Site 81. Lysterfield Hills

The ridge top and slopes of the Lysterfield Hills, excluding land within parks. Centred on Melway ref. 82 F6.

Site Significance Level: *State*

- Much of the vegetation present belongs to threatened Ecological Vegetation Classes;
- A large number of indigenous plant species (152) has been recorded from the half of the site for which data are available, and more would undoubtedly be found in a thorough survey;
- Even though data is available from only part of the site, no fewer than eighteen of the indigenous plant species that have been recorded are critically endangered in Knox, along with twenty other plant species that are threatened in Knox at levels lower than 'critically endangered';
- The site is known habitat for several rare fauna species, including Powerful Owl and Speckled Warbler;
- The site's ecological values are threatened by quarry expansions.

Note

Permission was not obtained to enter the quarry land that makes up the majority of this site, nor one of the private lots. For these properties, the inspection was done from the fence and aerial photographs. This may have caused some biologically significant attributes to be overlooked. The Precautionary Principle (see the Glossary at the end of Volume 1) should be applied when considering protection of this site in the absence of full scientific certainty about its attributes.

Aerial photograph and plan: See page 409.

Boundaries

The site boundary is outlined in red and marked '81' on the aerial photograph. It includes the western road verge of Cornish Rd, but not the verge of Wellington Rd (which is part of Site 96).

Land use & tenure: The site includes the Boral Lysterfield Quarry, the Hanson Quarry (formerly owner by Pioneer), one ownerless 'old title' lot in the site's extreme southwest, and three private grazing lots between the ownerless lot and Heany Park (Site 80).

Site description

This 286 ha site straddles the Lysterfield Hills ridge, which is oriented southwest to northeast. Elevations vary from approximately 80 m in the southwestern corner to 240 m on the ridge. The upper slopes have a gradient up to 40% and the lower slopes (below the 120m contour) have much more gentle gradients because rock and earth has slipped from uphill and deposited there (called colluvium). Two commercial hard rock quarries extract hornfels from the site, with pits on each side of the ridge.

On the upper slopes, the hornfels has decomposed at the surface to form a shallow, stony, rather infertile clay loam that does not drain well and dries very hard. The lower slope, where rock and earth have been deposited from uphill, has soil that is deeper than the upper slopes, but still rather infertile.

There is a marked difference in the natural vegetation between the side of the ridge that faces northwest and the side that faces southeast. On the northwestern side, above the level where colluvium has deposited, the native vegetation is believed to grade between Grassy Forest and the rare community described for the first time in Appendix A of Volume 1 under the name, 'Lysterfield Grassy Dry Forest'. This vegetation type was confirmed in the vicinity of Heany Park and Cornish Rd at each end of the site, but permission was not obtained to inspect the whole of the expected area of this vegetation type.

The native vegetation on the lower northwestern slopes, in the colluvium, is predominantly Valley Grassy Forest (a regionally vulnerable EVC), as judged from Wellington Rd and Heany Park. This gives way to Valley Heathy Forest (an endangered EVC) in the southwestern corner of the site, but the pre-European line of disjunction between these two EVCs now lies within native pasture and cannot be seen.

The southeastern side of the ridge has a quite different pattern of vegetation. The present author was not authorised to go there, but according to unconfirmed mapping by others and discussions with people who have been there, the vegetation is dominated by the form of Grassy Forest that is associated with the Gippsland Plain bioregion, interrupted by gully headwaters with Herb-rich Foothill Forest and small patches of Damp Forest. A 1998 report by Mueck and Timewell about the Hanson Quarry site states that Creekline Herb-rich Woodland is present, but the report provides little evidence for this and it was written before the limits of that EVC were well understood. A site survey would be required to check whether the 1998 report is consistent with current conventions.

Quarrying and associated activities have removed a substantial proportion of the site's native vegetation, as can be seen (in part) on the aerial photograph. Some of the quarry excavations have been planted with Australian native trees and shrubs. Weeds and rabbits have been a serious problem on the quarry land, and the quarry companies are trying to reduce the weeds. Quarrying has been rapidly extended into areas of native vegetation since 2004.

There is a small, treed lot without an owner in the site's southwestern corner. It supports Valley Heathy Forest with 45 indigenous plant species and a dam with 21 indigenous species of wetland plants. Three of the eucalypts are *Eucalyptus viminalis* subsp. *pryoriana* (or possibly hybrids between this species and *Eucalyptus cephalocarpa*), which had never been recorded in Knox prior to the study reported here.

This treed lot and the three private lots between it and Heany Park have been long grazed by stock but retain predominantly indigenous ground flora, including substantial populations of some species that are threatened in Knox. Their conservation significance far exceeds expectations of grazing land in this part of Victoria.

Although the information about these private lots is incomplete, it appears that the ecological condition of native vegetation there is mostly good (rating B) or fair (rating C). The ridge top and southeastern slopes appear to be in better condition on average than the northwestern slopes, but this was not able to be investigated in this study. A 1998 report by Mueck and Timewell on the Hanson Quarry site indicates that some vegetation is in good condition (probably rating B) with a large number of indigenous plant species, many of which are unique or critically endangered in Knox; however, at least some of this vegetation has been cleared in the last few years.

Relationship to other land

The site is effectively part of a larger area of biological significance in combination with the Dandenong Police Paddocks Reserve, Heany Park (Site 80), Churchill National Park, Lysterfield Park (Site 82) and bushland to the northeast of Lysterfield Park. Many species of fauna undoubtedly move between these sites and some will rely on doing so in order to have enough habitat. Some fauna carry pollen or seeds, thereby linking plant populations across the area.

Bioregion: The Valley Heathy Forest and farm dam on the lower slopes in the west are in the Gippsland Plain bioregion and the other vegetation types are in the Highlands Southern Fall bioregion.

Habitat types

Lysterfield Grassy Dry Forest (intermediate between EVC 22 and EVC 128. The conservation status of this rare type is vulnerable or endangered): Estimated to cover 48 ha. The ecological condition is unclear, but a rough estimate is 20% in good condition (rating B) and 40% in each of ratings C and D (fair and poor).

Canopy trees: Dominated by *Eucalyptus radiata* (typically 10 m tall) and *E. goniocalyx*.

Lower trees: Dominated by *Acacia mearnsii, Acacia implexa*, *Allocasuarina littoralis* and *Exocarpos cupressiformis*.

Shrubs: Indigenous shrubs are sparse except for patches of regrowth of *Acacia paradoxa* or *Kunzea ericoides*. Other species include *Cassinia aculeata, Cassinia longifolia* and *Leptospermum continentale*. The weeds, *Chrysanthemoides monilifera monilifera* and *Pittosporum undulatum* are dense in much of the area seen by the author.

Vines: *Comesperma volubile* is abundant.

Ferns: Absent.

Ground flora: Grassy and apparently naturally sparse, with fairly low diversity. Dominated by *Rytidosperma pallidum, Microlaena stipoides* and *Lomandra filiformis* subsp. *coriacea*.

Valley Grassy Forest (EVC 47, **regionally Vulnerable**): Estimated to cover 12 ha. The ecological condition is unclear, but a rough estimate is equal proportions in each of ratings C and D (fair and poor).

Canopy trees: Dominated by Yellow Box (*Eucalyptus melliodora*), Narrow-leafed Peppermint (*Eucalyptus radiata*) and Bundy (*Eucalyptus goniocalyx*) with a few Candlebarks (*Eucalyptus rubida*).

Lower trees: *Allocasuarina littoralis, Exocarpos cupressiformis*, *Acacia mearnsii, Acacia implexa* and *Acacia melanoxylon*.

Shrubs: The natural shrub layer has been mostly replaced by weeds, particularly *Pittosporum undulatum*.

Ground flora: Densely grassy with abundant *Rytidosperma* species.

Valley Heathy Forest (EVC 127, **Endangered**): Estimated to cover 1 ha, comprising 0·1 ha in fair ecological condition (rating C) and 0·9 ha in poor ecological condition (rating D).

Canopy trees: Dominated by *Eucalyptus cephalocarpa*, with fewer *E. radiata* and *E. goniocalyx*.

Lower trees: Dominated by *Allocasuarina littoralis, Acacia melanoxylon, Acacia mearnsii, Acacia implexa* and *Exocarpos cupressiformis*.

Shrubs: Includes *Acacia paradoxa*, *Bursaria spinosa, Cassinia arcuata, Kunzea ericoides* and *Leptospermum continentale*.

Ferns: None seen.

Ground flora: Densely grassy and dominated by *Microlaena stipoides*. Grasses in the genera *Rytidosperma*, *Austrostipa* and *Themeda* are also abundant. *Lomandra filiformis* subsp. *coriacea* is also abundant. The characteristic species, *Drosera whittakeri* and *Hibbertia riparia*, are present, as are *Dianella admixta* and *Oxalis perennans* (both typically present in Valley Heathy Forest).

Herb-rich Foothill Forest (EVC 23, conservation status rated 'Least Concern' in the bioregion): Vegetation mapping from the Department of Sustainability & Environment depicts this EVC in the headwaters of gullies on the southeastern side of the ridge. Eyewitness descriptions of these areas and the report by Mueck and Timewell (1998) tend to confirm this. The extent and condition of the vegetation is not known.

Damp Forest (EVC 29, conservation status listed as of 'Least Concern' in the bioregion): Depicted on some departmental vegetation maps as being present at the headwaters of gullies on the southeastern slopes. Eyewitness accounts tend to support this. The extent and condition of the vegetation is not known.

Grassy Forest (EVC 128, **regionally Vulnerable**). Depicted on departmental vegetation maps, on southeast-facing slopes between the gullies. The extent and condition of the vegetation is not known.

Swampy Woodland (EVC 937, **regionally Vulnerable**) or Creekline Herb-rich Woodland (EVC 164, **regionally Endangered**). Departmental vegetation maps are inconsistent in their depiction of these EVCs, but plant species recorded by Mueck and Timewell (1998), such as *Eucalyptus ovata* and *Gratiola peruviana*, confirm that at least one of these EVCs is present.

Wetland (EVC 74, listed as regionally Endangered but in this case the wetlands are artificial):

A farm dam of 1,600 m² in the southwest corner of the site, estimated to contain:

- 1,200 m² of fringing and emergent vegetation, in good ecological condition (rating B) with 14 indigenous plant species;
- 400 m² of open water with unknown bottom-dwelling flora.

Trees, shrubs, vines and ferns: Absent.

Aquatic and semi-aquatic flora: Dominated by *Juncus sarophorus* in shallower water and *Eleocharis sphacelata* in deeper water. There are dense patches of *Carex fascicularis* and an indeterminate species of *Typha*. Other abundant species include *Centella cordifolia, Epilobium hirtigerum, Persicaria decipiens* and *Senecio minimus*. The tiny floating species, *Lemna disperma* and *Wolffia australiana* are both present in large numbers but small total area. The usual wetland weed, *Juncus articulatus*, is absent.

A dam at the Boral Quarry appears to have fringing wetland vegetation (judging from aerial photography) of indeterminate composition or extent. Its open water, and that of two other dams at the quarry, may provide low-grade habitat for common aquatic fauna and waterbirds.

Plant species

The following plant species were recorded by various observers in the years indicated. Records from 2007-9 are the author's. Additional species would no doubt be detectable if the whole area were to be surveyed. 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, *Austrostipa rudis* subsp. *australis* is rare in Victoria and species with names in bold are rare in the Melbourne region.

Risk	Indigenous Species	Year
	Acacia dealbata	2004
V	*Acacia implexa*	2007
V	*Acacia mearnsii*	2009
V	*Acacia melanoxylon*	2007
	Acacia paradoxa	2009
E	*Acacia stricta*	1998
C	*Acacia verniciflua*	2004
V	*Acacia verticillata*	2004
	Acaena novae-zelandiae	2004
	Achrophyllum dentatum	2004
	Acrotriche serrulata	2007
V	*Adiantum aethiopicum*	2004
V	*Allocasuarina littoralis*	2007
C	*Amyema pendula*	2009
C	*Arthropodium milleflorum* s.l.	2004
	Arthropodium strictum	2009
C	*Asperula conferta*	2004
C	*Asplenium flabellifolium*	1998
	Atrichum androgynum	2004
V	*Austrostipa mollis*	2007
	Austrostipa pubinodis	2009
V	***Austrostipa rudis* subsp. *australis***	2009
	Austrostipa rudis subsp. *rudis*	2009
V	*Azolla filiculoides*	2004
E	*Banksia marginata*	2004
	Billardiera mutabilis	2009
E	***Blechnum cartilagineum***	2004
	Bossiæa prostrata	2009
	Breutelia affinis	2004
	Burchardia umbellata	2007

Risk	Indigenous Species	Year
	Bursaria spinosa	2009
V	*Caesia parviflora*	2004
C	***Callitriche muelleri***	1998
V	*Calochlaena dubia*	2004
	Campylopus clavatus	2009
	Campylopus introflexus	2004
	Carex appressa	2004
	Carex breviculmis	2003
E	***Carex fascicularis***	2007
	Cassinia aculeata	2007
	Cassinia arcuata	2004
V	*Cassinia longifolia*	2007
E	*Cassytha melantha*	2004
E	*Centella cordifolia*	2007
C	*Centrolepis strigosa*	1998
C	*Chamaescilla corymbosa*	2009
C	*Cheilanthes austrotenuifolia*	1998
V	*Chiloglottis valida*	2004
V	*Clematis aristata*	2004
	Clematis decipiens	2004
V	*Comesperma volubile*	2007
V	*Coprosma quadrifida*	2004
V	*Cotula australis*	1998
V	*Crassula decumbens*	2009
V	*Crassula sieberiana* s.l.	1998
E	*Cyathea australis*	2004
C	*Cymbonotus preissianus*	2004
E	*Cynoglossum suaveolens*	2009
C	***Cyperus lucidus***	1998
E	*Desmodium gunnii*	2004
	Deyeuxia quadriseta	2009
	Dianella admixta	2007
V	*Dianella longifolia* s.l.	2004
	Dichelachne rara	2007
C	***Dichelachne sieberiana***	1998
	Dichondra repens	2009
E	*Dipodium roseum*	1985
C	*Diuris sulphurea*	2004
V	*Drosera peltata* subsp. *auriculata*	2007
E	*Drosera peltata* subsp. *peltata*	1998
V	*Drosera whittakeri*	2009
E	*Echinopogon ovatus*	2004
	Einadia nutans – a recent immigrant	2009
	Eleocharis sphacelata	2007
	Elymus scaber	2007
V	*Epacris impressa*	2004
V	*Epilobium billardierianum* subsp. *cinereum*	2004
	Epilobium hirtigerum	2004
	Eragrostis brownii	1998
V	*Eucalyptus cephalocarpa*	2009
V	*Eucalyptus cypellocarpa*	2004
	Eucalyptus goniocalyx	2007
V	*Eucalyptus melliodora*	2009
V	*Eucalyptus obliqua*	2004
V	*Eucalyptus ovata*	2004
E	*Eucalyptus radiata*	2009
C	*Eucalyptus rubida*	1994
C	***Eucalyptus viminalis* subsp. *pryoriana***	2009
E	*Eucalyptus viminalis* subsp. *viminalis*	2004

Risk	Indigenous Species	Year
V	*Euchiton collinus*	2004
E	*Euchiton involucratus*	2007
V	*Exocarpos cupressiformis*	2007
	Fissidens asplenioides	2004
	Funaria hygrometrica	2004
	Gahnia radula	2007
E	*Gahnia sieberiana*	2004
C?	***Galium australe***	2004
E	*Galium gaudichaudii*	1998
E	*Galium propinquum*	1998
	Galium sp.	2004
E	***Geranium gardneri***	1998
V	*Geranium potentilloides*	2004
V	*Geranium* sp. 2	1998
V	*Glycine clandestina*	2004
E	***Glycine microphylla***	2004
E	*Gonocarpus humilis*	1998
	Gonocarpus tetragynus	2009
	Goodenia lanata	2004
	Goodenia ovata	2004
C	***Goodia lotifolia***	2004
C	*Gratiola peruviana*	2004
V	*Hardenbergia violacea*	2004
V	*Helichrysum scorpioides*	2004
	Heteroscyphus fissistipus	2004
E	*Hibbertia riparia*	2007
C	***Histiopteris incisa***	1994
V	*Hovea heterophylla*	1998
C	*Hydrocotyle callicarpa*	2004
E	*Hydrocotyle foveolata*	2009
V	*Hydrocotyle hirta*	2004
E	*Hydrocotyle laxiflora*	1998
C	***Hydrocotyle tripartita***	1998
E	*Hypericum gramineum*	2009
	Hypnodendron vitiense subsp. *australe*	2004
	Hypnum cupressiforme	2009
C	*Hypoxis hygrometrica*	2007
E	*Imperata cylindrica*	1998
E	*Isolepis cernua* var. *cernua*	1998
E	*Isolepis hookeriana*	1998
V	*Isolepis inundata*	2007
V	*Isolepis* sp.	2007
	Juncus amabilis	2007
	Juncus gregiflorus	2004
	Juncus pallidus	2007
E	*Juncus planifolius*	2007
	Juncus sarophorus	2007
	Juncus sp.	2004
E	*Juncus subsecundus*	2007
	Kunzea ericoides spp. agg.	2004
	Lachnagrostis filiformis	2007
V	*Lagenophora gracilis*	2009
E	*Lagenophora stipitata*	2004
E	*Lemna disperma*	2007
	Lepidosperma elatius	1998
	Lepidosperma gunnii	2009
V	*Lepidosperma laterale*	2009
	Leptospermum continentale	2007
E	*Leptospermum scoparium*	2007
V	*Lindsaea linearis*	2004

Risk	Indigenous Species	Year
E	*Lobelia anceps*	2007
	Lomandra filiformis subsp. *coriacea*	2009
	Lomandra filiformis subsp. *filiformis*	2009
	Lomandra longifolia	2007
V	*Luzula meridionalis*	1998
C	*Lyperanthus suaveolens*	1998
V	*Lythrum hyssopifolia*	2007
	Marchantia sp.	2004
E	*Melaleuca ericifolia*	2004
	Microlaena stipoides	2009
C	*Microtis unifolia*	2004
C	*Muellerina eucalyptoides*	2003
C	***Neopaxia australasica***	1998
E	***Olearia argophylla***	2004
V	*Olearia lirata*	2004
V	*Opercularia ovata*	2009
V	*Opercularia varia*	2007
	Oxalis exilis/perennans	2009
E	*Ozothamnus ferrugineus*	2004
	Pandorea pandorana	2004
C	*Pelargonium australe*	1998
C	*Pelargonium inodorum*	2004
E	*Pentapogon quadrifidus*	2007
	Persicaria decipiens	2007
E	*Pimelea curviflora*	2008
V	*Pimelea humilis*	2009
C	***Poa clelandii***	2004
	Poa ensiformis	2004
E	*Poa labillardierei* var. *labillardierei*	2007
	Poa morrisii	2009
	Poa sieberiana (needs confirmation)	2004
E	*Poa tenera*	2004
E	*Polyscias sambucifolia*	2004
E	***Polystichum proliferum***	2004
	Polytrichum juniperinum	2004
	Poranthera microphylla	2007
	Pteridium esculentum	2004
E	*Pterostylis melagramma*	2004
C	*Pterostylis pedunculata*	1998
	Ptychomnion aciculare	2004
V	*Pultenaea gunnii*	2004
	Racopilum cuspidigerum	2004
C	***Ranunculus amphitrichus***	1998
E	*Ranunculus lappaceus*	2004
C	***Ranunculus pumilio* var. *pumilio***	1998
	Rosulabryum billarderi	2004
E	*Rubus parvifolius*	2004
E	*Rytidosperma caespitosum*	2007
	Rytidosperma geniculatum	2009
	Rytidosperma laeve	2007
	Rytidosperma linkii var. *fulvum*	2007
	Rytidosperma pallidum	2007
	Rytidosperma penicillatum	2007
V	*Rytidosperma pilosum*	2007
	Rytidosperma racemosum	2009
E	*Rytidosperma semiannulare*	1998
	Rytidosperma setaceum	2009
	Rytidosperma tenuius	2009
	Schoenus apogon	2007
	Senecio glomeratus	2007
	Senecio hispidulus	2007
C	***Senecio linearifolius***	2004
E	*Senecio minimus*	2007
E	*Senecio prenanthoides*	2004
	Senecio quadridentatus	2009
C	*Solanum aviculare*	2004
V	*Solanum laciniatum*	2007
C	***Solanum prinophyllum***	2004
C	*Stellaria pungens*	2004
E	*Stylidium armeria/graminifolium*	2004
C	*Thelymitra ixioides* s.l.	2004
V	*Thelymitra peniculata*	2004
	Themeda triandra	2009
	Thuidiopsis furfurosa	2009
V	*Thysanotus patersonii*	2004
	Tricoryne elatior	2009
	Triquetrella papillata	2004
E	*Typha domingensis*	2007
E	*Veronica calycina*	2004
E	*Veronica plebeia*	2004
E	*Viola hederacea*	2007
C	*Wahlenbergia gracilenta*	2004
E	*Wahlenbergia gracilis*	2007
E	*Wahlenbergia* sp.	2004
E	*Wahlenbergia stricta*	2004
	Wijkia extenuata	2004
V	***Wolffia australiana***	2007
E	*Wurmbea dioica*	2009
V	*Xanthorrhoea minor*	1998

Introduced Species

Acacia baileyana	*Aster subulatus*	*Conyza sumatrensis*	*Galium aparine*
Acacia floribunda	*Billardiera heterophylla*	*Cortaderia selloana*	*Galium murale*
Acacia longifolia longifolia	*Briza maxima*	*Cotoneaster* sp.	*Gamochaeta purpurea*
Agapanthus praecox	*Bromus hordeaceus*	*Crataegus monogyna*	*Genista linifolia*
Agrostis capillaris	*Callitriche stagnalis*	*Cynodon dactylon*	*Genista monspessulana*
Aira caryophyllea	*Centaurium erythraea*	*Cyperus eragrostis*	*Helminthotheca echioides*
Aira cupaniana	*Centaurium tenuiflorum*	*Cytisus scoparius*	*Holcus lanatus*
Aira elegantissima	*Cerastium glomeratum*	*Dactylis glomerata*	*Hypochoeris radicata*
Allium triquetrum	*Chamaecytisus palmensis*	*Dipogon lignosus*	*Juncus articulatus*
Anagallis arvensis	*Chrysanthemoides monilifera*	*Ehrharta erecta*	*Juncus capitatus*
Anthoxanthum odoratum	*Cicendia filiformis*	*Ehrharta longiflora*	*Juncus microcephalus*
Arctotheca calendula	*Cirsium vulgare*	*Eriobotrya japonica*	*Leontodon taraxacoides*
Asparagus asparagoides	*Conyza bonariensis*	*Eucalyptus cladocalyx*	*Lolium perenne*

Lonicera japonica
Lotus corniculatus
Lotus subbiflorus
Malus pumila
Moenchia erecta
Oxalis pes-caprae
Pennisetum clandestinum
Phalaris aquatica
Phytolacca octandra
Pinus radiata
Pittosporum undulatum
Plantago lanceolata
Poa annua
Polypogon monspeliensis
Prunella vulgaris
Ranunculus repens
Romulea rosea
Rosa rubiginosa
Rubus anglocandicans
Rumex pulcher
Sisyrinchium iridifolium
Solanum americanum
Solanum nigrum
Sonchus asper
Sonchus oleraceus
Sporobolus africanus
Stellaria media
Stenotaphrum secundatum
Trifolium glomeratum
Trifolium subterraneum
Ulex europaeus
Veronica arvensis
Vicia sativa subsp. *nigra*
Vinca major
Vulpia bromoides
Vulpia myuros
Watsonia meriana var. *bulbillifera*
Zantedeschia aethiopica

Notes concerning some of the locally threatened plant species

Austrostipa mollis (a Spear-grass). Moderately common in the site's west, and perhaps elsewhere.

Callitriche muelleri (Round Water Starwort). Recorded by Mueck and Timewell (1998), the only record in Knox.

Carex fascicularis (Tassel Sedge). 4 m² was found at the dam in the site's southwestern corner.

Clematis microphylla (Small-leafed Clematis). Found beside Cornish Rd in 2003, where scarce.

Cyperus lucidus (Leafy Flat-sedge). Regarded here as a possible misidentification by Mueck & Timewell (1998).

Eucalyptus viminalis subsp. *pryoriana*. Found in the site's southwestern corner in 2004 (albeit with flowers predominantly in sevens, suggesting possible interbreeding with *E. cephalocarpa*). The *Eucalyptus viminalis* reported by Mueck and Timewell is likely to be the same subspecies. The only other records in Knox are nearby in Lysterfield Park.

Glycine tabacina/microphylla (a Glycine). Mueck & Timewell's (1998) identification of *Glycine tabacina* is treated here as a probable misidentification of *G. microphylla*, which is common in the adjacent Lysterfield Park. There is no reliable record of *G. tabacina* in the Melbourne region south of the Yarra River.

Gratiola peruviana (Austral Brooklime). Recorded by Mueck and Timewell (1998).

Lemna disperma (Common Duckweed). Large numbers were found in the dam in the site's southwestern corner.

Neopaxia australasica (White Purslane). Recorded by Mueck and Timewell (1998), the only record in Knox.

Pelargonium australe (Austral Stork's-bill). Recorded by Mueck and Timewell (1998), the only record in Knox.

Pimelea curviflora (Curved Rice-flower). Present in unknown numbers on private grazing land in the site's west.

Poa labillardierei (Common Tussock-grass). Found by the author beside Cornish Rd in 2003, in the site's southwest in 2007, and by Mueck & Timewell at the Hanson Quarry in 1998.

Ranunculus amphitrichus (Small River Buttercup). Recorded by Mueck and Timewell (1998), the only record in Knox.

Ranunculus pumilio (Fan-leaf Buttercup). Recorded by Mueck and Timewell (1998), the only record in Knox.

Rytidosperma geniculatum (Kneed Wallaby-grass). Moderately common in the site's southwest, and perhaps elsewhere.

Wahlenbergia gracilenta (Annual Bluebell). Recorded by Mueck and Timewell (1998), the only record in Knox.

Wolffia australiana (Tiny Duckweed). Large numbers were found by the author in 2004 in the dam in the site's southwestern corner.

Fauna of special significance

Vulnerable in Victoria

Powerful Owl. Reported repeatedly from the area.

Speckled Warbler. Reported repeatedly from the area, including in the 1998 study by Mueck and Timewell.

Uncommon in the Melbourne region

Australian King-parrot. Reported by neighbours to be not uncommon in the area.

Eastern Grey Kangaroo. Abundant, but hardly known in the area until recent years.

Weasel Skink. Seen during the 1998 study by Mueck and Timewell.

Spotted Brown Butterfly. The Lysterfield Hills are one of the strongholds of this generally localised species.

Uncommon in Knox

Shining Bronze-Cuckoo.
Yellow-faced Honeyeater. } Seen during the 1998 study by Mueck and Timewell.
Eastern Whipbird.

Short-beaked Echidna. Apparently fairly common in the area, and seen by the author beside Cornish Rd during fieldwork.

Black Wallaby. Reported by both Mr John Erwin (Knox City Council) and in the 1998 report by Mueck and Timewell.

Peregrine Falcon. A pair is resident and has been observed to nest on quarry cliffs.

Fauna habitat features

- Quarry cliffs serve as nest sites for Peregrine Falcons;
- The combination of treed areas and open grassland is ideal for the large kangaroo population;
- The tree canopy and shrubs provide habitat for insects, bats, possums and a wide variety of forest birds;

- There are mature trees with hollows suitable for nesting or other occupation by native birds, bats, possums or insects;
- Fallen timber provides the sort of cover required by many reptiles and invertebrates;
- The abundant large wattles provide sap to feed Sugar Gliders, which have been seen in the adjacent Heany Park and probably occur within this site;
- The grassy ground flora provides fodder for butterfly caterpillars and other invertebrates, including Spotted Brown butterflies;
- It is likely that butterflies congregate on the ridgetop (which is what many butterflies do on hilltops);
- The farm dam in the site's southwest, along with its fringing wetland vegetation, provide habitat for waterbirds, frogs and aquatic invertebrates, and drinking water for other native fauna such as kangaroos and wallabies. It is not clear whether dams on the Boral quarry site have any habitat value.

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

This site is a part of a large habitat corridor extending from Dandenong Ck in the Dandenong Police Paddocks Reserve to Birdsland Reserve in Belgrave Heights, and beyond. Criterion 1.2.6 attributes **Regional** significance to any corridor that meets the description 'Important at regional scale (link within bioregion or catchment)', which is a reasonable description of the corridor of interest here. Criterion 1.1.2 also awards Local significance to 'areas of 100 ha or more of contiguous native vegetation in a heavily fragmented landscape', which applies to the Lysterfield Hills.

Regionally Threatened Ecological Vegetation Classes

Valley Heathy Forest is endangered. It follows from Appendix 3 of *Victoria's Native Vegetation Management - a Framework for Action* (NRE 2002a) that the native vegetation of this EVC in the site's southwest is necessarily of at least High conservation significance. This, in turn, gives the site **State** significance under criterion 3.2.3 of Amos (2004).

Most of the rest of the native vegetation within the site is in sufficiently good ecological condition to also achieve **State** significance under criterion 3.2.3. Some of the land occupied by vulnerable EVCs may only achieve Regional significance due to low habitat scores.

The significance of the site's wetland vegetation is not amenable to consideration under the guidelines of Amos (2004) because the water bodies are artificial features.

Rare or Threatened Flora

Criterion 3.1.2 attributes **Regional** significance to any site with known habitat for a small population of a species that is listed as rare or threatened in Victoria. This applies in the case of this site's known population of *Austrostipa rudis* subsp. *australis*. A summer survey may discover that the population of this taxon is larger than could be detected during past surveys, in which case the significance level could rise to State.

Some of the locally threatened plant species listed above are known to have viable populations, thereby meeting criterion 3.1.5 for a site of **Local** significance.

Rare or Threatened Fauna

Apart from the Powerful Owl and Speckled Warbler, the species listed as 'Fauna of special significance' above are rare or threatened locally or in the Melbourne area, but not throughout the whole of the relevant bioregion. This represents **Local** significance on the same basis as the rare flora just discussed.

The Powerful Owl is a vulnerable species in Victoria. It is known to frequent and roost in the Lysterfield Hills and there is evidently good quality habitat for it there. The population in the area is a small fraction of the bioregional total, but would be viable as part of the wider ranging population around the Dandenong Ranges. This represents **Regional** significance under criterion 3.1.2.

The Speckled Warbler population is of **Regional** significance on the same basis as the Powerful Owl.

Threats

- Quarry expansions;
- Invasion by environmental weeds, of which Boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*), Sweet Pittosporum (*Pittosporum undulatum*) and Gorse (*Ulex europaeus*) are very serious in parts of the site that could be inspected in this study;
- Eucalypt dieback, which is severe in places and includes substantial psyllid attack;
- Grazing by stock in the site's southwestern corner;
- Cattle hoofs trampling mud at the farm dam in the site's southwestern corner, destroying wetland vegetation including rare plants;

- Rabbit grazing;
- Loss or decline of plant species that have such small populations that they are vulnerable to inbreeding, poor reproductive success or random events such as trampling.

Management issues

- The ecological condition of vegetation on the public land in the site's southwestern corner could recover well if relieved from grazing;
- Weed control has been effective in recent years and should be kept up;
- Further management advice cannot be provided without the benefit of access to the quarry sites.

Administration matters

- A Reservoir Crescent property without a land title became the subject of ESO1 in February 2009. It is recommended that the proposed ESO2 should not include that property because the existing schedule ESO1 is adequate;
- The Planning Scheme zoning is mostly Special Use Zone 2 (SUZ2). The exceptions are 7·4 ha contiguous with Summit Rd and approximately 14·0 ha fronting Reservoir Crescent. Of these 7·4 ha, 6·8 ha is zoned Green Wedge Zone Schedule 2 (GWZ2) and 0·6 ha beside Reservoir Crescent is zoned Residential 1 Zone (R1Z);
- Parts of the Hanson Quarry site outside the current approved extraction area are covered by Public Acquisition Overlay Schedule 2 (PAO2);
- The site is outside the Urban Growth Boundary;
- This site is worthy of inclusion within the proposed Environmental Significance Overlay, ESO2, because of the endangered EVCs, the matters discussed under the heading 'Significance ratings', and the likelihood of biodiversity significance in parts of the site that could not be inspected or otherwise assessed;
- Part of the site is included under the existing Vegetation Protection Overlay Schedule 1 of the Knox Planning Scheme, based on the description of Sites 57 and 58 of the report by Water Ecoscience (1998). The boundary shown on p. 409 includes a larger area of native vegetation, as well as the quarry pits.

Information sources used in this assessment

- Mueck S.G. and Timewell C.A. (1998). *'Ecological Assessment of Native Vegetation Adjacent to a Proposed Extension of the Lysterfield Quarry'*, a draft report prepared for Pioneer Concrete (Vic) Pty Ltd;
- A site survey by Dr Lorimer for 3 hours 50 minutes on 25/7/04 within the most southwesterly lot in the site, including:
  - Compilation of lists of indigenous and introduced plant species in each of two vegetation types;
  - Description of the structural and floristic composition of each type of native vegetation;
  - Mapping and documentation of rare species populations and the ecological condition of the vegetation;
  - Incidental fauna observations;
  - Checks for fauna habitat, ecological threats and management issues;
- Similar information collected by Dr Lorimer on 25/4/03 along Cornish Rd (the site's northeastern edge), looking into the Boral Quarry land;
- Similar information collected by Dr Lorimer on 25/11/97 along Wellington Rd (the site's northern edge), looking into the Boral Quarry land, in preparation for the report, *'A Survey and Management Plan for Significant Vegetation of Roadsides in Knox'* by G.S. Lorimer for Knox City Council (May 1998, 137 pp.);
- Similar information collected by Dr Lorimer on 10/12/07 at Lot A Reservoir Crescent;
- A follow-up survey of the ownerless lot in the site's southwest by Dr Lorimer on 9/12/07 to provide up-to-date information that was presented at a planning panel hearing on 31/1/08;
- A walk by Dr Lorimer with parties to the abovementioned planning panel on 31/1/08 across the three most southwesterly lots within the site;
- The investigation of the pre-settlement distribution of 'Lysterfield Grassy Dry Forest' described in Appendix A of Volume 1;
- The Atlas of Victorian Wildlife;
- Aerial photography from February 2001 and April 2003;
- Satellite imagery of the district;
- The Department of Sustainability & Environment's BioMaps of the area;
- Maps of geology and topography produced by agencies of the Victorian government.

Acknowledgment

Thanks to Mr Michael Dileo, the owner of Lot A Reservoir Crescent (Standard Parcel Identifier A\PS428532), for providing access to his property.