Site 66. Corhanwarrabul Creek and its Tributaries

Floodplain and riparian habitat of the Corhanwarrabul Ck catchment, upstream of Stud Rd. Melway maps 72-74.

Site Significance Level: *State* except the northeasternmost polygon, which is ***Local***

- The site is part of a corridor for daily and seasonal movements of fauna, including waterbirds, fish and Platypus;
- Native vegetation is fragmented and in poor ecological condition overall, but there is enough to indicate that it belongs to various regionally endangered Ecological Vegetation Classes;
- A strip of road verge along Karoo Rd has the only known remnant occurrence of River Red Gum within Knox;
- Waterbirds that are listed as threatened in Victoria are easily found at artificial wetlands within the site;
- Even golf courses and open, grassy expanses within the site are providing prey for birds such as Brown Goshawks.

Boundaries

The site comprises the eight polygons outlined in red on the aerial photograph on the next page, totalling 160·9 ha.

Much of the site has been delineated here to exclude shared paths running adjacent to the rear fences of private properties. Most of the remaining boundaries follow cadastral boundaries. However, the cadastre available from the state government at the time of writing (July 2008) does not match the limits of where buildings are being constructed in the Waterford Park retirement village, on the western side of Bunjil Way. The author's intention has been to skirt the fences of the new retirement properties. Some refinement of the boundary drawn here may be desirable when a reliable cadastre becomes available.

The narrow sections of the site along Monbulk Ck east of Blackwood Park Drive, in Ferntree Gully and Lysterfield, are defined by the presence of tree cover, in the absence of any nearby cadastral boundaries.

The site includes strips of road verge beside Stud Rd and Karoo Rd. The latter corresponds to a fenced reserve for Knox's only population of River Red Gum (*Eucalyptus camaldulensis*).

The magenta outlines on the aerial photograph are boundaries of other sites in this report, labelled with their site numbers.

Land use & tenure: Mostly Council land and the private Waterford Valley Golf Course. There are small sections of road verge as described above, and a strip of unused road reservation that intersects Napoleon Rd. The strips along Monbulk Ck upstream of Blackwood Park Drive are on private agricultural land.

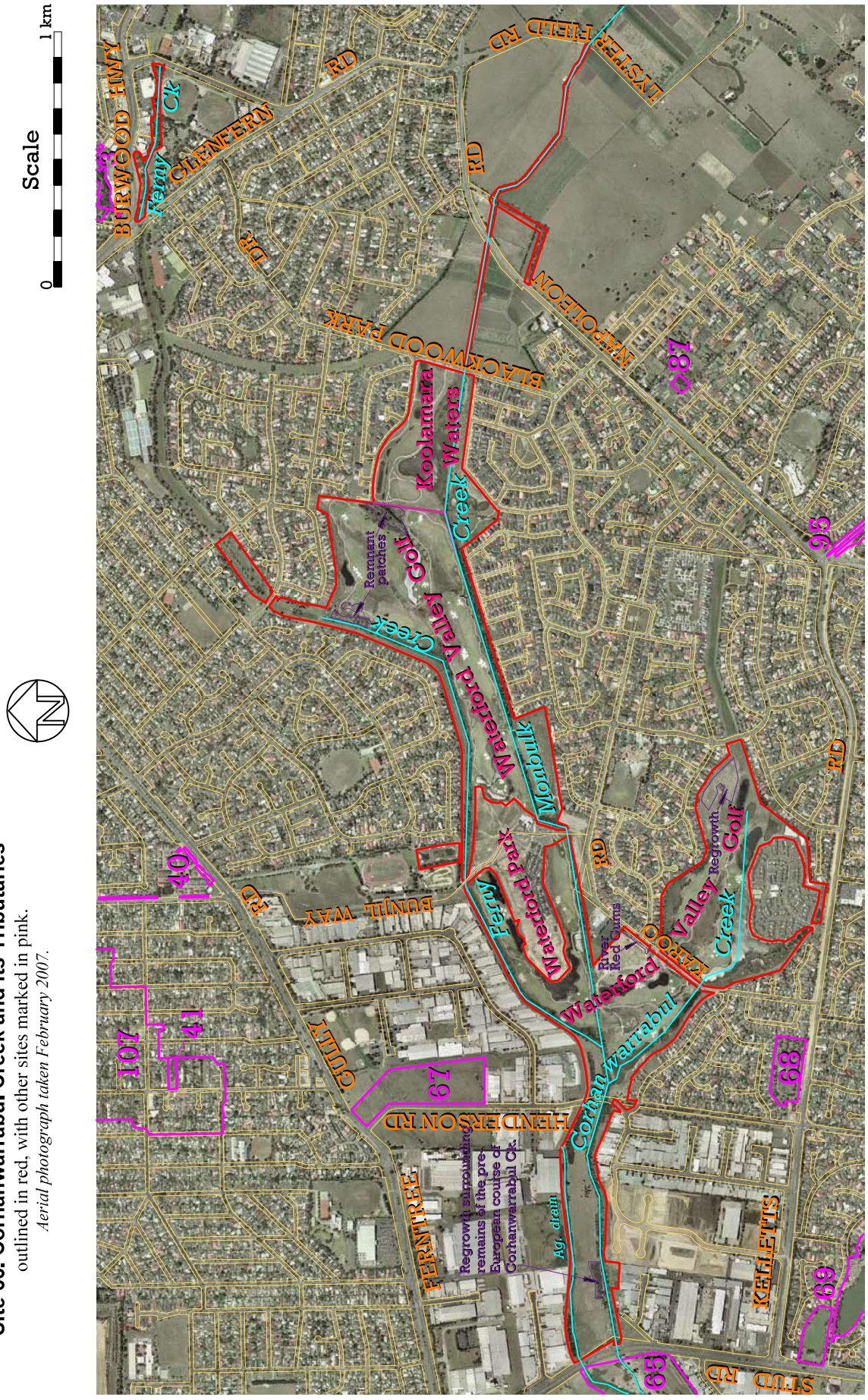
Site description

Almost the whole site has alluvial soil. The exception is the short, east-west strip of road reservation intersecting Napoleon Rd, whose clay loam soil has formed from decomposition of the underlying Devonian hornfels.

The polygon on Ferny Ck upstream of Glenfern Rd is on the floodplain of Upper Ferntree Gully, at elevations of 90-95 m. This is the only section of stream within the site that has not been replaced by a straightened drain. It is also the only section with Manna Gum (*Eucalyptus viminalis*) or Yellow Box (*Eucalyptus melliodora*). Although the tree canopy is fragmented and there is little native understorey, this is the only representation of the EVC known as Riparian Forest in the whole site. Some of the Manna Gums are large, old and impressive.

The rest of the site would have been part of a large swamp of more than 400 ha prior to settlement. The elevations vary from 56m to 90m and the average slope is 0·6%. The native vegetation of the swamp or floodplain probably had sparse trees and much of it would have been almost impenetrable due to bogginess and dense scrub of paperbark and reeds. Streams would have meandered across the floodplain, leaving wetlands in their old courses. The nature of the topography and the presence of species such as River Red Gum (*Eucalyptus camaldulensis*), Muttonwood (*Rapanea howittiana*), Tree Violet (*Melicytus dentatus*), Hazel Pomaderris (*Pomaderris aspera*) and an abundance of Hemp Bush (*Gynatrix pulchella*) suggest that the pre-European vegetation belonged to the EVCs, Floodplain Riparian Woodland and Floodplain Wetland Complex, rather than the Swampy Woodland mapped by the Department of Sustainability & Environment. All of these EVCs are now regionally endangered, having been cleared for agriculture in most of their original range.

Early settlers converted the floodplain to farmland by decimating the dense vegetation and replacing the creeks with numerous straight drains. Native plants were mostly replaced by pasture, with willows and other woody weeds along the drainage channels. The limited regrowth of native flora was predominantly thickets of Blackwood (*Acacia melanoxylon*) or Swamp Paperbark (*Melaleuca ericifolia*), with scattered eucalypts and patches of Common Reed (*Phragmites australis*). There were also wetlands with predominantly indigenous plants when the site was surveyed in detail in 1997 for the report, *'Vegetation Survey of Linear Reserves – A Management Strategy for Riparian and Flood Plain Vegetation'* by Reid, Moss and Lorimer for Knox City Council.



Site 66. Corhanwarrabul Creek and its Tributaries
outlined in red, with other sites marked in pink.
Aerial photograph taken February 2007.

Since late 2000, the Waterford Valley and Koolamara Waters developments have further changed the area's hydrology and habitat availability. Despite some destruction of habitat and rare plants in the process, there has been a net increase in habitat due to the creation of large areas of artificial wetlands and the planting of wetlands and along the waterways.

Wetlands constructed in autumn 2008 on the floodplain west of Henderson Rd do not appear on the aerial photograph above, which is from 2007.

When the site was inspected by the author in June 2008 to update this report, a high diversity of waterbirds was observed in the site's wetlands (even without a formal bird survey), including three listed threatened species. The wetland plantings had reproduced naturally and been augmented by indigenous plants that appeared to have been brought in by waterbirds. The birds of prey that had been noted hunting across the site in 1997 were still represented by Brown Goshawk and Black-shouldered Kite, now hunting in the golf course.

Along the creeks, weed control and planting since 2000 has been very successful despite prolonged drought conditions. There are more indigenous plants (particularly of the locally rare species) and far fewer weeds such as blackberries. The great majority of locally rare plants that were mapped in 1996-7 were found again in 2008 at their original locations, and those which could not be re-found were more than compensated by plantings and new discoveries of the same species. There were also some new discoveries of locally rare plants, including only the second record ever of *Melaleuca parvistaminea* in Knox (previously overlooked for *Melaleuca ericifolia*) beside Corhanwarrabul Ck near the Stud Rd bridge.

There is an interesting patch of regrowth along the remains of the winding, pre-European course of Corhanwarrabul Ck, 200-350 m east of Stud Rd. Although the original creek course is now disconnected from the flow except during floods, its banks are well populated with the locally rare Hemp Bush, *Gynatrix pulchella*, just as would have been the case prior to the arrival of Europeans. There is also a Hazel Pomaderris, *Pomaderris aspera*, which had become scarce along the site's waterways prior to recent plantings. These locally rare plants are embedded in a dense regrowth scrub dominated by a the indigenous coloniser, Tree Everlasting (*Ozothamnus ferrugineus*). The weeds, Blackberry, Gorse and Toowoomba Canary-grass are also abundant.

Other notable patches of remnant vegetation within the site are located:

- On the south bank of Corhanwarrabul Ck, extending westward from the Henderson Rd bridge, where there is a mature stand of Swamp Gums and at least 13 of the locally rare *Gynatrix pulchella*;
- Each side of the 16th tee in the northeast of the Waterford Valley golf course, where there is a mature stand of Swamp Gums with sixteen indigenous understorey species, including the locally rare *Poa labillardierei*;
- North of the golf course's 12th green (near the western end of Koolamara Blvd), where there is a rich wetland adjoining a patch containing twelve indigenous plant species, including the regionally rare *Calystegia marginata* and *Carex fascicularis*;
- In a strip beside Karoo Rd containing the only remaining wild River Red Gums (*Eucalyptus camaldulensis*) in Knox, most of which are fenced for their protection;
- In the far southeast of the Waterford Valley golf course (behind houses fronting Kellbourne Drive), where recent scalping of the ground has initiated mass regeneration of indigenous plants. This patch was dominated in June 2008 by *Cassinia arcuata, Goodenia ovata* and *Rytidosperma setaceum*.

The ecological condition of the native vegetation in the site ranges between fair and poor (ratings C and D), and there would be very little in the 'fair' category if not for recent revegetation. Nevertheless, the vegetation still contains a high density of locally rare plants and represents extensive habitat for native fauna such as waterbirds, frogs, birds of prey and Platypus.

Relationship to other land

The site is part of a corridor for daily and seasonal movements of fauna, particularly waterbirds, fish and occasionally Platypus. Such movements are corroborated by the regular observations along the corridor of Platypus (in good years), fish (including Shortfin Eels) and nomadic or highly mobile waterbirds (e.g. egrets and ducks). Common forest birds such as Crimson Rosellas and Grey Fantails were observed moving along the corridor each day that the site was surveyed for this study. Many of the site's waterbirds, including vulnerable species such as Great Egret, are expected to move between this site and other habitat areas, both nearby (e.g. Lakewood Nature Reserve and Caribbean Lake) or as far away as Siberia.

There is a substantial gap in Ferny Creek's riparian vegetation between Glenfern Rd and Hancock Dr, Ferntree Gully. Knox City Council proposes to revegetate that gap, which is hoped to bring about a significant increase in the diversity of bird and insect species moving along the corridor.

Fish, and particularly eels, rely on movement between the site and reaches further upstream and downstream. Barrel-drains and retarding basins represent barriers to such movements for most fish species.

The aerial photograph on the previous page has been marked with pink outlines to show neighbouring sites.

Bioregion: Gippsland Plain

Habitat types

Stream (No EVC number or conservation status available). 13 indigenous plant species recorded.

Riparian Forest (EVC 18, **Vulnerable** in the Gippsland Plain bioregion): Approximately 1·0 ha in many fragments upstream of Glenfern Rd, all in poor ecological condition (rating D). 15 indigenous plant species were found, plus a record of the former existence of *Olearia argophylla* from Mr Darren Wallace.

Dominant canopy trees: *Eucalyptus viminalis* and *E. melliodora* with smaller numbers of *E. ovata* and *E. radiata*.

Dominant lower trees: *Acacia melanoxylon* and *A. mearnsii*, with fewer *Exocarpos cupressiformis, Melaleuca ericifolia* and three *Rapanea howittiana*.

Shrubs: *Coprosma quadrifida* and *Bursaria spinosa*.

Vines: *Cassytha melantha* is present but very scarce. The weeds *Hedera helix, Lonicera japonica* and *Rubus discolor* are also present.

Ferns: None.

Ground flora: The indigenous ground flora has been heavily replaced by weeds, reduced to some *Phragmites australis* and small numbers of *Lomandra longifolia* and *Juncus gregiflorus*.

Floodplain Riparian Woodland (EVC 56, **regionally Endangered**), possibly incorporating some vegetation that might be more associated with Swampy Woodland (which is also regionally Endangered): Estimated as 6·1 ha in fair ecological condition (rating C) and 8·8 ha in poor ecological condition (rating D). 67 indigenous plant species were recorded in 1997, 2002 or 2008.

Canopy trees: In the small remnants where eucalypts remain, they are *E. ovata* or (beside Karoo Rd) *E. camaldulensis*.

Lower trees: *Acacia melanoxylon* and *Melaleuca ericifolia* are abundant. *Pomaderris aspera and Acacia mearnsii* are less common. There is a single *Exocarpos cupressiformis* near the 16th tee of the golf course. *Rapanea howittiana* seedlings and saplings are scattered along the creek banks but it is unclear whether they are planted or wild.

Shrubs: Few of the shrubs in 2008 were wild, but among them are *Acacia verticillata, Cassinia arcuata, Coprosma quadrifida, Gynatrix pulchella, Goodenia ovata, Ozothamnus ferrugineus*, *Solanum ?laciniatum, Gynatrix pulchella, Goodenia ovata* and a solitary *Melicytus dentatus*.

Vines: Represented only by a single *Calystegia marginata* midway between the 12th and 14th greens of the golf course.

Ferns: There is a single, dense patch of *Pteridium esculentum* beside the drainage channel north of the 12 green.

Ground flora: *Phragmites australis* is common along much of the waterway banks. *Persicaria decipiens* and *Juncus* species are abundant beside the water of the creeks, with *P. subsessilis* and *Rytidosperma racemosum* scattered on the banks.

Floodplain Wetland Complex (EVC 172, **regionally Endangered**): If one includes the artificially created wetlands (which are mostly good replicas of natural wetlands), the total area is approximately 24 ha. The ecological condition of most of the areas of open water is hard to assess without investigating the bed, but it is estimated that 75% is in fair ecological condition (rating C) and 25% in poor ecological condition (rating D). 25 indigenous plant species were found in 2008.

Aquatic and semi-aquatic flora: Dominated variously by *Phragmites australis*, *Typha domingensis* or species of *Persicaria, Eleocharis* or *Juncus* (of which eight species are present).

Plant species

The following plant species were observed by the author, mainly in winter 2008. Additional species would no doubt be detectable in other seasons. The column headed 'Risk' indicates the indigenous species' risk of extinction in Knox as follows: 'C'=Critically Endangered; 'E'=Endangered; and 'V'=Vulnerable. In addition, the species with names in bold are rare throughout the Melbourne region.

Risk	Indigenous Species
	Acacia dealbata (wild & planted)
V	*Acacia mearnsii*
V	*Acacia melanoxylon* (wild & planted)
	Acacia paradoxa (wild & planted)
E	*Acacia stricta* (planted)
V	*Acacia verticillata* (wild & planted)
	Acaena novae-zelandiae
	Alisma plantago-aquatica
V	*Allocasuarina littoralis* (planted)
V	*Alternanthera denticulata*
C	*Amyema pendula*
V	*Amyema quandang*
	Austrostipa rudis
V	*Azolla filiculoides*
	Bursaria spinosa (wild & planted)
E	***Calystegia marginata***
	Carex appressa
	Carex breviculmis
E	***Carex fascicularis***
E	***Carex ?gaudichaudiana***

Risk	Indigenous Species
	Carex inversa
	Cassinia arcuata
E	*Cassytha melantha*
E	*Centella cordifolia*
V	*Coprosma quadrifida*
E	*Crassula helmsii*
V	*Eleocharis acuta*
	Eleocharis sphacelata
	Epilobium hirtigerum
C	*Eucalyptus camaldulensis*
V	*Eucalyptus cephalocarpa*
V	*Eucalyptus melliodora*
V	*Eucalyptus ovata* (wild & planted)
E	*Eucalyptus radiata*
E	*Eucalyptus viminalis* (wild & planted)
E	*Euchiton involucratus*
V	*Exocarpos cupressiformis*
	Gahnia radula
	Geranium sp.
	Gonocarpus tetragynus
	Goodenia ovata
	Goodenia ovata (wild & planted)
E	*Gynatrix pulchella* (wild & planted)
V	*Hemarthria uncinata*
E	*Indigofera australis* (planted)
V	*Isolepis inundata*
	Juncus amabilis
C	***Juncus australis***
	Juncus gregiflorus
C	*Juncus holoschoenus*
	Juncus pallidus
E	*Juncus pauciflorus*
E	*Juncus planifolius*
E	*Juncus procerus*
	Juncus sarophorus
E	*Juncus subsecundus*
C	***Juncus vaginatus***
	Lachnagrostis filiformis
E	*Lemna disperma*
	Lepidosperma elatius
	Leptospermum continentale
E	*Leptospermum lanigerum* (planted)
E	*Leptospermum scoparium* (planted)
E	*Lobelia anceps*
	Lomandra longifolia
C	***Lycopus australis* (perhaps planted)**
V	*Lythrum hyssopifolia*
E	*Melaleuca ericifolia* (wild & planted)
C	***Melaleuca parvistaminea***
E	*Melicytus dentatus* (wild & planted)
	Microlaena stipoides
	Microtis parviflora
C	***Myrsine howittiana***
V	*Olearia lirata* (planted)
E	*Ozothamnus ferrugineus* (wild & planted)
	Persicaria decipiens
E	*Persicaria hydropiper*
C	***Persicaria subsessilis***
E	*Phragmites australis*
E	*Poa labillardierei* var. *labillardierei*
E	*Pomaderris aspera* (wild & planted)
C	***Pomaderris racemosa* (planted)**
V	*Potamogeton crispus*
V	*Potamogeton ochreatus*
	Pteridium esculentum
	Rytidosperma racemosum
E	*Rytidosperma semiannulare*
	Rytidosperma setaceum
	Schoenus apogon
	Senecio glomeratus
E	*Senecio minimus*
	Senecio quadridentatus
V	*Solanum laciniatum*
	Themeda triandra
E	*Triglochin striata* (flat leaf variant)
E	*Typha domingensis*
E	*Typha orientalis*
C	*Vallisneria americana* (planted)
C	***Viminaria juncea* (planted)**

Introduced Species

Acetosa sagittata	*Foeniculum vulgare*	*Nasturtium officinale*	*Rosa rubiginosa*
Agrostis capillaris	*Fraxinus angustifolia*	*Oxalis pes-caprae*	*Rubus anglocandicans*
Allium triquetrum	*Fumaria* sp.	*Paraserianthes lophantha*	*Rumex conglomeratus*
Anthoxanthum odoratum	*Galium aparine*	*Paspalum dilatatum*	*Rumex crispus*
Araujia sericifera	*Genista linifolia*	*Paspalum distichum*	*Salix babylonica* s.l.
Aster subulatus	*Genista monspessulana*	*Pennisetum clandestinum*	*Salix × rubens*
Atriplex prostrata	*Hakea salicifolia*	*Persicaria maculosa*	*Solanum americanum*
Bromus catharticus	*Hedera helix*	*Phalaris aquatica*	*Solanum mauritianum*
Callitriche stagnalis	*Helminthotheca echioides*	*Pinus radiata*	*Solanum nigrum*
Cirsium vulgare	*Holcus lanatus*	*Plantago coronopus*	*Solanum pseudocapsicum*
Cortaderia selloana	*Hypericum tetrapterum*	*Plantago lanceolata*	*Sonchus asper*
Cotoneaster pannosus	*Hypochoeris radicata*	*Plantago major*	*Sonchus oleraceus*
Crataegus monogyna	*Juncus articulatus*	*Prunella vulgaris*	*Taraxacum officinale*
Cynodon dactylon	*Juncus microcephalus*	*Prunus cerasifera*	*Tradescantia fluminensis*
Cyperus eragrostis	*Leontodon taraxacoides*	*Pyracantha* sp.	*Trifolium repens*
Dactylis glomerata	*Lonicera japonica*	*Quercus robur*	*Ulex europaeus*
Delairea odorata	*Lotus uliginosus*	*Ranunculus repens*	*Verbena bonariensis* s.l.
Echium plantagineum	*Lythrum junceum*	*Raphanus raphanistrum*	*Zantedeschia aethiopica*
Ehrharta erecta	*Malus pumila*	*Romulea rosea*	

Notes concerning some of the locally threatened plant species

Eucalyptus camaldulensis (River Red Gum). The only specimens in Knox, four old trees and dozens of saplings beside Karoo Rd, mostly fenced for their protection.

Melaleuca parvistaminea (a paperbark). Found beside Corhanwarrabul Ck near the Stud Rd bridge, and possibly more widespread but overlooked through similarity to the abundant *M. ericifolia*.

Rapanea howittiana (Muttonwood). Found upstream of Glenfern Rd and scattered along Monbulk Ck and Ferny Ck, but only the first of these is certainly wild rather than planted.

Fauna of special significance

Endangered in Victoria

Blue-billed Duck. Observed in lakes at Waterford Valley Golf Course in 2008 (and known to be a regular feature of the similar lakes at Lakewood Nature Reserve and Caribbean Gardens, nearby).

Vulnerable in Victoria

Hardhead. Five observed in lakes at Waterford Valley Golf Course in 2008 (and known to be a regular feature of the similar lake at Lakewood Nature Reserve, nearby).

Great Egret. Observed in 2008 in the artificial wetland abutting the southeast of Knox Park and in the stormwater treatment system close to Cath Ct (off Karoo Rd). Likely to be present within the site frequently.

Royal Spoonbill. Recorded in the Atlas of Victorian Wildlife on the basis of a species list up to 1988. More potential habitat exists now than in the 1980s and both local species of spoonbill are likely to visit occasionally.

Uncommon in the Melbourne Region

White-necked Heron

Platypus. Found along Monbulk Ck in good years but may have retreated during the recent years of drought.

Fauna habitat features

- The stream provides habitat for Platypus, fish and their food sources;
- The large areas of wetland are used by frogs and a wealth of waterbirds (including threatened species);
- The corridors of riparian vegetation are
- There are some large eucalypts, particularly Manna Gums (*Eucalyptus viminalis*) with tree hollows that are undoubtedly nesting or roosting sites of birds, bats, possums or insects;
- Open spaces such as Waterford Valley Golf Course are used as hunting grounds by birds of prey such as Brown Goshawk, Nankeen Kestrel and Black-Shouldered Kite, particularly where there are scattered trees (even dead ones).

Significance ratings

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 the native vegetation beside the site's watercourses.

The riparian vegetation was observed to be used by various common forest birds for nomadic movements. The extent of such usage suggests that it is important for bird movements at a Local scale. Criterion 1.2.6 takes such corridors to represent **Local** significance.

Regionally Threatened Ecological Vegetation Classes

The native vegetation in this site includes remnants and regrowth of regionally endangered EVCs. Some of it meets the Department of Sustainability & Environment's definition of a remnant patch, even though it differs substantially from the original EVCs. According to the criteria of *'Victoria's Native Vegetation Management – A Framework for Action'* (NRE 2002a), patches of native vegetation belonging to an endangered EVC have a conservation significance rating of High if they are in a substantially degraded state (as in the present site). Criterion 3.2.3 assigns **State** significance to any site that includes a 'remnant patch' of High conservation significance due to the presence of a threatened EVC. However, the site's northeastern polygon (on the western side of Glenfern Rd) does not qualify as a remnant patch because of its fragmented tree canopy and weedy understorey, so this polygon does not achieve State significance under criterion 3.2.3.

Rare or Threatened Flora

Many of the 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 site's ponds represent good habitat for the Blue-billed Duck, which was readily observed at the site and is a regular feature at the similar water bodies nearby at Lakewood Nature Reserve and Caribbean Gardens. This species is listed as endangered in Victoria and occurs in several states. The support that the site provides for such a species qualifies as **State** significance under criterion 3.1.2.

The site's water bodies were also observed to be supporting two waterbird species that are listed as vulnerable in Victoria; namely, Hardhead and Great Egret. Both species also occur interstate. This qualifies as **Regionally** significant under criterion 3.1.2 on the basis that the site is unlikely to represent an 'important site'.

Of the remaining species listed above under the heading, 'Fauna of special significance', the less common ones are sufficiently rare and threatened locally that their presence confers at least **Local** significance upon the site under criterion 3.1.5. Criterion 3.1.4 may also confer Regional significance on some of the species.

Threats

- Environmental weeds. Along the streams, the worst weeds are Angled Onion (*Allium triquetrum*), Couch (*Cynodon dactylon*), Drain Flat-sedge (*Cyperus eragrostis*), Panic Veldt-grass (*Ehrharta erecta*), Fumitory (*Fumaria* sp.), Cleavers (*Galium aparine*), Wood-sorrels (*Oxalis pes-caprae* and *Oxalis incarnata*), Kikuyu Grass (*Pennisetum clandestinum*), Toowoomba Canary-grass (*Phalaris aquatica*), Creeping Buttercup (*Ranunculus repens*), Watercress (*Rorippa nasturtium-aquaticum*) and Wandering Jew (*Tradescantia albiflora*). In the wetlands, the worst weeds are Couch, Drain Flat-sedge, Water Couch (*Paspalum distichum*) and Creeping Buttercup (*Ranunculus repens*). Brown-top Bent (*Agrostis capillaris*), Blackberry (*Rubus anglocandicans*) and Gorse (*Ulex europaeus*) are locally severe in patches of remnant vegetation on the plain. Only two or three plants each were found of the vine weeds, White Bladder-flower (*Araujia sericifera*) and Rambling Dock (*Acetosa sagittata*) – the first records in Knox – but these species have the potential to cause enormous environmental harm by smothering riparian shrubs, as they do in Floodplain Riparian Woodland along the Yarra River;
- Incremental removal of native vegetation on private land east of Napoleon Rd;
- Fertiliser leaching from the golf course's fairways and greens into wetlands and streams;
- Removal of old habitat trees (alive and dead), because such trees may be removed for the safety of golfers or the public;
- Loss or decline of plant species whose populations are dangerously small, due to inbreeding, poor reproductive success or vulnerability to localised chance events;
- European Carp, which have already caused serious ecological damage in nearby Jells Lake and could do so in this site if they were to arrive there;
- Foxes, which kill wildlife and spread woody weeds and blackberries.

Management issues

- Revegetation that has occurred along Ferny Ck and Monbulk Ck has established very well, but the task remains to plug the substantial gap in the corridor between Glenfern Rd and Hancock Dr, Ferntree Gully. Revegetation of this gap would complete a link from the Dandenong Ranges to the Dandenong Creek floodplain west of Stud Rd. This should bring about a significant increase in the diversity of bird and insect species moving along the corridor;
- Weed control should remain a high priority, including monitoring for outbreaks of White Bladder-flower (*Araujia sericifera*), Rambling Dock (*Acetosa sagittata*) and Square-stemmed St John's Wort (*Hypericum tetrapterum*);
- Care should be taken not to over-use fertiliser on the golf course;
- Some vegetation management guidelines have been provided to Knox City Council in periodic reports from the Australian Platypus Conservancy.

Administration matters

- This site is worthy of inclusion within the proposed Environmental Significance Overlay, ESO2, because of the riparian habitat, the potential for environmental damage from earthworks, the threatened EVCs and the other attributes discussed under the heading 'Significance ratings' above;
- It is proposed that ESO2 provide exemptions for normal, routine maintenance of the existing golf course, paths, roads and stormwater treatment wetlands;
- Some parts of the site are presently covered by Schedule 1 of the Vegetation Protection Overlay in the Knox Planning Scheme, on the basis of their recognition by Water Ecoscience (1998) as their Sites 89 and 285. The different boundaries used in this report reflect more detailed investigation and changed circumstances due to land development.

Information sources used in this assessment

- 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 descriptions of vegetation composition, compilation of forty-four lists of indigenous and introduced plant species for

different parts of the site, three quadrats (Department of Sustainability & Environment's numbers N04062, N04063 and N04067), incidental fauna observations, and checks for fauna habitat, ecological threats and management issues;

- Re-inspections of the site in and around the Waterford Valley development by Dr Lorimer during March 2001 to assist Knox City Council's environmental oversight of the development works;
- A site survey of the Karoo Rd road verge undertaken during this study by Mr Rik Brown on 15/7/02, following this study's standard procedures discussed in Section 2.4 of Volume 1. This included descriptions of the composition and condition of the vegetation, compilation of lists of indigenous and introduced plant species, incidental fauna observations, and checks for fauna habitat, ecological threats, management issues and populations of scarce or threatened plant species;
- A survey on foot and bicycle of all parts of the site west of Blackwood Park Drive and Glenfern Rd by Dr Lorimer on 16th and 18th June 2008 for a total of eleven hours, including:
  - Mapping of vegetation types, ecological condition, wildlife habitat features and locations of rare plants, rare bird sightings and serious weeds;
  - Compilation of lists of indigenous and introduced plant species for nine sections of the site, including estimates of the abundance of each species;
  - Checking the survival of rare plants that had been mapped in 1997;
  - Assessment of the severity of each weed species within each section;
  - Checking for ecological threats and management issues;
  - Observations of wildlife, with particular attention to waterbirds on the wetlands.
- Written reports of the Australian Platypus Conservancy about Platypus surveys conducted within the site almost annually from 1994 to 2001. In the November 2000 survey, five Platypus, four fish species and at least one Water Rat were found;
- Aerial photography from February 2001, April 2003 and February 2007;
- 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

Thanks to the management of the Waterford Valley golf course for permission to inspect the course.