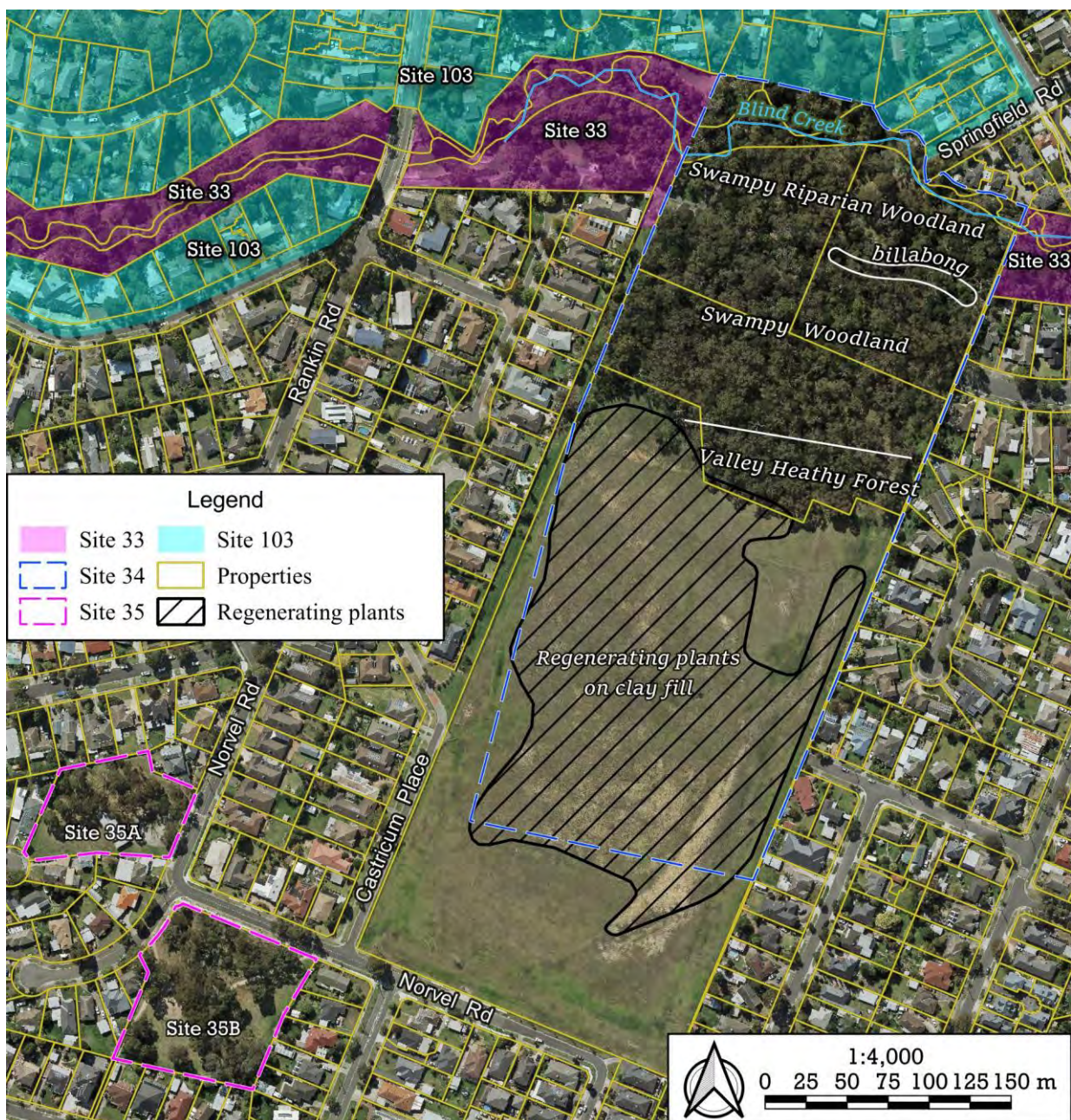


Site 34. Blind Creek Billabong & Norvel Estate, Ferntree Gully

Riparian and swampy vegetation with a shallow waterbody, plus remarkable natural regeneration of indigenous plants on clay fill that has been placed over a decommissioned clay quarry.

Summary of significant features:

- State significance: patches of the regionally-threatened Ecological Vegetation Classes, Swampy Riparian Woodland, Swampy Woodland and Valley Heathy Forest, some in good ecological condition;
- Regionally significant: 35 plants of the regionally-rare globe-pea, *Sphaerolobium minus*. (However, its habitat is planned to be developed for a new residential subdivision);
- Locally significant: viable populations of many plant species threatened with dying out in Knox;
- Locally significant: riparian (streamside) vegetation that forms part of a habitat corridor.



Boundaries

This 9.3 ha site is outlined with mid-blue dashes on the aerial photograph on the previous page. Compared with the previous (2010) edition of this report, the site has been extended greatly to the south to circumscribe most of an area where indigenous plants have regenerated in clay that has been used to fill a former clay pit. The northern boundary has changed in line with changes to the state cadastre along the banks of Blind Creek and to include undeveloped land closer to the creek bank than Melbourne Water's 20 m stream setback guideline.

Land use & tenure: The site's lots that are seen on the aerial photograph to have tree cover are reserves; however, about two-thirds of that land is fenced to exclude the public because of its history as part of the quarry property. The rest of the site is a proposed residential development site on top of the former clay pit, also fenced.

Site description

As seen on the aerial photograph, Site 34 contains a 'billabong' (possibly manmade) surrounded by forest or woodland, as well as an expanse of clay where a former clay pit has been filled in.

The area labelled 'Valley Heathy Forest' has a shallow slope of 1:20, facing north. Its soil is clay loam over clay subsoil, derived from Lower Devonian siltstone of the Humevale formation. North of there is a floodplain formed by alluvium that has been deposited by Blind Creek, with a shallow water table. The creek channel and billabong are etched into the alluvium. Elevations range from 89 m on the bank of the creek to 105 m on the site's southern boundary.

At least some of the clay fill in the site's southern half originates from the site and was used to form a bund around the clay pit. Remarkably, at least 73 indigenous plant species germinated after the clay was spread, including many locally-threatened species that regenerated prolifically. Unfortunately, the clay is within the planned Norvel Estate residential subdivision and will not survive. Steps have been taken to rescue some plants and collect seeds of others.

In the rest of the site, the most significant vegetation is in three areas:

- The western third of the billabong;
- On the left (southern) bank of the creek channel; and
- In the northwest corner of the fenced bushland, where there is rich native understorey with some plant species that are very rare in Knox.

Other parts of the site have been ecologically degraded to varying degrees by past clearing, excavation, drainage works, dumping of overburden from the quarry, and consequent proliferation of environmental weeds such as blackberry. However, efforts by Knox City Council and the Friends of Blind Creek Billabong to rehabilitate the vegetation have been very successful and, in most respects, the ecological condition is steadily improving, particularly as fauna habitat.

Large old eucalypts are scattered through much of the site.

Relationship to other land

The site is part of the Blind Creek habitat corridor, and is treated here separately from Site 33 only because its vegetation stands out for its breadth, ecological condition, abundance of uncommon species and separate management regime.

The treed residential neighbourhood to the north forms Site 103 (see the aerial photograph above). It represents an extension of the site's habitat for some wildlife, such as rosellas and Tawny Frogmouths. Land south of Blind Ck provides much less ecological linkage except for the Norvel Road Reserves (Site 35).

Bioregion: Gippsland Plain

Habitat types

Wetland (the billabong and the creek channel): Estimated to cover 1,500 m², roughly half in fair ecological condition (rating C) and half in poor ecological condition (rating D) but varying substantially from wet years to drought years.

Trees, shrubs, vines and ferns: Restricted to some *Melaleuca ericifolia* that extends into the billabong.

Aquatic and semi-aquatic flora: Dominated variously by *Carex appressa*, *C. gaudichaudiana*, *Phragmites australis* and members of *Juncus* and *Typha*, with the duckweed, *Lemna disperma*, becoming dominant in at least some summers. *Persicaria praetermissa* is quite scarce. *Machaerina rubiginosa* was present in the billabong in 1997 but appears to have died out.

Swampy Riparian Woodland (EVC 83, regionally Endangered) tending toward Riparian Forest (EVC 18): Estimated in c. 2003 to occupy 4,400 m², comprising 500 m² in good ecological condition (rating B), 1,500 m² in fair ecological condition (rating C) and 2,400 m² in poor ecological condition (rating D). These figures do not include subsequent revegetation.

Canopy trees: *Eucalyptus ovata*, *E. obliqua*, *E. cephalocarpa*, *E. viminalis*, *E. melliodora*.

Sub-canopy trees: *Acacia melanoxylon* and *Acacia mearnsii*.

Shrubs: *Prostanthera lasianthos* is abundant, *Leptospermum scoparium* is fairly abundant and *Bursaria spinosa* is scattered.

Ferns: *Pteridium esculentum* is very dense in the area that retains the highest density of remnant plant species.

Creepers: *Acaena novae-zelandiae* is fairly abundant; *Dichondra repens* is scarce. Notably, the globally-critically-endangered species, *Platylobium infecundum*, is present.

Other groundcover: Few indigenous species in this category remain, mostly grasses and sedges: *Gahnia radula*, *Glyceria australis*, *Lepidosperma elatius/laterale*, *Lomandra longifolia*, *Lomandra filiformis*, *Phragmites australis*.

Swampy Woodland (EVC 937, regionally Endangered): Estimated in c. 2003 to occupy 22,000 m², comprising 2,000 m² in good ecological condition (rating B), 19,500 m² in fair ecological condition (rating C) and 500 m² in poor ecological condition (rating D). In 2023–2024, the author did not enter the fenced area, which contains most of this EVC, so some of the information below refers to his prior (1997) survey.

Canopy trees: Dominated by *Eucalyptus cephalocarpa* followed by *E. ovata*.

Sub-canopy trees: Dominated by *Acacia mearnsii* followed by *Acacia melanoxylon* and *Exocarpos cupressiformis*, except in thickets dominated by *Melaleuca ericifolia*.

Shrubs: Patchy in density and fairly rich in species. *Goodenia ovata*, *Ozothamnus ferrugineus*, *Prostanthera lasianthos* and *Pultenaea gunnii* are (or have been) fairly abundant. *Coprosma quadrifida* is dense in places.

Vines: *Billardiera mutabilis*, *Clematis aristata* and *Cassytha melantha* have all been recorded.

Creepers: Creepers are represented by no fewer than nine species, of which *Poa tenera* and *Centella cordifolia* are (or have been) the most abundant. The ecological indicator species, *Gonocarpus micranthus*, *Goodenia elongata*, *Gratiola pubescens* and *Hemarthria uncinata* were all present in 1997 but some of these have probably died out.

Ferns: *Lindsaea linearis* is (or at least was) abundant and *Pteridium esculentum* rather less so. One *Cyathea australis* was found in 1985.

Groundcover: Moderately to very dense, dominated by *Gahnia radula*, *Microlaena stipoides* and *Rytidosperma* species. Other abundant species are *Deyeuxia quadriseta*, *Eragrostis brownii*, *Gonocarpus tetragynus*, *Juncus planifolius*, *Schoenus apogon*, *Austrostipa rudis* and *Themeda triandra*. The ecological indicator species, *Empodisma minus*, *Schoenus tesquorum*, *Machaerina rubiginosa*, *Triglochin striatum* and *Ornduffia reniformis* have all been recorded.

Valley Heathy Forest (EVC 127, regionally Endangered): Estimated to occupy 6,000 m², comprising 5,000 m² in fair ecological condition (rating C) and 1,000 m² in poor ecological condition (rating D).

Canopy trees: Dominated by *Eucalyptus cephalocarpa* and *E. radiata*.

Sub-canopy trees: Scattered *Acacia melanoxylon*.

Shrubs: Low to moderate density, the most abundant species being *Acacia myrtifolia*, *A. stricta*, *Bursaria spinosa* and *Cassinia aculeata*. The locally rare species, *Viminaria juncea*, germinated at the edge of the quarry in c.1995 but was bulldozed in 1997 (along with the locally rare wildflower, *Wahlenbergia multicaulis*).

Vines: *Billardiera mutabilis* is fairly abundant.

Ferns: Small amounts of *Lindsaea linearis*.

Groundcover: Grassy but with the characteristic heathy elements of *Hibbertia australis*, *Acrotriche serrulata*, *Epacris impressa*, *Dillwynia cinerascens*, *Lepidosperma gunnii*, *Platylobium obtusangulum* and *Xanthosia dissecta*. Dominant graminoids include *Gahnia radula*, *Microlaena stipoides*, *Austrostipa rudis* and

Themeda triandra. Other species that help to characterise the vegetation include substantial numbers of *Dianella longifolia* and *Gonocarpus tetragynus*, as well as small numbers of *Leptorhynchus tenuifolius*.

Plant species

Two lists follow. The first contains the regenerating indigenous plants on the clay fill, as observed in spring, 2021. (The clay fill is expected to be cleared for a residential subdivision.) That is followed by a list of all wild plants (indigenous and introduced) recorded in the rest of the site since 1985. In the latter list, the year of each species' most recent record is shown as a superscript except for indigenous species seen in the author's brief 2024 inspection of the unfenced land. The column headed 'Risk' indicates the indigenous species' risk of dying out in Knox as follows: 'C'=Critically Endangered; 'E'=Endangered; 'V'=Vulnerable; and 'N'=Near threatened. In addition, *Sphaerolobium minus* is rare throughout the Port Phillip and Western Port region. Planted species are not listed. Records dated 2001 or 2005 come from two lists that appear to include observations that were actually made in 1985 or 1997.

Risk	Indigenous species on the clay fill	Risk	Indigenous species on the clay fill
V	<i>Acacia mearnsii</i> , Black Wattle		<i>Lachnagrostis filiformis</i> , Common Blown-grass
V	<i>Acacia melanoxylon</i> , Blackwood		<i>Lepidosperma elatius</i> , Tall Sword-sedge
E	<i>Acacia myrtifolia</i> , Myrtle Wattle		<i>Lepidosperma gunnii</i> , Slender Sword-sedge
V	<i>Acacia pycnantha</i> , Golden Wattle	V	<i>Lepidosperma laterale</i> , Variable Sword-sedge
E	<i>Acacia stricta</i> , Hop Wattle		<i>Leptospermum scoparium</i> , Manuka
V	<i>Acacia verticillata</i> , Prickly Moses		<i>Lomandra filiformis</i> subsp. <i>coriacea</i> , Wattle Mat-rush
	<i>Austrostipa rudis</i> subsp. <i>rudis</i> , Veined Spear-grass		<i>Lomandra filiformis</i> subsp. <i>filiformis</i> , Wattle Mat-rush
	<i>Billardiera mutabilis</i> , Common Apple-berry		<i>Lomandra longifolia</i> subsp. <i>?exilis</i> , Cluster-headed Mat-rush
N	<i>Bossiaea prostrata</i> , Creeping Bossiaea		<i>Lomandra longifolia</i> subsp. <i>longifolia</i> , Spiny-headed Mat-rush
	<i>Burchardia umbellata</i> , Milkmaids	V	<i>Microtis parviflora</i> , Slender Onion-orchid
	<i>Bursaria spinosa</i> , Sweet Bursaria	V	<i>Opercularia varia</i> , Variable Stinkweed
	<i>Carex breviculmis</i> , Short-stem Sedge		<i>Oxalis exilis/perennans</i> , Wood-sorrel
	<i>Carex inversa</i> , Knob Sedge	V	<i>Ozothamnus ferrugineus</i> , Tree Everlasting
E	<i>Centella cordifolia</i> , Centella	C	<i>Patersonia occidentalis</i> , Long Purple-flag
C	<i>Daviesia latifolia</i> , Hop Bitter-pea	E	<i>Pimelea humilis</i> , Common Rice-flower
	<i>Deyeuxia quadriseta</i> , Reed Bent-grass	E	<i>Platylobium obtusangulum</i> , Common Flat-pea
	<i>Dianella revoluta</i> , Black-anther Flax-lily		<i>Poa morrisii</i> , Soft Tussock-grass
V	<i>Dillwynia cinerascens</i> , Grey Parrot-pea	V	<i>Poranthera microphylla</i> , Small Poranthera
N	<i>Drosera hookeri</i> , Branched Sundew	V	<i>Pultenaea gunnii</i> , Golden Bush-pea
C	<i>Epacris impressa</i> , Common Heath		<i>Rytidosperma fulvum</i> , Leafy Wallaby-grass
	<i>Eragrostis brownii</i> , Common Love-grass	E	<i>Rytidosperma semiannulare</i> , Tasmanian Wallaby-grass
E	<i>Eucalyptus cephalocarpa</i> , Mealy Stringybark		<i>Rytidosperma setaceum</i> , Bristly Wallaby-grass
V	<i>Eucalyptus ovata</i> , Swamp Gum		<i>Rytidosperma tenuius</i> , Purplish Wallaby-grass
	<i>Euchiton japonicus</i> , Creeping Cudweed		<i>Schoenus apogon</i> , Common Bog-rush
V	<i>Exocarpos cupressiformis</i> , Cherry Ballart	C	<i>Sphaerolobium minus</i> , Globe-pea
C	<i>Gahnia radula</i> , Thatch Saw-sedge	C	<i>Stylidium graminifolium</i> , Grass Trigger-plant
E	<i>Gahnia sieberiana</i> , Red-fruit Saw-sedge	E	<i>Thelymitra ?peniculata</i> , Trim Sun-orchid
	<i>Gonocarpus tetragynus</i> , Common Raspwort		<i>Themeda triandra</i> , Kangaroo Grass
C	<i>Goodenia humilis</i> , Swamp Goodenia		<i>Tricoryne elatior</i> , Yellow Rush-lily
	<i>Goodenia ovata</i> , Hop Goodenia	V	<i>Veronica gracilis</i> , Slender Speedwell
C	<i>Hibbertia australis</i> , Upright Guinea-flower	C	<i>Viminaria juncea</i> , Golden Spray
E	<i>Hypericum gramineum</i> , Small St John's Wort	E	<i>Viola hederacea</i> , Ivy-leaf Violet
	<i>Juncus amabilis</i> , Hollow Rush	V	<i>Xanthosia dissecta</i> , Cut-leaf Xanthosia
	<i>Juncus bufonius</i> , Toad Rush		
C	<i>Juncus holoschoenus</i> , Joint-leaf Rush		
	<i>Juncus pallidus</i> , Pale Rush		
E	<i>Juncus planifolius</i> , Broad-leaf Rush		
	<i>Juncus sarophorus</i> , Broom Rush		
	<i>Kunzea leptospermoides</i> , Yarra Burgan		

Risk Indigenous species (not on the clay fill)

- Acacia dealbata*, Silver Wattle
V *Acacia mearnsii*, Black Wattle
V *Acacia melanoxylon*, Blackwood
E *Acacia myrtifolia*, Myrtle Wattle ²⁰⁰¹
E *Acacia stricta*, Hop Wattle ¹⁹⁹⁷
V *Acacia verticillata*, Prickly Moses ²⁰⁰⁵
Acaena novae-zelandiae, Bidgee-widgee
E *Acrotriche serrulata*, Honey-pots ²⁰¹⁹
C *Amyema pendula*, Drooping Mistletoe ²⁰¹⁹
Arthropodium strictum, Chocolate Lily ²⁰⁰¹
Austrostipa pubinodis, Tall Spear-grass ¹⁹⁹⁷
Austrostipa rudis subsp. *rudis*, Veined Spear-grass ²⁰⁰⁵
Billardiera mutabilis, Common Apple-berry
N *Bossiaea prostrata*, Creeping Bossiaea ¹⁹⁸⁵
Burchardia umbellata, Milkmaids ²⁰⁰⁵
Bursaria spinosa, Sweet Bursaria
V *Caesia parviflora*, Pale Grass-lily ¹⁹⁹⁷
Carex appressa, Tall Sedge
Carex breviculmis, Short-stem Sedge ²⁰⁰⁵
E *Carex gaudichaudiana*, Fen Sedge
Cassinia aculeata, Common Cassinia ²⁰⁰⁵
E *Cassytha melantha*, Coarse Dodder-laurel ¹⁹⁹⁷
E *Cassytha pubescens*, Downy Dodder-laurel ¹⁹⁸⁵
E *Centella cordifolia*, Centella ²⁰⁰¹
C *Centrolepis strigosa*, Hairy Centrolepis ¹⁹⁹⁷
V *Clematis aristata*, Mountain Clematis ²⁰⁰¹
V *Coprosma quadrifida*, Prickly Currant-bush
C *Cyathea australis*, Rough Tree-fern ¹⁹⁹⁷
Deyeuxia quadriseta, Reed Bent-grass ²⁰⁰¹
Dianella longifolia var. *longifolia*, Pale Flax-lily ²⁰⁰⁵
Dianella tasmanica, Tasman Flax-lily
Dichondra repens, Kidney-weed
V *Dillwynia cinerascens*, Grey Parrot-pea ¹⁹⁹⁷
E *Dipodium roseum*, Rosy Hyacinth-orchid ¹⁹⁹⁷
V *Drosera aberrans*, Scented Sundew ²⁰¹⁹
V *Drosera auriculata*, Tall Sundew ¹⁹⁹⁷
C *Empodisma minus*, Spreading Rope-rush ²⁰⁰⁵
C *Epacris impressa*, Common Heath ²⁰⁰⁵
Eragrostis brownii, Common Love-grass ²⁰⁰⁵
E *Eucalyptus cephalocarpa*, Mealy Stringybark
E *Eucalyptus melliodora*, Yellow Box
E *Eucalyptus obliqua*, Messmate Stringybark
V *Eucalyptus ovata*, Swamp Gum
E *Eucalyptus radiata*, Narrow-leaved Peppermint ²⁰⁰⁵
C *Eucalyptus viminalis* subsp. *viminalis*, Manna Gum
E *Euchiton involucratus*, Common Cudweed ¹⁹⁹⁷
V *Exocarpos cupressiformis*, Cherry Ballart
C *Gahnia radula*, Thatch Saw-sedge
E *Gahnia sieberiana*, Red-fruit Saw-sedge ¹⁹⁸⁵
V *Glyceria australis*, Australian Sweet-grass
C *Gonocarpus micranthus* subsp. *micranthus*, Creeping Raspwort ¹⁹⁹⁷

Risk Indigenous species (not on the clay fill)

- Gonocarpus tetragynus*, Common Raspwort ²⁰⁰⁵
C *Goodenia elongata*, Lanky Goodenia ²⁰⁰¹
C *Goodenia humilis*, Swamp Goodenia ²⁰²³
N *Goodenia lanata*, Trailing Goodenia ²⁰²⁰
Goodenia ovata, Hop Goodenia
C *Gratiola pubescens*, Glandular Brooklime ¹⁹⁹⁷
V *Hemarthria uncinata*, Mat Grass ¹⁹⁹⁷
C *Hibbertia australis*, Upright Guinea-flower ²⁰⁰⁵
E *Hypericum gramineum*, Small St John's Wort ²⁰⁰⁵
Hypoxis hygrometrica, Golden Weather-glass ¹⁹⁹⁷
C *Imperata cylindrica*, Blady Grass
Isolepis inundata, Swamp Club-rush ²⁰⁰⁵
C *Isolepis marginata*, Little Club-rush ¹⁹⁸⁵
V *Isolepis platycarpa*, a club-rush ¹⁹⁹⁷
Juncus amabilis, Hollow Rush ²⁰⁰⁵
Juncus bufonius, Toad Rush ¹⁹⁹⁷
Juncus gregiflorus, Green Rush
Juncus pallidus, Pale Rush ²⁰⁰⁵
E *Juncus pauciflorus*, Loose-flower Rush ¹⁹⁹⁷
E *Juncus planifolius*, Broad-leaf Rush ¹⁹⁹⁷
E *Juncus procerus*, Tall Rush ²⁰⁰⁵
Juncus sarophorus, Broom Rush
E *Juncus subsecundus*, Finger Rush ¹⁹⁹⁷
Kunzea leptospermoides, Yarra Burgan
Lachnagrostis filiformis, Common Blown-grass
Laphangium luteoalbum, Jersey cudweed ²⁰⁰⁹
Lemna disperma, Common Duckweed
Lepidosperma laterale/elatius, a sword-sedge
Lepidosperma gunnii, Slender Sword-sedge ²⁰⁰⁵
C *Leptorhynchus tenuifolius*, Wiry Buttons ¹⁹⁹⁷
C *Leptospermum continentale*, Prickly Tea-tree ²⁰⁰⁵
C *Leptospermum lanigerum*, Woolly Tea-tree ¹⁹⁹⁷
Leptospermum scoparium, Manuka
V *Lindsaea linearis*, Screw Fern ²⁰¹⁹
E *Lobelia anceps*, Angled Lobelia ²⁰⁰⁵
Lomandra filiformis subsp. *coriacea*, Wattle Mat-rush
Lomandra filiformis subsp. *filiformis*, Wattle Mat-rush ¹⁹⁹⁷
Lomandra longifolia, Spiny-headed Mat-rush
Lythrum hyssopifolia, Lesser Loosestrife ²⁰⁰¹
C *Machaerina acuta*, Pale Twig-rush ¹⁹⁹⁷
C *Machaerina rubiginosa*, Soft Twig-rush
E *Melaleuca ericifolia*, Swamp Paperbark
Microlaena stipoides, Weeping Grass
V *Microtis parviflora*, Slender Onion-orchid ²⁰¹⁹
C *Muellerina eucalyptoides*, Creeping Mistletoe ¹⁹⁹⁷
E *Olearia lirata*, Snowy Daisy-bush

Risk	Indigenous species (not on the clay fill)
V	<i>Oxypetalum varia</i> , Variable Stinkweed ²⁰⁰⁵
C	<i>Ornithoglossum reniformis</i> , Running Marsh-flower ²⁰¹⁹
	<i>Oxalis exilis/perennans</i> , Wood-sorrel
V	<i>Ozothamnus ferrugineus</i> , Tree Everlasting
	<i>Pandorea pandorana</i> , Wonga Vine
C	<i>Pentapogon quadrifidus</i> , Five-awned Spear-grass ¹⁹⁹⁷
	<i>Persicaria decipiens</i> , Slender Knotweed ¹⁹⁹⁷
	<i>Persicaria praetermissa</i> , Spotted Knotweed
E	<i>Pimelea humilis</i> , Common Rice-flower ¹⁹⁸⁵
E	<i>Platylobium infecundum</i> , a flat-pea
E	<i>Platylobium obtusangulum</i> , Common Flat-pea ²⁰⁰⁵
	<i>Poa morrisii</i> , Soft Tussock-grass ²⁰⁰⁵
E	<i>Poa tenera</i> , Slender Tussock-grass
V	<i>Polyscias sambucifolia</i> , Elderberry Panax ²⁰⁰¹
	<i>Poranthera microphylla</i> , Small Poranthera ²⁰⁰⁵
V	<i>Prostanthera lasianthos</i> , Victorian Christmas-bush
	<i>Pteridium esculentum</i> , Austral Bracken
	<i>Pteris tremula</i> , Tender Brake
V	<i>Pultenaea gunnii</i> , Golden Bush-pea ²⁰⁰⁵
	<i>Rytidosperma laeve</i> , Smooth Wallaby-grass ¹⁹⁹⁷
E	<i>Rytidosperma pallidum</i> , Red-anther (or Silvertop) Wallaby-grass ²⁰⁰⁵
	<i>Rytidosperma penicillatum</i> , Slender Wallaby-grass ¹⁹⁹⁷
	<i>Rytidosperma racemosum</i> , Clustered Wallaby-grass
E	<i>Rytidosperma semiannulare</i> , Tasmanian Wallaby-grass ¹⁹⁹⁷
	<i>Rytidosperma setaceum</i> , Bristly Wallaby-grass ²⁰⁰¹
	<i>Rytidosperma tenuius</i> , Purplish Wallaby-grass ¹⁹⁹⁷
	<i>Schoenus apogon</i> , Common Bog-rush ²⁰⁰⁵
C	<i>Schoenus tesquorum</i> , Soft Bog-rush ¹⁹⁹⁷
E	<i>Senecio ?campylocarpus</i> , Bulging Fireweed ²⁰²³
V	<i>Senecio glomeratus</i> , Annual Fireweed
	<i>Senecio minimus</i> , Shrubby Fireweed ¹⁹⁹⁷
	<i>Senecio quadridentatus</i> , Cotton Fireweed ²⁰⁰¹
V	<i>Solanum ?laciniatum</i> , Large Kangaroo Apple ¹⁹⁹⁷
	<i>Tetrarrhena juncea</i> , Forest Wire-grass
	<i>Themeda triandra</i> , Kangaroo Grass ²⁰⁰⁵
V	<i>Triglochin striata</i> , Streaked Arrow-grass ²⁰⁰⁵
	<i>Typha domingensis</i> , Cumbungi ²⁰⁰¹
	<i>Typha ?orientalis</i> , Cumbungi
C	<i>Viminaria juncea</i> , Golden Spray ¹⁹⁹⁷
E	<i>Viola hederacea</i> , Ivy-leaf Violet ²⁰⁰⁵
C	<i>Wahlenbergia multicaulis</i> , Tadgell's Bluebell ¹⁹⁹⁷
E	<i>Wurmbea dioica</i> , Common Early Nancy ²⁰¹⁹

Risk	Indigenous species (not on the clay fill)
E	<i>Xanthorrhoea minor</i> , Small Grass-tree ¹⁹⁸⁵
V	<i>Xanthosia dissecta</i> , Cut-leaf Xanthosia ²⁰⁰⁵
Introduced species (not on the clay fill)	
	<i>Acacia floribunda</i> , White Sallow-wattle ¹⁹⁹⁷
	<i>Agrostis capillaris</i> , Brown-top Bent ²⁰⁰¹
	<i>Aira caryophyllea</i> , Silvery Hair-grass ¹⁹⁹⁷
	<i>Anthoxanthum odoratum</i> , Sweet Vernal-grass ²⁰⁰⁵
	<i>Arbutus unedo</i> , Irish Strawberry Tree ¹⁹⁹⁷
	<i>Asparagus scandens</i> , Asparagus Fern ²⁰⁰¹
	<i>Bellardia viscosa</i> , Sticky Bartsia ¹⁹⁹⁷
	<i>Briza maxima</i> , Large Quaking-grass ²⁰⁰⁵
	<i>Briza minor</i> , Lesser Quaking-grass ¹⁹⁹⁷
	<i>Cassinia sifton</i> , Sifton Bush ²⁰⁰¹
	<i>Cenchrus clandestinus</i> , Kikuyu Grass ¹⁹⁹⁷
	<i>Centaurium erythraea</i> , Common Centaury ²⁰⁰⁵
	<i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i> , Boneseed ²⁰⁰⁵
	<i>Cirsium vulgare</i> , Spear Thistle ²⁰⁰⁵
	<i>Coprosma repens</i> , Mirror-bush ²⁰⁰¹
	<i>Cordyline australis</i> , New Zealand Cabbage Tree ¹⁹⁹⁷
	<i>Cortaderia selloana</i> , Pampas Grass ¹⁹⁹⁷
	<i>Cotoneaster glaucophyllus</i> , Cotoneaster ¹⁹⁹⁷
	<i>Cotoneaster simonsii</i> , Himalayan Cotoneaster ¹⁹⁹⁷
	<i>Crepis capillaris</i> , Smooth Hawksbeard ¹⁹⁹⁷
	<i>Crocsmia × crocosmiiflora</i> , Montbretia ¹⁹⁹⁷
	<i>Cynodon dactylon</i> , Couch ²⁰⁰⁵
	<i>Cyperus eragrostis</i> , Drain Flat-sedge ¹⁹⁹⁷
	<i>Danthonia decumbens</i> , Heath Grass ¹⁹⁹⁷
	<i>Echinochloa crus-galli</i> , Common Barnyard Grass ¹⁹⁹⁷
	<i>Ehrharta erecta</i> , Panic Veldt-grass ²⁰⁰⁵
	<i>Erica lusitanica</i> , Spanish Heath ²⁰⁰⁵
	<i>Gamochaeta purpurea</i> , Spiked Cudweed ¹⁹⁹⁷
	<i>Genista monspessulana</i> , Montpellier Broom ²⁰⁰⁵
	<i>Hedera helix/hibernica</i> , Ivy ²⁰⁰¹
	<i>Holcus lanatus</i> , Yorkshire Fog ²⁰⁰⁵
	<i>Hypochaeris radicata</i> , Cat's Ear ²⁰⁰⁵
	<i>Juncus articulatus</i> , Jointed Rush ²⁰⁰¹
	<i>Juncus tenuis</i> , Slender Rush ¹⁹⁹⁷
	<i>Leontodon saxatilis</i> , Lesser Hawkbit ²⁰⁰¹
	<i>Lonicera japonica</i> , Japanese Honeysuckle ²⁰⁰⁵
	<i>Lotus corniculatus</i> , Bird's-foot Trefoil ¹⁹⁹⁷
	<i>Lotus subbiflorus</i> , Hairy Bird's-foot Trefoil ²⁰⁰¹
	<i>Paspalum dilatatum</i> , Paspalum ²⁰⁰⁵
	<i>Pinus radiata</i> , Monterey Pine ²⁰⁰⁵
	<i>Pittosporum undulatum</i> , Sweet Pittosporum ²⁰⁰⁵
	<i>Plantago lanceolata</i> , Ribwort ²⁰⁰⁵
	<i>Plantago major</i> , Greater Plantain ²⁰⁰¹
	<i>Prunella vulgaris</i> , Self-heal ²⁰⁰¹
	<i>Prunus cerasifera</i> , Cherry-plum ¹⁹⁹⁷
	<i>Romulea rosea</i> , Common Onion-grass ²⁰⁰⁵
	<i>Rubus anglocandicans</i> , Blackberry ²⁰⁰⁵
	<i>Rumex crispus</i> , Curled Dock ²⁰⁰¹
	<i>Setaria parviflora</i> , Slender Pigeon Grass ¹⁹⁹⁷
	<i>Sisyrinchium micranthum</i> , Blue Pigroot ¹⁹⁹⁷

Introduced species (not on the clay fill)

Solanum nigrum, Black Nightshade ²⁰⁰¹
Sonchus oleraceus, Sow-thistle ²⁰⁰⁵
Symphotrichum subulatum, Aster-weed ²⁰⁰⁵
Taraxacum sect. *Taraxacum*, Garden Dandelion ²⁰⁰⁵
Tradescantia fluminensis, Wandering Trad ¹⁹⁹⁷

Introduced species (not on the clay fill)

Trifolium campestre var. *campestre*, Hop Clover ¹⁹⁹⁷
Trifolium repens, White Clover ¹⁹⁹⁷
Ulex europaeus, Gorse (Furze) ²⁰⁰⁵
Watsonia meriana var. *bulbillifera*, Bulbil Watsonia ²⁰⁰⁵

Notes concerning some of the locally-threatened plant species

Critically Endangered, globally

Platylobium infecundum (a flat-pea) – Two adjacent plants remain amid Ivy and Angled Onion, approximately 1 m and ½ m across. Care is needed to avoid damaging the plants during weeding.

Listed as Endangered under Victorian law

Senecio ?campylocarpus (Bulging Fireweed) – the author in late 2023 found a solitary, immature plant believed to be this species, in mud beside the billabong (seemingly excellent habitat for it). This species is listed as endangered in Victoria but it tends to volunteer freely wherever there is mud and limited competition.

Threatened in metro Melbourne

Sphaerolobium minus (a globe-pea) – 35 individuals were found growing in the clay fill in 2021, the only record in Knox since 2013, when the author found three at the Bateman Street Bush in Wantirna (Site 49).

Machaerina rubiginosa (Soft Twig-rush) – a substantial patch remains at the western edge of the fenced area in 2024. The patch found in the billabong in 1997 appears to have died out.

Viminaria juncea (Golden Spray) – found beside the quarry in 1997 and subsequently destroyed, but over 100 germinated in the clay spread over the former clay pit – still present when last checked on 23/7/24.

Wahlenbergia multicaulis (Tadgell's Bluebell) – found beside the quarry in 1997 and subsequently destroyed.

Fauna of special significance

No significant fauna species make more than fleeting visits to the site, e.g. a Grey Goshawk in 1997.

Fauna habitat features

- The billabong provides habitat for frogs and a range of invertebrates, potentially including any of the threatened cray species known to occur in Boronia and Ferntree Gully;
- There are large eucalypts with hollows that provide suitable roosting or nesting sites for certain fauna;
- Some large Manna Gums (*Eucalyptus viminalis*) may provide nest sites for bird species that only breed in particularly tall trees;
- Patches of dense undergrowth provide habitat for small insect-eating birds such as wrens;
- The groundcover of dense grasses and sedges in much of the site is excellent habitat for butterflies that rely on such plants.

Significance ratings

The following is an assessment of the site's biological significance against the Department of Energy, Environment & Climate Action'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.

Endangered Vegetation Types

Most of the site's treed area easily meets the definition of a 'remnant patch' adopted by the standard criteria. All the EVCs present in the site are listed as regionally Endangered. Appendix 3 of *Victoria's Native Vegetation Management – a Framework for Action* (NRE 2002a) recognises such vegetation as being of at least High conservation significance. That translates to **State** significance under criterion 3.2.3.

Threatened flora

There are two plants of the flat-pea, *Platylobium infecundum*, in the site, on the southern bank of the old creek course. That species is listed under the *Flora and Fauna Guarantee Act* as Critically Endangered and it does not occur outside Victoria. A literal reading of criterion 3.1.2 gives any known habitat of such a species National significance. However, as discussed in Section 8.1 of Volume 1, this report adopts the policy that the presence of just one or two plants of *Platylobium infecundum* is only of **Local** significance because it does not (in the words of the criteria document) ‘make a substantial contribution to the conservation of the asset’ at the National level.

The Bulging Fireweed (*Senecio campylocarpus*) is listed as Endangered under Victorian law. If the species were to occur regularly or consistently in Site 34, that would qualify for State significance under criterion 3.1.2. However, the only record is of a solitary plant found at the billabong in this study, which is here deemed inadequate to qualify under criterion 3.1.2.

The globe-pea, *Sphaerolobium minus*, is rare throughout the Gippsland Plain bioregion and its population in the bioregion has plummeted since the turn of the century (particularly during the Millennium Drought). The 35 individuals found growing in the clay fill represent an important population on the regional scale, thereby meeting criterion 3.1.4 for **Regional** significance. The clay fill is planned to be developed but as it stands in 2024, the population is important as a resource for propagation of plants to be planted elsewhere.

Many of the locally-threatened plant species listed above have viable populations, thereby meeting criterion 3.1.5 for **Local** significance. Even if the plants growing in the clay fill are deemed not to represent viable populations because of the planned residential subdivision, species such as Golden Spray (*Viminaria juncea*) are so prolific and such important seed resources that they meet criterion 3.1.5 for **Local** significance.

Threats

- The planned residential subdivision, which will remove the plants growing in the clay fill;
- Human-induced climate change, which is predicted to cause more severe droughts, heatwaves, fires and storms, as well as substantially lower rainfall (particularly in winter);
- Displacement of indigenous flora by environmental weeds such as Japanese Honeysuckle (*Lonicera japonica*), Sweet Pittosporum (*Pittosporum undulatum*), Blackberry (*Rubus anglocandicans*) and Bulbil Watsonia (*Watsonia meriana*);
- Loss or decline of plant species that are present in such precariously small numbers that they are vulnerable to inbreeding, poor reproductive success or localised chance events such as being struck by a falling tree limb;
- Foxes, which kill wildlife and spread woody weeds and blackberries.

Strategic planning

- As a result of the second edition of this report in 2010, the original version of this site is covered by Schedule 2 of the Environmental Significance Overlay (ESO2). That edition cited the State significance, the endangered EVCs, the areas of native vegetation with all strata present, the large number of significant plant species, the richness of the site’s native vegetation and the habitat provided for fauna. This edition has almost doubled the size of the site to include the significant plants that have regenerated on clay fill that is destined for residential subdivision. Although the regenerated plants are significant, that part of the site should not be covered by ESO2 because it that would conflict with the strategic planning that led to the subdivision proposal. Instead, it is recommended to amend the current southern ESO2 boundary to match that of the reserve, RES1\PS915838. That will omit the former clay pit. It is also recommended to amend the northern ESO2 border to match the one adopted here, following the Melbourne Water stream setback guidelines. The abutting Vegetation Protection Overlay for Site 103 would need to be amended to the same alignment;
- The properties in the site are larger than 0.4 ha and therefore do not qualify for the size-based exemption from the state-wide baseline planning controls over removal of native vegetation (clause 52.17). However, the regrowth on the clay fill is exempt on the basis of being less than ten years old;
- A strip along the creek is zoned Urban Floodway Zone (UFZ) and the rest of the site is zoned Special Use Zone – Schedule 2 (SUZ2).

Information sources used in this assessment

- Data from three quadrats north of the former quarry fence (numbers N13171-N13173) and five quadrats south of that fence (numbers N13275-N13279), compiled by Andrew Paget in May 1985;

- The 1997 report, '*A Management Plan for Blind Creek Billabong, Ferntree Gully*' by J.C. Reid, G.S. Lorimer and H. Moss for Knox City Council, along with the supporting field data, including six lists of indigenous and introduced plant species for various parts of the site, a quadrat in the Swampy Woodland, incidental fauna observations, and checks for fauna habitat, ecological threats and management issues;
- The 1997 report, '*Vegetation Survey of Linear Reserves – A Management Strategy for Riparian and Flood Plain Vegetation*', by Reid, Moss and Lorimer for Knox City Council, along with the supporting field data. This included the same sorts of data as above (except for the absence of a quadrat) for parts of the site that were outside the area covered by the management plan just cited;
- Site inspections (without collecting species data) by Dr Lorimer in 2007 and on 7/6/08, including mapping of the interface between the clay pit and native vegetation;
- A detailed survey of the plants that regenerated on the clay by Dr Lorimer on 2nd October 2021, supplemented by records of other species seen by Darren Wallace. This work led to a report to Knox City Council titled '*Norvel Estate Plant Regeneration*', dated 10th December 2021;
- An inspection of the billabong by Dr Lorimer on 14th September 2023;
- A botanical survey by Dr Lorimer of the publicly-accessible part of the site excluding the billabong on 23rd July 2024;
- Casual observations by Dr Lorimer during his periodic trips along the shared path;
- The Melbourne Water stream setback guidelines in the organisation's 2013 document, '*Waterway Corridors – Guidelines for Greenfield Development Areas within the Port Phillip and Westernport Region*';
- Records of flora and fauna observations stored in Knox City Council's biodiversity database;
- Records of flora and fauna observations stored in the Atlas of Living Australia, noting that most of the indigenous plant records since 2009 are of planted plants but not flagged as such;
- The Victorian Government's 'NatureKit' website;
- Aerial and satellite imagery from between 1946 and 2025;
- A 1946 Crown Lands and Survey cadastral map of the area, showing the course of Blind Creek;
- Maps of geology, topography and strategic planning information produced by agencies of the Victorian Government.