

## Site 5. Koolunga Native Reserve, Ferntree Gully

Council reserve of 6 ha, half of it with native vegetation. Melway ref. 65 C11.

### Site Significance Level: *State*

- Includes vegetation of the two endangered Ecological Vegetation Classes, Swampy Woodland and Valley Heathy Forest, some of it in good ecological condition;
- There are large numbers of plant species that are rare or threatened in Knox or more widely;
- There are frequent reports of the rare Powerful Owl in the reserve;
- The 150 naturally occurring, indigenous plant species represents rich flora by Knox standards.



Scale 1:3,500

0 50 100m

*Aerial photograph taken February 2001*

The areas on the aerial photograph with bright green outlines are Swampy Woodland and those with magenta outlines are Valley Heathy Forest. The remaining forest is Herb-rich Foothill Forest. The grey lines are paths and the dashed blue line is a gully, which is thought to be the pre-European course of the creek.

### Boundaries

The site boundary mostly follows the property boundaries of the reserve. The exceptions are a deviation at the northeastern end of Elmo Av, the exclusion of the car park area and the exclusion of the lot that provides access to Daffodil Rd. The pine windbreaks and open grass are of much lower significance than the rest of the reserve, but these areas are included because of the large numbers of sun-orchids, sundews, crassulas and other indigenous ground flora that occur there, and because it is generally preferable for site boundaries to match property boundaries.

**Land use & tenure:** Council reserve with bushland and open expanses of lawn, for nature conservation, recreation and drainage.

## Site description

This 5.8 ha site is at the edge of the volcanic geological formation of the Dandenong Ranges. Elevations vary from 110 m in the western corner to 135 m beside Forest Rd. The soil originates from higher up the slope, having eroded and slipped, or washed, downhill into the reserve. The parent rhyodacite rock is exposed in the creek bed at one location.

The site includes 3.2 hectares of forest and approximately two hectares of open grass and pine windbreaks. The latter conserves several plant species that are scant or absent in the forest (including the rarest plant in the reserve, *Montia fontana*), but it has lower conservation significance than the forest. The open grass and pine windbreaks north of the creek were daffodil fields until 1971, part of Chandlers' farm established 1913. Daffodils are still scattered through the reserve, including the bushland. The open grass south of the creek probably once had a house and garden.

The rest of the reserve appears superficially to be fairly natural, but was actually heavily modified by early settlers. The original course of the creek apparently followed the course of the dashed blue line on the aerial photograph, according to old contour maps and the author's interpretation of the topography and vegetation. Swampy Woodland vegetation occurs along most of the old creek course. Just upstream (east) of the eastern end of the dashed blue line on the photograph there appears to have been a levee constructed across the original creek.

The current-day creek enters the reserve in the southeast via a pipe, at a location within the original watercourse. It then flows west-northwest, whereas the natural course headed northwest. The natural and current-day creek courses converge just west of the centre of the reserve, near a boardwalk bridge.

There must have been substantial clearing of native vegetation associated with the creek diversion. Some trees on the slopes of the diversion channel are quite mature, indicating that the diversion must have been many decades ago. The vegetation type along the current-day creek is Herb-rich Foothill Forest, in contrast to the Swampy Woodland along the natural watercourse.

The indigenous plants within the reserve are, like the topography, not as natural as appears at first. Many plants indigenous to the district have been planted in the reserve, sometimes making it difficult to determine whether a species is naturally occurring or not (e.g. *Banksia marginata*). This is particularly so for species that have reproduced from planted specimens, such as *Solanum laciniatum*. There are specimens of non-indigenous fern species that are popular in cultivation, suggesting that a fern enthusiast may have been active in the reserve. This makes it very difficult to tell whether ferns such as *Doodia media* are planted or freak natural occurrences.

Plantings in the reserve are mostly not documented. The presence or absence of species from early plant lists for the reserve sometimes helps in a small way to determine whether a species is only present due to planting. However, the early lists are demonstrably incomplete, they do not always distinguish reliably between planted and natural occurrences, and some species that occur naturally today may not have been present or visible in the past (e.g. due to recent germination of seed brought in by wind or birds).

The author believes that it is much harder to distinguish the natural flora of Koolunga Native Reserve than any other bushland area in Knox. An uncommonly large number of indigenous plant species has been recorded in the reserve (201, as at mid-2006), including species that are present only due to planting. A substantial proportion of these species are present in such small numbers that it raises concerns about their vulnerability to reproductive problems or misadventure (e.g. a bicycle running over the last individual or colony of one of these species).

Whatever the origin of the native plants, the vegetation provides good habitat for birds and probably insects. This is enhanced by substantial areas of revegetation, although some of the species that have been chosen in years gone by are not ideally suited.

There is also a garden at the northeastern end of St Elmo Av, established in 2004, specifically to demonstrate indigenous plants suitable for gardens that need little watering.

Additional information about the reserve is in the 2006 management plan for the reserve, by Dr Lorimer.

## Relationship to other land

The Vaughan Road Bushland (Site 6) abuts Koolunga Native Reserve and the two sites function to a large degree as a single ecological unit. However, the ecological functioning of the smaller and more degraded area of native vegetation in the Vaughan Road Bushland is more dependent on Koolunga Native Reserve than the converse.

The Vaughan Road Bushland appears to form a habitat link between Koolunga Native Reserve (Site 5) and the Belgrave Railway Line corridor (Site 88), which in turn provides a habitat link with the Blind Creek corridor (Site 33).

Koolunga Native Reserve is 600 m from the Chandlers Hill section of the Dandenong Ranges National Park. The scattered remnant indigenous trees between the two parks would be expected to encourage movements of birds, insects and perhaps bats between the parks. Almost certainly, the Powerful Owls that are regularly observed in and near the reserve would rely on the national park for most of their habitat.

**Bioregion:** On the margin between the Highlands Southern Fall and the Gippsland Plain. Maps of the Department of Sustainability & Environment show the site as being clearly within the Gippsland Plain bioregion, which is appropriate for the Valley Heathy Forest and perhaps also for the Swampy Woodland. However, the Herb-rich Foothill Forest and many species indicative of foothill forests (e.g. *Plantago debilis*, *Pterostylis alpina*, *Olearia argophylla*) are more strongly affiliated with the Highlands Southern Fall.

### Habitat types

Perennial Stream (No EVC number) with semi-aquatic plants such as *Isolepis inundata*.

Wetland (EVC 74, regionally Endangered, but in this case the wetland has been created artificially): 100 m<sup>2</sup> in area, in fair ecological condition (rating C).

Trees, vines and ferns: Absent.

Shrubs: *Melaleuca ericifolia* is sparse and possibly present only due to planting.

Semi-aquatic flora: Strongly dominated by *Carex fascicularis* which has been planted, with very dense cover.

Swampy Woodland (EVC 937, **regionally Endangered**): Estimated to cover 0.27 ha in three patches along the original course of the creek. 0.17 ha is in good ecological condition (rating B) and 0.10 ha in fair ecological condition (rating C).

Dominant canopy trees: Pure stands of *Eucalyptus ovata*, moderately dense in the east and very sparse in the parts of the western patch that are least well drained.

Lower trees: Small numbers of *Exocarpos cupressiformis*.

Shrubs: Dominated by *Goodenia ovata*. Other shrubs are mostly sparse except at the edges, the main species being *Coprosma quadrifida*, *Leptospermum scoparium* and *Ozothamnus ferrugineus*.

Vines: *Clematis aristata* is fairly abundant. *Billardiera mutabilis*, *Rubus parvifolius* and *Pandorea pandorana* are present in small numbers.

Ferns: There are scattered patches of *Adiantum aethiopicum*, *Pteridium esculentum* and *Calochlaena dubia*. There is also an isolated *Doodia australis*.

Ground flora: A dense, deep layer of sedges, with typically 75% cover of *Lepidosperma elatius*. *Poa tenera* is abundant. Other common species are *Acaena novae-zelandiae*, *Rytidosperma semiannulare*, *Gahnia radula*, *Gonocarpus tetragynus*, *Juncus* species, *Microlaena stipoides*, *Oxalis perennans*, *Poa tenera* and *Tetrarrhena juncea*. The ecological indicator species, *Lobelia anceps*, is scattered through the vegetation.

Valley Heathy Forest (EVC 127, **regionally Endangered**): Estimated as 0.9 ha, comprising 200 m<sup>2</sup> in good ecological condition (rating B), 0.7 ha in fair ecological condition (rating C) and 0.2 ha in poor ecological condition (rating D). In addition to this area, an orchid-rich patch of vegetation on the northeast side of the bridge near the dead end of St Elmo Avenue is arguably a patch of Valley Heathy Forest that has become isolated as a result of the redirection of the creek, but it has not been segregated here from the surrounding Herb-rich Foothill Forest.

Canopy trees: *Eucalyptus obliqua*, *E. cephalocarpa*, *E. macrorhyncha*, *E. goniocalyx* and *E. radiata*.

Lower trees: *Exocarpos cupressiformis* is fairly abundant and *Acacia mearnsii* less so.

Shrubs: The shrub layer is dense and fairly rich in species, dominated by *Bursaria spinosa* and *Coprosma quadrifida*. Other species include *Acacia leprosa*, *A. stricta*, *Leptospermum continentale* and a range of other species.

Vines: *Billardiera mutabilis* and *Comesperma volubile* are fairly abundant. *Pandorea pandorana* is dense where soil has been disturbed.

Ferns: Minor occurrence, limited to occasional *Adiantum aethiopicum* and *Pteridium esculentum*.

Ground flora: Densely grassy, dominated by *Poa morrisii*, *Themeda triandra*, *Austrostipa rudis*, *S. pubinodis*, *Microlaena stipoides* and *Gahnia radula*. Other abundant species include *Acrotriche serrulata*, *Gonocarpus tetragynus*, *Oxalis perennans*, *Platylobium formosum*, *Thelymitra* species and *Xanthorrhoea minor*. The following additional species serve as ecological indicators: *Caesia parviflora*, *Dianella longifolia*, *D. admixta*, *Dipodium roseum* and *Pimelea humilis*.

Herb-rich Foothill Forest (EVC 23 – The conservation status is given as ‘Least Concern’ if the occurrence in Koolunga Native Reserve is taken to be part of the Highlands Southern Fall bioregion, or ‘Vulnerable’ if it is taken to be part of the Gippsland Plains bioregion): Estimated as 1.8 ha, comprising 0.1 ha in good ecological condition (rating B), 1.2 ha in fair ecological condition (rating C) and 0.5 ha in poor ecological condition (rating D).

Canopy trees: Dominated by *Eucalyptus obliqua*, with somewhat fewer *E. radiata*, *E. goniocalyx* and *E. macrorhyncha*, and small numbers of *E. cypellocarpa* and *E. cephalocarpa*.

Lower trees: *Exocarpos cupressiformis* is abundant. *Acacia melanoxylon* and *A. dealbata* are thinly scattered.

**Shrubs:** The shrub layer is moderately dense, not hard to walk through. Dominant species are *Coprosma quadrifida*, *Acacia leprosa* (Dandenong Range variant), and *Goodenia ovata*. Less abundant species include *Bursaria spinosa*, *Cassinia aculeata*, *Olearia lirata* and *Ozothamnus ferrugineus*.

**Vines:** Abundant, including the vigorous climbers *Clematis aristata* and *Pandorea pandorana*, the light twiners *Billardiera mutabilis* and *Glycine clandestina*, and the parasite *Cassytha pubescens*.

**Ferns:** Modest-sized, scattered patches of *Adiantum aethiopicum*, *Calochlaena dubia* or *Pteridium esculentum*.

**Ground flora:** Grassy, dominated by *Gahnia radula*, *Poa ensiformis* and *Lomandra longifolia*. Other abundant species include *Dianella tasmanica*, *Gonocarpus tetragynus*, *Oxalis perennans*, *Platylobium formosum* and *Tetrarrhena juncea*.

## Plant species

Altogether, there are reliable records in recent years of approximately 177 indigenous plant species whose presence does not result solely from planting. The following plant list includes a column to indicate the most recent year that each species has been recorded. The column headed 'Risk' indicates the risk of species' extinction in Knox as follows: 'C'=Critically Endangered; 'E'=Endangered; 'V'=Vulnerable. Species with names in bold have fewer than 10 localities listed in 'Flora of Melbourne'. In addition, *Acacia leprosa* (Dandenong Range variant) is listed by Walsh and Stajsic (2007) as rare nationally.

Risk	Indigenous Species	Year	Risk	Indigenous Species	Year
V	<i>Acacia leprosa</i> (Dandenong Range variant)	2007	V	<i>Coprosma quadrifida</i>	2007
V	<i>Acacia mearnsii</i>	2007	E	<i>Correa reflexa</i>	1999
V	<i>Acacia melanoxydon</i>	2007	V	<i>Cotula australis</i>	2005
E	<i>Acacia myrtifolia</i>	2001	V	<i>Crassula decumbens</i>	2005
E	<i>Acacia paradoxa</i>	2004	E	<i>Cyathea australis</i>	2004
E	<i>Acacia pycnantha</i>	2004	E	<i>Cynoglossum suaveolens</i>	2004
V	<i>Acacia verticillata</i>	2007	E	<i>Daviesia latifolia</i>	1985
	<i>Acaena novae-zelandiae</i>	2007	C	<b><i>Derwentia derwentiana</i></b>	2004
V	<i>Acrotriche prostrata</i>	2007	C	<b><i>Deyeuxia densa</i></b>	2004
	<i>Acrotriche serrulata</i>	2007		<i>Deyeuxia quadriseta</i>	2004
V	<i>Adiantum aethiopicum</i>	2007		<i>Dianella admixta</i>	2007
	<i>Alisma plantago-aquatica</i>	2004	V	<i>Dianella longifolia</i> s.l.	2007
C	<b><i>Amphibromus archeri</i></b>	2004	V	<i>Dianella tasmanica</i>	2007
C	<i>Amyema pendula</i>	2004		<i>Dichelachne rara</i>	2007
	<i>Arthropodium strictum</i>	2004	C	<b><i>Dichelachne sieberiana</i></b>	2001
C	<i>Asperula conferta</i>	2007		<i>Dichondra repens</i>	2007
	<i>Austrostipa pubinodis</i>	2007	V	<i>Dillwynia cinerascens</i>	2007
	<i>Austrostipa rudis</i> subsp. <i>rudis</i>	2007	E	<i>Dipodium roseum</i>	2007
E	<i>Banksia marginata</i>	2004	C	<i>Diuris orientis</i>	1984
	<i>Billardiera mutabilis</i>	2007	C	<b><i>Doodia australis</i> (perhaps planted)</b>	1999
C	<b><i>Blechnum minus</i> (perhaps planted)</b>	2004	V	<i>Drosera peltata</i> subsp. <i>auriculata</i>	2004
	<i>Bossiaea prostrata</i>	2001	V	<i>Drosera whittakeri</i>	1984
V	<i>Brunonia australis</i>	2004		<i>Elymus scaber</i>	2001
	<i>Burchardia umbellata</i>	2004	V	<i>Epacris impressa</i>	2007
	<i>Bursaria spinosa</i>	2007		<i>Eragrostis brownii</i>	1999
V	<i>Caesia parviflora</i>	2004	V	<i>Eucalyptus cephalocarpa</i>	2004
V	<i>Calochlaena dubia</i>	2007	V	<i>Eucalyptus cypellocarpa</i>	2007
	<i>Campylopus introflexus</i>	2007		<i>Eucalyptus goniocalyx</i>	2007
	<i>Carex appressa</i>	2004	E	<i>Eucalyptus macrorhyncha</i>	2007
	<i>Carex breviculmis</i>	2007	V	<i>Eucalyptus obliqua</i>	2007
	<i>Cassinia aculeata</i>	2007	V	<i>Eucalyptus ovata</i>	2007
V	<i>Cassinia longifolia</i> (planted?)	2004	E	<i>Eucalyptus radiata</i>	2007
E	<i>Cassytha melantha</i>	2004	V	<i>Euchiton collinus</i>	2004
E	<i>Cassytha pubescens</i>	2004	E	<i>Euchiton involucreatus</i>	1999
E	<i>Centella cordifolia</i>	2007	V	<i>Exocarpos cupressiformis</i>	2007
C	<i>Cheilanthes austrotenuifolia</i> (planted?)	2004	E	<i>Exocarpos strictus</i>	2004
	<i>Chiloscyphus semiteres</i>	2007		<i>Gahnia radula</i>	2007
V	<i>Clematis aristata</i>	2007	E	<i>Gahnia sieberiana</i> (perhaps planted)	2004
V	<i>Comesperma volubile</i>	2007	E	<i>Galium gaudichaudii</i>	2004

Risk	Indigenous Species	Year	Risk	Indigenous Species	Year
C	<i>Gastrodia sesamoides</i>	2001		<i>Pericaria decipiens</i>	2007
C	<b>Geranium homeanum</b>	2004	C	<b>Pimelea axiflora</b>	1999
V	<i>Geranium potentilloides</i>	2004	V	<i>Pimelea humilis</i>	2007
V	<i>Geranium</i> sp. 2	2007	C	<b>Plantago debilis</b>	2002
V	<i>Glyceria australis</i>	1999	V	<i>Plantago varia</i>	2007
V	<i>Glycine clandestina</i>	2007	V	<i>Platylobium formosum</i>	2007
	<i>Gonocarpus tetragynus</i>	2007	V	<i>Platylobium obtusangulum</i>	
	<i>Goodenia lanata</i>	2004		<i>Poa ensiformis</i>	2007
	<i>Goodenia ovata</i>	2007		<i>Poa morrisii</i>	2007
C	<b>Gratiola pubescens</b>	1994	E	<i>Poa tenera</i>	2007
V	<i>Hardenbergia violacea</i>	2004	E	<i>Polyscias sambucifolia</i>	2007
V	<i>Helichrysum scorpioides</i>	2004	E	<b>Polystichum proliferum</b>	2007
V	<i>Hemarthria uncinata</i>	2007		<i>Poranthera microphylla</i>	2004
V	<i>Hovea heterophylla</i>	2004	V	<i>Potamogeton ochreatus</i>	2004
V	<i>Hydrocotyle hirta</i>	2004	E	<i>Prostanthera lasianthos</i>	2007
E	<i>Hypericum gramineum</i>	2007		<i>Pteridium esculentum</i>	2007
C	<b>Hypolepis muelleri</b>	1999	E	<b>Pteris tremula</b>	2004
C	<i>Hypoxis hygrometrica</i>	1995	C	<i>Pterostylis alpina</i>	2005
E	<i>Imperata cylindrica</i>	2007	E	<i>Pterostylis melagramma</i>	2007
E	<i>Indigofera australis</i> (planted?)	1999		<i>Pterostylis nutans</i>	2007
V	<i>Isolepis inundata</i>	2004	C	<i>Pterostylis pedunculata</i>	2005
	<i>Juncus amabilis</i>	2004	V	<i>Pultenaea gunnii</i>	2007
	<i>Juncus bufonius</i>	2004		<i>Rosulabryum ?billarderi</i>	2007
	<i>Juncus gregiflorus</i>	2007	E	<i>Rubus parvifolius</i>	2007
C	<i>Juncus holoschoenus</i>	2004		<i>Rytidosperma laeve</i>	2004
	<i>Juncus pallidus</i>	2004		<i>Rytidosperma linkii</i> var. <i>fulvum</i>	2004
E	<i>Juncus pauciflorus</i>	2004		<i>Rytidosperma pallidum</i>	2007
E	<i>Juncus planifolius</i>	1994		<i>Rytidosperma penicillatum</i>	2007
E	<i>Juncus subsecundus</i>	2004	V	<i>Rytidosperma pilosum</i>	2004
	<i>Kunzea ericoides</i> spp. agg.	2004		<i>Rytidosperma racemosum</i>	2007
	<i>Lachnagrostis filiformis</i>	1999	E	<i>Rytidosperma semiannulare</i>	2007
E	<i>Lagenophora stipitata</i>	1999		<i>Rytidosperma setaceum</i>	2004
	<i>Lepidosperma elatius</i>	2007		<i>Rytidosperma tenuius</i>	2004
	<i>Leptospermum continentale</i>	2007		<i>Schoenus apogon</i>	2004
E	<i>Leptospermum scoparium</i>	2007	C	<b>Schoenus maschalinus</b>	1994
V	<i>Lindsaea linearis</i>	2004		<i>Senecio glomeratus</i>	2001
E	<i>Lobelia anceps</i>	2004		<i>Senecio hispidulus</i>	2007
	<i>Lomandra filiformis</i> ssp. <i>coriacea</i>	2007	E	<i>Senecio minimus</i>	2002
	<i>Lomandra filiformis</i> ssp. <i>filiformis</i>	2004	C	<b>Senecio odoratus</b>	1994
	<i>Lomandra longifolia</i>	2007	E	<i>Senecio prenanthoides</i>	2001
V	<i>Luzula meridionalis</i>	2004		<i>Senecio quadridentatus</i>	2004
V	<i>Lythrum hyssopifolia</i>	1999	V	<i>Solanum laciniatum</i>	2004
E	<i>Melaleuca ericifolia</i>	2004	E	<i>Stylidium armeria/graminifolium</i>	2004
	<i>Microlaena stipoides</i>	2007		<i>Tetarrhena juncea</i>	2007
	<i>Microtis parviflora</i>	2004	E	<i>Tetrateca ciliata</i>	2002
C	<b>Montia fontana</b>	2005	C	<i>Thelymitra arenaria</i>	2004
C	<i>Muellerina eucalyptoides</i>	2001	V	<i>Thelymitra peniculata</i>	2004
E	<b>Olearia argophylla</b>	2004		<i>Themeda triandra</i>	2007
V	<i>Olearia lirata</i>	2007		<i>Thuidiopsis furfurosa</i>	2007
E	<i>Olearia myrsinoides</i>	2007	V	<i>Thysanotus patersonii</i>	2004
V	<i>Opercularia ovata</i>		E	<i>Thysanotus tuberosus</i>	2001
V	<i>Opercularia varia</i>	2004	E	<i>Viola hederacea</i>	2007
	<i>Oxalis exilis/perennans</i>	2007	E	<i>Wahlenbergia gracilis</i>	2004
E	<i>Ozothamnus ferrugineus</i>	2007	V	<i>Xanthorrhoea minor</i>	2007
	<i>Pandorea pandorana</i>	2007	E	<i>Xanthosia dissecta</i>	2004
C	<i>Patersonia occidentalis</i>				

In addition, the following significant species appear in Mr Andrew Paget's 1985 thesis for B.App.Sci. (Landscape Architecture) at RMIT, in a list for the reserve attributed to Mr Gary Cheers. However, these species are among numerous discrepancies between the list given by Paget and another list, purportedly also from Mr Cheers in the same year for the

same reserve, given by Mr Doug Western, in 'Knox Nature Trail' (self-published, 1985). At least one of the lists must be wrong, so records of the following species are regarded here as unreliable until firmer evidence is found.

*Caladenia catenata* (White Caladenia)  
*Caladenia dilatata* (Green-comb Spider-orchid)

*Glossodia major* (Wax-lip Orchid)  
*Pterostylis × ingens* (Sharp Greenhood)

### Introduced Species

<i>Acacia elata</i>	<i>Ehrharta erecta</i>	<i>Plantago coronopus</i>
<i>Acacia longifolia</i> subsp. <i>longifolia</i>	<i>Ehrharta longiflora</i>	<i>Plantago lanceolata</i>
<i>Acer negundo</i>	<i>Epilobium ciliatum</i>	<i>Plantago major</i>
<i>Agapanthus praecox</i>	<i>Erigeron karvinskianus</i>	<i>Poa annua</i>
<i>Agrostis capillaris</i>	<i>Euphorbia pepus</i>	<i>Polycarpon tetraphyllum</i>
<i>Aira</i> sp.	<i>Fraxinus angustifolia</i>	<i>Potentilla indica</i>
<i>Allium triquetrum</i>	<i>Galium aparine</i>	<i>Prunella vulgaris</i>
<i>Anagallis arvensis</i>	<i>Gamochaeta purpurea</i>	<i>Prunus cerasifera</i>
<i>Anthoxanthum odoratum</i>	<i>Genista monspessulana</i>	<i>Pseudoscleropodium purum</i>
<i>Arctotheca calendula</i>	<i>Geranium yeoi</i>	<i>Quercus robur</i>
<i>Asparagus scandens</i>	<i>Gladiolus undulatus</i>	<i>Ranunculus repens</i>
<i>Aster subulatus</i>	<i>Grevillea robusta</i>	<i>Romulea rosea</i>
<i>Bellis perennis</i>	<i>Hedera helix</i>	<i>Rubus anglocandicans</i>
<i>Briza maxima</i>	<i>Holcus lanatus</i>	<i>Rumex conglomeratus</i>
<i>Briza minor</i>	<i>Homalanthus populifolius</i>	<i>Rumex crispus</i>
<i>Bromus catharticus</i>	<i>Hypochoeris radicata</i>	<i>Rumex obtusifolius</i>
<i>Bromus diandrus</i>	<i>Ipomoea indica</i>	<i>Sisyrinchium iridifolium</i>
<i>Callitriche stagnalis</i>	<i>Isolepis levynsiana</i>	<i>Solanum nigrum</i>
<i>Cardamine flexuosa</i>	<i>Ixia polystachya</i>	<i>Solanum nigrum</i>
<i>Cardamine hirsuta</i>	<i>Juncus articulatus</i>	<i>Soliva sessilis</i>
<i>Centaurium erythraea</i>	<i>Leontodon taraxacoides</i>	<i>Sonchus asper</i>
<i>Cerastium glomeratum</i>	<i>Ligustrum lucidum</i>	<i>Sonchus oleraceus</i>
<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i>	<i>Linum trigynum</i>	<i>Sporobolus africanus</i>
<i>Cirsium vulgare</i>	<i>Lonicera japonica</i>	<i>Stachys arvensis</i>
<i>Conyza sumatrensis</i>	<i>Lotus corniculatus</i>	<i>Stellaria media</i>
<i>Cordyline australis</i>	<i>Lotus subbiflorus</i>	<i>Taraxacum officinale</i> spp. agg.
<i>Cortaderia selloana</i>	<i>Malus pumila</i>	<i>Tradescantia fluminensis</i>
<i>Cotoneaster glaucophyllus</i>	<i>Medicago polymorpha</i>	<i>Trifolium dubium</i>
<i>Cotoneaster pannosus</i>	<i>Mentha × piperita</i>	<i>Trifolium glomeratum</i>
<i>Crataegus monogyna</i>	<i>Modiola caroliniana</i>	<i>Trifolium repens</i>
<i>Crepis capillaris</i>	<i>Myosotis laxa</i> subsp. <i>caespitosa</i>	<i>Veronica persica</i>
<i>Crococsmia × crocosmiiflora</i>	<i>Nasturtium officinale</i>	<i>Viburnum tinus</i>
<i>Cynodon dactylon</i>	<i>Oxalis incarnata</i>	<i>Vicia disperma</i>
<i>Cynosurus echinatus</i>	<i>Oxalis pes-caprae</i>	<i>Vicia ?sativa</i>
<i>Cyperus eragrostis</i>	<i>Oxalis ?purpurea</i>	<i>Vinca major</i>
<i>Dactylis glomerata</i>	<i>Paspalum dilatatum</i>	<i>Vulpia bromoides</i>
<i>Digitaria sanguinalis</i>	<i>Pennisetum clandestinum</i>	<i>Zantedeschia aethiopica</i>
<i>Dipogon lignosus</i>	<i>Pinus radiata</i>	
<i>Echinochloa crus-galli</i>	<i>Pittosporum undulatum</i>	

### Fauna of special significance

#### Vulnerable in Victoria

Powerful Owl – according to the Atlas of Victorian Wildlife, recorded repeatedly, including recently. Such sightings are common around the Dandenong Ranges and the reserve is likely to be a small but frequently-visited part of the home range of one or more Powerful Owls.

#### Fauna habitat features

- The creek and wetland provide habitat for aquatic invertebrates and Southern Brown Tree Frogs;
- There are some large, old trees (alive and dead) with hollows that are likely to serve as roosting sites or nesting sites for birds, bats, possums or insects;
- Possum nest boxes have been installed, but their usage was not determined;
- The ground flora, logs and forest litter in the reserve represent suitable habitat for skinks, frogs and invertebrates. The abundant sedges and mat-rushes probably support many skipper butterflies;

- The high density and diversity of shrubs in parts of the reserve significantly improves the habitat for native insects and birds. The prickliness of many of the shrubs helps protect birds from cats;
- The site represents an ecological stepping-stone between the Dandenong Ranges National Park and the Blind Creek habitat corridor.

### Significance ratings

This site is registered as Site 4802 on the Department of Sustainability & Environment's 'BioSites' database, where it is rated as 'Regional' significance. However, the rating was not based on a thorough assessment of the site's attributes against current criteria.

The following is an assessment of the site's significance against the Department of Sustainability & Environment's standard criteria (Amos 2004).

#### *Ecological Integrity and Viability*

Criterion 1.1.1 attributes **Local** significance to 'All parts of riparian systems with riparian vegetation present', which applies to this site.

The site is also an ecological 'stepping stone' on the Blind Creek habitat corridor. The corridor is probably important at a Local scale. It follows that the site is of **Local** significance under criterion 1.2.6.

#### *Regionally Threatened Ecological Vegetation Classes*

Swampy Woodland is endangered in the Gippsland Plain bioregion and Valley Heathy Forest is endangered regardless of which bioregion. It follows from Appendix 3 of *Victoria's Native Vegetation Management - a Framework for Action* (NRE 2002a) that the patches of these EVCs are necessarily of at least High conservation significance, due to the endangered status. This, in turn, gives the site **State** significance under criterion 3.2.3.

The wetland vegetation is mainly the product of planting and its extent is very small. Therefore, it is not assigned any level of significance here despite the endangered status of wetland vegetation.

#### *Rare or Threatened Flora*

The site has a viable population of Water Blinks (*Montia fontana*), and the subspecies present in the reserve appears likely to be one that is listed in the Department of Sustainability & Environment's *Advisory List of Rare or Threatened Flora 2005*. As such, its presence is of **Regional** significance under criterion 3.1.2 of the standard criteria. The author discovered this species at Koolunga Native Reserve in October 2004 and in Bayswater North several days earlier, but the only prior record from the Melbourne area, by anyone, was in Croydon in 1940.

The Dandenong Range variant of *Acacia leprosa* is listed as 'rare' nationally and in Victoria. The large number of plants (approximately 100) in Koolunga Native Reserve form a viable local population, but still small compared with some other sites. This represents **Regional** significance under criterion 3.1.2 of the standard criteria.

Many of the other locally threatened plant species listed above have viable populations, thereby meeting criterion 3.1.5 for a site of **Local** significance.

#### *Rare or Threatened Fauna*

The Powerful Owl is a vulnerable species in Victoria and one or more of them periodically use Koolunga Native Reserve for habitat. However, the reserve is unlikely to support a viable population in its own right. Criterion 3.1.2 attributes **Regional** significance to sites such as this.

### Threats

- Invasion by environmental weeds, particularly near the creek and paths. See the forthcoming management plan for a full assessment;
- Eucalypt dieback disease, which is of moderate severity. It was noted as serious in a 1984 brochure about the reserve by the Knox Environment Society;
- Erosion along the creek;
- Trampling, particularly due to proliferation of shortcut paths;
- Loss or decline of many plant species that are present in dangerously small numbers due to inbreeding, poor reproductive success or vulnerability to localised chance events;
- Pet dogs and cats, which may affect wildlife by predation or marking habitat with their scent. Their faeces, urine and scratching also kills native flora. Very large numbers of dogs walk in the reserve daily;
- Plantings of species or strains of plants that are ecologically inappropriate (even if they occur naturally elsewhere in the district). Inappropriate plantings can lead to reproductive failure or outbreeding depression through breeding with naturally occurring species;
- Rubbish dumping.

### Management issues

- Knox City Council's current management regimen is part of a regular monitoring program; see '*Monitoring of Bushland Reserves in Knox*' and '*Monitoring of Bushland Reserves in Knox – 2002 Review*', both by Dr Lorimer for Knox City Council;
- Erosion along the creek behind private lots is to be investigated and corrected by Melbourne Water with high priority, according to the Blind Creek Waterway Management Activity Plan (Melbourne Water, 2002);
- Comprehensive, up-to-date management information and advice is being prepared by Dr Lorimer for a management plan to be released in spring 2004.

### Administration matters

- This site is worthy of inclusion within the proposed Environmental Significance Overlay, ESO2, because of its waterway and the features discussed under the heading 'Significance ratings';
- Koolunga Native Reserve is included under the existing Vegetation Protection Overlay Schedule 1 of the Knox Planning Scheme, based in part on the description of Site 3 of the report by Water Ecoscience (1998). The boundary of the site described in the present report differs in omitting adjacent private land;
- The Planning Scheme zoning is Public Park and Recreation Zone (PPRZ).

### Information sources used in this assessment

- A brochure about the reserve by the Knox Environment Society dated 1984;
- A plant list and data from ten quadrats (DSE numbers N13201-N13210) compiled by Mr Andrew Paget in March and April 1985;
- The 1994 report, '*Koolunga Flora and Fauna Reserve...Botanical Survey – Recorded Data, Analysis and Community Descriptions*', including data from three quadrats and compilations of earlier plant records. Authorship was claimed by Mark Allaway and Associates, but the work was principally done by Mr Damien Cook;
- Vegetation data gathered by Dr Lorimer during fieldwork in the reserve for this report and for the reports, '*Monitoring of Bushland Reserves in Knox*' (Lorimer 1999), '*Monitoring of Bushland Reserves in Knox – 2002 Review*' (Lorimer 2002), '*Monitoring of Bushland Reserves in Knox – 2007 Review*' (Lorimer 2007a) and '*2006 Bushland Management Plan for Koolunga Native Reserve, Ferntree Gully*' for Knox City Council, comprising:
  - Lists of plant species (indigenous and introduced) observed by Dr Lorimer in five separate vegetation types in the reserve on 19/12/01, 20/12/01 and 26/2/02, February 1999 and frequently during 2004-6;
  - Maps and assessments of the population sizes and distributions of thirty-nine scarce plant species in each of 1999 and 2002;
  - Data from four quadrats (three of them matching the three of Damien Cook in 1994 mentioned above), surveyed by the author on 16/2/99 and again on either 20/12/01 or 26/2/02;
  - Incidental fauna observations on all of the above dates;
  - Spotlighting on one evening.
  - Checks for fauna habitat, ecological threats and management issues on 20/12/01 and 26/2/02;
  - Five photographs of scenes that capture the main ecological features of the reserve and that will be useful for long-term monitoring of the reserve, taken originally on 9/11/98 and then again on 19/12/01;
- Various newsletters and other documents from the Friends of Koolunga Native Reserve, kindly provided by group convenor, Ms Kathleen Loxton;
- Verbal and written information from Ms Loxton and Mr Darren Wallace (local naturalist and bushland manager) about their own observations of the reserve's flora and fauna over many years;
- A list of plant species reported by Paget (1985) and attributed to Mr Gary Cheers (a former local naturalist), but treated here as dubious (see the end of the section above headed 'Plants of special significance');
- A purportedly equivalent (but substantially divergent) list attributed to Mr Cheers, also from 1985, presented by Western (1985);
- Records from the Atlas of Victorian Wildlife;
- Aerial photography from February 2001 and April 2003;
- Satellite imagery of the district;
- The Department of Sustainability & Environment's BioMaps of the area;
- Maps of geology and topography produced by agencies of the Victorian government.

### Acknowledgment

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