.

Distribution Sydney area: Boyd Plateau, Southern Highlands.

Select locations: CT: Jenolan Caves, Boyd River, Robertson, Penrose.

Habitat

Habitat: Swamps, creeks.

Altitude: 600–1200 m **Annual rainfall:** 1000–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Chorizandra sphaerocephala*, *Lepyrodia anarthria*; creek e.g. with *Leptospermum myrtifolium*, *Sphagnum*.

Substrate: Shallow water or mud, low nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Kanangra Boyd NP.

Isolepis fluitans

CYPERACEAE

Floating Club-Rush

Life history

Growth form: Slender, aquatic or dry-land perennial herb; stems weak, filiform, leafy, submerged or creeping to erect and tufted to 10 cm high on land.

Vegetative spread: Yes.

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Shiny, grey-brown to dark brown nut 1 mm long.

Dispersal, establishment & growth: Germination in glasshouse in summer (Britton & Brock 1994). Coloniser.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST; Qld, Vic., Tas., S.A., W.A., N.Z., Malesia, Asia, Eur., Afr.

Distribution Sydney area: Sporadic.

Select locations: CC: Narrabeen, Kurnell, Cronulla Beach. CT: Berrima (1998).

Habitat

Habitat: Swamps, streams, ephemeral wet places.

Altitude: 0–700 m

Annual rainfall: 900–1400 mm

Typical local abundance: Rare.

Vegetation: Open-forest e.g. with *Angophora costata*, *Eucalyptus robusta*.

Substrate: Sandy clay soil on alluvium, low nutrients, temporarily moist.

Exposure:

Conservation

Conservation: Conservation status unknown.

Isolepis gaudichaudiana

CYPERACEAE

Life history

Growth form: Small tufted annual or possibly perennial herb, with fine stems to 15 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Straw-coloured nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Western Sydney, Orange–Oberon area.

Select locations: CC: Agnes Banks, Nortons Basin, Elderslie. CT: Mt Canobolas, Nashdale, Wattle Flat, Clarence, Blackheath, Luthers Creek, Boyd River.

Habitat

Habitat: Moist situations, creekbanks, seepage areas, swamp margins.

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Swampy heath e.g. with *Melaleuca thymifolia*, *Leptospermum polygalifolium*, *Leptospermum obovatum*; riparian vegetation e.g. with *Leptospermum grandifolium*, *Leptospermum obovatum*, *Hypericum japonicum*; swamps e.g. with *Glyceria australis*, *Stellaria angustifolia*, *Eleocharis gracilis*.

Substrate: Sandy to clayey soils on alluvium, sandstone, sand, granite, low nutrients, moist.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Kanangra Boyd NP.

Isolepis habra

CYPERACEAE

Life history

Growth form: Slender perennial herb with short rhizome, occasionally proliferating; fine stems to 30 cm high.

Vegetative spread: Rhizomatous, mat-forming.

Longevity:

Primary juvenile period:

Flowers: January–March.

Fruit/seed: Straw-coloured to pale red-brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Lower Portland, Cattai, Agnes Banks, Glenbrook, Kowmung River, Cheltenham, Annangrove, Picnic Point, Kurnell, Audley, Bomaderry. CT: Orange, Mt Wilson, Katoomba, Blackheath, Hill Top, Mt Werong, Taralga, Robertson.

Habitat

Habitat: Moist places.

Altitude: 0–1000 m

Annual rainfall: 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*; swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca ericifolia*; swampy heath e.g. with *Lepyrodia scariosa*, *Melaleuca thymifolia*, *Banksia robur*, *Hakea teretifolia*; sedgeland margins e.g. with *Schoenus apogon*, *Carex appressa*, *Juncus usitatus*.

Substrate: Sandy soils on sand, sandstone, clay soils on alluvium, basalt, low–medium nutrients, periodically wet. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Garigal NP, Lane Cove NP, Sydney Harbour NP, Botany Bay NP.

Isolepis hookeriana

CYPERACEAE

Life history

Growth form: Small tufted annual herb, with fine stems usually to 12 cm high.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers:

Fruit/seed: Nut less than 1 mm long, November.

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., Tas., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Richmond, Gladesville, St Marys, Leppington, Kangaroo Valley, Shellharbour. CT: Ben Bullen, Bathurst, Carcoar, Edith, Wombeyan Caves.

Habitat

Habitat: Moist situations, swamps, streambanks.

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

Typical local abundance: Occasional.

Vegetation: Open-forest e.g. with *Eucalyptus viminalis*, *E. dabrympleana*, *E. blakelyi*.

Substrate: Clay loam on shale, alluvium, granite, low to medium nutrients, moist.

Exposure:

Conservation

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

Isolepis inundata* (*Scirpus inundatus*)*CYPERACEAE****Life history**

Growth form: Slender, tufted or shortly rhizomatous perennial herb, stems to 50 cm high.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: October–February.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth: Coloniser.

Fire response: Flowering 28 and 44 weeks after high intensity fire 1994 (Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Lower Portland, Cattai, Agnes Banks, Glenbrook, Kowmung River, Cheltenham, Annangrove, Picnic Point, Kurnell, Audley, Bomaderry. CT: Orange, Mt Wilson, Katoomba, Blackheath, Hill Top, Mt Werong, Taralga, Robertson.

Habitat

Habitat: Moist places.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus pilularis*, *E. saligna*; swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca ericifolia*; swampy heath e.g. with *Lepyrodia scariosa*, *Melaleuca thymifolia*, *Banksia robur*, *Hakea teretifolia*; sedgeland margins e.g. with *Schoenus apogon*, *Carex appressa*, *Juncus usitatus*.

Substrate: Sandy soils on sand, sandstone, clay soils on alluvium, basalt, low–medium nutrients, periodically wet. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Conserved in Western Sydney (James et al. 1999), conservation status elsewhere unknown. Reported in Garigal NP, Lane Cove NP, Sydney Harbour NP, Botany Bay NP.

***Isolepis marginata* ***

CYPERACEAE

Coarse Club-rush

Life history**Growth form:** Small tufted annual herb, with fine stems to 10 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Straw-coloured to dark brown nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa**Botanical subregions:** CC SC CT ST CWS SWS SWP SFWP; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Cooks River (1902), La Perouse (1996). CT: Blackheath (1964).**Habitat****Habitat:** Moist, disturbed situations.**Altitude:** 0–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Few sporadic records within the last 100 years. Potential to invade bush is unknown.***Isolepis nodosa* (*Scirpus nodosus*)**

CYPERACEAE

Knobby Club-rush

Life history**Growth form:** Perennial herb, with stems 15–100 cm high, spread along stout rhizome.**Vegetative spread:** Rhizomatous.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** January–March.**Fruit/seed:** Dark brown to black nut 1 mm long.**Dispersal, establishment & growth:** Coloniser.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., Tas., S.A., W.A., LHI.**Distribution Sydney area:** Coastline and estuaries.**Select locations:** CC: Budgewoi, Tuggerah Lake, Avoca, Berowra Creek, Barrenjoey, Epping, Dee Why Lagoon, Manly, Vaucluse, Centennial Park, Kurnell, Bundeena, Gerringong, Windang, Mt Keira, Shellharbour, Berry.**Habitat****Habitat:** Foreshores, lake margins, headlands.**Altitude:** 0–100 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Saltmarsh e.g. with *Juncus kraussii*; dune scrub e.g. with *Melaleuca quinquenervia*, *Casuarina glauca*; seacliff scrub.**Substrate:** Sand and mud on foreshores, coastal dunes, low–medium nutrients, saline to brackish.**Exposure:****Conservation****Conservation:** Conserved in Western Sydney (James et al. 1999). Reported in Bouddi NP, Brisbane Water NP, Lion Island NR, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.

Isolepis platycarpa

CYPERACEAE

Life history

Growth form: Small tufted annual or short-lived perennial herb, with fine stems to 20 cm high. Closely resembles *I. cernua* (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Dark brown to blackish nut less than 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC ST SWS; Vic., Tas., S.A., W.A., N.I., N.Z.

Distribution Sydney area: Sporadic.

Select locations: CC: Toongabbie, Centennial Park, Gerringong,

Habitat

Habitat: Moist situations, creekbanks, lagoons.

Altitude: 0–50 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Occasional–rare.

Vegetation: Sedgeland e.g. with *Isolepis prolifer*, *Isolepis inundata*, *Melaleuca quinquenervia*.

Substrate: Clay to peaty sandy soil on sand, alluvium, shale, low to medium nutrients, intermittently moist, brackish to fresh.

Exposure:

Conservation

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

Isolepis producta

CYPERACEAE

Life history

Growth form: Aquatic perennial herb, stems submerged and rooting at nodes, occasionally producing small tubers.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–January.

Fruit/seed: Shiny grey-brown nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area:

Select locations: CC: Porters Creek, Putty Creek, Colo River, Cattai, Casula, Glenfield, Mulgoa, Thirlmere, Bomaderry. CT: Lidsdale, Wingecarribee Swamp.

Habitat

Habitat: Lagoons, swamps, streams.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent.

Vegetation: Swamps with open water e.g. with *Eleocharis sphacelata*, *Nymphoides geminata*, *Myriophyllum*, *Glyceria australis*.

Substrate: Mud, mostly inundated but also drying out, low nutrients, permanent moisture.

Exposure:

Conservation

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

***Isolepis prolifera* *** (*Scirpus prolifer*)

CYPERACEAE

Budding Club-rush

Life history

Growth form: Slender, tufted or stoloniferous perennial herb, mostly proliferating, stems to 40 cm high, leaves reduced to sheaths. Superficially similar to *I. inundata* (Harden 1993).

Vegetative spread: Stoloniferous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: October–April.

Fruit/seed: Pale yellow nut 1 mm long, December–May.

Dispersal, establishment & growth:

Fire response: Probably resprouted after high intensity fire 1994 (at Lane Cove), fruiting in 15 months (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: NC CC SC CT; Vic., W.A.

Distribution Sydney area: Widespread, mainly coast. Abundant along Yosemite Creek (alongside Blue Mountains Refuse Tip, J. Hosking pers. comm.).

Select locations: CC: Wyong, Lower Portland, Narrabeen, Curl Curl, Centennial Park (1896), Homebush (1894), Kogarah (1893), Kurnell, Audley, Casula, Dapto, Berry, Kiama, Bomaderry. CT: Robertson.

Habitat

Habitat: Wet places, disturbed sites, riverbank, swamp margins, canals.

Altitude: 0–940 m **Annual rainfall:** 800–1600 mm

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Eleocharis sphacelata*, *Schoenoplectus mucronatus*, *Carex fascicularis*, *Juncus usitatus*, *Juncus articulatus*, *Persicaria* species.

Substrate: Wet muddy or sandy areas, medium nutrients, fresh.

Exposure: Full sun.

Conservation

Conservation: Widely naturalised for over a century.

***Isolepis sepulcralis* *** (*Scirpus chlorostachyus*)

CYPERACEAE

African Club-sedge

Life history

Growth form: Small tufted annual herb, with stems 4–25 cm high.

Vegetative spread:

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers:

Fruit/seed: Dark brown to blackish nut less than 1 mm long, October–April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: NC CC; Vic.

Distribution Sydney area: Widespread in suburban areas.

Select locations: CC: Hornsby (1914), Baulkham Hills, Cheltenham, Northmead, Concord, Centennial Park (1898), La Perouse, Kogarah (1863), Rookwood, Lansdowne Reserve, Nortons Basin, Narellan.

Habitat

Habitat: Moist places, creekbanks, drains.

Altitude: 0–200 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Melaleuca swamp, riparian forest e.g. with *Ceratopetalum apetalum*, *Tristaniopsis laurina*.

Substrate: Sandy to clay soil on alluvium, medium nutrients, permanently moist.

Exposure:

Conservation

Conservation: Naturalised for over a century.

Isolepis stellata* (*Scirpus stellatus*)*CYPERACEAE**

Star Club-rush

Life history

Growth form: Small tufted annual herb, with stems to cm high.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers:

Fruit/seed: Dark brown to black nut less than 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Apparently naturalised in CC, but native to southern Australia (Harden 1993).

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

Distribution Sydney area: Coast.

Select locations: CC: La Perouse, Kurnell.

Habitat

Habitat: Moist sites.

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

Typical local abundance: Rare.

Vegetation: Open areas in *Leptospermum laevigatum* shrubland e.g. with *Centrolepis strigosa*, *Isolepis inundata*.

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

Exposure:

Conservation

Conservation: Apparently naturalised in CC, but native to southern Australia (Harden 1993).

Isolepis subtilissima

CYPERACEAE

Life history**Growth form:** Small perennial herb, with short, fine rhizome; fine stems to 10 cm high.Closely resembles *I. habra* (Harden 1993).**Vegetative spread:** Mat-forming.**Longevity:** Indefinite.**Primary juvenile period:****Flowers:****Fruit/seed:** Pale yellow to pale red-brown nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC NT CT ST; Qld, Vic., Tas., N.Z., Malesia.**Distribution Sydney area:** Mainly at high elevations.**Select locations:** CC: Macquarie Rivulet. CT: Mt Canobolas, Lidsdale, Blackheath, Wentworth Falls, Luthers Creek, Boyd Plateau, Wildes Meadow.**Habitat****Habitat:** Moist places, creekbanks, swamps.**Altitude:** 0–1200 m **Annual rainfall:** 900–1600 mm**Typical local abundance:** Frequent–rare.**Vegetation:** Sedgeland e.g. with *Hydrocotyle peduncularis*, *Hypericum japonicum*, *Deyeuxia gunnifera*, *Isolepis subtilissima*, *Scirpus polystachyus*.**Substrate:** Peaty soils, alluvium, low nutrients, periodically wet.**Exposure:****Conservation****Conservation:** Conservation status unknown, only one record at low elevation at Macquarie Rivulet in 1992. Reported in Kanangra Boyd NP.***Lepidosperma concavum* (*L. squamatum*)**

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with long vertical rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** At any time of year.**Fruit/seed:** Pale to dark brown nut 4 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:** Food plant of butterfly larvae *Motasingha dirphia dilata* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Norah Head, Hornsby, North Head, Rose Bay, Lady Robinsons Beach, Rockdale, Padstow, Kurnell, Loftus, Marley, Darkes Forest, Bargo River, Mt Kembla. CT: Wentworth Falls, Lawson, Hill Top.

Habitat**Habitat:** Ridges.**Altitude:** 0–1000 m**Annual rainfall:** 900–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Heath e.g. with *Leptospermum laevigatum*, mallee eucalypts; open-forest e.g. with *Angophora costata*, *Eucalyptus piperita*, *Corymbia gummifera*; moist forest e.g. with *Ceratopetalum apetalum*.**Substrate:** Sandy soils on sandstone and dune sand, low nutrients, well-drained, sometimes moist sites.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Blue Mountains NP, Royal NP.***Lepidosperma curtisiae*****CYPERACEAE****Life history****Growth form:** Small tufted perennial, with very short rhizome; stems 2–25 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** October.**Fruit/seed:** Grey-green to dark brown nut 3 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** SC NT CT ST; Vic., Tas., S.A.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Blackheath.**Habitat****Habitat:** Cliff edges.**Altitude:** 1000 m**Annual rainfall:** 1400 mm**Typical local abundance:** Rare.**Vegetation:** Cliff heath e.g. with *Allocasuarina nana*, *Banksia ericifolia*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Rare, only known from Blackheath in Sydney area.

Lepidosperma elatius

CYPERACEAE

Life history**Growth form:** Tall tufted perennial herb, with short rhizome; stems 70–180 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–April.**Fruit/seed:** Greyish to red-brown nut 3 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT; Qld, Vic., Tas.**Distribution Sydney area:** Mainly coast.**Select locations:** CC: Wyong, Ourimbah, Cowan, Bayview, Allambie Heights, Lane Cove. CT: Blackheath.**Habitat****Habitat:** Damp areas, creeks.**Altitude:** 0–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus punctata*, *E. piperita*, *Corymbia gummifera*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Mainly coastal, only record for Blue Mountains was Blackheath in 1926.

Conservation status not known. Reported in Ku-ring-gai Chase NP.

Lepidosperma evansianum

CYPERACEAE

Life history**Growth form:** Tufted perennial herb 20–55 cm high, with a short rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January.**Fruit/seed:** Straw-coloured or grey-green nut 4 mm long, January.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Blackheath, Wentworth Falls.**Habitat****Habitat:** Moist cliff faces, rock ledges.**Altitude:** 600–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Rare–frequent.**Vegetation:** Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Empodisma minus*, *Xyris ustulata*, *Grevillea acanthifolia*, *Lepyrodia gracilis*.**Substrate:** Moist sandy soils on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Local endemic restricted to 3 populations at Blackheath and WentworthFalls, listed as Vulnerable (Schedule 2) under NSW *Threatened Species Conservation Act 1995*.

Reported in Blue Mountains National Park but threatened by urban run-off, weed encroachment and track encroachment.

Lepidosperma filiforme (*L. flexuosum*)

CYPERACEAE

Life history**Growth form:** Slender, tufted perennial herb, with very short rhizome; stems 30–100 cm high.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** January–May, peak May.**Fruit/seed:** Grey-green to red-brown nut 4 mm long, July–December.**Dispersal, establishment & growth:** ? Myrmecochore (Rice & Westoby 1981). Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts (D. Keith pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST; Vic., Tas., ?S.A., N.Z.**Distribution Sydney area:****Select locations:** CC: Colo, Cowan, Hornsby, Belrose, Linden, Lane Cove, La Perouse, Heathcote, Loddon River, Barren Grounds, Darkes Forest, Bulli Pass.

CT: Gospers Mountain, Blackheath, Wentworth Falls, Boyd Crossing.

Habitat**Habitat:** Ridges, hillsides, creekbanks.**Altitude:** 0–1100 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath e.g. with *Ptilantheium deustum*, *Schoenus imberbis*, *Caustis flexuosa*, *Allocasuarina nana*, *Eucalyptus stricta*.**Substrate:** Sandy soils on sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Garigal NP, Royal NP, Kanangra Boyd NP.***Lepidosperma forsythii***

CYPERACEAE

Life history**Growth form:** Tufted perennial herb with short rhizome; stems mostly 60–120 cm.**Vegetative spread:** Rhizomatous.**Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** February–August.**Fruit/seed:** Grey-brown nut 5 mm long, May–August.**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; Vic., Tas.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Centennial Park, La Perouse, Kurnell, Audley, Uloola Swamp, Bulli Pass. CT: Wentworth Falls, Bundanoon.**Habitat****Habitat:** Swampy heath.**Altitude:** 0–1000 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Moist heath e.g. with *Banksia robur*, *Hakea teretifolia*, *Sprengelia incarnata*; sedge swamp e.g. with *Gymnoschoenus sphaerocephalus*, *Gleichenia dicarpa*, *Empodisma minus*.**Substrate:** Sandy to clayey soils on sandstone, sand, low nutrients, permanently wet.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Royal NP.

Lepidosperma gunnii

CYPERACEAE

Life history

Growth form: Slender, tufted perennial herb, with short rhizome; stems 15–40 cm high. Similar to *L. laterale* (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–September.

Fruit/seed: Pale brown nut 3 mm long, November–September.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Lane Cove, Strathfield, Bass Hill, Penrith, Glenbrook, Curra Moors. CT: Pantoneys Crown, Mt Blaxland, Penrose.

Habitat

Habitat: Ridges, hillsides.

Altitude: 0–800 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus radiata*, *E. sclerophylla*, *E. agglomerata*, *E. punctata*, *Angophora costata*, *Eucalyptus sieberi*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus albens*, *E. crebra*, *Callitris endlicheri*, *Eucalyptus pulverulenta*.

Substrate: Clay soils on shale, limestone, granite, trachyte, medium nutrients.

Exposure:

Conservation

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

Lepidosperma latens

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with short rhizome; stems 35–60 cm high.

Vegetative spread: Rhizomatous, spreading up to 1 square metre (Herb. note).

Longevity: Indefinite.

Primary juvenile period:

Flowers: September–May.

Fruit/seed: Dark grey to red-brown nut 3 mm long, September–May.

Dispersal, establishment & growth:

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST.

Distribution Sydney area:

Select locations: CC: Morisset, Cowan, Dural, Pennant Hills Park, Lane Cove, O'Hares Creek. CT: Newnes SF, Clarence, Mt Wilson, Mount Tomah, Blackheath.

Habitat

Habitat: Ridgetops.

Altitude: 0–1000 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Eucalyptus stricta*, *Allocasuarina nana*, *Isopogon anethifolius*, *Corymbia gummifera*; open-woodland e.g. with *Eucalyptus sieberi*, *E. punctata*, *E. haemastoma*.

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

Exposure:

Conservation

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

Lepidosperma laterale (*L. lineare*)

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with very short rhizome; stems 30–100 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time of year.

Fruit/seed: Pale to dark brown nut 4 mm long, At any time of year.

Dispersal, establishment & growth: Ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).

Fire response: Resprouts from base (Bantry Bay, LMcD), fruiting one year later after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms: Seed eaten by Crimson Rosella *Platycercus elegans* (Lepschi 1993). Sometimes eaten by rabbits, particularly smaller plants (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong, Cowan, Pearl Beach, Arcadia, Asquith, Springwood, Glenbrook, Lane Cove, Kemps Creek, Bass Hill, Macquarie Fields, Loftus, Campbelltown, Werong Beach, Stanwell Park, Wollongong, Kangaroo Valley, Bombaderry Creek.

CT: Mt Coricudgy, Gaspers Mountain, Glen Davis, Orange, Mt Wilson, Tarana, Mt Blaxland, Blackheath, Wentworth Falls, Abercrombie Caves, Kanangra Walls, Wombeyan Caves, Mittagong, Fitzroy Falls, Penrose,.

Habitat

Habitat: Rocky hillsides, creeks.

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

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *E. pilularis*, *E. punctata*, *Syncarpia glomulifera*, *Angophora costata*; woodland e.g. with *Eucalyptus tereticornis*, *E. fibrosa*, *E. bridgesiana*, *E. melliodora*.

Substrate: Sandy soils on sandstones, granite, sandy clay on shale, basalt, low–medium nutrients, well-drained.

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Royal NP, Morton NP.

Lepidosperma limicola

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with short vertical rhizome; stems 60–150 cm high.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** At any time of year, peak April.**Fruit/seed:** Pale brown to greyish brown nut 3 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 SC NT CT ST; Qld, Vic.**Distribution Sydney area:** Widespread, mainly south of Sydney.**Select locations:** CC: Botany Bay, Sutherland, Darkes Forest, Barren Grounds.

CT: Coricudgy, Newnes SF, Clarence, Mt Wilson, Wentworth Falls, Yerranderrie, Bindook Swamp, Fitzroy Falls, Wingello.

Habitat**Habitat:** Swampy areas, depressions.**Altitude:** 0–1100 m **Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Shrubswamp e.g. with *Leptospermum lanigerum*, *Baeckea linifolia*, *Grevillea acanthifolia*, *Gymnoschoenus sphaerocephalus*.**Substrate:** Sandy soil over sandstone, low nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Royal NP.***Lepidosperma longitudinale***

CYPERACEAE

Life history**Growth form:** Clump-forming perennial herb, with short thick rhizome; stems 60–200 cm high.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:** At any time of year.**Fruit/seed:** Pale to dark brown nut 3 mm long. Viability of fresh seed nil (Vigilante et al. (1998).**Dispersal, establishment & growth:** ? Myrmecochore (Rice & Westoby 1981). Germination after smoke (Greening Australia 1996c).**Fire response:** Resprouts at base or below (Fox 1988, Vigilante et al. (1998).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Wyong, Glenbrook Lagoon, Agnes Banks, Kensington, La Perouse, Moorebank, Thirlmere Lakes, Bargo River. CT: Nattai Creek.**Habitat****Habitat:** Edge of lakes.**Altitude:** 0–600 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Dominant–frequent.**Vegetation:** Sedgeland e.g. with *Lepironia*, *Eleocharis sphacelata*; swamp forest e.g. with *Eucalyptus robusta*, *Melaleuca linariifolia*.**Substrate:** Deep sand, alluvium, permanently wet.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Reported in Royal NP, Thirlmere Lakes NP.

Lepidosperma neesii

CYPERACEAE

Life history

Growth form: Small tufted perennial herb, with long rhizome; stems usually 20–65 cm high.

Vegetative spread:

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

Primary juvenile period:

Flowers: Flowers abundantly only after fire (Keith 1996), November–March, peak January.

Fruit/seed: Whitish to pale red-brown nut 3 mm long.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts, secondary juvenile period 2 years (D. Keith pers. comm.), less than 15 months after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms: Some plants eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Vic.

Distribution Sydney area:

Select locations: CC: Wyee, Hornsby, Terrey Hills, Collaroy, Lindfield, Castlecove, Lane Cove, Centennial Park, Kogarah, Loftus, Picnic Point, Maddens Plains.

CT: Newnes SF, Wentworth Falls, Woodford, Hill Top, Penrose.

Habitat

Habitat: Hillsides.

Altitude: 0–1000 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent.

Vegetation: Heath e.g. with *Allocasuarina nana*, *Lepidosperma viscidum*, *Melaleuca nodosa*, *Allocasuarina distyla*; woodland e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*.

Substrate: Sandy soils on sandstone, low nutrients, moist, poorly-drained.

Exposure:

Conservation

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

Lepidosperma quadrangulatum

CYPERACEAE

Life history

Growth form: Tufted, glaucous perennial herb, with a long rhizome; stems 4-angled, 45–150 cm high.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers:

Fruit/seed: White to yellow-brown nut 3 mm long.

Dispersal, establishment & growth:

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld.

Distribution Sydney area: Coast.

Select locations: CC: Warnervale, Kincumber, Bensville, Woy Woy, Dee Why Lagoon, Maroubra Beach, Waterfall.

Habitat

Habitat: Coastal wet heath or swamp forest.

Altitude: 0–100 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Rare–frequent.

Vegetation: Sedgeland e.g. with *Schoenus brevifolius*, *Lepyrodia scariosa*, *Gymnoschoenus sphaerocephalus*, *Banksia robur*; wetland with *Baumea juncea*, estuarine wetland with *Melaleuca ericifolia*, *Juncus kraussii*, *Schoenus nitens*; swamp with *Eucalyptus robusta*, *Melaleuca linariifolia*.

Substrate: Clay loams and organic sands and peat over sandstone, deep sandy alluvial soil, impeded drainage, low to medium nutrients.

Exposure:

Conservation

Conservation: Restricted to isolated pockets, many of which are likely to disappear within 5 years. Inadequately conserved in the Sydney area. Threatened by urban development changes in watertables, invasion by *Imperata cylindrica* as a result of fire and sedimentation (R. Payne pers. comm. 1997). Not uncommon from Gosford to Port Macquarie (Van Klapake pers. comm.).

Lepidosperma tortuosum

CYPERACEAE

Life history

Growth form: Small tufted perennial herb, with very short rhizome; stems often twisted 10–35 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Grey-green nut 3 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Upper Blue Mountains.

Select locations: CT: Newnes SF, Clarence, Blackheath, Wentworth Falls, Boyd River, Kanangra.

Habitat**Habitat:** Moist slopes.**Altitude:** 800–1100 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Heath e.g. with *Eucalyptus stricta*; woodland e.g. with *Eucalyptus pauciflora*, *E. dives*, *E. sieberi*, *E. mannifera*, *E. radiata*.**Substrate:** Sandy soil on sandstone, granite, low nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown.***Lepidosperma urophorum*****CYPERACEAE****Life history****Growth form:** Tufted perennial herb, with very short rhizome; stems 60–150 cm high.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Pale brown to dark greyish nut 3–4 mm long.**Dispersal, establishment & growth:** Ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Hunter Range, Culoul Range, Gospers Creek, Bilpin, Springwood, Killara, Mulgoa, Douglas Park, O'Hares Creek, Berry, Barrengarry, CT: Blackheath, Moorara Range, Fitzroy Falls.**Habitat****Habitat:** Rocky areas, often near streams, cliff edges.**Altitude:** 0–1200 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus radiata*, *E. balxlandii*, *E. piperita*, *Angophora costata*, *Syncarpia glomulifera*, *Ceratopetalum apetalum*.**Substrate:** Sandy soils on sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Reported in Wollemi NP, Blue Mountains NP, Kanangra Boyd NP.

Lepidosperma viscidum

CYPERACEAE

Life history

Growth form: Clump-forming perennial herb, with short rhizome; stems 35–60 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time of year, peak May.

Fruit/seed: Pale to dark brown nut 3 mm long.

Dispersal, establishment & growth: Adapted for ant-dispersal (Rice & Westoby 1981).

Fire response: Stems killed, resprouts from base.

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Coast and Blue Mountains.

Select locations: CC: Wondabyne, Linden, North Head, Bondi, Botany, Bundeena, Appin.

CT: Gaspers Mountain, Hassans Walls, Clarence, Blackheath, Mt Banks, Katoomba, Wentworth Falls, Kanangra Tops.

Habitat

Habitat: Sandy or rocky ridges.

Altitude: 0–1000 m **Annual rainfall:** 900–1600 mm

Typical local abundance: Frequent.

Vegetation: Heath e.g. with *Allocasuarina nana*, *Banksia ericifolia*, *Caustis recurva*, *Lepidosperma flexuosum*, *Allocasuarina distyla*, *Darwinia fascicularis*; sea cliff scrub.

Substrate: Shallow sandy soil on sandstone, sand dunes, low nutrients.

Exposure:

Conservation

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

Lepironia articulata

CYPERACEAE

Life history

Growth form: Large, rush-like perennial herb, with stout woody rhizome; stems grey-green or glaucous 40–200 cm high.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: October–February.

Fruit/seed: Brown nut 3–6 mm long, February–March.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Aboriginal people reported to have eaten rhizomes (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., Malesia, N. Cal., Madagascar.

Distribution Sydney area: Sporadic.

Select locations: CC: Colo River, Umina, Glenbrook, Thirlmere Lakes, Coomonderry Swamp.

Habitat

Habitat: Lake edges extending into water.

Altitude: 0–200 m **Annual rainfall:** 1000–1400 mm

Typical local abundance: Occasional–frequent (dominant).

Vegetation: Sedgeland e.g. with *Eleocharis sphacelata*, *Melaleuca linariifolia*; swamp e.g. with *Melaleuca quinquenervia*, *Hypolepis muelleri*, *Baumea articulata*.

Substrate: Sandy sediments, low nutrients, permanently moist, up to 1 m deep.

Exposure:

Conservation

Conservation: Conservation status unknown, Thirlmere Lakes is southern geographical limit. Reported in Thirlmere Lakes NP.

Lipocarpa microcephala (*Rikliella australiensis*)

CYPERACEAE

Life history**Growth form:** Slender annual herb, with stems to 35 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** March.**Fruit/seed:** Pale brown nut 1 mm long, April–May.**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:** NC CC NWS CWS SWS NWP SWP NFWP; Qld, Vic., S.A., W.A., Malesia to Japan.**Distribution Sydney area:** Coast.**Select locations:** CC: Mellong Swamp, Richmond, Agnes Banks, Springwood, Linden, Lane Cove, Penrith, Centennial Park, Menangle Park.

Habitat**Habitat:** Damp places, stream banks, seepage areas.**Altitude:** 0–400 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent–rare.**Vegetation:** Moist grassland e.g. with *Fimbristylis dichotoma*, *Eleocharis minuta*, *Cyperus* species.**Substrate:** Sandy soils on sandstone, sandy alluvium, low nutrients, moist.**Exposure:**

Conservation**Conservation:** Conservation status unknown.

Ptilothrix deusta (*Ptilanthelium deustum*)

CYPERACEAE

Life history

Growth form: Slender tufted perennial herb, with rigid, nodeless flowering stems usually to 50 cm high; inflorescence with numerous spikelets clustered within large bracts, with black-brown sheathing bases.

Vegetative spread:

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

Primary juvenile period:

Flowers: Flowers abundantly only after fire (Keith 1996), April–October.

Fruit/seed: Dark brown to blackish nut 5 mm long.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts (e.g. at Agnes Banks, Benson 1981), secondary juvenile period 1 year (D. Keith pers. comm.).

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

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Mellong Swamp, Gosford, Maroota, Londonderry, Glenbrook, Dural, Thornleigh, Newport, Roseville, Waterfall, Douglas Park, Appin, Maddens Plain, Maldon, Thirlmere. CT: Bell, Mt Wilson, Blackheath, Leura, Woodford, Burragorang, Carrington Falls.

Habitat

Habitat: Hillsides, swamp margins.

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

Typical local abundance: Frequent–occasional.

Vegetation: Wet heath e.g. with *Banksia robur*, *Cyathochaeta diandra*; woodland e.g. with *Corymbia gummifera*, *Angophora hispida*, *Banksia ericifolia*; open-woodland e.g. with *Angophora bakeri*, *Eucalyptus sclerophylla*, *Melaleuca decora*.

Substrate: Sandy soil on sandstone, Tertiary alluvium, low nutrients, periodically moist.

Exposure: Full sun.

Conservation

Conservation: Probably adequately conserved Reported in Brisbane Water NP, Castlereagh NR, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Sydney Harbour NP, Royal NP.

Rhynchospora brownii (*R. glauca*)

CYPERACEAE

Life history**Growth form:** Slender tufted perennial herb, with short rhizome; flowering stems 30–90 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** December–February.**Fruit/seed:** December–June.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT; Qld, Vic., N.T., Malesia, Asia, Afr.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Northbridge, Bundeena, Menangle Park.**Habitat****Habitat:** Beside streams, in swamps, along drainage lines, creekflats.**Altitude:** 0–300 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Creekside vegetation e.g. with *Chorizandra cymbaria*, *Schoenus melanostachys*, *Gahnia clarkei*, *Leptospermum polygalifolium*, *Phragmites australis*, *Carex appressa*, *Melaleuca*.**Substrate:** Sandy soils on sandstone, alluvium, low–medium nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown.**Schoenoplectus erectus** * (*Isolepis erectus*)

CYPERACEAE

Soft Club-rush

Life history**Growth form:** Annual tufted herb, with nodeless flowering stems to 30 cm high.**Vegetative spread:** No.**Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** December–January.**Fruit/seed:** Nut 1 mm long, April–May.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Africa.**Botanical subregions:** CC NWP; Qld, Vic.**Distribution Sydney area:** Western Sydney.**Select locations:** CC: Agnes Banks (1993), Moorebank, Menangle Park (1967).**Habitat****Habitat:** Damp, open disturbed situations, lagoons, road gutters.**Altitude:** 0–100 m**Annual rainfall:** 700–900 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Lagoon edge e.g. with *Philydrum lanuginosum*, *Juncus continuous*; *Melaleuca* scrub e.g. with *Melaleuca nodosa*, *Melaleuca decora*, *Melaleuca erubescens*.**Substrate:** Sandy to clayey soil on alluvium, sand.**Exposure:****Conservation****Conservation:** First reported at Menangle Park (1967, 1971, 1973). Large increase in extent at Moorebank (1989–1992) (Herb. record). Likely to spread further e.g. disturbed lagoon at Angles Banks (1993).

***Schoenoplectus lineolatus* ***

CYPERACEAE

Linear Club-rush

Life history**Growth form:** Small perennial herb, with long rhizome; stems to 35 cm high, solitary at distant nodes of rhizome.**Vegetative spread:** Rhizomatous spread up to 1 square metre (Herb. note).**Longevity:** Indefinite.**Primary juvenile period:****Flowers:** January–March.**Fruit/seed:** Dark brown nut 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Japan, Taiwan.**Botanical subregions:** CC NWS; Vic.**Distribution Sydney area:** Manly Dam.**Select locations:** CC: Manly Dam (1988), Nepean River (1899).**Habitat****Habitat:** Swampy areas.**Altitude:** 0–50 m**Annual rainfall:** 800–1200 mm**Typical local abundance:** Rare.**Vegetation:** Sedgeland e.g. with *Eleocharis sphacelata*, *Isolepis inundata*.**Substrate:** Mud, low nutrients, periodically or permanently inundated.**Exposure:****Conservation****Conservation:** Recently recorded at Manly Dam (1988, 1990) the first record for Sydney area since 1899. Potential spread unknown.***Schoenoplectus mucronatus* (*Scirpus mucronatus*)**

CYPERACEAE

Life history**Growth form:** Rhizomatous perennial herb; flowering stems to 50–100 cm high, with reduced leaves.**Vegetative spread:****Longevity:** Perennial.**Primary juvenile period:****Flowers:** December–March.**Fruit/seed:** January–May, seed 2 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC NT NWS; Qld, N.T., W.A., Malesia, Eurasia, Vanuatu.**Distribution Sydney area:** Coast and western Sydney.**Select locations:** CC: Lower Portland, Castlereagh, Shane Park, Macquarie Fields, Glenfield, Centennial Park (1896), Audley.**Habitat****Habitat:** Wetlands, excavated sites.**Altitude:** 0–200 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Wetland e.g. with *Eleocharis sphacelata*, *Myriophyllum latifolium*, *Persicaria hydropiper*, *Juncus usitatus*, *Melaleuca linariifolia*; woodland e.g. with *Eucalyptus parramattensis*, *Melaleuca nodosa*, *Melaleuca decora*.**Substrate:** Wet mud of sandy soil on alluvium, Tertiary alluvium, low nutrients, moist.**Exposure:** Full sun.**Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Status elsewhere unknown.

Schoenoplectus subulatus (*Scirpus litoralis*)

CYPERACEAE

Life history

Growth form: Tall rhizomatous perennial herb, with flowering stems 60–150 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November–March.

Fruit/seed: Grey-brown to dark brown nut, 2 mm long, January–May.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Foodplant of Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons*, seed eaten by Plumed Whistling Duck *Dendrocygna eytoni*, and Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990). Rhizomes reported to be edible after pounding or grinding and baking (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld, N.T., S.A., W.A., Medit. region to Africa & Asia.

Distribution Sydney area: Coastal Sydney.

Select locations: CC: Narrabeen, Manly (1888), Silverwater, Cooks River (1916), Tempe (1894), Kurnell, Towra Point.

Habitat

Habitat: Brackish to freshwater swamps, drains.

Altitude: 0–50 m

Annual rainfall: above 1200 mm

Typical local abundance: Occasional.

Vegetation: Wetland margin, saltmarsh and *Casuarina glauca*.

Substrate: Mud, water table mostly high, sometimes in tidal zone, saline to brackish.

Exposure:

Conservation

Conservation: Rare, conservation status unknown.

Schoenoplectus validus (*Scirpus validus*)

CYPERACEAE

Life history

Growth form: Tall rhizomatous perennial herb, with flowering stems 100–200 cm high, leaves reduced.

Vegetative spread: Rhizomatous.

Longevity: Indefinite.

Primary juvenile period:

Flowers: November–March.

Fruit/seed: Grey-brown to dark-brown nut 2 mm long, January–May.

Dispersal, establishment & growth: Seed weight 0.98 mg, germination 47% within 30 days (Shipley & Parent 1991). Coloniser. Can be grown in wide range of nutrient and organic matter strengths, particularly in high nutrient agricultural wastewaters (Tanner 1994).

Fire response:

Interaction with other organisms: Foodplant of Black Swan *Cygnus atratus*, Pacific Black Duck *Anas superciliosa*, Grey Teal *Anas gibberifrons* and Freckled Duck *Stictonetta naevosa* (Barker & Vestjens 1989,1990). Rhizomes reported to be edible after pounding or grinding and baking (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT ST NWS SWS NWP SWP NFWP SFWP; Qld, Vic., Tas., S.A., W.A., N. Cal.

Distribution Sydney area: Widespread on coast.

Select locations: CC: Bucketty, Richmond, Manly, Toongabbie, Shane Park, St Marys, Cooks River, Kurnell, Kogarah, Woolooware Bay, Lake Illawarra, Berry, Kangaroo Valley, Shoalhaven River. CT: Bowral.

Habitat

Habitat: Creeks, lakes, open swamps.

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

Typical local abundance: Occasional–frequent.

Vegetation: Wetland species e.g. *Pericaria*, *Phragmites australis*, *Casuarina glauca*.

Substrate: In or on edge of shallow water, clay soil on shale, water table permanently high, freshwater to brackish. Recorded on saline sites in western NSW (Semple 1993).

Exposure: Full sun.

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Reported in Botany Bay NP.

Schoenus apogon

CYPERACEAE

Life history

Growth form: Tufted annual herb, with flowering stems 3–25 cm high.

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

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: January–April.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth: No particular morphology for dispersal (McIntyre et al. 1995). Recruitment mainly after fire (D. Keith pers. comm.). Germination outside in autumn, winter, spring in Northern Tablelands (Britton & Brock 1994).

Fire response: Resprouts e.g. at Agnes Banks (Benson 1981), 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 NWS CWS SWS NWP; Qld, Vic., Tas., S.A., N.Z.

Distribution Sydney area: Widespread.

Select locations: CC: Lake Macquarie, Wyong, Gosford, Mt Yengo, Castlereagh SF, Asquith, Cheltenham, Manly, Centennial Park, Lakemba, Kurnell, Menangle Park, Darkes Forest, Foxground. CT: Orange, Mt Jellore, Kangaloon, Bundanoon.

Habitat

Habitat: Seasonally wet habitats.

Altitude: 0–800 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *Eucalyptus sclerophylla*, *E. mannifera*, *E. radiata*; sedgeland e.g. with *Empodisma*, *Leptocarpus tenax*, *Lepidosperma longitudinale*.

Substrate: Sandy soil on sandstone, alluvium, low nutrients, moist. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Conservation status unknown.

Schoenus brevifolius**CYPERACEAE****Life history**

Growth form: Perennial herb, with short stout rhizome; flowering stems 30–90 cm long.

Vegetative spread:

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

Primary juvenile period:

Flowers: Visited by Honeybees for pollen, possibly effecting some pollination (P. Kubiak pers. comm.), October–February.

Fruit/seed: Nut 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.).

Resprouted at Agnes Banks (Benson 1981).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT; Qld, Vic., Tas., W.A., N.Z., N. Cal.

Distribution Sydney area: Mainly coast.

Select locations: CC: Putty, Wyong, Gosford, Cowan, Agnes Banks, Avalon, Centennial Park, Sutherland, Sublime Point, Appin, Thirlmere Lakes, Darkes Forest. CT: Leura, Barren Grounds.

Habitat

Habitat: Swamps, damp heath.

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

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Banksia robur*, *Banksia ericifolia*, *Gahnia sieberiana*; low woodland e.g. with *Eucalyptus parramattensis*, *Angophora bakeri*, *Eucalyptus sieberi*, *E. piperita*.

Substrate: Sandy soils on sandstone, sand, low nutrients, periodically moist, inundated.

Exposure:

Conservation

Conservation: Conservation status unknown.

Schoenus ericetorum

CYPERACEAE

Life history

Growth form: Tufted perennial herb, with flowering stems 15–40 cm long.

Vegetative spread:

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

Primary juvenile period:

Flowers: September–October.

Fruit/seed: Nut 2 mm long.

Dispersal, establishment & growth: Dispersal: no special morphology (Westoby et al. 1990).

Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts (D. Keith pers. comm., Benson 1981, Fox 1988), flowering 10 months after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CT ST NWS CWS NWP; Qld, Vic., Tas., W.A., N.Z., N Cal.

Distribution Sydney area: Coast and Blue Mountains.

Select locations: CC: Putty, Somersby, Hornsby, Agnes Banks, Cheltenham, Lane Cove, Rockdale, La Perouse, Waterfall, Menangle Park, Cataract Dam, Bulli. CT: Currant Mountain Gap, Hassans Walls, Bell, Blackheath, Katoomba, Kanangra Tops, Hill Top, Penrose.

Habitat

Habitat: Ridges, slopes.

Altitude: 0–1000 m

Annual rainfall: 1000–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Allocasuarina distyla*, *Allocasuarina nana*, *Banksia ericifolia*, *Baeckea brevifolia*, *Lepidosmerma*; woodland e.g. with *Eucalyptus haemastoma*, *Eucalyptus sieberi*, *E. sclerophylla*, *Angophora bakeri*, *Eucalyptus radiata*, *E. mannifera*.

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

Exposure:

Conservation

Conservation: Widespread and probably adequately conserved. Reported in Brisbane Water NP, Muogamarra NR, Garigal NP, Dalrymple Hay NR, Lane Cove NP, Barren Grounds NR.

Schoenus evansianus

CYPERACEAE

Life history

Growth form: Small, tufted perennial herb, with short rhizome; flowering stems 4–12 cm long.

Vegetative spread: No.

Longevity:

Primary juvenile period:

Flowers: April.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: SC CT ST.

Distribution Sydney area: Kanangra.

Select locations: CT: Kanangra Walls..

Habitat

Habitat: Seepage areas on sandstone outcrops.

Altitude: 1200 m

Annual rainfall: 1000 mm

Typical local abundance: Frequent.

Vegetation: Rock platform heath e.g. with *Baeckea brevifolia*, *Eucalyptus stricta*; sedgeland e.g. with *Carex appressa*, *Empodisma minus*, *Isolepis crassiuscula*.

Substrate: Shallow sandy soils on sandstone, low nutrients, permanently moist.

Exposure:

Conservation

Conservation: Kanangra Walls is northern geographical limit. Reported in Kanangra Boyd NP.

Schoenus imberbis**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with flowering stems 8–35 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time, peak November–May.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth: No special morphology for dispersal (Westoby et al. 1990).

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), fruiting in 18 months (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT; Vic.

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Kulnura, Woy Woy, Calga, Cowan, Wisemans Ferry, Grose Vale, Springwood, Hornsby, Narrabeen, Centennial Park, Woronora River, Bargo, Burragorang Valley. CT: Mt Darcy, Gaspers Mountain, Glen Davis, Mt Banks, Wentworth Falls.

Habitat

Habitat: Ridges, hillsides.

Altitude: 0–1000 m

Annual rainfall: 600–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Corymbia eximia*, *Corymbia gummifera*, *Eucalyptus piperita*, *Banksia serrata*, *Angophora bakeri*; mallee and scrub e.g. with *Eucalyptus stricta*, *E. burgessiana*, *E. laophylla*.

Substrate: Sandy soil on sandstones, low nutrients, dry.

Exposure:

Conservation

Conservation: Probably adequately conserved. Reported in Blue Mountains NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.

Schoenus lepidosperma* subsp. *pachylepis

CYPERACEAE

Life history**Growth form:** Perennial tufted herb, with very short rhizome; flowering stems 10–60 cm long.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** July–November.**Fruit/seed:** Nut 4–5 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.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Qld, Vic.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Pearl Beach, West Head, Dee Why, Frenchs Forest, Centennial Park (1896), Oatley, Helensburgh. CT: Wentworth Falls.**Habitat****Habitat:** Shaded slopes, ridgetops.**Altitude:** 0–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Heath e.g. with *Eucalyptus stricta*, *Leptospermum trinervium*, *Melaleuca nodosa*, *Darwinia fascicularis*; woodland e.g. with *Corymbia gummifera*, *Eucalyptus obstans*, *Banksia serrata*.**Substrate:** Sandy soil on sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Mainly restricted to coast with the only Tablelands record for Wentworth Falls (1915, 1985). Conservation status unknown. Reported in Brisbane Water NP, Ku-ring-gai Chase NP, Royal NP.***Schoenus maschalinus***

CYPERACEAE

Life history**Growth form:** Small, loosely mat-forming perennial herb; flowering stems 4–20 cm long.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:****Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:** Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts (D. Keith pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Qld, Vic., Tas., S.A., W.A., N.Z., Marianas, Malaysia.**Distribution Sydney area:** Widespread.**Select locations:** CC: Linden, Centennial Park, La Perouse, Kogarah, Marley Lagoon, Thirlmere, Darkes Forest. CT: Blackheath, Wentworth Falls, Mt Werong, Hill Top, Barrengarry Mountain.**Habitat****Habitat:** Damp to swampy places, waterfalls, margins of swamps, cliff faces.**Altitude:** 0–1000 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Swamp e.g. with *Melaleuca quinquenervia*, *Viminaria juncea*, *Phragmites australis*.**Substrate:** Sandy soil on sand, sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Sydney Harbour NP, Royal NP.

Schoenus melanostachys**CYPERACEAE****Life history**

Growth form: Perennial herb, with stems arising from short stout rhizome, often forms large weeping tussocks; flowering stems 30–125 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: September–February.

Fruit/seed: Nut 2 mm long.

Dispersal, establishment & growth: No special morphology for dispersal (Westoby et al. 1990).

Fire response: Resprouted after high intensity fire 1994 (at Lane Cove and Narrabeen), fruiting in 1 year (P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Linden, Hornsby, Cheltenham, Balmoral Beach, Randwick, Kogarah, Waterfall, Helensburgh, Austinmer, Cambewarra, Bomaderry. CT: Lithgow, Mt Wilson, Blackheath, Wentworth Falls, Kangaloon, Carrington Falls, Fizroy Falls, Wingello.

Habitat

Habitat: Wetland, gullies, cliffs, creeks.

Altitude: 0–1000 m

Annual rainfall: 900–1600 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*; cliff edges e.g. with *Epacris crassifolia*, *Allania endlicheri*, *Leptospermum polygalifolium*.

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

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Blue Mountains NP, Marramorra NP, Muogamarra NR, Garigal NP, Dalrymple Hay NR, Lane Cove NP.

Schoenus moorei**CYPERACEAE****Life history**

Growth form: Tufted perennial herb, with flowering stems 7–22 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–November.

Fruit/seed: Nut 1–2 mm long.

Dispersal, establishment & growth:

Fire response: Stems killed, resprouts from base. Fruiting in 1 year after high intensity fire 1994 (at Lane Cove, P. Kubiak pers. comm.).

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

Distribution

Status/origin: Native.

Botanical subregions: CC SC CT ST NWS CWS; ?Vic.

Distribution Sydney area: Coast and Upper Blue Mountains.

Select locations: CC: Cowan, Berowra, West Head, Mona Vale, Frenchs Forest, Northbridge, Centennial Park, Kogarah, Voyagers Point, Minto, Douglas Park. CT: Lithgow, Bell, Mt Wilson, Leura.

Habitat

Habitat: Ridges, plateaus.

Altitude: 0–1000 m

Annual rainfall: 900–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Allocasuarina nana*, *Eucalyptus stricta*, *Angophora hispida*; woodland e.g. with *Eucalyptus parramattensis*, *Melaleuca decora*.

Substrate: Sandy soils on sandstone, Tertiary alluvium, periodically wet.

Exposure:

Conservation

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

Schoenus nitens**CYPERACEAE****Life history**

Growth form: Small perennial herb, with slender creeping rhizome; flowering stems 3–37 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: September–October.

Fruit/seed: Nut 1 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Coastal estuaries.

Select locations: CC: Frenchs Forest, Dee Why, La Perouse, Sandringham, Little Salt Pan Creek, Bass Point.

Habitat

Habitat: Damp areas behind beaches or near brackish soaks further inland.

Altitude: 0–100 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Occasional.

Vegetation: Estuarine sedgeland e.g. with *Juncus kraussii*, *Baumea juncea*, *Melaleuca ericifolia*; rocky areas e.g. with *Apium prostratum*, *Isolepis cernua*, *Isolepis nodosa*; wet heath.

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

Exposure:

Conservation

Conservation: Conservation status unknown.

Schoenus paludosus

CYPERACEAE

Life history**Growth form:** Tufted annual herb, with flowering stems 5–15 cm long.**Vegetative spread:** No.**Longevity:** Less than 1 year. Indefinite (D. Keith pers. comm.).**Primary juvenile period:** Less than 1 year.**Flowers:** March–May.**Fruit/seed:** Nut 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 CT; Qld.**Distribution Sydney area:** Mainly coastal.**Select locations:** CC: Somersby, Mooney Mooney, Bowens Creek, West Head, Cowan, Belrose, Randwick, La Perouse, Kurnell, Loftus, Darkes Forest, Bulli Pass, Mt Ousely, Cataract Dam. CT: Lawson.**Habitat****Habitat:** Damp places.**Altitude:** 0–800 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Empodisma*; wet heath e.g. with *Banksia oblongifolia*, *Banksia ericifolia*; woodland e.g. with *Eucalyptus sieberi*, *E. piperita*.**Substrate:** Sandy soils on sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Mainly coast and with one old record (Lawson 1905) in the Blue Mountains.

Conservation status unknown. Reported in Brisbane Water NP, Muogamarra NR, Garigal NP, Sydney Harbour NP, Royal NP.

Schoenus turbinatus

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with erect, rigid flowering stems 14–40 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January–February.**Fruit/seed:** Nut 1–2 mm long.**Dispersal, establishment & growth:** Possibly ant-dispersed (Rice & Westoby 1981)**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT; Vic., Tas.**Distribution Sydney area:****Select locations:** CC: Cheltenham, La Perouse, Springwood, Appin, Mt Ousley. CT: Newnes Junction, Hartley, Mt Wilson, Blackheath, Leura, Lawson, Mt Werong, Robertson.**Habitat****Habitat:** Rocky ridges.**Altitude:** 0–1000 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath and scrub e.g. with *Eucalyptus stricta*, *Banksia ericifolia*; woodland e.g. with *Eucalyptus sparsifolia*, *Corymbia gummifera*.**Substrate:** Sandy soils on sandstone, low nutrients, well-drained.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Blue Mountains NP.

Schoenus villosus

CYPERACEAE

Life history**Growth form:** Tufted perennial herb, with erect flowering stems 15–40 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** January–August.**Fruit/seed:** Nut 1 mm long.**Dispersal, establishment & growth:****Fire response:** Stems killed, resprouts from base; conspicuous after fire. Flowers mature 15 months after high intensity fire 1/1994 (at Lane Cove, P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC CT ST; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Howes Valley, Kariong, East Kurrajong, Springwood, Hornsby, Darkes Forest. CT: Mt Darcy, Newnes Junction, Clarence, Mt Wilson, Blackheath, Lawson, Hill Top, Robertson.**Habitat****Habitat:** Moist sites, margins of swamps.**Altitude:** 0–1000 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath e.g. with *Angophora hispida*, *Banksia oblongifolia*, *Ptilothrix deusta*, *Schoenus imberbis*; woodland e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *Eucalyptus mannifera*, *E. radiata*.**Substrate:** Sandy soils on sandstone, low nutrients, damp sites.**Exposure:****Conservation****Conservation:** Reported in Brisbane Water NP, Royal NP.***Scirpus polystachyus***

CYPERACEAE

Life history**Growth form:** Robust, tufted perennial herb, with short, stout rhizome; stems 50–200 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:****Fruit/seed:** Pale yellow-brown nut 1 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC SC NT CT ST; Qld, Vic.**Distribution Sydney area:** Oberon area.**Select locations:** CT: Running Stream, Oberon, Edith, Jenolan Caves, Boyd Plateau.**Habitat****Habitat:** Creeks, swampy areas.**Altitude:** 1000–1300 m **Annual rainfall:** 900–1100 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Sedgeland e.g. with *Restio australis*, *Empodisma minus*; riparian vegetation e.g. with *Leptospermum*, *Carex appressa*, *Blechnum*.**Substrate:** Alluvial soil, low to medium nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Kanangra Boyd NP.

Scleria mackaviensis

CYPERACEAE

Life history

Growth form: Slender perennial herb, with very short rhizome; flowering stems scabrous, 5–30 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: February–April.

Fruit/seed: Nut, February–April.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT NWS CWS; Qld, N.Cal.

Distribution Sydney area: Mainly Western Sydney and Illawarra.

Select locations: CC: Mt Druitt, Casula, Werong Beach, Mount Annan, Razorback, Albion Park, Thirlmere, Coaldale, Coolangatta Mountain. CT: Goodmans Ford.

Habitat

Habitat: Rocky slopes, outcrops.

Altitude: 0–600 m **Annual rainfall:** 700–1400 mm

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*, *E. crebra*, *Bursaria spinosa*, *Themeda australis*, *Allocasuarina verticillata*; margins of dry rainforest e.g. with *Guioa semiglauca*, *Streblus brunonianus*, *Aphanopetalum resinosum*.

Substrate: Clay soils on shale, latite, medium nutrients, dry, well-drained.

Exposure:

Conservation

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

Tetraria capillaris

CYPERACEAE

Life history

Growth form: Loosely tufted perennial herb, with slender rhizome; flowering stems 18–60 cm long.

Vegetative spread:

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

Primary juvenile period:

Flowers: October.

Fruit/seed: Nut 2 mm long, October.

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; Qld, Vic., Tas., S.A., W.A., N.Z.

Distribution Sydney area: Widespread.

Select locations: CC: Bilpin, Windsor, Galston, Bayview, Duffys Forest, Lane Cove, Blaxland, Darkes Forest, Mt Keira, Jamberoo, Barrengarry Mountain. CT: Blackheath.

Habitat

Habitat: Ridges, creeks.

Altitude: 0–1000 m **Annual rainfall:** 800–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Corymbia eximia*, *Angophora costata*, *Eucalyptus sparsifolia*, *Banksia ericifolia*; heath e.g. with *Banksia robur*.

Substrate: Sandy to clay soils on sandstone, or with shale influence, low nutrients, periodically impeded drainage.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Tricostularia pauciflora

CYPERACEAE

Life history**Growth form:** Small tufted perennial herb, with flowering stems 10–45 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** September–November.**Fruit/seed:** Nut 2 mm long, November–December.**Dispersal, establishment & growth:** Ant-adapted food body for dispersal (Westoby et al. 1990).**Fire response:** 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; Vic., Tas., S.A.**Distribution Sydney area:****Select locations:** CC: Hornsby, Frenchs Forest, Manly, Woodford, La Perouse, Cronulla, Otford, Mt Keira. CT: Kanangra Walls.**Habitat****Habitat:** Ridgetops.**Altitude:** 0–1000 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Heath e.g. with *Leptospermum polygalifolium*, *Petrophile pulchella*, *Allocasuarina distyla*, *Caustis flexuosa*, *Corymbia gummifera*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Ku-ring-gai Chase NP, Garigal NP, Royal NP, Kanangra Boyd NP.***Uncinia tenella***

CYPERACEAE

Life history**Growth form:** Small densely-tufted perennial herb, with very slender rhizome; stems to 15 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–December.**Fruit/seed:** Yellow-brown to grey-brown nut 3 mm long.**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, Katoomba, Lawson.**Habitat****Habitat:** Creek beds, moist cliffs.**Altitude:** 700–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Rainforest e.g. with *Ceratopetalum apetalum*, *Elaeocarpus holopetalus*, *Dicksonia antarctica*.**Substrate:** Sandy soil on sandstone, alluvium, low to medium nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Rare, restricted to Upper Blue Mountains. Conservation status unknown.

Dioscorea transversa**DIOSCOREACEAE****Life history**

Growth form: Climber, with annual twining stems 2–4 m long and cylindrical, pale-coloured, tuber or 'yam' usually less than 10 mm diam.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Male and female flowers on different plants, greenish, September.

Fruit/seed: Papery, 3-lobed capsule 20–30 mm long, with flat, winged seeds 5 mm long, October.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Tuber or 'yam', may be eaten raw but usually roasted or boiled, popular food amongst Aboriginal people (Wightman & Andrews 1991).

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT; Qld, N.T.

Distribution Sydney area: Coast.

Select locations: CC: Cooranbong, Morisset, Mandalong, Ourimbah Creek, Gosford, Bayview, Manly, Stanwell Park.

Habitat

Habitat: Creekbanks.

Altitude: 0–200 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Occasional.

Vegetation: Gallery rainforest; moist forest e.g. with *Eucalyptus saligna*, *E. paniculata*, *Angophora floribunda*.

Substrate: Sandy to clay soils on alluvium, shale, sandstone, medium nutrients.

Exposure:

Conservation

Conservation: Regionally rare in Illawarra region (Mills 1988), conservation status elsewhere unknown. Stanwell Tops is southern geographical limit.

Doryanthes excelsa**DORYANTHACEAE****Life history**

Growth form: Giant rosette plant with numerous basal, sword-shaped leaves.

Vegetative spread: Possible subterranean branching following fire (Denham & Auld 2002), shoots from base forming 3–4 rosettes in the bush or often about 10 in cultivation, with a few flowering each year (P. Vaughan, Gumnuts 44, 2002).

Longevity: 5–10 years in cultivation (Rymer 1983, Elliot & Jones 1984), much long in the wild (A. Denham pers. comm.).

Primary juvenile period: 7 years (P. Vaughan, Gumnuts 44, 2002).

Flowers: Red, June–December.

Fruit/seed: Red-brown capsule 7–10 cm long, taking more than 12 months to mature (Nash 1996), mature March–June, with disc-like seeds, 15 mm diam., 2 mm thick, approx. weight 43 mg (Denham & Auld 2002).

Dispersal, establishment & growth: No special dispersal morphology (Westoby et al. 1990), wind-dispersed to 7 m, no dormancy; following fire (in Royal NP 1994) germination began after 2.5 years (Denham & Auld 2002), survival of seedlings after 5.5 years is more than 50% (A. Denham pers. comm.).

Fire response: Resprouts, with plants taking 19 months to flower from apical buds protected in underground leaf bases (after fire 1994 in Royal NP); fire appears to stimulate a single post-fire flowering event, following which individuals undergo subterranean branching, also flowers sporadically in absence of fire (Denham & Auld 2002).

Interaction with other organisms: Post dispersal seed predation probably by Swamp Wallaby *Wallabia bicolor* and Rusa Deer as well as *Rattus fuscipes* and invertebrates (Denham & Auld 2002).

Distribution

Status/origin: Native.

Botanical subregions: NC CC.

Distribution Sydney area: Somersby, Georges River to Bulli.

Select locations: CC: Somersby, Calga, Canoelands, Kentlyn, Audley, Woronora River, Menai, Maddens Plains, Darkes Forest, Bulli Pass.

Habitat

Habitat: Hillsides, plateaus.

Altitude: 0–200 m **Annual rainfall:** 900–1400 mm

Typical local abundance: Frequent.

Vegetation: Eucalyptus open-forest, woodland e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. sieberi*, *Corymbia gummifera*.

Substrate: Sandy, clayey soils derived from sandstone, often with ironstone influence, low nutrients.

Exposure:

Conservation

Conservation: Bulli is southern geographical limit. Reported in Brisbane Water NP, Royal NP.

Eriocaulon scariosum**ERIOCAULACEAE****Life history**

Growth form: Small tufted herb.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November, peak December.

Fruit/seed: Capsule.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Agnes Banks, Yarramundi, Balgowlah, Watsons Bay, Centennial Park, Coogee, Canterbury (1893), Kogarah (1893), La Perouse, Loftus, Thirlmere. CT: Currant Mountain Gap, Running Stream, Ben Bullen, Wingello.

Habitat

Habitat: Bogs, drainage areas, running water.

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

Typical local abundance: Frequent–occasional.

Vegetation: Heath e.g. with *Banksia ericifolia*, *Hakea teretifolia*; swamp woodland e.g. with *Eucalyptus parramattensis*, *Melaleuca decora*; soaks e.g. with *Gonocarpus*, *Lobelia alata*, *Xyris*, *Utricularia*.

Substrate: Sandy soil on sandstone, alluvium, low nutrients, permanently moist.

Exposure:

Conservation

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

Flagellaria indica**FLAGELLARIACEAE****Life history**

Growth form: Perennial climber with robust, bamboo-like stems to 15 m high and 10 mm diam. and numerous thick, fleshy roots.

Vegetative spread: Often forms dense thickets.

Longevity:

Primary juvenile period:

Flowers: Numerous fragrant white flowers, spring–autumn.

Fruit/seed: Fleshy greenish-red fruit 5 mm diam., usually with 1 seed, October.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Host to butterfly Larger Darter *Telicota anisodesma* (Jones & Gray 1988). An important plant for ceremonial purposes amongst Aboriginal people, used for armbands, rope, fibre for baskets, fruit eaten when it turns pink, also used for medicinal purposes (Wightman & Andrews 1991), stems can be tapped for water (Cribb & Cribb 1984).

Distribution

Status/origin: Native.

Botanical subregions: NC CC; LHI, Qld, N.T., W.A., Pac.Is., Asia, E Afr.

Distribution Sydney area: Coast.

Select locations: CC: Point Clare, Bola Creek.

Habitat

Habitat: Creekbanks.

Altitude: 0–200 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Rare.

Vegetation: Gully rainforest, moist eucalypt forest e.g. with *Eucalyptus pilularis*.

Substrate: Sandy clay on alluvium, shales, medium nutrients.

Exposure:

Conservation

Conservation: Rare, Royal NP is southern geographical limit. Conservation status unknown.

Haemodorum corymbosum**HAEMODORACEAE****Life history**

Growth form: Herb to 70 cm high, with terete leaves; bulbous rootstock with orange-red pigment.

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: Brown or black in terminal clusters. Flowers abundantly only after fire (Keith 1996), October–January, peak December.

Fruit/seed: 3-lobed capsule 7–12 mm long, with flat, winged seeds, December–April.

Dispersal, establishment & growth: Wind-dispersed (Westoby et al. 1990). Recruitment mainly after fire (D. Keith pers. comm.).

Fire response: Resprouts, secondary juvenile period 2 years (D. Keith pers. comm.).

Interaction with other organisms: Leaves on some plants eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

Botanical subregions: CC SC ST.

Distribution Sydney area: Coast.

Select locations: CC: Agnes Banks, Narrabeen, Beacon Hill, Manly, Maroubra, Waterfall, Darkes Forest, Barrengarry.

Habitat

Habitat: Swampy areas, sandstone plateaus, hillsides.

Altitude: 0–200 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Angophora costata*, *Eucalyptus piperita*, *E. sclerophylla*, *Banksia serrata*; heath e.g. with *Angophora hispida*, *Allocasuarina distyla*.

Substrate: Dry and swampy sandy soil on sandstone, dune sand, low nutrients, moist.

Exposure:

Conservation

Conservation: Restricted to coastal Sydney with inland population at Agnes Banks near Richmond. Conservation status unknown. Reported in Royal NP.

Haemodorum planifolium**HAEMODORACEAE****Life history**

Growth form: Herb to 1.3 m high, with flat leaves; bulbous rootstock with orange-red pigment.

Vegetative spread:

Longevity: Indefinite.

Primary juvenile period:

Flowers: Blackish, in terminal clusters. Flowers abundantly only after fire (Keith 1996).

Fruit/seed: 3-lobed capsule 5–11 mm long, with flat, winged seeds.

Dispersal, establishment & growth:

Fire response: Stems killed, resprouts at base or below (Fox 1988 and others), shedding seeds 1 year after high intensity fire 1/1994 (at Lane Cove and Narrabeen, P. Kubiak pers. comm.).

Interaction with other organisms: Leaves on some plants eaten by rabbits (P. Kubiak pers. comm.).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Toronto, Charmhaven, Bilpin, Agnes Banks, Shane Park, Glenbrook Lagoon, Commodore Heights, Asquith, Tumbledown Dick, Bondi, La Perouse, Thirlmere, Bargo, Hill Top. CT: Newnes SF, Bell, Mt Hay, Blackheath, Katoomba, Barren Grounds.

Habitat**Habitat:** Ridges, hillsides.**Altitude:** 0–1200 m**Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Corymbia gummifera*, *Eucalyptus sieberi*, *E. piperita*, *E. sclerophylla*, *Angophora costata*; open-forest e.g. with *Eucalyptus pilularis*, *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus paniculata*, with grassy understorey; seacliff-top scrub.**Substrate:** Sandy soil on sandstone, sometimes lateritic or shaley, granite, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Ku-ring-gai Chase NP, Royal NP, Georges River NR.***Muscari armeniacum* *****HYACINTHACEAE**

Common Grape Hyacinth

Life history**Growth form:** Erect perennial herb to 45 cm high, with bulb 15–30 mm diam. and fibrous roots.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Scented, dark blue, with paler or white lobes, September–October.**Fruit/seed:** Capsule 7–9 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to SE Europe, Asia Minor; introduced as ornamental.**Botanical subregions:** CT ST; Vic., S.A.**Distribution Sydney area:** Tablelands.**Select locations:** CT: Carcoar Cemetery (1998), Mittagong (1984), Lidsdale (1977).**Habitat****Habitat:** Old gardens, cemeteries, roadside.**Altitude:** 900–1000 m**Annual rainfall:** 900–1000 mm**Typical local abundance:** Occasional.**Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Not truly naturalised. Commonly cultivated as ornamental in cooler regions, with record for roadside at Lidsdale.

Egeria densa* **HYDROCHARITACEAE**

Dense Waterweed

Life history

Growth form: Attached submerged aquatic perennial, stems to 1.5 m long, rooting at lower nodes, with most growth near the surface of stationary or slowly flowing water.

Vegetative spread: Thick mat of intertwining stems produced below surface (Parsons & Cuthbertson 1992).

Longevity: Indefinite.

Primary juvenile period:

Flowers: White, only male flowers recorded in NSW, during warmer months.

Fruit/seed: Reproduction in Australia is vegetative only (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Sole means of dispersal in Australia is by stem fragments; growth commences in spring as water temperature rises above 15°C, with rapid growth continuing until February–March (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America. Introduced to Australia through aquarium trade (Parsons & Cuthbertson 1992).

Botanical subregions: NC CC SC SWS SWP; Qld, Vic., Tas., N.T., W.A.

Distribution Sydney area: Coast.

Select locations: CC: Lane Cove, North Rocks (1950), Pendle Hill, Liverpool, Audley, Dapto, Shoalhaven Heads.

Habitat

Habitat: Wetlands, creeks, dams.

Altitude: 0–200 m **Annual rainfall:** 800–1400 mm

Typical local abundance: Frequent.

Vegetation: e.g. with other aquatics, *Potamogeton*, *Vallisneria*, *Alternanthera*.

Substrate: In stationary or flowing fresh water especially where substrate has been disturbed. Mild to warm water at all depths to 7 m (Parsons & Cuthbertson 1992).

Exposure:

Conservation

Conservation:

Elodea canadensis* **HYDROCHARITACEAE**

Elodea, Canadian Pondweed

Life history

Growth form: Submerged aquatic perennial herb; stems to 3 m long, with long thread-like, often reddish roots at lower nodes.

Vegetative spread: Horizontal stolons extend the vegetative mat (Parsons & Cuthbertson 1992).

Longevity: Indefinite.

Primary juvenile period:

Flowers: Male flowers November–February (Parsons & Cuthbertson 1992). Female flowers not recorded in Australia (Bowmer et al. 1995).

Fruit/seed: Not produced in Australia (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Diaspore: vegetative dispersal only, stem fragments break readily at nodes with mechanical disturbance or wave action; growth is limited by temperature, new growth in September or October as water temperatures rise above 15°C, with vigorous growth in summer if temperature remains above 25°C, declines in March (Parsons & Cuthbertson 1992). Vigorous coloniser in disturbed areas.

Fire response:

Interaction with other organisms: Potential biological control agents *Hydrilla* leaf-mining fly and stem boring weevil (Bowmer et al. 1995), European carp aids weed spread by fragmentation (Parsons & Cuthbertson 1992).

Distribution

Status/origin: Exotic, native to N America. Introduced as aquarium ornamental.

Botanical subregions: NC CC ST CWS SWS SWP; Qld, Vic., Tas., W.A.

Distribution Sydney area: Coastal river systems.

Select locations: CC: Centennial Park (1973), Yarramundi Lagoon (1994), Warragamba Dam, Wallacia, Nepean River (1994), Shoalhaven River (1988).

Habitat

Habitat: Lagoons, dams.

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

Typical local abundance: Occasional.

Vegetation: e.g. with *Potamogeton*, *Vallisneria*.

Substrate: Deep, cold, flowing or stationary water, fresh, up to 10 m deep.

Exposure: Relatively light-demanding; growth may continue under cover of ice (Bowmer et al. 1995).

Conservation

Conservation: Probably initially introduced through discarded aquaria contents, dispersal is mostly by stem fragments floating downstream, though it is confined to cold water. Aggressive aquatic weed that blocks irrigation and drainage channels, difficult to control with herbicide (Bowmer et al. 1995).

Halophila decipiens**HYDROCHARITACEAE**

Seawrack

Life history

Growth form: Submerged marine perennial herb, with one root at each node of rhizome.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Rarely flowers but more likely during warmer months (Harden 1993).

Fruit/seed: Fruit 2 mm long.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC; Qld, Pac., Indian & Atlantic Oceans.

Distribution Sydney area: Coastal estuaries.

Select locations: CC: Sydney Harbour, Botany Bay, Port Hacking.

Habitat

Habitat: Estuarine or protected marine habitats 2–18 m deep.

Altitude: 2–18 m below sealevel. **Annual rainfall:** —

Typical local abundance:

Vegetation:

Substrate: Usually on sand, not exposed at low tide.

Exposure:

Conservation

Conservation: Conservation status unknown.

Halophila ovalis**HYDROCHARITACEAE**

Seawrack

Life history

Growth form: Submerged marine aquatic, perennial herb; rhizomes to 3 mm diam. and 1 or 2 roots at each node.

Vegetative spread: Creeping rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Rarely flowers but more likely during warmer months (Harden 1993).

Fruit/seed: Berry-like 5–10 mm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; LHI, Qld, Vic., Tas., N.T., S.A., W.A., Pac. & Indian Oceans.

Distribution Sydney area: Estuaries and coastal lakes.

Select locations: CC: Lake Macquarie, Brisbane Water, Wagstaff, Pittwater, Clontarf, Balmoral, Watsons Bay, Parsley Bay, Kogarah Bay, Towra, Quibray Bay, Port Hacking.

Habitat

Habitat: Estuarine or protected marine habitats to 5 m deep, lake margins.

Altitude: 0–5 m below sea level. **Annual rainfall:** —

Typical local abundance: Occasional.

Vegetation: Seagrass meadows e.g. with *Posidonia* and *Zostera*.

Substrate: Sand or mud, rarely exposed at low tide.

Exposure:

Conservation

Conservation: Conservation status unknown.

Hydrilla verticillata**HYDROCHARITACEAE**

Hydrilla, Water Thyme

Life history

Growth form: Attached, branched submerged aquatic perennial herb with stems to 2 m long and axillary turions and tubers. Does not develop aerial leaves (Cook & Lüönd 1982).

Vegetative spread: Stoloniferous.

Longevity:

Primary juvenile period:

Flowers: Funnel-like, close to the surface of the water, with lower part underwater while open to the air above, pollinated by aerial transport of pollen (Cook & Lüönd 1982).

Fruit/seed: Fruit 7 mm long, with 2–6 seeds 2–3 mm long. Produces seed from monoecious plants but reproduces mainly from vegetative propagules (Spencer et al. 1994).

Dispersal, establishment & growth: Growth rarely limited by water quality; vegetative dispersal by detached stem fragments that readily form new plants and attach to substrate (Cook & Lüönd 1982).

Fire response:

Interaction with other organisms: Foodplant of Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990).

Distribution

Status/origin: Native.

Botanical subregions: NC CC NWS CWS SWS SWP SFWP; Qld, Vic., N.T., S.A., W.A., Asia, Afr.

Distribution Sydney area: Hawkesbury-Nepean River, coastal swamps.

Select locations: CC: Upper Colo, Wisemans Ferry, Richmond, Centennial Park, East Lakes, Macquarie Fields, Chipping Norton, Bents Basin.

Habitat**Habitat:** Rivers, lakes.**Altitude:** 0–100 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** e.g. with *Najas*, *Potamogeton*.**Substrate:** Freshwater, still to flowing, 30–100 cm deep. Rarely in swiftly-flowing water; found in acidic oligotrophic to eutrophic water, tolerates strongly alkaline and brackish water (Cook & Lüönd 1982).**Exposure:** Avoids shady habitats (Cook & Lüönd 1982).**Conservation****Conservation:*****Ottelia ovalifolia*****HYDROCHARITACEAE**

Swamp Lily

Life history**Growth form:** Tufted aquatic perennial or annual with submerged and floating leaves.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or coloured, November–January.**Fruit/seed:** Indehiscent, 25–40 mm long, enclosed in a bladder-like sac, with numerous seeds, withdraws into the water as it matures (Harden 1993).**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS NWP SWP NFWP; Qld, Vic., N.T., S.A., W.A.**Distribution Sydney area:** Coast.**Select locations:** CC: Tuggerah, Pitt Town, Luddenham, Springwood, Faulconbridge, Lane Cove River, Penrith, Cabramatta, Mount Annan. CT: Berrima.**Habitat****Habitat:** Waterholes, creeks, dams in stationary or moving water to 1 m deep.**Altitude:** 0–500 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent.**Vegetation:** e.g. with *Juncus usitatus*, *Elatine gratioloides*.**Substrate:** Clay soils on alluvium, shale, medium nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Hypoxis hygrometrica* var. *hygrometrica

HYPOXIDACEAE

Golden Weather-grass

Life history**Growth form:** Perennial herb with a cylindrical corm 12–40 mm long and fleshy to fibrous roots;**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Yellow, October–January.**Fruit/seed:** Capsule 2–5 mm long, with dark brown to black seeds 2 mm wide.**Dispersal, establishment & growth:** No particular mechanism for dispersal (McIntyre et al. 1995). Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Resprouts, secondary juvenile period 1 year (D. Keith pers. comm.).**Interaction with other organisms:** Rhizomes eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS; Vic., Tas., S.A.**Distribution Sydney area:** Coast and Western Blue Mountains.**Select locations:** CC: Ryde, Darkes Forest, Bulli. CT: Jenolan Caves, Oberon, Katoomba.**Habitat****Habitat:** Moist sites, hanging swamp.**Altitude:** 0–1000 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Moist sedgeland, open-woodland e.g. with *Eucalyptus sclerophylla*.**Substrate:** Sandy loam on sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Conserved status unknown. Reported in Kanangra Boyd NP.***Hypoxis hygrometrica* var. *villosisepala***

HYPOXIDACEAE

Life history**Growth form:** Perennial herb, with corm 12–40 mm long; roots fleshy-fibrous, more or less tuberous.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Bright yellow, sporadic, August–January.**Fruit/seed:** Capsule 2–5 mm long, with dark brown to black seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS SWS; Qld, Vic.**Distribution Sydney area:** Mainly Western Sydney.**Select locations:** CC: Pitt Town, Tempe, Lansdowne, Mount Annan, Mt Kembla.

CT: Ganguddy Creek.

Habitat**Habitat:** Moist sites.**Altitude:** 0–800 m **Annual rainfall:** 700–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Woodland e.g. with *Eucalyptus moluccana*, *E. crebra*, *E. fibrosa*.**Substrate:** Sandy clay on shale, alluvium, medium nutrients, moist.**Exposure:****Conservation****Conservation:** Conservation status unknown.

Hypoxis pratensis* var. *pratensis

HYPOXIDACEAE

Golden Weather-grass

Life history

Growth form: Perennial herb, with corm less than 15 mm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, November–March.**Fruit/seed:** Capsule 3–7 mm long, with dark brown to black seeds 1 mm diam., February–April.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution

Status/origin: Native.**Botanical subregions:** NC CC SC CT CWS; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Richmond, Hornsby, Emerton, Rooty Hill, Stanwell Park, Kangaroo Valley, Berry. CT: Glanmire.

Habitat

Habitat: Moist sites, grassy hillsides.**Altitude:** 0–800 m**Annual rainfall:** 800–1600 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus longifolia*, *E. fibrosa*, *Melaleuca decora*.**Substrate:** Clay soils on shale, alluvium, volcanic necks, medium nutrients, moist.**Exposure:**

Conservation

Conservation: Conservation status unknown.***Hypoxis pratensis* var. *tuberculata***

HYPOXIDACEAE

Life history

Growth form: Perennial herb, with corm less than 15 mm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, summer to autumn.**Fruit/seed:** Capsule 3–7 mm long, with dark brown to black seeds 1 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution

Status/origin: Native.**Botanical subregions:** CC; Qld, Vic.**Distribution Sydney area:** Western Sydney.**Select locations:** CC: Richmond (1905), Picton (1998).

Habitat

Habitat: Moist sites, near creeks.**Altitude:** 0–300 m**Annual rainfall:** 800 mm**Typical local abundance:** Rare.**Vegetation:** Woodland e.g. with *Eucalyptus crebra*, *E. eugenioides*, *E. baueriana*.**Substrate:** Clay soils on shale, medium nutrients.**Exposure:**

Conservation

Conservation: Rare, only one recent NSW record from Picton in 1998. Otherwise only known from Richmond (1905).

Hypoxis vaginata* var. *brevistigmata**HYPOXIDACEAE****Life history****Growth form:** Perennial herb, with corm less than 12 mm long**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, spring.**Fruit/seed:** Capsule 8–14 mm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CT SWS; Vic., Tas.**Distribution Sydney area:** Abercrombie Caves.**Select locations:** CT: Abercrombie Caves (1951).**Habitat****Habitat:** Damp sites.**Altitude:** 600–800 m**Annual rainfall:** 800 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Rare, only Sydney area record and northern geographical limit is Abercrombie Caves, collected in 1951.***Aristea ecklonii* *****IRIDACEAE****Life history****Growth form:** Herb to 70 cm high, with woody rhizome; leaf bases usually red.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Bright blue and green, opening for a few hours only, September–November.**Fruit/seed:** Capsule 20 mm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:** Resprouted after high intensity fire 1/1994 (at Narrabeen), fruiting in 11 months (P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S and tropical W Africa.**Botanical subregions:** CC.**Distribution Sydney area:** Northern Sydney.**Select locations:** CC: McCarrs Creek (1990), Deep Creek (1992).**Habitat****Habitat:** Disturbed woodland, roadside.**Altitude:** 0–200 m**Annual rainfall:** 1100–1200 mm**Typical local abundance:** Frequent.**Vegetation:** Woodland e.g. with *Eucalyptus gummifera*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Recently reported (1990–92) spreading locally on roadsides and near creeks in northern Sydney. Probably spread from dumped garden waste. Potential for spread unknown.

***Babiana stricta* ***

IRIDACEAE

Life history**Growth form:** Perennial herb 12–40 cm high, with corms and annual leaves and flowers.**Vegetative spread:** Probably spread from corms.**Longevity:****Primary juvenile period:****Flowers:** Purple to blue, September–October.**Fruit/seed:** Capsule with numerous seeds.**Dispersal, establishment & growth:** Vegetative dispersal (Carr et al. 1992) by corms.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa, introduced as ornamental.**Botanical subregions:** NC CC; ?Vic., S.A., W.A.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: St Ives (1989), Balgowlah (1952), Albion Park (1963).**Habitat****Habitat:** Roadsides, wasteland, drainage lines.**Altitude:** 0–200 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** *Themeda* grassland.**Substrate:** Sandy soils on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Cultivated and occasionally locally naturalised, probably originating as dumped garden waste.***Chasmanthe floribunda* ***

IRIDACEAE

Life history**Growth form:** Perennial herb 1–1.5 m high, with corm to 6 cm diam; leaves and flowers annual.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Orange-red or yellow, August–December.**Fruit/seed:** Capsule with a few orange seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Cape Province S Africa. Introduced as ornamental.**Botanical subregions:** CC; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: East Lakes (1998), Campbelltown (1965).**Habitat****Habitat:** Swamp margin.**Altitude:** 0–200 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Rare.**Vegetation:****Substrate:** Clay, sand.**Exposure:****Conservation****Conservation:** Cultivated, reported from cemeteries, golf course, but probably from old plantings or garden refuse dumping.

***Crocosmia* × *crocosmiiflora* ***

IRIDACEAE

Life history

Growth form: Perennial herb 30–100 cm high, with stolons, and up to 15 corms 20–30 mm diam; annual leaves and flowers.

Vegetative spread: Stolons and corms.

Longevity: Indefinite.

Primary juvenile period:

Flowers: Red-orange, January–March.

Fruit/seed: Capsule 7–10 mm diam., with about 6 seeds 3 mm long.

Dispersal, establishment & growth: Diaspore: vegetative dispersal by corms in dumped garden refuse (Muyt 2001). Apparently not producing viable seed (Harden 1993).

Fire response: Probably resprouted after high intensity fire 1/1994 (at Lane Cove and Narrabeen), fruiting in 10 months (at Lane Cove, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, horticultural hybrid between *C. aurea* and *C. pottsii*, produced in France in 1880 (Harden 1993), introduced as ornamental.

Botanical subregions: NC CC SC CT; LHI, Vic., Tas., S.A., W.A.

Distribution Sydney area: Coast and Blue Mountains.

Select locations: CC: Glenbrook, Beecroft (1975), Holdsworthly (1964). CT: Katoomba (1954), Blackheath (1954), Lawson, Lithgow, Robertson.

Habitat

Habitat: Old gardens, roadsides, moist forest.

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

Typical local abundance: Frequent–occasional.

Vegetation: Eucalypt woodland.

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

Exposure:

Conservation

Conservation: Naturalised on coast and particularly in Blue Mountains, where it was first recorded as naturalised 50 years ago.

***Dierama pendulum* ***

IRIDACEAE

Life history

Growth form: Tufted perennial herb 1–1.2 m high, with corms.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pink, December–January.

Fruit/seed: Papery, 3-lobed capsule 7 mm diam., with few seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: CT; S.A.

Distribution Sydney area: Sporadic.

Select locations: CT: Wentworth Falls (1958), Moss Vale (1930), Wildes Meadow (1993).

Habitat

Habitat: Roadside, wet ground.

Altitude: 600–1000 m **Annual rainfall:** 900–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Roadside woodland remnants.

Substrate: Sandy soils on alluvium.

Exposure: Full sun.

Conservation

Conservation: Reported occasionally naturalised from garden escapes near Robertson (1993) and Wentworth Falls (Harden 1958).

***Dierama pulcherrimum* ***

IRIDACEAE

Life history**Growth form:** Tufted perennial herb 1–1.2 m high, with corms 3–4 cm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Dark pink to purple-red, October–November.**Fruit/seed:** Papery, 3-lobed capsule, with few seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CT.**Distribution Sydney area:****Select locations:** CC: Ingleburn (1936).**Habitat****Habitat:****Altitude:** 0–200 m**Annual rainfall:** 800–900 mm**Typical local abundance:****Vegetation:****Substrate:** Moist, well-drained soils.**Exposure:** Full sun.**Conservation****Conservation:** Only one record from Ingleburn 1936, doubtfully naturalised.***Freesia* * hybrid**

IRIDACEAE

Life history**Growth form:** Perennial herb 10–40 cm high, with annual leaves and flowers; corms 15 mm diam., bulbils in lower leaf axils.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to cream with yellow, August–October.**Fruit/seed:** Capsule 10–15 mm diam., with 3–4 brown to black seeds.**Dispersal, establishment & growth:** Vegetative spread by corms and bulbils e.g. in dumped garden refuse.**Fire response:** Probably resprouted after high intensity fire 1/1994 (at Lane Cove), fruiting in 10 months (P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CC; Vic., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Gosford (1969).**Habitat****Habitat:** Roadsides, wasteland.**Altitude:** 0–200 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Occasionally naturalised after dumping of garden refuse, though records from cemeteries would be from old graveside plantings.

***Gladiolus angustus* ***

IRIDACEAE

Life history

Growth form: Perennial herb 20–60 cm high, with annual leaves and flowers; corms to 15 mm diam.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to cream or pinkish, October–December.

Fruit/seed: Fruit not seen.

Dispersal, establishment & growth:

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: Exotic, native to S Africa, introduced as ornamental.

Botanical subregions: CC; S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Wyee (1953), Somersby (1993), Hurstville (1950).

Habitat

Habitat: Roadsides, drains, vacant land.

Altitude: 0–200 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Weedy sites e.g. with *Coreopsis lanceolata*, *Briza major*, *Verbena bonariensis*.

Substrate: Sandy soil over sandstone, low nutrients, periodically wet.

Exposure:

Conservation

Conservation: Occasionally naturalised locally in the Sydney area.

***Gladiolus carneus* ***

IRIDACEAE

Life history

Growth form: Perennial herb 35–80 cm high, with annual leaves and flowers; corms 20–30 cm diam.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to pink or lavender, October–November.

Fruit/seed: Fruit not seen.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: CC CT; S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Little Bay (1975), Narellan (1965), Shoalhaven (1985). CT: Crookwell, Bundanoon.

Habitat

Habitat: Roadsides, riverflats.

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

Typical local abundance: Occasional.

Vegetation:

Substrate: Clay soils on shale, basalt, alluvium.

Exposure:

Conservation

Conservation: Occasionally locally naturalised in Sydney area.

***Gladiolus gueinzii* ***

IRIDACEAE

Life history

Growth form: Perennial herb 20–60 cm high, with annual leaves and flowers, bulbils in axils of leaves and underground corms, each with 16–35 cormils at least (Heyligers 1999).

Vegetative spread: Some cormils sprout forming a clump of plants around the parent (Heyligers 1999).

Longevity: Indefinite.

Primary juvenile period:

Flowers: Mauve-pink, self-compatible, mainly October–December (Heyligers 1999).

Fruit/seed: Capsule 2.5–3.5 cm long, with numerous winged seeds 10 mm long. Seeds shed when capsule matures in summer (Heyligers 1999).

Dispersal, establishment & growth: Diaspore: seeds, wind and water-dispersed, as well as vegetative dispersal by cormils, which may float for up to 7 months in seawater (Heyligers 1999).

Fire response:

Interaction with other organisms:

Distribution

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

Botanical subregions: NC CC SC.

Distribution Sydney area: Coastline.

Select locations: CC: The Entrance, Barrenjoey, Narrabeen, Kurnell, Shoalhaven Heads.

Habitat

Habitat: Coastal sand dunes, beaches.

Altitude: 0–5 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Pioneer species on foredunes e.g. with *Spinifex hirsutus*.

Substrate: Dune sand, low nutrients, well-drained.

Exposure:

Conservation

Conservation: First collected near Newcastle in 1950 and has spread 250 km to the north and 500 km to the south (Heyligers 1999).

***Gladiolus undulatus* ***

IRIDACEAE

Life history

Growth form: Perennial herb 40–80 cm high, with annual leaves and flowers; corms 20–30 mm diam., with numerous bulbils.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: White to cream and greenish, November–January, peak December.

Fruit/seed: Fruit not seen.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

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

Distribution Sydney area: Widespread.

Select locations: CC: Lower Hawkesbury River, Hornsby, Pennant Hills (1938), Eastwood, Lane Cove River (1917), Middle head, Centennial Park (1911), La Perouse, Leumeah. CT: Carcoar (1998).

Habitat

Habitat: Roadsides, drainage channels.

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation:

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

Exposure:

Conservation

Conservation: Reported for nearly a century and widely naturalised on coast.

***Herbertia lahue* subsp. *caerulea* ***

IRIDACEAE

Life history**Growth form:** Perennial herb to 20 cm high, with annual leaves and flowers; bulb 2 cm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale blue, October–December.**Fruit/seed:** Capsule 15–20 mm long, with seeds 1–2 mm long, December–January.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to America.**Botanical subregions:** NC CC.**Distribution Sydney area:** Coast.**Select locations:** CC: Gosford (1926), Glenorie, Ryde (1902), Parramatta Park, Blackett, Mount Annan.**Habitat****Habitat:** Disturbed sites.**Altitude:** 0–300 m**Annual rainfall:** 700–1200 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Grassland and lawn.**Substrate:** Clay soils on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Occasionally naturalised.***Iris germanica* ***

IRIDACEAE

Tall Bearded Iris

Life history**Growth form:** Clump-forming perennial herb to 120 cm high, with fleshy rhizomes 3–5 cm diam; sword-shaped leaves in fan-shaped clusters.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:** White or blue, violet, yellow or multicoloured, September–October.**Fruit/seed:** Capsule 4–5 cm long, with numerous wrinkled brown seeds 5 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to Europe and W Asia, introduced as ornamental.**Botanical subregions:** CC ST NWS CWS; Vic., Tas., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Kembla Grange (1921), Camden (1965).**Habitat****Habitat:** Roadsides, wasteland.**Altitude:** 0–300 m**Annual rainfall:** 700–1200 mm**Typical local abundance:****Vegetation:****Substrate:** Clay soils on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Widely cultivated, occasionally naturalised locally.

Ixia flexuosa * (*I. columellaris*)

IRIDACEAE

Life history**Growth form:** Perennial herb 30–55 cm high, with corm 10–13 mm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White or pale mauve to pink, November–December.**Fruit/seed:** Capsule with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CC; Tas.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Maroubra (1954), Narellan (1966), Bargo (1953).

Habitat**Habitat:** Disturbed sites, roadsides, sandhills.**Altitude:** 0–300 m**Annual rainfall:****Typical local abundance:** Occasional.**Vegetation:****Substrate:** Clay or sandy soils.**Exposure:**

Conservation**Conservation:** Occasionally naturalised in Sydney area.***Libertia paniculata***

IRIDACEAE

Life history**Growth form:** Perennial herb, with rhizomes.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White, September–November.**Fruit/seed:** Black capsule 5–8 mm diam., with numerous dark brown seeds 1 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT; Qld, Vic.**Distribution Sydney area:** Coast and Blue Mountains.**Select locations:** CC: Boorai Ridge, Grose River, Otford. CT: Galah Mountain, Blackheath, Moorara Boss, McMahons Lookout, Mount Murray.

Habitat**Habitat:** Slopes of moist gullies, sometimes near sea.**Altitude:** 0–1000 m**Annual rainfall:** 1000–1800 mm**Typical local abundance:** Frequent.**Vegetation:** Tall open-forest e.g. with *Eucalyptus fastigata*, *E. deanei*, *Syncarpia glomulifera*, *Eucalyptus botryoides* with mesic understorey; gully rainforest e.g. with *Ceratopetalum apetalum*.**Substrate:** Sandy loam from shale, basalt, granite, fertile. Water table mostly high, moisture supply intermittent, fresh.**Exposure:** Indifferent to exposure–sheltered; light shade.

Conservation**Conservation:** Conservation status unknown. Reported in Wollemi NP, Blue Mountains NP.

Libertia pulchella

IRIDACEAE

Life history**Growth form:** Perennial herb with rhizomes.**Vegetative spread:** Stoloniferous, probably capable of spreading.**Longevity:****Primary juvenile period:****Flowers:** Cream-white, November–January**Fruit/seed:** Brown capsule 3–5 mm diam., with numerous dark brown seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC NT CT; Vic., Tas. N.G., N.Z.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CC: Mount Tomah. CT: Wentworth Falls.**Habitat****Habitat:** Moist gullies, wet rock faces, falls splash zone.**Altitude:** 500–1000 m **Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent.**Vegetation:** In Sphagnum moss on rock faces in gully rainforest e.g. with *Blechnum*, *Bauera rubioides*.**Substrate:** Sandstone boulders and rock faces. Infertile soil. Water table permanently high, moisture supply continuous, fresh.**Exposure:** Sheltered situations; deep–mid shade.**Conservation****Conservation:** Restricted local occurrences in Sydney area, conservation status unknown.***Moraea collina* * (*Homeria collina*)**

IRIDACEAE

Cape Tulip

Life history**Growth form:** Perennial herb to 35 cm high, with annual leaves and flowers; corms 12–18 mm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale yellow or salmon pink, August–September.**Fruit/seed:** Cylindrical capsule 3–4 cm long, with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CC SC SWS; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Penrith area.**Select locations:** CC: Penrith (1903), Mulgoa (1908), Wallacia (1923).**Habitat****Habitat:** Disturbed sites.**Altitude:** 0–200 m **Annual rainfall:** 800 mm**Typical local abundance:****Vegetation:****Substrate:****Exposure:****Conservation****Conservation:** Reported naturalised in Penrith area 1900–1925.

***Moraea flaccida* *** (*Homeria flaccida*)

IRIDACEAE

One-leaved Cape Tulip

Life history

Growth form: Perennial herb 25–60 cm high, with annual leaves and flowers; corms 20 mm diam.

Vegetative spread: 1–3 new corms produced above the old corm each year (Parsons & Cuthbertson 1992).

Longevity: Indefinite.

Primary juvenile period:

Flowers: Salmon orange or yellow, September–October.

Fruit/seed: Cylindrical capsule 2.5–5.5 cm long, with numerous seeds.

Dispersal, establishment & growth: Diaspore: seed, dispersed as contaminant of agricultural produce, on machinery and feet of animals, in animal droppings; vegetative spread by corms e.g. in gravel for roadmaking; seeds not long-lived in soil, germinate in autumn more readily on surface than when buried; corms dormant during adverse conditions, stimulated by rain and high soil temperature (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: Poisonous to cattle, sheep and goats, all parts of the plant toxic whether green or dry (Parsons & Cuthbertson 1992).

Distribution

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

Botanical subregions: NC CC SC NWS SWS; Vic., Tas., S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: North Head (1986), Punchbowl (1951), Wollongong (1948).

Habitat

Habitat: Waste places.

Altitude: 0–300 m

Annual rainfall: 1000–1200 mm

Typical local abundance:

Vegetation:

Substrate: Wide range of soil types (Parsons & Cuthbertson 1992).

Exposure: Does not establish well on shaded sites (Parsons & Cuthbertson 1992).

Conservation

Conservation: Occasionally naturalised. Control by repeated cultivation at the most susceptible time of year, June–July, for at least 4 years to exhaust the supply of dormant corms (Parsons & Cuthbertson 1992).

Moraea ochroleuca * (*Homeria ochroleuca*)

IRIDACEAE

Life history

Growth form: Perennial herb 40–70 cm high, with annual leaves and flowers; corms 20 mm diam.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Yellow, sometimes with orange centre, September–November.

Fruit/seed: Cylindrical capsule 2–4 cm long, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S Africa.

Botanical subregions: CC SWS SWP; Vic., S.A., W.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Rydalmere (1945).

Habitat

Habitat:

Altitude: 0–200 m

Annual rainfall: 1000 mm

Typical local abundance:

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Locally serious weed south from Sydney district (Harden 1993), with only Sydney record at Rydalmere in 1945, where it was reported to be widespread on hospital grounds, evidently spread by cultivation.

Patersonia fragilis

IRIDACEAE

Life history

Growth form: Tufted, glabrous, perennial herb to 50 cm high, with woody rhizome.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Violet to blue-violet, October–January.

Fruit/seed: Cylindrical capsule 25–30 mm long; seeds 2 mm long, black, glossy, with a white aril, January–February.

Dispersal, establishment & growth: Diaspore: seed, with ant-adapted food body for dispersal.

Fire response:

Interaction with other organisms: Food plant of butterfly larvae *Mesodina halyzia halyzia* (Common & Waterhouse 1981).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Tablelands.

Select locations: CT: Clarence, Dingo Swamp, Warlock Ridge.

Habitat

Habitat: Wet heath.

Altitude: 1000–1200 m

Annual rainfall: 1000–1200 mm

Typical local abundance: Frequent–occasional.

Vegetation: Shrub swamp e.g. with *Leptospermum grandifolium*, *Grevillea acanthifolia*, *Empodisma minus*; moist heath.

Substrate: Peaty to sandy soil on sandstone, low nutrients, permanently moist.

Exposure:

Conservation

Conservation: Conservation status unknown, reported in Kanangra Boyd NP.

Patersonia glabrata

IRIDACEAE

Life history**Growth form:** Subshrub 30–80 cm high, with woody rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Pale violet, August–October, peak September. Small beetles seen feeding destructively on flower (P. Kubiak pers. comm.).**Fruit/seed:** Cylindrical capsule 20–40 mm long; seeds 4 mm long, brown, glossy, with a white aril, October–March. Viability of fresh seed 84% (Vigilante et al. (1998).**Dispersal, establishment & growth:** Diaspore: seed, with ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981).**Fire response:** Resprouts at base or below (Fox 1988, Vigilante et al. (1998), fruiting and shedding seeds in 1 year; flowering more prolific in 2nd year after fire (P. Kubiak pers. comm.).**Interaction with other organisms:** Food plant of butterfly larvae *Mesodina halyzia halyzia* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT CWS; Qld.**Distribution Sydney area:** Widespread.**Select locations:** CC: Putty, Gosford, Colo Heights, Windsor, Bilpin, Cheltenham, Frenchs Forest, Centennial Park, Canterbury, Waterfall, Berry. CT: Gospers Mountain, Clarence, Wentworth Falls, Kanangra, Wombeyan.**Habitat****Habitat:** Plateaus, hillsides.**Altitude:** 0–1100 m **Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Woodland e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *Corymbia eximia*, *Eucalyptus sparsifolia*; open-forest e.g. with *Angophora costata*, *Eucalyptus globoidea*, *E. notabilis*; coastal heath e.g. with *Angophora hispida*, *Banksia obongifolia*.**Substrate:** Sandy clay on shaley sandstone, laterite, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown. Reported in Brisbane Water NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Lane Cove NP, Sydney Harbour NP.

Patersonia longifolia

IRIDACEAE

Life history**Growth form:** Perennial tufted herb to 60 cm high, with woody rhizome.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Blue-violet, at any time, peak October–December.**Fruit/seed:** Capsule 15–25 mm long, with cylindrical seeds 3 mm long.**Dispersal, establishment & growth:** Diaspore: seed, adapted for ant-dispersal (Rice & Westoby 1981).**Fire response:** Stems killed, resprouts from base.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC CT ST; Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Howes Valley, Bilpin, Springwood, Wisemans Ferry, Berowra, Rookwood. CT: Clarence, Katoomba, Hill Top, Penrose SF.**Habitat****Habitat:****Altitude:** 0–1100 m **Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Eucalypt open-forest e.g. with *Eucalyptus sieberi*, *E. sclerophylla*, *Angophora costata*, *Corymbia gummifera*, *Eucalyptus radiata*, *E. mannifera*; heath e.g. with *Eucalyptus stricta*, *Leptospermum trinervium*, *Angophora hispida*.**Substrate:** Sandy soil on sandstone, occasionally on shale, low nutrients.**Exposure:****Conservation****Conservation:** Conservation status unknown.***Patersonia sericea***

IRIDACEAE

Life history**Growth form:** Densely tufted perennial herb to 60 cm high, with woody rhizome.**Vegetative spread:****Longevity:** Indefinite (D. Keith pers. comm.).**Primary juvenile period:****Flowers:** Blue-violet, August–March, peak September**Fruit/seed:** Capsule 15–30 mm long; seeds 3 mm long, cylindrical, brown, with waxy bloom, without aril; seed weight 5 mg (Westoby et al. 1982), September–December.**Dispersal, establishment & growth:** Diaspore: seed, with ant-adapted food body for dispersal (Westoby et al. 1990, Rice & Westoby 1981). Recruitment mainly after fire (D. Keith pers. comm.).**Fire response:** Stems killed, resprouts from base. Seeds shed almost 1 year following high intensity fire 1/1994 (at Lane Cove, P. Kubiak pers. comm.).**Interaction with other organisms:** Leaves sometimes eaten by rabbits (P. Kubiak pers. comm.). Food plant of butterfly larvae *Mesodina halyzia halyzia*, *M. aeluropis* (Common & Waterhouse 1981).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS; Qld, Vic.**Distribution Sydney area:** Widespread.**Select locations:** CC: Putty, Doyalson, Kariong, Maraylya, Agnes Banks, Berkshire Park, Hornsby, Cheltenham, Frenchs Forest, Roseville, Kogarah, Waterfall, Audley, Douglas Park, Cataract Dam, Bargo, Fitzroy Falls, Bomaderry. CT: Mt Coricudgy, Clarence, Lithgow, Katoomba, Lawson, Wombeyan, Robertson.

Habitat**Habitat:** Ridges, plateaus.**Altitude:** 0–1100 m**Annual rainfall:** 700–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Open-forest e.g. with *Eucalyptus sieberi*, *Corymbia gummifera*, *E. radiata*, *E. dives*, *E. piperita*, *Angophora costata*; woodland e.g. with *Eucalyptus sclerophylla*, *E. haemastoma*, *E. pauciflora*, *E. mannifera*, *Angophora bakeri*, *Corymbia eximia*; heath e.g. with *Angophora hispida*, *Banksia serrata*.**Substrate:** Sandy soil on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** Probably adequately conserved. Reported in Wollemi NP, Brisbane Water NP, Marramarra NP, Muogamarra NR, Ku-ring-gai Chase NP, Garigal NP, Sydney Harbour NP, Royal NP.**Romulea rosea** var. **australis** *

IRIDACEAE

Life history**Growth form:** Small perennial herb, with roundish corm, without an aerial stem; leaves basal.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow and pale to bright pink or rarely white, August–November.**Fruit/seed:** Cylindrical capsule 10 mm long, with numerous seeds, September–November.**Dispersal, establishment & growth:** Growth period spring, dies down after flowering.**Fire response:** Probably reprinted after high intensity fire 1994 (at Lane Cove and Narrabeen), flowering after 9 months (P. Kubiak pers. comm.).**Interaction with other organisms:** Purple Swamphens *Porphyrio porphyrio* feed on corms in autumn and winter (Diez & Clarke 1996).**Distribution****Status/origin:** Exotic, native to S Africa.**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: Richmond (1906), Mosman, Parramatta, RBG (1898), Cooks River (1912), Mount Annan, Narellan (1916), Menangle Park, Pt Kembla. CT: Carcoar.**Habitat****Habitat:** Pastures, lawns, roadsides.**Altitude:** 0–900 m**Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Grassland, lawns.**Substrate:** Clay soils on shale, alluvium, medium nutrients.**Exposure:****Conservation****Conservation:** A common weed of pastures, lawns and roadsides, recorded for over a century.

***Sisyrinchium iridifolium* ***

IRIDACEAE

Blue Pigroot

Life history**Growth form:** Grass-like annual or perennial herb 10–60 cm high, with rhizomes.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** White to cream with purple or blue centre, October–November.**Fruit/seed:** Brown capsule 3–8 mm diam, with numerous dark brown seeds 1 mm diam., November–January.**Dispersal, establishment & growth:****Fire response:** Possibly killed by high intensity fire 1/1994 (at Lane Cove and Narrabeen), fruiting 10 months later (P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America and Mexico.**Botanical subregions:** CC SC CT; Qld, Vic., Tas., S.A.**Distribution Sydney area:** Widespread on coast and Southern Highlands.**Select locations:** CC: Hornsby, Carlton (1895), Kangaroo Valley, Unanderra.

CT: Wingecarribee Swamp, Bowral, Berrima, Marulan.

Habitat**Habitat:** Gardens, waste ground, swamp margins.**Altitude:** 0–700 m **Annual rainfall:** 1000–1600 mm**Typical local abundance:** Frequent.**Vegetation:** Grassy heathland, swamp margins; open-woodland e.g. with *Eucalyptus sclerophylla*.**Substrate:** Sandy to clay loam on shales, medium nutrients, periodically moist.**Exposure:****Conservation****Conservation:** Weed of gardens, waste ground and rough pasture.***Sisyrinchium species A* * (*S. micranthum*)**

IRIDACEAE

Life history**Growth form:** Tufted annual herb 5–20 cm high. Uncertain taxonomy.**Vegetative spread:****Longevity:** Less than 1 year.**Primary juvenile period:** Less than 1 year.**Flowers:** Pale yellow, with brown-purple markings in centre, or blue to mauve with a yellowish throat, October–December.**Fruit/seed:** Capsule 2–4 mm diam., with numerous black, pitted seeds.**Dispersal, establishment & growth:****Fire response:** Possibly killed by high intensity fire 1/1994 (at Lane Cove and Narrabeen), fruiting 10 months later (P. Kubiak pers. comm.).**Interaction with other organisms:** Reported toxic to stock.**Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC NT CT ST NWS CWS; LHI, Qld, Vic., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wyong, Gosford (1893), Linden, Richmond (1925), Cheltenham, St Marys (1888), Cooks River (1912), Homebush (1892), Macquarie Fields, Campbelltown, Albion Park, Wollongong, Berry (1941). CT: Currant Mountain Gap.**Habitat****Habitat:** Pastures, roadsides, drainage ditches.**Altitude:** 0–800 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Grassland, pastures.**Substrate:** Sandy soils, low nutrients, periodically wet.**Exposure:****Conservation****Conservation:** Widely naturalised since 1880s.

***Sparaxis bulbifera* ***

IRIDACEAE

Harlequin Flower

Life history**Growth form:** Perennial herb 15–55 cm high, with annual leaves and flowers; corms 10–15 mm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Yellow, September–November.**Fruit/seed:** Capsule 10 mm long, with numerous seeds 2 mm diam.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa. Introduced as ornamental.**Botanical subregions:** CC CT; Vic., S.A., W.A.**Distribution Sydney area:** Leura.**Select locations:** CT: Gordon Falls Reserve (2000).**Habitat****Habitat:** Roadsides, wasteland.**Altitude:** 900–1000 m **Annual rainfall:** 1400 mm**Typical local abundance:** Rare.**Vegetation:** Revegetation area e.g. with *Allium triquetrum*, *Myosotis sylvatica*, *Anthoxanthum odoratum*.**Substrate:** Silty sand on sandstone, low nutrients.**Exposure:****Conservation****Conservation:** One recent record for Leura in 2000, probably garden escape but potential to spread unknown.***Tritonia lineata* ***

IRIDACEAE

Lined Tritonia

Life history**Growth form:** Perennial herb 30–60 cm high, with annual leaves and flowers; corms to 20 mm diam.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** Cream, September–October.**Fruit/seed:** Capsule with numerous seeds.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CC CT SWS; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Suburban areas.**Select locations:** CC: Cooranbong, Gosford (1946), Cheltenham (1941), Roseville, Curl Curl, Malabar, Rookwood, Albion Park, Nowra (1943). CT: Lawson, Hazelbrook (1950).**Habitat****Habitat:** Disturbed sites, grassland, dry slopes.**Altitude:** 0–800 m **Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Grassland e.g. with *Themeda australis*; scrub e.g. with *Acacia longifolia*, *Banksia aemula*.**Substrate:** Sandy to clay soils on sand, shale, low to medium nutrients.**Exposure:****Conservation****Conservation:** Locally naturalised since 1940s on vacant land and remnant of old gardens, sometimes in bushland remnants.

***Watsonia borbonica* subsp. *ardernei* * (*W. pyramidata*)**

IRIDACEAE

Life history**Growth form:** Perennial herb to 2 m high, with annual leaves and flowers; corms 3–4 cm diam.**Vegetative spread:** Corms.**Longevity:****Primary juvenile period:****Flowers:** Pink to light purple, September–November.**Fruit/seed:** Woody capsule 3 cm long.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa. Introduced as ornamental.**Botanical subregions:** CC CT; Vic., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Cooranbong (1978), Helensburgh (1996). CT: Hazelbrook (1998).**Habitat****Habitat:** Ridgetops.**Altitude:** 0–800 m**Annual rainfall:** 1100–1600 mm**Typical local abundance:** Occasional.**Vegetation:** Eucalypt woodland.**Substrate:** Clay soil, low nutrients.**Exposure:****Conservation****Conservation:** A few recent records though not clear whether truly naturalised.***Watsonia meriana* cv. *bulbillifera* * (*W. angusta*)**

IRIDACEAE

Wild *Watsonia*, Bugle Lily**Life history****Growth form:** Perennial herb 1–2 m high, with annual leaves and flowers; corms 4–8 cm diam.**Vegetative spread:** Corms.**Longevity:** Indefinite. Parts above ground level died off within 1 year after resprouting (at Lane Cove, P. Kubiak pers. comm.).**Primary juvenile period:****Flowers:** Orange to red, rarely pink or purple, October.**Fruit/seed:** Capsule not seen.**Dispersal, establishment & growth:** Spread by seed and vegetatively from bulbils on flowering stem and corms dumped in garden waste (EWAN).**Fire response:** Probably resprouted after high intensity fire 1/1994 (at Lane Cove and Narrabeen), flowering 10 months later; bulbils shed about 1 year after fire (at Lane Cove, P. Kubiak pers. comm.).**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa. Introduced as ornamental.**Botanical subregions:** NC CC SC CT ?NWP; Qld, Vic., Tas., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Central Mangrove (1974), Mt Colah (1973), North Turrumurra (1960), Rookwood (1973), La Perouse (1975), Heathcote (1966). CT: Lawson (1982).**Habitat****Habitat:** Roadsides, slopes, creeks.**Altitude:** 0–800 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:****Substrate:** Sandy to clayey soils on sands, shale, low to medium nutrients.**Exposure:****Conservation****Conservation:** Locally naturalised since 1960s, probably spreading from old garden plantings or garden waste dumping. Spreading locally by corms.

***Juncus acuminatus* ***

JUNCACEAE

Life history

Growth form: Tufted or shortly rhizomatous perennial herb, with flowering stems 25–60 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Occasionally proliferates from flowers.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to N and C America.

Botanical subregions: NC CC CT NWS; Tas.

Distribution Sydney area: Royal NP, Southern Highlands.

Select locations: CC: Audley, Hacking River (1973), Bola Creek, Woronora River.

CT: Wildes Meadow, Belmore Falls (1976).

Habitat

Habitat: Swamps, drains.

Altitude: 0–700 m

Annual rainfall: 1200–1400 mm

Typical local abundance: Frequent.

Vegetation: Sedgeland e.g. with *Juncus effusus*, *Juncus sarophus*, *Juncus procerus*, *Lycopus australis*, *Restio tetraphyllus*.

Substrate: Sandy soils on alluvium, medium nutrients, permanently wet.

Exposure:

Conservation

Conservation: Naturalised for at least 30 years, ability to spread unknown.

***Juncus acutiflorus* ***

JUNCACEAE

Life history

Growth form: Perennial herb, with short rhizome and flowering stems 20–110 long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe, NW Africa, SW Asia.

Botanical subregions: CT.

Distribution Sydney area: Wentworth Falls.

Select locations: CT: Wentworth Falls (1991).

Habitat

Habitat: Swamp.

Altitude: 800–1000 m

Annual rainfall: 1400 mm

Typical local abundance: Frequent.

Vegetation: Swamp e.g. with *Leptospermum*, *Juncus articulatus*, *Juncus microcephalus*, *Juncus effusus*.

Substrate:

Exposure:

Conservation

Conservation: Naturalised in swampy area at Central Park, Wentworth Falls (recorded 1991, 1992, 1993). Ability to spread is unknown.

Juncus acutus* subsp. *acutus* **JUNACEAE****Life history**

Growth form: Tussock-forming perennial herb, with short rhizome and flowering stems 30–160 cm long.

Vegetative spread: Rhizomatous, short distance.

Longevity:

Primary juvenile period: 2–3 years (Parsons & Cuthbertson 1992).

Flowers: July–December.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet. Seeds 1 mm long, with papery appendages, germinate at most times of the year (Parsons & Cuthbertson 1992).

Dispersal, establishment & growth: Diaspore: seed or capsules, water-dispersed, contaminant of agricultural produce, in mud and on machinery; also vegetative dispersal by rhizomes through soil movement (Parsons & Cuthbertson 1992).

Fire response:

Interaction with other organisms: Establishment along waterways may prevent stock gaining access to water and provides habitat for vermin e.g. rabbits (Parsons & Cuthbertson 1992).

Distribution

Status/origin: Exotic, native to Europe, Mediterranean region, SW Asia.

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

Distribution Sydney area: Mainly coastal.

Select locations: CC: Bilpin (1958), Brooklyn, Belrose, Watsons Bay, Villawood, Concord, Bankstown (1909), Botany, Leppington.

Habitat

Habitat: Tidal flats, saline areas, roadsides.

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

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus moluccana*, *E. tereticornis*; saltmarsh.

Substrate: Clay soils on shale, alluvium. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Appears to be spreading in last 30 years. Control by mechanical removal of plants (Parsons & Cuthbertson 1992).

Juncus alexandri* subsp. *melanobasis**JUNACEAE****Life history**

Growth form: Perennial herb, with rhizomes; flowering stems 70–150 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–October.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC NT CT.

Distribution Sydney area: Mt Coricudgy.

Select locations: CT: Mt Coricudgy, Kerry Mountain.

Habitat

Habitat: Depressions.

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

Typical local abundance: Occasional.

Vegetation: Moist eucalypt forest and rainforest.

Substrate: Clay soil on alluvium, basalt, medium to high nutrients.

Exposure:

Conservation

Conservation: Mt Coricudgy is southern geographical limit. Conservation status unknown.

Juncus amabilis

JUNCACEAE

Life history**Growth form:** Perennial herb with short rhizomes and flowering stems 50–110 cm long.**Vegetative spread:** Rhizomatous.**Longevity:****Primary juvenile period:****Flowers:** December.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic in CC, but native to other parts of Australia.**Botanical subregions:** *CC SWS SWP SFWP; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Sporadic.**Select locations:** CC: Flemington (1969), Leightonfield (1993).**Habitat****Habitat:** Damp places, railway yard, saleyards.**Altitude:** 0–200 m **Annual rainfall:** 900–1000 mm**Typical local abundance:** Occasional.**Vegetation:** Depression with *Casuarina glauca*.**Substrate:** Clay soil on shale, medium nutrients.**Exposure:****Conservation****Conservation:** Native to Western NSW, probably introduced to Sydney region with stock.***Juncus aridicola***

JUNCACEAE

Life history**Growth form:** Perennial herb with short rhizomes and soft grey-green flowering stems 55–115 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** October–November.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native in CT but introduced to CC.**Botanical subregions:** *CC CT NWS CWS SWS NWP SWP NFWP SFWP; *LHI, Qld, Vic., N.T., S.A., W.A.**Distribution Sydney area:****Select locations:** CC: Rookwood Cemetery (1973), Flemington Saleyards (1968), Villawood (1988). CT: Megalong Valley (1963).**Habitat****Habitat:** Wet places.**Altitude:** 0–600 m **Annual rainfall:** 900–1000 mm**Typical local abundance:** Occasional.**Vegetation:** Woodland e.g. with *Eucalyptus sclerophylla*, *E. sideroxylon*, *Angophora floribunda*.**Substrate:** Clay soil on shale, alluvium, medium nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Native to western NSW but probably introduced to Sydney area with stock.

Juncus articulatus* **JUNCACEAE****Life history**

Growth form: Perennial herb, with short rhizomes; flowering stems to 60 cm long.

Vegetative spread: Roots at nodes.

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Germination in all seasons in Northern Tablelands (Britton & Brock 1994).

Fire response: Resprouted after high intensity fire 1/1994 (at Lane Cove), flowering 10 weeks later (P. Kubiak pers. comm.).

Interaction with other organisms: Foodplant of Black Swan *Cygnus atratus* (Barker & Vestjens 1989,1990).

Distribution

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

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

Distribution Sydney area: Widespread.

Select locations: CC: Mellong Swamp, Wisemans Ferry, Cowan Creek (1915), Beecroft, Middle Harbour, Carlingford, Parsley Bay, Bondi (1883), Kogarah (1901), Woolooware Bay, Campbelltown, Stanwell Park, O'Hares Creek, Nepean Dam, Berry. CT: Ilford, Nashdale, Katoomba, Boyd Crossing, Wombeyan Caves, Wingecarribee Swamp, Fitzroy Falls.

Habitat

Habitat: Moist places, creeks, ponds.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent.

Vegetation: Wetland vegetation e.g. with *Juncus* species, *Eleocharis* species, *Persicaria* species.

Substrate: Sandy soil on sand, alluvium, sandstone, granite, low to medium nutrients, permanently moist. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: Introduced by 1900 and now widely naturalised in damp situations.

Juncus australis**JUNCACEAE****Life history**

Growth form: Strongly rhizomatous perennial herb, with flowering stems 50–100 cm long.

Vegetative spread: Rhizomatous.

Longevity:

Primary juvenile period:

Flowers: August–April, peak February–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Diaspore mobile (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST NWS CWS SWS; Vic., Tas., S.A., N.Z.

Distribution Sydney area: Mainly Tablelands.

Select locations: CC: Bilpin, Kurrajong Heights, Mt Kembla. CT: Hill End, Ganguddy Creek, Orange, Mt Wiagdon, Mt Canobolas, Blackmans Flat, Glanmire, Georges Plains, Wolgan Gap, Little Hartley, Megalong Valley, Blackheath, Sunny Corner, Blayney, Oberon, Wentworth Falls, Yerranderrie, Burruga, Taralga, Hill Top, Mittagong, Wingecarribee Swamp.

Habitat

Habitat: Seasonally wet places, slopes, creekbanks.

Altitude: 500–1400 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassland, woodland e.g. with *Eucalyptus viminalis*, *Eucalyptus sparsifolia*, *E. pauciflora*, *E. melliodora*, *E. blakelyi*, *E. bridgesiana*, *E. aggregata*, *E. ovata*.

Substrate: Clay soil on alluvium, slates, rhyolite, shale, sandstone, low to high nutrients, moist.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Winburdale NR.

Juncus bufonius* * (*J. plebeius*)*JUNCACEAE**

Toad Rush

Life history

Growth form: Tufted annual herb. Culms terete 2–20 cm long; leaves basal and cauline, shorter than culms.

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

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: Often fertilised within unopened flower (cleistogamous), at any time of year, peak October–December.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet. Seed weight 0.01 mg (Shiple & Parent 1991).

Dispersal, establishment & growth: Diaspore mobile (McIntyre et al. 1995), dispersed in mud on cars (Wace 1977). Germination in all seasons in Northern Tablelands (Britton & Brock 1994), 20% within 30 days (Shiple & Parent 1991). Coloniser.

Fire response: Fruiting 38 weeks after high intensity fire 1/1994 (at Narrabeen, P. Kubiak pers. comm.).

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to temperate regions.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS SWP NFWP; LHI, Qld, Vic., Tas., N.T., S.A., W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Wyong Creek, Richmond, Oxford Falls, Castlecove, Dennistone, Domain (1902), Kogarah (1899), Glenfield, Tahmoor, Waterfall (1895), Mt Keira, Upper Kangaroo Valley, Bomaderry. CT: Ilford, Molong Creek, Orange, Katoomba, Hartley, Jenolan Caves (1899), Boyd River.

Habitat

Habitat: Disturbed sites, creeks.

Altitude: 0–1000 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent–occasional.

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

Substrate: Sandy soils on sandstone, low nutrients, periodically moist. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

Conservation: First recorded over a century ago, now widely naturalised.

***Juncus bulbosus* ***

JUNCACEAE

Life history

Growth form: Tufted perennial herb, with slightly bulbous bases; flowering stems to 30 cm long, often with proliferation from inflorescence.

Vegetative spread: Rooting from nodes.

Longevity:

Primary juvenile period:

Flowers: October–May.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Growth stimulated by high carbon dioxide levels combined with high ammonium concentration (Roelofs et al. 1994).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, Native of NW Africa, Europe, Iceland, Greenland & Newfoundland

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

Distribution Sydney area: Mainly Upper Blue Mountains.

Select locations: CC: Glenbrook Lagoon, Marley Lagoon. CT: Lithgow, Clarence (1919, 1961), Mt Wilson (1951), Wentworth Falls, Wingecarribee Swamp.

Habitat

Habitat: Wet places.

Altitude: 0–1200 m **Annual rainfall:** 1000–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Creekbank e.g. with *Juncus planifolius*; lagoon edge e.g. with *Lepyrodia muelleri*, *Baumea juncea*; heath e.g. with *Allocasuarina nana*, *Leptospermum trinervium*.

Substrate: Sandy soils on sandstone, alluvium, low nutrients, moist, sometimes inundated.

Exposure:

Conservation

Conservation: Naturalised in wet situations, particularly on Tablelands.

Juncus caespiticus

JUNCACEAE

Life history

Growth form: Tufted or shortly rhizomatous perennial herb, with flowering stems 20–55 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: December–March.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC; Vic., Tas., S.A., W.A., N.Z.

Distribution Sydney area: Coast.

Select locations: CC: Lake Munmorah, La Perouse, Kurnell, Garie Beach, Werrong Beach.

Habitat

Habitat: Damp places, creekbanks, behind saltmarsh, sand dunes.

Altitude: 0–100 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Swampy areas e.g. with *Isolepis nodosa*, *Ranunculus inundatus*, *Lomandra longifolia*.

Substrate: Sandy soil, on sand dunes, alluvium, low nutrients, fresh water.

Exposure:

Conservation

Conservation: Lake Munmorah is northern geographical limit. Conservation status unknown. Reported in Royal NP.

***Juncus canadensis* ***

JUNCACEAE

Life history**Growth form:** Tufted perennial herb, with flowering stems 40–65 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** March.**Fruit/seed:** Smooth, shiny capsule, with numerous tailed seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to N America.**Botanical subregions:** CT.**Distribution Sydney area:** Wentworth Falls.**Select locations:** CT: Jamieson Creek, Wentworth Falls (1965).**Habitat****Habitat:** Damp situations, along creeks, tracks.**Altitude:** 800–900 m **Annual rainfall:** 1400 mm**Typical local abundance:** Frequent.**Vegetation:** Sclerophyll forest e.g. with *Leptospermum*, *Hakea*, *Eucalyptus*; along creek above falls.**Substrate:** Sandy soil on sandstone, low nutrients, permanently moist.**Exposure:****Conservation****Conservation:** Locally naturalised in bushland at Wentworth Falls (recorded 1965, 1971, 1972, 1975, 1980, 1991, 1993). Ability to spread further unknown.***Juncus capensis* ***

JUNCACEAE

Life history**Growth form:** Tufted, shortly rhizomatous perennial herb, with flowering stems 20–50 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** August–March.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S Africa.**Botanical subregions:** CC.**Distribution Sydney area:** Eastern suburbs.**Select locations:** CC: Centennial Park (1901), Eastlakes, Botany Bay (1908), La Perouse.**Habitat****Habitat:** Swampy areas.**Altitude:** 0–100 m **Annual rainfall:** 1200 mm**Typical local abundance:** Frequent.**Vegetation:** Swampy disturbed areas e.g. with *Lantana camara*, *Acetosa sagittata*; scrub e.g. with *Kunzea ambigua*.**Substrate:** Sandy soil on sand, sandstone, low nutrients, moist.**Exposure:****Conservation****Conservation:** Naturalised in Eastern Suburbs for over a century.

Juncus capillaceus* **JUNACEAE****Life history**

Growth form: Shortly rhizomatous perennial herb, with flowering stems to 25 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: All year, peak March.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America.

Botanical subregions: NC CC ; Vic.

Distribution Sydney area: Suburban areas.

Select locations: CC: Marsfield, Pennant Hills, Northbridge (1962), Lane Cove, Homebush (1952), Moorebank, La Perouse (1953), Sutherland, Bundeena, Waterfall.

Habitat

Habitat: Riverbanks, pastures, lawns.

Altitude: 0–200 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassy areas, lawns.

Substrate: Sandy soils on sandstone, low nutrients.

Exposure:

Conservation

Conservation: Weed in pastures, naturalised for at least 50 years.

Juncus capitatus* **JUNACEAE****Life history**

Growth form: Tufted annual herb, with flowering stems to 12 cm long.

Vegetative spread: No.

Longevity: Less than 1 year.

Primary juvenile period: Less than 1 year.

Flowers: October–November.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe, Mediterranean region, E Africa.

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

Distribution Sydney area: Widespread.

Select locations: CC: Cheltenham, St Marys, Rookwood, Cabarita, Glenfield, Oatley (1903), La Perouse, Menangle, Dapto (1948). CT: Oberon (1952), Berrima (1996).

Habitat

Habitat: Creeks, moist sites.

Altitude: 0–1000 m

Annual rainfall: 700–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Grassland, heath e.g. with *Banksia ericifolia*, *Melaleuca nodosa*.

Substrate: Clay soils on shale, sandy soils on sandstone, low–medium nutrients, moist sites.

Exposure:

Conservation

Conservation:

Juncus cognatus* **JUNCACEAE****Life history**

Growth form: Tufted to shortly rhizomatous perennial herb, with flowering stems 25–65 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time, peak January–March.

Fruit/seed: Smooth shiny capsule, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to S America.

Botanical subregions: NC CC SC NT CT.

Distribution Sydney area: Mainly coastal.

Select locations: CC: Dora Creek, Wyong Creek, Kincumber, Cowan, Londonderry, Cheltenham, Castlecove (1951), Cabarita, Nielsen Park, Centennial Park (1953), Cooks River, Towra Point, Malabar, La Perouse, Campbelltown, Maianbar, Stanwell Park (1954), Bulli Pass, Coomonderry Swamp. CT: Blackheath, Hill Top, Belmore Falls.

Habitat

Habitat: Creekbanks, roadsides.

Altitude: 0–800 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Swamps e.g. with *Melaleuca decora*, *Melaleuca linariifolia*; moist forest.

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

Exposure:

Conservation

Conservation: First recorded about 50 years ago and now widely naturalised.

Juncus continuus**JUNACEAE****Life history**

Growth form: Rhizomatous perennial, flowering stems 35–115 cm long, with continuous pith. Forms hybrids with *Juncus usitatus*, *J. australis*.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time, peak December–January.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Coloniser of disturbed sites (e.g. bulldozed sites).

Fire response: Resprouted after high intensity fire 1/1994 (at Narrabeen), flower buds 42 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 NWP; Qld, Vic., ?*S.A., N.T.

Distribution Sydney area: Widespread.

Select locations: CC: Howes Valley, Dora Creek, Ourimbah, Mountain Lagoon, Agnes Banks, Asquith, Cheltenham, Glenbrook, Dennistone, Bradleys Head, Kogarah, Salt Pan Creek, La Perouse, Waterfall, Nepean Dam, Wollongong, Coomonderry Swamp. CT: Orange, Mt Darcy, Cullen Bullen, Wolgan Gap, Clarence, Mt Wilson, Blackheath, Boyd River, Mt Werong, Wombeyan Caves, Hill Top, Belmore Falls, Bundanoon.

Habitat

Habitat: Edge of swamps, creeks, disturbed sites.

Altitude: 0–1000 m **Annual rainfall:** 600–1600 mm

Typical local abundance: Frequent.

Vegetation: Swamp forest e.g. with *Melaleuca linariifolia*, *Melaleuca nodosa*; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*; heath e.g. with *Angophora hispida*, *Allocasuarina distyla*, *Banksia ericifolia*; woodland e.g. with *Eucalyptus cinerea*, *E. dives*, *E. rossii*.

Substrate: Sandy soils on sandstone, sand, basalt, volcanic necks, low to high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Juncus effusus* **JUNACEAE****Life history**

Growth form: Shortly to strongly rhizomatous perennial herb, with flowering stems 30–100 cm long.

Vegetative spread: Rhizomatous.

Longevity:

Primary juvenile period:

Flowers: December–May.

Fruit/seed: Smooth shiny capsule, with numerous seeds, January–April.

Dispersal, establishment & growth: Seed weight 0.01 mg, germination 61% within 30 days (Shiple & Parent 1991).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to Europe, Asia, Africa.

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

Distribution Sydney area: Widespread.

Select locations: CC: Casula (1991), Hacking River (1975). CT: Bowenfels, Clarence, Blackheath (1965), Leura (1967), Wildes Meadow.

Habitat

Habitat: Damp sites, swamps, creeks.

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

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland e.g. with *Gymnoschoenus sphaerocephalus*, *Gahnia sieberiana*, *Empodisma minus*; open-forest e.g. with *Eucalyptus sieberi*, *E. piperita*.

Substrate: Sandy to peaty soils on sandstone, alluvium, low nutrients, moist.

Exposure:

Conservation

Conservation: First reported at Blackheath in 1965 and now widespread, mainly in Upper Blue Mountains.

Juncus falcatus**JUNCACEAE****Life history**

Growth form: Rhizomatous perennial herb, with flowering stems 10–35 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic., Tas., N Amer., N Asia.

Distribution Sydney area: Tablelands.

Select locations: CT: Kanangra Walls, Mt Werong, Ruby Creek.

Habitat

Habitat: High-altitude swamps.

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

Typical local abundance: Frequent.

Vegetation: Shrub swamp e.g. with *Leptospermum*, *Empodisma minus*, *Baloskion australe*, *Carex gaudichaudiana*.

Substrate: Sandy alluvium, low nutrients, moist.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus filicaulis**JUNCACEAE****Life history**

Growth form: Slender, shortly rhizomatous perennial herb, with flowering stems 15–45 cm long. Hybridizes with *J. subsecundus* particularly in disturbed situations (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–February.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Diaspore mobile (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST NWS CWS SWS; Vic., Tas., ?W.A.

Distribution Sydney area: Bathurst–Taralga area.

Select locations: CT: Capertee Valley, Yetholme, Bathurst, Oberon, Marulan, Taralga.

Habitat

Habitat: Creeks, near swamps.

Altitude: 600–1000 m

Annual rainfall: 600–1200 mm

Typical local abundance: Occasional–rare.

Vegetation: Grassy woodland e.g. with *Eucalyptus viminalis*, *E. bridgesiana*, *E. dives*; grassland.

Substrate: Clayey, or peaty sandy soil.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus firmus* (*J.* sp. D2 in Jacobs & Pickard, 1981)*JUNCACEAE****Life history**

Growth form: Strongly rhizomatous perennial herb, with flowering stems 55–110 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: March–May.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC NT CT NWS CWS; Qld.

Distribution Sydney area: Bathurst–Orange area.

Select locations: CT: Orange, Bathurst, Sofala, Capertee Valley.

Habitat

Habitat: Creekbank, swampy areas.

Altitude: 600–900 m

Annual rainfall: 600–1000 mm

Typical local abundance: Frequent.

Vegetation: Swampy area e.g. with *Eleocharis acuta*, *Typha orientalis*, *Schoenus apogon*; woodland e.g. with *Eucalyptus melliodora*, *E. albens*, *Angophora floribunda*.

Substrate: Clay soils on alluvium, seasonally wet.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus flavidus

JUNACEAE

Life history

Growth form: Shortly to strongly rhizomatous perennial herb, with flowering stems 25–90 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: At any time.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Coloniser species.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Hornsby, Willoughby, Northbridge, Engadine, Holsworthy, Warumbul, Waterfall. CT: Hill End, Nashdale, Cullen Bullen, Mittagong, Marulan.

Habitat

Habitat: Seasonally wet or briefly wet situations, hillsides, vacant land, urban areas.

Altitude: 0–1000 m **Annual rainfall:** 600–1300 mm

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Eucalyptus melliodora*, *E. macrorhyncha*, *E. dalrympleana*, *E. bridgesiana*, *E. viminalis*, *E. amplifolia*, *E. radiata*.

Substrate: Clay soils on basalt, high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Juncus fockei

JUNACEAE

Life history

Growth form: Tufted or shortly rhizomatous perennial herb, with flowering stems 8–45 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–April, peak December–January.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Richmond, Centennial Park, Glenfield, Narellan. CT: Currant Mountain Gap, Orange, Ben Bullen, Clarence, Marrangaroo, Wentworth Falls, Boyd Plateau, Bindook, Hill Top.

Habitat

Habitat: Damp situations, creeks, swamps.

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

Typical local abundance: Frequent.

Vegetation: Boggy sedgeland e.g. with *Carex appressa*, *Carex gaudichaudiana*; scrub e.g. with *Leptospermum obovatum*, *Leptospermum myrtifolium*.

Substrate: Peaty to sandy soil on alluvium, sandstone, granite, low nutrients, moist.

Exposure:

Conservation

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

Juncus gregiflorus

JUNACEAE

Life history**Growth form:** Shortly rhizomatous perennial herb, with flowering stems 50–140 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–March.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** CC SC CT ST; Vic., Tas., W.A.**Distribution Sydney area:** Mainly Southern Highlands.**Select locations:** CC: Kogarah (1893). CT: Bowenfels, Abercrombie River, Mittagong, Bowral, Belmore Falls, Bundanoon, Penrose,**Habitat****Habitat:** Stream banks and near swamps.**Altitude:** 0–1000 m **Annual rainfall:** 800–1100 mm**Typical local abundance:** Occasional–frequent.**Vegetation:** Riparian vegetation e.g. with *Juncus subsecundus*, *Juncus filicaulis*, *Juncus usitatus*, *Juncus effusus*.**Substrate:** Sandy to clay loam and sandstone, alluvium, medium nutrients, moist.**Exposure:****Conservation****Conservation:** Only one CC record at Kogarah in 1993 and is likely to be extinct there now. Conservation status elsewhere unknown. Bowenfels is northern geographical limit.***Juncus holoschoenus***

JUNACEAE

Life history**Growth form:** Tufted or shortly rhizomatous perennial herb, with flowering stems 25–75 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–April.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**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 CT ST CWS SWS SWP; Vic., Tas., S.A., W.A., N.Z.**Distribution Sydney area:** Mainly Tablelands.**Select locations:** CC: Casula, Leppington, Nepean Dam. CT: Ilford, Wattle Flat, Mt Werong.

Habitat

Habitat: Damps soils, ponds, ditches.

Altitude: 0–1000 m

Annual rainfall: 700–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Wet meadow e.g. with *Juncus articulatus*; surrounded by woodland e.g. with *Eucalyptus aggregata*, *E. bridgesiana*, *E. viminalis*; wetland edge e.g. with *Typha orientalis*, *Eleocharis acuta*, *Eucalyptus amplifolia*.

Substrate: Clay soils on alluvium, shale, medium nutrients, periodically inundated. Recorded on saline sites in western NSW (Semple 1993).

Exposure:

Conservation

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

Juncus homalocaulis**JUNCACEAE****Life history**

Growth form: Tufted, shortly rhizomatous perennial herb, with flowering stems to 35 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth: Diaspore mobile (McIntyre et al. 1995). Coloniser of disturbed sites.

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Mountain Lagoon, Galston, Richmond, Woodford, Cheltenham, Rookwood, Penshurst, Ingleburn, Albion Park, Kangaroo Valley, Cambewarra. CT: Upper Cudgegong Valley, Lidsdale, Glanmire, Yerranderie, Fitzroy Falls, Marulan.

Habitat

Habitat: Moist sites, swamp margins, disturbed sites in suburban areas.

Altitude: 0–1000 m

Annual rainfall: 600–1400 mm

Typical local abundance: Occasional.

Vegetation: Woodland e.g. with *Eucalyptus pauciflora*, *E. dalrympleana*, *E. aggregata*, *E. longifolia*, *Melaleuca decora*; open-forest e.g. with *Syncarpia glomulifera*, *Angophora costata*.

Substrate: Sandy to clay soil on sandstone, shale, basalt, low to high nutrients.

Exposure:

Conservation

Conservation: Conservation status unknown.

***Juncus imbricatus* ***

JUNCACEAE

Life history**Growth form:** Tufted, shortly rhizomatous perennial herb, with flowering stems 10–45 cm long.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–January.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:** Probably resprouts.**Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC SC; Vic., W.A.**Distribution Sydney area:** North Shore, Shellharbour.**Select locations:** CC: Lindfield, Northbridge (1952), Royal Botanic Gardens (1913), Shellharbour (1949).**Habitat****Habitat:** Disturbed situations, roadsides, bush tracks, beaches.**Altitude:** 0–100 m**Annual rainfall:** 1200–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Grassy areas.**Substrate:** Sandy soil on sandstone, beach sand, well-drained.**Exposure:****Conservation****Conservation:** Recorded for about 90 years, established in North Shore suburbs, and coast at Shellharbour. Potential for spread unknown.***Juncus kraussii* subsp. *australiensis* (*J. maritimus* var. *australiensis*)**

JUNCACEAE

Sea Rush

Life history**Growth form:** Tussock-forming, strongly rhizomatous perennial herb, with flowering stems 40–150 cm long.**Vegetative spread:****Longevity:** Indefinite.**Primary juvenile period:****Flowers:** December–June.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet. Seed weight 0.01 mg (Shiple & Parent 1991), December.**Dispersal, establishment & growth:** Diaspore seed, probably wind-dispersed; seed sinks immediately in tapwater and seawater (Clarke & Hannon 1970). 29 % germination in tapwater and 12 % in 20 % seawater, germination prevented by salinity above 20 % seawater (Clarke & Hannon 1970), 20 % germination within 30 days (Shiple & Parent). Seedling stages showed slight preference for waterlogged conditions and were not adversely affected by freely drained conditions. No salt requirement (Clarke & Hannon 1970)**Fire response:** Probably resprouts.**Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., Tas., N.T., S.A., W.A., N.Z.**Distribution Sydney area:** Coastal estuaries**Select locations:** CC: Martinsville, Barrenjoey, Bayview, Berowra Creek, Narrabeen, Kogarah, Tempe, Georges Hall, Woolooware Bay, Port Hacking River, Five Islands, Shoalhaven River.

Habitat

Habitat: Saltmarsh, headlands.

Altitude: 0–40 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Dominant–occasional.

Vegetation: Saltmarsh e.g. with *Suaeda australis*, *Sporobolus virginicus*, forming zone more landward than the *Sarcocornia* zone where flooding occurs infrequently and salinity is always much lower than in the *Sarcocornia* zone (Clarke & Hannon 1970). Understorey under *Casuarina glauca*.

Substrate: Sandy loam on alluvium, sandstone, medium nutrients, periodically flooded, saline to brackish.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Sydney Harbour NP.

Juncus laeviusculus* subsp. *illawarrensis**JUNCACEAE**

(*J.* sp. *D1* in Jacobs & Pickard, 1981)

Life history

Growth form: Stongly rhizomatous perennial herb, with flowering stems 35–150 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–March.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC CT ST.

Distribution Sydney area: Southern Highlands.

Select locations: CC: Macquarie Falls, Jamberoo Pass, Foxground. CT: Wingecarribee Swamp, Wildes Meadow, Carrington Falls, Bundanoon.

Habitat

Habitat: Edges of swamps, gullies.

Altitude: 0–750 m **Annual rainfall:** 1200–1800 mm

Typical local abundance: Frequent–occasional.

Vegetation: Moist forest e.g. with *Eucalyptus fastigata*, *Hedycarya angustifolia*, *Acacia melanoxydon*; swamp margins e.g. with *Carex gaudichaudiana*, *Cyperus lucidus*, *Juncus australis*.

Substrate: Clay soils on shale, sandstone, medium to high nutrients, moist.

Exposure:

Conservation

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

Juncus laeviusculus* subsp. *laeviusculus

JUNACEAE

(J. sp. D1 in Jacobs & Pickard, 1981)

Life history**Growth form:** Stongly rhizomatous perennial herb, with flowering stems 35–150 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** November–April, peak March.**Fruit/seed:** Smooth shiny capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:****Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NT CT.**Distribution Sydney area:** Bathurst–Oberon area.**Select locations:** CT: Running Stream, Sunny Corner, Gulf Stream, Mt Wilson, Jenolan Caves, Mt Werong.**Habitat****Habitat:** Drainage lines, creekbanks, gullies.**Altitude:** 900–1200 m **Annual rainfall:** 700–1400 mm**Typical local abundance:** Occasional.**Vegetation:** Moist forest e.g. with *Eucalyptus dalrympleana*, *E. pauciflora*, *E. viminalis*, *E. stellulata*, *E. ovata*, *E. radiata*.**Substrate:** Clay soils on sediments, basalt, alluvium, medium to high nutrients, moist.**Exposure:****Conservation****Conservation:** Mt Werong is southern geological limit, conservation status unknown. Reported in Winburndale NR.***Juncus microcephalus* ***

JUNACEAE

Life history**Growth form:** Tufted or shortly rhizomatous perennial herb, with flowering stems 20–80 cm high.**Vegetative spread:****Longevity:****Primary juvenile period:****Flowers:** At any time.**Fruit/seed:** Smooth shiny red-brown capsule, with numerous seeds, mucilaginous when wet.**Dispersal, establishment & growth:** Seed weight 0.01 mg, germination 61% within 30 days (Shiple & Parent). Coloniser of disturbed open sites.**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Exotic, native to S America.**Botanical subregions:** NC CC NT CT; Vic., Tas., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wyong Creek, Richmond, Asquith, McCarrs Creek (1966), Oxford Falls, Manly, Frenchs Forest (1965), East Lakes, La Perouse (1965), Austinmer. CT: Wentworth Falls.**Habitat****Habitat:** Damp, disturbed places, gullies, creeks, ponds.**Altitude:** 0–1000 m **Annual rainfall:** 800–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Sedgeland e.g. with *Baumea rubiginosa*, *Juncus* species; open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*.**Substrate:** Sandy soils on sand, sandstone, alluvium, low nutrients, moist.**Exposure:****Conservation****Conservation:** First recorded in 1965, now widely naturalised on the coast. Potential spread unknown.

Juncus mollis (*J. sp. X* in Jacobs & Pickard 1981)

JUNCACEAE

Life history

Growth form: Shortly to strongly rhizomatous perennial herb, with flowering stems 85–145 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: December–June.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; ?Qld.

Distribution Sydney area: Coastal estuaries.

Select locations: CC: Dora Creek, Budgewoi, Warnervale, Wyong Creek, St Albans, Kincumber, Cattai Creek, Milperra.

Habitat

Habitat: Swamps, creekbanks.

Altitude: 0–100 m

Annual rainfall: 900–1200 mm

Typical local abundance: Frequent.

Vegetation: Swamp forest e.g. with *Melaleuca quinquenervia*, *Eucalyptus robusta*, *Melaleuca linariifolia*, *Melaleuca decora*, *Casuarina glauca*, *Baumea juncea*, *Baumea articulata*, *Juncus* species; edge of mangroves with *Juncus kraussii*.

Substrate: Clay soils on alluvium, medium nutrients, moist, saline–brackish, seasonally wet situations.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus ochrocoleus (*J. sp. H* in Jacobs & Pickard 1981)

JUNCACEAE

Life history

Growth form: Strongly rhizomatous perennial herb, with flowering stems 35–85 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC NT NWS CWS NWP; Qld.

Distribution Sydney area: Howes Valley.

Select locations: CC: Howes Valley, Wollombi.

Habitat

Habitat: Creekbanks.

Altitude: 0–200 m

Annual rainfall: 800–900 mm

Typical local abundance: Frequent–occasional.

Vegetation: Riparian vegetation e.g. with *Casuarina cunninghamiana*, *Eucalyptus tereticornis*, *E. punctata*, *Angophora bakeri*.

Substrate: Sandy soils on alluvium, low nutrients, seasonally wet.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus pallidus**JUNACEAE****Life history**

Growth form: Tall, strongly rhizomatous perennial herb, flowering stems 70–135 cm long, with continuous pith.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: September–February, peak September.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet, September–June.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Coast, Broken Bay to Port Hacking.

Select locations: CC: Curl Curl, Centennial Park, Tempe, Padstow, Rockdale, Malabar, La Perouse, Woollooware Bay, Audley.

Habitat

Habitat: Moist sites.

Altitude: 0–200 m

Annual rainfall: 1000–1400 mm

Typical local abundance: Occasional.

Vegetation: Freshwater swamp e.g. with *Eleocharis sphacelata*; adjacent to mangroves e.g. with *Juncus kraussii*, *Phragmites australis*.

Substrate: Sandy soils on deep sand, sandstone, alluvium, low nutrients, moist.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Royal NP.

Juncus pauciflorus

JUNCACEAE

Life history

Growth form: Slender, shortly rhizomatous perennial herb, shiny flowering stems 15–55 cm long, with continuous pith.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–April, peak April.

Fruit/seed: Smooth shiny capsule, with numerous 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., W.A., N.Z.

Distribution Sydney area: Mainly Blue Mountains.

Select locations: CC: Kurrajong Heights, Waterfall, Otford, Macquarie Falls. CT: Mt Coricudgy, Mt Wilson, Mount Tomah, Blackheath, Lawson, Jenolan Caves, Boyd River, Yerranderie, Fitzroy Falls.

Habitat

Habitat: Moist situations, creeks, below cliffs, near waterfalls.

Altitude: 0–1000 m **Annual rainfall:** 800–1600 mm

Typical local abundance: Occasional.

Vegetation: Moist open-forest, riparian forest e.g. with *Casuarina cunninghamiana*; swamp margins e.g. with *Leptospermum*, *Sphagnum*.

Substrate: Clay soils on basalt, alluvium, sandstone, granite.

Exposure: Mid-shade.

Conservation

Conservation: Conservation status unknown. Reported in Royal NP, Kanangra Boyd NP.

***Juncus phaeanthus* (J. sp. F in Jacobs & Pickard, 1981)**

JUNCACEAE

Life history

Growth form: Shortly to strongly rhizomatous perennial, with flowering stems 30–100 cm high.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Distinctly reddish inflorescence. December–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic.

Distribution Sydney area: Boyd Plateau.

Select locations: CT: Boyd River, Ruby Creek, Dingo Swamp.

Habitat

Habitat: Swampy creeks, swampy flats.

Altitude: 1000–1300 m **Annual rainfall:** 1000–2000 mm

Typical local abundance: Occasional.

Vegetation: Sedgeland e.g. with *Carex iynx*, *C. inversa*, *Restio australis*.

Substrate: Boggy organic sediments on granite, low nutrients, moist.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Blue Mountains NP, Kanangra Boyd NP.

Juncus planifolius**JUNACEAE****Life history**

Growth form: Tufted annual or perennial herb, with short vertical rhizome; flowering stems 13–60 cm long, with occasional proliferation from flowers.

Vegetative spread:

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

Primary juvenile period:

Flowers: Numerous, clustered at apex of branches, at any time, peak October–January.

Fruit/seed: Smooth shiny capsule, with numerous seeds.

Dispersal, establishment & growth: Recruitment mainly after fire (D. Keith pers. comm.). Coloniser.

Fire response: Resprouts (D. Keith pers. comm.).

Interaction with other organisms: Leaves possibly 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., Tas., S.A., W.A., N.Z., Chile.

Distribution Sydney area: Widespread.

Select locations: CC: Woy Woy, Richmond, Galston, Shane Park, Narrabeen, Centennial Park, Castlecove, Neutral Bay, Kogarah, La Perouse, Waterfall, Austinmer, Saddleback Mountain.

CT: Currant Mountain Gap, Lithgow, Mt Wilson, Katoomba, Springwood, Boyd River, Mt Werong, Yerranderrie, Hill Top, Paddys River.

Habitat

Habitat: Moist situations, creekbanks, gullies.

Altitude: 0–1000 m **Annual rainfall:** 800–1800 mm

Typical local abundance: Frequent–occasional.

Vegetation: Open-forest e.g. with *Eucalyptus piperita*, *Angophora costata*, *Eucalyptus dalrympleana*, *E. pauciflora*, *E. viminalis*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus fibrosa*, *E. crebra*, *E. sclerophylla*.

Substrate: Sandy to clay soils on sandstone, sand, shale, basalt, low–high nutrients, moist sites.

Exposure:

Conservation

Conservation: Widespread and probably adequately conserved. Conserved in Western Sydney (James et al. 1999).

Juncus polyanthemus**JUNACEAE****Life history**

Growth form: Shortly to strongly rhizomatous perennial herb, with flowering stems 65–115 cm long. Hybridizes with *J. usitatus* and *J. mollis* especially in cleared wet pastures (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–January.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC CWS; Qld, N Cal.

Distribution Sydney area: Coastal.

Select locations: CC: Dora Creek, Manly Dam, Doonside, Silverwater, Voyager Point, Seven Mile Beach.

Habitat

Habitat: Swampy situations.

Altitude: 0–100 m **Annual rainfall:** 1200–1400 mm

Typical local abundance: Occasional.

Vegetation: Swamp e.g. with *Melaleuca linariifolia*, *Eucalyptus amplifolia*, *Carex appressa*; woodland e.g. with *Eucalyptus sclerophylla*, *E. parramattensis*, *E. longifolia*, *Melaleuca decora*, *Melaleuca nodosa*; saltmarsh.

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

Exposure:

Conservation

Conservation: Vulnerable in Western Sydney (James et al. 1999). Port Kembla is southern geographical limit.

Juncus prismatocarpus**JUNCACEAE****Life history**

Growth form: Tufted, annual or perennial herb, flowering stems to 40 cm long; leaves spread along culms, equal or shorter.

Vegetative spread: Spreading by rhizome.

Longevity: Indefinite.

Primary juvenile period:

Flowers: November–March.

Fruit/seed: Capsule, with numerous seeds, mucilaginous when wet, released at maturity. Seeds 0.5 mm long, 0.2 mm diam. (J. Howell pers. comm.).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wyong Creek, Maroota, Cheltenham, Centennial Park, Eastlakes, Liverpool, Londonderry, Appin, Albion Park, Berry. CT: Rylstone, Winburndale, Nashdale, Clarence, Blackheath, Kowmung, Wingecarribee Swamp, Barren Grounds.

Habitat

Habitat: Swamp margins, riverbanks, roadside gutters.

Altitude: 0–1000 m **Annual rainfall:** 700–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Sedgeland with other *Juncus* spp. e.g. *J. cognatus*, *J. pauciflorus*, *J. gregiflorus*.

Substrate: Sandy alluvium from Tertiary sediments, granite, sandstone, low nutrients, damp places. Water table mostly high, moisture supply intermittent, fresh.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus procerus**JUNACEAE****Life history**

Growth form: Strongly rhizomatous perennial herb, with flowering stems 65–145 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: November–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: CC SC NT CT ST; Vic., Tas., S.A., N.Z., Chile.

Distribution Sydney area: Widespread.

Select locations: CC: Rookwood, Shellharbour, Coomonderry Swamp. CT: Luthers Creek, Boyd Crossing, Wingecarribee Swamp, Wildes Meadow.

Habitat

Habitat: Moist sites, edge of swamps, creeks.

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

Typical local abundance: Frequent–occasional.

Vegetation: Shrubswamp e.g. with *Leptospermum obovatum*, *Baeckea utilis*, *Empodisma minus*, *Restio australis*; wet meadow e.g. with *Juncus effusus*, *J. sarophorus*, *J. procerus*, *J. acuminatus*, *Lycopus australis*.

Substrate: Sandy soils on alluvium, low nutrients, periodically inundated.

Exposure:

Conservation

Conservation: Conservation status unknown. Reported in Kanangra Boyd NP.

Juncus radula**JUNACEAE****Life history**

Growth form: Slender, shortly rhizomatous perennial herb, with flowering stems 20–65 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Smooth shiny capsule, with numerous seeds.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native, probably introduced to CT.

Botanical subregions: NT ?CT CWS SWS NWP SWP SFWP; Qld, Vic., S.A., W.A.

Distribution Sydney area: Lithgow area.

Select locations: CT: Mt Blaxland.

Habitat

Habitat: Seasonally damp areas, hillsides.

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

Typical local abundance: Occasional.

Vegetation:

Substrate:

Exposure:

Conservation

Conservation: Probably introduced to CT (Harden 1993).

Juncus remotiflorus (*J.* sp. A in Jacobs & Pickard, 1981)

JUNCACEAE

Life history

Growth form: Slender, shortly rhizomatous perennial herb, with flowering stems 15–70 cm high. Hybridizes with *J. subsecundus* (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Capertee River, Llandilo, Toongabbie, North Ryde, Fairfield, Engadine, Tahmoor. CT: Hill End, Oberon, Abercrombie Caves, Hill Top, Mittagong, Paddys River.

Habitat

Habitat: Minor watercourses.

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

Typical local abundance: Frequent–occasional.

Vegetation: Woodland e.g. with *Eucalyptus polyanthemos*, *E. macrorhyncha*, *E. mannifera*, *E. amplifolia*; *Melaleuca* scrub e.g. with *Melaleuca decora*, *M. thymifolia*, *Eucalyptus parramattensis*, *E. sideroxylon*.

Substrate: Gravelly clay soils on slates, granite, shales, low nutrients, ephemerally wet.

Exposure:

Conservation

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

Juncus sandwithii

JUNCACEAE

Life history

Growth form: Shortly rhizomatous perennial or annual herb, more or less mat-forming (Wilson & Johnson 2001); flowering stems to 10 cm long

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers:

Fruit/seed: Smooth shiny capsule, with numerous seeds 5 mm long, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic., Tas., N.G.

Distribution Sydney area: Kanangra area.

Select locations: CT: Blackheath, Luthers Creek, Wheengee-whungee Swamps, Boyd Plateau.

Habitat

Habitat: Damp areas, creekbanks.

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

Typical local abundance: Frequent.

Vegetation: Swamp sedgeland and creekbanks e.g. with *Leptospermum obovatum*, *Hypericum japonicum*, *Isolepis subtilissima*, *Lilaeopsis polyantha*.

Substrate: Sandy soil on sandstones.

Exposure:

Conservation

Conservation: Rare mat-forming plant restricted to high elevation wet areas. Reported in Kanangra Boyd NP.

Juncus sarophorus

JUNACEAE

Life history

Growth form: Shortly or strongly rhizomatous perennial herb, with flowering stems 55–170 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–March.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: SC NT CT ST CWS SWS; Vic., Tas., S.A., N.Z.

Distribution Sydney area: Tablelands.

Select locations: CT: Mt Coricudgy, Mullion Creek, Sunny Corner, Ben Bullen, Mt Canobolas, Kirkconnell, Bowenfels, Oberon, Mt Werong, Wingecarribee Swamp, Wildes Meadow.

Habitat

Habitat: Damp and swampy situations.

Altitude: 500–1400 m **Annual rainfall:** 800–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Shrub swamp e.g. with *Leptospermum obovatum*, *Eucalyptus dalrympleana*, *Empodisma minus*, *Baloskion australis*, *Carex gaudichaudiana*, *Carex appressa*; wet meadow e.g. with *Eucalyptus bridgesiana*, *E. macrorhyncha*, *E. viminalis*.

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

Exposure:

Conservation

Conservation: Reported in Blue Mountains NP, Winburndale NR, Kanangra Boyd NP.

***Juncus subglaucus* (*J. sp. U* in Jacobs & Pickard, 1981)**

JUNACEAE

Life history

Growth form: Shortly, strongly rhizomatous herb, with flowering stems 40–105 cm long. Hybridizes with other species (Harden 1993).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–May.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT CT NWS CWS NWP SWP; Qld.

Distribution Sydney area: Western Sydney, Bathurst area.

Select locations: CC: Doonside, Chullora. CT: Hill End, Bathurst.

Habitat

Habitat: Swamps, creekbanks.

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

Typical local abundance: Occasional.

Vegetation: Swamps e.g. with *Eucalyptus amplifolia*, *Carex appressa*, *Juncus usitatus*, *Juncus polyanthemos*.

Substrate: Clay soils on shale, medium nutrients, periodically moist.

Exposure:

Conservation

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

Juncus subsecundus**JUNCACEAE****Life history**

Growth form: Slender, shortly rhizomatous perennial; flowering stems terete, 25–90 cm long, cataphylls 3–11 cm long.

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

Longevity:

Primary juvenile period:

Flowers: October.

Fruit/seed: Capsule with numerous seeds, mucilaginous when wet, October–April.

Dispersal, establishment & growth: Diaspore mobile seed (McIntyre et al. 1995).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wollombi, Dora Creek, Wyong Creek, Spencer, Richmond, Galston, Hornsby, Cheltenham, Doonside, St Marys, Rookwood, East Hills, Oatley, Glenfield, Waterfall, Narellan, Dapto, Kangaroo Valley, Cambewarra Range. CT: Cudgegong Valley, Mt Darcy, Capertee, Mullion Creek, Mt Horrible, Nashdale, Mt Canobolas, Kirkconnell, Winburndale, Glanmire, Mt Blaxland, Blackheath, Wentworth Falls, Kowmung Creek, Wombeyan Caves, Robertson, Wildes Meadow, Bundanoon.

Habitat

Habitat: Creeks, swamp margins.

Altitude: 0–1100 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent.

Vegetation: Open-forest e.g. with *Angophora costata*, *Syncarpia glomulifera*, *Eucalyptus acmenioides*, *E. fibrosa*, *E. sideroxylon*; woodland e.g. with *Eucalyptus dalrympleana*, *E. bridgesiana*, *E. amplifolia*, *E. tereticornis*.

Substrate: Sandy to clay soils on sandstone, shale, alluvium, low to medium nutrients, periodically moist.

Exposure:

Conservation

Conservation: Conservation status unknown.

Juncus tenuis* **JUNACEAE****Life history**

Growth form: Tufted perennial herb, with short rhizome; flowering stems 10–50 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: October–March.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Exotic, native to N America.

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

Distribution Sydney area: Widespread.

Select locations: CC: Capertee Valley, Lindfield, Lane Cove, Neutral Bay, Domain (1962), Centennial Park (1900), Waterfall, Belmore Falls. CT: Blackheath, Katoomba, Wentworth Falls, Lawson.

Habitat

Habitat: Disturbed areas, roadsides, creekbanks, moist areas.

Altitude: 0–1000 m **Annual rainfall:** 600–1400 mm

Typical local abundance: Frequent–occasional.

Vegetation: Creek vegetation, grassy areas.

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

Exposure:

Conservation

Conservation: Recorded for over a century. Naturalised mostly near areas of human disturbance.

Juncus usitatus**JUNACEAE****Life history**

Growth form: Densely tufted, shortly rhizomatous perennial herb, flowering stems to 110 cm long. Hybridizes with *J. polyanthemus* (Harden 1993).

Vegetative spread: Spreads by rhizome, perhaps ? 10 cm per year.

Longevity: Indefinite.

Primary juvenile period: ? 3–4 years.

Flowers: Most of the year, peak January.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet, matures November–July.

Dispersal, establishment & growth: Diaspore: capsule, mobile (McIntyre et al. 1995), possibly wind/water-dispersed; seeds ? wind-dispersed, float but sink when disturbed, germinate without treatment establishing best in open bare areas, clay, cracks in rocks etc. Coloniser.

Fire response: Probably resprouts.

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC NT CT ST NWS CWS SWS NWP SWP; Qld, Vic, *SA, *WA, NZ., N Cal.

Distribution Sydney area: Widespread.

Select locations: CC: Dora Creek, Wyong, Beecroft, La Perouse, Kurrajong, Milperra, Razorback, Albion Park, Kangaroo Valley. CT: Capertee Valley, Mullions Range, Katoomba, Yerranderie.

Habitat

Habitat: Creekbanks, damp places, floodplains.

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

Typical local abundance: Frequent–dominant.

Vegetation: Sedgeland or rushland e.g. with *Persicaria* spp. or woodland e.g. with *Eucalyptus amplifolia*, *E. macorhyncha*, *E. melliodora*.

Substrate: Clay soils from alluvium, shale, basalt, sometimes more sandy soils, low–medium nutrients. Water table mostly high–permanently high, fresh. Recorded on saline sites in western NSW (Semple 1993).

Exposure: Full sun.

Conservation

Conservation: Conserved in Western Sydney (James et al. 1999). Reported in Blue Mountains NP.

Juncus vaginatus**JUNCACEAE****Life history**

Growth form: Shortly to strongly rhizomatous perennial herb, with flowering stems 30–100 cm long.

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

Longevity:

Primary juvenile period:

Flowers: October–April.

Fruit/seed: Smooth shiny capsule, with numerous seeds, mucilaginous when wet.

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 NWS CWS SWS; Qld, Vic., Tas., ?S.A., ?W.A.

Distribution Sydney area: Widespread.

Select locations: CC: Wolgan River, Laguna, Bucketty, Kellyville, Regentville, Leumeah, Menangle Park, Waterfall, Budgong. CT: Mt Coricudgy, Clarence, Mullion Range, Ben Bullen, Little Hartley, Carcoar, Blackheath, Wentworth Falls.

Habitat

Habitat: Damp to wet situations, creekbanks, roadside, grassland.

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

Typical local abundance: Occasional–frequent.

Vegetation: Open-forest e.g. with *Eucalyptus dalrympleana*, *E. blaxlandii*, *E. pauciflora*, *E. viminalis*; woodland e.g. with *Eucalyptus dives*, *E. sclerophylla*, *E. tereticornis*.

Substrate: Sandy soil, gravelly clay on sandstone, basalt, alluvium.

Exposure:

Conservation

Conservation: Conservation status unknown.

Luzula densiflora (*L. paucipila* ms)

JUNACEAE

Life history**Growth form:** Small, erect perennial grass-like herb, with robust tufts; flowering stems 11–50 cm long.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Pale red brown, with creamy margins, spring–summer.**Fruit/seed:** Smooth shiny, red-brown to yellow-brown capsule, with numerous seeds that have white ± fleshy appendages, October–November.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC CC SC NT CT ST NWS CWS SWS SWP; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Widespread.**Select locations:** CC: Yengo Creek, Richmond, Kogarah (1893), Casula, Lake Illawarra, Shellharbour. CT: Orange, Mt Canobolas, Georges Plains, Hartley Vale, Oberon, Hampton, Marulan.

Habitat**Habitat:** Creekbanks, swamps.**Altitude:** 0–1000 m **Annual rainfall:** 700–1200 mm**Typical local abundance:** Occasional.**Vegetation:** Eucalypt woodland e.g. with *Eucalyptus melliodora*, *E. bridgesiana*; heathy swamp e.g. with *Leptospermum myrtifolium*, *Leptospermum polygalifolium*.**Substrate:** Clayey to peaty soils on alluvium, medium nutrients, moist.**Exposure:** Shady sites.

Conservation**Conservation:** Conservation status unknown.***Luzula flaccida*** (*L. flaccida* form A)

JUNACEAE

Life history**Growth form:** Small, erect perennial grass-like herb, with loose tufts; flowering stems 12–40 cm long.**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Red brown or dark brown, with creamy margins, spring–summer.**Fruit/seed:** Smooth shiny, yellow-brown capsule, with numerous seeds that have white ± fleshy appendages, October–February.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:**

Distribution**Status/origin:** Native.**Botanical subregions:** NC SC NT CT ST NWS CWS SWS; Vic., Tas.**Distribution Sydney area:** Widespread.**Select locations:** CC: Wisemans Ferry, Richmond, Milperra, Stanwell Park. CT: Gulf Stream, Clarence, Mt Cameron, Mount Tomah, Mt Bindo, Mittagong.

Habitat**Habitat:** Hillsides, gullies.**Altitude:** 0–1400 m **Annual rainfall:** 600–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Open-forest e.g. with *Eucalyptus radiata*, *E. viminalis*, *E. dalrympleana*, *E. pilularis*, *Syncarpia glomulifera*; woodland e.g. with *Eucalyptus sclerophylla*, *Angophora floribunda*, *Eucalyptus rossii*, *E. dives*.**Substrate:** Clay soil on basalt, shale, also sandy alluvial soil, low to high nutrients.**Exposure:****Conservation****Conservation:** Vulnerable in Western Sydney (James et al. 1999). Conservation status elsewhere unknown. Reported in Dharug NP, Tarlo River NP, Winburndale NR.***Luzula meridionalis*****JUNCACEAE****Life history****Growth form:** Small, erect perennial grass-like herb, with slender tufts; flowering stems 18–30 cm long. Hybridizes with *L. flaccida* (Harden 1993).**Vegetative spread:** No (McIntyre et al. 1995).**Longevity:****Primary juvenile period:****Flowers:** Red-brown to dark brown, spring–summer.**Fruit/seed:** Smooth shiny, pale yellow-brown to red-brown capsule, with numerous seeds that have white ± fleshy appendages.**Dispersal, establishment & growth:** No particular morphology for dispersal (McIntyre et al. 1995).**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NT CT ST NWS CWS SWS; Vic., Tas., S.A., W.A.**Distribution Sydney area:** Upper Blue Mountains.**Select locations:** CT: Mt Coricudgy, Mt Towinhingy, Mt Wilson.**Habitat****Habitat:** Mountain tops.**Altitude:** 800–1250 m **Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Grassland understorey e.g. with *Ranunculus* in open-forest e.g. with *Eucalyptus viminalis*, *E. dalrympeana*, *E. radiata*, *E. blaxlandii*.**Substrate:** Clay loam on basalt, high nutrients.**Exposure:****Conservation****Conservation:** Restricted to high elevation basalt caps. Conservation status unknown.

Luzula modesta

JUNCACEAE

Life history

Growth form: Small, erect perennial grass-like herb, with tallish tufts from extensive rhizomes; flowering stems 18–50 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pale brown to red-brown, with whitish margins, spring–summer.

Fruit/seed: Smooth shiny, red-brown or pale brown capsule, with numerous seeds that have white ± fleshy appendages, November–January.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

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

Distribution Sydney area: Tablelands.

Select locations: CT: Kelgoola, Ilford, Mt Canobolas, Newnes Plateau, Blackheath, Hampton.

Habitat

Habitat: Swamp margins.

Altitude: 700–1100 m **Annual rainfall:** 900–1200 mm

Typical local abundance: Frequent–rare.

Vegetation: Sedge swamp e.g. with *Lepidosperma limicola*, *Restio australis*, *Leptospermum myrtifolium*; woodland e.g. with *Eucalyptus pauciflora*, *E. dives*, *E. viminalis*.

Substrate: Peaty to sandy soils on sediments, sandstone, basalt, low to medium nutrients, permanently moist.

Exposure:

Conservation

Conservation: Conservation status unknown.

Luzula ovata

JUNCACEAE

Life history

Growth form: Small, erect perennial grass-like herb, with slender tufts; flowering stems 10–35 cm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: Pale red-brown, with broad creamy to whitish margins.

Fruit/seed: Smooth shiny, ruby red or ox-blood red capsule, with numerous seeds that have white ± fleshy appendages, November.

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NT CT ST; Vic.

Distribution Sydney area: Tablelands.

Select locations: CT: Mt Canobolas, Oberon, Boyd River, Tuglow Caves, Moss Vale.

Habitat

Habitat: Swamps at high altitudes.

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

Typical local abundance: Occasional–rare.

Vegetation: Upland wetland e.g. with *Carex appressa*, *Eleocharis gracilis*; woodland e.g. with *Eucalyptus viminalis*, *E. pauciflora*.

Substrate: Peaty loam, low nutrients, permanently moist.

Exposure:

Conservation

Conservation: Conservation status unknown.

Maundia triglochinoxides**JUNCAGINACEAE****Life history**

Growth form: Erect rhizomatous perennial herb with spongy, inflated leaves

Vegetative spread: Tufts of leaves arise along rhizome.

Longevity:

Primary juvenile period:

Flowers: November–January. Pollination probably anemophilous (dispersed by wind) (Cook 1990).

Fruit/seed: Smooth shiny dehiscent capsule, with numerous seeds, December–January.

Dispersal, establishment & growth: Diaspore: seeds and root tubers, probably dispersed by water (Cook 1990).

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC; Qld.

Distribution Sydney area: Coastal.

Select locations: CC: Wyong Creek, Tuggerah, Kogarah Swamp (1903), Sans Souci (1903).

Habitat

Habitat: Swamps, creeks.

Altitude: 0–200 m

Annual rainfall: 1100–1200 mm

Typical local abundance: Rare.

Vegetation: Wetland vegetation e.g. with *Triglochin procerum*.

Substrate: Shallow fresh water 30–60 cm deep, over clay, low nutrients.

Exposure:

Conservation

Conservation: Listed as Vulnerable (schedule 2) NSW *Threatened Species Conservation Act 1995*.

Triglochin microtuberosum (incl. in *T. procerum* s. lat.)**JUNCAGINACEAE****Life history**

Growth form: Robust, emergent aquatic perennial herb, with small roundish tubers 4.5–13 mm long. Numerous small distinctive tubers terminate in very short roots, clustered closely against the horizontal rhizome (Aston 1995).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–May, peak November–April (Aston 1993).

Fruit/seed: Smooth shiny capsule 7–10 mm long, with numerous seeds. Fruit is pear-shaped, with squat summit and stalk-like base, with absence of dorsal ridges (Aston 1995), mature August–May, peak November–April (Aston 1993).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms: Swollen roots baked and eaten by Aboriginal people (Cribb & Cribb 1984). Heavily grazed by cattle and sheep when stock gain access after falls in water levels (Aston 1995).

Distribution

Status/origin: Native.

Botanical subregions: NC CC SC; Qld, Vic.

Distribution Sydney area: Western Sydney, Illawarra coast.

Select locations: CC: Richmond, Vineyard, Leumeah, Cobbitty, Dapto, Albion Park.

Habitat

Habitat: Swamps, swampy creeks, dams.

Altitude: 0–200 m **Annual rainfall:** 800–1000 mm

Typical local abundance: Frequent–occasional.

Vegetation: Swamp vegetation e.g. with *Melaleuca ericifolia*, *Eleocharis sphacelata*, *Juncus usitatus*, *Cyperus gunnii*, *Myriophyllum*, *Triglochin procerum*, *Cotula coronopifolia*, *Ludwigia peploides*, *Potamogeton ochreateus* (Aston 1993).

Substrate: Stationary or gently flowing fresh water to 50(–120) cm deep in seasonal to permanent swamps, stagnant water, often highly eutrophic and humic with farm run-off, rotting vegetation and cattle dung or clear flowing water; rhizomes and roots embedded in fine black humic silt, loamy-peat, grey loam, loamy to gravelly sand, mud or clay (Aston 1993).

Exposure:

Conservation

Conservation: Conservation status unknown.

Triglochin multifractum**JUNCAGINACEAE****Life history**

Growth form: Perennial aquatic herb, with thick, woody horizontal to upcurved rhizomes and tubers 13–40 mm long.

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: August–May (Aston 1993).

Fruit/seed: Small round fruits to 5 mm long, with up to 1000 on each infructescence, October–June (Aston 1993).

Dispersal, establishment & growth:

Fire response:

Interaction with other organisms:

Distribution

Status/origin: Native.

Botanical subregions: NC CC NT ST NWS CWS SWS; Qld, Vic., N.T., S.A.

Distribution Sydney area: Sporadic.

Select locations: CC: Wollondilly River. CT: Boyd River.

Habitat

Habitat: Damp soil, swamps, lagoons, riverbanks.

Altitude: 0–600 m **Annual rainfall:** 800–1100 mm

Typical local abundance: Occasional.

Vegetation: Frequently co-exists with *Triglochin procerum* (Aston 1993).

Substrate: Fresh still to slow-flowing, usually clear water to 70 cm deep, surviving on saturated to damp soils left above receding waters; rhizomes and roots embedded in sandy to heavy grey clays overlain with soft silt and in red-grey loamy clay (Aston 1993).

Exposure:

Conservation

Conservation: Conservation status unknown.

Triglochin procerum**JUNCAGINACEAE**

Water Ribbons

Life history

Growth form: Perennial aquatic herb, with thick, semi-horizontal woody rhizomes; an eastern variant occurs in coastal or near-coastal areas (Aston 1995).

Vegetative spread:

Longevity:

Primary juvenile period:

Flowers: September–December.

Fruit/seed: Capsule 7–14 mm long.

Dispersal, establishment & growth:

Fire response: Probably resprouted after high intensity fire 1/1994 (at Narrabeen), fruiting in 20 weeks (P. Kubiak pers. comm.).

Interaction with other organisms: Has been a staple food of Aboriginal people in northern and south-eastern Australia (Aston 1995). Plays an important role in transfer of methane from sediments to the atmosphere (Muller et al. 1994).

Distribution

Status/origin: Native.

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

Distribution Sydney area: Widespread.

Select locations: CC: Wheeny Creek, Tuggerah, McCarrs Creek, Gladesville, Doonside, Duck River, Centennial Park, Sans Souci, Botany, Kurnell, Leppington, Regentville, Mount Annan, Cobbitty, Albion Park. CT: Megalong Valley, Wingecarribee Swamp.

Habitat

Habitat: Swamps, creeks.

Altitude: 0–600 mm **Annual rainfall:** 800–1600 mm

Typical local abundance: Frequent–occasional.

Vegetation: Freshwater swamp e.g. with *Eleocharis sphacelata*, *Machaerima*, *Villarsia*, *Casuarina glauca*.

Substrate: Fresh, still to running water, up to 1 m deep, rooted in sediment on alluvium, shale, sandstones, sand, low to medium nutrients, periodically drying out. Rhizomes and tubers are usually deeply subterranean e.g. with rhizomes 20–25 cm below soil surface and tubers 40–60 cm below (Aston 1995).

Exposure:

Conservation

Conservation: Conservation status unknown.

Triglochin rheophilum (incl. in *T. procerum* s. lat.)**JUNCAGINACEAE**

Water Ribbons

Life history**Growth form:** Perennial aquatic herb, with thick, woody horizontal to vertical rhizomes.**Vegetative spread:****Longevity:** Perennial.**Primary juvenile period:****Flowers:** August–January (Aston 1993). Green, Sept. Probably insect pollinated.**Fruit/seed:** Smooth shiny capsule 5–10 mm long, breaking into 6 mericarps (seeds) that fall from the spike on slight contact (mature November–January). Fruit 9–16 mm long, September–February (Aston 1993).**Dispersal, establishment & growth:** Diaspore: mericarp, dispersal by water and perhaps by other vectors (Cook 1990), germinates freely with treatment on wet soil surface. Growth rate quick. Coloniser. Seedlings establish on saturated edge soils (Aston 1993).**Fire response:****Interaction with other organisms:** Swollen roots baked and eaten by Aboriginal people (Cribb & Cribb 1984).**Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; Qld, Vic., Tas.**Distribution Sydney area:** Coastal Sydney.**Select locations:** CC: Tunks Creek, Epping, Port Hacking River, O'Hares Creek.**Habitat****Habitat:** Restricted to clear, often swiftly flowing, non-polluted flood-prone streams and rivers (Aston 1993).**Altitude:** 0–300 m**Annual rainfall:** 900–1400 mm**Typical local abundance:** Frequent.**Vegetation:** Freshwater wetland e.g. with *Eleocharis sphacelata*, *Juncus usitatus*, *Paspalum distichum*. Sites in wet sclerophyll forest with thick shrub understoreys; creekbank vegetation e.g. with *Tristaniopsis laurina*, *Tristania neriifolia*, *Callistemon subulatus* (Aston 1993).**Substrate:** Fresh, gently to swiftly flowing, usually cold clear water to 1 m deep, with water level rises of 3–4 m; bedrock of sandstone/mudstone; rhizomes and roots embedded in thick sand or gravel, often secured beneath rocks (Aston 1993). Recorded on saline sites in western NSW (Semple 1993).**Exposure:** No shade.**Conservation****Conservation:** Conservation status unknown.

Triglochin striatum**JUNCAGINACEAE**

Streaked Arrowgrass

Life history**Growth form:** Slender, erect, rhizomatous herb to 30 cm high.**Vegetative spread:****Longevity:** Perennial.**Primary juvenile period:****Flowers:** September–May. Insect-pollinated (Cook 1990).**Fruit/seed:** Smooth shiny capsule, with numerous seeds, October–May.**Dispersal, establishment & growth:** Diaspore: mericarps, dispersed by water and perhaps by other vectors (Cook 1990), buoyant for 10 days in both tapwater and seawater (Clarke & Hannon 1970). 52 % Germination in tapwater and 12 % in 20 % seawater (Clarke & Hannon 1970). No salt requirement; much less tolerant of high salt than *Sarcocornia* or *Suaeda* for growth and germination but a small percentage of individuals can survive high salinities (Clarke & Hannon 1970)**Fire response:****Interaction with other organisms:****Distribution****Status/origin:** Native.**Botanical subregions:** NC CC SC; LHI, Qld, Vic., Tas., N.T., S.A., W.A., S Afr, Amer., N.Z.**Distribution Sydney area:** Coast and estuaries.**Select locations:** CC: Gunderman, Wondabyne, Patonga Creek, Narrabeen, Dee Why Lagoon, Toongabbie, Parramatta, Gladesville, Newington, Homebush Bay, Cooks River, Rockdale, Hurstville, Leppington, Cronulla, Cape Solander, Woolooware Bay, Port Hacking, Wollongong, Lake Illawarra, Berry.**Habitat****Habitat:** Saltmarsh, shallow saline aquatic habitats, moist areas on coastal cliffs.**Altitude:** 0–10 m**Annual rainfall:** 1000–1400 mm**Typical local abundance:** Frequent–occasional.**Vegetation:** Saltmarsh, more frequently waterlogged (either by sea or rainwater) and hence less saline parts, generally confined to small pools (Clarke & Hannon 1970); creek flat e.g. with *Mimulus repens*, *Cotula coronopifolia*.**Substrate:** Clay soils, alluvium, shale, medium nutrients, periodically unundated. Saturated conditions necessary for adventitious growth; plants in freely-drained conditions failed to survive and there was a marked decrease in density in dry seasons (Clarke & Hannon 1970)**Exposure:****Conservation****Conservation:** Conservation status unknown.

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