

FINAL REPORT:

Biodiversity Management Plan, Cardinia Road Employment Precinct, Officer, Victoria

ON BEHALF OF:

Cardinia Shire Council

July 2008

Ecology Partners Pty Ltd

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1 INTRODUCTION

Ecology Partners Pty. Ltd. was commissioned by Cardinia Shire Council to prepare a Biodiversity Management Plan (BMP) for the Cardinia Employment Precinct, Cardinia Road, Officer, Victoria.

The BMP is provided in accordance with the requirements of the Draft Precinct Structure Guidelines, Growth Areas Authority and the Department of Sustainability and Environment (DSE). It is intended to guide the management of biodiversity assets prior to, during and after construction.

1.1 Study Area

The study area is located in Officer South, approximately 50 kilometres south-east of Melbourne's central business district. The study area is bounded by the Pakenham Bypass to the north, Gum Scrub Creek in the west and Toomuc Creek in the east, extending south to the transmission line. The study area is located within the Urban Growth Boundary (UGB), is used predominantly for agricultural purposes and the vegetation is dominated by introduced pasture species.

According to DSE Biodiversity Interactive Mapping (www.dse.vic.gov.au) the study area is within the Port Phillip and Westernport catchment boundary and the Gippsland Plain bioregion. The Gippsland Plain bioregion extends from Port Phillip Bay in the west to Bairnsdale in the east, between the southern slopes of the Great Dividing Range and Wilsons Promontory, excluding the Strzelecki Ranges.

1.2 Vegetation Condition and Ecological Vegetation Class

1.2.1 Ecological Vegetation Classes

A review of DSEs databases indicates that the study area would have originally supported five Ecological Vegetation Classes (EVCs): Swampy Riparian Woodland, Plains Grassland/Plains Grassy Woodland mosaic, Swampy Woodland and Swamp Scrub.

Extant DSE vegetation mapping indicates that there are currently two EVCs within the study area: Swamp Scrub and Plains Grassland/Plains Grassy Woodland mosaic. However, the only areas of remnant native vegetation (small isolated patches of Swamp Scrub and Swampy Woodland) occur along the Cardinia Road, Lecky Road and Enterprise Road roadside reserves.

1.2.2 Vegetation Condition

The study area is highly modified, with exotic pasture grasses forming the dominant vegetation type. Little remnant native vegetation remains within the study area (Figure 1). Swampy Woodland (EVC 937) occurs within roadside reserves along Lecky Road and Cardinia Road (Figure 2).

Within the study area Swampy Woodland is characterised by a sparse overstorey of Swamp Gum *Eucalypts ovata* with an understorey of Blackwood *Acacia melanoxylon* and Swamp Paperbark *Melaleuca ericifolia*, together with rushes, sedges, grasses and herbs. This EVC typically occurs on low-lying sites with seasonally waterlogged soils, often caused by surface run-off (Oates and Taranto 2001).

Swamp Scrub (EVC 53_61) occurs within road reserves within the study area (Figure 1). It consists of a closed scrub dominated by Swamp Paperbark with either an herbaceous or moss/lichen/liverwort dominated ground layer (Oates and Taranto 2001). However, the understorey of Swamp Scrub within the study area was dominated by Common Reed *Phragmites australis*.

Lecky Road

There are two patches of Swamp Scrub (HZ1) and two patches of Swampy Woodland (HZ2) along Lecky Road between Cardinia Road and Gum Scrub Creek. The eastern patches of Swamp Scrub and Swampy Woodland either side of the low-lying area are proposed for retention, and are dominated by Swamp Paperbark and Blackwood respectively, both mature and regenerating. The ground layer was dominated by Common Reed and exotic grasses. Further west there are additional areas of Swamp Scrub proposed for retention along Lecky Road, and a small patch of Swampy Woodland. The area of Swamp Scrub on the northern side of Lecky Road has a sparser canopy cover, and a higher diversity of native understorey species. In some areas the understorey was dominated by Blackberry *Rubus fruticosus* spp. agg.

Cardinia Road

Within the study area, approximately half of the length of the Cardinia Road reserve is lined with linear patches of highly modified Swampy Woodland. In the northern section of Cardinia Road, the Swampy Woodland on the eastern side of the road is dominated by Blackwood, with an understorey of regenerating Swamp Paperbark, sedges, exotic grasses, and occasional Spiny-headed Mat-rush *Lomandra longifolia*. Both patches of Swampy Woodland adjacent to the drainage line crossing west of Cardinia Road, are dominated by Blackwood.

Approximately 300 metres south of this drainage line is the only patch of Swampy Woodland that contains a eucalypt species. A single Swamp Gum *Eucalyptus ovata* is located at the northern end of the remnant patch, and the rest of the patch comprises Blackwood, Swamp Paperbark, and Hawthorn *Crataegus monogyna*, with an understorey of Common Reed, Spiny-headed Mat-rush, and exotic grasses.

Another patch of Swampy Riparian Woodland occurs 100 metres further south on Cardinia Road. This patch is similar in composition to the patch of Swampy Woodland described above, although this patch does not contain Swamp Gum.

A small patch of Swamp Scrub lies approximately 100 metres north of the southern boundary of the study area, and is similar in composition to the Swamp Scrub on Lecky Road. All areas of vegetation on Cardinia Road are proposed for removal, except for two small areas around the drainage line.

Enterprise Road

There are two very small areas of Swamp Scrub and Swampy Woodland within the road reserve. The patch of Swamp Scrub is the highest quality patch within the study area due to the paucity of noxious weeds, while the patch of Swampy Woodland is the lowest quality patch due to its depleted canopy cover (Plate 1). These areas are proposed to be removed.

Plate 1. Swamp Paperbark, planted eucalypts and understorey weeds along Gum Scrub Creek



Toomuc Creek

The majority of the vegetation along Toomuc Creek is planted, non-indigenous native vegetation consisting of eucalypts and wattles. The understorey consists of introduced species such as Willows, Hawthorn, Gorse, Blackberry, Pine and pasture grasses. The western portion of the study area, particularly the large permanent waterbody immediately adjacent to Toomuc Creek and several farm dams are considered be part of a broader area of habitat of national conservation significance for the Growling Grass Frog *Litoria raniformis* (Hamer and Organ 2006a, 2006b). Detailed monitoring of the species within the study area over the past four breeding seasons (Timewell 2003; Organ 2004; Organ and Hamer 2006c) and broader strategic surveys within Pakenham Urban Growth Corridor (Hamer and Organ 2006a, 2006b) have revealed that the creek is likely to be utilised by the species for foraging and dispersal activities. The species may also occasionally breed at suitable sites along the creek.

2 BIODIVERSITY MANAGEMENT PLAN

2.1 General Objectives

The aim of the BMP is to provide information in an easily accessible format, to be strategic and to focus on actions and performance measures in order to manage key threatening processes within the study area.

In addition, the aim of the plan is to maintain and enhance Growling Grass Frog and other indigenous fauna habitats, and to prevent further declines in overall vegetation cover and condition. Therefore, it is essential that management, where possible, preserves and replicates ecological processes to enhance indigenous landscapes and habitat.

Management should reflect changes in knowledge as well as ecosystem structure and function (i.e. adaptive management). Indeed, adaptive management should be used to maintain the ecological functioning and integrity of area of ecological values within the study area.

The objectives of the BMP within the focus area include:

- Maintain and, if possible, expand populations of significant fauna species, principally the Growling Grass Frog;
- Maintain or increase biodiversity values through the protection and management of areas supporting ecological values;
- Protect environmental assets, ensuring that remnant native vegetation persists into the future;
- Control and, if possible, eliminate populations of pest plants and animals; and,
- Achieve a high level of ecologically sound on-ground management.

All actions must be undertaken by personnel experienced in the management of indigenous/wetland ecosystems, who are able to identify exotic and indigenous species, and who are aware of areas of ecological sensitivity such as Growling Grass Frog habitat.

2.2 Overview of Key Threats

2.2.1 Habitat loss

Growling Grass Frog has been recorded at several sites (creeklines and artificial waterbodies) within the Cardinia Road Employment Precinct (Figure 2). While several common fauna species are likely to occur within the Cardinia Road Employment Precinct, no other significant fauna species are likely to regularly use habitats with the study area due to a lack of suitable habitat for such species.

Several artificial waterbodies within the local area are occupied by this species, with a concentration of records within the Cardinia Road Employment Precinct. The metapopulation in Officer and Pakenham (including the occupied waterbodies within the study area) is considered to be of national conservation significance (Timewell 2003; Organ 2004; Organ 2005; Hamer and Organ 2006a) (Figure 2). Ongoing monitoring of populations within the study area and primarily throughout the Cardinia Road Employment Precinct has continued over the 2007/08 breeding period. Preliminary results reveal that populations are declining throughout the study area.

One key breeding site for Growling Grass Frog adjacent to the study area is a large dam directly east of Toomuc Creek, and south of the Pakenham Bypass. It is likely that this species uses Toomuc and Gum Scrub Creeks and the Cardinia Road Open Drain as dispersal routes through the Cardinia Road Employment Precinct. Growling Grass Frog is known to successfully use created habitat in urban areas, such as within the nearby Pakenham Estate and in other areas around Melbourne (e.g. Caroline Springs). However, ongoing management of habitats including the removal of predatory fish (e.g. Plague Minnow *Gambusia holbrooki*), protection of vegetation cover, maintenance of water levels and water quality, together with habitat connectivity throughout the study area are important to ensure that the population persists in the future.

Detailed information relating to the population dynamics of the local Growling Grass Frog population, including the population in the study area, is discussed in detail in Hamer and Organ (2006b).

Development within the study area has the potential to impact on the structure and connectivity of Growling Grass Frog habitat. Providing buffers and maintaining the linkages within existing habitat such as Toomuc Creek, Gum Scrub Creek, and artificial waterbodies is crucial in maintaining the viability of Growling Grass Frog populations.

Where disturbance to, or removal of habitat is unavoidable, it is recommended that survey be undertaken prior to, and during development. Where direct impact to occupied habitat is unavoidable, then salvage and translocation of individuals occupying this habitat may be necessary.

As part of the future development of the study area several habitat improvement works are proposed for Growling Grass Frog along the Gum Scrub Creek, Cardinia Road Drain/drainage line, and in other appropriate areas (Ecology Partners Pty. Ltd. 2008).

2.2.2 Weeds

Remnant native vegetation within the study area is under constant threat from weed encroachment. Weeds often out-compete and exclude native vegetation, leading to the deterioration in flora and fauna habitats, and may result in a decline in soil quality and structure. Declared noxious weeds in Victoria are plants proclaimed under the *Catchment and Land Protection Act 1994* (CALP Act) because they cause environmental or economic harm, or have the potential to cause such harm. There are four categories of noxious weeds defined under the Act:

- State Prohibited (S).
- Regionally Prohibited (P).
- Regionally Controlled (C).
- Restricted (R).

Regionally Prohibited Weeds (P)

In general Regionally Prohibited Weeds are not widely distributed in a Region but are capable of spreading further and they must be managed to eradicate them from the Region. Land owners and managers, including public authorities responsible for the management of Crown lands, are responsible for control of these weeds on their lands.

Regionally Controlled Weeds (C)

These weeds are usually widespread and are considered important in a particular region. To prevent their spread, continuing control measures are required. Landowners have the responsibility to take all reasonable steps to control and prevent the spread of these weeds on their land and the roadsides that adjoin their land.

The National Weeds Strategy Executive Committee was established in 1997, which concluded that the greatest impact from weed problems within Australia was related to the effect and spread of specific individual species. On this basis, they developed a list of weeds of national significance (WONS).

Weeds of National Significance (WONS)

The determination of Weeds of National Significance (WONS) is the first attempt to prioritise weeds over a range of land uses at the national level. WONS are those weeds that have been identified as already causing significant environmental damage and must be eradicated.

The study area currently contains four WONS (Blackberry, Gorse and Bridal Creeper) and several other undesirable weed species (Table 1).

Table 1. Priority weeds known to occur within the study area.

Common Name	Scientific Name	Current threat level	Extent of infestation
Blackberry (WON)	<i>Rubus fruticosus</i> spp. agg.	High	Low
Willow (WON)	<i>Salix</i> spp.	High	Low
Bridal Creeper (WON)	<i>Asparagus asparagoides</i>	Moderate	Low
Gorse (WON)	<i>Ulex europaeus</i>	High	Low
Spear Thistle (C)	<i>Cirsium vulgare</i>	High	Low
Onion Weed	<i>Romulea rosea</i>	Moderate	Low
Common Sow-thistle	<i>Sonchus oleraceus</i>	Moderate	Low
Wild oat	<i>Avena fatua</i>	Moderate	Low
Capeweed	<i>Arctotheca calendula</i>	High	Low
Flax-leaf Broom (C)	<i>Genista linifolia</i>	High	Low
Montpellier Broom (C)	<i>Genista mospessulana</i>	High	Low

Threat level: High – rapidly spreading species with the potential for high ecological impacts.
Moderate – moderately spreading species with the potential for high ecological impacts.
Low – slow spreading species with the potential for high ecological impacts on ecological values.

Infestation level: High – weed infestation over large areas across the site.
Moderate – weed infestation over moderate areas on the site.
Low – localised weed infestation across the site.

2.3 Specific Actions

The following management actions and performance measures are detailed below to protect and enhance remnant native vegetation within the study area, and to ensure the long-term functionality of the site in the future.

2.3.1 Access control

Ensuring appropriate access and usage of designated conservation areas is important to minimise impact to flora values and fauna habitat. As such, activities incompatible with nature conservation should be restricted within the areas of ecological values within the study area.

The strategic placement of fencing around patches of retained remnant native vegetation is one of the most significant requirements for managing areas of native vegetation within the study area.

Several important habitat resources occur within the study area and these should also be protected and, where possible, enhanced. For example, ground material such as logs and other suitable ground debris should not be removed as they provide refuge habitat for small ground dwelling fauna.

Actions

- Ensure that areas of remnant native vegetation and other retained areas of ecological value (i.e. farm dams) are adequately fenced;
- Regularly monitor fence condition and immediately repair any gaps/holes; and,
- Where possible, ensure that important fauna habitats are provided and enhanced as part of the future development within the Precinct.

Performance Measures

- Fences should be constructed with minimal impact to remnant native vegetation within the study area (i.e. no soil/material stock piling);
- Access should be controlled and vehicles should be prohibited or limited from entering areas of ecological value during fence construction;
- There should be no excessive pedestrian trampling or the creation of new disturbance through areas of remnant vegetation;
- There should be no soil disturbance/compaction from any vehicle/machinery movement within remnant vegetation or around the root zone of remnant trees; and,
- There is minimal disturbance to important fauna habitats within the study area.

2.3.2 Litter and hard rubbish management

Industrial subdivisions are notorious for their generation of litter and the subsequent illegal dumping of hard rubbish which impact open space, wildlife, conservation reserves and waterways. The following management actions should be adopted within these areas:

Actions

- Erect fences around areas of ecological values (i.e. remnant native vegetation along Lecky Road) prior to any disturbance;
- Limit vehicle access throughout the study area to reduce dumping of hard rubbish into retained areas;
- Erect signs around the site stating fines will be allocated if hard rubbish is dumped within the development area; and,
- Regularly monitor areas within the precinct for litter and hard rubbish and remove as soon as possible.

Performance Measures

- Fences should be constructed with minimal impact to remnant native vegetation within the study area (i.e. no soil/material stock piling);
- Litter levels should be kept low within the study area; and,
- There should be no hard rubbish dumped throughout the study area.

2.3.3 Pest plant control

The control of pest plants is a major requirement for management, as the study area is under continual pressure from weeds invasion (e.g. Blackberry). In order to control and/or eradicate these weed species, particularly in and adjacent to areas of remnant native vegetation, several on-going techniques can be used (e.g. herbicide application). However, with any weed control works it is important to establish a cover of native species as soon as possible to occupy the newly vacated environment. While native species will naturally recolonise such areas, so will exotic species, if weed seed is present.

A list of priority weeds that require control within the study area, and their current level of threat are listed in Table 1. Several management techniques are recommended to control weeds, including physical removal, brush cutting and herbicide application. In the majority of cases, herbicide should only be applied to weeds by using the spot-spraying technique, to prevent off-target issues. Weed control works should seek to eliminate all WONS and at a minimum control all other weed species, particularly high and moderate threat species in Table 1.

Herbicides are currently proposed to be used to eradicate thistle species and other broad-leaved weeds, particularly during spring and summer. It is important to ensure that weed control works using herbicides are both targeted (i.e. spot spraying) and undertaken at the right time of the year, as this can also reduce the requirement for future weed control works.

The following general guidelines should be taken as basic management principles in regards to weed control:

- Any weed control should be done in a manner that minimises soil disturbance;
- Herbicide use immediately adjacent to waterbodies should be minimised to avoid adverse effects on frogs and invertebrates. Where herbicide application is necessary, waterway sensitive products such as Roundup Biactive®, Weedmaster Duo® or Weedmaster 360® should be employed, without the addition of surfactant;
- Where herbicides are used, selective application is preferable to broad area application;
- Non-residual herbicides are generally preferable to residual herbicides;

- Pest plants that reproduce sexually (by seed) are best controlled before seed ripens; and,
- Weed control works should be monitored regularly to assess their effectiveness, perform follow up works and evaluate the feasibility of management objective.

Actions

- Undertake weed control prior to the weeds setting seed or spreading vegetatively;
- Eliminate State prohibited weeds, WONS and other woody weeds;
- Control all other weed to manageable levels;
- Co-ordinate weed control works with the appropriate grazing regime; and,
- Monitor for the occurrence of new weeds or the further spread of current weeds in areas proposed to be retained.

Performance Measures

- State prohibited weeds, WONS and other woody weeds are eliminated;
- Weed-cover is reduced to less than 25%.
- No new significant weed invasions occur in the study area;
- Weed control undertaken regularly and effectively by experienced personnel;
- No detrimental effects on the native vegetation as a consequence of weed management activities (i.e. inappropriate herbicide use);
- Weed levels reduced to manageable amounts; and,
- There is persistence and expansion of indigenous species populations.

2.3.4 Growling Grass Frog Monitoring

Monitoring is required to assess the influence of management actions on Growling Grass Frog and other ecological values and to implement change if required. As baseline data already exists for Growling Grass Frog populations, it is important to conduct on-going monitoring and reporting. A detailed Conservation Management Plan for the species is currently being prepared (Ecology Partners Pty. Ltd. in prep.)

Monitoring should be undertaken by qualified ecologists and include, but not be limited to the following:

- Assessment of habitat variables such as depth, flow and water quality, and biotic characteristics such as vegetation diversity, structure, composition and percentage cover at sites of known and potential habitat.
- Nocturnal surveys comprising quiet listening at each waterbody and imitation of calls to elicit a response from any adult males residing within the waterbodies. Hand-held spotlights should then be used to search for frogs on banks, on floating vegetation and in areas of emergent vegetation. Surrounding terrestrial habitat within 10 metres of waterbodies should also be inspected.
- To uniquely identify individuals, a Passive Integrated Transponder microchip (PIT tags) (Trovan Ltd., UK) may be inserted into unmarked individuals if their snout-vent length (SVL) exceeds 40 millimetres, following the methodology of Christy (1996). This allows all specimens recaptured to be identified using an electronic tag reader.
- All frog species detected and their locations should be recorded during surveys.

Actions

- Undertake monitoring of habitat as above; and,
- Prepare a brief annual monitoring report.

Performance Measures

- The maintenance or expansion of Growling Grass Frog populations (i.e. an increase in site occupancy and overall populations sizes);
- The maintenance of retained and created wetlands within the Precinct;
- The provision of adequate connection between waterbodies within the outside of the Precinct; and,
- Production of annual monitoring reports.

1.4.6. Translocation

In the event that Growling Grass Frogs are discovered in areas proposed for development, it will be necessary to translocate the individuals to nearby suitable habitat.

A suitably experienced ecologist will be required to survey areas planned for development prior to and during works in order to maximise the salvage of Growling Grass Frog Individuals.

Actions

- Undertake monitoring of in areas proposed to be retained within the study area;
- Monitor Growling Grass Frog habitat during works;
- Tag and translocate any Growling Grass Frog individuals at wetlands proposed to be removed; and,
- Prepare a brief report outlining the results of monitoring and translocation prior to and during works.

Performance Measures

- The maintenance or expansion of Growling Grass Frog populations and associated habitats;
- Site occupancy, successful breeding, and recruitment maintained and ideally increased;
- The maintenance of habitat conditions at retained and created waterbodies, and maintenance of habitat connectivity; and,
- Production of annual monitoring reports.

2.3.5 Wetland Design and Habitat Enhancement for Growling Grass Frog

Previous research on Growling Grass Frog has shown that a landscape-based approach to habitat creation and management is required (Robertson et al. 2002; Hamer *et al.* 2002). For example, the likelihood of the species occupying a waterbody is largely dependent on the distance to a nearby occupied site. Therefore, it is recommended to create habitat close (i.e. within 500 metres) of the existing population in the far south-east corner of the study area, to augment the current extent of habitat for Growling Grass Frog. Key design requirements to be incorporated into wetland creation should follow the recommendations of Organ (2005a, 2005c), which outlined design features for created wetlands to mitigate the impact of the proposed Pakenham Bypass. The ‘Constructed Wetland Systems Design Guidelines for Developers’ (Melbourne Water 2002), should be referred to during all phases of wetland design and construction. A summary of key design requirements for created wetlands for Growling Grass Frog in the study area includes:

- Where possible, wetlands should be located within 200-300 metres of currently occupied sites and at any underpass and culvert entrances where roads are proposed to be constructed;
- Where possible, wetlands should be greater than 400 square metres in size (e.g. 30 metres x 20 metres);
- There should be provision of a range of edge habitats;

- Wetlands should have low water turbidity, be still, have low nitrate and phosphate, and salinity levels;
- Wetlands should be surrounded by a terrestrial buffer in which there is no development, mowing, slashing or use of herbicides and pesticides, but which may be landscaped with indigenous grasses, herbaceous species and low shrubby vegetation (but no trees);
- Wetlands should have permanent water levels between 0.5 metres and 2 metres in depth;
- There should be inclusion of rock piles, rock matrices and large woody debris around wetlands;
- Wetlands should be planted with a dense cover and diversity of emergent, submerged and floating vegetation;
- Access tracks, roads, houses and other infrastructure should not be located near created wetlands, and there should be no apparent barriers to dispersal;
- Wetlands should be kept free of predatory fish such as Plague Minnow and non-native fish such as Redfin;
- Cattle grazing should be discouraged around existing and created wetlands, and movement corridors, particularly within the riparian zone of Gum Scrub Creek and any areas conserved adjacent to the creek;
- Several smaller ephemeral wetlands should be created around the larger permanent wetland that provide additional habitat that is more likely to remain fish-free, because it will dry out during periods of extended dry; and,
- Small ponds and depressions should be constructed between created wetlands, and between created wetlands and potential dispersal corridors such as Gum Scrub Creek, preferably along drainage lines, to act as smaller movement corridors in the study area.
- If fencing is necessary as a safety requirement standard farm or garden fencing such as Stocklock® should be utilised.

Created wetlands should be not used for recreational purposes and should not be stocked with fish for sporting or other purposes. The suitability of vegetation for Growling Grass Frog should be determined and supplementary plantings undertaken by a qualified wetland practitioner. Undesirable weeds or aquatic vegetation that is choking the wetland (e.g. *Typha* sp.) should be removed preferably by physical removal, although frog-sensitive herbicides such as Roundup Bi-active may be used where this is not possible or not feasible. Damage to aquatic vegetation immediately after planting in newly created wetlands by waterfowl may be prevented by protective netting.

Wetlands should be pumped dry if predatory fish invade, although the implications of draining on tadpoles and frogs in the wetland needs to be considered prior to any drainage activities.

Actions

- Undertake construction of habitat as per above specifications; and,
- Undertake regular inspections of newly constructed wetlands.

Performance Measures

- The occurrence of Growling Grass Frog within instated wetlands, and;
- The maintenance or expansion of Growling Grass Frog populations throughout the site.

2.3.6 Timetable of works

To achieve the greatest conservation benefit for the study area all aspects of the Biodiversity Management Plan, including pest animal and plant control, need to be implemented in a co-ordinated fashion. For more detailed explanation of the actions below refer to each section above. The following briefly sets out a timeframe in order to achieve this. This plan should be reviewed after five years.

Access: Construct fences to reduce inappropriate vehicle and pedestrian access. Inform all contractors requiring access to the site of the importance of keeping within defined areas. Regularly check integrity of fencing throughout the life of the management.

Monitoring: Regularly monitor composition and trends of Growling Grass Frog populations to assess management effectiveness and guide future management actions. Monitoring should occur each year and a brief report prepared annually.

Pest Plant Control: Herbaceous weed control to be undertaken regularly throughout the year using spot spraying technique. Focus on elimination of high threat herbaceous and woody weeds such as Blackberry, Gorse and Broom.

Annual Works Plan: Prepare a detailed Annual Works Plan, which considers all management actions above, including, Access, Monitoring, Pest Plant Control and Pest Animal Control.

2.3.7 Timeframe, priority setting and performance criteria

Personnel who are involved with this work will need to prioritise management activities at specific sites, depending upon available resources, with important management actions to be undertaken in the immediate to short-term, such as fencing, control and elimination of high threat weeds while other important actions, such as pest animal control would be undertaken over both the short and long-term. The plan will be implemented over a number years (i.e. 1 – 10).

Urgent or high priority ecological management actions would concentrate on areas supporting higher ecological values such as Growling Grass Frog habitat.

Recommendations provided above need to be revised dependent on the results of management, new management techniques or relevant information becoming available. A detailed Conservation Management Plan for the species is currently being developed (Ecology Partners Pty. Ltd. in prep.).

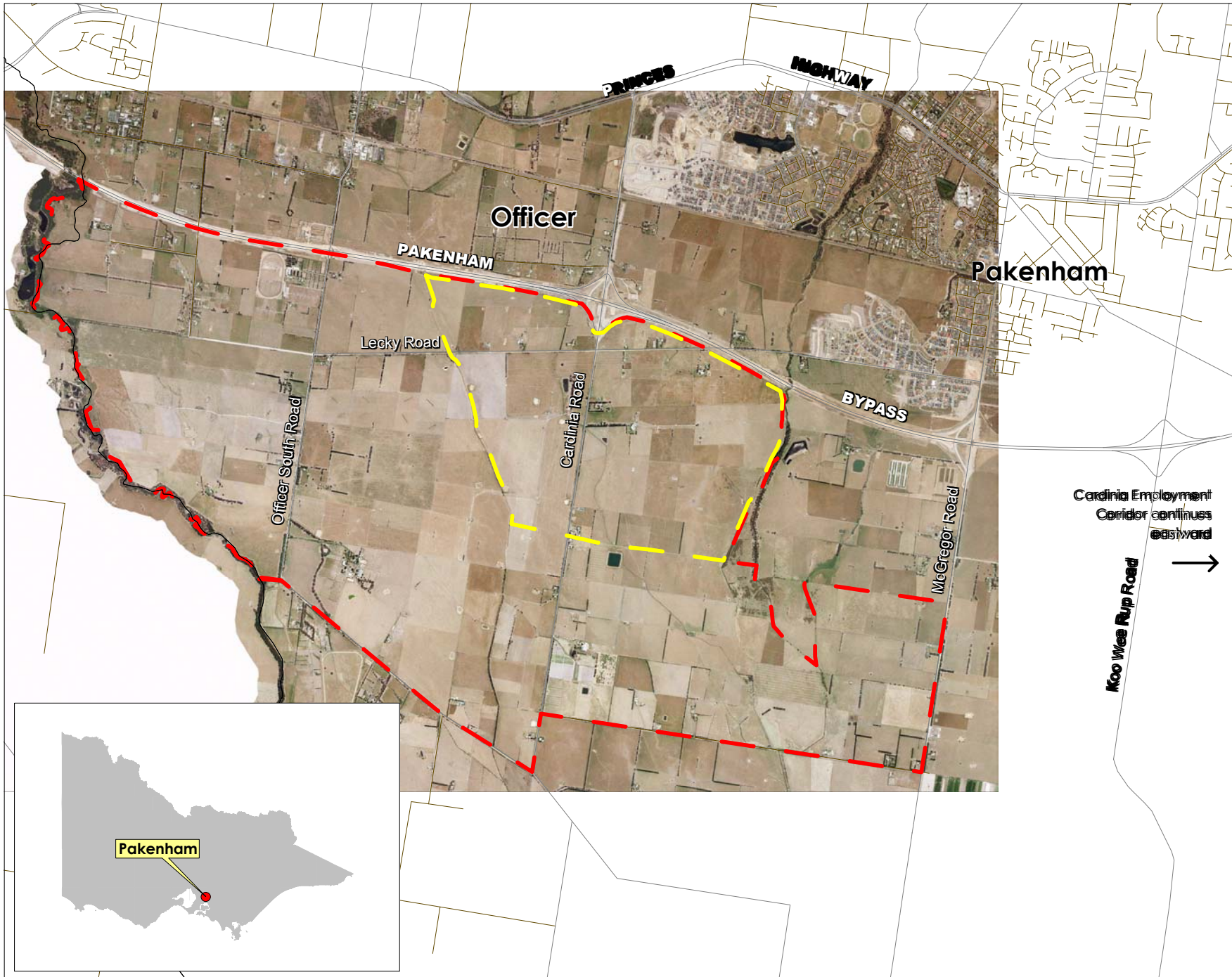
Regular monitoring of results and alterations in management actions should also be undertaken. Performance measures have also been provided so that the personnel can measure the success of management actions in the long-term.

2.3.8 Responsibility

During construction works the contractor shall be responsible for the protection of ecological assets and the control of litter and hard rubbish.

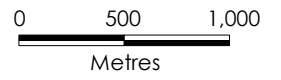
The various developers within the Precinct will be responsible for the implementation of the plan during the construction stages of the development. Cardinia Shire Council will be responsible for the control of weeds within the developed area and the long-term protection of flora and fauna values after a statement of compliance has been issued for the various stages of the development.

FIGURES



Western portion of Cardinia Employment Corridor (Ecology Partners 2008)

Study area - Cardinia Road Employment Precinct

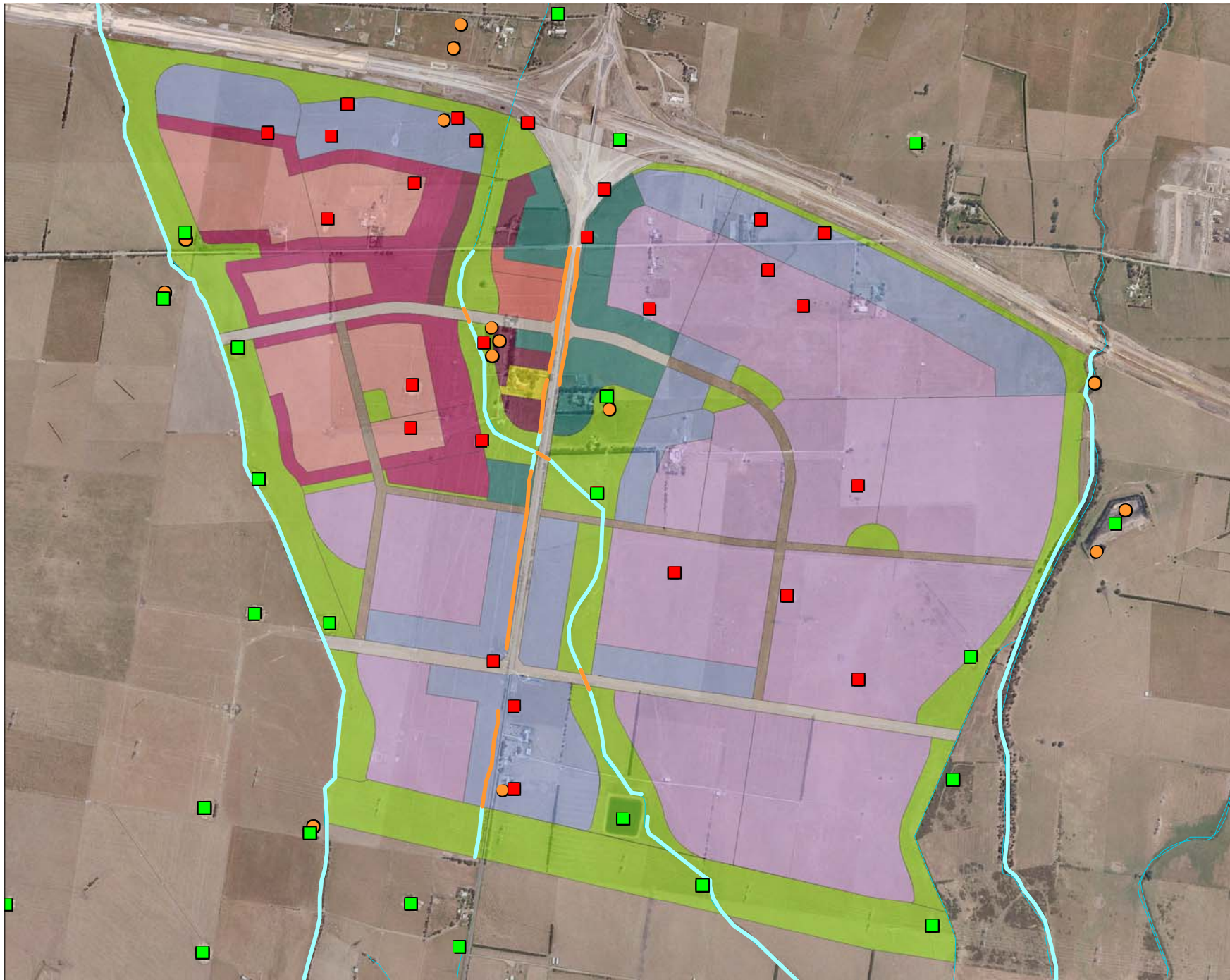


Cardinia Employment Corridor continues eastward



Figure 1
Location of study area





Growing Grass Frog habitat

- Existing waterbody (farm dam) retained
- Existing waterbody (farm dam) removed
- Creek/Drainage line removed
- Creek/Drainage line retained

Previous Growing Grass Frog records

- Record
- Areas of retention (Open space)

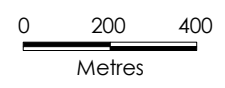


Figure 2
Development plan and
Growing Grass Frog habitat

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