

Site 43. Lakewood Nature Reserve, Knoxfield

Council reserve with bushland, a lake, a small dam, revegetation areas and open, grassed areas.

Summary of significant features:

- State significance: patches of the regionally-endangered vegetation types, Valley Heathy Forest, Swampy Woodland and Aquatic Herbland;
- State significance: substantial populations of Bulging Fireweed (*Senecio campylocarpus*) and Spoon Mudmat, *Glossostigma cleistanthum*, both listed as Endangered under Victorian law;
- State significance: known habitat for Latham's Snipe, which is listed as vulnerable under Commonwealth law;
- Regionally significant: known habitat of Blue-billed Duck and Eastern Great Egret, both listed as Vulnerable under Victorian law;
- Locally significant: viable populations of many locally-threatened plant species and several locally-threatened bird species;
- Locally significant: an ecological stepping-stone for waterbirds that move from wetland to wetland.

Boundaries

The site is the whole of the reserve, outlined in red on the plan on the next page. It occupies 18.05 ha.

Land use & tenure: Reserve used for passive recreation, exercise, nature conservation, education, stormwater management and flood mitigation.

Site description

The reserve is popular for passive recreation and exercise. It has a 'Friends' group and is used as an educational resource by the adjacent Knox Park Primary School. It has a path system with paving, boardwalks, a pier and signs about natural history. There are also informal paths whose foot traffic causes some damage to the vegetation. There are no buildings.

The reserve was part of the Scoresby Horticultural Research Station until the 1980s. It lies in a broad, very shallow valley draining westward, between the more major valleys of Blind Ck and Monbulk Ck. The slopes are very shallow (<5%) and the elevation range is 70–81 m.

The Riddell Drain has been dug along the valley floor, flowing west-northwestward into the reserve's 3.3-hectare lake. The lake is within a flood retarding basin and has a normal depth of 2 m.

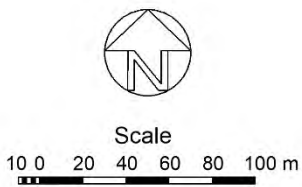
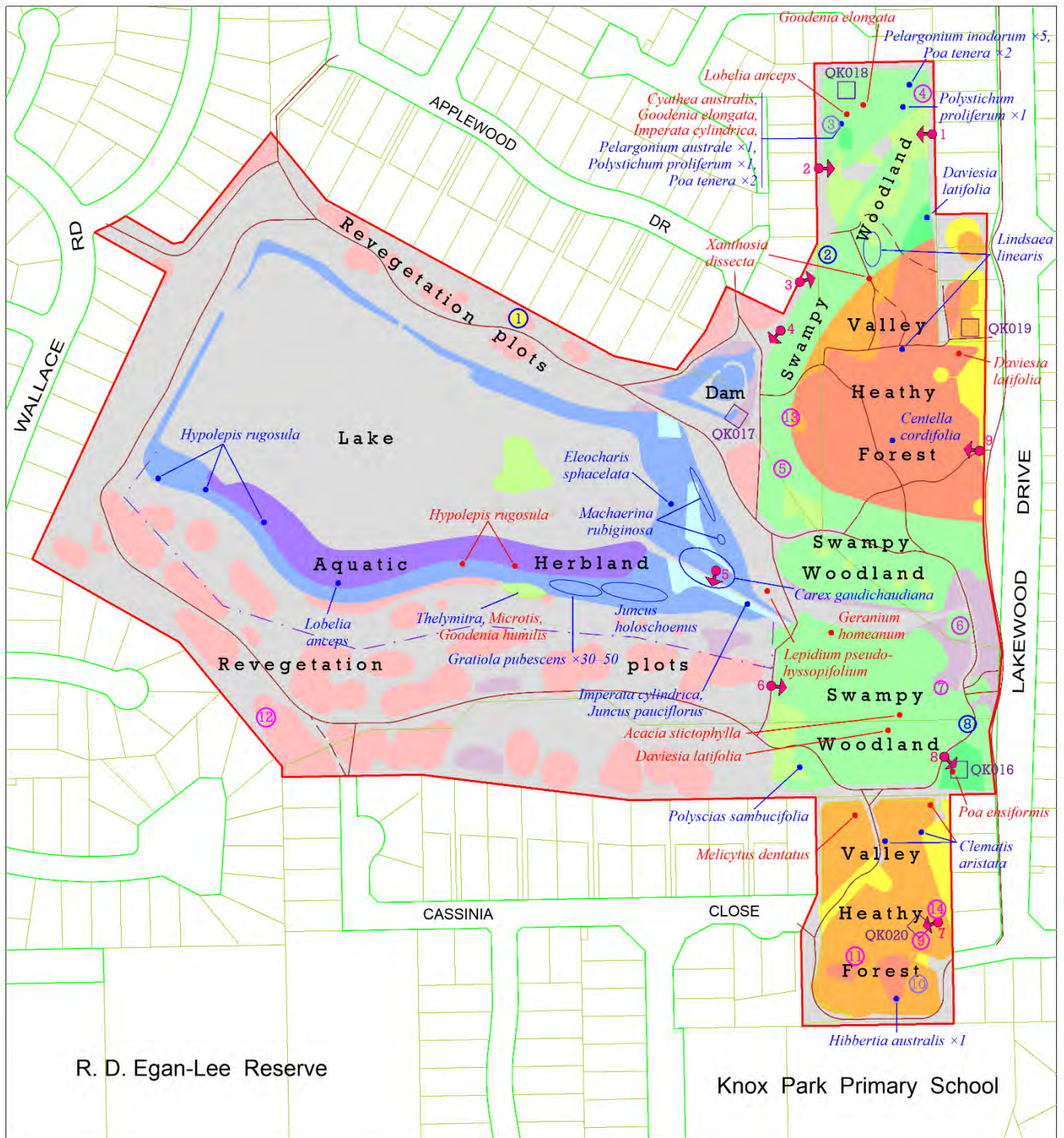
The other natural inflow to the lake is a shallow, indistinct drainage line that passes through the northeastern extremity of the reserve, labelled 'Swampy Woodland' on the plan below, then through the labelled dam. Late in the 20th Century, conditions within that Swampy Woodland were quite swampy; There was a tall, dense thicket of Swamp Paperbarks (*Melaleuca ericifolia*) dominating a range of swamp-loving understorey plant species such as Angled Lobelia (*Lobelia anceps*), Lanky Goodenia (*Goodenia elongata*), Mother Shield-fern (*Polystichum proliferum*) and Red-fruit Saw-sedge (*Gahnia sieberiana*). Drainage for the urban development upslope (north) of this area caused increasing dryness. During and since the Millennium Drought, soil conditions have been so dry that some of the moisture-loving plant species have died out and the rest have been decimated. By 2020, the formerly dense, tall paperbarks were reduced to three young sprouts.

The natural topsoil within roughly 60 m each side of the Riddell Drain is alluvium washed down from higher up the catchment. The drainage line from the north has shallower alluvium. There are also swamp deposits beneath and surrounding the lake. The rest of the site has shallow, poorly draining, clay loam over clay subsoil, derived from weathering of the underlying Lower Devonian siltstone of the Humevale formation.

The lake was constructed sometime between 1976 (when an aerial photograph shows it absent) and 1979 (when another aerial photograph shows it present). It is one of the most biologically significant features of the whole municipality. The abundant waterbirds that visit the lake have introduced numerous indigenous wetland plants, including some that are quite rare. These plants have developed into the regionally-endangered EVC, Aquatic Herbland, around the lake perimeter. The lake's water level rises and falls seasonally and from year to year, causing the width and composition of the fringing vegetation to vary. At any one time, bands of vegetation can

be dominated variously by rushes, sedges, Water Couch (*Paspalum distichum*) and short-lived species such as Waterwort (*Elatine gratioloides*) and the rare mud-mat, *Glossostigma cleistanthum*.

Plan of Lakewood Nature Reserve, from 'Monitoring of Bushland Reserves in Knox – 2020 Review'



LEGEND

<ul style="list-style-type: none"> Path Minor path Fence Reserve boundary 1 Photo point QK020 Quadrat 	<p>Significant species</p> <ul style="list-style-type: none"> current former 	<p>Large Old Trees</p> <ul style="list-style-type: none"> ① Good condition ⑤ Fair condition ⑧ Poor condition ⑨ Very poor condition ⑦ Dead 	<p>Ecological Condition</p> <table border="1"> <tr> <td>B</td> <td>C</td> <td>D</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <p>Vegetation Types</p> <ul style="list-style-type: none"> Valley Heathy Forest Swampy Woodland Aquatic Herbland Revegetation No native vegetation 	B	C	D									
B	C	D													

The last of these species is testament to the remarkable ability of wetland plants to spread across the landscape with the aid of waterbirds: The nearest record of the species prior to the first (2004) edition of this report was near the Murray River, 200 km away. At various times there have been other rare plants such as Pigweed (*Dysphania glomulifera*), as well as the wetland environmental weed, *Bidens tripartita*, more than 100 km further west than any previously known occurrence in Australia.

The plants originally brought into the lake by waterbirds have, in turn, created habitat for waterbirds, frogs and invertebrates. Threatened bird species, such as the resident Blue-billed Ducks, can be seen on and around the lake daily. The fact that non-fish-eating diving birds like Blue-billed Ducks can be seen diving in the lake indicates that the lake bottom is at least partially vegetated and has some ecological function, but the author found no vegetation while wading in gumboots in the eastern (shallow) end of the lake.

A vegetated island is marked on the plan above and appears on the cover of this volume but the author has not visited it. Its perimeter was observed being used for hunting by the uncommon Great Crested Grebe and threatened egrets, and mudflats around it were seen being used by other uncommon birds such as Blue-billed Ducks and Black-fronted Dotterels.

The lake is an excellent example of how a wetland can be artificially created and acquire the species, diversity and ecological functions of a naturally created ecosystem. It well deserves a proper investigation of its aquatic and amphibious fauna. It is also an excellent resource for recreation, amenity and education (e.g. by the neighbouring Knox Park Primary School, Site 108).

The small dam marked on the plan is now filled almost solely by stormwater from the nearby residential area. It is managed as a stormwater treatment wetland, subject to periodic excavation to remove silt. In 1989, before planting began, several of the plant species growing on the dam's eastern bank were rare in the Melbourne area, e.g. the Swamp Mazus (*Mazus pumilio*). These had declined by 1999, apparently due mainly to machinery operating there to remove silt. The rare species are now no longer present and planted plants now dominate over the diminished number of wild, indigenous plants.

There is a large old Mealy Stringybark (*Eucalyptus cephalocarpa*) north of the lake with a small area of remnant understorey around it. The tree is significant for its size and the likely habitat value of its hollows. It is represented on the plan above by a circle with a '1' in it. Its ecological function is being increasingly supplemented by adjacent revegetation areas. There are many more revegetation plots on the southern side of the lake.

Open, grassed areas around the lake are grazed by waterbirds – mainly Purple Swamphens and Australian Wood Ducks. Masked Lapwings also frequently use the grassed areas.

Insectivorous bats can be seen above the lake at dusk (but easily confused with swallows). They may be just as numerous above the forest, but less easily seen. They would be roosting during the daytime in hollows and fissures within the forest's trees.

The reserve's 5½ ha of forest are of comparable biological significance to the lake. The two EVCs that are present – Valley Heathy Forest and Swampy Woodland – are both regionally endangered, and they tend to intergrade into one another. As can be seen on the plan above, the forest's ecological condition is quite variable, but there is some of each EVC in good ecological condition. The main causes for deterioration of the native vegetation have been the effects of clearing and drainage works, and consequential establishment of environmental weeds.

Eucalypt dieback is widespread and has been severe in parts but it is apparently not trending worse.

Environmental weeds that were having severe impact in many parts of the forest until early this century have been eradicated and there has been extensive natural regeneration of indigenous flora, including species that are rare or threatened in the Melbourne area. Conversely, Wonga Vine (*Pandorea pandorana*), which is not indigenous to Knoxfield, is now seriously displacing indigenous plants. Overall, the number of indigenous plant species in the reserve has been stable. Most of the losses of species can be attributed to legacy effects of the history of the area, particularly urbanisation.

Ecological burning was conducted in the reserve's southeastern tongue in 1999 and in the northeastern tongue in 2020. The regeneration that followed produced short-term benefits for some indigenous plant species but it did not result in a pulse of seed production, so some species have less seeds in the soil after the burns than before.

A feature of particular interest in the reserve is the unusually high abundance of Black Sheoak (*Allocasuarina littoralis*) in the forest, in both the Valley Heathy Forest and the Swampy Woodland. Such a large, secure, breeding population is unusual in the Melbourne area.

Relationship to other land

The site's canopy of Valley Heathy Forest continues into the adjoining Knox Park Primary School (Site 108), which has very scarce and patchy native understorey. There is a gap of less than 200 m from there to R.D. Egan-Lee Reserve (Site 41). Some birds and insects no doubt commute between these sites but the incidental observations during the fieldwork for this study did not reveal such movements other than by common urban birds.

There is almost no other native understorey for a radius of 900 m from these three sites, and the nearest 'core' areas of native vegetation are more than 3 km away, along Dandenong Ck and in the Dandenong Ranges. These distances represent substantial disconnection of the reserves from other forest habitat, other than for mobile fauna such as waterbirds.

Many of the abundant waterbirds at the lake apparently move between there and the various other lakes on the floodplain of the Dandenong Creek system. Waterbirds can often be seen crossing Burwood Hwy on a trajectory between Lakewood Nature Reserve and the dam informally known as 'Lake Knox', 1.2 km to the north-northeast. Other nearby lakes include Caribbean Lake, Koolamarra Waters, the Waterford Valley lakes and Jells Park's lake. Some species of waterbirds move among these on a daily basis and others move seasonally.

Bioregion: Gippsland Plain

Habitat types

Open Water in the lake and small dam, apparently with bottom-dwelling vegetation, based on the presence of diving waterbirds such as Blue-billed Ducks that need such vegetation. The size of the area varies above and below 3.3 ha as the water level rises and falls from month to month and year to year. This habitat is critical for the many significant waterbirds that live in the reserve or visit it.

Aquatic Herbland (EVC 653, **regionally Endangered**) fringing the lake and small dam. Although the water bodies are artificially created, the fringing vegetation has colonised naturally. The area is typically 1.5 ha but varies as the water level rises and falls.

Trees and vines: None.

Shrubs: There are a few *Goodenia ovata* and *Melaleuca ericifolia* on the southern fringe, and several seedlings of *Viminaria juncea* have been planted at the eastern end of the lake.

Ferns: Four patches of *Hypolepis rugosula* on the southern fringe.

Groundcover: Dominated by indigenous rushes, particularly *Juncus sarophorus* and *Juncus procerus*, with patches of various *Persicaria* species (particularly *P. decipiens*), *Carex appressa*, *Carex gaudichaudiana*, *Typha* species, *Triglochin striatum*, *Eleocharis acuta* and seasonally, many small, amphibious herbs such as *Elatine gratioloides*, *Glossostigma cleistanthum*, *Dysphania glomulifera*, *Isolepis* species and *Alternanthera denticulata*. There are also bands of the serious environmental weed, *Paspalum distichum*. *Alisma plantago-aquatica* is abundant, as are *Pseudognaphalium luteoalbum* and *Senecio campylocarpus*, in season.

Valley Heathy Forest (EVC 127, **regionally Endangered**): 2.8 ha in total.

Canopy trees: Dominated by *Eucalyptus cephalocarpa* with smaller numbers of *Eucalyptus radiata* and *Eucalyptus ovata*.

Sub-canopy trees: *Acacia melanoxylon*, *Acacia mearnsii*, *Exocarpos cupressiformis* and *Allocasuarina littoralis* are fairly dense.

Shrubs: There is a shrub layer that is approximately 3 m tall, mostly dense and prickly at maturity but with open patches. It is dominated by *Acacia paradoxa* or *Bursaria spinosa*, accompanied variously by *Coprosma quadrifida*, *Leptospermum continentale*, *Leptospermum scoparium* or *Kunzea*. There are also plenty of smaller shrubs, of which *Epacris impressa* is the main species emerging above the groundcover.

Vines: *Billardiera mutabilis* is fairly abundant but with small total cover. There is one dense patch of *Clematis aristata*.

Ferns: *Pteridium esculentum* is dense in patches.

Groundcover: Grassy but with scattered sub-shrubs including the characteristic species, *Hibbertia australis*. There are patches dominated variously by *Microlaena stipoides*, *Gahnia radula*, *Poa morrisii*, *Austrostipa rudis* and several *Rytidosperma* species. Other abundant species are *Arthropodium strictum*, *Burchardia umbellata*, *Caesia parviflora*, *Dianella longifolia*, *Dillwynia cinerascens*, *Gonocarpus tetragynus*, *Goodenia lanata*, *Rytidosperma pallidum*, *Lepidosperma gunnii*, *Lomandra filiformis*, *Themeda triandra*

and *Xanthorrhoea minor*. The characteristic species *Acrotriche serrulata*, *Bossiaea prostrata*, *Caesia parviflora*, *Dianella revoluta*, *Pimelea humilis*, *Platylobium obtusangulum* and *Veronica gracilis* are present.

Swampy Woodland (EVC 937, regionally Endangered): 2.5 ha in total.

Canopy trees: Dominated by *Eucalyptus ovata* to approximately 20 m tall, with considerably fewer *Eucalyptus cephalocarpa* and occasional *Eucalyptus radiata*.

Sub-canopy trees: Rather dense, comprising *Acacia melanoxylon*, *Acacia mearnsii*, *Exocarpos cupressiformis*, *Allocasuarina littoralis* and a tall patch of *Melaleuca ericifolia*.

Shrubs: There is a layer approximately 3–4 m tall, dominated by *Coprosma quadrifida* with smaller numbers of *Ozothamnus ferrugineus*, *Bursaria spinosa*, *Kunzea* and *Leptospermum scoparium*. There are also scattered lower shrubs, comprising *Acacia verticillata*, *Leptospermum continentale* and *Goodenia ovata*.

Vines: *Billardiera mutabilis* is fairly abundant.

Ferns: *Pteridium esculentum* is scattered and there is a dense, ferny patch that includes approximately 13 *Cyathea australis* and one plant each of *Polystichum proliferum* and *Adiantum aethiopicum*.

Groundcover: Dominated variously by *Lomandra longifolia*, *Gahnia radula*, *Gahnia sieberiana*, *Microlaena stipoides* and patches of *Pteridium esculentum*. Species that are abundant but not dominant include *Acaena novae-zelandiae*, *Burchardia umbellata*, *Dianella longifolia*, *Gonocarpus tetragynus*, *Poa morrisii* and *Austrostipa rudis*. The characteristic species, *Goodenia elongata*, *Hemarthria uncinata*, *Dianella tasmanica*, *Lobelia anceps* and *Poa tenera* are (or were formerly) all present.

Plant species

The following plant species have been reliably recorded within the reserve's native vegetation. Species not seen during the 2020s are indicated by superscripts showing the year of the most recent record. *Wurmbea dioica* was recorded by Chris Klep, the 1989 records are from an Ecological Horticulture botanical survey and the rest are the author's. The many additional records (mainly orchids) in a 1970 compilation list from the Scoresby Horticultural Research Station are excluded because the species may not have been within what is now the reserve. A 2022 list of species has been excluded due to too many clear misidentifications. 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, *Glossostigma cleistanthum*, *Senecio campylocarpus* and *Acacia stictophylla* are listed as Endangered under Victorian law and species with names in bold are rare throughout the Melbourne region.

Wild indigenous non-vascular species

Alga

Chara australis, a stonewort

Liverworts

Chiloscyphus semiteres, Green Worms

Lunularia cruciata, Moonwort²⁰¹⁴

Riccia crystallina, a liverwort²⁰⁰⁹

Ricciocarpos natans, Ricciocarpos

Mosses

Campylopus clavatus, Broody Swan-neck Moss

Campylopus introflexus, Heath Star Moss

Eurhynchium praelongum, Common Feather-moss

Fissidens curvatus, a pocket-moss

Funaria hygrometrica, Common Fire-moss

Hypnum cupressiforme, Common Hypnum

?*Philonotis tenuis*, Apple Moss

Polytrichum juniperinum, Common Juniper-moss²⁰¹⁴

Ptychomnion aciculare, Paper Moss, Pipe-cleaners

Racopilum cuspidigerum var. *convolutaceum*, a moss

Rosulabryum billarderi, Common Thread-moss²⁰⁰⁹

Wild indigenous non-vascular species

Sematophyllum homomallum, a moss

Thuidiopsis furfurosa, Golden Weft-moss

Risk Wild indigenous vascular species

Fern species

V *Adiantum aethiopicum*, Common Maidenhair

C *Cyathea australis*, Rough Tree-fern²⁰¹⁴

C *Hypolepis rugosula*, Ruddy Ground-fern

V *Lindsaea linearis*, Screw Fern

E *Polystichum proliferum*, Mother Shield-fern

Pteridium esculentum, Austral Bracken

Flowering species

V *Acacia mearnsii*, Black Wattle

V *Acacia melanoxylon*, Blackwood

Acacia paradoxa, Hedge Wattle

Acacia paradoxa × *stictophylla*, Cinnamon Wattle × Hedge Wattle hybrid¹⁹⁸⁹

V *Acacia stictophylla*, **Dandenong Range Cinnamon Wattle** (died out c. 2019)

V *Acacia verticillata*, Prickly Moses

Acaena novae-zelandiae, Bidgee-widgee

Risk Wild indigenous vascular species

- E *Acrotriche serrulata*, Honey-pots
 N *Alisma plantago-aquatica*, Water Plantain
 V *Allocasuarina littoralis*, Black Sheoak
 V *Alternanthera denticulata*, Lesser Joyweed
Anthosachne scabra, Common Wheat-grass
Arthropodium strictum, Chocolate Lily
Austrostipa pubinodis, Tall Spear-grass
Austrostipa rudis subsp. *rudis*, Veined Spear-grass
Billardiera mutabilis, Common Apple-berry
 N *Bossiaea prostrata*, Creeping Bossiaea
Burchardia umbellata, Milkmaids
Bursaria spinosa, Sweet Bursaria
 V *Caesia parviflora*, Pale Grass-lily
Carex appressa, Tall Sedge
Carex breviculmis, Short-stem Sedge
 E *Carex fascicularis*, Tassel Sedge
 E *Carex gaudichaudiana*, Fen Sedge
Carex inversa, Knob Sedge (probably not indigenous) ²⁰¹⁴
Cassinia aculeata, Common Cassinia
Cassinia longifolia, Shiny Cassinia
 E *Centella cordifolia*, Centella
 V *Clematis aristata*, Mountain Clematis
Clematis decipiens, a small-leaved clematis
 E *Comesperma volubile*, Love Creeper
 C ***Coprosma hirtella*, Rough Coprosma** ¹⁹⁸⁹
 V *Coprosma quadrifida*, Prickly Currant-bush
 C *Coronidium scorpioides*, Button Everlasting
Cotula australis, Common Cotula ²⁰⁰⁹
Crassula decumbens, Spreading Crassula ²⁰¹⁴
 V *Crassula helmsii*, Swamp Crassula
 C *Daviesia latifolia*, Hop Bitter-pea
Deyeuxia quadriseta, Reed Bent-grass
Dianella longifolia var. *longifolia*, Pale Flax-lily
Dianella revoluta, Black-anther Flax-lily
Dianella tasmanica, Tasman Flax-lily (planted?)
Dichelachne rara, Common Plume-grass
Dichondra repens, Kidney-weed
 V *Dillwynia cinerascens*, Grey Parrot-pea
 V *Drosera aberrans*, Scented Sundew ²⁰¹⁹
 N *Drosera hookeri*, Branched Sundew
 E ***Dysphania glomulifera*, Pigweed** ²⁰⁰⁷
 V *Elatine gratioloides*, Waterwort
 V *Eleocharis acuta*, Common Spike-rush
Eleocharis sphacelata, Tall Spike-rush
 C *Epacris impressa*, Common Heath
 V *Epilobium billardiereanum* subsp. *cinereum*, Variable Willow-herb ²⁰⁰⁷
Epilobium cf. *billardiereanum* subsp. *intermedium*, a willow-herb ²⁰¹⁴
Epilobium hirtigerum, Hairy Willow-herb
 E *Epilobium pallidiflorum*, Showy Willow-herb
Eragrostis brownii, Common Love-grass
 E *Eucalyptus cephalocarpa*, Mealy Stringybark

Risk Wild indigenous vascular species

- E *Eucalyptus melliodora*, Yellow Box
 E *Eucalyptus obliqua*, Messmate Stringybark
 V *Eucalyptus ovata*, Swamp Gum
 E *Eucalyptus radiata*, Narrow-leaved Peppermint
Eucalyptus hybrids
 E *Euchiton involucratus*, Common Cudweed
Euchiton japonicus, Creeping Cudweed
 E *Euchiton sphaericus*, Star Cudweed ²⁰⁰⁷
 V *Exocarpos cupressiformis*, Cherry Ballart
 C *Gahnia radula*, Thatch Saw-sedge
 E *Gahnia sieberiana*, Red-fruit Saw-sedge
Geranium homeanum, Rainforest Crane's-bill ²⁰¹⁴
 E ***Glossostigma cleistanthum*, Spoon Mud-mat** ²⁰⁰⁹
Glossostigma ?elatinoides, Small Mud-mat ²⁰⁰⁷
 V *Glyceria australis*, Australian Sweet-grass
 E *Glycine clandestina*, Twining Glycine ²⁰¹⁴
Gonocarpus tetragynus, Common Raspwort
 C ***Goodenia elongata*, Lanky Goodenia** ²⁰¹⁴
 C *Goodenia humilis*, Swamp Goodenia ²⁰¹⁸
 N *Goodenia lanata*, Trailing Goodenia
Goodenia ovata, Hop Goodenia
 C *Gratiola pubescens*, Glandular Brooklime
 E *Hardenbergia violacea*, Purple Coral-pea
 V *Hemarthria uncinata*, Mat Grass ²⁰⁰⁷
 C *Hibbertia australis*, Upright Guinea-flower
 C *Hovea heterophylla*, Common Hovea ²⁰¹⁴
 V *Hydrocotyle hirta*, Hairy Pennywort
 E *Hypericum gramineum*, Small St John's Wort
 C *Imperata cylindrica*, Blady Grass
Isolepis inundata, Swamp Club-rush
 C *Isolepis marginata*, Little Club-rush
 V *Isolepis platycarpa*, a club-rush
Juncus amabilis, Hollow Rush
Juncus bufonius, Toad Rush
Juncus gregiflorus, Green Rush
 C *Juncus fockei/holoschoenus*, a joint-leaf rush
Juncus pallidus, Pale Rush
 E *Juncus pauciflorus*, Loose-flower Rush
 E *Juncus planifolius*, Broad-leaf Rush
 E *Juncus procerus*, Tall Rush
Juncus sarophorus, Broom Rush
 E *Juncus subsecundus*, Finger Rush ²⁰¹⁴
 C *Kennedia prostrata*, Running Postman ²⁰⁰²
Kunzea ericoides group, Burgan
Lachnagrostis filiformis, Common Blown-grass
 V *Lagenophora sublyrata*, Slender Bottle-daisy
Laphangium luteoalbum, Jersey cudweed
Lemna disperma, Common Duckweed
 C ***Lepidium pseudohyssopifolium*, Pepper-cress** ²⁰⁰⁹
Lepidosperma gunnii, Slender Sword-sedge

Risk Wild indigenous vascular species

- V *Lepidosperma laterale*, Variable Sword-sedge
 C *Leptorhynchus tenuifolius*, Wiry Buttons ¹⁹⁹⁹
 C *Leptospermum continentale*, Prickly Tea-tree
Leptospermum scoparium, Manuka
 E *Lobelia anceps*, Angled Lobelia
Lomandra filiformis subsp. *coriacea*, Wattle
 Mat-rush
Lomandra filiformis subsp. *filiformis*, Wattle
 Mat-rush
Lomandra longifolia subsp. *longifolia*, Spiny-headed Mat-rush
 V *Luzula meridionalis*, Common Woodrush
Lythrum hyssopifolia, Lesser Loosestrife
 C ***Machaerina rubiginosa*, Soft Twig-rush**
 C ***Mazus pumilio*, Swamp Mazus** (destroyed by desilting the dam in the 1990s)
 E *Melaleuca ericifolia*, Swamp Paperbark
 V *Melicytus dentatus*, Tree Violet
Microlaena stipoides, Weeping Grass
 V *Microtis parviflora*, Slender Onion-orchid
 V *Opercularia ovata*, Broad-leaf Stinkweed ¹⁹⁸⁹
 V *Opercularia varia*, Variable Stinkweed
Oxalis exilis/perennans, Wood-sorrel
 V *Ozothamnus ferrugineus*, Tree Everlasting
 C *Pelargonium australe*, Austral Stork's-bill
 C *Pelargonium inodorum*, Kopata
Persicaria decipiens, Slender Knotweed
 E *Persicaria hydropiper*, Water-pepper ²⁰⁰⁷
 E *Persicaria lapathifolia*, Pale Knotweed ²⁰⁰⁴
 V *Persicaria praetermissa*, Spotted Knotweed ¹⁹⁸⁹
 E *Pimelea humilis*, Common Rice-flower ²⁰⁰⁷
 E *Platylobium obtusangulum*, Common Flat-pea
Poa ensiformis, Sword Tussock-grass ²⁰¹⁴
Poa morrisii, Soft Tussock-grass
 E *Poa tenera*, Slender Tussock-grass
 V *Polyscias sambucifolia*, Elderberry Panax
Poranthera microphylla, Small Poranthera
 E *Potamogeton ochreatus*, Blunt Pondweed ²⁰⁰⁷
Rytidosperma ?fulvum, Leafy Wallaby-grass ²⁰⁰⁷
Rytidosperma laeve, Smooth Wallaby-grass
 E *Rytidosperma pallidum*, Red-anther (or Silvertop) Wallaby-grass
Rytidosperma penicillatum, Slender Wallaby-grass
Rytidosperma pilosum, Velvet Wallaby-grass
Rytidosperma racemosum, Clustered Wallaby-grass
 E *Rytidosperma semiannulare*, Tasmanian Wallaby-grass ²⁰⁰²
Rytidosperma setaceum, Bristly Wallaby-grass
Rytidosperma tenuius, Purplish Wallaby-grass
Schoenus apogon, Common Bog-rush
 C ***Schoenus ?tesquorum*, Soft Bog-rush** ¹⁹⁸⁹
 E ***Senecio campylocarpus*, Floodplain Groundsel**
 V *Senecio glomeratus*, Annual Fireweed

Risk Wild indigenous vascular species

- Senecio hispidulus*, Rough Fireweed
Senecio minimus, Shrubby Fireweed ²⁰¹⁴
 V *Senecio prenanthoides*, Common Fireweed
Senecio quadridentatus, Cotton Fireweed
 C *Solanum aviculare*, Kangaroo Apple ¹⁹⁸⁹
 V *Solanum laciniatum*, Large Kangaroo Apple
 E *Thelymitra peniculata*, Trim Sun-orchid
Themeda triandra, Kangaroo Grass
Tricoryne elatior, Yellow Rush-lily
 V *Triglochin striata*, Streaked Arrow-grass
Typha domingensis, Cumbungi ²⁰⁰⁷
Typha orientalis, Cumbungi
 V *Veronica gracilis*, Slender Speedwell
 E *Viola hederacea*, Ivy-leaf Violet
Wahlenbergia gracilis, Sprawling Bluebell ²⁰⁰⁹
 E *Wurmbea dioica*, Common Early Nancy ²⁰¹⁹
 E *Xanthorrhoea minor*, Small Grass-tree
 V *Xanthosia dissecta*, Cut-leaf Xanthosia ²⁰¹⁴

Risk Planted species (indigenous or not)

- V *Acacia implexa*, Lightwood
 V *Acacia mearnsii*, Black Wattle ²⁰¹⁴
 V *Acacia melanoxylon*, Blackwood
 E *Acacia myrtifolia*, Myrtle Wattle ²⁰¹⁴
Acacia paradoxa, Hedge Wattle ²⁰¹⁴
 V *Acacia pycnantha*, Golden Wattle
 V *Acacia stictophylla*, Dandenong Range
 Cinnamon Wattle
 E *Acacia stricta*, Hop Wattle
 V *Acacia verticillata*, Prickly Moses
Acaena novae-zelandiae, Bidgee-widgee
 V *Allocasuarina littoralis*, Black Sheoak
Calocephalus lacteus, Milky Beauty-heads
Carex appressa, Tall Sedge
 E *Carex fascicularis*, Tassel Sedge
 E *Carex gaudichaudiana*, Fen Sedge
Carex tereticaulis, Poong'ort
Correa hybrid ²⁰¹⁴
 V *Crassula helmsii*, Swamp Crassula
Dianella longifolia var. *longifolia*, Pale Flax-lily ²⁰¹⁴
Dichondra repens, Kidney-weed
 C *Eucalyptus camaldulensis*, River Red-gum
 V *Eucalyptus ovata*, Swamp Gum
Eucalyptus sp., a eucalypt
 C *Eucalyptus viminalis* subsp. *viminalis*, Manna Gum
 E *Gahnia sieberiana*, Red-fruit Saw-sedge
Goodenia ovata, Hop Goodenia
 C *Goodia lotifolia*, Common Golden-tip
 C *Gratiola pubescens*, Glandular Brooklime ²⁰¹⁴
 E *Gynatrix pulchella*, Hemp Bush
 C *Hakea nodosa*, Yellow Hakea
Hakea ?sericea, Silky Hakea ²⁰¹⁴
 C *Indigofera australis*, Austral Indigo
 E *Juncus subsecundus*, Finger Rush ²⁰¹⁴

Risk Planted species (indigenous or not)

- C *Leptospermum continentale*, Prickly Tea-tree
 C *Leptospermum lanigerum*, Woolly Tea-tree
Lomandra longifolia subsp. *longifolia*, Spiny-headed Mat-rush
 E *Melaleuca ericifolia*, Swamp Paperbark
 C *Melaleuca squarrosa*, Scented Paperbark
Myoporum insulare, Common Boobialla
 C *Myriophyllum crispatum*, Upright Water-milfoil²⁰¹⁴
 C *Myrsine howittiana*, Muttonwood
 E *Olearia lirata*, Snowy Daisy-bush
 V *Ozothamnus ferrugineus*, Tree Everlasting
Poa ensiformis, Sword Tussock-grass
 V *Pomaderris aspera*, Hazel Pomaderris
 E *Pomaderris lanigera*, Woolly Pomaderris
 C *Pomaderris racemosa*, Cluster Pomaderris
 E *Rubus parvifolius*, Small-leaf Bramble
Rytidosperma ?tenuius, Purplish Wallaby-grass
Rytidosperma setaceum, Bristly Wallaby-grass
 V *Solanum laciniatum*, Large Kangaroo Apple
 V *Spyridium parvifolium*, Australian Dusty Miller
Themeda triandra, Kangaroo Grass²⁰¹⁴
 C *Viminaria juncea*, Golden Spray
Xerochrysum palustre, Swamp Everlasting²⁰¹⁴

Wild introduced species

- Acacia floribunda*, White Sallow-wattle
Acacia howittii, Sticky Wattle²⁰¹⁴
Acacia longifolia subsp. *longifolia*, Sallow Wattle
Acacia sp. (naturalised), Wattle (naturalised)²⁰⁰²
Acer negundo, Box Elder²⁰¹⁴
Acetosella vulgaris, Sheep Sorrel
Agapanthus praecox, Agapanthus
Agrostis capillaris, Brown-top Bent
Aira caryophyllea, Silvery Hair-grass
Allium triquetrum, Angled Onion
Alternanthera philoxeroides, Alligator Weed¹⁹⁹⁷
Anredera cordifolia, Madeira Vine
Anthoxanthum odoratum, Sweet Vernal-grass
Aphanes arvensis, Parsley Piert
Araujia sericifera, White Bladder-flower
Asparagus aethiopicus, Sprengeri Fern
Asparagus asparagoides, Bridal Creeper
Asparagus scandens, Asparagus Fern
Atriplex prostrata, Hastate Orache
Avena barbata, Bearded Oat
Bellis perennis, English Daisy
Bidens tripartita, Trifid Burr-marigold²⁰⁰⁷
Billardiera fusiformis, Bluebell Creeper
Briza maxima, Large Quaking-grass
Briza minor, Lesser Quaking-grass
Bromus catharticus, Prairie Grass
Bromus diandrus, Great Brome
Callistemon ?viminalis, Weeping Bottlebrush

Wild introduced species

- Callitriche stagnalis*, Pond (or Common) Water-starwort
Cardamine flexuosa/hirsuta, a bitter-cress²⁰¹⁴
Cassinia sifton, Sifton Bush
Cenchrus clandestinus, Kikuyu Grass
Centaureum erythraea, Common Centaury
Cerastium glomeratum s.l., Common Mouse-ear Chickweed
Chlorophytum comosum, Spider Plant
Chrysanthemoides monilifera subsp. *monilifera*, Boneseed
Cirsium vulgare, Spear Thistle
Coprosma repens, Mirror-bush²⁰¹⁴
Cordyline australis, New Zealand Cabbage Tree
Correa baeuerlenii, Chef's Cap Correa
Correa hybrids
Cortaderia selloana, Pampas Grass
Cotoneaster glaucophyllus, Cotoneaster²⁰¹⁴
Cotoneaster pannosus, Cotoneaster
Cotoneaster simonsii, Himalayan Cotoneaster¹⁹⁸⁹
Cotula coronopifolia, Water Buttons²⁰⁰⁴
Crassula multicava, Shade Crassula
Crataegus monogyna, Hawthorn¹⁹⁸⁹
Crepis capillaris, Smooth Hawksbeard
Cynodon dactylon, Couch
Cyperus congestus, Dense Flat-sedge
Cyperus eragrostis, Drain Flat-sedge
Dactylis glomerata, Cocksfoot
Danthonia decumbens, Heath Grass¹⁹⁹⁹
Daucus carota, Carrot
Dietes grandiflora, Wild Iris
Dimorphotheca fruticosa, Dimorphotheca
Echinochloa crus-galli, Common Barnyard Grass²⁰⁰²
Ehrharta erecta, Panic Veldt-grass
Ehrharta longiflora, Annual Veldt-grass
Epilobium ciliatum, Glandular Willow-herb²⁰¹⁴
Eragrostis mexicana, Mexican Love-grass
Erigeron karvinskianus, Seaside Daisy
Erigeron sumatrensis, Fleabane
Eriobotrya japonica, Loquat
Euphorbia peplus, Petty Spurge
Festuca arundinacea, Tall Fescue
Fraxinus angustifolia, Desert Ash
Fumaria bastardii, Bastards Fumitory
Fumaria muralis subsp. *muralis*, Wall Fumitory
Fumaria sp., an unidentified fumitory²⁰¹⁴
Galium aparine, Cleavers
Gamochaeta purpurea, Spiked Cudweed
Genista monspessulana, Montpellier Broom
Geranium dissectum, Cut-leaf Crane's-bill
Grevillea hybrid or cultivar
Hakea salicifolia, Willow-leaf Hakea
Hedera helix/hibernica, Ivy
Helminthotheca echioides, Ox-tongue
Holcus lanatus, Yorkshire Fog
Hypericum tetrapterum, Square-stem St John's Wort

Wild introduced species

Hypochaeris radicata, Cat's Ear
Isolepis levynsiana, Tiny Flat-sedge
Jasminum polyanthum, Pink (or Winter) Jasmine
Juncus articulatus, Jointed Rush
Juncus bulbosus, Bulbous Rush
Juncus capillaceus, String Rush ²⁰¹⁴
Juncus capitatus, Dwarf Rush
Juncus pallescens, a rush ²⁰¹⁴
Lactuca serriola, Prickly Lettuce
Leontodon saxatilis, Lesser Hawkbit
Ligustrum lucidum, Large-leafed Privet
Ligustrum vulgare, European Privet
Linum trigynum, French Flax ²⁰¹⁴
Lolium perenne, Perennial Rye-grass ²⁰⁰²
Lonicera japonica, Japanese Honeysuckle
Lotus corniculatus, Bird's-foot Trefoil
Lotus subbiflorus, Hairy Bird's-foot Trefoil
Lotus uliginosus, Greater Bird's-foot Trefoil ²⁰¹⁴
Lysimachia arvensis, Pimpernel
Lysimachia minima, Chaffweed
Lythrum junceum, Mediterranean Loosestrife
Malus pumila, Domestic Apple ¹⁹⁹⁹
Medicago polymorpha, Burr Medic
Melaleuca styphelioides, Prickly Paperbark
Mentha sp., Mint
Modiola caroliniana, Carolina Mallow
Myoporum ?insulare, Common Boobialla ²⁰¹⁴
Myosotis sylvatica, Wood Forget-me-not
Nassella trichotoma, Serrated Tussock ²⁰¹⁴
Oxalis ?corniculata, Creeping Wood-sorrel
Oxalis incarnata, Pale Wood-sorrel
Oxalis pes-caprae, Soursob
Pandorea pandorana, Wonga Vine
Paraserianthes lophantha, Cape Wattle
Paspalum dilatatum, Paspalum
Paspalum distichum, Water Couch
Passiflora cinnabarina, Red Passion-flower
Phalaris aquatica, Toowoomba Canary-grass
Phalaris arundinacea, Reed Canary-grass ²⁰¹⁴
Pinus radiata, Monterey Pine
Pittosporum undulatum, Sweet Pittosporum
Plantago coronopus, Buck's-horn Plantain
Plantago lanceolata, Ribwort
Plantago major, Greater Plantain
Poa annua/infirma, a meadow-grass ¹⁹⁸⁹
Poa trivialis, Rough Meadow-grass

Wild introduced species

Polycarpon tetraphyllum, Four-leafed Allseed
Polygala myrtifolia, Myrtle-leaf Milkwort ²⁰¹⁴
Polygonum aviculare, Hogweed
Prunella vulgaris, Self-heal
Prunus cerasifera, Cherry-plum
Pseudoscleropodium purum, Neat Feather-moss
Ranunculus muricatus, Sharp Buttercup
Ranunculus repens, Creeping Buttercup
Raphanus raphanistrum, Wild Radish
Romulea rosea, Common Onion-grass
Rosa rubiginosa, Sweet Briar ²⁰¹⁴
Rubus anglocandicans, Blackberry
Rumex conglomeratus, Clustered Dock
Rumex crispus, Curled Dock
Salix sp., unidentified willow ²⁰¹⁴
Senecio vulgaris, Common Groundsel ²⁰¹⁴
Setaria parviflora, Slender Pigeon Grass ²⁰¹⁴
Sisyrinchium micranthum, Blue Pigroot
Solanum americanum, Glossy Nightshade
Solanum mauritianum, Tobacco-bush ²⁰¹⁴
Solanum nigrum, Black Nightshade
Sonchus asper, Rough Sow-thistle
Sonchus oleraceus, Sow-thistle
Sporobolus africanus, Rat-tail Grass
Stachys arvensis, Stagger Weed ²⁰¹⁴
Stellaria media, Chickweed ²⁰¹⁸
Symphotrichum subulatum, Aster-weed
Syzygium smithii, Lilly Pilly
Taraxacum sect. *Taraxacum*, Garden Dandelion ²⁰¹⁴
Torilis arvensis, Spreading Hedge-parsley
Tragopogon porrifolius subsp. *porrifolius*, Salsify
Trifolium campestre var. *campestre*, Hop Clover
Trifolium dubium, Suckling Clover
Trifolium repens, White Clover
Tropaeolum majus, Nasturtium
Ulex europaeus, Gorse (Furze)
Verbena bonariensis, Purple-top Verbena
Veronica ?persica, Persian Speedwell ²⁰⁰⁷
Veronica arvensis, Wall Speedwell
Viburnum ?tinus, Laurustinus ²⁰⁰²
Vicia disperma, French Tiny Vetch
Vicia sativa, Common Vetch ¹⁹⁹⁹
Viola odorata, Common Violet
Vulpia bromoides, Squirrel-tail Fescue
Vulpia myuros, Rat's-tail Fescue

Notes concerning some of the significant plant species

Information about significant plant species beyond what is provided below can be found in the author's report, 'Monitoring of Bushland Reserves in Knox – 2020 Review'.

Listed as Endangered under Victorian law

Acacia stictophylla (Dandenong Range Cinnamon Wattle): One wild plant used to grow near where the Riddell Drain enters the reserve. It died in c. 2005 but many plants subsequently regenerated and then died. The species remains represented in the reserve by planted plants.

Glossostigma cleistanthum (Spoon mud-mat): In the author's 2004 and 2009 surveys, this opportunistic annual species was abundant in mud where the lake's water had receded over the preceding weeks or months. The same has probably occurred in other favourable years but gone unnoticed for want of a botanical survey. The water level in the lake was too high during the 2020 survey for the species to be detected.

Senecio campylocarpus (Bulging Fireweed): This short-lived, sporadic species of drying mud appears beside the lake and dam in numbers that vary from year to year according to the cycle of rising and falling water levels. Dozens were seen in 2004 and 2007, thousands in 2009 and only six in 2014. It was not recorded before 2004 because it had not been scientifically named or described. It is expected to reappear episodically.

Locally threatened

Acacia stictophylla × *paradoxa* (Cinnamon Wattle × Hedge Wattle hybrid) – Last recorded in 1989.

Carex fascicularis (Tassel Sedge) – Wild plants are scattered along the southern edge of the lake, probably descended from plants that have been planted elsewhere in the reserve.

Carex gaudichaudiana (Fen Sedge) – Formerly confined to within a few metres of the Riddell Drain in the Aquatic Herbland, this species had expanded northward in 2014 and has since expanded on both sides of the drain. In 2020, there was approximately 150 m² north of the drain and 100 m² south of the drain. The species has also been planted elsewhere in the reserve.

Dysphania glomulifera (Pigweed) – growing as a diminutive form. Discovered in 2004 growing densely in a number of patches at the lake's edge, and seen in smaller numbers up to 2009. Subsequent botanical surveys have not detected it because the lake's water level has been too high on each occasion.

Elatine gratioloides (Waterwort) – Seasonally abundant in the Aquatic Herbland.

Epilobium pallidiflorum (Showy Willow-herb) – Hundreds of plants are scattered around the lake's edge – the only known population in Knox.

Euchiton sphaericus (Annual Cudweed) – Many plants germinated next to the small dam following de-silting in 2001 and others were seen by the lake in subsequent years.

Gahnia sieberiana (Red-fruit Saw-sedge) – A stable population of over 20 plants.

Glossostigma cleistanthum (a mud-mat) – Seasonally abundant in mud at the lake's edge, mainly in the southeast. The nearest record of this species prior to this discovery in 2004 was on the Murray River, roughly 200 km away.

Goodenia elongata (Lanky Goodenia) – The reserve's sole colony, in the northeast, shrunk through the Millennium Drought until it could not be found in 2009 but a tiny vestige was found in 2014. That vestige could not be found in November 2020, after fire on 21/3/20.

Goodenia humilis (Swamp Goodenia) – A large population beside the small dam was destroyed by de-silting work in 2001.

Gratiola pubescens (Glandular Brooklime) – Not present until it was planted in c. 2012 on the southern shore of the lake, where it reproduced. The population in January 2014 was estimated to be over fifty. In 2020, it was 30–50 but more could easily have been obscured beneath dense growth.

Hypolepis rugosula (Ruddy Ground-fern) – Three patches grow on the lake's southern shore, with no clear long-term trend in population size.

Imperata cylindrica (Blady Grass) – A patch of this species was seen consistently in the reserve's northeastern tongue from 1999 to 2007 but not seen in subsequent surveys. However, a new patch of 1½ m² was found in 2020 on the left bank of the Riddell Drain in Aquatic Herbland.

Isolepis platycarpa (a Club-rush) – Grows around the small dam and probably the lake, at least in some years.

Juncus fockei/holoschoenus (a joint-leaf rush) – Several were scattered south of the inlet to the lake in 2004 but have not been seen since. They may well reappear but are threatened by climate change.

Kennedia prostrata (Running Postman) – A single plant germinated following the 1999 fire in the southern forest area. Being solitary, the plant produced no seeds during its short life.

Lemna disperma (Common Duckweed) – Last recorded in 1989 but likely to reappear from time to time.

Lepidium pseudohyssopifolium (a pepper-cress) – In 2009, a pair was seen on the edge of revegetation just north of the Riddell Drain between the lake and the path that encircles the lake. None could be found in 2014 or 2020.

Machaerina rubiginosa (Soft Twig-rush) – A small patch of this species was found near the eastern tip of the Aquatic Herbland in 2007 and 2014. By 2020, the patch had expanded to two larger and denser patches; a more northern one 35 m×4 m and a southern one 6 m×4 m.

Mazus pumilio (Swamp Mazus) – Last recorded in 1989 around the small dam, destroyed in the 1990s by desilting work.

Pelargonium australe (Austral Stork's-bill) – A single plant of this species was discovered in 2020 in the reserve's northeastern tongue – only the second known occurrence in Knox's history. The species has extremely long-lived seeds that fire often stimulates to germinate, as happened in this case.

Pelargonium inodorum (Kopata) – Approximately twenty plants germinated following the 2020 burn in the reserve's northeastern tongue. This species, like the last, has extremely long-lived seeds that fire often stimulates to germinate.

Persicaria lapathifolia (Pale Knotweed) – Recorded only in 2004, in the Aquatic Herbland.

Polystichum proliferum (Mother Shield-fern) – One plant discovered in 2002 in the reserve's northeastern tongue had died back to a fraction of one frond by June 2007. Two plants were seen there in 2009 and 2014. One of those plants survived the burn in 2020 and was joined by a young plant with vigorous post-fire regrowth.

Solanum aviculare (Kangaroo Apple) – Scattered in the northern forest area. The author could not confirm the identity of these *Solanums*, but *S. aviculare* was recorded by Jaremovic *et al.* (1989).

Triglochin striatum (Streaked Arrow-grass), flat leafed variant – Abundant around the lake's southern and eastern shores, with an increasing trend.

Fauna of special significance

Listed as Vulnerable under Commonwealth law

Latham's Snipe – Despite the species' cryptic nature, it is recorded in the reserve at least once in almost every summer.

Listed as Vulnerable under Victorian law

Blue-billed Duck – Resident, breeding at the lake.

Eastern Great Egret – Frequently seen around the lake.

Locally rare

Hardhead – Formerly resident, now apparently an occasional visitor.

Royal Spoonbill – A sporadic visitor, e.g. five records in January–February 2022 but none since.

Buff-banded Rail – Frequently recorded around the lake.

Grey Shrike-thrush – One of few places in Knox where this species still lives (at least up to 2022).

Australasian Reed-warbler – Resident.

Little Grassbird – Resident.

Fauna habitat features

As explained in the site description, the lake is one of the most biologically significant fauna habitats in Knox, and is supplemented by the small dam.

The cover of remnant trees within the forest provides good habitat for forest and woodland birds but the area of tree canopy and the paucity of similar habitat in the neighbourhood must be limiting the fauna that can take advantage of the habitat. There are some large Swamp Gums and Mealy Stringybarks with hollows suitable for habitation by certain birds, bats, possums or invertebrates.

Some nest boxes have been installed but their usage is unknown.

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

The reserve is a 'stepping stone' for movements of nomadic and migratory waterbirds, as evidenced by abundance of such species at the lake. It is unclear whether the site attracts birds moving along the Blind

Creek corridor, the Corhanwarrabul/Monbulk Creek corridor, or both. Either way, the reserve fits the description in criterion 1.2.6 of Amos (2004) of a “Corridor or component of ‘stepping stones’ ... Local scale link between individual remnant habitat blocks or within subcatchment”. **Local** significance applies to sites meeting this description.

Richness and Diversity

The tally of over 130 recently-seen indigenous plant species is high for Knox but this type of attribute is not formally recognised in the standard criteria. Despite the absence of a fauna survey, the abundance of waterbirds also stands out in Knox.

Regionally Threatened Ecological Vegetation Class

All the EVCs present at Lakewood Nature Reserve are listed as regionally-endangered. They each meet the definition of a ‘remnant patch’ adopted by the standard criteria, i.e. a continuous area of at least 0.25 ha that has at least 10% native understorey cover throughout. Appendix 3 of *Victoria’s Native Vegetation Management – a Framework for Action* (NRE 2002a) classifies any remnant patch of a regionally-endangered EVC as having at least High conservation significance. Standard criterion 3.2.3 translates this to **State** significance.

Threatened Plants

The reserve has substantial populations of two species listed as Endangered under the *Flora and Fauna Guarantee Act*: the Bulging Fireweed (*Senecio campylocarpus*) and Spoon Mud-mat, *Glossostigma cleistanthum*. Both species also occur interstate. Criterion 3.1.2 treats any known habitat for such a species as **State** significance.

The substantial population of the regionally rare Pigweed (*Dysphania glomulifera*) is of **Regional** significance under criterion 3.1.4.

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

Threatened Fauna

Latham’s Snipe is listed under Commonwealth law as a vulnerable species and small numbers of this cryptic species are observed beside the lake most years. The frequency of records indicates that the site is regularly used as habitat but not an ‘important site’ in the terms of the standard criteria. Criterion 3.1.1 treats such habitat as **State** significance.

The reserve has a small breeding, resident population of the Blue-billed Duck. It is also frequently visited by small numbers of the Eastern Great Egret. These species are listed as Vulnerable under the *Flora and Fauna Guarantee Act 1988* and both occur outside Victoria. Criterion 3.1.2 treats any known habitat for such a species as **Regional** significance.

The remaining species listed above under the heading, ‘Fauna of special significance’ are sufficiently rare and threatened locally that the reserve’s habitat for them qualifies for **Local** significance under criterion 3.1.5.

Threats

- Human-induced climate change, which is predicted to cause more severe droughts, heatwaves, floods, fires and storms, as well as substantially lower rainfall (particularly in winter). This particularly affects the Swampy Woodland, which relies on groundwater and winter-sodden soil;
- Further decline of tree health, partly due to the abovementioned droughts and storms;
- Silt build-up in the lake, if it were to significantly reduce the water depth in the deepest parts;
- De-silting of the lake or small dam, if it were to be done without due care for the rare and threatened flora and fauna in and around the lake;
- Displacement of indigenous flora and fauna by environmental weeds, but the only serious species not currently under control is Wonga Vine (*Pandorea pandorana*);
- Loss or decline of plant species that have such small populations that they are vulnerable to inbreeding, poor reproductive success or chance events such as being scratched out by a dog or struck by a falling tree limb.
- Loss or decline of plant species that have such small populations that they are vulnerable to inbreeding, poor reproductive success or chance events such as a being scratched out by a dog or struck by a falling tree limb.

Strategic planning

- The previous (2010) edition of this report led to the reserve being covered by Schedule 2 of the Environmental Significance Overlay (ESO2). That edition cited the State significance of the reserve's native vegetation and the presence of riparian and lake habitat that could be harmed by works in areas with no native vegetation. There have been no significant changes since 2010 to the reasons for applying ESO2 to the reserve, so no amendment is recommended;
- The reserve is larger than 0.4 ha and therefore does not qualify for the size-based exemption from the state-wide baseline planning controls over removal of native vegetation (clause 52.17).

Information sources used in this assessment

- Jaremovic R., McMahon A.R.G, Carr G.W. and McWha M. (1989). *Lakewood Estate Nature Reserve – Concept Development Plan Final Report*. A copy is held by Knox City Council. This includes a set of photographs, vegetation community descriptions, lists of flora and fauna species and data from sixteen quadrats;
- Vegetation monitoring data, as described in the Dr Lorimer's reports in the series, *'Monitoring of Bushland Reserves in Knox'*, in 1999, 2002, 2007, 2014 and 2020. The reports were prepared for Knox City Council and each one contains:
 - Updated data for three of the quadrats of Jaremovic *et al.* and for two additional quadrats;
 - Lists of plant species (indigenous and introduced) observed in the reserve by Dr Lorimer;
 - Maps and assessments of the population sizes and distributions of plant species that are scarce or significant;
 - An assessment of environmental weed impacts and other matters affecting vegetation management;
 - A list of fauna observed incidentally; and
 - A series of photographs from nine fixed points, highlighting aspects of the reserve's vegetation;
- Site inspections totalling approximately seven hours by Dr Lorimer between 30/4/04 and 19/5/04 for the first edition of this report;
- A thorough ecological investigation with approximately twenty hours of fieldwork by Dr Lorimer for *'2009 Bushland Management Plan for Lakewood Nature Reserve, Knoxfield'* for Knox City Council;
- Various herbarium specimens collected by Dr Lorimer during his fieldwork in the projects above;
- A site inspection by Dr Lorimer on 18th May 2024 to check whether anything significant had changed in regard to this report since his detailed 2020 monitoring study;
- Bird lists from U3A Knox Birdwatching Group, who visit the site from time to time;
- Records of flora and fauna observations stored in the Atlas of Living Australia;
- Aerial and satellite imagery from between 1976 and 2025;
- The Victorian Government's 'NatureKit' website;
- Maps of geology, topography and strategic planning information produced by agencies of the Victorian Government.