

**Prepared on behalf of
Department of Sustainability and Environment
and Darebin and Banyule City Councils**

**Management Plan,
Cherry Street Grassland Reserve, Macleod**



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Frontispiece: Themeda-dominant grassland, Western Zone, Cherry Street Grassland Reserve.

1. SITE CONDITIONS, METHODOLOGY & SUMMARY

1.1 Introduction

This document is a long-term management plan for the Cherry Street Grassland Reserve in MacLeod, Victoria. The site is a crown land reserve in the southeast corner of the former Health Department land at MacLeod, which included Plenty Hospital and several other Health Department buildings.

The plan begins with a general assessment of flora and fauna and a detailed assessment of the vegetation through quality mapping. This approach clearly shows where the highest quality vegetation is in the reserve and which areas are significantly degraded. This quality assessment coupled with the definition of management blocks then guides and provides a template for considering, discussing and targeting all management actions throughout the report.

Several management issues applicable to the reserve as a whole are specifically discussed in Section 2. Specific actions to resolve the issues are then proposed.

The management blocks and their condition are then discussed in detail in Part 3. These detailed descriptions are the basis for understanding and implementing the first three year works plan proposed in Part 4. The management block descriptions will also be useful for developing future work programs.

1.2 Study Area

The area under study is 13.5 hectares in size and is reserved as Crown Land. Traditionally the area known as Cherry Street Grasslands was smaller in size but now includes sections of Harold Pottage Reserve, the Avenue of Honour and a section of remnant grassy woodland in the north (within 100 metres of Gresswell Hill).

Two small areas adjacent to the reserve have been included in the management plan recommendations and maps although they actually fall outside the reserve boundaries. These areas are a section of Harold Pottage Reserve and the western end of the Avenue of Honour. Management recommendations for these areas are included in this plan simply for the information of land managers and are not obligations according to the terms of this plan. The actual boundaries of the Cherry Street Grassland Reserve are defined on Map 4, Management Zones Map.

1.2.1 Fauna Values

Several studies in recent years have recorded rare and significant fauna within the general Macleod–Bundoora area including Beardsell (1997), Kern and Pittle (1997) and Costello et al (1993). As well, rangers from Latrobe University Wildlife Reserve have made numerous sightings of rare fauna in the area over the last two decades (George Paras pers. comm.).

Rare and significant fauna species recorded in the area in recent years include Swift Parrots and Regent Honeyeaters (both National Significant), Eastern Broad-nosed Bats (State Significant), Barking Owls and Powerful Owls (both State Significant). Several Regional Significant species have also been noted in the area.

Any of the rare and significant species recorded within and that continue to inhabit the general Macleod–Bundoora area are likely to make use of habitat at Cherry Street Grasslands Reserve due to the fact that the site is one of the few remaining stands of relatively intact habitats left in this region. Cherry Street Grassland Reserve is part of the complex of habitat sites and/or conservation reserves in the surrounding local area that includes Darebin Creek, Bundoora Park, the Latrobe University campus, Latrobe University Wildlife Reserve, Gresswell Habitat Link, Gresswell Hill, Gresswell Forest, Forensic Drive and Harold Pottage Reserve. As it forms an integral part of the collective habitats found in the Macleod–Bundoora area, Cherry Street Grasslands Reserve is therefore considered to be Regionally Significant fauna habitat (Beardsell 1997).

Details of rare and significant fauna known or likely to occur at Cherry Street Grasslands Reserve can be found in Beardsell, 1997, Vol. 3, pgs. 5–12. (The relevant extract is provided as a PDF file with the CD version of this report titled Appendix 5).

It is beyond the scope of this study to directly address fauna management issues. However, those responsible for management of the reserve can assume that managing native vegetation in the reserve to maintain a diversity of habitats and conditions will inherently support rare and common local fauna making use of the reserve.

1.3 Remnant Ecological Vegetation Class and Conservation Significance

DSE has developed a system where various vegetation communities are combined into Ecological Vegetation Classes (EVCs). EVC's are "one or a number of vegetation communities that exist under a common regime of ecological processes in a particular environment" (Parks Victoria 2000). EVC's provide a standard statewide system of classification that recognises that broadly similar vegetation types occur in different parts of the state because they exist under similar environmental conditions.

Past information on vegetation communities and current information on EVC's from a recent study in the Port Phillip and Westernport region (Oates and Taranto 2001) was used to determine the EVC of the study site. The excerpt of the map from Oates and Taranto (2001) shows that only part of the site was assessed, however all additional areas are also considered to be of the same EVC.

One remnant EVC was determined to be present on the study site: **EVC 55 Plains Grassy Woodland**.

Beardsell (2001) notes in his DSE Biosites Summary for Cherry Street two Plains Grassy Woodland communities at the Reserve: **Plains Grassy Woodland** – Exposed Plain–slope and **Plains Grassy Woodland** – Sheltered Plain–slope.

The EVC is still relatively intact in significant portions of the reserve. Several areas are more reminiscent of Plains Grassland EVC due to the original pre–settlement tree canopy being cleared and then maintained largely free of any over–storey component. The description of the EVC highlights that several “floristic communities” exist and three have been documented across Victoria. The closest floristic community documented would appear to be the Western Plains type but it is limited to basalt soils and the site is clearly dominated by Silurian–derived soils (Dept. of Mines 1981). The site does certainly support an example of a Plains Grassy Woodland but the floristic community of the EVC on the site could easily be an undocumented example of a floristic community within Plains Grassy Woodland.

The following description of the EVC is taken directly from Oates and Taranto (2001):

EVC 55 Plains Grassy Woodland

An open, grassy eucalypt woodland in low (mostly <700mm per annum) rainfall areas occurring on fertile soils on flats and gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a diverse grassy, herb-rich ground layer. Widespread and extensive in the past but has now been largely cleared for agriculture, and more recently for urban development resulting in few relatively intact remnants remaining in the Port Phillip/Westernport area.

Plains Grassy Woodland is a very variable EVC and includes a range of communities. The original floristics of many of these are now conjectural. Within the study area there are at least three formally recognised floristic communities of Plains Grassy Woodland and undoubtedly others do exist.

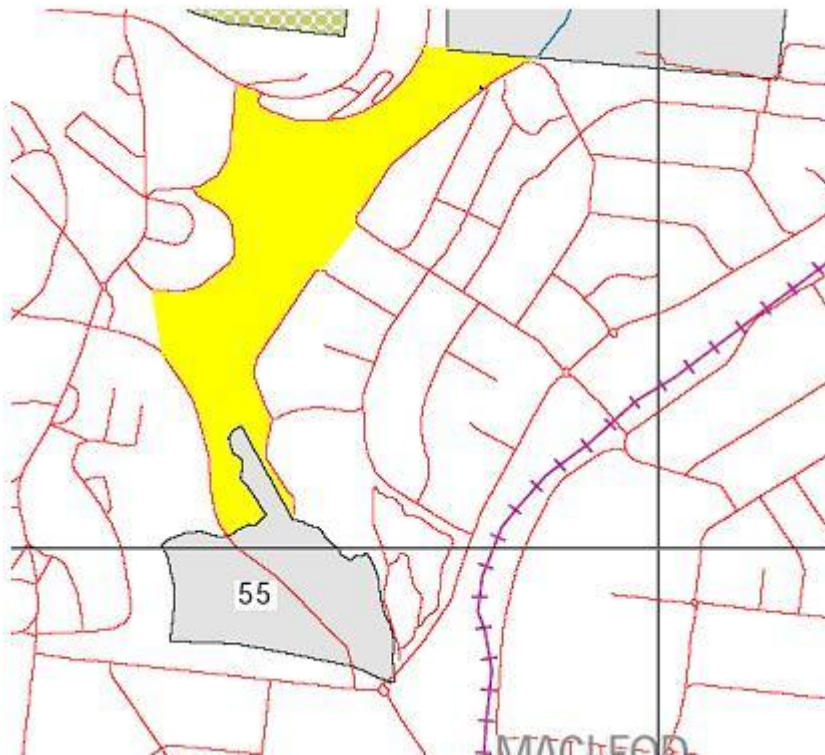


Figure 1. Excerpt from EVC map for Port Phillip showing the distribution of Plains Grassy Woodland in and adjacent to Cherry Street Grassland Reserve (shown in grey as Site 55). All other sections of Cherry Street Grassland Reserve also contain Plains Grassy Woodland - these areas are highlighted in yellow.

1.3.1 Conservation Status of the Ecological Vegetation Class

Plains Grassy Woodland in the Victorian Volcanic Plain Bioregion is considered 'endangered' DNRE (2000). The information in the table below is taken from Traill and Porter (2001):

Table 4. The Conservation Status of the Ecological Vegetation Classes

Ecological Vegetation Class	Pre-1750 Distribution Area (ha)	Current Distribution Area (ha)	Extant/Pre-1750 % remaining	Conservation Status in bioregion^	Reservation Status in Region % Extant Area	Private/extent
Plains Grassy Woodland	612,871	6,804	1%	Endangered	1%	67%

This is a highly depleted EVC and only occurs as small remnants that are often degraded (usually by weed invasion). The Broad Vegetation Type (BVT) Plains Grassy Woodland has 3% extent remaining in Victoria (Traill and Porter 2001). Given this, the BVT is considered 'endangered' in Victoria. The EVC is also poorly represented in conservation reserves as well. The data in Table 4 indicates why the EVC on the site is "Endangered". It has "contracted to less than 10% of former range; or less than 10% pre-European extent remains" (DNRE 2002). The study site makes an important contribution to the conservation of this endangered vegetation type.

1.4 Nomenclature

All plant names in this report are according to the most recent plant census for Victoria from the National Herbarium (Ross 2003).

1.5 Management Zones

Cherry Street Grassland Reserve has been divided up into seven management zones as a means of assisting managers to locate specific features and target conservation works more effectively. It is envisaged that the land manager adopt this system for use in all future management plans and projects at the reserve.

The seven zones have been defined on the basis of roads, tracks, trails and reserve boundaries. Other than the Avenue of Honour, all zones have been named using logical geographic references. The seven zones are:

- Avenue of Honour
- Southern Zone
- South-east Zone
- Eastern Zone
- Western Zone
- Mid-North Zone
- Northern Zone

The seven Management Zones are shown in the Management Zone Map. Throughout this study reference will be made to features and / or management issues within particular zones. Refer to the Management Zone section of this report for details on specific management issues affecting each zone.

1.6 Methods

The vegetation of Cherry Street Reserve was surveyed and assessed over November and December 2003. Fieldwork consisted of:

- surveying for all indigenous and non-indigenous species
- determining the sites Ecological Vegetation Class (EVC) and vegetation community
- determining the dominant flora species
- plotting the location(s) of rare and significant species
- determining population sizes of rare and significant species
- establishing four permanent survey quadrats at the site, and
- identifying all non-indigenous species and assessing the threat(s) each species poses.

Additional flora data was obtained from various sources, most notably Carr and McMahon (1988), Costello et al (1993) and Beardsell (1997).

Comprehensive flora species lists have been compiled; these are presented as Appendixes 1 and 2. Within the species list and throughout the text of this report all non-indigenous (exotic) species are shown with an asterisk (*) preceding their common and / or botanical name.

1.7 Vegetation Assessment

A total of two hundred and fifty five species are recorded for Cherry Street Grassland Reserve. One hundred and twelve species are indigenous (44 % of the total flora) and one hundred and forty three are non-indigenous (56 % of the total flora).

Most species noted in earlier studies were re-located in 2003. Fourteen additional indigenous species and sixty additional non-indigenous species were recorded during the 2003 study. Several indigenous species recorded by Carr and McMahon or Costello *et al*/could not be relocated in 2003. It is uncertain whether some or all of these species still occur at the site or were simply overlooked during the 2003 study. A list of all species recorded is included as Appendixes 1 and 2. Lists include a note on whether the species was recorded in 2003 and / or earlier studies.

Thirty-seven of the indigenous species are significant occurrences (44 % of the total number of indigenous species). State and National Significant species are sourced from the Department of Sustainability and Environment's list of VROT species. Regionally

Significant species have been determined by the authors and by reference to various reports including Beardsell (1997), Kern (1997) and Muyt (2003). Broadly the significance of a species is based on the following criteria developed by Carr *et al* (1991):

- Naturally uncommon or rare in Greater Melbourne or parts thereof (*Regionally Significant*) or Victoria (*State significant*) or across Australia (*Nationally Significant*).
- Formerly widespread in the region or Victoria but now depleted through habitat destruction or degradation;
- Remnant population(s) providing important information on floristics of the regional flora;
- Species which are taxonomically or biogeographically interesting;
- Potentially valuable source of propagation material for re-vegetation or species-enhancement plantings.

One species of National Significance is recorded at the Reserve: *Dianella amoena* – Matted Flax Lily. One taxon of State Significance is recorded: *Eucalyptus xstudleyensis* – Studley Park Gum. Thirty-five species are of Regional Significance within Greater Melbourne. A note on species significance is incorporated in the indigenous species list (provided as Appendix 1).

Management issues and actions for significant species are provided in the *Vegetation Management* section of this report.

1.8 Quadrats

Quadrats have been established at four locations. Each quadrat measures 10 m X 10 m in size, i.e., 100sq.metres. The four corners of each quadrat have been marked with steel pickets to allow quadrats to be re-surveyed regularly. Two corners of each quadrat have been plotted with a GPS unit with the locations stored at DSE, Box Hill. Quadrat locations are shown on the Vegetation Quality Maps (created by DSE). The vegetation in each quadrat has been recorded and a visual assessment made of the cover abundance of each species using the Braun-Blanquet system:

+ cover: < 5 %, a few individual plants

1 cover: < 5 %, any number of plants

2 cover: 5–20%, any number of plants

3 cover: 20–50%, any number of plants

4 cover: 50–75%, any number of plants

5 cover: 75–100%, any number of plants

All four quadrats are located within areas of intact (high quality) remnant ground–flora. They are intended to be used as monitoring points to capture changes in quality rather than simply capturing species occurrences.

Quadrat survey data is found in Appendix 4.

1.9 Vegetation Quality Maps

To assist in identifying management priorities, the quality of the ground–flora through Cherry Street Reserve has been surveyed and mapped using a four–tiered colour–coded system based on one developed for the NSW National Trust (Buchanan 1989). The indicative quality of the ground–flora in any one section of the site is represented by one of four colours:

Green: 75–100% indigenous cover. Areas of ground–flora largely or completely intact and carrying little or no exotic flora.

Blue: 50–75% indigenous cover. Areas of ground–flora substantially intact but with a moderate cover of exotic flora.

Orange: 25–50% indigenous cover. Areas of ground–flora substantially degraded and predominantly carrying exotic flora but where some indigenous ground–flora remains.

Red: < 25% indigenous cover. Areas where the ground–flora is severely degraded and largely or totally dominated by exotic flora.

All vegetation quality data has been captured using a GPS unit with the information stored at DSE, Box Hill.

Vegetation Quality Maps help to define priorities by providing base–line data capturing areas of intact or relatively ground–flora, invasive ‘hotspots’, fronts and trends. As a means of monitoring changes over time, additional vegetation quality mapping should be undertaken every five years.

2. MANAGEMENT ISSUES

2.1 Vegetation Management

2.1.1 Rare, Threatened and Notable Taxa

Two formally recognized rare or threatened taxa are located at Cherry Street Reserve: *Dianella amoena* and *Eucalyptus Xstudleyensis*.

D. amoena is listed as an Endangered Australian Rare or Threatened taxon (AROT) under the Commonwealth Endangered Species Protection Act and is considered endangered in Victoria with formal listing under way (D. Cameron, pers. comm. 10th Dec 2003). *Eucalyptus Xstudleyensis* is listed as an Endangered Victorian Rare or Threatened taxon.

Occurrences of both taxa have been plotted by DSE using a GPS unit with locations shown on the VROT Map attached to this report.

***Dianella amoena* (Matted Flax Lily).** A total of one hundred and four colonies (104) of this species have been identified as occurring at Cherry Street Grassland Reserve. *D. amoena* is a rhizomatous perennial herb that can form extensive open mats up to 5 metres wide (Carr & Horsfall, 1995). In many locations at Cherry Street Grassland Reserve and elsewhere, it is extremely difficult to distinguish individual *D. amoena* specimens due to the rhizomatous growth and form of plants. Therefore, for the purposes of this report, all locations of *D. amoena* plants at Cherry Street Grassland Reserve are referred to as colonies. In this report colonies are defined as either:

1. a single rhizome with leaves attached, or,
2. two or more rhizomes with leaves attached *and* growing in close proximity (<1 metre away) *and* completely separated from other colonies by at least 2 metres.

There is a paucity of biological and ecological information about the species, probably as a consequence of the species only being formally recognised in the mid-1990s. From observations made by the authors elsewhere in Victoria, the species appears tolerant of light to moderate weed invasion and like other *Dianella* species in Victorian grasslands – grassy woodlands, appears tolerant of irregular burning. Whether it is tolerant of frequent fires, i.e., every year or two, is uncertain. Intensive grazing is known to eliminate plants; presumably intensive close mowing / slashing would also eliminate plants.

As is clear from the VROT Map, *D. amoena* colonies at Cherry Street are not restricted to any one part or vegetation type and in fact are found in greatly contrasting situations, for example, along the fence-line of Cherry Street, at the base of *Eucalyptus cladocalyx*

plantings in the Avenue of Honour, within dense *Acacia pycnantha* groves, within intact *Themeda triandra*-dominant grassland, within intact grassy woodlands, within moderately intact grasslands and grassy woodlands and within highly modified, weed-dominated areas. Colonies occur in exposed and sheltered locations, areas devoid of overstorey, in shady locations and essentially everything in between.

The best means of ensuring that the species persists at similar or greater abundance in the reserve is to protect and *actively* manage all areas of remnant vegetation. Additionally, several specific actions for the species are required, for application across the Reserve:

1. Protective measures must be undertaken whenever infrastructure or tree maintenance works (i.e. along the Avenue of Honour) are planned or undertaken in the vicinity of colonies.
2. Protective measures must be undertaken whenever weed control works occur in the vicinity of colonies. This is particularly important whenever herbicides are used near colonies.
3. Several colonies are at major risk of being overrun by weeds, particularly from **Pennisetum clandestinum* (Kikuyu) and **Rubus fruticosus* spp.agg. (Blackberry). Colonies on the edges of, or amongst severe weed infestations should be prioritised for management. Where colonies occur in or near highly degraded, weedy vegetation, weed controls need not be undertaken with major vegetation restoration / rehabilitation objectives in mind as this would inevitably place a severe drain on resources and thus place at risk other conservation management aims at the reserve. In such situations weed controls need only involve regular weed control or containment to remove the immediate threat (i.e., along the invasive edge) until such time as resources allow major vegetation restoration / rehabilitation to occur in the location as a whole.
4. Tall woody weeds and tall plantings of non-indigenous species in the vicinity of colonies should be controlled / removed in ways that minimise the risks to colonies, i.e., felling trees away from colonies, not removing felled material through colonies, etc.
5. Colonies within the annual seasonal firebreak along the northern, eastern and south-eastern boundaries should be clearly marked *in situ* before slashing occurs and then left unslashed.
6. Colonies within 2 metres of roadways and vehicle tracks should be clearly marked *in situ* as a means of minimising inadvertent damage or destruction by management vehicles.

7. Following any ecological burns or unplanned fires, burnt areas should be surveyed to determine whether additional colonies are present. Any additional colonies should be formally mapped by DSE at least every five years.
8. The species should be a priority feature in any revegetation projects planned for the Reserve.

Eucalyptus Xstudleyensis (Studley Park Gum). A population of this taxon is located in the Northern Zone. Cameron *et al* (1999) ranked the Cherry Street population as the fourth most important location (out of 28 populations) for the taxon. Recent housing developments around the hybrid swarm population at the Streeton Views Estate in Yallambie means Cherry Street Reserve is now one of only two secure hybrid swarm populations remaining in Melbourne, the other being at the Simpson Army Barracks in nearby Greensborough.

Cameron *et al's* assessment of the Cherry Street population is that it is highly introgressed towards the *E. ovata* parent and therefore the long-term prognosis for the population at Cherry Street is poor:

The Plenty Hospital site (now Cherry Street Reserve) at Macleod supports a more modest population of highly introgressed hybrids with a relatively intact ground stratum which has a high intrinsic significance for grassland conservation. Whilst of all the sites investigated, the vegetation at this site has possibly the highest ecological worth, the hybrid swarm at this site is highly atypical and is unlikely to maintain its genetic integrity over future generations. (pg.19)

There is very little that can be done to intercede with natural reversion to one or other of the hybrid's parent species. However, regardless of whatever natural processes evolve with time, the fact this is one of the few conserved stands left makes active management of the stand critical.

Because of the presence of an *E. ovata* population and the highly introgressed nature of the *E.Xstudleyensis* population it has proven extremely difficult to clearly distinguish and identify the entire hybrid swarm in the Northern Zone. The need to both maintain various age classes of the hybrid and the management imperative to undertake overstorey thinning through the zone in order to maintain conditions favourable to the ground-flora, means it is critical that the extent of the hybrid population be clearly established before any overstorey thinning occurs in the zone. Therefore a botanist familiar with the taxon should be bought in within 12 months to identify and clearly mark all seedling, sapling and mature *E.Xstudleyensis* through the zone. Once this has been done management strategies should be developed that balance the need to maintain various age classes of *E.Xstudleyensis* with thinning of the overstorey through the zone (refer pg. 32, Indigenous Tree and Shrub Regeneration).

Relevant extracts from Cameron *et al* are attached as Appendix 4. Note that in Cameron *et al*'s report Cherry Street Grassland Reserve is referred to as the *Plenty Hospital* site.

Two other taxa at Cherry Street are notable occurrences: *Dianella brevicaulis* and a hybrid between *Eucalyptus ovata* and the non-indigenous *Eucalyptus botryoides*.

***Dianella brevicaulis*.** Two clumps of this species are located in the south-eastern section of the Reserve, on the grassy verge between the rail embankment and main roadway. Both clumps are well established and produced several inflorescences this November. They are both 9–12 centimetres wide at the base.

D. brevicaulis occurs across southern Australia, primarily in coastal and near coastal environments. It was first described in 1995 (Carr and Horsfall, 1995). In the northern region of Melbourne it occurs at a few widely scattered locations in very low numbers: at Keilor on basalt soils, West Essendon on Tertiary Age volcanics, and at Coburg on Silurian Age sediments. (Ian Taylor, Western Plains Flora and Brian Bainbridge, Merri Creek Management Committee, pers. comm. 11th Dec. 2003). It appears these are the closest naturally occurring populations to Cherry Street Reserve. Because of its rarity in northern Melbourne the species is considered to be Regionally Significant.

Australia's foremost *Dianella* expert Geoff Carr hypothesizes that the plants at Cherry Street may be naturalized from nearby plantings rather than being truly indigenous. He bases this on the premise that in Victoria the species is usually found in coastal locations or, if found away from the coast, on soils derived from recent marine / coastal depositions. Carr has noted naturalized populations of two other species of *Dianella*, *D. tasmanica* and *D. brevipedunculata*. (Geoff Carr, pers. comm. 10th Dec. 2003).

With this in mind the three indigenous nurseries in the northern region of Melbourne most likely to grow and supply *D. brevicaulis* were contacted to clarify the extent of propagation and use of the species. Keelbundoora Nursery (associated with La Trobe University Wildlife Reserve) has never grown the species while the Victorian Indigenous Nursery Co-operative, Fairfield, and Western Plains Flora Nursery, Sunbury, only started propagating and selling the species in the last four years. VINC have not grown the species for the last two years due to a paucity of seed, attributed to the severe drought conditions of recent years. Plantings have not been widespread with the closest known planting to Cherry Street being along the Merri Creek at Reservoir in 2000 or 2001 but it is estimated that less than 25 plants remain, with others failing to establish due to drought conditions. The City of Moreland planted about 2000 plants in 1999 or 2000, while the City of Hume planted a few hundred plants in 1999 or 2000. It is not known how many of these plantings remain. (Judy Allen, VINC; Ian Taylor, WPF; George Paras, La Trobe University Wildlife Reserve, Brian Bainbridge, MCMC, all pers. comm. 11th December 2003).

Despite the lack of evidence of propagation and local use, it is possible the species has been planted by a local resident who sourced material from an indigenous nursery outside the northern suburbs, presumably from a coastal supplier. It is also possible that local indigenous nurseries have inadvertently grown and sold the species in the past, perhaps misidentifying it for the superficially similar *Dianella admixta*.

It is virtually impossible to determine whether the occurrences of *D. brevicaulis* at Cherry Street are indigenous or naturalized, however it is the view of the authors that the population is *highly likely* to be indigenous rather than naturalised. This conclusion is based on the following:

- the species has never been widely propagated or planted in the northern region of Melbourne, any plantings that have occurred are within the last four years and the nearest known plantings are at least five kilometres away;
- use of indigenous species in home gardens is an exception rather than the rule: there is really only a small 'boutique' market for them (considerably much less than 1 in 20 home gardens). The chances of a nearby home gardener growing the species are considered extremely low, particularly as nursery material has not been readily available until very recently.
- mis-identification of the species by local indigenous nurseries is considered extremely low. Each of the suppliers has at least ten years experience dealing with local species and propagation of other *Dianella* spp. is very common suggesting that 'unusual' forms would be obvious to experienced suppliers.
- plants at Cherry Street are several years old and recent severe drought conditions suggest that establishment within the last three or four years is unlikely.
- plants do grow in the northern region of Melbourne on soils that aren't derived from recent marine / coastal depositions;
- elements of Tertiary Age marine depositions do occur at Cherry Street Reserve. (It must be acknowledged that the complex geology of the general Macleod – La Trobe University area and physical disturbances associated with the construction of the railway and roads at the Reserve make it extremely difficult to determine the true extent of these depositions at the Reserve).

Eucalyptus Xbotryoides. David Cameron noted this hybrid at the Reserve several years ago (D. Cameron, pers.comm. 13th Nov 2003) and the taxon has been located again for this report. Two large mature plants and several saplings and seedlings are located in the Northern Zone. One mature plant occurs approximately 50 metres south-east of Quadrat 4 within high quality remnant vegetation. The other mature plant and a cluster of seedlings and saplings occur approximately 50 metres south of the Quadrat, right on

the edge of a weed-dominated flattened mound (refer pg. 72, Northern Zone descriptions for more detail).

Eucalyptus ovata is widespread in the Northern Zone. Presumably the *Eucalyptus botryoides* source is several plantings in the area between Cherry Street Reserve and Gresswell Hill.

Given the taxon has established successfully and is now self seeding, there is the distinct possibility that if nothing were done to contain its spread it may eventually establish more widely in the Zone, if not in other areas of the Reserve. This could affect the persistence of other indigenous species at the Reserve, most notably *E. xstudleyensis*, *E. ovata* and other eucalypt species. Also of concern is the risk that seed from the hybrid is mistakenly collected for propagation and use in revegetation projects in the northern suburbs of Melbourne. Such a situation has occurred in the past, most notably when seed of *Eucalyptus trabutii* (a hybrid between *E. camaldulensis* and *E. botryoides*) was collected at Yarra Bend Park and propagated in the mistaken belief the hybrid was *E. Xstudleyensis* (Judy Allen, pers.comm., 11th Dec. 2003; D. Cameron, pers.comm.13th Nov. 2003)

David Cameron suggests that hybrid plants be retained in the immediate future as the taxon is undescribed and therefore has scientific / academic interest. Accepting this, after studies have concluded at least one of the mature trees and all seedlings and sapling should be removed. Any seedlings that then emerge from any remaining specimen should also be removed.

To ensure seed is never collected for revegetation purposes all plants should be clearly marked as soon as possible with a sign or tag stating something along the lines of *Not for seed collecting - hybrid between local and non-local species.*

Below: A (non-flowering) colony of the VROT-listed species *Dianella amoena* amongst indigenous grasses and forbs, Eastern Zone.



2.1.2 Invasive Species

Of the one hundred and forty two exotic, non-indigenous species at the reserve, ninety-eight species are environmental weeds posing some form of threat to the indigenous flora here. Information on invasive species has been sourced from Blood (2002), Muyt (2001), Carr (1993) Carr, Yugovic, Robinson (1992), as well as the authors' experiences and observations of invasive species elsewhere in South-east Australia.

Weed invasion is arguably the major threat to the preservation of the flora and fauna values at Cherry Street Grassland Reserve. Weeds are widespread through all parts of the reserve and while they are most abundant in degraded sections, pose a very serious threat to all remaining high quality stands of indigenous vegetation. The most obvious invasive species at the reserve are various woody weeds but all woody invasive species are a relatively straightforward matter to control and deal with. Of much greater concern are invasive grasses and forbs, both in terms of abundance and the difficulties involved in their management and control.

The degree of threat a species poses at Cherry Street Grassland Reserve varies widely. Some species are highly invasive or potentially highly invasive while others are incremental invaders or have not yet displayed invasive tendencies but may in the medium to long term, particularly if no control measures are implemented.

Fourteen of the ninety-eight invasive species are formally declared Noxious Weeds under the *Catchment & Land Protection Act 1994* (Refer *Weeds in Victoria*, 1998). These fourteen species are classed as *Regionally Controlled* weeds within the Port Phillip East Region, the region covering Cherry Street. The control and management of Regionally Controlled weeds is the responsibility of the landholder. Refer to the table in section 2.1.3 for details of the Regionally Controlled species at the reserve.

Controlling and eradicating the invasive species at the reserve entails developing overarching weed management strategies and utilising a variety of well-proven and sometimes experimental management and control techniques. Broadly, the range of techniques encompass:

- **Hand-weeding treatments.** For small infestations or where sensitive removal methods are required; includes hand-digging, pulling and grubbing.
- **Herbicides.** For large-scale infestations and / or tenacious weeds; encompasses non-selective, grass-selective and broad-leaf selective herbicides.
- **Woody weed treatments.** For various shrubs and trees; involves cut-paint, drill-fill, frilling and ringbarking techniques.
- **Control burns.** For removal of weed propagules, plant bio-mass and encouraging regrowth for follow-up sprays; encompasses hand-held spot-burners and burns over select areas of the reserve.

- **Competition strategies.** For out-competing invasive species; involves direct seeding, natural regeneration, thinning of the overstorey canopy.
- **Mowing and slashing treatments.** For containment of invasive populations by preventing seed drop / spread; involves the use of brushcutting, mowing, slashing.

It is beyond the scope of this study to present specific details on control methods for individual species. A substantial body of literature has been produced on environmental weed management in recent years. Relevant sources include Davies (1997), Muyt (2001), Brown and Brooks (2002), journals such as *Plant Protection Quarterly* (Weed Science Society) and *Under Control* (DPI Research Institute) as well as weed control literature produced by DSE, DPI and various local government organisations.

The following table lists the invasive species at the reserve, ranking their invasive potential and prioritising control, containment and eradication. The timeframes shown in the table of three and six years are based on the *short -medium - long-term* formula used in the Management Zone Descriptions, i.e., within 3 years = short-term and within 6 years = medium term.

The priority weeds for control in each management zone are provided in the Management Zone descriptions (commencing page 46).



Above: **Watsonia meriana* var. *bulbillifera* within the high quality grassy woodland vegetation in the South-East Zone. Several small infestations of this highly invasive species have established across the reserve.

Below: **Rubus fruticosus* spp. agg. infestation within the high quality grassy woodland in the Northern Zone. The species is one of the most abundant woody weeds in the reserve.





Above: Grassy species are the most problematic weeds at the Reserve. Here **Anthoxanthum odoratum* forms the dominant cover over portions of the Southern Zone. **Below:** Large portions of the Reserve are completely dominated by weeds. In this section of the Western Zone weeds form the dominant cover.



2.1.3 Environmental Weeds: For control, containment and/or eradication.

Key

- RC: Regional Controlled Weed in Port Phillip East (Legal Obligation to Control)

- ^: Plants as weeds (outside Avenue of Honour plantings)

- 1: Eradicate pops from entire Reserve over 3 years
- 2: Eradicate pops from entire Reserve over 6 years
- 3: Eradicate pops within or threatening higher quality vegetation over 6 years
- 4: Control populations within higher quality vegetation as required

A: High Impact in short, medium and long term

B: Minimal Impact over next 6 years; Moderate to High Impact in long term

C: Minimal Impact over next 6 years; Potential Impact in long term

Life Form	Botanical Name	Common Name	Status	Priority
Grasses, Rushes & Sedges	<i>Agrostis capillaris</i>	Brown-top Bent		4 - C
	<i>Aira caryophyllea</i>	Silvery Hair Grass		4 - B
	<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass		3 - A
	<i>Avena</i> spp.	Wild Oats		4 - B
	<i>Briza maxima</i>	Large Quaking Grass		3 - A
	<i>Briza minor</i>	Small Quaking Grass		3 - A
	<i>Bromus</i> spp.	Brome Grasses		3 - B
	<i>Cortaderia</i> sp.	Pampas Grass		1 - B
	<i>Cynodon dactylon</i>	Couch		3 - B
	<i>Cynosurus echinatus</i>	Rough Dog's Tail		4 - C
	<i>Cyperus eragrostis</i>	Drain Flat-Sedge		4 - B
	<i>Dactylis glomerata</i>	Cocksfoot		3 - A
	<i>Ehrharta erecta</i>	Panic Veldt Grass		3 - A
	<i>Ehrharta longifolia</i>	Annual Veldt Grass		3 - A
	<i>Holcus lanatus</i>	Yorkshire Fog		3 - B
	<i>Lolium perenne</i>	Perennial Rye Grass		4 - B
	<i>Lolium rigidum</i>	Wimmera Rye Grass		4 - B
	<i>Nassella neesiana</i>	Chilean Needle Grass		1 - A
	<i>Nassella trichotoma</i>	Serrated Tussock	RC	1 - A
	<i>Paspalum dilatatum</i>	Paspalum		3 - A
	<i>Pennisetum clandestinum</i>	Kikuyu		3 - A
	<i>Phalaris aquatica</i>	Phalaris		4 - B
<i>Sporobolus africanus</i>	Rat-tail Grass		4 - C	
<i>Vulpia bromoides</i>	Squirrel-tail Fescue		3 - B	

Life Form	Botanical Name	Common Name	Status	Priority
Narrow-leaf Forbs	<i>Agapanthus praecox</i>	Agapanthus		1 - B
	<i>Allium triquetrum</i>	Angled Onion	RC	1 - B
	<i>Chlorophytum comosum</i>	Spider Plant		1 - C
	<i>Freesia</i> hybrid	Freesia		1 - B
	<i>Gladiolus</i> sp.	Gladiolus		1 - B
	<i>Iris</i> sp.	Iris		2 - C
	<i>Narcissus</i> sp.	Daffodil		1 - C
	<i>Romulea rosea</i>	Onion Grass		4 - B
	<i>Tritonia lineata</i>	Lined Tritonia		1 - B
	<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia	RC	1 - A
Broad-leaf Forbs	<i>Anagallis arvensis</i>	Scarlet Pimpernel		4 - B
	<i>Arctotheca calendula</i>	Cape Weed		4 - B
	<i>Cerastium glomeratum</i>	Mouse-eared Chickweed		4 - B
	<i>Cirsium vulgare</i>	Spear Thistle	RC	4 - B
	<i>Cynara cardunculus</i>	Artichoke Thistle	RC	4 - C
	<i>Echium plantagineum</i>	Paterson's Curse	RC	4 - C
	<i>Foeniculum vulgare</i>	Fennel	RC	3 - B
	<i>Galium aparine</i>	Cleavers		4 - C
	<i>Hypochoeris radicata</i>	Cats Ears		4 - A
	<i>Linum trigynum</i>	French Flax		4 - B
	<i>Medicago polymorpha</i>	Burr Medic		4 - C
	<i>Oxalis</i> spp.	Sorrels		3 - C
	<i>Oxalis pes-caprae</i>	Soursob		3 - C
	<i>Plantago lanceolata</i>	Ribwort		4 - A
	<i>Raphanus raphanistrum</i>	Wild Radish		4 - C
	<i>Silene gallica</i>	French Catchfly		4 - C
	<i>Silene vulgaris</i>	Bladder campion		4 - B
	<i>Tragopogon porrifolius</i>	Salsify		4 - C
	<i>Trifolium</i> spp.	Suckling Clover		4 - A
	<i>Vicia</i> spp.	Vetches		4 - B
<i>Viola odorata</i>	Violet		2 - B	
Climbers, Creepers, Twiners	<i>Asparagus aethiopicus</i>	Asparagus Fern		1 - C
	<i>Drosanthemum candens</i>	Rodondo Creeper		1 - B
	<i>Hedera helix</i>	English Ivy		1 - B
	<i>Lonicera japonica</i>	Japanese Honeysuckle		1 - A
	<i>Salpichroa origanifolia</i>	Pampas Lily-of-the- Valley		4 - C
	<i>Sollya heterophylla</i>	Bluebell Creeper		1 - B
	<i>Tradescantia fluminensis</i>	Tradescantia		1 - B

Life Form	Botanical Name	Common Name	Status	Priority
Shrubs	<i>Acacia longifolia</i> var. <i>longifolia</i>	Sallow Wattle		1 - B
	<i>Acacia floribunda</i>	White Sallow Wattle		1 - B
	<i>Callistemon</i> sp.	Callistemon		1 - C
	<i>Chamaecytisus proliferus</i>	Tree Lucerne		1 - B
	<i>Chrysanthemoides monilifera</i> subsp. <i>Monilifera</i>	Boneseed	RC	1 - A
	<i>Coprosma repens</i>	Mirror Bush		1 - C
	<i>Cotoneaster</i> spp.	Cotoneasters		2 - A
	<i>Crassula multicava</i>	Heart-leaf Crassula		2 - B
	<i>Crassula multicava</i>	Crassula		2 - B
	<i>Crataegus monogyna</i>	Hawthorn	RC	2 - B
	<i>Cytisus scoparius</i> ssp. <i>scoparius</i>	English Broom	RC	1 - B
	<i>Genista monspessulana</i>	Montpellier Broom	RC	1 - B
	<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea		2 - B
	<i>Grevillea</i> sp.	Grevillea		2 - C
	<i>Hakea salicifolia</i>	Willow-leaf Hakea		1 - A
	<i>Melaleuca armillaris</i>	Giant Honey Myrtle		1 - B
	<i>Melaleuca hypericifolia</i>	Hillock Bush		2 - C
	<i>Opuntia robusta</i>	Wheel Pear		1 - C
	<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort		1 - B
	<i>Prunus cerasifera</i>	Cherry-plum		2 - A
<i>Pyracantha</i> spp.	Firethorns		2 - A	
<i>Rosa rubiginosa</i>	Sweet Briar Rose	RC	2 - B	
<i>Rubus fruticosus</i> spp. agg.	Blackberry	RC	3 - A	
<i>Ulex europaeus</i>	Gorse	RC	1 - B	
Trees	<i>Arbutus unedo</i>	Irish Strawberry Tree		2 - C
	<i>Brachychiton populneus</i>	Kurrajong		2 - C
	<i>Eucalyptus X botryoides</i>	Hybrid Southern Mahogany		1 - B
	<i>Eucalyptus cladocalyx</i>	Sugar Gum	^	3 - A
	<i>Fraxinus angustifolia</i>	Desert Ash		3 - A
	<i>Melaleuca stypheloides</i>	Prickly-leaved paperbark		2 - B
	<i>Phoenix canariensis</i>	Canary Islands Date Palm		1 - C
	<i>Pinus radiata</i>	Monterey Pine	^	2 - B
	<i>Pittosporum undulatum</i>	Sweet Pittosporum		2 - A
	<i>Populus alba</i>	White Poplar		4 - B
	<i>Quercus robur</i>	English Oak		4 - C
	<i>Ulmus procera</i>	English Elm		4 - B

2.1.4 Fencing of Core Conservation Areas

Urban bushland remnants are commonly subject to various recreational pressures that directly and indirectly contribute to the degradation of the indigenous flora (Buchanan, 1990). Cherry Street has a long history of recreational use (mainly walking, jogging and dog exercise; also cycling and trail bike riding) and the population increase associated with the Springthorpe Development will inevitably mean recreational use rises dramatically. This has the potential to threaten the long-term future of specific species and plant communities at the reserve, particularly the remnant grassland and grassy woodland ground-flora.

Accepting that recreational use is desirable and that maintaining conservation values is critical, the best means of balancing these interests is to restrict access in and through all areas of the reserve that retain high quality vegetation. The only effective means of doing so is to fence such areas off. A similar approach has been adopted at various urban remnants elsewhere in northeastern Melbourne, i.e., at Yarra Bend Park, Banyule Flats, along the Merri Creek, at Yarra Valley Parklands and at several sites in the City of Hume (authors personal observations).

Seven core conservation areas have been identified for fencing (refer to Core Conservation Areas Map). While none of these areas could be described as pristine, each contains largely intact grassland-grassy woodland vegetation. All areas include populations of the VROT-listed *D. amoena* and several Regional Significant species. Seventy six of the one hundred and four colonies – three quarters of the total population – would be fenced off, significantly improving the species chances of persisting at the reserve.

All fences should be of sturdy construction so that vehicles, ecological management burns or unplanned fires do not damage them. To lessen their visual impact they should be no higher than 1.5 metres tall and should have a raised skirt or open mesh design to allow native fauna to move in and out of areas.

Four of the areas are small enough to be accessed from outside the fence should weed spraying or fire suppression be necessary. The other three areas are large and so gates should be installed to allow for the possibility of management and / or MFB access (refer to Core Conservation Map for the location of gates).

There has been unimpeded access to all parts of Cherry Street Grasslands Reserve and Harold Pottage Reserve for decades so excluding users from certain sections has the potential to upset some people. To lessen this likelihood, signs should be strategically placed on all fences to inform users of the reasons why sections of the reserve are fenced off.

Action	
1	Seven core conservation areas should be fenced off to limit recreational access.
2	Fences should be of a sturdy design and allow for native fauna movement in and out of areas.
3	Gates should be installed on the fences surrounding the three largest areas to allow for management / MFB access.
4	Signs should be placed on all fences to inform recreational uses of the values of the core conservation areas.

2.1.5 Ecological Burns

In South-east Australia various native ecosystems including native grasslands and grassy woodlands have evolved with and adapted to particular fire regimes. Such fire regimes form an integral part of the ecological processes shaping the composition and structure of specific vegetation communities. Fire is a basic and fundamental process that maintains the growth, vigour and health of both specific species and the vegetation communities as a whole. In certain ecosystems fires may also be critical for maintaining or promoting specific fauna habitats. Without fires (or some other means of promoting favourable conditions) such communities are susceptible to ecological processes that can lead to species loss, structural changes, reduced or greatly simplified cover, loss of fauna habitat and weed invasions. (Buchanan 1991; Lunt 1990; Lunt 1991; Scarlett *et al.* 1992; Cameron *et al.* 1999).

Because of its remnant grassland and grassy woodland communities, Cherry Street Grassland Reserve is one area in which the absence of, or long periods without fire (+10 years), is likely to lead to the loss of floristic diversity, structural changes to the vegetation communities, a simplified vegetation cover and accelerated weed invasions. For this reason ecological burns are considered a critical management requirement at the reserve.

Themeda triandra (Kangaroo Grass) forms the dominant cover in grassland areas, while various grasses including *Microlaena stipoides* (Weeping Grass), *Poa* spp. (Tussock Grasses), *Austrodanthonia* spp. (Wallaby Grasses) and *Austrostipa* spp. (Spear Grasses) may be locally dominant / co-dominant in grassy woodland areas. (*T. triandra* is also present in the woodlands and occasionally forms small, locally dominant stands). *Themeda* grasslands occur in four of the seven zones: the Southern, Western, Mid-North and Northern Zones. Grassy woodlands occur in four zones: the South-eastern, Eastern, Mid-North and Northern Zones. The two communities require different approaches to using ecological burns in them.

Over the past fifteen years a considerable body of knowledge has developed concerning the optimum fire regime and ecological burning requirements of *Themeda*-dominant grasslands (see McDougall, 1989; Lunt 1991; Scarlett *et al.* 1992; Ross, 1995; Bush & Faithfull, 1997, amongst others). In the absence of fire (or some other means of removing biomass, i.e., grazing or mowing), *Themeda* eventually suppresses and excludes other indigenous species growing within the inter-tussock spaces. As well, *Themeda* tussocks eventually develop rank and brittle growth and commonly senesce, a scenario that may favour weed invasion particularly by exotic herbaceous species. Essentially these grasslands require burning at least once every five years, if not more frequently, in order to maintain floristic diversity and the vigour of *Themeda* tussocks.

In the *Themeda* grasslands it is recommended that ecological burns occur every 2–4 years. As there may be climatic factors affecting growth, i.e., extended dry periods or high rainfall events, the trigger for such burns should not be based on an exact timeframe beyond the general 2–4 year period. This period provides a broad indication of the time it generally takes for biomass to accumulate to a level that may threaten the floristic values of the grassland. Triggers that indicate when biomass reduction should occur are:

- when the inter-tussock space is <33% of the *Themeda* cover (as per the EVC benchmark for Plains Grassland, DSE 2003);
- when there is the potential for herbaceous species to be smothered or thinned out within the grassland;
- when there is the potential for *Themeda* tussocks to develop brittle, rank growth or senesce.

In contrast, there is a paucity of documented knowledge regarding the optimum fire regimes and ecological burning requirements in grassy woodlands. Certainly it is well understood by ecologists and conservation managers that fire in these communities is necessary to maintain floristic diversity and structure, (see Cameron *et al.* 1999 for example), however, no specific timeframe has been developed that clarifies and clearly identifies the frequency of burns in different types of grassy woodlands. However, the lack of specific information need not prevent ecological burns from being applied in such areas provided certain principles frame their use.

Firstly, no remnant grassy woodland areas should be burnt more frequently than once every four to five years as burning any more frequently may affect the persistence of certain species. Secondly, no more than 20% of grassy woodland areas should be burnt in any one year. Thirdly, burns should be conducted on a patchwork or mosaic approach, leaving unburnt areas next to burnt areas. Burning no more than 20% and leaving areas unburnt ensures that should there be any negative consequences following burns, then the impacts are not necessarily widespread or catastrophic.

It is clear from this site and similar grassy woodlands that in the absence of fire (or other forms of disturbance) *Microlaena stipoides* may form dense grassy thatch that can suppress or exclude other indigenous ground-flora species. The difference between *Microlaena* and *T. triandra* is that *Microlaena* plants do not easily senesce and may form an essentially intact, closed grassy sward for an indefinite length of time. Senescence of individual plants does of course occur but recruitment by new *Microlaena* plants is commonplace.

While dense *Microlaena* swards have the potential to suppress or exclude other species, there is nothing fundamentally wrong about such a process, indeed such stands can have high ecological integrity, i.e., by providing protective cover for certain ground-flora including perennial forbs and bryophytes and resistance to certain weed incursions. With this in mind, *Microlaena* swards at Cherry Street are only really a management 'issue' where there is the potential for them to dominate floristically diverse areas. In such cases, ecological burns are considered the best means of containing *Microlaena* growth while maintaining more open conditions.

Fires can seriously advantage weeds particularly in disturbed remnants such as Cherry Street Grassland Reserve where weed populations are high. It is therefore critical that sufficient resources be available for follow-up weed control works whenever ecological burns occur through higher quality ground-flora areas. If resources are insufficient then burns should be postponed until such time as sufficient resources are available.

Ecological burns also have validity in weed-dominated areas of the site. Burns are probably the best means of determining whether *Dianella amoena* (and other significant species) occur within specific degraded sections of the Reserve. For example, within the eastern sections of the Southern Zone, remnants of grassland flora persist amongst dense swards of **Anthoxanthum odorata* (Sweet Vernal Grass). An ecological burn here may reveal patches of *D. amoena*.

Ecological burning is also useful for a range of weed management purposes. These burns may encompass:

- using spot-burners to destroy the maturing seed heads of annual grasses (applied in spring on species such as **Briza maxima*, **Ehrharta longifolia*, **Aira* spp.).
- using spot-burners to reduce exotic, perennial grass tussocks and tufts to discrete clumps that can then be sprayed more easily (for use amongst predominantly indigenous vegetation or along an invasive front adjacent to indigenous vegetation).
- using spot-burners to stimulate the soil-stored seed bank of weed species for follow-up controls (for use amongst predominantly indigenous vegetation or along an invasive front adjacent to indigenous vegetation).

- burning a specific weed infestation in order to reduce its biomass, encourage regrowth (thus improving the potential for herbicide uptake) and alter conditions to favour natural regeneration or prepare restoration / revegetation.

Action	
1.	Ecological burns are a management necessity within all higher quality grassy areas of the Reserve.
2.	Ecological burns should be used to determine the extent of <i>Dianella amoena</i> colonies in degraded sections of the Reserve.
2.	Ecological burns are useful for weed management and should form part of basic weed-control strategies at the Reserve.

2.1.6 Ecological Burn Procedure

Future land managers will decide who carries out ecological burns within the reserve, whether they are carried out by the land managers themselves or in combination with other organisations such as the CFA/MFB. Regardless of who is to carry out a particular burn, detailed burn plans will be developed before any burns will take place. The burn plans may include the following information:

- Full names of persons conducting ecological burns;
- Exact area to be burnt;
- Location of control lines;
- Weather conditions required before burn can take place;
- Constraints relevant at the site to ensure asset protection;
- Lighting pattern to be applied;
- Detailed lists of resources/equipment to be available;
- Officer in charge of proceedings, and
- A map of the area affected.
- As well as the preparation of a detailed fire plan, the following procedures will be observed prior to any ecological burns:
 - Information from the burn plan will be made available to concerned residents upon request;
 - All relevant organisations will be notified on the day of the burn and supplied with a map, and

- 'Notification to Burn' notices will be posted on all major tracks around the area prior to the burn.

Action	
1	Establish and carry out formal procedures prior to any ecological burns.

2.1.7 Unplanned Fires

Unplanned fires are a relatively common event in many urban bushland remnants and are probably a consequence of areas becoming more accessible to greater numbers of people. While it is unclear how often unplanned fires have occurred in Cherry Street over recent decades, it is known that several have occurred nearby at Gresswell Hill over the last two decades, including one in autumn 2002 that burnt a hectare of the site (Muyt, 2002).

Because housing abuts the reserve any unplanned fires have the potential to threaten these properties. The experience in similar settings elsewhere in Melbourne shows that there is little that can be done to *prevent* unplanned fires from occurring at the Reserve; what is important is to develop strategies and actions that aid fire fighters and help to reduce the threat such fires pose to neighbouring properties (refer Incoll, 2002; also authors personal observations in the City of Hume, 1994–2000).

The eastern boundary of Cherry Street Reserve is the critical one to consider in light of fire risks; the majority of wild fires are likely to burn towards the southern and eastern sides of the Reserve due to the predominant south–westerly to north–easterly wind directions in the region.

An annual seasonal firebreak needs to be implemented along the eastern boundary of the Reserve, along the fence line of the houses abutting the reserve. The firebreak should be created in mid spring and conclude in mid autumn each year, coinciding with the period when fires are most likely to occur. The firebreak should be 10 to 20 metres deep back from the fence lines. Refer to the Fire Management Plan Map for the location of this firebreak.

Over 90% of the vegetation in the eastern firebreak consists of exotic grasses and forbs so the slashing program will have little impact on indigenous flora and should help to impede the spread of exotic plants from this section into the interior of the Reserve.

There is one small area in the north–east where indigenous vegetation dominates (refer Vegetation Quality Map). Tractor slashing will not be possible through much of this section due to the presence of trees and a small rise above an open culvert but slashing is not considered critical here as the ground–flora is reasonably sparse and abuts open space (a car park for the aged–care home).

Because there is some risk of fires running from a southerly direction, there is a need to create an annual seasonal firebreak at the back of the houses adjoining Harold Pottage Reserve. This area is the responsibility of Banyule City Council so if they have not yet implemented annual firebreaks here, they should be asked to do so. Only one small section along this boundary consists of high quality indigenous vegetation and as a track separates it from houses, it is not considered necessary to slash any of it. Refer to the Fire Management Plan Map for the location of this firebreak.

Because houses will eventually abut the northern edge of the reserve an additional annual firebreak will also be necessary along the far northern boundary. A major track runs parallel to this boundary and provides the basis for the firebreak here: the vegetation between it and the reserve boundary should be kept slashed over the spring–summer–autumn period each year. Refer to the Fire Management Plan Map for the location of this firebreak.

As a major concrete path will run between houses and the reserve along the south–western, western and north–western boundaries, it is not considered necessary to develop any firebreaks along these boundaries.

Currently there is good access through all parts of the reserve for any MFB vehicles. However, the proposal to internally fence core conservation areas affects this access. (Refer pg. 25, Fencing of Core Conservation Areas). Four of the fenced areas are small enough to be accessed from outside the fence should fire suppression be necessary. The other three fenced areas are quite large therefore gates should be installed on these fences to ensure MFB access.

At present the only vehicle entrance into the reserve is from Cherry Street, at the southern most point of the reserve. At least two other vehicle entrances should be developed in order to improve the MFB's ability to respond to any fires. The preferred location for these are, firstly, at the north of the reserve, at the Cherry Street – Gresswell Hill Habitat Link and secondly, at the north–western corner of Harold Pottage Reserve. Refer to the Fire Management Plan Map for the location of these entrances. (In the event that land managers determine that they require additional vehicle access, two extra vehicle entrances have been identified for the reserve. The locations for these are shown on the Fire Management Plan Map).

Fuel loads at the Reserve are not particularly high, especially when compared with the nearby remnants at Gresswell Hill, Gresswell Forest and La Trobe Wildlife Reserve. Other than leaf litter and small branches there is very little fallen material from indigenous trees and shrubs at the Reserve. (Presumably in recent years locals have gathered fallen material for home use). As the cover of indigenous understorey and overstorey vegetation at the Reserve is not dense, fuel reduction burning is not considered either desirable or necessary.

Planned ecological burns in areas with indigenous ground-flora will help to reduce fuel loads further as will thinning of indigenous overstorey seedlings and saplings. There are large populations of woody weeds at Cherry Street and clearing these will also assist with reducing fuel loads. To ensure fuel loads are reduced, felled woody weed material should always be removed from the Reserve for disposal off-site.

Action	
1	An annual (seasonal) slashed firebreak will be created along the eastern boundary.
2	An annual (seasonal) slashed firebreak will be created along the northern boundary.
3	Liaise with Banyule Council to create a trafficable annual (seasonal) firebreak at the northern boundary of the Harold Pottage Reserve
4	To improve MFB vehicle access, three entrances to the reserve are necessary. Refer Fire Management Plan for locations.
5	To ensure MFB vehicle access, gates need to be installed on the fences surrounding the three largest core conservation areas.
5	Fuel loads will be reduced through selective ecological burns, seedling and sapling thinning and woody weed controls.

2.1.8 Indigenous Tree and Shrub Regeneration

Tree and shrub recruitment occurs through most areas of Cherry Street Reserve. In places recruitment is prolific and the process appears to have accelerated in the last five to ten years presumably in response to alterations to the management regime that had prevented extensive recruitment from occurring in previous decades.

To maintain tree and shrub populations at the Reserve overstorey recruitment is both necessary and desirable. However, the scale and abundance of overstorey recruitment at Cherry Street has serious consequences on other indigenous vegetation, particularly those areas where high quality ground-flora persists (shown as green and blue areas on the Vegetation Quality Map).

Large-scale overstorey recruitment within grassy ecosystems is a process that can seriously undermine the diversity and quality of indigenous ground-flora. Regenerating overstorey plants compete vigorously for moisture and nutrients and as the canopy develops, over-shading can result in the thinning out of ground-flora species unsuited to the new conditions. Species adapted to the altered conditions will take their place; in disturbed environments where weeds are abundant, this commonly means shade-tolerant invasive species displacing indigenous species (Muyt, 2001).

It is widely acknowledged that much of the conservation worth and significance of Cherry Street Grassland Reserve relates to its stands of intact / relatively intact grassy flora (Carr & McMahon 1988; Costello *et al* 1993; Beardsell 1997; Pt. Phillip Biosites

Study 2001). In order to maintain the diversity and fundamental values of the grassy flora it is essential that overstorey recruitment be controlled and contained within all higher quality grassy areas of the reserve.

There are four *Themeda*-dominant grassland areas at the reserve (refer to the Management Zone descriptions for details). In these areas, all overstorey regeneration should be removed except for within small weed-dominated sections that are unlikely to be rehabilitated. Regeneration should be actively encouraged at the perimeter of each core area and within any degraded sections that are unlikely to be rehabilitated provided this does not conflict with conservation of the core grassland areas, i.e., does not encourage over-shading, highly invasive weed fronts, etc. All four core areas are less than a hectare in size and maintaining treeless open conditions in less than 10% of the reserve is not considered to pose any risk to the long term viability of overstorey species at the reserve.

Within the higher quality grassy woodland areas of the Reserve, overstorey regeneration should be thinned considerably, with seedlings and saplings retained at ratios of 1–3 plants every 100sq metres. Regeneration within the grassy woodlands should be actively encouraged at the perimeter of higher quality areas provided this does not conflict with conservation of ground-flora species, i.e., does not encourage over-shading, highly invasive weed fronts, etc.

Overstorey regeneration is extensive within most degraded sections (shown as red and orange on the Vegetation Quality Map) but in these areas the process should be allowed to continue as it assists in maintaining both overstorey cover and species at the reserve and does not appear to be affecting fundamental conservation values.

Action	
1.	Overstorey recruitment is to be controlled and contained within all higher quality grassy areas of the Reserve.
2.	Overstorey recruitment is to be encouraged within all degraded sections of the Reserve.

2.1.9 Eastern Boundary

Several property owners along the eastern boundary have taken advantage of the areas general lack of management over the years to establish vegetable gardens, ornamental plantings, woodpiles and beehives behind their properties. Over many years property owners here have also dumped garden clippings and prunings in to the bushland, a process that has inevitably contributing to the destruction of remnant flora and the spread of certain exotic species. Now that the area has been declared a reserve and is to be formally managed, such practices are obviously no longer acceptable. Therefore all gardens, woodpiles and beehives along the eastern boundary should be removed and the practice of dumping garden clippings and prunings discouraged.

Neighbouring property owners have no legitimate right to use the land but the long history of use could mean there is resentment towards both the changed status of the land and conservation of the remnant vegetation. With this in mind it is recommended that the land manager give neighbours a 6 to 12-month period to remove materials, plants and woodpiles. As well a meeting should be convened informing them of the conservation and recreation values of the reserve and asking for their co-operation in its care and maintenance.

Residents should also be informed that the practice of dumping clippings and prunings into the Reserve is no longer acceptable.

These neighbours have legitimate concerns over the risk of fire along their boundary and most have kept the ground behind their properties mown. The land manager needs to reassure them that this practice, albeit in a modified form, will continue but that it is now the responsibility of reserve managers. (Refer Unplanned Fires, pg. 30)

Action	
1	Adjacent property owners have 6–12 months to remove all materials and plants along the eastern boundary.
2	Information about the conservation and recreational values of the reserve should be provided to property owners along the eastern boundary.
3	Neighbouring property owners are to be discouraged from discarding garden clippings and prunings into the reserve.



Above: Tree and shrub regeneration is extensive through much of the Reserve. Here *Eucalyptus camaldulensis* seedlings are emerging en masse through a sparsely treed area of native grassland. **Below:** Wood and rubbish piles behind houses along the eastern boundary.



2.1.10 Integrating Management with Banyule Council

The boundary between the Cities of Darebin and Banyule passes directly through bushland at the edge of Harold Pottage Reserve. Banyule Council manages all bushland to the east of this boundary while bushland to the west makes up part of Cherry Street Grassland Reserve, managed by DSE at the time of drafting management plan. All bushland on the Cherry Street side is within the South–East Zone (refer Management Zones Map).

Because of the lack of on–ground references to this boundary and similar vegetation and conditions on either side of the boundary, a decision was made to map the quality of the vegetation eastwards as far a small well–defined track running roughly parallel to the boundary in a north–south direction. This track is actually 2 to 10 metres beyond the formal boundary of Cherry Street Reserve (the actual boundary of the Cherry Street Grassland Reserve is shown on the Management Zone Map). For practical purposes, numerous management actions for the land between the formal boundary and the track to its east have been incorporated into the Cherry Street Grasslands Reserve Works Program and Zone Descriptions.

As is clear from the Vegetation Quality Map, vegetation on either side of the boundary is of very similar quality. This has major implications for the management of the bushland here; from the ecological and recreational perspectives, it makes no sense to undertake separate management programs in this area simply because an arbitrary line has been drawn through it. Several issues on one side of the boundary inevitably impact in the other so it is important that the land manager develop joint management with Banyule Council for this area. Issues that need to be addressed by both organisations include:

- conserving and managing populations of *Dianella amoena* as well as several Regional Significant species;
- conserving and managing areas of high quality ground–flora;
- weed management and control;
- revegetation strategies and actions;
- public access;
- community involvement, and
- seasonal firebreaks.

The major issue that needs clarifying within the next 12 months is the proposal to fence the bushland as far as the small, well–defined track east of the formal boundary. (Refer to the Core Conservation Map for the location of the fence). This track has been chosen as it forms a useful edge and avoids artificially dividing the bushland. It also ensures a

greater area of high quality ground–flora, large populations of several Regional Significant species as well as five populations of *Dianella amoena* are better protected.

It is beyond the scope of this report to propose which organization funds or undertakes specific tasks in this section of bushland. This aspect obviously needs clarifying during discussions between both organizations.

Action	
1	The land manager will seek to develop a joint management approach with Banyule City Council for adjacent bushland areas in the South–East Zone and Harold Pottage Reserve.

2.1.11 Drainage Construction and Rehabilitation

As part of the Springthorpe Development two old open drains dissecting the Western Zone and discharging at the base of the old railway embankment in the Eastern Zone were replaced with a single underground drain. The route of the new drain was selected to avoid high quality indigenous vegetation and populations of the VROT–listed *D. amoena*. Drainage construction works were completed in autumn 2004. Field observations by the authors confirms that soil disturbance was kept to an absolute minimum and little if any indigenous vegetation was destroyed.

A letter dated 18th June 2003 from Jude Westrup, Senior Land Use Planner DSE to Zig Inge Group developers granted approval for the construction of the drain on the basis that Zig Inge agreed to: 1. carry out revegetation of the disturbed area, and 2. conduct weed eradication works every four months for a period of two years along the length of drainage line (DSE Ref: 12Rs1436). The Committee of Management now has responsibility for ensuring these rehabilitation actions are carried out (Adam Shalekoff, Darebin City Council, pers.comm., 10th June 2004).

Action	
1	Ensure regular weed controls occur along the new drainage route. Ensure revegetation occurs along the new drainage route.

2.1.12 Rubbish Dumping and Wind–borne Litter.

Rubbish dumping in the reserve is a very minor issue and should cease completely once gates are installed at entrance ways. Most rubbish consists of old building materials with some minor dumping of garden clippings and prunings. Material is mostly located along the edges of the main asphalt pathway. There are also some old car parts dumped in the Northern Zone and three dumped cars in the old railway reservation (these probably date back to the 1970's or 1980's). All rubbish could be gathered over

a day or two using a tip truck. Refer to the Management Zone descriptions for details on the location of dumped rubbish.

Land adjacent to the Southern, Western and Northern Zones is being developed for housing. Perimeter fencing around the Reserve minimises the risk of machinery and vehicles illegally entering the Reserve from the development and so reduces the likelihood of building waste being dumped here. However, wind-borne litter from building sites is an issue in parts of the reserve.

The Western, Northern and Southern Zones are currently in the process of being prepared for housing sites; litter in these areas is very sparse at present. However, building litter is strewn through the Mid-North Zone, the only zone to date next to building sites. Litter here is smothering indigenous plants, is likely to be undermining the reserve's aesthetics and may also be an impediment to fauna movement.

In recent years many councils in Melbourne have developed codes of practice for building sites that include details on how waste and litter have to be dealt with. For example, the City of Hume Building and Works Code of Practice states that "*building sites must have a waste container to prevent wind borne litter from blowing around...the container must have a lid and be emptied regularly*" (City of Hume 2001).

As building construction is set to occur next to the Western, Northern and Southern Zones within a few months, the land manager should liaise with the Springthorpe Developers to ensure a similar code of practice is implemented *before* construction commences.

Action	
1.	Accumulated rubbish should be removed as soon as possible
2.	Liaise with developers to ensure wind-borne litter does not enter the Reserve from building sites.



Above: Cherry Street Grassland Reserve grades into Harold Pottage Reserve along the edge of the South–East Zone. Given the similarity in vegetation and management issues, management of the two reserves in this area should be integrated. **Below:** Wind-blown rubbish is common in sections of the reserve abutting housing developments. Here in the Mid–North Zone building rubbish lies strewn through a *Themeda*-dominant grassland.



2.2 Recreation and Public Use Issues

2.2.1 Naming the Reserve

The current name of the reserve, Cherry Street Grassland Reserve, is something of a relic and needs to be reconsidered in light of the vegetation occurring across the entire site. Historically Cherry Street Grassland was an informal name applied by botanists, ecologists and local residents to the area of native grassland nearest Cherry Street. This area now makes up less than a quarter of the new reserve. The familiarity and history of this name may be enough to retain its use to describe the entire reserve, however, it could be that in a reserve where woodland now forms the predominant vegetation cover that a name containing 'grassland' is now inappropriate, if not misleading.

A traditional Koori name could be considered for the reserve, either as an addition to the current name or to replace it all together. By consulting with the local Koori community a suitable name could be chosen from the Wurundjeri language to reflect both the current values and history of the reserve.

Action	
1.	Consider an alternative name for the reserve and initiate a process of community consultation for a suitable name change.

2.2.2 Signage and Interpretation

Signage within the reserve is necessary to serve two purposes. Firstly, strategically placed signs are necessary to present information as to the nature of the open space as well as who is responsible for the management of the reserve and with whom any communications can be made. A site-specific sign strategy based on general council guidelines will eventually determine the exact positioning and nature of such signs.

The second purpose of signage within the reserve is to provide interpretation for recreational users. These signs, along with leaflets and guided walks, would provide information on the heritage and conservation values of the reserve.

Interpretation signs can convey any number of themes but are best focused on unique features or those that are readily discernible by users, i.e. Avenue of Honour plantings, the old railway line, birds and butterflies, commonly identifiable trees, shrubs and ground-flora plants. Ideally no more than three or four signs should be erected at the reserve. Any more than this number and users are inclined to 'tune out' from the intended messages.

As a general rule people do not read or absorb lots of words on signs but do relate to visual representations of particular features, animals or plants. Interpretation signs should therefore be visually-based rather than textually-based.

Interpretation signs are often subject to vandalism, particularly graffiti. Materials and coatings are available that allow graffiti on signs to be cleaned off. While expensive, such coatings are worth the extra cost as it means signs don't have to be replaced and can remain *in situ* for many years. As interpretation signs are at risk of destruction from fires it is best to locate signs away from high-risk areas, i.e., at or near entrances and along the central asphalt roadway.

Smaller information signs should also be erected on the perimeter fences proposed for the core conservation areas to explain to users the reasons why these areas are fenced. (Refer page 25, Fencing around Core Conservation Areas).

A small leaflet could be produced to highlight the significance of the reserve, including historical features such as the Avenue of Honour and the old railway line and 'green' features such as local fauna, plant communities and significant vegetation. It could incorporate a map of the track and trail system and links to nearby reserves such as Gresswell Hill, Gresswell Forest and La Trobe University Wildlife Reserve. The leaflet could be distributed in the surrounding streets and also made available at entrances to the reserve.

Each spring a guided walk could be undertaken for interested locals. This could perhaps be organised through the two local councils, Friends of La Trobe University Wildlife Reserve or interested local conservation groups.

Action	
1.	Design a site-specific signage strategy and interpretation program. Interpretation may take the form of leaflets, guided walks and signs.
2.	Interpretation signs should only be located in areas that are unlikely to be at risk of serious fires.
3.	Small signs should be placed on the fences around the core conservation areas to identify the management objectives in these areas.

2.2.3 Dogs

Dogs are likely to impact on the conservation values at Cherry Street in two ways. Firstly, dog droppings and urine may contribute to the decline in the condition of the indigenous ground-flora by elevating nutrient levels. The deposition of dog faeces is one of the recognized processes that elevate nutrient levels in urban open spaces; it is estimated that dog faeces contribute up to 2kg of phosphorus per hectare per annum in some urban parklands (Kern *et al* 1992). Such levels have the potential to favour introduced vegetation over local species adapted to lower nutrient levels.

Secondly, dogs may present a physical threat to native fauna, particularly ground-dwelling animals such as birds, reptiles, lizards and amphibians. Dogs commonly harass and attack native fauna while their barking, urine and scent may deter native fauna from using or inhabiting bushland. Of course dogs may also be a physical threat to people using the Reserve.

Both the movement of dogs and the deposition of their faeces in the reserve need addressing. The entire reserve should be a 'dogs-on-lead' area at all times, with signs placed at entrances to inform users of this policy. Disposable bags for dog droppings should also be available at entrances.

Action	
1.	Dogs are to be 'on-lead' at all times in the reserve.
2.	Disposable bags for dog droppings are to be available at entrances to the reserve.

2.2.4 Unauthorised Vehicle Access

At present there is unimpeded vehicle access through the reserve from Cherry Street. Cars and trucks have been noted in the reserve several times during the compiling of this report. This includes trucks driving through the reserve to access parts of the Springthorpe Development, trucks parking and off-loading equipment in the reserve (for works at the Springthorpe Development) and cars accessing the back of properties along the eastern boundary.

Unauthorised vehicle use in the reserve should be stopped as there is a significant risk of damage / destruction to indigenous flora from vehicles driving through or parking on vegetation or from materials being dumped from vehicles.

The surest means of preventing unauthorized access is to place sturdy gates at each vehicle entrance. Gates should be kept securely locked at all times, with access restricted to management and MFB vehicles. Refer to the Fire Management Plan for the locations of vehicle entrances.

Action	
1.	Vehicle access at the reserve is to be restricted to management and MFB vehicles.
2.	Sturdy gates will be installed at all vehicle entrances. Gates are to be secured by locks at all times.

2.2.5 Road, Track and Trail Network

There is no need or justification to develop any new roads, tracks or trails in the reserve as a well-established network of formal roads, paths and tracks and numerous informal tracks and trails already exists. The relatively small size of the reserve matched with this network means management vehicles, walkers, joggers and bike riders have no real impediments to accessing all parts of the reserve.

The one major problem with this network is that several of these paths, tracks and trails dissect sections of the reserve supporting high quality indigenous ground-flora, including large and small colonies of the VROT-listed *D. amoena*.

As unimpeded access through such areas has the potential to disturb and degrade the vegetation, it is desirable to close off some of these paths, tracks and trails. Because several other roads, tracks and trails would remain open, such closure should have little or no effect on users ability to enjoy the landscape and move easily through it.

It is proposed to fence-off seven core conservation areas (refer page 25, Fencing of Core Conservation areas). By erecting these fences most access along these paths, tracks and trails will effectively end except for occasional management needs such as weed control works, ecological burns, interpretative walks, etc.

Refer to the Road, Track and Trail Network Map for the location of all roads, paths, tracks and trails. This map shows which paths, tracks and trails would be closed to public access once fences are erected around the seven core conservation areas.

Action	
1	No new roads, tracks, paths or trails are necessary at the reserve because of the extensive and well-established road-track-trail network in place.
2	Public access along tracks, paths and trails through core conservation areas is to be discouraged (by fencing these areas off).

Below: An extensive network of tracks and trails dissects the reserve. Several run through areas of intact ground–flora and access through such areas should be restricted as a means of helping to preserve the vegetation.



2.2.6 Cherry Street Fence Line

The existing steel pipe and wire fence along Cherry Street is an outdated, decrepit eyesore that significantly detracts from the appearance of the Reserve. It should be removed as a priority and replaced with a fence more in keeping with the heritage and conservation values of the Reserve.

A traditionally styled, post and rail timber fence is considered the most appropriate design to use. It would be softer in appearance and compliment the landscape better and also has the advantage that if any one section is damaged then that section can be replaced without affecting the appearance or tension in other sections. As vegetation near the fence line is sparse and fuel loads low, it is highly unlikely that a timber fence here is at risk of being destroyed by wildfire.

Action	
1.	Remove the existing steel pipe and wire fence and replace it with a traditional style, timber post and rail fence.

2.2.7 Facilitating Community Involvement

Local residents have taken a keen interest in the Cherry Street grasslands for several years, indeed this is part of the reason the area is being preserved while adjacent areas are being developed. Obviously community interest should be encouraged and their involvement formalised in some way; there are two broad means by which this can be done.

Firstly, locals should be encouraged to form a Friends-type group. Traditionally Friends groups operate as independent bodies working in co-operation with land managers to undertake a range of conservation-orientated activities including weeding, planting, rubbish removals, fauna and flora surveys, seed collection, etc. The types of activities such a group could carry out at the reserve is ultimately up to the group itself – in most cases, it is usually determined by both the level of experience and interest in particular activities members may have.

Secondly, key community members could be encouraged to become part of an advisory committee for the Reserve. Local councils have powers under the Local Government Act to form such committees. Advisory committees are not meant to determine day-to-day management decisions / activities but instead contribute to the setting of broad management directions.

Action	
1.	Local residents should be encouraged to form a Friends group for the reserve with the aim of undertaking a range of practical on-ground activities.
2.	An Advisory Committee should be formed with the aim of formalising community involvement in the management of the reserve.

3. MANAGEMENT ZONES

3.1 Avenue of Honour Zone

Note: The Avenue of Honour extends along the length of Cherry Street but the western section does not form part of the Cherry Street Grassland Reserve. As exotic vegetation dominates most of the ground-flora and no VROT / AROT species occur in it, the western section has not been included in the description here. It should be noted that two highly invasive environmental weeds not within Cherry Street Grassland Reserve, occur in the western section of the Avenue of Honour: *Acacia saligna (Golden Wreath Wattle) and *Nassella trichotoma (Serrated Tussock). To minimise the risk these species pose to indigenous vegetation in the reserve, land managers should liaise with the managers of the western section to eradicate them.

Physical Description

A rectangular zone extending along the Cherry Street frontage for a distance of approximately 500 metres.

The zone is approximately 2 hectare in size. The entire zone has a gentle slope, falling gradually to the south.

A well-formed dirt road runs along the length of the zone forming its northern boundary. The main entrance to the Reserve dissects the zone at the south-eastern corner. Two small walking tracks dissect the middle of the zone.

Indigenous Vegetation Description

Plantings of the non-indigenous **E. cladocalyx* and **P. radiata* form the dominant canopy with little indigenous over-storey remaining except for a very scattered cover of *E. camaldulensis* (most *E. cam.* plants are < 25 y.o). A very sparse *Acacia*-dominated understorey occurs in the zone (*A. implexa*, *A. mearnsii*, *A. pycnantha*). Indigenous ground-flora persists through much of the zone although in most sections exotic ground-flora species are abundant. Small pockets of high quality indigenous ground-flora persist in sections, particularly in the vicinity of the **E. cladocalyx* planting row.

Significant Indigenous Species, Occurrences

Arthropodium strictum; *Austrostipa scabra* (several hundred plants); *Dianella amoena* (VROT) - 12 colonies; *Dianella admixta*; *Einadia nutans* (largest stands at reserve); *Pimelea curviflora*; *Thelymitra pauciflora*

Priority Weed Species

**Agapanthus praecox*; **Anthoxanthum odorata*; **Asparagus aethiopicus*; **Briza maxima*; **Chrysanthemoides monilifera*; *Cotoneaster spp.*; **Crassula multicava*; **Crassula tetragona*; **Drosera sp.*; **Ehrharta erecta*; **Eucalyptus cladocalyx* (seedlings/saplings); **Hypochoeris radicata*; *Iris sp.*; *Pinus radiata* (seedlings/saplings); **Pittosporum undulatum*; **Plantago lanceolata*; **Sporobolus africanus*.

Summary Description of Weed Infestations
<p>Mature plantings of *<i>E. cladocalyx</i> dominate the zone – there are numerous seedlings, saplings and younger trees dotted throughout. There are also mature plantings of *<i>P. radiata</i> in the zone with occasional seedlings and saplings present. Exotic shrub cover is sparse but includes serious invasive spp such as *<i>P. undulatum</i>, *<i>Cotoneaster</i> and *<i>Chrysanthemoides monilifera</i>. Exotic grasses are extremely common and locally dominant in sections, with *<i>E. erecta</i>, *<i>B. maxima</i> and *<i>D. glomerata</i> the most widespread exotic grasses present. Several herbaceous forbs occur in the zone with *<i>P. lanceolata</i> and *<i>H. radicata</i> the most common. *<i>A. praecox</i> and *<i>Crassula</i> spp. are scattered through the zone – these have presumably originated from garden refuse or plantings.</p>
Conservation Management Aims
<ul style="list-style-type: none"> ➤ Ensure protection of areas of high quality indigenous ground–flora ➤ Minimise threats; maintain conditions favouring retention of ground–flora ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species
Heritage Management Aims
<ul style="list-style-type: none"> ➤ Maintain health and vigour of Avenue of Honour plantings ➤ Implement maintenance schedule (as identified in A of H Management Plan) ➤ Enhance aesthetics by constructing new fence along Cherry Street frontage ➤ Remove old steel and wire fence and replace with one more in keeping with the cultural / environmental heritage of the Reserve (post & rail?)
Recreational Management Aims
<ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure well–formed dirt track along northern boundary of zone is maintained (for vehicle and pedestrian access) ➤ Develop interpretative signage ➤ Place interpretation sign at Cherry Street entrance to reserve (conveying information on the cultural / environmental heritage of reserve)
Summary of Management Issues
<ul style="list-style-type: none"> ➤ Maintain Avenue of Honour planting rows ➤ Poor health and vigour of <i>E. cladocalyx</i> plantings ➤ Self–sown *<i>E. cladocalyx</i> and *<i>P. radiata</i> (threatening long–term viability of established planted trees as well as indigenous ground–flora) ➤ Weed infestations ➤ Protection of <i>D. amoena</i> (VROT) ➤ Protection / enhancement of indigenous ground–flora ➤ Maintaining / encouraging recreational use and access ➤ Recreational use and impacts on indigenous flora

Short-term (0–3 years) Management Actions
<p><i>Liaise with tree maintenance contractors to ensure *E. cladocalyx rehabilitation works do not impact on D. amoena pops. and high quality ground-flora in zone.</i></p> <ul style="list-style-type: none"> ➤ Temporary fencing to be erected around all pops of <i>D. amoena</i> and all areas of higher quality ground-flora prior to works commencing. ➤ Tree maintenance works crews are to conduct all work from the main dirt track adjacent to the *<i>E. cladocalyx</i> row. ➤ Vehicles are not to be parked or driven on verge between row of *<i>E. cladocalyx</i> and Cherry Street fence. ➤ Where possible limbs and branches are to be felled away from indigenous ground-flora.
<p><i>Construct new fence along Cherry Street frontage</i></p> <ul style="list-style-type: none"> ➤ Temporary fencing to be erected around all pops of <i>D. amoena</i> and all areas of higher quality ground-flora near the fence prior to works commencing. ➤ Ensure <i>D. amoena</i> pops. growing on the fence line are not damaged / destroyed during fence construction. ➤ Vehicles are not to be parked or driven on verge between row of *<i>E. cladocalyx</i> and Cherry Street fence.
<p><i>Erect interpretative signs for recreational users</i></p> <ul style="list-style-type: none"> ➤ At Cherry Street entrance to reserve. ➤ Interpretative sign should highlight cultural and environmental values of the reserve.
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality ground-flora</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence removals of *E. cladocalyx and *P. radiata seedling and saplings</i></p> <ul style="list-style-type: none"> ➤ Concentrating on largest plants (at or near maturity).
<p><i>Remove woody weeds throughout Zone</i></p> <ul style="list-style-type: none"> ➤ Eradicate *<i>P. undulatum</i>, *<i>C. monilifera</i>, *<i>Cotoneaster</i> spp.
Medium-term (3–6 years) Management Actions
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.

<i>Continue with removals of *E. cladocalyx and *P. radiata seedling and saplings</i> <ul style="list-style-type: none">➤ Remove emergent plants
Long-term (6 years +) Management Actions
<i>Remove weed infestations threatening D. amoena populations</i> <ul style="list-style-type: none">➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<i>Eradicate non-woody weed infestations threatening high quality ground-flora concentrating on priority weed species:</i> <ul style="list-style-type: none">➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<i>Continue with removals of *E. cladocalyx and *P. radiata seedling and saplings</i> <ul style="list-style-type: none">➤ Remove emergent plants



Above: The ornamental row of *Eucalyptus cladocalyx*, Avenue of Honour.

3.2 South–Eastern Zone (part Harold Pottage Reserve)

<p><i>Note: For reasons of similar conditions, vegetation and management issues, this Zone incorporates the western–most section of the Harold Pottage Reserve, which is outside the formal boundary of Cherry Street Grassland Reserve. (Refer Mgt. Zone Map for details).</i></p>
<p>Physical Description</p> <p>This zone extends across the south–east corner of the reserve, from Cherry Street northwest towards 55–57 Broadford Crescent. It is approximately 2 hectares in size – Harold Pottage Reserve land makes up about 1/3rd of the zone.</p> <p>Formal and informal roads, pathways and tracks encircle the zone and an informal, well–used dirt track dissects the middle of it. An old railway line reservation runs north–south through the zone.</p> <p>The zone has a very gentle fall towards the south and east. Two mounded embankments on either side of the railway reservation run the length of the zone.</p>
<p>Indigenous Vegetation Description</p> <p>The zone retains extensive overstorey cover throughout, dominated by <i>E. camaldulensis</i> with scattered populations of <i>E. melliodora</i> and <i>E. ovata</i>. Overstorey regeneration is widespread. The understorey cover is diverse and extensive in places with <i>Acacia melanoxylon</i> and <i>A. pycnantha</i> the most common species. <i>A. mearnsii</i>, <i>A. implexa</i> and <i>Allocasuarina verticillata</i> and <i>A. littoralis</i> are also present.</p> <p>Understorey regeneration is widespread. There are extensive areas of intact and substantially intact ground–flora remaining, particularly east of the old railway reservation. At the southern corner of the zone a section of the old railway reservation has been revegetated (presumably by Banyule CC in the mid to late 1990’s).</p>
<p>Significant Indigenous Species, Occurrences</p> <p><i>Allocasuarina littoralis</i>; <i>Allocasuarina verticillata</i>; <i>Arthropodium strictum</i> (+several hundred plants); <i>Burchardia umbellata</i> (+several hundred plants); <i>Caesia calliantha</i>; <i>Convolvulus remotus</i>; <i>Deyeuxia quadriseta</i>; <i>Dianella amoena</i> (VROT) – 26 colonies; <i>Dianella brevicaulis</i> (one of only two colonies known at reserve); <i>Dillwynia cinerascens</i> (only known pop. at reserve); <i>Leptorhynchos squamatus</i> (only known pop. at Reserve); <i>Microlaena stipoides</i> (size and quality of population); <i>Pimelea curviflora</i> (+ 100 plants); <i>Stylidium graminifolium</i> (several hundred plants); <i>Thelymitra pauciflora</i> (+100 plants); <i>Themeda triandra</i> (size and quality of population); <i>Tricoryne elatior</i> (+100 plants).</p>
<p>Priority Weed Species</p> <p>*<i>Anthoxanthum odorata</i>; *<i>Briza maxima</i>; *<i>Crataegus monogyna</i>; *<i>Dactylis glomerata</i>; *<i>Ehrharta erecta</i>; *<i>Ehrharta longiflora</i>; *<i>Foeniculum vulgare</i>; *<i>Fraxinus angustifolia</i>; *<i>Grevillea rosmarinifolia</i>; *<i>Holcus lanatus</i>; *<i>Hypochoeris radicata</i>; *<i>Paspalum dilatatum</i>; *<i>Pittosporum undulatum</i>; *<i>Plantago lanceolata</i>; *<i>Pennisetum clandestinum</i>; *<i>Prunus sp.</i>; *<i>Rosa rubiginosa</i>; *<i>Rubus fruticosus</i>; *<i>Sollya heterophylla</i>; *<i>Ulex europaeus</i>; *<i>Watsonia meriana</i>.</p>

Summary Description of Weed Infestations

Exotic species occur throughout the zone. The ground-flora through most of the south-east and north-western sections is highly degraded and dominated by extensive pops of invasive grasses including **P. clandestinum*, **P. dilatatum*, **D. glomerata* and **E. erecta*. Woody weeds are common but not widespread. There are three small stands of **Ulex europaeus* in the zone. **R. fruticosus* is common particularly in degraded sections but has only begun to form dense thickets within parts of the old railway reservation. **A. odorata* and **B. maxima* are the most widespread and problematic exotic grasses within higher quality indigenous ground-flora while **P. lanceolata* and **H. radicata* are the most widespread and problematic exotic broadleaf weeds within these areas. A **W. meriana* infestation is developing, posing a very serious long-term threat to indigenous ground-flora.

Conservation Management Aims

- Integrate management of Cherry Street Grassland Reserve land with remnant vegetation in the Harold Pottage Reserve.
- Ensure complimentary management of remnant vegetation within this zone and abutting bushland in Harold Pottage Reserve
- Ensure protection of high quality ground-flora areas
- Minimise threats; maintain conditions favouring retention of ground-flora
- Ensure protection of all *D. amoena* colonies
- Removal of threats to indigenous species; encourage spread and regeneration of indigenous species
- Ensure protection of indigenous overstorey component
- Minimise threats; encourage regeneration (where this does not conflict with maintaining diverse indigenous ground-flora)
- Enhance habitat and floristic values of zone
- Revegetate within degraded sections (shrub / tree species only)

Recreational Management Aims

- Maintain track and trail access
- Ensure main track along western boundary of zone is maintained (for vehicle and pedestrian access)
- Ensure main trail leading to old railway embankment is maintained (for vehicle and pedestrian access)
- Maintain track/ trail at eastern-most edge of zone (within HP Reserve)
- Limit access through zone
- Close off small trail dissecting high quality ground-flora areas
- Maintain slashed firebreak along north-eastern boundary
- Ensure 10-20 metre firebreak is kept slashed from late spring to mid-autumn each year (Banyule CC responsibility)
- Ensure rubbish dumping, clippings, etc is removed along western boundary and within old railway reservation.
- Place interpretation sign on fence around core conservation area

Summary of Management Issues
<ul style="list-style-type: none"> ➤ Integration of bushland management between Cherry Street Grasslands Reserve land managers and the land managers of the Harold Pottage Reserve ➤ Weed infestations ➤ Protection / enhancement of indigenous overstorey ➤ Protection / enhancement of indigenous ground-flora ➤ Overstorey regeneration within high quality indigenous ground-flora ➤ Protection of <i>D. amoena</i> (VROT) ➤ Maintaining / encouraging recreational use and access ➤ Recreational use and impacts on indigenous flora ➤ Rubbish dumping ➤ Fire protection
Short-term (0–3 years) Management Actions
<p><i>Liaise with Harold Pottage land manager to develop complimentary management of bushland adjacent to zone</i></p> <ul style="list-style-type: none"> ➤ To integrate management strategies, priorities, techniques, etc.
<p><i>Remove rubbish across zone</i></p> <ul style="list-style-type: none"> ➤ To improve aesthetics ➤ Primarily on edges of roadways and paths. Also within old railway embankment.
<p><i>Erect internal fence around core ground-flora conservation area</i></p> <ul style="list-style-type: none"> ➤ To protect high quality ground-flora area from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality ground-flora from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.
<p><i>Erect interpretative signs for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fence protecting core conservation area (to inform users of values and reasons why area is fenced) ➤ At entrance to reserve
<p><i>Remove weed infestations threatening <i>D. amoena</i> populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate weed infestations across zone</i></p> <ul style="list-style-type: none"> ➤ Eradicate all <i>*W. meriana</i>, <i>*U. europaeus</i>, <i>*S. heterophylla</i> from zone
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence woody weed / climber controls</i></p> <ul style="list-style-type: none"> ➤ Control <i>*C. monogyna</i>, <i>*F. angustifolia</i>, <i>*P. undulatum</i>, <i>*Prunus</i> sp.; <i>*R. rubiginosa</i>; <i>*R. fruticosus</i> infestations within high quality ground-flora areas.

<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p>Medium-term (3–6 years) Management Actions</p>
<p><i>Liaise with Harold Pottage land manager to develop complimentary management of bushland adjacent to zone</i></p> <ul style="list-style-type: none"> ➤ To integrate management strategies, priorities, techniques, etc.
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around D. amoena populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Eradicate all woody weeds across zone</i></p> <ul style="list-style-type: none"> ➤ Continue with wood weed removals, aiming to eliminate all standing plants by end of year 6
<p><i>Develop revegetation plantings of ground-flora spp., shrubs and trees within degraded old railway reservation at entrance to Cherry Street and Harold Pottage Reserve</i></p> <ul style="list-style-type: none"> ➤ Building on poorly maintained existing plantings with the aim of enhancing the aesthetics of this area (area is well-used and has high public profile) ➤ Prepare planting site by removing all exotic vegetation ➤ Plantings of appropriate species to be undertaken following preparatory weed removals
<p>Long-term (6 years +) Management Actions</p>
<p><i>Liaise with Harold Pottage land manager to develop complimentary management of bushland adjacent to zone</i></p> <ul style="list-style-type: none"> ➤ To integrate management strategies, priorities, techniques, etc.
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around D. amoena populations

<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas concentrating on priority weed species</i></p> <ul style="list-style-type: none">➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none">➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora➤ Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Continue woody weed controls</i></p> <ul style="list-style-type: none">➤ Eradicate any emergent woody weeds
<p><i>Maintain revegetation plantings of ground-flora spp., shrubs and trees within degraded old railway reservation at entrance to Reserve and Harold Pottage Reserve</i></p> <ul style="list-style-type: none">➤ Undertaking weed controls to ensure establishment of plantings➤ Undertaking weed controls to ensure aesthetics of area are enhanced
<p><i>Vegetation restoration within degraded old railway reservation area (directly north of first planting site)</i></p> <ul style="list-style-type: none">➤ Finalise removal of woody weeds through this section followed by eradication of all exotic ground-flora➤ Direct seed area with indigenous grasses followed by plantings of appropriate shrub and tree species➤ Undertake weed controls to ensure establishment of sowings / plantings

Below: A section of high quality ground-flora, South-East Zone



3.3 Southern Zone

Physical Description
<p>A roughly triangular-shaped zone extending from the Avenue of Honour along the south-western edge of Cherry Street Grassland Reserve for a distance of approximately 200 metres. The western boundary will abut an Aged Care facility with an asphalt road forming the eastern boundary.</p> <p>The zone is approximately 2 hectares in size. The entire zone slopes, with a gradual fall towards the south and east.</p> <p>The asphalt road runs the length of the eastern boundary. A small asphalt path runs east-west through the zone. Five other small informal paths dissect the zone.</p>
Indigenous Vegetation Description
<p>The zone has a very open canopy of mature <i>E. camaldulensis</i> including a couple of trees that are probably +200 years old and several that are +50y.o. A scattered cover of <i>E. melliodora</i> occurs, concentrated in the section towards the asphalt roadway. Extensive overstorey regeneration is occurring, particularly north of the asphalt path. The mature shrub canopy is sparse and dominated by various <i>Acacia</i> spp. with an occasional <i>Allocasuarina verticillata</i> present. Shrub regeneration is extensive. Ground-flora is of very mixed quality, with about half the zone of good to very good quality and the other half, poor to very poor quality. There is a very high quality <i>Themeda</i>-dominant grassland remnant towards the south-west of the zone. Characteristic of similar <i>Themeda</i>-dominant Plains Grassland communities found nearby in the western and northern suburbs of Melbourne, there are abundant populations of other herbaceous species through this <i>Themeda</i> sward.</p>
Significant Indigenous Species, Occurrences
<p><i>Allocasuarina verticillata</i>; <i>Arthropodium strictum</i> (+several hundred plants); <i>Austrostipa scabra</i> (several hundred plants); <i>Bulbine bulbosa</i> (+100 plants); <i>Burchardia umbellata</i> (+200 plants); <i>Dianella amoena</i> (VROT) – 20 colonies; <i>Dianella admixta</i>; <i>Elymus scabrus</i> (+ several hundred plants); <i>Haloragis sp.</i>; <i>Microtis unifolia</i>; <i>Pimelea curviflora</i> (+ 100 plants); <i>Poa spp.</i>; <i>Stylidium graminifolium</i>; <i>Thelymitra pauciflora</i> (+100 plants), <i>Themeda triandra</i> (size and quality of population); <i>Tricoryne elatior</i> (+several hundred plants);</p>
Priority Weed Species
<p>*<i>Agrostis capillaris</i>, *<i>Anthoxanthum odorata</i>; *<i>Briza maxima</i>; *<i>Briza minor</i>; *<i>Dactylis glomerata</i>; *<i>Echium plantagineum</i>; *<i>Ehrharta erecta</i>; *<i>Fraxinus angustifolia</i>; *<i>Holcus lanatus</i>; *<i>Hypochoeris radicata</i>; *<i>Lolium sp.</i>; *<i>Paspalum dilatatum</i>; *<i>Plantago lanceolata</i>; *<i>Pennisetum clandestinum</i>; *<i>Rosa rubiginosa</i>; *<i>Rubus fruticosus</i>.</p>

<p>Summary Description of Weed Infestations</p> <p>Other than <i>*R. fruticosus</i> which is widespread and locally abundant, woody weeds are very sparse. Exotic grasses are widespread, completely dominating some areas, particularly in the south-eastern sections of the zone. <i>*A. odorata</i> forms 50–75% of the cover through the degraded lower eastern sections. <i>*A. odorata</i> is the most widespread and problematic exotic grass with locally abundant populations of <i>*A. capillaris</i>, <i>*B. maxima</i>, <i>*B. minor</i>, <i>*H. lanatus</i>, <i>*Lolium</i> sp. and <i>*P. dilatatum</i>. <i>*P. lanceolata</i> and <i>*H. radicata</i> are the most widespread and problematic exotic broadleaf weeds within these areas.</p>
<p>Conservation Management Aims</p> <ul style="list-style-type: none"> ➤ Ensure protection of high quality ground-flora areas ➤ Minimise threats; maintain conditions favouring retention of ground-flora ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species ➤ Ensure protection of indigenous overstorey component ➤ Minimise threats; encourage regeneration (where this does not conflict with maintaining diverse indigenous ground-flora)
<p>Recreational Management Aims</p> <ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure main track along southern and eastern boundary of zone is maintained (for vehicle and pedestrian access) ➤ Limit access through zone ➤ Close off small asphalt track and several small informal tracks dissecting high quality ground-flora areas ➤ Develop interpretative signage ➤ Place interpretation sign on edge of high quality ground-flora area
<p>Summary of Management Issues</p> <ul style="list-style-type: none"> ➤ Weed infestations (particularly herbaceous species) ➤ Protection / enhancement of indigenous overstorey ➤ Protection / enhancement of indigenous ground-flora ➤ Overstorey regeneration within high quality indigenous ground-flora ➤ Protection of <i>D.amoena</i> (VROT) ➤ Maintaining / encouraging recreational use and access ➤ Recreational use and impacts on indigenous flora
<p>Short-term (0–3 years) Management Actions:</p> <p><i>Erect internal fence around core ground-flora conservation area</i></p> <ul style="list-style-type: none"> ➤ To protect high quality ground-flora area from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality ground-flora from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.

<p><i>Erect sign for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fence protecting core conservation area (to inform users of values and reasons why area is fenced)
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Undertake D. amoena ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn *<i>A. odorata</i>-dominated eastern sections of zone to determine whether any other <i>D. amoena</i> pops are present
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland areas to maintain inter-tussock spacing (in year 2 or 3)
<p><i>Commence woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Control *<i>R. fruticosus</i> infestations within high quality ground-flora areas.
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p>Medium-term (3–6 years) Management Actions:</p>
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland areas to maintain inter-tussock spacing (in year 4, 5 or 6)
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)

<p><i>Eradicate all woody weeds across zone</i></p> <ul style="list-style-type: none"> ➤ Continue with wood weed removals, aiming to eliminate all standing plants by end of year 6
<p>Long-term (6 years +) Management Actions:</p>
<p><i>Remove weed infestations threatening <i>D. amoena</i> populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland areas to maintain inter-tussock spacing (every 2 to 4 years)
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Continue woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Eradicate any emergent woody weeds

3.4 Eastern Zone

<p>Physical Description</p> <p>The zone extends north from the South-east Zone for approximately 500 metres and is located between houses to the east and the asphalt roadway through the reserve in the west.</p> <p>The zone is approximately 2 ½ to 3 hectares in size. The zone slopes gently towards the south and east. An old railway reservation runs through north-south through the middle of the zone. The embankment associated with the railway line is elevated 2-3 metres in sections.</p> <p>Two old open drains in the middle of the zone have recently been combined into a single covered drain as part of the Springthorpe development.</p> <p>Formal roads and pathways encircle the zone. An asphalt pathway runs along the top of the railway embankment and several small informal, tracks dissect sections.</p>
<p>Indigenous Vegetation Description</p> <p>The zone has a disjunct cover of indigenous vegetation through it with large areas dominated by exotic species. Only a sparse canopy remains in the northern section. A moderately dense canopy of <i>E. camaldulensis</i> occurs through the middle and southern sections with several trees +100 years old. A developing canopy of <i>E. camaldulensis</i> occurs between the embankment and houses to the east. A scattered cover of <i>E. melliodora</i> occurs in the southern section. Overstorey regeneration is moderate and occurs mainly in the middle and southern sections. The shrub canopy is sparse and dominated by various <i>Acacia</i> spp. Shrub regeneration is moderate and occurs predominantly in the southern section. The cover of indigenous ground-flora is generally poor with only about a quarter of the zone retaining moderate to high quality vegetation.</p>
<p>Significant Indigenous Species, Occurrences</p> <p><i>Arthropodium strictum</i> (several hundred plants); <i>Burchardia umbellata</i> (+100 plants); <i>Dianella amoena</i> (VROT) - 17 colonies; <i>Dianella brevicaulis</i> (one of only two colonies known at reserve); <i>Pimelea curviflora</i>; <i>Thelymitra pauciflora</i>; <i>Tricoryne elatior</i></p>
<p>Priority Weed Species</p> <p>*<i>Acacia longifolia</i>; *<i>Acacia floribunda</i>; *<i>Agapanthus praecox</i>; *<i>Allium triquetrum</i>; *<i>Anthoxanthum odorata</i>; *<i>Briza maxima</i>, *<i>Chrysanthemoides monilifera</i>; *<i>Cytisus scoparius</i>; *<i>Dactylis glomerata</i>; *<i>Ehrharta erecta</i>; *<i>Ehrharta longiflora</i>; *<i>Eucalyptus botryoides</i>; *<i>Hedera helix</i>; *<i>Fraxinus angustifolia</i>; *<i>Genista monspessulana</i>; *<i>Gladiolus sp.</i>; *<i>Grevillea rosmarinifolia</i>; *<i>Holcus lanatus</i>; *<i>Hypochoeris radicata</i>; <i>Iris sp.</i>; *<i>Lonicera japonica</i>; *<i>Melaleuca stypheloides</i>; *<i>Nassella neesiana</i>; *<i>Paspalum dilatatum</i>; *<i>Plantago lanceolata</i>; *<i>Pennisetum clandestinum</i>; *<i>Pittosporum undulatum</i>; *<i>Polygala myrtifolia</i>; *<i>Rubus fruticosus</i>; *<i>Sollya heterophylla</i>; *<i>Tradescantia fluminensis</i>; *<i>Tritonia lineata</i>; *<i>Quercus robur</i>.</p>

Summary Description of Weed Infestations
<p>This zone has the highest abundance of weeds in the reserve. Woody weeds completely dominate the middle sections where poor drainage has led to a proliferation of highly invasive species including *F. angustifolia and *R. fruticosus. Several highly invasive woody weeds have established small populations at the northern end including *C. monilifera, *C. scoparius and *G. monspessulana. Several highly invasive climbers / creepers have established in the zone including *T. fluminensis, *S. heterophylla, *H. helix and *L. japonica. Several bulbous / cormous species have established small populations including *T. lineata, *Gladiolus sp., *Iris sp. Exotic grasses are abundant and completely dominate the southern and eastern sections. *P. clandestinum threatens the one area of high quality indigenous ground-flora in the zone. Two small populations of the highly invasive *N. neesiana occur in the zone. Also of note is the number of non-indigenous tree plantings in the zone. Most of these plants are not invasive although small thickets of *M. stypheloides have established in the vicinity of mature plantings.</p>
Conservation Management Aims
<ul style="list-style-type: none"> ➤ Ensure protection of high quality ground-flora areas ➤ Minimise threats; maintain conditions favouring retention of ground-flora ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species ➤ Enhance habitat and floristic values of zone ➤ Revegetate within degraded sections (shrub / tree species only)
Recreational Management Aims:
<ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure main track along western boundary of zone is maintained (for vehicle and pedestrian access) ➤ Ensure main trail along old railway embankment is maintained (for vehicle and pedestrian access) ➤ Limit access through zone ➤ Close off two small trails dissecting high quality ground-flora areas ➤ Maintain slashed firebreak along eastern boundary ➤ Ensure 10–20 metre firebreak is kept slashed from late spring to mid-autumn each year ➤ Enhance aesthetics by rehabilitating drain construction area ➤ Ensure soil is smoothed out, area revegetated following completion of works

Management Issues:
<ul style="list-style-type: none"> ➤ Weed infestations (particularly woody weeds) ➤ Overstorey regeneration within high quality ground-flora areas ➤ Protection of <i>D. amoena</i> (VROT) ➤ Maintenance / enhancement of high quality ground-flora areas ➤ Recreational use and impacts on high quality ground-flora areas ➤ Fire protection ➤ Rehabilitate drain construction area
Short-term (0–3 years) Management Actions:
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Erect two internal fences around core ground-flora conservation areas</i></p> <ul style="list-style-type: none"> ➤ To protect high quality ground-flora area from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality ground-flora from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.
<p><i>Rehabilitate area of drain construction.</i></p> <ul style="list-style-type: none"> ➤ The construction zone should be rehabilitated, i.e, weed controls undertaken, appropriate revegetation plantings undertaken, etc.
<p><i>Erect sign for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fences protecting core conservation areas (to inform users of values and reasons why area is fenced)
<p><i>Remove weed infestations threatening <i>D. amoena</i> populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate *<i>N. neesiana</i> infestations</i></p> <ul style="list-style-type: none"> ➤ Eradicate small populations of *<i>N. neesiana</i> along south-eastern and north-eastern edge of zone.
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence woody weed / climber controls</i></p> <ul style="list-style-type: none"> ➤ Eliminate standing plants of *<i>A. longifolia</i>; *<i>C. scoparius</i>, *<i>G. monspessulana</i>, *<i>P. myrtifolia</i>, *<i>S. heterophylla</i>, <i>L. japonica</i>, *<i>C. monilifera</i> ➤ Control *<i>R. fruticosus</i>, *<i>F. angustifolia</i> infestations within high quality ground-flora areas.
<p><i>Remove indigenous overstorey regeneration within high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality ground-flora.

Medium-term (3–6 years) Management Actions:
<i>Implement annual seasonal firebreak</i> ➤ Slash along eastern boundary from mid–spring to autumn each year
<i>Remove weed infestations threatening D. amoena populations</i> ➤ Eradicate any non–indigenous species in and around <i>D. amoena</i> populations
<i>Eradicate non–woody weed infestations threatening high quality ground–flora areas</i> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand–weeding, herbicides, differential mowing, spot–burning.
<i>Remove indigenous overstorey regeneration within high quality ground–flora areas</i> ➤ Continue to remove seedlings, saplings of all overstorey species within high quality indigenous ground–flora
<i>Continue woody weed / climber controls</i> ➤ Eliminate regenerating plants of * <i>A. longifolia</i> ; * <i>C. scoparius</i> , * <i>G. monspessulana</i> , * <i>P. myrtifolia</i> , * <i>S. heterophylla</i> , <i>L. japonica</i> , * <i>C. monilifera</i> ➤ Control * <i>R. fruticosus</i> , * <i>F. angustifolia</i> infestations within high quality ground–flora areas. ➤ Commence large–scale woody weed removals along edge of embankment
Long-term (6 years +) Management Actions:
<i>Implement annual seasonal firebreak</i> ➤ Slash along eastern boundary from mid–spring to autumn each year
<i>Remove weed infestations threatening D. amoena populations</i> ➤ Eradicate any non–indigenous species in and around <i>D. amoena</i> populations
<i>Eradicate non–woody weed infestations threatening high quality ground–flora areas</i> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand–weeding, herbicides, differential mowing, spot–burning.
<i>Remove indigenous overstorey regeneration within high quality ground–flora areas</i> ➤ Continue to remove seedlings, saplings of all overstorey species within high quality indigenous ground–flora
<i>Eradicate all woody weeds across zone</i> ➤ Continue with wood weed removals, aiming to eliminate all standing plants by end of year 7
<i>Remove all non–indigenous tree plantings</i> ➤ Target all non–indigenous tree plantings for removal
<i>Develop revegetation plantings of trees and shrubs along degraded edge of embankment</i> ➤ Plantings of appropriate tree and shrub species to be undertaken following final removal of woody weeds through this section



Above: High quality *Themeda*-dominant grassland is common through the western portions of the Southern Zone. **Below:** *Cytisus scoparius* ssp. *scoparius* and *Genista monspessulana*, Eastern Zone. Woody weeds are very abundant in the Eastern Zone.



3.5 Western Zone

Physical Description
<p>A narrow zone extending north from the Southern Zone, along the western edge of Cherry Street Grassland Reserve for a distance of approximately 500 metres. The north-western boundary abuts houses with an aged care facility soon to be built behind its south-western edge.</p> <p>An asphalt road runs along its entire eastern boundary. One small informal trail runs in an east-west direction up from the asphalt road to the western boundary fence. The zone is approximately 2 hectares in size. The entire zone slopes and has a gradual fall towards the south and east. Two open drains once dissected the zone in the southern section – these were recently combined into a single covered drain as part of the Springthorpe development in autumn 2004.</p>
Indigenous Vegetation Description
<p>Vegetation is highly degraded with less than 25% of the zone carrying remnant vegetation. The over-storey consists of a sparse canopy of <i>E. camaldulensis</i>, all of which are < 50y.o. <i>Acacia</i> spp. including <i>A. implexa</i>, <i>A. melanoxylon</i> and <i>A. mearnsii</i> form a sparse understorey through the zone. There is a very high quality <i>Themeda</i>-dominant grassland remnant towards the centre of the zone. Characteristic of similar <i>Themeda</i>-dominant Plains Grassland communities found nearby in the western and northern suburbs of Melbourne, there are abundant populations of other herbaceous species through this <i>Themeda</i> sward. A smaller, highly degraded <i>Themeda</i> grassland remnant occurs in-between the two old open drainage lines. Most of the vegetation along these old drains is exotic but small populations of <i>Typha domingensis</i> and <i>Persicaria decipiens</i> have established at the eastern edge of the southern drain where water was able to pool.</p>
Significant Indigenous Species, Occurrences
<p><i>Arthropodium strictum</i>; <i>Burchardia umbellata</i>; <i>Dianella amoena</i> (VROT) – 11 colonies; <i>Hypericum gramineum</i> (+100 plants); <i>Microtis unifolia</i> (several hundred plants); <i>Opercularia</i> sp. (+100 plants); <i>Stylidium graminifolium</i> (several hundred plants); <i>Thelymitra pauciflora</i> (several hundred plants); <i>Themeda triandra</i> (size and quality of population); <i>Tricoryne elatior</i> (+ 100 plants).</p>
Priority Weed Species
<p>*<i>Agrostis capillaris</i>; *<i>Anthoxanthum odorata</i>; *<i>Briza minor</i>, * <i>Chrysanthemoides monilifera</i>; *<i>Cortaderia</i> sp.; *<i>Ehrharta erecta</i>; *<i>Fraxinus angustifolia</i>; *<i>Holcus lanatus</i>; *<i>Hypochoeris radicata</i>; *<i>Paspalum dilatatum</i>; *<i>Plantago lanceolata</i>; *<i>Populus alba</i>; *<i>Rubus fruticosus</i>; *<i>Ulmus procera</i>.</p>

Summary Description of Weed Infestations
<p>Exotic grasses form the dominant vegetation through the zone. Both old drainage lines support a dense cover of moisture-associated weed species, particularly grasses. Within the high quality grassland remnant <i>*A. odorata</i> is the most common and problematic grass with <i>*B. minor</i>, <i>*H. lanatus</i> and <i>*P. dilatatum</i> abundant within small sections. <i>*P. lanceolata</i> and <i>*H. radicata</i> are the most problematic exotic forbs in this grassland area. Woody weed species occur across the zone but are not abundant, except for <i>*R. fruticosus</i>, which is common particularly in the highly degraded southern section. There are a few mature <i>*U. procera</i> and <i>*F. angustifolia</i> trees present. <i>*U. procera</i>, <i>*F. angustifolia</i> and <i>*C. monilifera</i> seedlings are emerging within the high quality grassland remnant.</p>
Conservation Management Aims
<ul style="list-style-type: none"> ➤ Ensure protection of high quality grassland area ➤ Minimise threats; maintain conditions favouring retention of grassland ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species ➤ Enhance habitat and floristic values of zone ➤ Revegetate within degraded sections (overstorey species only)
Recreational Management Aims:
<ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure main track along eastern boundary of zone is maintained (for vehicle and pedestrian access) ➤ Limit access through zone ➤ Close off small trail dissecting high quality grassland area ➤ Enhance aesthetics by rehabilitating drain construction area ➤ Ensure soil is smoothed out, area revegetated following completion of works
Management Issues:
<ul style="list-style-type: none"> ➤ Weed infestations ➤ Overstorey regeneration within high quality grassland area ➤ Protection of <i>D. amoena</i> (VROT) ➤ Maintenance / enhancement of high quality grassland area ➤ Recreational use and impacts on high quality grassland area ➤ Rehabilitate drain construction zone.
Short-term (0–3 years) Management Actions:
<p><i>Erect internal fence around core conservation area (high quality grassland)</i></p> <ul style="list-style-type: none"> ➤ To protect high quality grassland from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality grassland from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.

<p><i>Rehabilitate area of drain construction.</i></p> <ul style="list-style-type: none"> ➤ The construction zone should be rehabilitated, i.e, weed controls undertaken, appropriate revegetation plantings undertaken, etc.
<p><i>Erect sign for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fence protecting core conservation area (to inform users of values and reasons why area is fenced)
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality grassland remnant</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Concentrating on <i>*R. fruticosus, *C. monilifera, *P. alba, *U. procera</i> within high quality grassland area.
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland areas to maintain inter-tussock spacing (in year 2 or 3)
<p><i>Remove indigenous overstorey regeneration within high quality grassland area</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality grassland remnant.
<p>Medium-term (3–6 years) Management Actions:</p>
<p><i>Remove threatening weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality grassland area</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Eradicate all woody weeds across zone</i></p> <ul style="list-style-type: none"> ➤ Continue with wood weed removals, aiming to eliminate all standing plants by end of year 6
<p><i>Remove indigenous overstorey regeneration within high quality grassland area</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland areas to maintain inter-tussock spacing (in year 4, 5, or 6)

<p><i>Develop revegetation plantings of overstorey species within degraded sections</i></p> <ul style="list-style-type: none"> ➤ Plantings of appropriate shrub species to be undertaken through degraded sections of zone (either side of high quality grassland area)
<p>Long-term (6 years +) Management Actions:</p>
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality grassland area</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Remove indigenous overstorey regeneration within high quality grassland area</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn high quality grassland area to maintain inter-tussock spacing (every 2 to 4 years)
<p><i>Continue woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Eradicate any emergent woody weeds

3.6 Mid-North Zone

Physical Description
<p>A zone extending 200 metres north from the Eastern Zone to the edge of the Northern Zone. Houses abut the eastern and western boundaries and will soon abut the northern boundary.</p> <p>The zone is approximately 1 ½ to 2 hectares in size and the entire area slopes gradually towards the southeast. No asphalt roads pass through the zone but two well-formed dirt tracks dissect the zone in a north-south direction. A small track runs north-south through the middle.</p> <p>Recently soils and vegetation along the northern and western boundaries were severely disturbed during construction of the reserve's perimeter fence-line.</p>
Indigenous Vegetation Description
<p>Large sections of this zone are completely dominated by exotic grasses and woody species. The overstorey canopy is generally sparse and dominated by <i>E. melliodora</i> and <i>E. camaldulensis</i>, with the understorey dominated by various <i>Acacia</i> spp., including <i>A. implexa</i> and <i>A. melanoxylon</i>. Shrub and tree regeneration is occurring but is concentrated in sections where the ground-flora is relatively intact. In general the quality of the ground-flora is poor although good quality vegetation remains in the north-east and towards the centre of the zone. The ground-flora in the centre is characteristic of similar <i>Themeda</i>-dominant Plains Grassland communities found nearby in the western and northern suburbs of Melbourne.</p>
Significant Indigenous Species, Occurrences
<p><i>Arthropodium strictum</i>; <i>Burchardia umbellata</i> (+100 plants); <i>Dianella amoena</i> (VROT) – 5 colonies; <i>Leptorhynchos tenuifolius</i>; <i>Pimelea curviflora</i>; <i>Thelymitra pauciflora</i>; <i>Themeda triandra</i> (size and quality of population); <i>Tricoryne elatior</i>.</p>
Priority Weed Species
<p>*<i>Agrostis capillaris</i>; *<i>Anthoxanthum odorata</i>; *<i>Briza maxima</i>, *<i>Cotoneaster</i> spp.; *<i>Dactylis glomerata</i>; *<i>Grevillea</i> spp.; *<i>Hakea salicifolia</i>; *<i>Holcus lanatus</i>; *<i>Hypochoeris radicata</i>; *<i>Nassella neesiana</i>; *<i>Paspalum dilatatum</i>; *<i>Pennisetum clandestinum</i>; <i>Pinus radiata</i>; *<i>Pittosporum undulatum</i>; *<i>Plantago lanceolata</i>; *<i>Pyracantha</i> spp.; *<i>Rosa rubiginosa</i>; *<i>Rubus fruticosus</i>.</p>

Summary Description of Weed Infestations
<p>This zone has extensive weed populations. <i>*R. fruticosus</i> is widespread, completely dominating sections. Several highly invasive woody weeds have established small populations including <i>*P. undulatum</i>, <i>*Pyracantha</i> spp., <i>*Cotoneaster</i> spp. and <i>*H. salicifolia</i>. Exotic grasses are abundant and completely dominate the western and southeastern sections. <i>*P. clandestinum</i> threatens the one area of high quality indigenous ground-flora in the zone. <i>*B. maxima</i> has widely established on the edge of high quality ground-flora. One small population of the highly invasive <i>*N. neesiana</i> occurs in the zone, along the edge of indigenous ground-flora. Also of note is the number of 'native' non-indigenous tree and shrub plantings in the zone.</p>
Conservation Management Aims
<ul style="list-style-type: none"> ➤ Ensure protection of high quality grassland area ➤ Minimise threats; maintain conditions favouring retention of grassland ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species ➤ Enhance habitat and floristic values of zone ➤ Revegetate within degraded sections
Recreational Management Aims:
<ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure main track along eastern boundary of zone is maintained (for vehicle and pedestrian access) ➤ Limit access through zone ➤ Close off small trail dissecting high quality grassland area ➤ Ensure 10–20 metre firebreak along eastern boundary is kept slashed from late spring to mid–autumn each year ➤ Enhance aesthetics by removing woodpiles, vegetable gardens, clippings, rubbish, beehives, etc along eastern boundary. ➤ Enhance aesthetics by removing wind–borne rubbish (from adjacent development)
Management Issues:
<ul style="list-style-type: none"> ➤ Weed infestations ➤ Overstorey regeneration within high quality indigenous ground-flora ➤ Protection of <i>D. amoena</i> (VROT) ➤ Maintenance / enhancement of indigenous ground-flora ➤ Maintenance / enhancement of indigenous overstorey ➤ Maintaining / encouraging recreational use and access ➤ Recreational use and impacts on indigenous flora ➤ Rehabilitation of soils and vegetation along the perimeter fence–line. ➤ Fire protection ➤ Vegetable gardens, clippings, rubbish, etc along eastern boundary ➤ Rubbish

Short-term (0–3 years) Management Actions:
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Remove all vegetable gardens, clippings, rubbish, etc ➤ Remove all non-indigenous plantings ➤ Ensure garden clippings and prunings are not placed in the Reserve.
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Rehabilitate disturbed soils and vegetation along perimeter fence-line</i></p> <ul style="list-style-type: none"> ➤ To prevent weed establishment and improve aesthetics ➤ Establish planting beds along the fence-line incorporating appropriate ground-flora and shrub species.
<p><i>Erect internal fence around core ground-flora conservation area</i></p> <ul style="list-style-type: none"> ➤ To protect high quality ground-flora area from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality ground-flora from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.
<p><i>Erect sign for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fence protecting core conservation area (to inform users of values and reasons why area is fenced)
<p><i>Eradicate *N. neesiana infestations</i></p> <ul style="list-style-type: none"> ➤ Eradicate small populations of *N. neesiana along northern edge of zone.
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around D. amoena populations
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Concentrating on woody weed species within high quality ground-flora areas
<p><i>Remove indigenous overstorey regeneration within high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality ground-flora.
Medium-term (3–6 years) Management Actions:
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Ensure garden clippings and prunings are not placed in the Reserve.
<p><i>Manage planting beds along perimeter fence-line</i></p> <ul style="list-style-type: none"> ➤ To aid establishment, prevent weed growth and maintain aesthetics

<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Remove indigenous overstorey regeneration within high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora
<p><i>Eradicate all woody weeds across zone</i></p> <ul style="list-style-type: none"> ➤ Continue with wood weed removals, aiming to eliminate all standing plants by end of year 6
<p>Long-term (6 years +) Management Actions:</p>
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Ensure garden clippings and prunings are not placed in the reserve.
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Remove indigenous overstorey regeneration within high quality ground-flora areas</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora
<p><i>Eradicate all woody weeds across zone</i></p> <ul style="list-style-type: none"> ➤ Eradicate all emergent wood weeds
<p><i>Manage planting beds along perimeter fence-line</i></p> <ul style="list-style-type: none"> ➤ To prevent weed growth and maintain aesthetics
<p><i>Develop revegetation plantings of ground-flora spp., shrubs and trees within area formerly dominated by *R. fruticosus thickets</i></p> <ul style="list-style-type: none"> ➤ Plantings of appropriate species to be undertaken following preparatory weed removals

3.7 Northern Zone

Physical Description
<p>Extending from the northern boundary of Cherry Street Reserve south to the Mid–West Zone. After the completion of the Springthorpe development the zone will be bounded on the eastern, western and northern sides by housing.</p> <p>The zone is approximately 3 hectares in size. There is only one small flat section in the zone, along the western edge. Elsewhere, the land falls gradually towards the south and south–east.</p> <p>No asphalt roads dissect the zone although there are a number of well–used tracks and trails through it. One existing well–formed track runs along the northern boundary before dropping down the slope and running parallel with the eastern boundary.</p> <p>At some point in time a small area of the western section was physically disturbed and a flattened mound (for a building?) was formed.</p>
Indigenous Vegetation Description
<p>The zone contains the largest continuous and most intact indigenous vegetation at the reserve. The overstorey consists of an open canopy dominated by <i>E. ovata</i> with lightly scattered populations of <i>E. camaldulensis</i> and <i>E. melliodora</i>. <i>Acacia</i> spp. including <i>A. implexa</i>, <i>A. melanoxylon</i> and <i>A. mearnsii</i> form a sparse understorey through the zone. Extensive stands of various tussock grasses including <i>Themeda triandra</i>, <i>Austrodanthonia</i> spp. and <i>Austrostipa</i> spp, as well as the stoloniferous / rhizomatous <i>Microlaena stipoides</i> occur throughout. Most of the northern, central and eastern sections of the zone are dominated by dense stands of <i>Microlaena stipoides</i>. In the west, on the only flat part of the zone, <i>Themeda triandra</i> forms the dominant indigenous ground–flora species. Characteristic of similar <i>Themeda</i>–dominant Plains Grassland communities found nearby in the western and northern suburbs of Melbourne, there are abundant populations of other herbaceous species through this <i>Themeda</i> sward.</p>
Significant Indigenous Species, Occurrences
<p><i>Arthropodium strictum</i> (many hundred plants); <i>Arthropodium</i> sp. (only known location in Reserve); <i>Austrostipa</i> spp. (size and quality of population); <i>Burchardia umbellata</i> (+100 plants); <i>Dianella amoena</i> (VROT) – 11 colonies; <i>Eucalyptus Xstudleyensis</i> (VROT); <i>Hypoxis hygrometrica</i> (only known location in Reserve); <i>Leptorhynchos tenuifolius</i> (+100 plants); <i>Microlaena stipoides</i> (size and quality of population); <i>Opercularia</i> sp.; <i>Pimelea curviflora</i> (+ 100 plants); <i>Poa</i> spp. (size and quality of populations); <i>Stylidium graminifolium</i>; <i>Thelymitra pauciflora</i> (+100 plants); <i>Themeda triandra</i> (size and quality of population); <i>Tricoryne elatior</i> (+several hundred plants).</p>

<p>Priority Weed Species</p> <p><i>*Acacia longifolia; *Anthoxanthum odorata; *Briza maxima, *Dactylis glomerata; *Eucalyptus X botryoides (E. ovata X E. botryoides); *Ehrharta erecta; *Fraxinus angustifolia; *Grevillea rosmarinifolia; *Grevillea sp.; *Hakea salicifolia; *Holcus lanatus; *Hypochoeris radicata; *Paspalum dilatatum; *Pennisetum clandestinum; *Plantago lanceolata; *Rosa rubiginosa; *Rubus fruticosus.</i></p>
<p>General Comments on Exotic Species</p> <p>Exotic species occur throughout the zone. The south-east corner and most of the eastern boundary are highly degraded, with large numbers of exotic herbaceous species present. <i>*R. fruticosus</i> is the most obvious exotic species in the zone, in places forming large closed thickets approaching 100–200sq. metres in size. <i>*F. angustifolia</i> seedlings are establishing en-masse along the western edges of the zone. A small number of non-indigenous ‘native’ plants occur in the zone, primarily in the central-western section. A small population of a hybrid between the indigenous eucalypt, <i>E. ovata</i> and the non-indigenous eucalypt <i>*E. botryoides</i> occurs in the central-west of the zone. <i>*A. odorata</i> is the most common and problematic exotic grass in the zone with <i>*B. maxima</i>, <i>*P. clandestinum</i> and <i>*P. dilatatum</i> common but only abundant within small sections. <i>*P. lanceolata</i> and <i>*H. radicata</i> are the most widespread exotic forbs but only form extensive populations in the most disturbed and degraded sections of the zone. Extensive pops. of <i>*R. fruticosus</i> and <i>*P. clandestinum</i> are located on the flattened mound adjacent to high quality <i>Themeda</i>-dominant grassland.</p>
<p>Conservation Management Aims</p> <ul style="list-style-type: none"> ➤ Ensure protection of indigenous ground-flora component ➤ Minimise threats; maintain conditions favouring ground-flora ➤ Ensure protection of indigenous overstorey component ➤ Minimise threats; encourage regeneration (where this does not conflict with maintaining diverse indigenous ground-flora) ➤ Ensure protection of all <i>D. amoena</i> colonies ➤ Removal of threats to indigenous species; encourage spread and regeneration of indigenous species. ➤ Ensure protection of <i>E. Xstudleyensis</i> populations ➤ Removal of threats; encourage regeneration

Recreational Management Aims:
<ul style="list-style-type: none"> ➤ Maintain track and trail access ➤ Ensure main track is maintained (for vehicle and pedestrian access) ➤ Ensure minor trails are maintained for pedestrian access ➤ Ensure 10–20 metre firebreak along eastern boundary is kept slashed from late spring to mid–autumn each year ➤ Enhance aesthetics by removing woodpiles, vegetable gardens, clippings, rubbish, beehives, etc along eastern boundary. ➤ Develop interpretative signage at entrance to Reserve (at Cherry Street–Gresswell Hill Habitat Link)
Management Issues:
<ul style="list-style-type: none"> ➤ Weed infestations ➤ Overstorey regeneration within high quality indigenous ground–flora Protection of <i>D.amoena</i> (VROT) ➤ Maintenance / enhancement of indigenous ground–flora ➤ Maintenance / enhancement of indigenous overstorey ➤ Maintaining / encouraging recreational use and access ➤ Recreational use and impacts on indigenous flora ➤ Fire protection ➤ Woodpiles, vegetable gardens, clippings, rubbish, beehives, etc along eastern boundary ➤ Rubbish ➤ Intended development along northern boundary
Short–term (0–3 years) Management Actions:
<p><i>Implement annual seasonal fire break</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern / northern boundary from mid–spring to autumn each year.
<p><i>Erect internal fence around core ground–flora conservation area</i></p> <ul style="list-style-type: none"> ➤ To protect high quality ground–flora area from recreational impacts, i.e., dogs, bikes, pedestrians ➤ To protect high quality ground–flora from inadvertent management vehicle impacts, i.e., tractors, MFB vehicles, etc.
<p><i>Liaise with developers, Darebin CC to ensure development along northern boundary does not impact on site</i></p> <ul style="list-style-type: none"> ➤ No vehicles, machinery, etc. to enter site; fencing to be erected prior to works commencing; wind–borne building detritus to be kept within building zone.
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Remove all woodpiles, vegetable gardens, clippings, rubbish, beehives, etc ➤ Remove all non–indigenous plantings ➤ Ensure garden clippings and prunings are not placed in the Reserve.
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid–spring to autumn each year

<p><i>Remove rubbish across zone</i></p> <ul style="list-style-type: none"> ➤ To improve aesthetics and prevent further damage to indigenous vegetation.
<p><i>Erect interpretative signs for recreational users</i></p> <ul style="list-style-type: none"> ➤ On fence around core conservation area (to inform users of values and reasons why area is fenced) ➤ At entrance to Reserve (where habitat link from Gresswell Hill enters Reserve)
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Contain (and where possible eradicate) any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Undertake ecological burn</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland in western section to maintain inter-tussock spacing (in year 2 or 3)
<p><i>Contain (and where possible eradicate) non-woody weed infestations threatening areas of high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Commence woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Concentrating on * <i>F. angustifolia</i>, *<i>R. fruticosus</i> within high quality indigenous vegetation, particularly ground-flora areas.
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Identify all E. X studleyensis plants</i></p> <ul style="list-style-type: none"> ➤ Clearly mark all <i>E. X studleyensis</i> trees, saplings, seedlings ➤ Allow seedling emergence of hybrid to ensure long-term perpetuation on-site (where possible avoiding areas of highest quality ground-flora)
<p><i>Identify all E. X botryoides plants</i></p> <ul style="list-style-type: none"> ➤ Clearly mark all <i>E. X botryoides</i> trees, saplings, seedlings ➤ Remove all plants once scientific investigation of taxon is complete
<p>Medium-term (3–6 years) Management Actions:</p>
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along northern boundary from mid-spring to autumn each year
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Ensure garden clippings and prunings are not placed in the Reserve.
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations

<p><i>Eradicate non-woody weed infestations threatening areas of high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Concentrating on priority weed species. ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Continue with woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Concentrating on various 'native' plantings and *<i>F. angustifolia</i>, *<i>R. fruticosus</i>.
<p><i>Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Continue to remove seedlings, saplings of <u>all</u> overstorey species within high quality indigenous ground-flora ➤ Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)
<p><i>Encourage E. X studleyensis continuation at Reserve</i></p> <ul style="list-style-type: none"> ➤ Allow seedling emergence of hybrid to ensure long-term perpetuation on-site (where possible avoiding areas of highest quality ground-flora)
<p><i>Undertake ecological burns</i></p> <ul style="list-style-type: none"> ➤ Burn <i>Themeda</i>-dominant grassland in western section to maintain inter-tussock spacing (in year 4, 5, or 6) ➤ Determine whether ecological burning is necessary within <i>Microleana</i>-dominant grassy areas
<p>Long-term (6 years +) Management Actions:</p>
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along northern boundary from mid-spring to autumn each year
<p><i>Liaise with property owners along eastern boundary over various issues</i></p> <ul style="list-style-type: none"> ➤ Ensure garden clippings and prunings are not placed in the Reserve
<p><i>Implement annual seasonal firebreak</i></p> <ul style="list-style-type: none"> ➤ Slash along eastern boundary from mid-spring to autumn each year
<p><i>Remove weed infestations threatening D. amoena populations</i></p> <ul style="list-style-type: none"> ➤ Eradicate any non-indigenous species in and around <i>D. amoena</i> populations
<p><i>Eradicate non-woody weed infestations threatening areas of high quality indigenous ground-flora</i></p> <ul style="list-style-type: none"> ➤ Concentrating on *<i>A. odoratum</i>, *<i>B. maxima</i>, *<i>E. erecta</i>, *<i>H. radicata</i>, *<i>P. clandestinum</i>, *<i>P. dilatatum</i>, *<i>P. lanceolata</i> populations ➤ Utilise a variety of control methods including hand-weeding, herbicides, differential mowing, spot-burning.
<p><i>Continue with woody weed controls</i></p> <ul style="list-style-type: none"> ➤ Eradicate all 'native' tree plantings and remaining woody weeds across zone.

Selectively thin indigenous overstorey regeneration within high quality indigenous ground-flora

- Continue to remove seedlings, saplings of all overstorey species within high quality indigenous ground-flora
- Continue to allow for sparse natural recruitment of overstorey species within high quality indigenous ground-flora (one plant spaced approximately every 10 metres)

Undertake ecological burns

- Burn *Themeda*-dominant grassland in western section to maintain inter-tussock spacing (every two to four years)
- Determine whether ecological burning is necessary within *Microlaena*-dominant grassy areas

Encouraging E. X studleyensis continuation at Reserve

- Allow seedling emergence of hybrid to ensure long-term perpetuation on-site (where possible avoiding areas of highest quality ground-flora)

Vegetation restoration at disturbed mound in the western section

- Remove all weeds through this section
- Direct seed area with indigenous grasses followed by plantings of appropriate shrub and tree species
- Undertake weed controls to ensure establishment of sowings / plantings



Above: Grassy woodland vegetation in the Northern Zone. This Zone contains the largest area of intact remnant vegetation at the Reserve. **Below:** The Western Zone contains a small section of very high quality *Themeda*-dominant grassland.



4. WORKS PROGRAMME 2004–2007

AVENUE OF HONOUR ZONE			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
VROT Protection	Ensure <i>D. amoena</i> pops marked and protected during tree maintenance program.	Ensure <i>D. amoena</i> protected when new fence is constructed along Cherry Street.	
Indigenous Vegetation Protection	Ensure indig. ground-flora protected during tree maintenance program.		
Infrastructure	Install lockable gate at Cherry Street entrance.	Install new fence along Cherry Street.	
Weed Controls	Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation.	Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation.	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Eradicate all woody weeds across zone.

AVENUE OF HONOUR (Cont.)			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Overstorey regeneration		Commence removals of * <i>E. cladocalyx</i> and * <i>P. radiata</i> seedlings and saplings.	Continue removals of * <i>E. cladocalyx</i> and * <i>P. radiata</i> seedlings and saplings.
Tree Maintenance	Undertake tree maintenance program as identified in A of H Management Plan (2003)		
Interpretation		Install interpretation sign at entrance to Reserve	

SOUTH-EAST ZONE (Part HAROLD POTTAGE RESERVE)

ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Infrastructure		Erect fence around Core Conservation Area	
Weed Controls	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Eradicate standing pops of <i>*W. meriana</i>, <i>*U. europeus</i>, <i>*S. hetrophylla</i> from zone 	Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation.	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary) - Treat emergent <i>*U. europeus</i> & <i>*W. meriana</i>.
Indigenous Overstorey regeneration		Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.	Continue with selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.
Liaison	Develop joint management strategies and actions for the two reserves in this zone.	Land managers undertaking co-ordinated & complimentary management actions.	Land managers undertaking co-ordinated & complimentary management actions.

SOUTH-EAST ZONE (Part HAROLD POTTAGE RESERVE) (Cont.)

ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Interpretation		-Install interpretation sign on fence enclosing Core Conservation Area - Run Spring Interpretation Walk	Run Spring Interpretation Walk
Fire Protection	Seasonal firebreak created at northern edge of HP Reserve	Seasonal firebreak created at northern edge of HP Reserve	Seasonal firebreak created at northern edge of HP Reserve
Rubbish	- Remove rubbish along edges of asphalt road and path	- Remove 3 old car bodies in railway embankment	

SOUTHERN ZONE			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Ecological Burns	Undertake ecological burn in eastern sections to determine presence of <i>D. amoena</i> and any other significant species.		Undertake ecological burn in <i>Themeda</i> -dominant grassland
Infrastructure		Erect fence around Core Cons. Area	
Weed Controls	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Target <i>*R. fruticosus</i> within higher quality vegetation. 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Target <i>*R. fruticosus</i> within higher quality vegetation. 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Target <i>*R. fruticosus</i> within higher quality vegetation.
Indigenous Overstorey regeneration		Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.	Continue with selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.
Interpretation		<ul style="list-style-type: none"> - Install interpretation sign on fence enclosing Core Conservation Area. - Run Spring Interpretation Walk 	Run Spring Interpretation Walk

EASTERN ZONE			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
VROT Protection	Ensure <i>D. amoena</i> pops marked and protected during drain construction		
Rehabilitation	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.
Infrastructure		Erect fences around two Core Conservation Areas	
Weed Controls	<ul style="list-style-type: none"> - Undertake non- woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Target <i>*N. neesiana</i> for eradication. 	<ul style="list-style-type: none"> - Undertake non- woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary) - Target emergent <i>*N.neesiana</i> 	<ul style="list-style-type: none"> - Undertake non- woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Continue woody weed removals, targeting priority weeds (described in Mgt Zone Summary) - Target emergent <i>*N.neesiana</i>

EASTERN ZONE (Cont.)			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Fire Protection	Seasonal firebreak created at eastern boundary	Seasonal firebreak created at eastern boundary	Seasonal firebreak created at eastern boundary
Indigenous Overstorey regeneration		Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.	Continue with selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.
Interpretation		-Install interpretation sign on fence enclosing Core Conservation Area - Run Spring Interpretation Walk	Run Spring Interpretation Walk

WESTERN ZONE			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Rehabilitation	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.	Ensure weeds are controlled and vegetation is rehabilitated in drain construction zone.
Infrastructure		Erect fence around Core Conservation Area	
Weed Controls	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary) 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary)
Ecological Burns		Undertake ecological burn in <i>Themeda</i> -dominant grassland	
Indigenous Overstorey regeneration			Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.

WESTERN ZONE (Cont.)			
Activity	Year 1: 2004	Year 2: 2005	Year 3: 2006
Interpretation		-Install interpretation sign on fence enclosing Core Conservation Area - Run Spring Interpretation Walk	Run Spring Interpretation Walk

MID-NORTH ZONE			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Rehabilitation	Ensure soils and vegetation are rehabilitated along perimeter fence	Maintain revegetation works along perimeter fence	Maintain revegetation works along perimeter fence
Infrastructure		Erect fence around Core Conservation Area	
Rubbish	- Remove accumulated wind-blown rubbish		
Fire Protection	Seasonal firebreak created at eastern boundary	Seasonal firebreak created at eastern boundary	Seasonal firebreak created at eastern boundary
Indigenous Overstorey regeneration			Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.
Liaison	Land manager to liaise with neighbouring property owners to remove gardens, clippings, etc.		
Interpretation		-Install interpretation sign on fence enclosing Core Conservation Area - Run Spring Interpretation Walk	Run Spring Interpretation Walk

MID-NORTH ZONE (cont.)			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Weed Controls	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Target *<i>N. neesiana</i> for eradication. 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary) - Target emergent *<i>N. neesiana</i> 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Continue woody weed removals, targeting priority weeds (described in Mgt Zone Summary) - Target emergent *<i>N. neesiana</i>

NORTHERN ZONE

ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Infrastructure	Install lockable gate at northern entrance to Reserve (at Cherry Street - Gresswell Hill Habitat Link)	Erect fence around Core Conservation Area	
Rubbish	Remove accumulated rubbish		
Fire Protection	Seasonal firebreak created at north and eastern boundaries	Seasonal firebreak created at north and eastern boundaries	Seasonal firebreak created at north and eastern boundaries
Indigenous Overstorey Regeneration	Clarify extent of <i>Euc. Xstudleyensis</i> population	Commence selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.	Continue selective thinning of indig. seedlings and saplings in areas of high quality ground-flora.
Flora Investigation	Embark on scientific investigation of <i>Euc. X botryoides</i>	Remove most <i>Euc.X botryoides</i>	
Ecological Burns		Undertake ecological burn in <i>Themeda</i> -dominant grassland	

NORTHERN ZONE (Cont.)			
ACTIVITY	Year 1: 2004	Year 2: 2005	Year 3: 2006
Interpretation		<ul style="list-style-type: none"> - Install interpretation sign on fence enclosing Core Conservation Area - Run Spring Interpretation Walk 	Run Spring Interpretation Walk
Weed Controls	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Commence woody weed removals, targeting priority weeds (described in Mgt Zone Summary) 	<ul style="list-style-type: none"> - Undertake non-woody weed removals around <i>D. amoena</i> pops and within higher quality vegetation. - Continue woody weed removals, targeting priority weeds (described in Mgt Zone Summary)

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Appendix 1: Indigenous Species Cherry Street Reserve, November 2003

Key

X Recorded in Surveys

^ Planting

2003 Surveys: A. Muyt

Previous Surveys: Carr, McMahon (1988); Costello, Meredith, Larwill, Yugovic (1993);

Significance: National (AROT), State (VROT), Regional (Greater Melbourne)

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
MONOCOTYLEDONS				
CYPERACEAE				
<i>Carex breviculmis</i>	Short-stemmed Sedge	X	X	
<i>Carex inversa</i>	Common Sedge	X	X	
<i>Schoenus apogon</i>	Common Bog-rush	X	X	
JUNCACEAE				
<i>Juncus amabilis</i>	Hollow Rush	X		
<i>Juncus holoschoenus</i>	Joint-leaf Rush	X		
<i>Juncus subsecundus</i>	Finger Rush	X	X	
<i>Juncus sp.</i>	Rush	X		
<i>Luzula meridionalis</i>	Common Woodrush	X		
LILIACEAE				
<i>Arthropodium strictum</i>	Chocolate Lily	X	X	Regional
<i>Arthropodium sp.</i>	Vanilla Lily		X	Regional
<i>Bulbine bulbosa</i>	Yellow Bulbine Lily	X	X	Regional
<i>Burchardia umbellata</i>	Milkmaid	X	X	Regional
<i>Caesia calliantha</i>	Blue Grass Lily	X	X	Regional
<i>Dianella amoena</i>	Matted Flax-lily		X	VROT/AROT
<i>Dianella brevicaulis</i>	Small-flowered Flax Lily		X	Regional
<i>Dianella laevis (syn D. longifolia var. longifolia)</i>	Smooth Flax Lily	X		Regional
<i>Dianella admixta (syn. D. revoluta)</i>	Black-anther Flax-lily	X	X	
<i>Hypoxis hygrometrica var. villosisepala</i>	Yellow Star Lily		X	Regional
<i>Tricoryne elatior</i>	Yellow Rush Lily	X	X	Regional
<i>Wurmbea dioica</i>	Early Nancy	X		Regional

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
ORCHIDACEAE				
<i>Microtis unifolia</i>	Common Onion Orchid	X	X	Regional
<i>Thelymitra pauciflora</i>	Sun Orchid	X	X	Regional
POACEAE				
<i>Austrodanthonia caespitosa</i>	Wallaby Grass	X	X	
<i>Austrodanthonia laevis</i>	Branched Wallaby Grass	X	X	
<i>Austrodanthonia linkii</i>	Leafy Wallaby Grass	X	X	Regional
<i>Austrodanthonia pilosa</i>	Velvet Wallaby Grass	X		
<i>Austrodanthonia racemosa</i>	Branched Wallaby Grass	X		
<i>Austrodanthonia setacea</i>	Bristly Wallaby Grass	X	X	
<i>Austrodanthonia tenuior</i>	Long-leaf Wallaby Grass	X		
<i>Austrostipa mollis</i>	Soft Spear Grass	X		
<i>Austrostipa rudis</i>	Veined Spear Grass	X	X	
<i>Austrostipa scabra</i> (ssp. ?)	Rough Spear Grass	X	X	Regional
<i>Austrostipa semibarbata</i>	Fibrous Spear Grass	X	X	
<i>Austrostipa</i> sp.	Spear Grass	X		
<i>Deyeuxia quadriseta</i>	Reed Bent Grass	X	X	Regional
<i>Dichelachne crinita</i>	Long-hair Plume Grass	X	X	
<i>Dichelachne micrantha</i>	Short-hair Plume Grass	X	X	
<i>Elymus scaber</i>	Common Wheat Grass	X	X	
<i>Eragrostis brownii</i>	Common Love Grass	X		
<i>Hemarthria uncinata</i>	Mat Grass	X		
<i>Lachnagrostis aemula</i>	Blown Grass	X		
<i>Lachnagrostis filiformis</i>	Common Blown Grass	X	X	
<i>Microlaena stipoides</i>	Weeping Grass	X	X	
<i>Poa labillardierei</i>	Common Tussock Grass	X	X	
<i>Poa morrisii</i>	Velvet Tussock Grass	X	X	
<i>Poa sieberiana</i>	Grey Tussock Grass	X	X	
<i>Themeda triandra</i>	Kangaroo Grass	X	X	
TYPHACEAE				
<i>Typha domingensis</i>	Cumbungi		X	
XANTHORRHOEACEAE				
<i>Lomandra filiformis</i> ssp. <i>coriacea</i>	Wattle Mat-rush	X	X	
<i>Lomandra filiformis</i> ssp. <i>filiformis</i>	Wattle Mat-rush	X	X	
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush		^	Planting

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
DICOTYLEDONS				
ASTERACEAE				
<i>Cassinia arcuata</i>	Drooping Cassinia	X	X	
<i>Euchiton collinus</i>	Creeping Cudweed	X	X	
<i>Euchiton</i> sp.	Cudweed	X		
<i>Leptorhynchos squamatus</i>	Scaly Buttons	X	X	Regional
<i>Leptorhynchos tenuifolius</i>	Wiry Buttons		X	Regional
<i>Pseudognaphalium luteo-album</i>	Jersey Cudweed	X	X	
<i>Senecio hispidulus</i>	Rough Fireweed	X	X	
<i>Senecio quadridentatus</i>	Cottony Fireweed	X	X	
<i>Solenogyne dominii</i>	Smooth Solenogyne		X	
BORAGINACEAE				
<i>Cynoglossum suaveolens</i>	Sweet Hound's Tongue		X	Regional
CAMPANULACEAE				
<i>Wahlenbergia gracilis</i>	Sprawling Bluebell		X	
<i>Wahlenbergia</i> sp.	Bluebell		X	
CASUARINACEAE				
<i>Allocasuarina littoralis</i>	Black She-oak	X	X	Regional
<i>Allocasuarina verticillata</i>	Drooping She-oak	X	X	Regional
CHENOPODIACEAE				
<i>Atriplex semibaccata</i>	Berry Saltbush	X	X	
<i>Einadia nutans</i>	Climbing Saltbush	X	X	
CLUSIACEAE				
<i>Hypericum gramineum</i>	Small St. John's Wort	X	X	Regional
<i>Hypericum japonicum</i>	Matted St. John's Wort	X		Regional
CONVOLVULACEAE				
<i>Convolvulus</i> spp. (<i>syn. C. erubescens</i>)	Blushing Bindweed	X	X	Regional
<i>Convolvulus remotus</i>	Grassy Bindweed	X	X	Regional
<i>Dichondra repens</i>	Kidney Weed	X	X	
CRASSULACEAE				
<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula	X	X	

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
<i>Crassula tetramera</i> (syn. <i>C sieberiana</i> ssp. <i>tetramera</i>)	Sieber Crassula	X	X	
DROSERACEAE				
<i>Drosera peltata</i> ssp. <i>peltata</i>	Pale Sundew	X	X	
EUPHORBIACEAE				
<i>Poranthera microphylla</i>	Small Poranthera	X		Regional
FABACEAE				
<i>Bossiaea prostrata</i>	Creeping Bossiaea	X	X	Regional
<i>Daviesia</i> sp.	Daviesia	X	X	Regional
<i>Dillwynia cinerascens</i>	Grey Parrot Pea	X	X	Regional
<i>Glycine tabacina</i> s.l.	Variable Glycine	X		Regional
<i>Kennedia prostrata</i>	Running Postman	X		Regional
GERANIACEAE				
<i>Geranium retrorsum</i>	Grasslands Crane's Bill	X		
GOODENIACEAE				
<i>Goodenia ovata</i>	Hop Goodenia	X	^	Planting
HALORAGACEAE				
<i>Gonocarpus tetragynus</i>	Common Raspwort	X	X	
<i>Haloragis</i> sp.	Raspwort		X	
LORANTHACEAE				
<i>Muellerina eucalyptoides</i>	Creeping Mistletoe	X	X	
LYTHRACEAE				
<i>Lythrum hyssopifolia</i>	Small Loosestrife	X	X	
MIMOSACEAE				
<i>Acacia implexa</i>	Lightwood	X	X	
<i>Acacia mearnsii</i>	Black Wattle	X	X	
<i>Acacia melanoxylon</i>	Blackwood	X	X	
<i>Acacia pycnantha</i>	Golden Wattle	X	X	
MYRTACEAE				
<i>Eucalyptus camaldulensis</i>	Red Gum	X	X	
<i>Eucalyptus melliodora</i>	Yellow Box	X	X	
<i>Eucalyptus ovata</i>	Swamp Gum	X	X	

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
<i>Eucalyptus X studleyensis</i>	Studley Park Gum	X	X	VROT
<i>Kunzea ericoides</i>	Burgan	X	X	
ONAGRACEAE				
<i>Epilobium hirtigerum</i>	Willow Herb	X		
OXALIDACEAE				
<i>Oxalis perennans</i>	Wood Sorrel	X	X	
PITTOSPORACEAE				
<i>Bursaria spinosa ssp. spinosa</i>	Sweet Bursaria		^	Planting
PLANTAGINACEAE				
<i>Plantago varia</i>	Variable Plantain	X		Regional
POLYGONACEAE				
<i>Persicaria decipiens</i>	Slender Knotweed		X	
RANUNCULACEAE				
<i>Clematis microphylla</i>	Small-leaf Clematis		X	
ROSACEAE				
<i>Acaena agnipila</i>	Hairy Sheep's Burr	X	X	
<i>Acaena ovina</i>	Australian Sheep's Burr	X	X	
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	X		
RUBIACEAE				
<i>Asperula scoparia</i>	Prickly Woodruff	X	X	
<i>Opercularia ovata</i>	Broad Stinkweed	X		
<i>Opercularia varia</i>	Variable Stinkweed	X	X	Regional
SANTALACEAE				
<i>Exocarpos cupressiformis</i>	Cherry Ballart	X	X	
SAPINDACEAE				
<i>Dodonaea viscosa</i>	Wedge-leaf Hop Bush		^	Planting
SCROPHULARIACEAE				
<i>Veronica gracilis</i>	Slender Speedwell	X	X	
SOLANACEAE				
<i>Solanum laciniatum</i>	Large Kangaroo Apple		X	

Scientific Name	Common Name	Previous Surveys	2003 Survey	Significance
STYLIDIACEAE				
<i>Stylidium graminifolium</i>	Grass Trigger-plant	X	X	Regional
THYMELAEACEAE				
<i>Pimelea curviflora</i> var. 1	Curved Rice Flower	X	X	Regional
<i>Pimelea humilis</i>	Small Rice Flower	X	X	
TOTAL NO. SPECIES =	112 species			

Appendix 2: Non-Indigenous Species Cherry Street Reserve, November 2003

Key

RC Regionally Controlled Weed (Port Phillip East Region)

X Recorded in Surveys

^ ; # Refer to Notes at end of list

2003 Surveys: A. Muyt

Previous Surveys: Carr, McMahon (1988); Costello, Meredith, Larwill, Yugovic (1993).

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
GYMNOSPERMS				
CUPRESSACEAE				
<i>Cupressus</i> sp.	Cypress			X
<i>Cupressus</i> sp.	Cypress			X
PINACEAE				
<i>Pinus radiata</i>	Radiata Pine		X	X
MONOCOTYLEDONS				
AGAVACEAE				
<i>Cordyline australis</i>	New Zealand Cabbage Tree			X
AIZOACEAE				
<i>Drosanthemum candens</i>	Rodondo Creeper			X
ARECACEAE				
<i>Phoenix canariensis</i>	Canary Island Date Palm			X
COMMELINACEAE				
<i>Tradescantia fluminensis</i>	Tradescantia		X	X
CYPERACEAE				
<i>Cyperus eragrostis</i>	Drain Flat-sedge		X	X

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
IRIDACEAE				
<i>Freesia alba</i> X <i>F. leichtlinii</i>	Freesia		X	
<i>Gladiolus</i> sp.	Gladiolus			X
<i>Iris</i> sp.	Iris			X
<i>Romulea rosea</i> var. <i>australis</i>	Onion Grass		X	X
<i>Tritonia lineata</i>	Lined Tritonia		X	X
<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia	RC		X
LILIACEAE				
<i>Agapanthus praecox</i> ssp. <i>orientalis</i>	Agapanthus			X
<i>Allium triquetrum</i>	Angled Onion		X	X
<i>Asparagus aethiopicus</i>	Asparagus Fern			X
<i>Chlorophytum comosum</i>	Spider Plant			X
<i>Narcissus</i> sp.	Daffodil			X
POACEAE				
<i>Agrostis capillaris</i>	Brown-top Bent		X	X
<i>Aira caryophyllea</i>	Silvery Hair Grass		X	X
<i>Aira elegantissima</i>	Hair Grass		X	
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass		X	X
<i>Arundo dondax</i>	Giant Reed			X
<i>Avena barbata</i>	Bearded Oat		X	X
<i>Avena</i> sp.	Wild Oat		X 93	
<i>Bambusa</i> sp.	Rhizomatous Bamboo			X
<i>Briza maxima</i>	Large Quaking Grass		X	X
<i>Briza minor</i>	Small Quaking Grass		X	X
<i>Bromus catharticus</i>	Prairie Grass		X	X
<i>Bromus diandrus</i>	Great Brome		X	X
<i>Cortaderia</i> sp. (prob. <i>C. selloana</i>)	Pampas Grass			X
<i>Cynodon dactylon</i>	Couch		X	X
<i>Cynosurus echinatus</i>	Rough Dog's Tail			X
<i>Dactylis glomerata</i>	Cocksfoot		X	X
<i>Ehrharta erecta</i>	Panic Veldt Grass		X	X
<i>Ehrharta longiflora</i>	Annual Veldt Grass		X	X
<i>Holcus lanatus</i>	Cocksfoot		X	X
<i>Lolium perenne</i>	Perennial Rye Grass		X	X
<i>Lolium rigidum</i>	Wimmera Rye-Grass		X	X
<i>Nassella neesiana</i>	Chilean Needle Grass		X	X
<i>Nassella trichotoma</i>	Serrated Tussock	RC	X 93	#
<i>Paspalum dilatatum</i>	Paspalum		X	X
<i>Pennisetum clandestinum</i>	Kikuyu		X	X
<i>Phalaris aquatica</i>	Phalaris			X

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
<i>Poa annua</i>	Winter Grass		X	X
<i>Sporobolus africanus</i>	Rat-tail Grass		X	X
<i>Vulpia bromoides</i>	Squirrel-tail Fescue		X	X
DICOTYLEDONS				
APIACEAE				
<i>Foeniculum vulgare</i>	Fennel		X	X
ARALIACEAE				
<i>Hedera helix</i>	English Ivy		X	X
ASTERACEAE				
<i>Arctotheca calendula</i>	Cape Weed		X	X
<i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i>	Boneseed	RC	X	X
<i>Cirsium vulgare</i>	Spear Thistle	RC		X
<i>Conyza</i> sp.	Conyza			X
<i>Cynara cardunculus</i>	Artichoke Thistle	RC		X
<i>Gamochaeta purpurea</i>	Spike Cudweed		X	X
<i>Hypochoeris glabra</i>	Smooth Cats Ears		X	X
<i>Hypochoeris radicata</i>	Cats Ears		X	X
<i>Lactuca serriola</i>	Wild Lettuce			X
<i>Leontodon taraxacoides</i>	Hairy Hawksbit		X	
<i>Sonchus oleraceus</i>	Common Sow-thistle		X	X
<i>Taraxacum</i> Sect. <i>Hamata/Ruderalia</i> (syn. <i>T. officinale</i>)	Dandelion			X
<i>Tragopon porrifolius</i>	Salsify			X
BORAGINACEAE				
<i>Echium plantagineum</i>	Paterson's Curse	RC		X
BRASSICACEAE				
<i>Lepidium africanum</i>	Common Pepper-cress		X	X
<i>Raphanus raphanistrum</i>	Wild Radish		X	X
CACTACEAE				
<i>Opuntia robusta</i>	Wheel Pear		X	X
CALLITRICHACEAE				
<i>Callitriche stagnalis</i>	Water Starwort		X	

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
CAPRIFOLIACEAE				
<i>Lonicera japonica</i>	Japanese Honeysuckle		X	X
CARYOPHYLLACEAE				
<i>Cerastium glomeratum</i>	Mouse-eared Chickweed		X	X
<i>Sagina apetala</i>	Annual Pearlwort			X
<i>Silene gallica</i>	French Catchfly			X
<i>Silene vulgaris</i>	Bladder Campion			X
CRASSULACEAE				
<i>Crassula multicava</i> ssp. <i>multicava</i>	Heart-leafed Crassula			X
<i>Crassula tetragona</i> ssp. <i>robusta</i>	Crassula			X
ERICACEAE				
<i>Arbutus unedo</i>	Strawberry Tree			X
FABACEAE				
<i>Chamaecytisus proliferus</i>	Tree Lucerne		X	
<i>Cytisus scoparius</i>	English (Scotch) Broom	RC		X
<i>Genista monspessulana</i>	Montpellier Broom	RC	X	X
<i>Medicago polymorpha</i>	Burr Medic		X	X
<i>Melilotus indicus</i>	Sweet Melilotus		X	X
<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Narrow-leaf Clover		X	X
<i>Trifolium dubium</i>	Suckling Clover		X	
<i>Trifolium subterraneum</i>	Subterraneum Clover		X	X
<i>Ulex europaeus</i>	Gorse	RC	X	X
<i>Vicia sativa</i>	Vetch		X	X
<i>Vicia</i> sp.	Vetch		X 93	X
FAGACEAE				
<i>Quercus robur</i>	English Oak			X
FUMARIACEAE				
<i>Fumaria bastardii</i>	Bastard Fumitory		X	X
GENTIANACEAE				
<i>Centaurium erythraea</i>	Common Centaury		X	X
<i>Centaurium tenuiflorum</i>	Centaury		X	
<i>Cicendia quadrangularis</i>	Square Cicendia		X	

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
LINACEAE				
<i>Linum trigynum</i>	French Flax		X	X
MALVACEAE				
<i>Modiola caroliniana</i>	Red-flowered Mallow		X	
MIMOSACEAE				
<i>Acacia floribunda</i>	White Sallow Wattle			X
<i>Acacia longifolia</i> ssp. <i>longifolia</i>	Sallow Wattle			X
MYRTACEAE				
<i>Callistemon</i> sp. (yellow flowering)	Callistemon			X
<i>Eucalyptus botryoides</i>	Southern Mahogany		X	X
<i>Eucalyptus cladocalyx</i>	Sugar Gum		X	X
<i>Eucalyptus cladocalyx</i> var. <i>nana</i>	Dwarf Sugar Gum			X
<i>Eucalyptus X botryoides</i>	Hybrid Southern Mahogany			X
<i>Eucalyptus leucoxyton</i> (var. <i>rosea</i> ?)	Yellow Gum			X
<i>Eucalyptus</i> sp. (poss. <i>E. maculata</i>)	Eucalyptus			X
<i>Eucalyptus</i> sp.	Eucalyptus			X
<i>Lophostemon confertus</i>	Brush Box			X
<i>Melaleuca armillaris</i>	Giant Honey Myrtle			X
<i>Melaleuca hypericifolia</i>	Hillock Bush			X
<i>Melaleuca stypheloides</i>	Prickly-leaved Paperbark			X
OLEACEAE				
<i>Fraxinus angustifolia</i> ssp. <i>angustifolia</i>	Desert Ash		X 93	X
OXALIDACEAE				
<i>Oxalis corniculata</i>	Sorrel		X 93	X
<i>Oxalis incarnata</i>	Pale Wood Sorrel		X	
<i>Oxalis pes-caprae</i>	Soursob		X	X
PITTOSPORACEAE				
<i>Pittosporum undulatum</i>	Sweet Pittosporum		X	X
<i>Sollya heterophylla</i>	Bluebell Creeper			X
POLYGALACEAE				
<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort			X
PLANTAGINACEAE				
<i>Plantago lanceolata</i>	Ribwort		X	X

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
POLYGONACEAE				
<i>Acetosella vulgaris</i>	Sheep Sorrel		X	
<i>Rumex crispus</i>	Curled Dock		X	X
PRIMULACEAE				
<i>Anagallis arvensis</i>	Scarlet Pimpernel		X	X
PROTEACEAE				
<i>Banksia integrifolia</i>	Coast Banksia			X
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea			X
<i>Grevillea</i> sp.	Grevillea			X
<i>Grevillea</i> sp.	Grevillea			X
<i>Hakea salicifolia</i>	Willow-leaf Hakea			X
ROSACEAE				
<i>Cotoneaster glaucophylla</i>	Large-leaf Cotoneaster		X	X
<i>Cotoneaster pannosus</i>	Cotoneaster		X	X
<i>Crataegus monogyna</i>	Hawthorn	RC	X	X
<i>Prunus cerasifera</i>	Cherry-plum		X	X
<i>Pyracantha angustifolia</i>	Orange Firethorn			X
<i>Pyracantha crenulata</i>	Firethorn			X
<i>Rosa rubiginosa</i>	Sweet Briar Rose	RC	X	X
<i>Rubus fruticosus</i> spp. agg	Blackberry	RC	X	X
RUBIACEAE				
<i>Coprosma repens</i>	Mirror Bush		X	X
<i>Diosma ericoides</i>	Diosma			X
<i>Galium aparine</i>	Cleavers			X
SALICACEAE				
<i>Populus alba</i>	White Poplar		X	X
SCROPHULARIACEAE				
<i>Veronica peregrina</i>	Veronica		X 93	
SOLANACEAE				
<i>Salpichroa organifolia</i>	Pampas Lily of the Valley			X
<i>Solanum nigrum</i>	Black Nightshade			X
STERCULIACEAE				
<i>Brachychiton populneus</i>				X

Scientific Name	Common Name	Regionally Controlled	Prev Surveys	2003 surveys
ULMACEAE				
<i>Ulmus aff. procera</i>	English Elm			X
VIOLACEAE				
<i>Viola odorata</i>	Violet			X

TOTAL NO. SPECIES = 143

Note: Non-indigenous species occurring in the Avenue of Honour west of the Reserve's formal boundary are not included in this list.

Note: no plants observed in the Reserve in 2003 but a single plant noted along the Avenue of Honour north of the Reserve's formal boundary

Appendix 3: Quadrat Data Cherry Street Reserve, November 2003

Quadrat One: South-East Zone

Key

* Introduced Plant

+ cover: < 5 %, a few individual plants

3 cover: 20–50%, any number of plants

1 cover: < 5 %, any number of plants

4 cover: 50–75%, any number of plants

2 cover: 5–20%, any number of plants

5 cover: 75–100%, any number of plants

Scientific Name	Common Name	Cover Abundance
<i>Acacia melanoxylon</i>	Blackwood	2
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	1
<i>Arthropodium strictum</i>	Chocolate Lily	1
<i>Austrodanthonia sp.</i>	Wallaby Grass	2
<i>Austrostipa sp.</i>	Soft Spear Grass	2
<i>Bossiaea prostrata</i>	Creeping Bossiaea	1
* <i>Briza maxima</i>	Large Quaking Grass	1
<i>Burchardia umbellata</i>	Milkmaids	1
<i>Caesia calliantha</i>	Blue Grass Lily	1
<i>Deyeuxia quadrisetia</i>	Reed Bent Grass	1
<i>Dianella admixta</i>	Black-anther Flax Lily	+
<i>Dianella amoena</i>	Matted Flax Lily	+
<i>Dichelacne crinita</i>	Long-hair Plume Grass	1
<i>Elymus scabrous</i>	Common Wheat Grass	1
<i>Eucalyptus camaldulensis</i>	Red Gum (mature)	1
<i>Eucalyptus camaldulensis</i>	Red Gum (seedlings & saplings)	2
<i>Gonocarpus tetragynus</i>	Common Raspwort	1
<i>Lomandra filiformis</i>	Wattle Mat-rush	1
<i>Microlaena stipoides</i>	Weeping Grass	1
<i>Pimelea curviflora</i>	Curved Rice Flower	1
<i>Pimelea humilis</i>	Small Rice Flower	1
<i>Poa sp.</i>	Tussock Grass	+
<i>Stylidium graminifolium</i>	Grass Trigger Plant	2
<i>Thelymitra pauciflora</i>	Sun Orchid	1
<i>Themeda triandra</i>	Kangaroo Grass	1
<i>Tricoryne elatior</i>	Yellow Rush Lily	1
% Bare Ground, Moss Cover		–
% Leaf Litter, Twigs, Logs, etc. Cover		1

Quadrat Two: Southern Zone

Key

* Introduced Plant

+ cover: < 5 %, a few individual plants

1 cover: < 5 %, any number of plants

2 cover: 5–20%, any number of plants

3 cover: 20–50%, any number of plants

4 cover: 50–75%, any number of plants

5 cover: 75–100%, any number of plants

<i>Scientific Name</i>	Common Name	Cover Abundance
* <i>Agrostis capillaris</i>	Brown-top Bent	1
* <i>Anagallis arvensis</i>	Scarlet Pimpernel	1
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	+
<i>Austrodanthonia spp.</i>	Wallaby Grass	1
<i>Bossiaea prostrata</i>	Creeping Bossiaea	+
* <i>Briza maxima</i>	Large Quaking Grass	+
* <i>Centaureum sp.</i>	Centaury	+
<i>Dianella amoena</i>	Matted Flax Lily	+
<i>Dichelachne crinita</i>	Long-hair Plume Grass	+
<i>Elymus scabrous</i>	Common Wheat Grass	1
<i>Eucalyptus camaldulensis</i>	Red Gum (seedlings & saplings)	1
<i>Haloragis sp.</i>	Raspwort	1
* <i>Hypochoeris radicata</i>	Cats Ears	+
* <i>Linum trigynum</i>	French Flax	1
<i>Lomandra filiformis</i>	Wattle Mat-rush	1
<i>Microtis unifolia</i>	Common Onion Orchid	1
* <i>Paspalum dilatatum</i>	Paspalum	1
* <i>Plantago lanceolata</i>	Plantain	1
<i>Poa sp.</i>	Tussock Grass	+
* <i>Romulea rosea</i>	Onion Grass	1
<i>Themeda triandra</i>	Kangaroo Grass	4
<i>Tricoryne elatior</i>	Yellow Rush Lily	1
% Bare Ground, Moss Cover		2
% Leaf Litter, Twigs, Logs, etc. Cover		

Quadrat Three: Western Zone

Key

* Introduced Plant

+ cover: < 5 %, a few individual plants

1 cover: < 5 %, any number of plants

2 cover: 5–20%, any number of plants

3 cover: 20–50%, any number of plants

4 cover: 50–75%, any number of plants

5 cover: 75–100%, any number of plants

Scientific Name	Common Name	Cover Abundance
<i>Acacia melanoxylon</i>	Blackwood (suckers / seedlings)	+
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	1
<i>Austrodanthonia spp.</i>	Wallaby Grass	+
<i>Bossiaea prostrata</i>	Creeping Bossiaea	1
* <i>Briza minor</i>	Small Quaking Grass	+
* <i>Chrysanthemoides monilifera</i>	Boneseed (seedlings)	+
<i>Dianella admixta</i>	Black Anther Flax Lily	+
<i>Eucalyptus camaldulensis</i>	Red Gum (seedlings & saplings)	+
<i>Gonocarpus tetragynus</i>	Common Raspwort	1
<i>Hypericum gramineum</i>	Small St.John's Wort	1
* <i>Hypochoeris radicata</i>	Cats Ears	+
* <i>Linum trigynum</i>	French Flax	1
<i>Lomandra filiformis</i>	Wattle Mat-rush	+
<i>Microtis unifolia</i>	Common Onion Orchid	1
<i>Opercularia</i>	Stinkweed	2
* <i>Plantago lanceolata</i>	Plantain	1
* <i>Romulea rosea</i>	Onion Grass	1
* <i>Rosa rubiginosa</i>	Sweet Briar Rose	+
* <i>Rubus fruticosus</i> spp. agg.	Blackberry	1
<i>Stylidium graminifolium</i>	Grass Trigger Plant	2
<i>Thelymitra pauciflora</i>	Sun Orchid	1
<i>Themeda triandra</i>	Kangaroo Grass	4
<i>Tricoryne elatior</i>	Yellow Rush Lily	1
% Bare Ground, Moss Cover		2
% Leaf Litter, Twigs, Logs, etc. Cover		

Quadrat Four: Northern Zone

Key

* Introduced Plant

+ cover: < 5 %, a few individual plants

1 cover: < 5 %, any number of plants

2 cover: 5–20%, any number of plants

3 cover: 20–50%, any number of plants

4 cover: 50–75%, any number of plants

5 cover: 75–100%, any number of plants

Scientific Name	Common Name	Cover Abundance
<i>Acacia mearnsii</i>	Black Wattle	+
* <i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	+
<i>Austrodanthonia sp.</i>	Wallaby Grass	1
<i>Austrostipa sp.</i>	Soft Spear Grass	3
<i>Bossiaea prostrata</i>	Creeping Bossiaea	1
* <i>Briza minor</i>	Small Quaking Grass	+
* <i>Centaureum sp.</i>	Centaury	+
<i>Deyeuxia quadrisetia</i>	Reed Bent Grass	+
<i>Dianella amoena</i>	Matted Flax Lily	+
<i>Dichelachne crinita</i>	Long-hair Plume Grass	+
<i>Eucalyptus ovata</i>	Swamp Gum (mature)	2
<i>Eucalyptus spp.</i>	Eucalyptus seedlings / saplings	1
* <i>Fraxinus angustifolia</i>	Desert Ash (seedlings)	+
<i>Gonocarpus tetragynus</i>	Common Raspwort	1
* <i>Hakea salicifolia</i>	Willow-leaf Hakea (Dead)	+
<i>Haloragis sp.</i>	Raspwort	+
<i>Leptorhynchus tenuifolius</i>	Wiry Buttons	1
<i>Lomandra filiformis</i>	Wattle Mat-rush	1
<i>Microlaena stipoides</i>	Weeping Grass	1
* <i>Plantago lanceolata</i>	Plantain	1
<i>Poa sp.</i>	Tussock Grass	1
* <i>Romulea rosea</i>	Onion Grass	1
<i>Themeda triandra</i>	Kangaroo Grass	3
<i>Tricoryne elatior</i>	Yellow Rush Lily	1
<i>Veronica gracilis</i>	Slender Speedwell	+
<i>Wahlenbergia sp.</i>	Bluebells	+
% Bare Ground, Moss Cover		+
% Leaf Litter, Twigs, Logs, etc. Cover		2

Appendix 4: Extract from *Reassessment of Botanical Values on Streeton Views Estate Stage 11 Yallambie with Particular Reference to the Significance of the Natural Hybrid Eucalyptus Xstudleyensis Studley Park Gum and the Endangered Species Dianella amoena Matted Flax Lily*. Cameron. D., Rule. K., Robinson. R., (1999). Pages 18–24

***Eucalyptus Xstudleyensis* (Studley Park Gum)**

The investigation of the status of this taxon has become a complex and major undertaking which has generated a large volume of material which now requires documentation. It is beyond the scope of this report to present that material in full or to canvass all the considerations pertinent to the assessment of the significance of the hybrid taxon *Eucalyptus Xstudleyensis*. In lieu of the presentation of the complete findings of our investigation, which will be reported elsewhere, we here present a brief synopsis only of our key findings and conclusions.

The assessment of the significance of any taxon requires at the outset a clear statement of its taxonomic status and circumscription, a knowledge of its distribution, population size, age structure and an assessment of the threats which are known or suspected to result in its decline or which, if they were to operate, might be expected to result in its decline. Once this information has been assembled an agreed set of criteria are applied to determine the significance and conservation status of the taxon. For most well-documented species of established taxonomic status and uncontroversial circumscription, the required information can be readily assembled and the agreed criteria applied. In the case of a fertile hybrid which is capable of backcrossing to produce a hybrid swarm, problems of definition and circumscription apply at every step in the assessment process. At every step, novel approaches are required to deal with the special circumstances which apply to a fertile hybrid.

Field identification and circumscription of any hybrid requires a sound knowledge of the morphology of the parent taxa and familiarity with the range of phenetic expression expected of hybrid progeny in the genus as a whole. Armed with this knowledge, we inspected in the field all reported occurrences of *Eucalyptus Xstudleyensis* (Studley Park Gum) that had come to our attention from a variety of sources. A total of 27 sites were investigated across an area ranging from Hawthorn to Greensborough. One report has yet to be investigated and one, although investigated, remains unconfirmed. Whilst most of the sites represent discrete stands that were probably already quite isolated from other stands at the time of European settlement, a number of sites, particularly in the Yallambie–Macleod–Rosanna area, represent the fragmented remnants of larger and possibly interconnected stands present at the time of settlement. In one instance a new site was

recognised whilst investigating a reported occurrence at another site. At each site the identity of all eucalypts was recorded, population size of any confirmed hybrid taxon measured or estimated, the age classes of hybrids noted and any acting or perceived threats to the security of confirmed hybrid populations noted.

The 28 sites investigated or awaiting investigation or confirmation are ranked in order of significance for the conservation of *Eucalyptus Xstudleyensis* as follows:

1. Simpson Army Barracks, east of Greensborough Road, Yallambie
2. Streeton Views Estate Stage 11, Yallambie
3. Commonwealth reserve & transmission line easement SW of Streeton Views Estate Stage 11, Yallambie
4. **Plenty Hospital, Macleod (CHERRY STREET RESERVE)**
5. Barron Way reserve, Streeton Views Estate, Yallambie
6. Bonds Road south of Palamino Court, Lower Plenty
7. Norris Reserve, Yarra Bend Park, Kew
8. Arthur Streeton Drive, Streeton Views Estate, Yallambie
9. Blamey Road, Simpson Army Barracks, Yallambie
10. Savige Road, Simpson Army Barracks, Yallambie
11. Silver Wattle Street, Streeton Views Estate, Yallambie
12. Interlaken Parade, Rosanna
13. The Billabong, Banyule Flats Reserve south of Somerset Drive, Heidelberg
14. The Boulevard near Redesdale Road, Ivanhoe
15. Eaglemont Station carpark, Allandale Road, Eaglemont
16. The Vine and the Branches Growing Centre, Yarra Valley Parklands, Bonds Road, Lower Plenty
17. Hawdon Street Cemetery,
18. Binnak Park, Watsonia
19. Plenty River reserve between Nepean Street and Errol Court, Greensborough

20. Martins Lane reserve at Hendersons Road intersection, View Bank
21. Macleod Primary School site, Macleod
22. Yarra Bend 9 Hole Par 3 Golf Course, Kew
23. Yarra River at Gardiners Creek confluence, Scotch College, Hawthorn
24. Derham Street opposite Albert Jones Reserve, Heidelberg
25. Hickling Avenue, Greensborough
26. Edwards Street, Lower Plenty
27. Yarra Bend Park opposite Fairfield Boathouse, Studley Park, Kew
28. Yarra Park near Melbourne Cricket Ground, Jolimont, East Melbourne

The Simpson Army Barracks east of Greensborough Road supports the largest and most extensive, and possibly also the most secure, hybrid swarm of *Eucalyptus Xstudleyensis* known to us, including at least 53 established trees and numerous juveniles.

The Streeton Views Estate Stage 11 site supports a population of 64 established hybrid trees and a total population of 117 hybrid individuals of all age and size classes (Opie *et al.* 1998b). The adjacent Commonwealth Military Reserve area and transmission line easement supports an extension of the hybrid swarm present within Stage 11. Together these two areas constitute an ecological management unit or conservation unit that has a considerably greater ecological viability than do each of the units managed independently or in isolation.

The Plenty Hospital site (CHERRY STREET RESERVE) at Macleod supports a more modest population of highly introgressed hybrids with a relatively intact ground stratum which has a high intrinsic significance for grassland conservation. Whilst, of all the sites investigated, the vegetation at this site has possibly the highest ecological viability, the hybrid swarm at this site is highly atypical and is unlikely to maintain its genetic integrity over future generations.

A further eleven sites (5–15) each support one or more confirmed occurrences of the hybrid *Eucalyptus Xstudleyensis* but since the hybrid population at each site is no longer subject to natural ecological processes, the opportunities for recruitment have been either greatly impaired or else, in most cases, lost altogether.

Reported sightings of *Eucalyptus Xstudleyensis* at eleven sites (16–26) are all based on misidentification of other eucalypt taxa. The most frequently misidentified taxon is the naturally occurring but artificially facilitated hybrid *Eucalyptus botryoides* x *camaldulensis* which was mistaken for *Eucalyptus Xstudleyensis* at the former Macleod Primary School site on Greensborough Road, at the Yarra Bend 9 hole Golf Course at Kew and at the confluence of the Yarra River and Gardiners Creek.

A recent report of *Eucalyptus Xstudleyensis* at Yarra Bend Park opposite the Fairfield Boathouse, Kew, requires field investigation before it can be confirmed. A small remnant stand reported to have been *Eucalyptus Xstudleyensis* at Yarra Park near the Melbourne Cricket Ground, Jolimont, has been investigated but since the trees have since been removed the report cannot be confirmed.

In conclusion, the hybrid swarm located within the integrated management unit comprising Stage 11 of the Streeon Views Estate and the 2 ha area immediately downslope is one of only three which have the potential to be managed as natural systems in which natural ecological processes provide the opportunity for the recruitment of new hybrid individuals. Furthermore, it is one of only two hybrid swarms which are likely to remain genetically stable in the long-term.

The assessment of the conservation status of hybrid taxa has not, to our knowledge, been satisfactorily addressed. We therefore need to develop assessment criteria which take account of the special circumstances which apply to hybrids. Firstly we argue that the most fundamental yardstick by which the significance of hybrids can be assessed is their potential contribution to biological evolution. Thus the first criterion must be whether the hybrid is fertile or sterile since only fertile hybrids can contribute to the genetic variability of future generations. Secondly we argue that the contribution of fertile hybrids to the creation of evolutionary novelty depends on the genetic distance between the parents. Closely related parents can only produce hybrids which are similar to both parents. If such hybrids (the F1 generation) produce further hybrids (F2, F3, etc. generations) and/or backcross to either or both parents, the resulting hybrid swarm will be scarcely distinguishable from its parents and may serve only to maintain a zone of intergradation between the parent populations. Even if the hybrid population stabilises over time to become a new hybridogenous entity, the new taxon will represent a genetic novelty of a low order only. If they are capable of hybridising at all, distantly related parents, by contrast, can be expected to produce new hybridogenous entities which represent genetic novelties of a high order. Spontaneous hybridisation between distant relatives is a rare event however. Two further conditions must also be met before a hybrid swarm can contribute to the evolution of an incipient hybridogenous taxon. The hybrid swarm needs to stabilise its characteristics and it must eventually show some tendency toward niche differentiation.

When we apply these criteria to *Eucalyptus Xstudleyensis* we find that this hybrid rates exceedingly well on all counts. The hybrid is clearly fertile since numerous backcrosses can be observed in the field. It is one of a very small number of inter-sectional hybrids within the genus *Eucalyptus*. Hybrids are unknown between sub-genera of *Eucalyptus* and some authorities argue that each of the sub-genera should be raised to the rank of genus. Hybrids between sections are very rare, hybrids between series are uncommon and hybrids within series are quite common. Field observations confirm that *Eucalyptus Xstudleyensis* is a taxon of long standing with the oldest trees showing the highest level of character stabilisation. There is no basis whatsoever for the suggestion that *Eucalyptus Xstudleyensis* is exclusively the product of recent post-settlement disturbance. This suggestion is made in

part because the restricted natural distribution of the hybrid coincides with an area of close urban settlement. However, we have developed a hypothesis which accounts for the observed distribution and other characteristics of the hybrid. Finally, we consider that the hybrid taxon does demonstrate a tendency toward niche differentiation by occupying sites which are sub-optimal for both parent species. Whether this is the result of a genetic recombination of the genomes of the parents which preadapts the hybrid to an unoccupied niche in the landscape or whether it is simply the result of competitive exclusion by the parent species is immaterial since both causes achieve the same evolutionary outcome – the progressive isolation of gene pools.

On each of the evolutionary and phylogenetic criteria, therefore, *Eucalyptus Xstudleyensis* is rated highly. Consequently, we consider that *Eucalyptus Xstudleyensis* represents a rare and phylogenetically significant hybrid combination which offers a unique opportunity for the creation of an evolutionary novelty which has the potential to spawn a new line of evolutionary development through further speciation within the genus *Eucalyptus*. We conclude that there is a strong case for maintaining active swarms of the hybrid on account of its scientific and evolutionary significance.

Conservation Status of *Eucalyptus Xstudleyensis* (Studley Park Gum)

The assessment of the conservation status of non-hybrid taxa and plant communities, and likewise the delineation and rating of sites of biological significance, each follow widely accepted guidelines and protocols. By contrast, the assessment of the conservation status of hybrid taxa, and of individual hybrid swarms or individual plants (or animals) of hybrid origin, has not been adequately addressed. Guidelines and protocols for the assessment of significance of hybrid taxa, hybrid swarms and individuals of hybrid origin have not been developed and applied consistently to Victorian or Australian plants. This does not mean, however, that hybrid taxa have not been assigned significance ratings or that the conservation of hybrid populations has not received management consideration or influenced land use decisions. On the contrary, a number of well known hybrid taxa have been consistently recognised by a number of authorities as rare or threatened taxa and some well known hybrid populations have contributed to the recognition of sites of botanical significance or to the establishment and management of parks and reserves.

At the state level, for example, Gullan *et al.* (1990) list as extinct in Victoria the hybrid taxa *Cassia artemisioides* (now recognised as *Senna artemisioides* nothosubspecies *Xartemisioides* ie. as a subspecies considered to result from the hybridisation of other subspecies of *Senna artemisioides*) (Silver Cassia) and *Diuris Xfastidiosa* (Proud Diuris) and as rare in Victoria the hybrid taxa *Cyathea Xmarcescens* (Skirted Tree-fern), *Thelymitra Xmacmillanii* (Crimson Sun-orchid), the presumed hybrid *Trymalium ramosissimum* (Branched Trymalium) and the suspected hybrid *Thelymitra mackibbinii* (Brilliant Sun-orchid) and also list as rare in Victoria the species *Isolepis wakefieldiana* (synonym *Scirpus wakefieldianus*) (Tufted Club-sedge) despite the suggestion by Willis (1970) that the taxon ‘appears to combine the characteristics of *S. inundatus* and *S. calocarpus*, and may comprise a hybrid population.’ Similarly, Backhouse and Jeanes (1995) list as endangered in Victoria

the hybrid taxa *Caladenia Xvariabilis* (Variable Spider-orchid), *Diuris Xfastidiosa* (Proud Diuris) and *Thelymitra Xmackibbinii* (Brilliant Sun-orchid) and the presumed hybrid taxon *Pterostylis aenigma* (Enigmatic Greenhood), as vulnerable in Victoria the hybrid taxon *Pterostylis Xtoveyana* (Mentone Greenhood) and the suspected hybrid *Thelymitra merraniae* (Merran's Sun-orchid) and as rare in Victoria the intergeneric hybrid taxon *XCalassodia tutelata* (Hybrid Caladenia or Bluebeard Waxlip Hybrid Orchid) and the hybrid taxa *Chiloglottis Xpescottiana* (Bronze Bird-orchid), *Diuris Xpalachila* (Broad-tip Diuris), *Pterostylis Xingens* (Sharp Greenhood), *Thelymitra Xchasmogamma* (Globe-hood Sun-orchid) and *Thelymitra Xmacmillanii* (Crimson Sun-orchid). Furthermore, the suspected hybrid *Thelymitra merraniae* (Merran's Sun-orchid) is listed as endangered in Victoria by the Department of Natural Resources and Environment and is listed under Schedule 2 of the Flora and Fauna Guarantee Act 1988 as a threatened taxon.

At the national level, the West Australian hybrid *Adenanthos Xcunninghamii* is listed as nationally Vulnerable by Briggs and Leigh (1995) and it is also currently listed as nationally Vulnerable both on the ANZECC List of Threatened Australian Flora 1997 and under the Commonwealth Endangered Species Protection Act 1992. Current amendments to the ANZECC list include a proposal to raise the status of this taxon from Vulnerable to Endangered. The Victorian endemic *Pterostylis aenigma* (Enigmatic Greenhood), whose presumed hybrid status was acknowledged by its author even prior to the publication of its description in 1993, is listed as nationally Poorly Known by Briggs and Leigh (1995). The taxon is listed as endangered in Victoria by the Department of Natural Resources and Environment and current amendments to the ANZECC List of Threatened Australian Flora include a proposal to list the taxon as nationally Endangered. The endemic Victorian suspected hybrid *Thelymitra mackibbinii* (Brilliant Sun-orchid) is listed as nationally Vulnerable by Briggs and Leigh (1995) and it is also listed as nationally Vulnerable under the Commonwealth Endangered Species Protection Act 1992. In a recent review of the conservation status of Victorian plants the Department of Natural Resources and Environment reassessed the status of this taxon as endangered in Victoria. The Victorian endemic hybrid *Trymalium Xramosissimum* (Branched Trymalium) is listed by Briggs and Leigh (1995) as a nationally Rare taxon. Although Briggs and Leigh list the taxon without reference to its hybrid status, the taxon is listed by Ross (1996) in the current edition of 'A Census of the Vascular Plants of Victoria' as *Trymalium X ramosissimum*.

It is evident from these examples that some hybrid taxa are explicitly protected by current State or Commonwealth legislation and that many hybrid taxa are included in both formal and informal advisory lists which guide both public and private land management and influence land use decision-making and planning processes at national, state and regional levels. The inclusion of hybrid taxa in such lists is quite inconsistent, however, and the conservation status of most naturally occurring hybrid taxa has not, in fact, ever been assessed. Most of the hybrid taxa which have received formal recognition as rare or threatened taxa to date have simply been assessed as if they were species without due consideration of their particular conservation requirements as hybrids. It is often considered that a hybrid taxon cannot be threatened with extinction unless at least one of

its known or presumed parents has also become extinct. For this reason some listing authorities are understandably reluctant to accredit hybrid taxa with threatened taxon status or even with rare taxon status. For example, the Department of Natural Resources and Environment has chosen not to include acknowledged hybrids in its recently revised list of rare or threatened Victorian plants. Further reasons for excluding hybrids from such lists include the notion that hybrids do not carry unique genes and that they are not real taxa. Such arguments overlook the fact that the persistence of most hybrid taxa requires that the opportunity for further hybridisation be maintained as well as that the survival of the parent taxa be ensured. They also overlook the fact that very few genes are unique to individual species and that the features which distinguish species are largely a result of the way in which genes are organised and expressed. In other words, species are distinct because they possess unique combinations of genes rather than by unique genes *per se*. Most genes are in fact shared among many species. The level of reorganisation or recombination of genes in a hybrid may in fact be more distinctive than that of many species, particularly where the parents are not closely related. Some hybrid taxa are therefore arguably genetically at least as distinctive as many species and some may carry a more distinctly 'unique' combination or expression of genes than many species. The loss of such combinations may be a more significant loss in evolutionary terms than the loss of many individual species within larger genera or species complexes.

A more serious impediment to the assessment of the conservation status of hybrids, however, is the incomplete state of taxonomic documentation of hybrid taxa. Relatively few hybrid taxa have been formally named and even fewer have been adequately described or circumscribed. Even in orchid genera such as *Thelymitra*, *Pterostylis*, *Caladenia* and *Diuris*, in which a number of the more common or distinctive hybrid taxa have been formally named, the application and circumscription of these names remains confused and most hybrid names in these genera are frequently indiscriminately misapplied to a class of similar hybrid taxa. If each such hybrid name were strictly limited only to the type to which the original description applied, numerous additional hybrid names would need to be created. The almost limitless number of potential or observed hybrid combinations which theoretically might warrant taxonomic recognition is a major disincentive to the taxonomic documentation and resolution of hybrid taxa. This in turn is a significant obstacle to the accurate field identification of suspected hybrids and consequently to the consistent and comprehensive assessment of the conservation status of hybrid taxa.

A related and equally serious impediment to the assessment of the status of some taxa is the uncertainty regarding the species or hybrid status of many taxa and the fact that in reality there is no clear demarcation between the two. Hybridisation is widely acknowledged to be one of the principal mechanisms responsible for the evolutionary development of new species and many well established hybrids could equally be regarded as incipient species. Conversely, many recently evolved species of hybrid origin could equally be regarded as stabilised hybrids. For example, *Eucalyptus fastigata* (Cut-tail Ash) has been considered by some authorities to be of recent hybrid origin with *Eucalyptus obliqua* (Messmate Stringybark) and *Eucalyptus regnans* (Mountain Ash), whose features it seems to combine, as

suggested parents. Yet a well-known but unnamed hybrid between these two parent species, which is quite distinct from *Eucalyptus fastigata*, occurs widely in the Otways (where it is known as Otway Messmate) and on Wilsons Promontory.

Conservation of species (or subspecies or varieties) is relatively straightforward in that it relies simply on ensuring the survival of existing populations of the taxon. Conservation of hybrid taxa is far more complex in that it relies, to varying degrees, on

- the survival in the wild of existing hybrid swarms,
- the maintenance of ecological processes which facilitate regeneration of the hybrid in the wild,
- the maintenance of ecological processes which facilitate further hybridisation in the wild and
- the survival in the wild of each of the presumed parent taxa.

The persistence of hybrid taxa can thus be threatened not only by threats to the survival of existing hybrid swarms but also by threats to each of the parent taxa and to the ecological processes responsible for regeneration of the hybrid population and for further hybridisation. Hybrid taxa are thus subject to a wider range of threatening processes than individual species and the assessment of their conservation status must take into account the complex interaction of all these threats. In view of all these complicating factors it is not surprising that the conservation of hybrids is often disregarded in biodiversity audits and planning processes or else consigned to the 'too hard basket'.

In our discussion of *Eucalyptus Xstudleyensis* (Studley Park Gum) as a significant 'species' we outline fundamental criteria which we suggest can be applied to the assessment of the conservation status of hybrid taxa in general. Our thesis is that whilst species (and subspecies and varieties) can be considered worthy of conservation principally because they represent the products of biological evolution and the substrate for further evolution, fertile hybrids can be considered worthy of conservation because they contribute to the process of evolution itself. Viewed in this light it is obvious that the conservation status of hybrids and species cannot be directly compared since their contribution to present biodiversity and their potential contribution to future biodiversity are qualitatively different, notwithstanding the grey area where the two classes of taxa merge. It is often assumed, more on ethical than biological grounds, that all species are equally significant and that therefore the conservation status of any species depends only on whether it is currently secure or threatened with extinction. However, it is sometimes suggested that the conservation status of a species should also take account of its evolutionary distinction, with phylogenetically isolated species such as those in monotypic genera or families considered more significant than those in larger genera or families. Hybrid taxa, however, are clearly not equally significant since both their contribution to further evolution and their phylogenetic

distinction vary considerably. We thus develop assessment criteria based on the relative potential contribution of hybrids to the evolution of new species. Relevant criteria include

- whether the hybrid is fertile
- the genetic distance between the parents
- population size ie. whether it is merely of sporadic occurrence or occurs in discernible swarms
- the extent of character stabilisation
- the tendency toward niche differentiation.

If the concept of phylogenetic weighting were to be applied seriously to both species and hybrids alike then it could be argued that the potential contribution to biodiversity conservation of certain hybrids which represent significant evolutionary novelties may be greater than that of many established species. Whilst such a suggestion may not gain wide acceptance at present, we would argue that a well established hybrid taxon such as *Eucalyptus Xstudleyensis*, which rates highly on all the above criteria, should be ranked alongside a species of comparable threat status. Since we can easily demonstrate that the populations of *Eucalyptus Xstudleyensis* are both rare and threatened in the wild, and that the ecological processes which facilitate hybridisation are either impaired or eliminated throughout the natural range of the taxon, we would argue that *Eucalyptus Xstudleyensis* should be considered a threatened taxon in Victoria and Australia. Whether it should attract a vulnerable or endangered status depends on an assessment of the estimated time to extinction, measured either in years or in generations for the taxon, assuming current threats continue unabated. Since we consider that the taxon is effectively doomed once all existing populations are reduced to ageing individuals isolated from the ecological processes required for regeneration or further hybridisation and all suitable ecologically intact potential habitat within the natural range of the taxon has been eliminated, and since it is quite plausible that such a scenario may eventuate within one to two generations for the taxon, we would argue that the taxon is endangered in Victoria and, by definition, also nationally endangered.

In its Guidelines for the Determination of Critical Habitat, the Flora and Fauna Guarantee Act 1988 acknowledges that, for any taxon, community or gene pool which exists at more than a single site, no single site can be deemed to constitute the critical habitat for the taxon, community or gene pool. In other words, to draw on the wisdom enshrined in a popular proverb, it is prudent never to 'carry all of one's eggs in one basket'. In accordance with this conservation guideline, we contend that the two 'natural' stands of *Eucalyptus Xstudleyensis* which are considered to still retain their long-term genetic viability (site 1 above and the combined sites 2 & 3 which comprise the 3.5 ha remnant stand of native vegetation which includes the Streeton Views Estate Stage 11 site) must together constitute the critical habitat for the hybrid taxon *Eucalyptus Xstudleyensis*. We further contend,

therefore, that it is mandatory that the appropriate ecological processes which give rise to hybrid formation be maintained within each of these 'natural' stands. All other reported occurrences of *Eucalyptus Xstudleyensis* consist of either a highly introgressed hybrid population of doubtful genetic viability (site 4) or isolated individuals in an artificially managed environment devoid of the associated understorey composition required for ecologically sustainable management of an active hybrid swarm (sites 5–15 & possibly also site 26) or else they are simply the result of misidentification (sites 15–25).

Appendix 5: Site Maps.

Eight maps have been included as PDF files for the CD–Rom version of this draft report. Printed maps will be incorporated into hard copy versions of the final report.

- **Map 1. Vegetation Quality**



1)Cherry St_veg_quality_Final_Jun04.pdf

- **Map 2. VROT Indigenous Species**



2)Cherry St_vrot_species_Final_Jun04.pdf

- **Map 3. Major Weed Occurrences**



3)Cherry St_major_weeds_Final_Jun04.pdf

- **Map 4. Management Zones**



4)Cherry St_mgt_zones_Final_Jun04.pdf

- **Map 5. Current Tracks and Trails**



5)Cherry St_tracks&trails_Final_Jun04.pdf

- **Map 6. Tracks and Trails Proposed Access**



6)Cherry St_restricted_access_Final_Jun04.pdf

- **Map 7. Fire Management**



7)Cherry St_fire_mgt_Final_Jun04.pdf

- **Map 8. Core Conservation Areas**



8)Cherry St_core_conservation_Final_Jun04.pdf

Appendix 6: Extract from NEROC study, Beardsell, 1997.

Information on fauna occurrences and habitat significance of the Cherry Street Grassland Reserve is contained within Beardsell's 1997 NEROC study, Sites of Faunal and Habitat Significance in North East Melbourne.

As it is not possible to extract material electronically from the 1997 CD-Rom version of Beardsell's study, the electronic versions of the Cherry Street Grassland Reserve Management Plan do not contain the NEROC extract. However, all hard-copy versions of the Cherry Street Grassland Reserve Management Plan do contain the 22 page NEROC extract.