

Victorian National Parks Association

Planning for Nature Conservation in Melbourne's Newest
Sustainable Communities - Submission, July 2009



VNPA Final Submission to the:

- Urban Growth Boundary / Protected Areas
- Outer Metropolitan Ring / E6 Transport Corridor
- Western Grasslands Reserves
- Biodiversity Impact Assessment Report Environment Protection and Biodiversity Conservation Act, 1999.



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The Victorian National Parks Association is dedicated to the protection of Victoria's unique natural environment and its biodiversity. For more information contact,
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1.0.0 Overview/ Summary

1.1.0 Structure of this submission

Our submission is structured around four key chapters:

1.0 Overview /Summary

2.0 Strategic Assessment Process and institutional issues

3.0 Conservation priorities in Growth Areas (includes Reserve Design & E6)

4.0 Recommendations for communities and species

Much of the site-specific information was collected with the help of local conservation groups, experts and other interested people. The growth area summaries should be read in conjunction with local community and regional group submissions and specific sites should be considered as recommendations. General recommendations are listed in each section and summarised at the end of this section.

1.2.0 Overview

With almost 8,000 hectares of critically endangered native grassland and grassy woodland proposed to be cleared under this urban expansion, the conservation stakes are very high.

We welcome the government's commitment to 15,000 ha of new grassland reserves and support the idea of a strategic approach, but we have a range of issues concerning proposed areas to be cleared, the process undertaken, and the prescriptions and plans proposed for the protection of threatened species.

The Victorian National Parks Association has four key areas of concern:

1. **A rushed process sets a poor precedent for Federal assessment**
2. **New reserves plan needs clarity**
3. **Better protection of high value sites needed within new growth areas**
4. **E6 Transport Corridor needs to be re-aligned.**

Detailed comment is also included on proposed prescriptions, and recommendations for additional national prescriptions on significant species and communities.

1) **A rushed process sets a poor precedent for Federal assessment**

In theory there is value in a Strategic Impact Assessment approach. However, this is undermined by a rushed process, with only 30 days allowed to comment, and gaps in the underlying ecological information. Decisions made as a result of this process will stand for decades and affect future generations.

Environment groups have written to the Federal Minister Peter Garrett and State Ministers Gavin Jennings and Justin Madden, requesting a significant extension to the process and highlighting four areas of concern:

- There is no further opportunity for community comment.
- Delays in receiving background information have undermined the process.
- The assessment is based on poor data. There is an urgent need for further ecological surveys in spring and summer.

The nature of the process set a poor precedent for the use of Federal Strategic Assessments under the Environmental Protection and Biodiversity Conservation (EPBC) Act. This is by far the largest and most complex strategic assessment undertaken to date in Australia, and it will test the credibility of the Federal government's key piece of environment legislation. See chapter 2.0 for more detail.

2) New reserves plan needs clarity

The proposal for 15,000 ha of new grassland reserves (on private land) west of Melbourne is great news and shows some foresight on behalf of the government. It will, however, be challenging to deliver over 10-20 years and numerous election cycles. There is also concern that the offsets or trade-offs between what is to be lost and what is to be protected do not add up in line with existing State Government offset policies. The reserve plan needs greater detail, particularly in relation to governance, purchasing and management, to ensure that a permanent and satisfactory outcome can be delivered. Issues and constraints include:

- Reserves need to be delivered within five years (one election cycle).
- Reserves need to be purchased upfront and established before clearing within the growth areas commences.
- Money (estimated \$200 - \$300 million +) needs to be raised with a mix of government money, developer levies and offset payments for clearing from developers.
- The proposed reserves need a high level of protection, with core areas reserved as national park and other areas as part of the protected areas network (which can include private land). Wider landscape protection needs addressing via funding for conservation covenants (delivered through market-based tools such as BushBroker) across the Volcanic Plains, and as a potential transitional measure for private landholders unwilling to sell in the short term to the proposed grassland reserve areas.
- There should be some key additions to proposed park area to connect and link the parks and add further high value areas. (See Wyndham Growth Area section and section 3.6.2)
- E6 Transport corridor needs slight re-alignment to allow better reserve design (see section 3.6.1)
- Funding needs to be managed via an independent trust at arm's length from government to ensure that the significant funds required are used for conservation and not re-directed at a later date if there is a change of government.

3) Better protection for high values sites within new growth areas

There are five growth areas, each with some high-value grassland and biodiversity sites which require better protection and recognition in the plan. Forty-two sites and key habitat links which need protection have been identified within the proposed urban growth areas.

The following is a summary of the key growth areas:

- **Whittlesea (Upper Merri) Growth Area.** – At least nine key areas have been identified as needing greater protection. There are no commitments for new reserves proposed in the north, which has more grassy woodland than the west. Underlying ecological information is poor and needs to be redone with targeted surveys over the coming spring. Up to 40-50% of high-value remnant areas could be destroyed, based on criteria in the Impact Assessment Report. (See Whittlesea (Upper Merri) brief for more detail)
- **Melton-Caroline Springs growth areas** – Seven areas of conservation significance, including the Boral Quarry site, have been identified as needing additional protection through inclusion in a Kororoit Creek Regional Park and realignment of the E6 transport corridor (see Melton-Caroline Spring section for more detail).
- **Wyndham Growth Area** – Seven key areas have been identified, including three high priority sites and three habitat links, as well as a realignment of the E6 Transport corridor (Outer Metropolitan ring road) to allow for the inclusion of high conservation significance sites to be avoided (see Wyndham section for more detail).
- **Sunbury Growth Area** – Twelve significant areas have been identified, with five high-value sites, including a significant expansion of the existing Holden Flora and Fauna Reserve and

seven habitat links to allow species to move when pressured with urban development (see Sunbury section for more detail).

- **South East Growth Area** – Seven areas including two key high conservation areas, and five habitat corridors, have been identified as requiring recognition and protection to safeguard the endangered Southern Brown Bandicoot and vulnerable Growling Grass Frog (see South East section for more detail).

4) E6 Transport Corridor (Outer Metro Ring Road) & revised grassland reserve design

The proposed alignment of the transport corridor cuts through a number of sites of high conservation significance. There has been no detailed on-ground assessment of the alignment. If it was moved slightly to the east, it would avoid these high conservation areas and allow for a greater consolidation of the remnant grassland areas in the proposed parks system (for more information see section 3.6.0).

1.3.0 Summary of General Recommendations

Recommendation:

- a) *That the period for consultation for the Strategic Impact Assessment be **significantly extended**. The extended timeline should:*
 - a. *Facilitate the detailed field assessment of ecological values, much of which would need to occur in spring and early summer.*
 - b. *Allow for additional studies required to address ecological communities listed for nomination under the EPBC Act 1999.*
 - c. *Allow for adequate time for the community and experts to comment on any new data, as well as existing data.*
- b) *That the Memorandum of Understanding between the State and Commonwealth be **altered** to include further opportunities for consultation with the community.*

Recommendation: *That a transparent and detailed reserve design plan be developed which demonstrates in detail the gains to be achieved in any of the offsets and includes a detailed implementation timetable developed to ensure that biodiversity protection gains are in place before any clearing occurs.*

Recommendation: *The detailed reserve design and implementation plan should include the following elements:*

- *Priority criteria and prescriptive formula for every hectare of habitat cleared;*
- *No clearing should be allowed until new reserves are in place.*
- *National parks status*
- *Lines on maps are not enough, upfront funding is required.*
- *New parks should be delivered within five years.*
- *Upfront Funding.*

Recommendation: *If market based instruments or stewardship schemes (such as Bush Broker) are used to offset grassland loss they should require legally binding permanent protection agreements, instead of short term contracts.*

Recommendations:

a) *High conservation value sites should be retained within the UGB, particularly if they have multiple values and can be logically managed as part of the urban conservation network. Key criteria for retention of sites include:*

- *species richness*
- *intactness/condition*
- *landscape context and connectivity, as part of a habitat corridor*

- extent of occurrence of key species, e.g Nationally and State significant species
- irreplaceability
- reserve design and management opportunities.
-

b) *The proposed prescriptions for grasslands and key species are not in line with current science or policy for the protection of biodiversity and national threatened species and communities, and need to be revised to allow key high-value sites within the urban growth boundary to be retained as part of the 'urban conservation network'.*

c) *With additional surveys, high priority sites should be incorporated into a enforceable 'ecological' structure plan which outlines an urban conservation network for the growth areas.*

Recommendation: *Enforceable management guidelines and management plans should be developed for all statutory authorities, local government and other utility operators with responsibility for significant grassland remnant patches in line with relevant EPBC Policy and Recovery Plans.*

Recommendation: *Grassland protection design guidelines should be developed for developers and responsible authorities for managing urban and peri-urban grassland remnant patches, in line with relevant EPBC Policy and Recovery Plans. These should be supported by initial seed funding by government, to enhance implementation and assist in long-term management of remnant sites.*

Recommendation: *That precinct planning and the Biodiversity Precinct Planning Kit, be reviewed and modified to incorporate grassland protection guidelines and design principles to allow the retention of high conservation patches of grassland and associated ecosystems as part of the public open space network.*

Recommendation: *Forty-two high conservation values sites and key habitat links across the five growth areas have been identified which need additional survey in spring and summer to allow retention and protection as part of urban conservation network (see Section 3.0 for detail)*

Recommendation: *That the Outer Metropolitan Ring Road be realigned to avoid high conservation significance grassland, wetlands and associated ecosystems and a detailed on-ground fauna and flora assessment be undertaken before any final alignment is decided.*

Recommendation: *The proposed Western Grassland reserves should be reconfigured to include:*

- *Addition of blocks south of Greigs Road to Grassland reserve*
- *Link the two reserves along Werribee River via Cobbledicks Road Block*
- *New alignment of E6 to protect important blocks to the west of Sewells Road, and to the east and west of Mt Atkins Road.*
- *The large wetland to the east of the proposed current areas has been overgrazed but would recover well with limited management. This should be added to the reserve.*
- *A significant block containing good quality grassland and a variety of important habitats, between the current proposed reserve and Geelong Road, should be added to the reserve.*

Recommendation: *That all high conservation significant priority locations be retained and that there be specific prescriptions developed for all ecosystems and species of national significance in line with Significant Impact Guidelines and best available ecological advice where guidelines do not exist, including, but not limited to:*

- *Protecting all waterways with a minimum of 200m buffers on each side of waterways*
- *Protecting all wetlands with minimum buffers as prescribed by Birds Australia (2009)*
- *Protecting all grassy woodland remnants; allow 100m buffers and optimise links.*

Recommendation: *That a more detailed 'ecological structure plan' be developed based on detailed on-ground surveys to proceed and inform any precinct structure plans*

2.0 Strategic Assessment Process and institutional issues

2.1.0 EPBC Strategic Assessment Process and timing

The VNPA has a number of concerns about the timing of the assessment and the comprehensiveness of the underlying ecological information. We believe that the timelines associated with the process are unreasonably short, especially considering the complex nature of the information, the importance of the process and the potential impacts of the decisions that will follow. There are four key concerns supporting the need for an extension or modification of the assessment process. These are:

1. **The Melbourne Strategic Impact Assessment is rushed.** There is clear discretion to extend the timelines – 28 days is the statutory minimum, not the norm. In fact other strategic assessments, none as large or as complex as the Melbourne one, have been done over years, not weeks, and have included a range of opportunities for community input. We have no direct experience with other Strategic Impact Assessments but understand that they are viewed as an approach that has merit when undertaken with due care and process. We are concerned that the process and timelines adopted for the Melbourne assessment will undermine the integrity of the approach.
2. **There is no further opportunity to comment.** Once submissions have been made on the draft, there is no opportunity to make additional comments on final proposals even if there have been significant changes.
3. **Significant delays in receiving the background information.** Many community groups have not received all the background papers and have had only 2-3 weeks to respond, which included two weeks of school holidays when many people have family care duties or take leave.
4. **The need for more biodiversity surveys and information collection in spring and summer.** Spring is just around the corner; it is a key time for grassland monitoring, and the only time for monitoring some of the key species such as Golden Sun Moth and Growling Grass Frog, which are only observable in spring and summer.

In our view, the additional time required would significantly improve the information base to allow proper assessment of the ecological impacts and mitigation measures proposed. It would also make the proposed Melbourne Strategic Assessment consistent with previous assessments.

These concerns are explored in detail below:

2.1.1 The Melbourne Strategic Impact Assessment is rushed

The use of the Strategic Impact Assessment provisions of the EPBC Act will potentially give the State and property developers an umbrella environmental approval for the next 20 years to clear significant native vegetation and habitat, without additional assessment, even if new information or knowledge arises or occurs. This means that the initial process should be undertaken with the highest level of integrity. The resulting decisions should be based on good quality data which is fit for the purpose.

The community should also be given sufficient time and opportunity for comment. Should Melbourne's Urban Growth Boundary be expanded as proposed, we are set to potentially lose significant amounts of Critically Endangered grassland areas, which equate to significant tracts of habitat for Nationally and State threatened species. In this context, we are very keen to see that the right decision-making process is being undertaken. On the basis of our preliminary assessment of the Strategic Impact Assessment process and resulting documents, we are not convinced that this is the case.

Two previous EPBC Strategic Impact Assessments have been commissioned: one in the Kimberly in Western Australia (started in February 2008) to look at the Natural Gas hub, and the other for urban

development for Molonglo in the ACT. Neither assessment has been completed and neither is at the scale and complexity proposed for Melbourne. Both these previous assessments have taken years, not weeks as for Melbourne.

Furthermore, these two previous assessments have had consultation periods on both the draft terms of reference and Strategic Impact Assessment reports. For the Melbourne Strategic Impact Assessment, there was no public consultation period on the terms of reference. An initial Memorandum of Understanding (MOU) was developed without consultation and signed between Commonwealth and State on 4 March 2009. Subsequently this MOU was re-written and signed on 16 June 2009, over three months later, again with no consultation. The renegotiation of the MOU was yet another opportunity for consultation that was not taken up.

The MOU was signed between the Commonwealth and the Victorian State Government to undertake a strategic assessment under Section 146(1) of the EPBC Act, 1999. The MOU sets out the following process:

- Consultation on Draft Report, 17 June –17 July 2009.
- Revise all Public Submissions and Final Report, Close of Business 14 August 2009.
- The final report consists of
 - (i) the amended draft report, and/or
 - (ii) a supplementary report
 - (iii) comments on how public responses have been taken into account

The timelines are ridiculously tight, with only four weeks between the closing of submissions and final lodgement. The process allows little time if further information is required or community views are given proper consideration, and gives a strong impression of a foregone conclusion.

The EPBC Act 1999 stipulates that the Strategic Impact Assessment report be exhibited for public comment for a period of at least 28 days. There is clearly discretion under the Act to allow for more than 28 days' consultation, as has been done in other cases.

We also note, based on legal advice, that there is nothing in the MOU between the State and Commonwealth which prevents an extension of the public consultation period, and that a variation to the agreement could be made subject to Clause 12 of the Agreement.

2.1.2 There is no further opportunity to comment

The State may make changes between the Draft Strategic Impact Assessment Report and the Final Report to be submitted to the Commonwealth on 14 August. Following the initial short submission period, there is no provision, other than directly through the political process, for the community and experts to comment on any revisions that will subsequently be submitted to the Commonwealth.

There should be substantial changes to some of the proposals to take ecological and community concerns into account. However, these changes cannot be assessed or commented on after the initial consultation period.

2.1.3 Delays in receiving the background information.

Many community groups and expert advisors did not receive all the background papers for some time, and then had only 2-3 weeks to respond. In Victoria, the public consultation phase included two weeks of school holidays when many people had family care duties or took leave. For example, three key regional organisations (Merri Creek Management Committee (MCMC), Western Region Environment Centre and Cardinia Environment Coalition) ordered copies of relevant reports and supporting technical documents on either 17 or 18 June. Neither group had received copies by 26 June, effectively reducing the time to consider and comment on documents by a further two weeks.

We have also had reports of people requesting documents being 'grilled' and questioned about their right to receive the documents if they were not an impacted landholder. Some were also told that a submission was not required unless their position had changed since the opportunity for comment via previous submissions on the location of the Urban Growth Boundary. Although this should be irrelevant, there was very little (in fact virtually no) information provided in earlier consultation on the UGB on ecological issues or impacts.

2.1.4 The need for more biodiversity surveys and information collection in spring and summer

The majority of the data which has informed the Strategic Impact Assessment was mainly sourced via a series of desktop studies. This includes both the consultants' reports and the Strategic Impact Assessment document itself. Very little on-ground assessment was conducted, and the majority of this was associated with ground-truthing native vegetation. Most of the field assessments were undertaken from mid to late summer and autumn. All consultants identified the need for targeted surveys, in the correct season, namely spring to early summer, especially of EPBC-listed species.

In view of the importance and lasting consequences of the outcomes of this process, we consider that the methods used and constraints to the studies have not resulted in good quality data, nor is it fit for purpose. Further detail is provided below.

Spring, just over a month away, is a key time for grassland monitoring, and the only time for monitoring some of the key species such as Golden Sun Moth, only observable in spring and early summer; Growling Grass Frog, which calls from September to December; and Southern Brown Bandicoot, which is most active in spring. An extension to the process, particularly to allow additional ground-truthing and monitoring, is critical if the ecological purposes of the Strategic Impact Assessment and the EPBC Act are to be fulfilled.

2.1.5 Limitations of the studies informing the Strategic Impact Assessment

A range of consultants were contracted by the Growth Areas Authority to provide advice on the constraints due to biodiversity values that should be applied to zones under consideration for development via the expansion of the Melbourne Urban Growth Boundary. The consultants each undertook an assessment of individual species of importance and native vegetation.

Limitations were identified to be associated with a few key areas, which included, but were not limited to:

1. Datasets and data provided by DSE (Native Vegetation and flora and fauna).
2. Lack of access, particularly to private land, for ground-truthing the presence, type and quality of native vegetation.
3. The timing of the assessments, potentially resulting in misleading results.
4. The incomplete alignment of DSE vegetation assessment methodology and classification with EPBC listed communities.

An additional limitation of the studies is associated with the fact that they did not consider on a case-by-case basis the ecological communities that are nominated for listing under the EPBC Act 1999. This should also be addressed prior to the development of the final report.

SMEC (2009) states that their assessment is '*a region-wide assessment and is not suitable for site specific or precinct based planning*'. They also state that '*it is apparent that some elements of the underlying data are deficient, inaccurate or old. In particular, the level of knowledge and survey effort for some threatened flora and fauna is very poor or highly restricted to a few surveys. Also, the timing of surveys and incidental observations may not correspond with ideal sampling periods; there may be limited survey effort in the area if it is extensively private land; and some species have naturally low detectability rates.*' They provide detailed information on the gaps associated with the study and recommendations for future work, and identify 25 areas that should be subject to supplementary field assessments.

Similarly, Biosis (2009) states that *'a full assessment of the ecological values of the Melton Desktop Area was not conducted.... However this assessment can be used to identify sites that require further field assessment to satisfy environmental legislation and policy requirements'*.

Birds Australia likewise highlights the incomplete nature of the studies. They comment: *'This should be viewed as an incomplete assessment, with the understanding that data is insufficient to meaningfully assess the importance of many areas.'* (Birds Australia 2009). They also *'... strongly encourage field surveys and further desk-top review to understand and limit possible impacts on birds'*

Native vegetation analysis was undertaken via three methods:

- using DSE's modelled native vegetation extent dataset
- aerial photograph interpretation
- ground truthing using a rapid qualitative assessment method across a small percentage (only 20% for the SMEC study) of each investigation area. Ground truthing was restricted to 'over the fence' assessments from public access points (largely roadsides) for private land, resulting in the majority of the investigation areas being poorly assessed.. In some cases, estimates applied to the extent of an entire property.

A number of the ecological consultants also commented on the limitations and the need for additional work on threatened flora and fauna, including: *'The assessment was conducted over a range of seasonal conditions which included both optimal and sub-optimal times for survey. As such the majority of seasonally visible species are likely to have been overlooked with a single site visit'*. and *'Seasonal surveys for threatened flora species should be conducted within relatively intact areas of native vegetation before any decisions are made as to their presence, absence or population size'* (Biosis 2009 p6)

In particular SMEC also identify that targeted flora and vegetation community assessment is recommended for almost all the sub-areas within the Investigation Area (Areas 2a, 2b - Sunbury/Jackson's Ck), 3a (most of upper Merri) and 3b, 3c and 3f). The report states: *'t is recommended that a survey is undertaken across the entire extent of Area x to identify areas of native vegetation (as defined by DSE) and to determine their quality (Habitat Hectares) based on DSE approved methods'* and: *'It is further recommended that targeted surveys be undertaken for the highly restricted Basalt Peppercross and Plump Swamp Wallaby-grass based on their known distribution and preferred habitat.'* (P.197)

2.1.6 No field assessment of E6 Transport Corridor

Further, there has been no on-ground assessment of the Outer Metropolitan Ring road and E6 Transport Corridor. A desktop assessment completed by Brett Lane & Associates Pty Ltd estimated the area of native vegetation to be cleared. The report itself notes: *"The current assessment was strictly limited to a desktop study and some threatened species may have been missed due to minimal previous research in some areas"* (p2). The consultants recommend that a broader 2km search area be undertaken and detailed field assessment carried out.

2.1.7 Targeted flora and fauna surveys required for critical species

As indicated above, the majority of the ecological consultants have highlighted the limitations associated with their assessment of potential impacts on threatened species, and recommend targeted flora and fauna surveys.

For example, SMEC, which surveyed areas to the north of Melbourne, and Biosis, which surveyed the west, highlight in their recommendations targeted fauna surveys for all sub-areas. Critical species include Golden Sun Moth, Growling Grass Frog, Brown Toadlet, Southern Toadlet, Striped Legless Lizard, Grassland Earless Dragon, Eastern Great Egret, Brown Quail, Diamond Firetail, Swift Parrot,

Azure Kingfisher, Plains Wanderer, Barking Owl, Fat-tailed Dunnart and Brush-tailed Phascogale (SMEC pp.201-208). Biosis (2009, p45), similarly recommends that targeted surveys be undertaken for all species of national and state significance in areas they identify as 'High Retention Areas' and in other 'Retention Areas' identified as containing likely habitat.

The only targeted surveys undertaken to inform the Strategic Impact Assessment were in the South-east expansion zone for the Southern Brown Bandicoot. In this case they were confined to motion-activated cameras at two locations and day-time survey (for a nocturnal animal). Survey for the Growling Grass Frog was also initially proposed for the South East, but the time of year, high temperatures and lack of access to private land ruled out this option (Practical Ecology, 2009).

Furthermore, the Strategic Impact Assessment Report identifies a number of species that require targeted survey (pp. 102-108). We strongly support the targeted survey and request that it be undertaken as part of the process of the Strategic Impact Assessment, not afterwards.

Timing is critical for further survey of flora and fauna species. It is widely acknowledged that spring and early summer are the best times for surveying grassland flora and many fauna species. Practical Ecology (2009, p. 11) states that more in-depth studies across the entire South East investigation area are required from September to December for Growling Grass Frog, and in spring for Southern Brown Bandicoot, using a wider variety of methods.

The EPBC Critically Endangered Golden Sun Moth is particularly prevalent in the grasslands to the north and west of Melbourne. Six years of study by the Merri Creek Management Committee have shown that Golden Sun Moth emergence times are erratic and seasonally dependent, the moths emerging mainly in early *summer* rather than spring. In 2005, a student studying Craigieburn grassland recorded 13 suitable dates for recording moth numbers between 12 November and 29 December. This would be the period when best results can be achieved, and attempting surveys outside optimum emergence periods risks false negative results.

Finally, many grassland flora and some fauna species are best and only observed in spring. The EPBC Policy Statement 3.8, Natural Temperate Grassland of the Victorian Volcanic Plain, for example, highlights the variable nature of grassland species: "*It can vary seasonally because many wildflowers only become visible during spring and early summer.... Therefore, any proper assessment should occur in spring and must occur more than 2 months since recent disturbance....*".

Recommendation:

- a) *That the period for consultation for the Strategic Impact Assessment be **significantly extended**. The extended timeline should:*
 - a. *Facilitate the detailed field assessment of ecological values, much of which would need to occur in spring and early summer.*
 - b. *Allow for additional studies required to address ecological communities listed for nomination under the EPBC Act 1999.*
 - c. *Allow for adequate time for the community and experts to comment on any new data, as well as existing data.*
- b) *That the Memorandum of Understanding between the State and Commonwealth be **altered** to include further opportunities for consultation with the community.*

2.2.0 Strategic Assessment Mitigation Strategy

The proposal for 15,000 ha of new grassland reserves is great news, but it is no excuse or substitute for the massive amount of native vegetation clearing proposed.

The integrity of the entire Strategic Impact Assessment Report has been undermined by the data on which it is based. Furthermore, it appears to be a biased assessment, predisposed to allow the clearing of 6,918 ha (3093 habitat hectares) of Natural Temperate Grasslands of the Victorian Volcanic Plain and 924 ha (275 habitat hectares) of Grassy Woodlands of the Victorian Volcanic Plain – a total of 7842 hectares.

The proposed reserves are on different soils and therefore have a significantly different floristic make-up compared with the grasslands within the proposed development areas. This means that grasslands within the Urban Growth Boundary (UGB) may not be directly comparable with those outside (see section 2.0 for more detail). There is also a need to refine the reserve proposed to link the two parks, and incorporate some additional areas of high value grassland (see section 3.2, Wyndham Growth Area, for detail)

Across the volcanic plains less than 30 000 hectares remain of Natural Temperate Grasslands of the Volcanic Plains. The proposed clearing of 8,000 ha is a significant portion (26%) of remaining native grassland habitat. The proposed new reserves may make up a significant proportion of remaining ecosystems, if they can be effectively delivered, but it is not clear that this does equate to a 'net gain' or even 'no net loss' of vegetation, unless significant management gains can be obtained in new reserves.

'Avoid': The Mitigation objective of 'Avoid' has been stated as having been met through locating the UGB and infrastructure to avoid the 'relevant matter for target'.

This may sound reasonable, but it does not actually address any steps that have been taken to avoid impacting upon the 'relevant community or species' within the proposed and existing UGB. Essentially, this should be the main focus of 'Avoid' but has not yet been addressed by the Strategic Impact Assessment. Furthermore, without actually addressing the whole question of how impacts will be avoided, there is no opportunity available to understand how 'Avoid' would be applied – if it was ever intended to be. This is not acceptable

'Minimise': The Mitigation Strategy to minimise impacts appears to rely almost exclusively on the Precinct Structure Planning Process. Prescriptions have then been developed to guide how this process would address Matters for Target. Deference to the Precinct Structure Planning Process is not an adequate substitute for a comprehensive higher level approach to minimise impacts. Precinct Planning will occur at a scale that is not appropriate to address the potential impacts of multiple occurrences of impact across the landscape.

'Offset': The Mitigation Strategy advises that it will offset any impacts largely by establishing the proposed Western Grassland Reserves. There is mention of the establishment of a grassy woodland reserve in the Sunbury area and another in the Whittlesea area, and of securing the Clarke's Road Grassland reserve. There is also mention of retaining some habitat following the cessation of quarrying activity in the South East.

There are no details for how any species offsets will be provided, nor details for any of the reserves and how they will meet the habitat requirements not only of individual species but of multiple species that have different requirements from the same vegetation/landscape mix. Essentially it has been made very difficult to comment on any of the offset proposals due to the scant detail provided, and this detail really should be considered insufficient.

There is no strict “net gain” assessment proposed in the Strategic Impact Assessment Report, so it is unclear if the level of clearing meets the State Government’s own Native Vegetation Framework. The report does document the proposed losses (7842 hectares, 3093 habitat hectares) but not the projected gains (in habitat hectares) from the proposed new reserves or other mitigation measures. There appears to be an over-emphasis on offsetting. The report clearly states that “offsetting is the primary way to mitigate impacts” (p. 3) as opposed to “avoidance, minimisation and then offsetting” which is required in the state’s Native Vegetation Framework.

Many of the prescriptions proposed for grassland in the proposed growth areas are designed to facilitate clearing rather than avoiding or retaining even the highest value areas. There appears to be no justifiable relationship with many of the prescriptions in either State or Federal biodiversity or conservation policy.

Many of the prescriptions outlined in the strategic assessment report depend on reserves being in place before clearing commences. For example, the prescription proposed in the Strategic Impact Assessment Report (page 139) claims that impacts on native grassland and Striped Legless Lizard habitat has already been avoided (assumed as part of the new grassland reserves). However, this is only the case if the reserves are secured prior to clearing commencing.

There needs to be a transparent and detailed reserve design plan developed which demonstrates in detail the gains to be achieved in any of the offsets, and includes a detailed implementation timetable developed to ensure that gains are in place before any clearing occurs.

Recommendation: *That a transparent and detailed reserve design plan be developed which demonstrates in detail the gains to be achieved in any of the offsets and includes a detailed implementation timetable developed to ensure that biodiversity protection gains are in place before any clearing occurs.*

2.3.0 Institutional arrangements for new grassland reserves and offsets

The Victorian Native Vegetation Management Framework includes an offset multiplier of x2 for very high conservation significance vegetation. In fact the offsetting of unavoidable losses under the Framework generally requires an area-to-area offset ratio of between 5:1 and 10:1 to ensure there is no net loss of native vegetation.

The new reserves will be subject to a public acquisition overlay, which will depend on individual property owners selling to the state. There is no guarantee (and in fact it is highly unlikely) that all individual landowners in the reserve area will be willing to sell, so there needs to be some flexibility and contingency developed as part of a detailed reserve implementation plan, with clear timelines, milestones and audit requirements.

Further, the proposed areas will require both transitional controls and incentives to ensure that habitat is not lost or degraded while the reserves are being acquired. Controls should take the form of both planning control through the establishment of a new ‘high priority conservation zone’ to restrict current as-of-right agricultural use, and a specific coordinated enforcement and monitoring program.

Stewardship incentives for good management should also be considered as both a transitional arrangement and possibly an add-on to encourage broader landscape scale conservation across the bioregion. This could be informed by a sub-regional and bioregional landscape protection plan and enforced or established through an EPBC Bioregional Plan and supporting state implementation plan. This would increase both implementation flexibility and likely conservation outcomes. It could also allow for offsets required from existing UGB areas to be targeted to other areas.

While the first priority should be to retain high value areas as part of the urban conservation network, where offsets are required the priority should be:

1. Establish the grassland reserves
2. Support private land conservation across the Werribee Plains and adjacent regions
3. Support private land conservation across the Victorian Volcanic Plains (VVP) Bioregion.

The establishment of a prescriptive formula for every hectare of habitat cleared in the secured area should be:

- 80% is secured in the proposed grassland reserve (sourced from clearing between existing growth area and new boundary)
- 20% is secured in private land covenants within the Werribee Plains Region and adjacent regions to establish a regional conservation network across tenures (sourced from clearing between existing growth area and new boundary)
- Private land conservation via Trust for Nature covenants supported by a stewardship program across the VVP is supported by offsets required from areas within existing growth boundaries or other associated clearing.

Other criteria for the establishment of new reserves include:

- **No clearing should be allowed until new reserves are in place.** It is absolutely critical that any new reserves are locked in as quickly as possible before property developers or the State Government start clearing for new housing or infrastructure. This is critical to ensure that gains are real before values are lost through development.
- **National parks.** Any new reserves should have the highest level of protection and be declared national parks.
- **Lines on maps are not enough, upfront funding is required.** It is very easy to draw lines on maps, but the purchase of private property for new national parks will cost hundreds of millions of dollars and take many years, even decades, leaving the fate of the grasslands open to the whims of multiple state and federal election cycles or speculative clearing by property owners. This means funding for the new reserves needs to happen upfront and a clear park implementation plan needs to be established.
- **New parks should be delivered within five years.** The reserves are proposed to be delivered within 10 years, while clearing will take 20 years. The areas for potential reserves may be damaged or neglected during this time while property owners decide whether to sell or not. Reserves should be delivered within five years, and a strict implementation timetable should be established.
- **Funding.** As yet there is no detail of how the new reserves will be funded. There needs to be at least \$50 million, if not more, provided up front to ensure that reserves are purchased before clearing commences. If the proposal is to survive the inevitable changes in governments, there also needs to be a transparent and robust funding plan that includes:
 - Establishment of an independent trust, with a strict terms of reference, overseen by an independent board of trustees at arm's length from government
 - A publicly available register of all clearing and offsets.

Recommendation: *The detailed reserve design and implementation plan should include the following elements:*

- *Priority criteria and prescriptive formula for every hectare of habitat cleared;*
- *No clearing should be allowed until new reserves are in place.*
- *National parks status*
- *Lines on maps are not enough, upfront funding is required.*
- *New parks should be delivered within five years.*
- *Upfront Funding.*

2.3.1 Permanency and security of offsets

If market-based instruments are used to protect broader landscape areas as part of the offsets for urban clearing, the issue of permanency of gains made through offset schemes such as BushBroker, or BushTender or similar schemes also needs to be considered. BushTender and similar programs offer two types of agreements, one fixed-term and one permanent. The fixed-term management agreements are common law contracts between the Secretary of the Department of Sustainability and Environment and the landowner. Parties to these agreements are the Secretary of DSE and the landholder(s) of the site and are not registered on title. Sale of the site or transfer of the lease would terminate the agreement. DSE may offer the new landholder the opportunity to sign a new agreement for completion of the actions specified in the original agreement.

Landholders' management obligations under the fixed-term agreements cease at the end of the agreement period and they will be able to manage the vegetation according to their own wishes in accordance with other responsibilities applying at that time.

The permanent conservation option relates to ongoing land use and is registered on the title through a conservation covenant via the *Victorian Conservation Trust Act 1972* or an agreement under the *Conservation, Forests and Lands Act 1987*. The agreement is a simple, plain-English document of three to five pages (Fitzsimons 2006).

According to a detailed review by Fitzsimons 2006, conservation covenants signed through BushTender under the *Victorian Conservation Trust Act* could qualify as protected areas, whereas those signed under the *Conservation, Forests and Lands Act 1987* would not.

Fixed-term agreements, due to their lack of permanency (not transferred with the title) and security (agreement variation between Secretary and the landowner; breach of agreement simply means cessation of payment) would not qualify for protected area status. This is despite payments for those sites for ecological management purposes potentially enabling better biodiversity management outcomes than binding agreements with non-payments.

If we take the criteria used to define protected areas as a surrogate for good biodiversity protection (as is recognized in International Conventions, etc), there should be a clear preference in BushBroker or other stewardship schemes for permanent protection of biodiversity over short-term agreements, especially for any offset arrangements.

There is also a significant question regarding the value of spending large amounts of public money on biodiversity restoration which does not have a permanent outcome for the public investment.

Recommendation: *If market based instruments or stewardship schemes (such as Bush Broker) are used to offset grassland loss they should require legally binding permanent protection agreements, instead of short term contracts.*

2.4.0 Proposed prescriptions for grasslands within the Urban Growth Areas

The Strategic Impact Assessment report states that areas of grassland and grassy woodland within the UGB in the northern regions will only be retained if they are contiguous with other grassland areas "typically of at least 150 ha." (Strategic Impact Assessment Report, p.126). This threshold appears to be based only on the needs of the Striped Legless Lizard, and is too high a threshold.

A range of studies have highlighted the values associated with Melbourne's grasslands. For example "The grasslands around Melbourne are floristically distinct to those in rural areas in western Victoria and contain threatened species not found at other sites" (Williams, 2005)

“Recent developments in the field of conservation planning and reserve design have emphasised the need to conserve areas based on their “irreplaceability” (the contribution that a site will make to the reserve network) and vulnerability (the likelihood of an area being destroyed or degraded)....Because of the very small amount of native grassland remaining in Melbourne, it is likely that all sites supporting native grassland in the region are irreplaceable and of great conservation value for any reserve system.” (Williams, 2005)

Many areas significantly smaller than 150 ha have been found to be viable and to maintain biodiversity. There should be no set minimum size; instead, areas for retention should be assessed on the basis of:

- species richness
- intactness/condition
- landscape context and connectivity, as part of a habitat corridor
- extent of occurrence of key species, e.g Nationally and State significant species
- irreplaceability
- role in ecological function/process
- reserve design and management opportunities.

There are many small grassland areas which, with appropriate management, can be effectively managed for conservation. Examples include the Evans Street Grassland in Sunbury (3 ha), Central Creek Grasslands in the Merri Catchment (Ngarri-djarrang), Cooper Street (40 ha), Altona Reserve (4ha), etc. Also key species such as Golden Sun Moth occur in smaller sites. For example, of the 50 known sites for Golden Sun Moth, around half are less than 10 ha in size (see page 144 of Strategic Assessment).

Williams (2005) notes *“...current government conservation planning policy is to create a reserve system with an “emphasis on long-term viability”, thus there (is) a concentration on larger sites away from urban areas... This policy assumes that urban grassland reserves are not viable in the long term, despite evidence that with appropriate resources and management they are able to persist and maintain the majority of their biological value.”*

Many grasslands are currently degrading owing to surrounding areas of non-remnant or poor quality paddocks that are often poorly managed from an ecological perspective (increased exogenous disturbance, eg. by Serrated Tussock infiltration and or active spraying for weed control). It is arguable that turning the surrounding non-remnant and poor quality paddocks (‘dead land’) into housing will decrease the amount of exogenous disturbance, and if combined with active management, create viable conservation areas. Various studies have found that native grasslands are relatively insensitive to area- and isolation-based fragmentation effects, and habitat quality is strongly influenced by management levels and by the landscape matrix surrounding remnant patches through changes in fire regimes and increased external disturbance (Williams et al 2006, Williams et al 2005)

William et al (2006) comment that: *“This study extends these findings to include evidence that the landscape surrounding remnant patches, as well as the quality of the habitat maintained within the remnant, may be more important drivers of fragmentation effects on plant species than spatial attributes of patches, such as area and isolation”*

The prescription (page 139) for areas between the current and new UGB in the west (assume Wyndham and Melton Growth areas) states that sites will be assessed on a case-by-case basis and that sites with significant species such as Spiny Rice Flower, Matted Flax Lily and Golden Sun Moth will be retained, if they meet a relevant prescription for one of the nationally listed species. However the prescriptions, when reviewed in detail, largely allow (or even recommend) clearing, with offsets.

The proposed prescription for key species such as Golden Sun Moth allows clearing *'if at least 80 percent of the total area where 'high contribution to species persistence' and 'confirmed habitat' have been protected within the bioregion'*. The argument proposed is that the new reserves will fulfil this function. It seems difficult to see how these competing prescriptions can be implemented logically, and in line with the current EPBC recovery plans or Significant Impact Guidelines (were they exist). For example, the draft Significant Impact Guidelines for the Golden Sun Moth outline a range of thresholds as a guide for significant impacts which set thresholds as low as 'loss or degradation' of more than 0.5 of ha in areas of more than 10 ha, and loss of any habitat area of less than 10 ha (see SIAR page 144)

The sequencing of implementation for these competing prescriptions does not make sense. If it will take ten years (or probably more) to put reserves in place, the proponent cannot clear habitat (see Scenario 2 pages 149) until those reserves are in place, which by default means that smaller areas within the UGB which contain Golden Sun Moth or other species with a prescription will need to be retained unless a additional further offset can be secured.

This arrangement is likely to cause huge uncertainty unless reserves can be put in place very early in the process, or there is an opportunity to retain areas of high significance within the urban growth boundary as part of the urban conservation network.

Further, it is unclear what the basis is of 80% of the total area of places (in a bioregion) where 'high contribution to species persistence' and 'confirmed habitat' intersect. The 80% of calculation does not appear have any basis in policy or science or any relationship to the existing Commonwealth Policy (Significant Impact Guidelines) for critically endangered and endangered species.

In addition, if the 80% bioregional target is reached does this mean that existing reserves secured for protection of key species such as the sun moth are then eligible for development ?

2.4.1 Creating an urban conservation network

High conservation value sites should be retained within the UGB, particularly if they have multiple values and can be logically managed as part of the urban conservation network. Key criteria for retention of sites (as listed above) include:

- species richness
- intactness/condition
- landscape context and connectivity, as part of a habitat corridor
- extent of occurrence of key species, e.g Nationally and State significant species
- irreplaceability
- role in ecological function/processes
- reserve design and management opportunities.

Many of these decisions are also left to the precinct planning stage. If a truly strategic approach were undertaken, the high conservation value areas should be able to be identified much earlier in the process. For example, additional targeted surveys in the coming spring would confirm many of the high value sites within the proposed UGB area and allow the establishment of a *detailed reserve design plan* or 'ecological structure plan'. This sort of plan would include a greater level of detail than outlined in the strategic assessment but allow for design, in broad terms, of areas required to be retained for conservation purposes as part of an urban conservation network., prior to precinct planning and as part of the Growth Area Framework Plans and not rezoned for development.

Priority sites should be considered on the basis of the key criteria (as above) and mapped as underlying networks of reserves and ecological features. This would allow a landscape approach to be applied before the pressures of development occurred, give greater certainty and security for both developers and the community, and produce a truly strategic approach to protecting biodiversity.

Lower value areas may need to be traded off during this process, but this should be done only as part of science-based and consultative processes. It is worth noting that these areas are unlikely to be huge or to significantly undermine the development objectives for Melbourne. Such an approach would be truly “Delivering Melbourne’s Newest Sustainable Communities”.

See Chapter 3 for list of priority sites identified by community groups.

Recommendations:

a) *High conservation value sites should be retained within the UGB, particularly if they have multiple values and can be logically managed as part of the urban conservation network. Key criteria for retention of sites include:*

- *species richness*
- *intactness/condition*
- *landscape context and connectivity, as part of a habitat corridor*
- *extent of occurrence of key species, e.g Nationally and State significant species*
- *irreplaceability*
- *reserve design and management opportunities.*

b) *The proposed prescriptions for grasslands and key species are not in line with current science or policy for the protection of biodiversity and national threatened species and communities, and need to be revised to allow key high-value sites within the urban growth boundary to be retained as part of the ‘urban conservation network’.*

c) *With additional surveys, high priority sites should be incorporated into a enforceable ‘ecological’ structure plan which outlines an urban conservation network for the growth areas which is incorporated in Growth Area Framework Plans and not rezoned for development.*

2.4.2 Habitat links and utility reserves

It is well documented that many examples of high-quality grasslands remain along utilities such as road or freeway reserves, railway lines, waterways and even power lines. Williams et al. (2005) show in their studies that “*Patches that were privately or government owned, close to major roads and close to Melbourne, were more likely to be destroyed, while patches close to streams or on railways had a lower probability of destruction. Patches with high perimeter to area ratios had a higher probability of being degraded*” (N.S.G. Williams et al. / *Landscape and Urban Planning* 71 (2005) 35–49)

Williams et al (2005) add “*For example, based on our results, good quality grassland close to any planned freeways should be targeted for purchase or protection using planning controls, while weed control should be a priority along railway easements supporting native grassland*”. (ibid.)

Rail, road or power line easements and the like which retain grasslands or act as high priority habitat links should have specific management plans or guidelines developed to inform management that takes into account protection of both flora and fauna. These should be based on relevant recovery and best practice ecological management.

The interim management guidelines currently recommended by the National Recovery Team for Striped Legless Lizards 1999-2003 suggest management guidelines based on Dorrrough (1996) which include:

- Where grazing has been part of management, past grazing regimes should be continued, with monitoring of stocking rates, ground cover and weed species to ensure suitable habitat is maintained.
- Where burning has previously been employed, it should be continued in a mosaic pattern at intervals of 3-5 years, with monitoring of weeds afterwards.

- If mowing or slashing is to be used, mowing heights should be set at approximately 100mm to maintain suitable structure, and slash raked and removed. This type of activity should be avoided during spring and early summer, as this coincides with the peak flowering season of many native plants and the most active and breeding season of *D. impar*. Care should be taken to minimise importation of weeds carried by equipment.
- As with mowing above, weed control equipment should be cleaned to ensure seed is not transported. In significant grassland sites, including all containing *D. impar*, spot spraying is the preferred method of control.
- No physical soil disturbance, such as ripping or ploughing, or pasture improvement, should be undertaken, as this destroys the habitat values of native grasslands.
- Trees should not be planted in areas of remnant grassland.

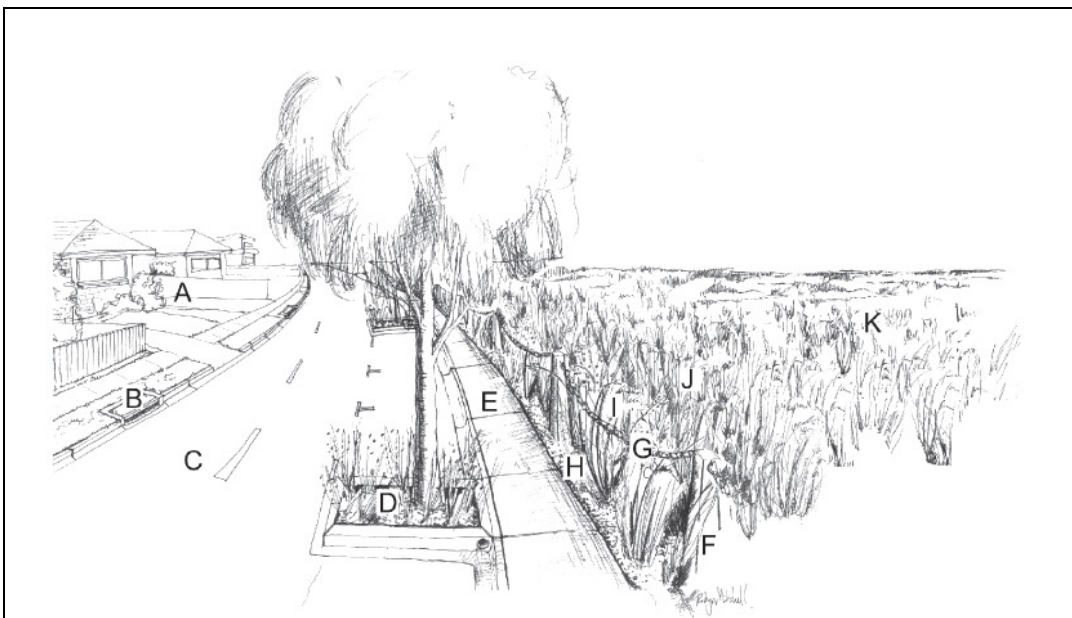
Likewise, Management Guidelines outlined in EPBC Act Policy Statement 3.11 are also a useful starting point.

Recommendation: *Enforceable management guidelines and management plans should be developed for all statutory authorities, local government and other utility operators with responsibility for significant grassland remnant patches in line with relevant EPBC Policy and Recovery Plans. These should be supported by initial seed funding by government, to enhance implementation.*

2.4.3 Design principles for urban grassland reserves

An extensive body of knowledge and experience is being developed for the design and management of urban grassland reserves. There is also evidence that these reserves have community support and help local communities to understand the nature of their environment. Williams (2005) highlights some key design features, outlined below.

Figure 1.0- Design of proposed buffer for residential or commercial development adjacent to native grasslands (from Williams et al 2005)



The diagram incorporates many of the ideas presented in the paper Williams, N.S.G (2005) *Management strategies for preventing weed invasion in urban grasslands*.

Legend:

A – New residential development. B– Storm water drain taking water away from grassland.

C – Road, footpath and car parking act as wide fire break. D – Planting cut-out containing compatible native

street trees and understorey planting. E – Footpath draining away from grassland. F – Fire resistant fence posts. G – Fence or chain and bollards to prevent vehicle and bicycle access and control pedestrian and pet access. H – Granitic sand to prevent weed invasion along path edge. I – Dense ornamental indigenous plantings to deter pet access. J – minimum 15 m dense buffer zone planting of kangaroo grass.

Recommendation: *Grassland protection design guidelines should be developed for developers and responsible authorities for managing urban and peri-urban grassland remnant patches, in line with relevant EPBC Policy and Recovery Plans. These should be supported by initial seed funding by government, to enhance implementation and assist in long-term management of remnant sites.*

2.4.4 Limitations of Precinct planning – Truganina South case study

There are at least 872 ha of natural temperate grassland within proposed urban precincts, and much of this is likely to be removed (Strategic Impacts Assessment p123). Based on recent examples, such as Truganina South (see below), precinct planning essentially rubber-stamps vegetation removal even when there is potential for successful conservation reserves.

Under this Native Vegetation Precinct Plan, 75 hectares of grassland, including many of very high significance, and 31 habitat-hectares would be cleared, including Golden Sun Moth habitat and one specimen of Spiny Rice-flower. The Net Gain Target would be 58 Habitat-hectares of very high conservation significance.

- 1) Not one Grassland Reserve is proposed, even though there is a logical linear reserve in this precinct along the southern side of the drainage line. The viable reserve, integrated with open space, drainage works and a habitat corridor along the creek, would include HZs 1, 2, 4, 6 and 15 as a minimum.
- 2) Under current rules, each of the grassland sites would still need an EPBC permit to be cleared. Precinct planning is already being used to clear high conservation significant native vegetation.
- 3) This will create difficulties for developers in finding offsets. Even if the grassland reserves are established, the difficulty of finding and paying for offsets is consistently assumed to be easier than it actually is.
- 4) This proposal to clear Very High sites goes right against Net Gain policy. Only projects of State significance can be used as an excuse to clear such sites, and urban subdivision doesn't measure up to that standard.
- 5) Even if grassland reserves are established outside the UGB, this should not give a licence to clear every last hectare inside the UGB

Figure 2 Area of grassland to be cleared in Truganina South

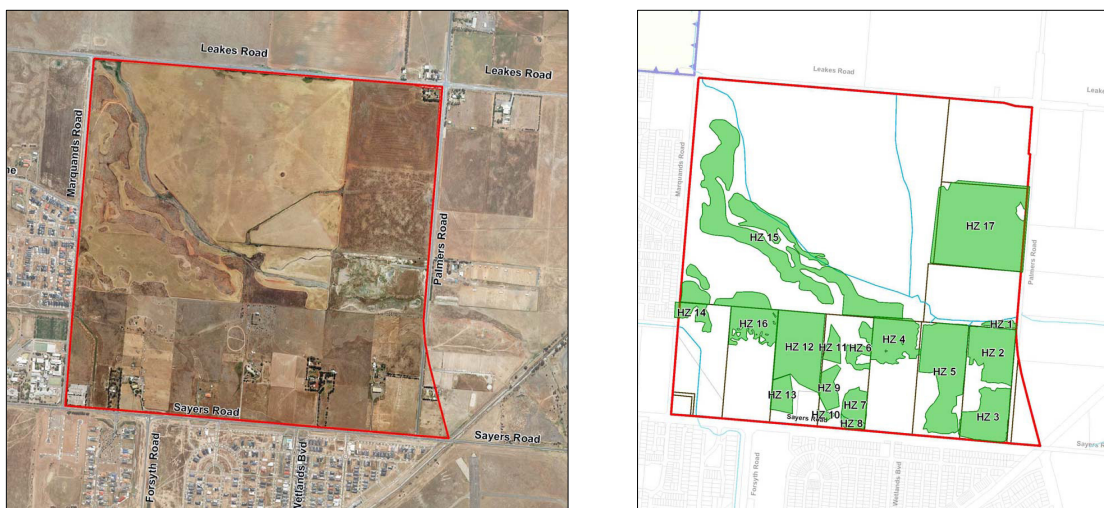


Table 1: Patches of native vegetation to be removed -- Truganina South

ID	Address	Area to be removed (ha)	Habitat Score (out of 1)	Framework Conservation Significance
HZ 1	99 Palmers Road	0.37	0.32	High
HZ 2	25 Palmers Road	4.90	0.38	Very High***
HZ 3	25 Palmers Road	4.50	0.22	Very High***
HZ 4	250 Sayers Road	4.03	0.45	Very High***
HZ 5	240 Sayers Road	8.49	0.50	Very High***
HZ 6	260 Sayers Road	1.37	0.22	Very High***
HZ 7	260 Sayers Road	1.55	0.41	Very High
HZ 8	260 Sayers Road	0.46	0.49	Very High
HZ 9	260 Sayers Road	1.51	0.53	Very High***
HZ 10	260 Sayers Road	0.23	0.56	Very High
HZ 11	260 Sayers Road	0.94	0.48	Very High
HZ 12	270 Sayers Road	7.39	0.51	Very High*
HZ 13	270 Sayers Road	1.57	0.31	High
HZ 14	290 Sayers Road	1.19	0.41	Very High
HZ 15	Lot 6 Leakes Road	17.55**	0.45	Very High
HZ 16	280 Sayers Road	3.17	0.36	Very High***
HZ 17	105 Palmers Road	15.8	0.36	High

TOTAL 75.02

* = supports one specimen of the threatened Spiny Rice-flower

** = default score (BL&A Report 2006)

*** = threatened Golden Sun Moths were observed

Recommendation: *That precinct planning and the Biodiversity Precinct Planning Kit, be reviewed and modified to incorporate grassland protection guidelines and design principles to allow the retention of high conservation patches of grassland and associated ecosystems as part of the public open space network.*

3.0 Conservation priorities in growth areas

Some very high conservation significance areas are proposed to be cleared, and more work needs to be done to retain as much habitat as possible. A series of meetings was held with local groups and a workshop undertaken with local field naturalists, conservationists and experts to determine high priority sites in the growth areas. These are described in some detail in following sections, but should also be read in conjunction with submissions from regional and local groups.

Almost 8,000 ha of Nationally Significant ecological communities are proposed to be cleared:

- 6918 ha of native grassland in Melbourne's western and northern suburbs.
- 924 ha of grassy woodland, mostly in the northern suburbs.

Some small areas are proposed to be set aside within the new growth areas:

- 530 ha of native grassland in Wyndham–Melton non-urban area.
- 700 ha of native grassland in Melbourne's north.
- 600 ha of grassy woodland in the north.

There is not enough detail provided for any of the Significantly Constrained areas, and not enough information provided for any organisation or individual to provide meaningful comment on the proposed uses of such areas.

On this basis, we have compiled our own list of locations that must be protected upfront through the Growth Area Structure Planning process. We also provide a list of important habitat links.

There are five growth areas, each of which has some high-value grassland and biodiversity sites which require better protection and recognition in the plan. Forty-two sites and key habitat links which need protection have been identified within the proposed urban growth areas..

Summary of key growth areas

- **Whittlesea (Upper Merri) Growth Area.** – At least nine key areas have been identified as needing greater protection. There are no commitments for new reserves proposed in the north, which has a higher dominance of Grassy Woodland than the west. Underlying ecological information is poor and needs to be redone with targeted surveys over the coming spring. Up to 40-50% of high value remnant areas could be destroyed, based on criteria in the Impact Assessment Report. (see Whittlesea (Upper Merri) brief for more detail)
- **Melton-Caroline Springs Growth Areas** – Seven areas of conservation significance (including the Boral Quarry site) have been identified as needing additional protection through inclusion in a Kororoit Creek Regional Park and realignment of the E6 transport corridor (see Melton-Caroline Spring brief for more detail)
- **Wyndham Growth Area** – Seven key areas identified, including three high priority sites and three habitat links, as well as a realignment of E6 Transport corridor (Outer Metro ring road) to allow high conservation significance sites to be avoided (see Wyndham brief for more detail).
- **Sunbury Growth Area** – Twelve significant areas have been identified, including five high value sites. A significant expansion of the existing Holden Flora and Fauna Reserve, and seven habitat links, are required to allow species to move when pressured with urban development (see Sunbury brief for more detail).

- **South East Growth Area** – Seven areas, including two key high conservation areas and five habitat corridors, have been identified as requiring recognition and protection to safeguard the endangered Southern Brown Bandicoot and vulnerable Growling Grass Frog. (see South East Brief for more detail)

General Recommendation: *Forty-two high conservation values sites and key habitat links across the five growth areas have been identified which need additional survey in spring and summer to allow retention and protection as part of urban conservation network (see Section 3.0 below for detail)*

3.1.0 Wyndham Growth Area

3.1.1 Introduction

- This region has already been subject to significant urban growth that threatens biodiversity values. Local groups and local government have watched some of Melbourne's last native grasslands disappearing under bitumen. Many local groups have been working hard to delineate the habitat links and areas containing important natural values to be preserved. More intensive development without areas for habitat and linking is not acceptable. If intensive development is allowed without preserving and managing for natural values, we will lose important landscape networks and species that are irreplaceable.
- The current alignment of the proposed Outer Metropolitan Ring-road will involve the destruction of known high-quality grassland sites. We suggest an alternative alignment to protect key sites (shown in the Figure, below).
- The design of the two Grassland Reserves has missed many key areas on its boundaries. We have made a number of suggestions regarding important sites that should be included (see below) including a link from Eynesbury remnant vegetation along the Werribee River.
- Creeks in the Growth Area provides significant habitat and landscape value. They currently exist within a semi-rural environment. The impacts of urban development need to be minimised. An unambiguous minimum 100m 'reserve' should be provided. Where grassland areas exist along streams (such as Lollypop Creek), a wider conservation reserve is required.
- The ecological and social value of smaller 'urban' grasslands needs recognition. Groups such as the Merri Creek Management Committee have demonstrated that sustainable management and enhancement of small grassland reserves is feasible; these areas provide important biodiversity value and opportunities for community education and involvement.

3.1.2 Issues

- It is unclear what mechanisms will protect areas of biodiversity value that are to be excluded from development.
- Areas within the proposed UGB and not identified as 'significantly constrained' may be developed, unless they are deemed as habitat required for certain EPBC listed species. This is unacceptable and we have identified sites that are too important to lose (listed below).
- The Wyndham Growth Area contains significant areas of Critically Endangered Western (Basalt) Plains Temperate Grassland of the Victorian Volcanic Plain. It also provides habitat for EPBC listed fauna: Striped Legless Lizard, Growling Grass Frog, Golden Sun Moth and Earless Dragon. EPBC listed flora include Spiny rice-flower; Large-fruited Groundsel, Swamp Wallaby-grass, Clover Glycine, Curly Sedge and Golden Moths. It also provides habitat for migratory waterbirds protected under the EPBC Act, 1999.

- Areas of grassland within the existing UGB will only be retained if they are contiguous with other grassland areas “typically of at least 150 ha.” (Strategic Impact Assessment Report p.126). This is too high a threshold. Many areas significantly smaller than 150 ha have been found to be viable and maintain biodiversity. There should be no set minimum size; instead, areas for retention should be assessed on the basis of species richness, intactness, connectivity, and extent of occurrence of key species.
- There is an over-emphasis on using the Precinct Structure Planning Process to work out biodiversity details. This appears to override the ‘avoid’ part of Victoria’s Native Vegetation Management Framework, in favour of offsets, particularly for grasslands. This is explicitly stated in the Strategic Impact Assessment report.
- Offsets for destruction of native grassland in this Zone are proposed to be provided by the western grasslands reserves, rather than locally. EVC mapping shows that many of the locations in the Wyndham Growth Area are Heavier-soils Plains Grassland, a different floristic community from that which will be largely represented by the reserves. This is not acceptable as the floristic differences, mean that these areas provide unique and important habitat, in many cases for threatened species, and are not transferable.
- Should any offsets be required for development within the expanded UGB, they should also occur within the boundary of the expansion area to enhance the important habitat connectivity for which this Area is vital.

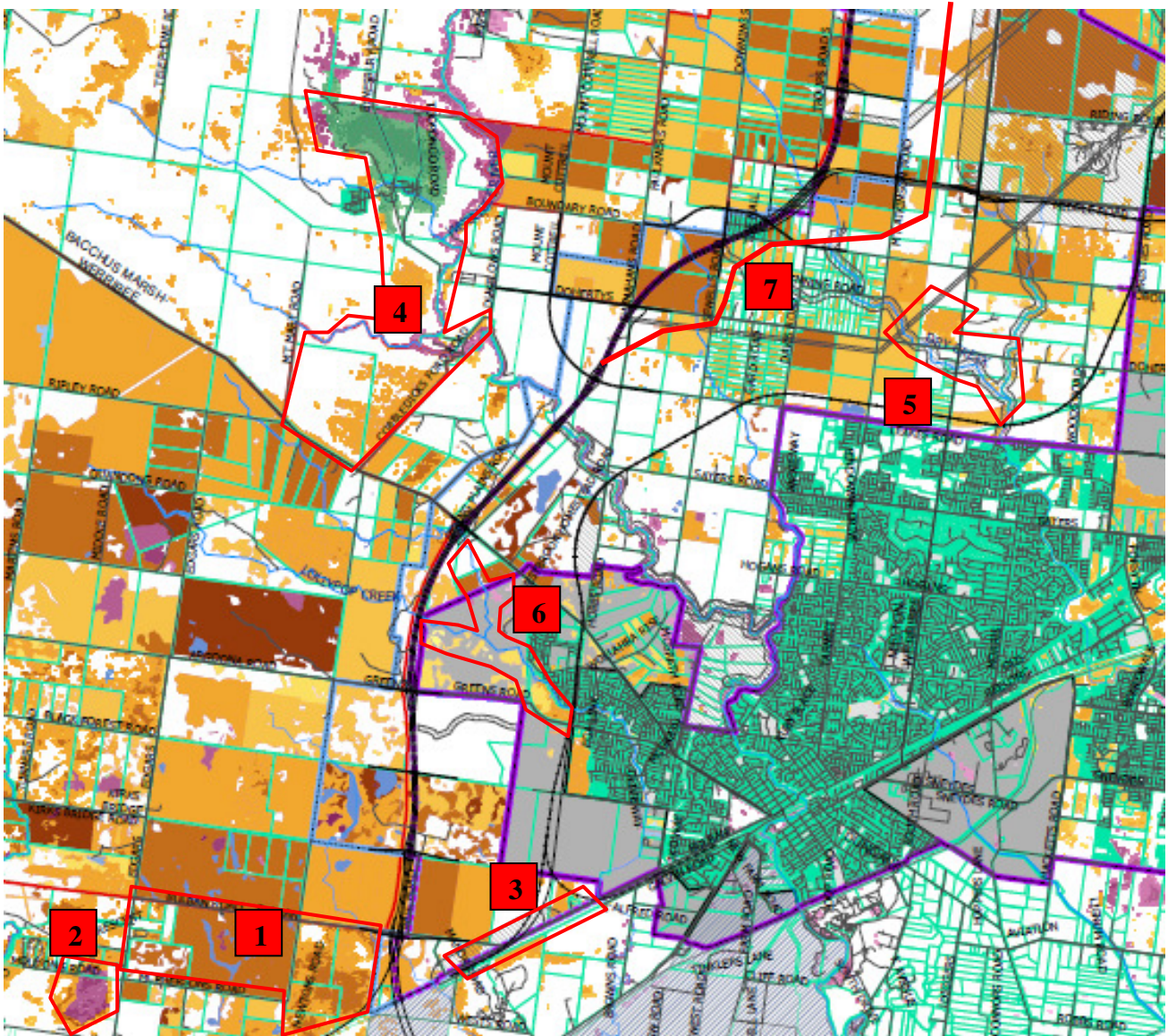
3.1.3 Areas that must be protected

Important biodiversity areas, and habitat corridor connections between some of these areas, are slated for development. The State Government must ensure the protection of the following areas of high biodiversity value and importance for connectivity. These areas should be clearly indicated in the Final Report to the Federal Government.

Table 2.0 Areas that must be protected – Wyndham Growth Area

Sites that must be protected	Locations – refer to map for numbers	Comments
	1. South of Bulban Road	A significant block south of Bulban Road, bounded by MacPherson Road to the south, Edgars Rd to the west and Newtons Road to the east, should be included in the Southern Grassland Reserve.
	2. Lignum Swamp wetland	This is a large Lignum Swamp wetland, currently overgrazed but which should come back well and should be added to the Southern Grassland Reserve.
	3. Proposed railway line	The rail reserve contains significant vegetation (EPBC listed Spiny Rice-flower, Large-fruited Groundsel and Small Golden Moths). The siting of the railway should be reconsidered to avoid these sites.
Habitat Links	4. From Eynesbury to the Grassland Reserve including the block west of Cobbledicks Rd	A link should be established between Eynesbury and the Northern Grassland Reserve. This link would be further strengthened by a link along the Werribee River to the Southern Grassland Reserve.
	5. Top of Skeleton Creek and Dry Creek	These waterways require buffers of 200m from the centre of the creeks. This area would be a good asset for the urban environment and allow for recreation. The area is known for its interesting landforms, biodiversity and cultural heritage.
	6. Lollypop Creek	Although a precinct plan is proposed, a creek buffer of 100m should be included as a prescription.

Figure 3- Priority Areas for Protection and Important Habitat Links Wyndham, Growth Area



3.2.0 Melton-Caroline Springs Growth Area

3.2.1 Introduction

- This region has already been subject to significant urban growth that threatens biodiversity values. Local groups and local government have watched some of Melbourne's last grasslands disappearing under bitumen. Many locals have been working hard to delineate the habitat links and areas containing important natural values to be preserved. More intensive development without areas for habitat and linking is not acceptable. If intensive development is allowed without preserving and managing for natural values, we will lose important landscape networks that are irreplaceable.
- Kororoit Creek has significant habitat value within the northern section of this Growth Zone. It provides habitat for Growling Grass Frog, Striped Legless Lizard and other important species. We note that various existing plans apply to Kororoit Creek, in particular the Kororoit Creek Regional Strategy 2005-2030. In addition to any requirements specified in this Strategy, there needs to be an unambiguous minimum 200m 'buffer', on both sides of the Creek, along its entire length, irrespective of biodiversity values within this buffer. The total corridor would need to be a minimum of 400m wide.
- Kororoit and Skeleton Creeks both flow through the Growth Area. On the basis that any previous planning for the wellbeing of the waterways did not account for an ever-encroaching urban environment, the impacts upon the integrity of the waterways and their habitat values must be addressed. They require significant protection not only for their value as habitat corridors but also to reduce flows of sediment, nutrients and pollution. A minimum buffer of 100m from the centre of the creek on each side is required.
- The ecological and social value of smaller potentially 'urban' grasslands needs recognition. Local groups have demonstrated that sustainable management and enhancement of small grassland reserves is feasible; these areas provide important biodiversity value and opportunities for community involvement. Furthermore, the value of securing and maintaining a network of grassland areas has been identified by Williams et. al. as assisting in maintaining the resilience of species populations in any one location.

3.2.2 Issues

- It is unclear what mechanisms will protect areas of biodiversity value that are to be excluded from development. Mention is made of the *Clarke's Road Grassland*, an area of State Significance, which is identified for protection, albeit with no details as to the protection mechanisms. An area to the west of Caroline Springs is identified whereby *'Park's Victoria's Linking People and Spaces proposes investigating the possibility for a new Regional Park along part of the Kororoit Creek'*. This sounds as though there is no guarantee of the Regional Park coming into existence. Furthermore, there is little detail for this in the reports.
- Areas within the proposed UGB and not identified as 'significantly constrained' may be developed, unless they are deemed as habitat required for certain EPBC listed species. This is unacceptable, and we have identified sites that are too important to lose (listed below).
- Areas of grassland within the existing UGB will only be retained if they are contiguous with other grassland areas *"typically of at least 150 ha."* (Strategic Impact Assessment Report p.126). This is too high a threshold. Many areas significantly smaller than 150 ha have been found to be viable and to maintain biodiversity. There should be no set minimum size; instead, areas for retention should be assessed on the basis of species richness, intactness, connectivity, and extent of occurrence of key species.
- There is an over-emphasis on using Precinct Structure Planning Process to work out biodiversity details. This appears to override the 'avoid' part of Victoria's Native Vegetation

Management Framework in favour of offsets, particularly for grasslands. This is explicitly stated in the strategic impact assessment report.

- Offsets for destruction of native grassland in this Zone are proposed to be provided by the western grasslands reserves, rather than locally. EVC mapping shows that many of the locations in the Melton-Caroline Springs Growth Area are Heavier-soils Plains Grassland, a different floristic community from that which will be largely represented by the reserves. This is not acceptable as the floristic differences mean that these areas contain unique and important habitat, in many cases for threatened species and are not transferable.
- If any offsets be required for development within the expanded UGB, they should also occur within the boundary of the expansion area to enhance the important habitat connectivity for which this Area is vital.

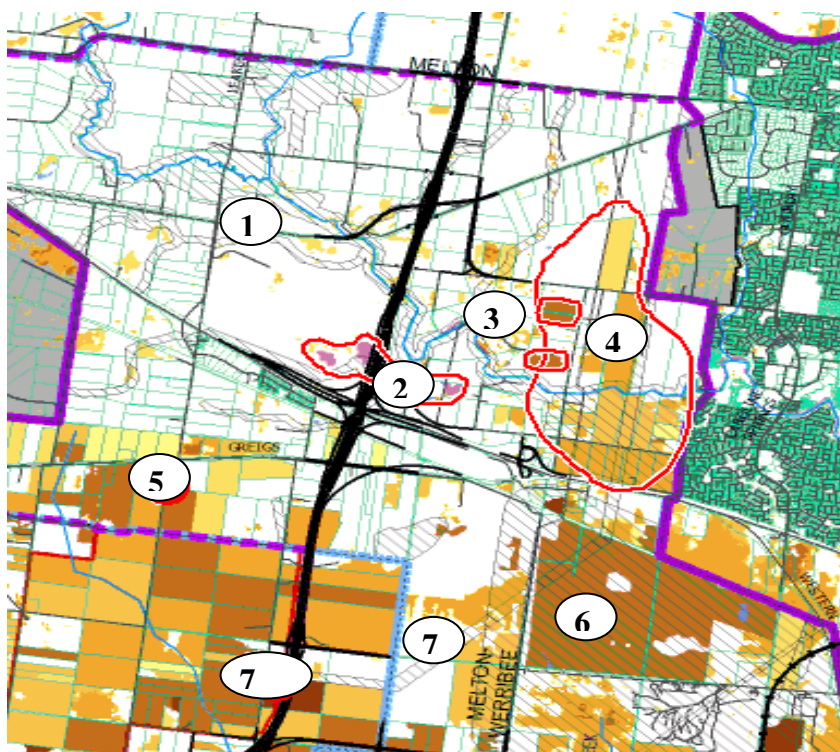
3.3.3 Areas that must be protected

Important biodiversity areas, and habitat corridor connections between some of these areas, are slated for development. The State Government must ensure the protection of the following areas of high biodiversity value and importance for connectivity. These areas should be clearly indicated within the Final Report to the Federal Government.

Table 3.0 Areas that must be protected – Melton Caroline Springs Growth Area

Locations	Comments
1. Rockbank Radio Station Woodland	Must be included within Kororoit Creek Regional Park or an exclusion zone. Contains wetland areas, including a Red Gum Wetland.
2. Dean’s Marsh and other wetlands	Realign E6 to the east of these wetlands. This area must be included within Kororoit Creek Regional Park or an exclusion zone.
3. Deanside	Containing good grassland vegetation. To be included within Kororoit Creek Regional Park or an exclusion zone.
4. Cluster of locations near Clarke’s Road	Clarke’s Road Grassland has been identified as an area that will be protected for biodiversity values. However, this should be supported by protection of four other blocks that adjoin or are in the vicinity of Clarke’s Road Grassland.
5. Greigs Road Cluster	Blocks that have been identified as comprising grassland with vegetation condition values of 41-50 south of Greigs Road and between Faulkeners Road and Troups Road should be protected by being added to the northern section of the proposed Grassland Reserves.
6. Boral Quarry	This quarry is known to contain high quality grasslands. It is currently identified as an area ‘significantly constrained’ for development. However, it has been granted a works permit for quarrying. This site contains EPBC listed Western (Basalt) Plains Temperate Grassland of the VVP in excellent condition, Spiny Rice Flower and Striped Legless Lizard. We propose that in the context of the proposed development in this area, this site is too important to lose. More detail is given in the case study below.
7. Realign E6 corridor	There has been no detailed on-ground assessment of the favoured corridor. The E6 corridor is currently aligned to intersect more than one block of high-quality grassland and wetland.

Figure 4.0 Priority areas for protection Melton – Caroline Springs Growth Areas



3.3.0 Sunbury Growth Area

3.3.1 Introduction

The Sunbury Growth Area contains important biodiversity areas and habitat corridor connections within the areas proposed for development. All areas of EPBC-listed ecosystems and endangered ecosystems as defined by DSE within the new UGB must not be cleared. Areas that are listed to be cleared are not unavoidable as suggested on p.122 of the Strategic Impact Assessment. Ground-truthing suggests that the only reason for their destruction is to make things slightly more convenient and more cost-effective for developers.

In many cases it seems that these areas of significant ecosystems are not listed as “significantly constrained land” because they are in a prime position (i.e. they would make more money for developers). Under the EPBC Act “Threatening Processes” are listed, i.e. processes seen as major factors in causing the further decline of endangered and critically endangered species and ecosystems. “Land Clearing” is listed as one of these threatening processes. The areas listed in this submission cannot be cleared. To do so would mean that this Commonwealth Law is effectively worthless.

These endangered and critically endangered ecosystems have developed over many thousands of years and they are almost gone. Once these last remnants have gone, they will be gone forever. Since the SMEC report is at best significantly lacking (as detailed below – e.g. many significant errors and incorrect modelling) and the ecosystems that are proposed to be cleared are so significant, it is recommended that the Sunbury areas be fully re-assessed and/or that more time is given for a full and proper assessment of the UGB proposal. While this is inconvenient, not to do so would be reckless and irresponsible.

Sunbury has been identified as a ‘satellite town’ and the surrounding areas still have many natural values, including significant grasslands, grassy wetlands, grassy woodlands and creeks. Many local groups and local government have worked hard to delineate habitat links and areas containing important natural values to be preserved. More intensive development, without preserving areas for habitat and habitat linking, is not acceptable. If intensive development is allowed without preserving and managing for natural values, we will lose important local areas of habitat and links that are irreplaceable. Preserving the areas recommended in this submission will have virtually no impact on the overall goal of the proposed UGB expansion. Also, many landholders with no significant vegetation remaining and bordering on, but outside, the new UGB, would be happy to have their land included in the UGB.

The adoption of the recommendations in this submission will go some way to alleviating the disastrous ecological consequences of the proposed new UGB. The State Government must ensure the protection of the areas of high biodiversity value mentioned in this submission and recognise their importance for connectivity. These areas should be clearly indicated within the Final Report to the Federal Government.

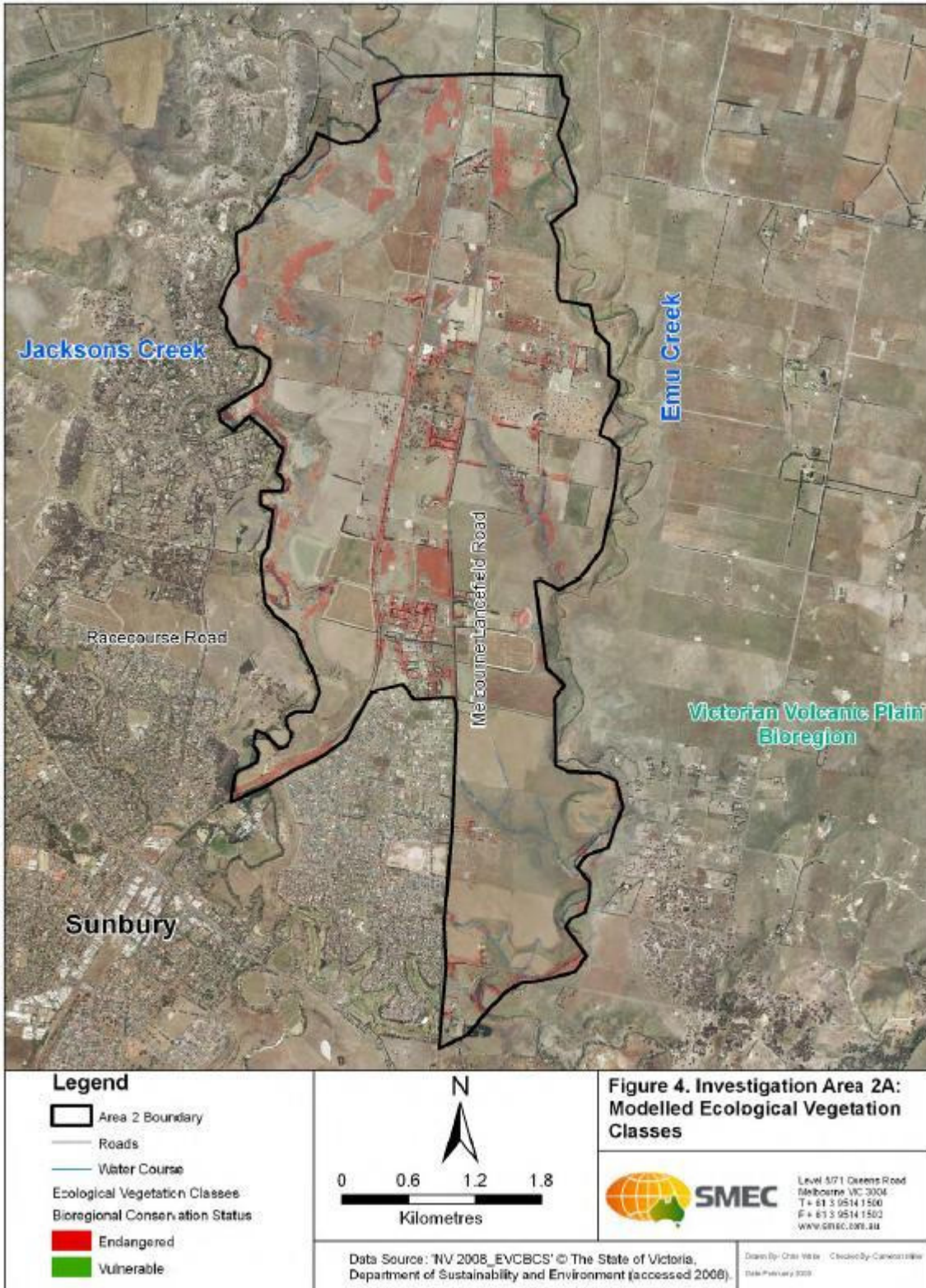
3.3.2 Issues

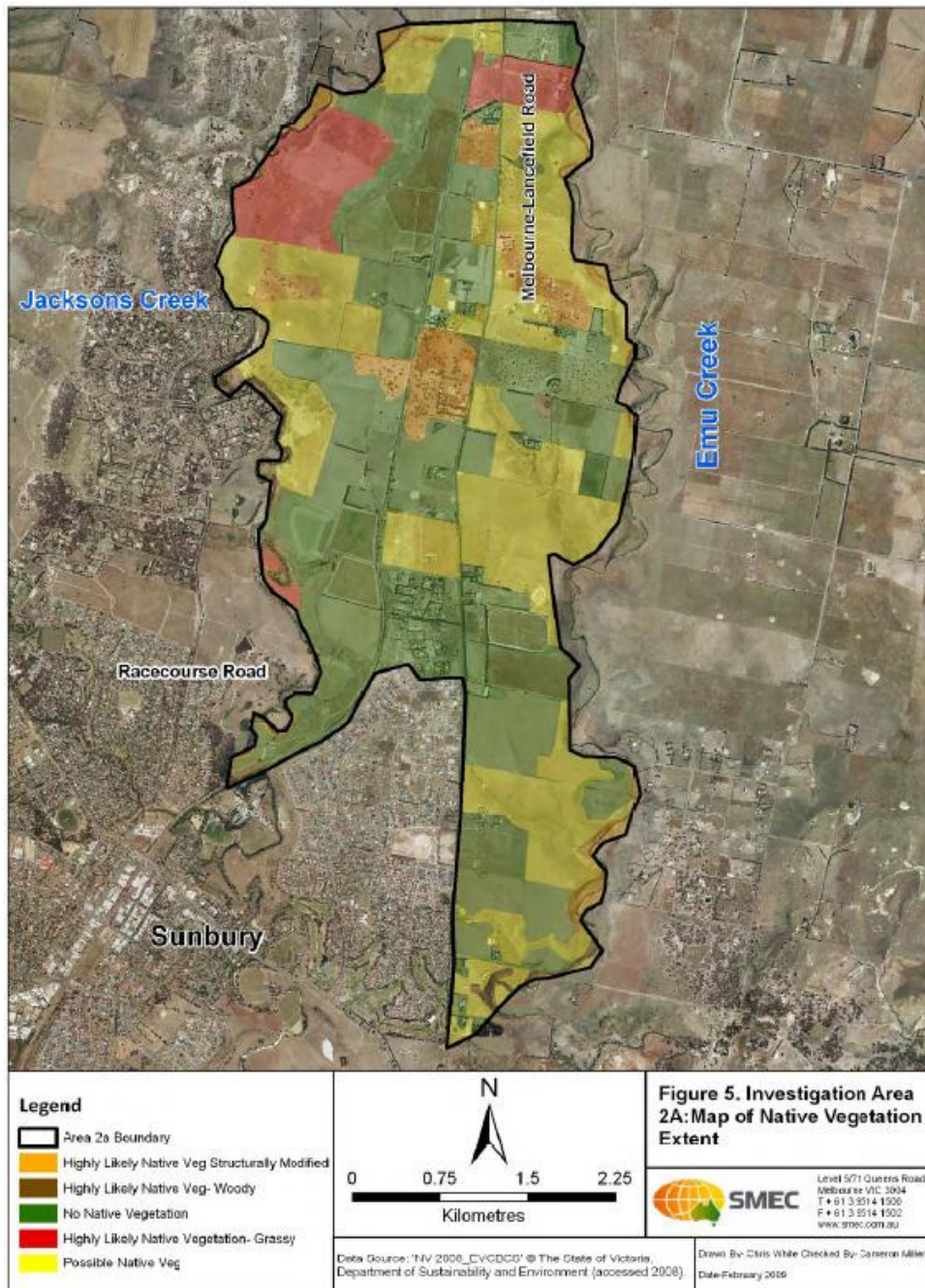
There are significant factual errors in the mapping and these give rise to the specific recommendations in this submission (section 3).

a) Mapping errors

Two maps have been relied on to determine the remnant vegetation values of the revised urban growth boundaries. These are reproduced below.

Figure 5.0 SMEC Base Maps of Sunbury





The consultants who undertook the work state that the information base is inadequate. Indeed, the maps are a major weakness of the report as they contradict each other, omit key information and contain major discrepancies.

Figure 4 is an example where data sourced from DSE has been altered when translated to SMEC's figure 5, resulting in a very different picture of the native vegetation. Many areas of what DSE designated "Endangered" EVC in figure 4 are shown as "No Native Vegetation" in figure 5. This includes not only the Raes Road Conservation Area but also the many roped-off DSE Biosites in the vicinity of Raes Road and southwards along the railway line.

There are many other examples of this unacceptable and seemingly nominal categorisation by SMEC. The Table below demonstrates how the original DSE data shows existing native vegetation in two main conditions. The SMEC data gives no sense that native vegetation exists at all, and the table below suggests that no ground-truthing has been done. This false interpretation of DSE data, the inadequacy of the original DSE data at times and the unjustifiable categorisation by SMEC mean that three levels of errors occur, making the final product in the report almost meaningless.

Table 5.0 Discrepancies between DSE and SMEC data.

DSE Data	SMEC data
Endangered	Highly likely native veg. structurally modified
Vulnerable	Highly likely native veg. - woody
	No native vegetation
	Highly likely native vegetation – grassy
	Possible native vegetation

Inadequate ecological information base The information base on which decisions are being made is acknowledged as inadequate by the report’s consultants, SMEC. SMEC state that extensive ground-truthing for native vegetation and targeted flora and fauna surveys are needed over much of the area covered.

Some of SMEC’s early maps and flora/fauna data seem to be an accurate reflection of the information available. The problem is that the information available is inadequate and in some cases plain wrong. Some ground-truthing of the DSE EVC data conducted by our groups show that many areas have been mapped wrongly, making the data and report at best unreliable, at worst wrong.

b) Omissions

Many grassland areas have been missed and/or misinterpreted. For example, possibly the best area of Themeda-dominated Grassland in the Sunbury Investigation Area is completely missed in SMEC’s survey. This mistake is of significance because this area of Grassland is fenced off (with significant fencing infrastructure) and designated a “Conservation Area” by Hume City Council with obvious signage (see photo below).

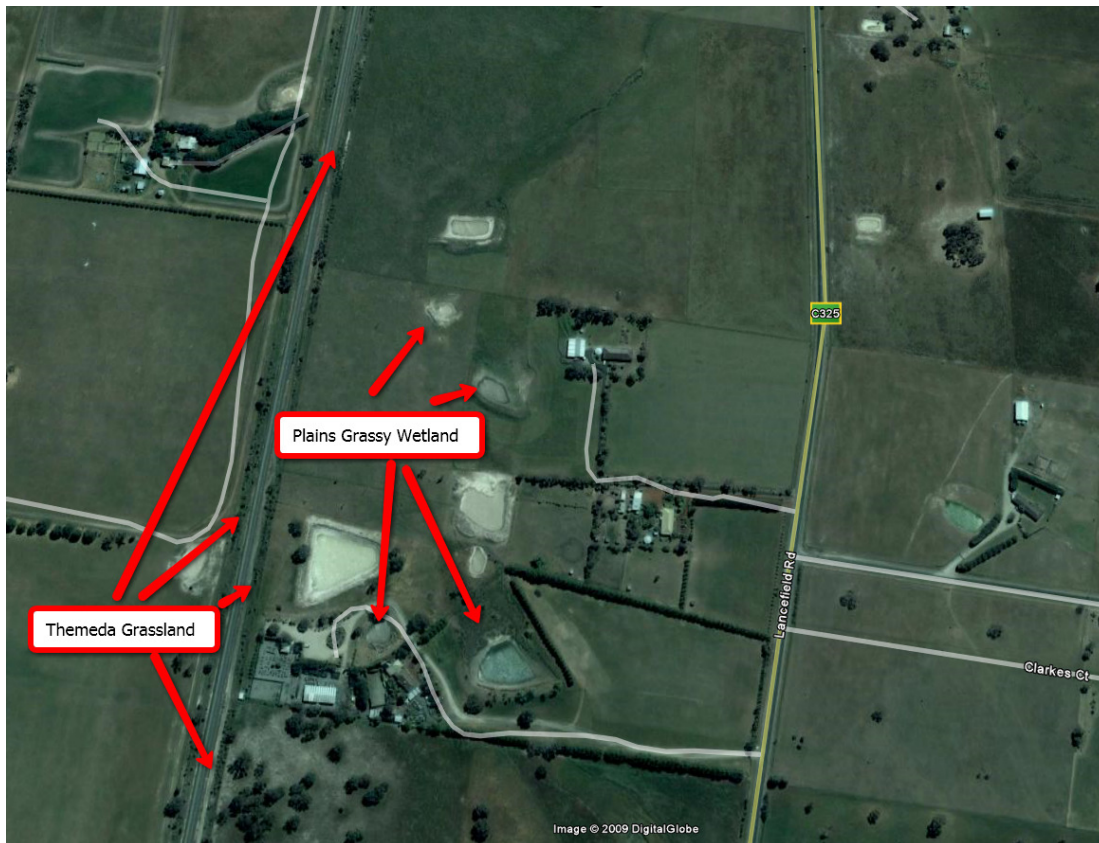
During a visit on 28 June 2009, members of our group walked only along one side of the grassland area (not inside) and photographed Themeda, Dianella, Hedge Wattle, Black Wattle, daisies, Spear Grass, Asperula (woodruff), Lomandra, Atriplex and Einadia species (all things expected to be seen at this time of year in a native grassland in the Sunbury area). This area is almost completely weed free.



Figure 6.0 Themeda-dominated grassland missed in UGB report. (Photo taken 28 June 2009)

The only area of Plains Grassy Wetland in the investigation area is also curiously omitted from the report. Areas adjoining these wetlands that slope down to the wetlands are designated as 'Proposed Non-urban Area (Development Avoided)' because of their 'Biodiversity'. These areas slope down to the wetlands, which are not themselves designated 'Biodiversity', and they are in the development area.

Figure 7.0 Map of Plains Grassy Wetlands in Sunbury



Plains Grassy Wetlands are now extremely rare and all efforts should be made to rehabilitate these area in a way that has been achieved elsewhere in Victoria (see diagram below). The wetlands above are still in reasonable condition and used by wetland birds. In a ten-minute visit to the site, we saw and photographed a number of wetland bird species, including ducks and cormorants, indicating that this area is still an important wetland for local wildlife.

Consequences of mapping errors

The mapping errors mean that many important remnant vegetation areas have been omitted. It is clear that probably up to 20% of the grassland areas, ranging from low to high quality areas (as defined by Biosis in their report for the proposed new reserves), have been missed by the SMEC report – including areas missed that are Council Conservation Areas and DSE Biosites of equal or probably higher remnant vegetation quality than any of the areas to be purchased for the proposed new reserves.

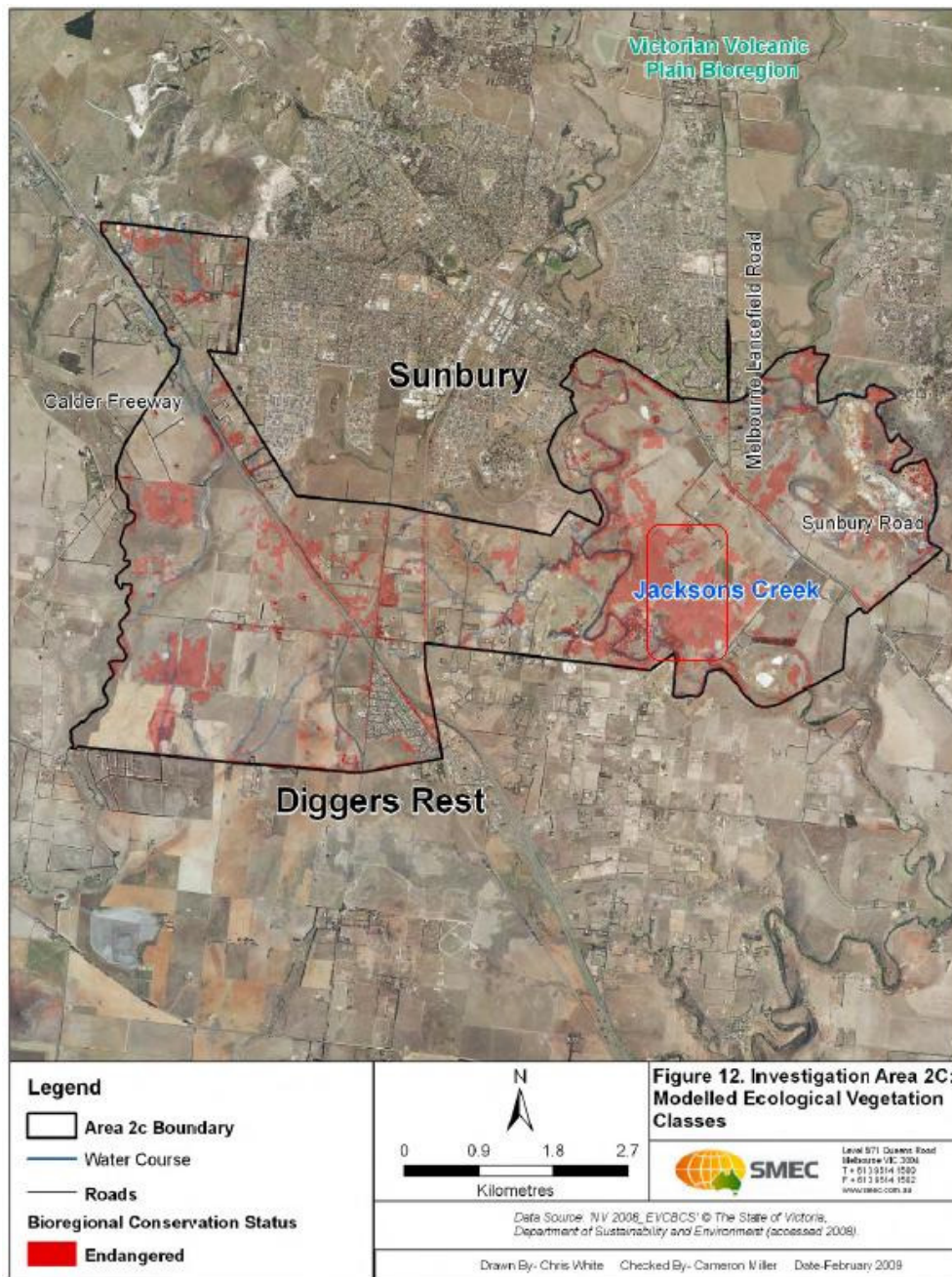
The consequences of the abovementioned mistakes and the inadequacy of the UGB report are many. 1) significant areas of endangered and critically endangered ecosystems have been completely missed by the consultants as presented in the UGB report; 2) these areas are designated to be cleared within the Sunbury Investigation Area with no 'offset'; 3) it is at best disturbing that SMEC has not consulted adequately with the relevant local government and other organisations in compiling the work that the UGB Report relies upon.

Figure 5 highlights the poor quality of the underlying analysis and data (the three categories are areas of 1. Highly Likely Native Veg., 2. Possibly Native Veg., 3. No Native Vegetation - there are

no categories of Known Native Vegetation, which shows their report is almost meaningless. What is worse, their baseless categories contradict DSE data – e.g. areas of green on figure 5 in the report (No Native Veg.) coincide with areas highlighted on figure 4 (both figure 5 above) that are designated as Endangered EVCs.

On SMEC’s Figure 5 all of the following are designated “No Native Vegetation”: a) many areas in the Sunbury Investigation Areas roped off as Biosites by DSE, b) areas designated as Conservation Areas by Hume City Council, c) significant remnant vegetation areas adjoining the Jacksons Creek escarpments (especially areas along Shepherds Lane and near Redstone Hill (pictures of that vegetation are below), d) all the very significant areas of very high quality remnant Themeda-dominated grassland along the many kilometres of rail reserves; e) many other areas completely missed by all maps (eg. Raes Road Conservation Reserve and west of Lancefield Road opposite the Fire Trail, as depicted on inset of recommendations map).

Figure 8.0 Endangered EVCs in Sunbury Area



The map above shows an encircled area designated an endangered EVC by DSE. Below are pictures of that area. Below that again are SMEC’s categories suggesting, wrongly, that these

areas that adjoin Holden Reserve have 'No Native Vegetation'. This area is almost weed-free native vegetation (wallaby grass and spear grass dominated).

Figure 9. Picture of grassland adjacent to Holden Flora and Fauna Reserve



Above and below: Land on top of the Jacksons Creek escarpment, east of Holden Reserve, on Shepherds Lane (this is designated 'No Native Vegetation' by the SMEC Report, yet it is designated as an Endangered EVC by DSE and, as can be seen, it is indeed excellent, weed-free, native vegetation).

It should be noted that the addition of this area to the Holden Flora and Fauna Reserve may increase the value of this reserve. There should also be some specific investigation for implications for the Grassland Earless Dragon. The NRP [National Recovery Plan] for Grassland Earless Dragon (2000-2004) notes that the Holden Flora and Fauna Reserve was one of the sites where there were sightings of Earless Dragons between 1988 and 1990.

Figure 10 Picture Shepherds Lane/Redstone Hill area



Above – Remnant *Atriplex semibaccata* (and other Chenopods) still dominate the Shepherds Lane/Redstone Hill area – in this case alongside a area dominated by Wallaby Grass. This is extraordinary considering that large parts of the similar areas west of Holden Reserve have been overtaken by Carpetweed. No Carpetweed was seen at the above site (Shepherds Lane - date: 28 June 2009).

3.3.3 Specific Sites in Sunbury Growth Area which require protection

**Figure 11 – Site 13
Palmers Lane links
and grasslands.**

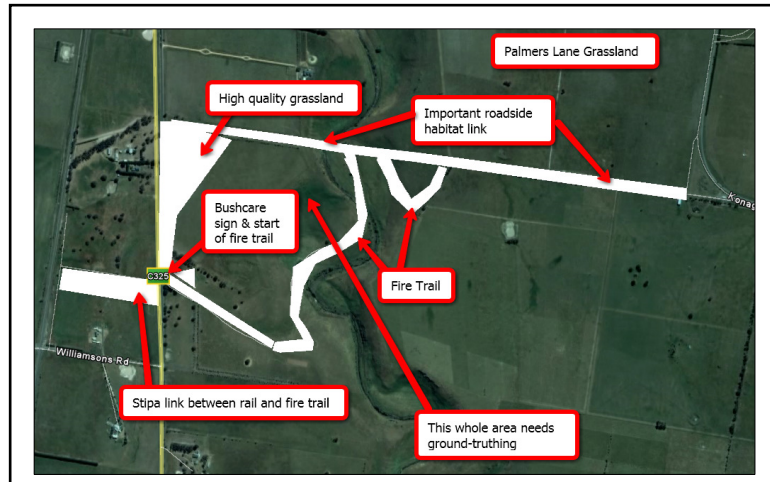


Figure -12 Priority areas for protection and habitat links.

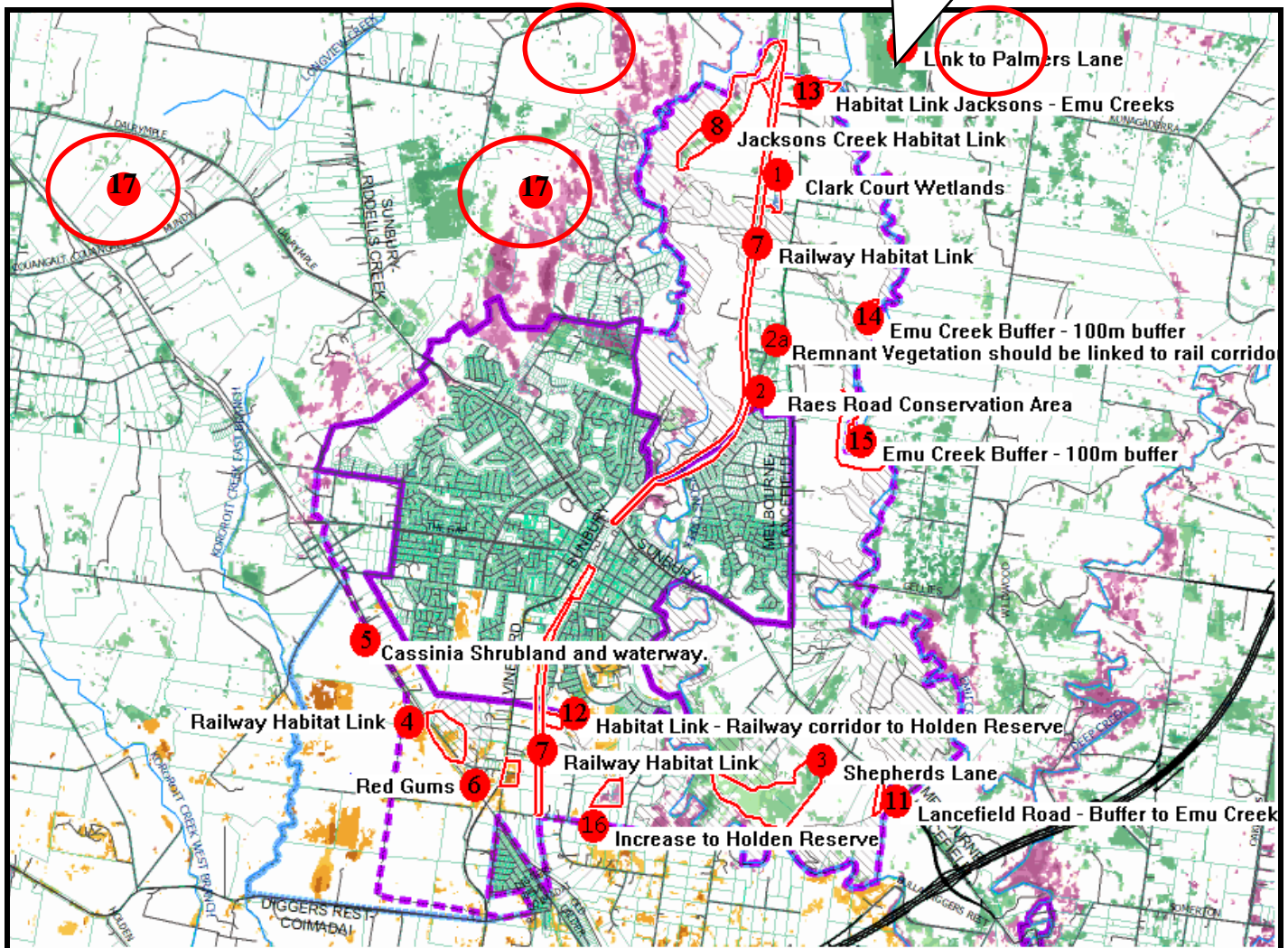



Table 6.0 Priority Areas for Protection in Sunbury

	Locations (see numbered items Refer to Figure above)	Comments
Sites that must be protected	1. Clark Court Wetlands (pictured above)	Plains Grassy Wetland – nominated for EPBC listing. Connected to Themeda grassland along the rail reserve.
	2. Raes Road Conservation Area (pictured above)	Very high quality Themeda grassland. Council managed, should not be available for development. Why is this not excluded? Missed by SMEC.
	2a. Remnant vegetation linked to rail corridor and Raes Road Conservation Area	Good quality remnant grassland exists in the housing estate south of Raes Road, on Raes Road roadside, south of Raes Road on Lancefield Road and north of Raes Road. All these areas should be connected and joined with the rail corridor (which in this area contains a number of DSE biosites).
	3. Shepherds Lane (pictured above)	This is a big block (128 ha) in very good condition and almost weed free. It connects with Holden Flora and Fauna Reserve across Jackson Ck.
	16. Increase to Holden Reserve	This area of endangered remnant vegetation sits alongside Holden Reserve and must not be cleared.
Sites among those that require urgent further assessment	4. Moores Road	This EPBC-listed grassland area requires further assessment.
	5. Cassinia Shrubland & Waterway	An unusual area that is recommended for rehabilitation (perhaps by Melbourne Water given the waterway located there).
	6. Red Gums	This area needs further assessment. The area includes a block of land containing significant Red Gums. The main area designated Grassland in this section now seems to be a winery.
Habitat links	7. Railway line easement	Biosites exist along this easement. Its entire length should be protected and a buffer of 50m either side included along its length as a wildlife corridor, irrespective of ground layer condition.
	8. Jacksons Creek Habitat link	Although included adjacent to a ‘constrained area’, these areas of native vegetation are not included in the constrained area and must be included. It is an important part of the Jacksons Creek habitat link.
	9. Palmers Lane grassland.	This is a patch of very high quality grassland that is important to the Sunbury area. It is, as a minimum, important to ensure that habitat links are retained to this area. At best it should be included as an offset and Reserved.
	12. Habitat Link – Railway line to Holden Reserve	Link between ‘constrained area’ adjoining the western border of Holden Reserve and the Railway line easement. The missing link here is very short and would result in a major habitat link.
	13. Jacksons Creek- Emu Creek.	Link Jacksons Creek with Emu Creek. This is a complicated area (see inset map) with important remnants and habitat links. The ‘Fire Trail’ and adjoining areas are part of a Bushcare project (Natural Heritage Trust) and the habitat link to the large area of intact, high quality grassland on

		<p>Palmers Lane is critically important. Creek Buffers are required. Emu Creek and Jacksons Creek both provide important links through the landscape. There needs to be an unambiguous minimum 50m conservation reserve from the top of each side of the creek escarpment along their entire length, irrespective of the current biodiversity values within this buffer.</p>
	<p>14 & 15 (& 11). Emu Creek</p>	<p>Requires buffers of 50m from the top of the escarpment (50m each side). Area 11 also seems to require a buffer to Emu Creek but could not be accessed.</p>
	<p>Melbourne – Lancefield Road</p>	<p>The entire length of this road within the proposed expanded UGB requires a 50m buffer.</p>
<p>Offsets or Land swaps</p>	<p>9 & 17</p>	<p>Some local offsets and land swaps are required for the considerable amount of EPBC-listed ecological communities in the Sunbury Investigation Area. These two areas are of significant ecological value to the Sunbury area.</p>

3.3.4 General Issues for Sunbury Growth Area

- The whole of the Sunbury Investigation needs to be re-assessed, with a substantial element of ground-truthing. The SMEC report is wholly inadequate. Ground-truthing could be done cost effectively, and it would be reckless and irresponsible not to do so. SMEC themselves say their report is a "broad overview", "not suitable for site specific planning", the flora and fauna analysis "has significant limitations" especially for areas that are "extensively private land" (this is the vast majority of the area studied in the report - and our ground-truthing on private land proves this point), their assessment "does not have the precision to pick up remnant scattered trees which are likely to occur across the investigation area" (this is what grassland is, scattered trees - basically saying the assessment they have done cannot pick up key aspects of the life-giving aspects of the vegetation communities they are trying to assess).
- Anyone submitting an assessment of this report is significantly disadvantaged in having to conduct ground-truthing in June and July when grassland areas cannot be assessed properly (e.g. many important plant species such as orchids, lilies and herbs that dominate the floral grassland display in late spring are underground and not assessable in June and July). More time is required is to assess the report properly, at least until the end of January 2010.
- A 100m buffer either side of all railway lines, creeks and other important linking elements of the landscapes (e.g. major power line easements) is essential to the preservation of the natural heritage values of Sunbury. Such buffer zones are realised today as imperative for the continued survival of ecosystems around the world.
- All 'Priority Areas Targeted for Supplementary Assessments' (items 1-4) in the report need to be assessed as per the SMEC recommendation, preferably not by SMEC but by Practical Ecology or Biosis.
- SMEC's habitat links have gaps that need to be filled. In addition, all important remnant vegetation patches adjoining these habitat links must be included within the habitat links and not cleared or developed.
- The principles applied in this assessment apply equally to the other investigation areas in the report: that is, buffering major easements as important habitat links, reserving and not clearing all the most important remnant vegetation sites in the entire new proposed UGB, better ground-truthing in all areas. There are many very important remnant areas in all areas that in some cases contain many EPBC-listed species and ecological communities. No endangered or critically endangered species and communities must be lost in this process.

3.4.0 Whittlesea/Hume & Merri Creek Corridor

3.4.1 Introduction

- This region has already been subject to significant urban growth, threatening biodiversity values. Many local groups and local government have worked hard to delineate habitat links and areas containing important natural values to be preserved. More intensive development without areas for habitat and linking is not acceptable. If intensive development is allowed without preserving and managing for natural values, we will lose important areas of habitat and links that are irreplaceable.
- There needs to be an unambiguous minimum 200m conservation reserve on both sides of the Merri Creek, along its entire length, irrespective of current biodiversity values adjacent to the Creek. The total corridor would need to be a minimum of 400m wide. Other land uses (recreation and community buildings, sporting facilities, infrastructure such as sewers, water mains and power lines) should not be located in this reserve. It should be managed as a continuous corridor for conservation and restoration of indigenous habitat.
- The proposed location of a new Sewerage Treatment Plant (STP) is adjacent to Merri Creek and a known stronghold of Growling Grass Frogs (GGF). Whilst the STP will also include provision of recycled water to new developments, the impacts on the Merri Creek and its values have not been addressed.
- Areas of high biodiversity value in the Upper Merri, such as the Bald Hills grasslands, are currently threatened by quarrying. The future of current extractive industry areas in the 'constrained land' is not clear.
- The ecological and social value of smaller 'urban' grasslands needs recognition. Groups like the Merri Creek Management Committee have demonstrated that sustainable management and enhancement of small grassland reserves is feasible; these areas provide important biodiversity value and opportunities for community development and involvement.
- With funding from the Natural Heritage Trust, DSE, private landholders and volunteers have contributed a considerable amount of investment, both on-ground and landholder capacity-building, to the Merriang Local Area Biodiversity Plan. Much of this investment stands to be destroyed.

3.4.2 Issues

- It is unclear what mechanisms will protect areas of biodiversity value that are to be excluded from development. Mention is made of *"...a selection of smaller reserves in the north, some within the urban context, providing additional protection for key sites and connectivity between related habitat types, particularly grassy woodlands, stony knolls and floodplain grasslands."* For Grassy Woodlands there is also the promise to *"Investigate establishing a large reserve south-west of Whittlesea."*
- Areas within the proposed UGB and not identified as 'significantly constrained' may be developed, unless they are deemed as habitat required for certain EPBC listed species. Instead of avoiding clearing grassland areas, it is proposed to retain only those grasslands that are contiguous with other grassland areas *"typically of at least 150 ha."* (Strategic Impact Assessment Report p.128). On this basis, it is estimated that approximately 40-50% of current grassland could be destroyed.
- There is an over-emphasis on using the Precinct Structure Planning Process to work out biodiversity details. This appears to override the 'avoid' part of Victoria's Native Vegetation Management Framework in favour of offsets, particularly for grasslands. Smaller grasslands within the new UGB are likely to be cleared, and 'offsets' for this clearance located in the two new western grassland reserves.
- Significantly constrained areas, where they are identified for biodiversity purposes, must remain so. There is no current assurance that this is the case.

- Offsets for destruction of native grassland in the Merri are proposed to be located 60km or more away in the new western parks, rather than in the Merri catchment itself. This is not acceptable, as the grasslands within the Merri Catchment provide important local habitat and genetic diversity, in many cases for threatened species.
For example the Flame Robin, listed under the EPBC Act as a migratory species, travels from the ranges to the grasslands in the lower Merri Catchment to feed over winter. There is no similar link from the ranges north-east of Melbourne to the proposed grassland reserves on the Werribee Plains, therefore effectively breaking the lifecycle requirements for this small but important bird. The Merri Creek catchment's Grasslands and Grassy Woodlands are not transferable.
- Should any offsets be required for development within the expanded UGB, they should occur within the boundary of the same growth area to enhance the important habitat connectivity for which this Zone is vital.

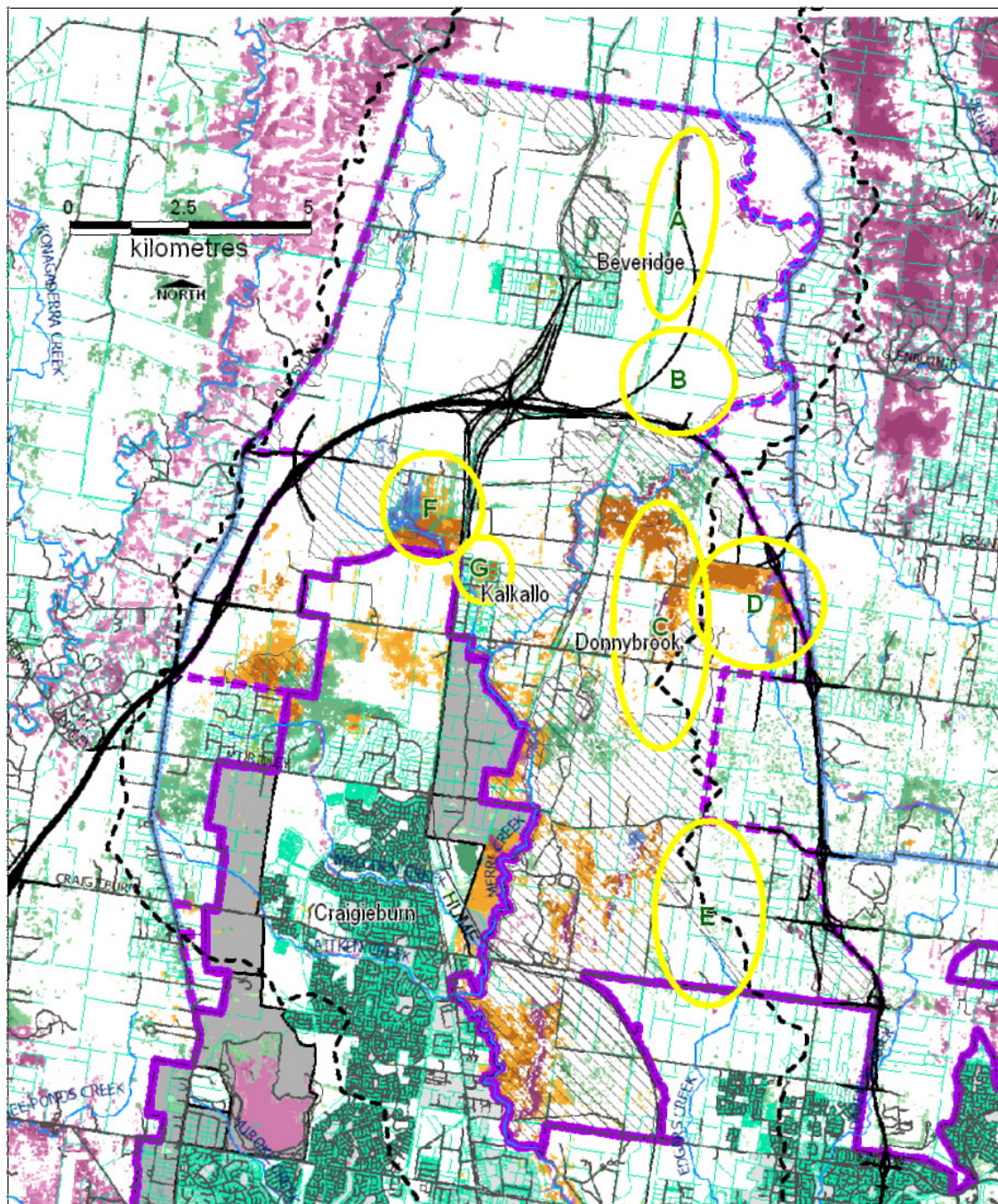
3.4.3 Areas that must be protected

Important biodiversity areas, and habitat corridor connections between some of these areas, are slated for development. The State Government must ensure the protection of the following areas of high biodiversity value and importance for connectivity. These areas should be clearly indicated within the Final Report to the Federal Government.

- A. Camoola Swamp Biosite (State significance) – Grassy Wetland - sits within the area designated as Intermodal and Logistics Terminal, including Interstate Freight terminal
- B. Northern half of Bald Hill Grassland Biosite (National significance) - Intermodal and Logistics Terminal
- C. Southernmost parts of Bald Hill Grassland Biosite
- D. Grasslands in Woodstock area
- E. Edgars Creek Headwaters (part) and Summerhill Road Biosites (State significance) – Grassland, Grassy Woodland, stony rises - area between Craigieburn Road East and Summerhill Rd
- F. A large area of Grassland between the Hume Freeway and the Kalkallo Retarding Basin
- G. Remnant grassland immediately to the north and contiguous with the Kalkallo Common.

Other important areas for protection identified by the Merri Creek Management Committee (MCMC) are shown in the two Figures below, along with important habitat links. Each of these areas requires protection in order to support the integrity of the catchments' natural systems and the important species that live there.

Figure 13 - Priority areas for protection in Merri Creek Corridor

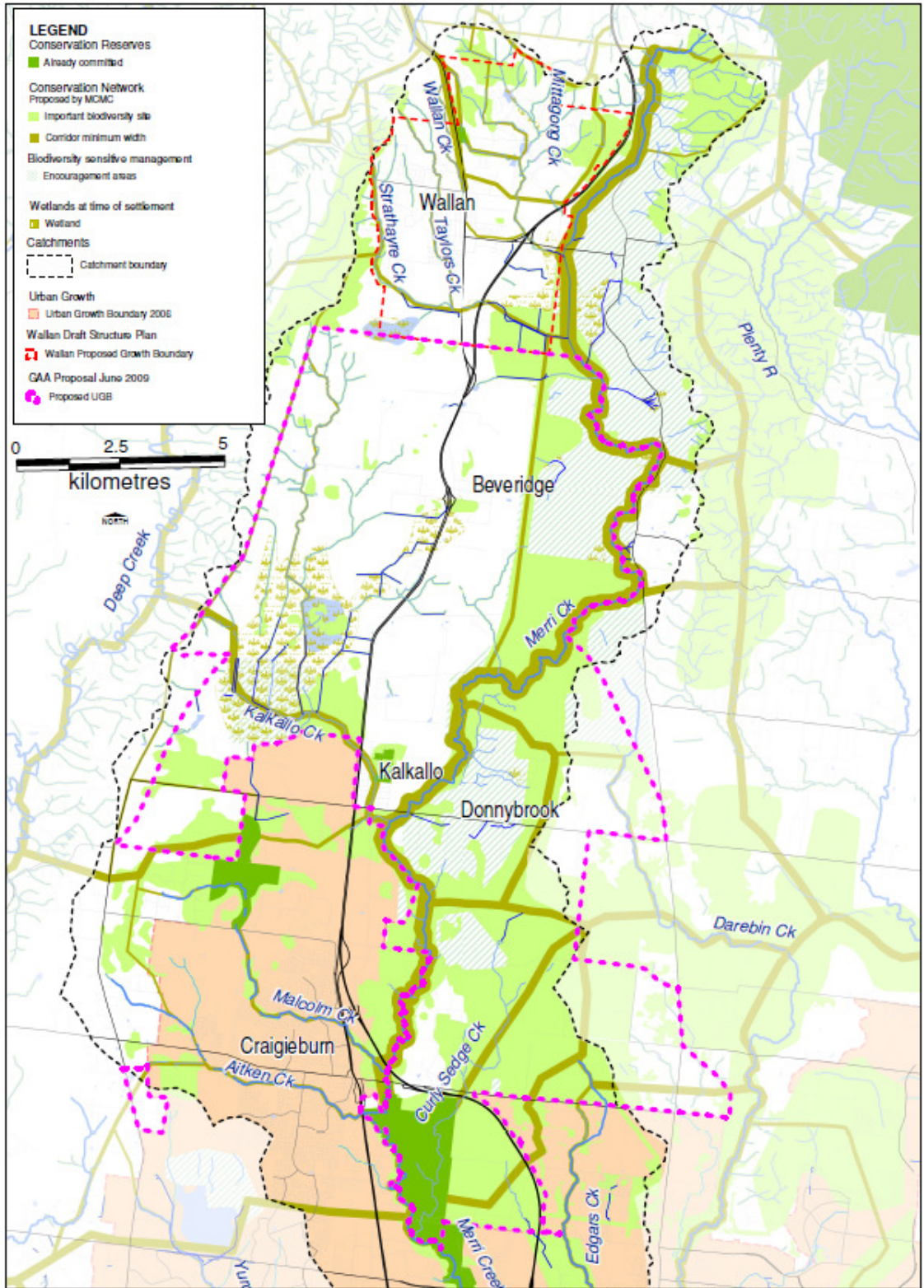


Important habitat corridor connections identified in MCMC's Upper Merri Biodiversity Network Plan, Feb 2009, that are slated for urban development, are shown in the Figure below. They include:

- H. North-south link between Craigieburn East Grassland/Grassy Woodland and the Grassland/Woodland areas north of Donnybrook (n.b. this link is not along Merri Creek but further to the east)
- I. An east-west link from the Kalkallo Retarding basin: west to remnant vegetation on the Old Sydney Rd ridge line, and east along Kalkallo Creek to Merri Creek.

Figure 14 Upper Merri Biodiversity Network Plan and proposed UGB.

Upper Merri Biodiversity Network Plan plus Proposed UGB



Note: MCMC reserves the right to update this proposal as further information comes to hand.
 Workspace X:\GIS\esball\conservation_network\WOR_ Date 19/7/08 Merri Creek Management Committee Inc.

3.5.0 South East Growth Area

3.5.1 Introduction

- Poor planning in Casey has already resulted in huge sprawling developments with little public amenity or natural values. The development area itself should combine development and natural conservation areas (i.e. not solid development with a compensatory wetland outside the area). Division of space should be such that per capita private land area is reduced but public open space increased (i.e. pockets of dense residential interspersed with carefully designed and well-planned public open space.)
- This region has already been subject to significant urban growth threatening biodiversity values. Many local groups and local government have worked hard to delineate green wedges, biolinks and areas containing important natural values to be preserved. More intensive development without areas for habitat and linking is not acceptable. If intensive development is allowed without preserving and managing for natural values, we will lose important areas of habitat and links that are irreplaceable.
- The waterways of the South-East Growth Zone feed directly to the Ramsar-listed wetlands of Western Port and provide habitat for Nationally threatened Australian Grayling, Dwarf Galaxias and Growling Grass Frog. They require significant protection, not only for their value as habitat corridors but also to reduce flow of sediment and pollution downstream.
- Active ongoing management of threatening processes affecting significant species is required. This would include weed control, pest control (foxes, cats) and restrictions for pets (especially cats).

3.5.2 Issues

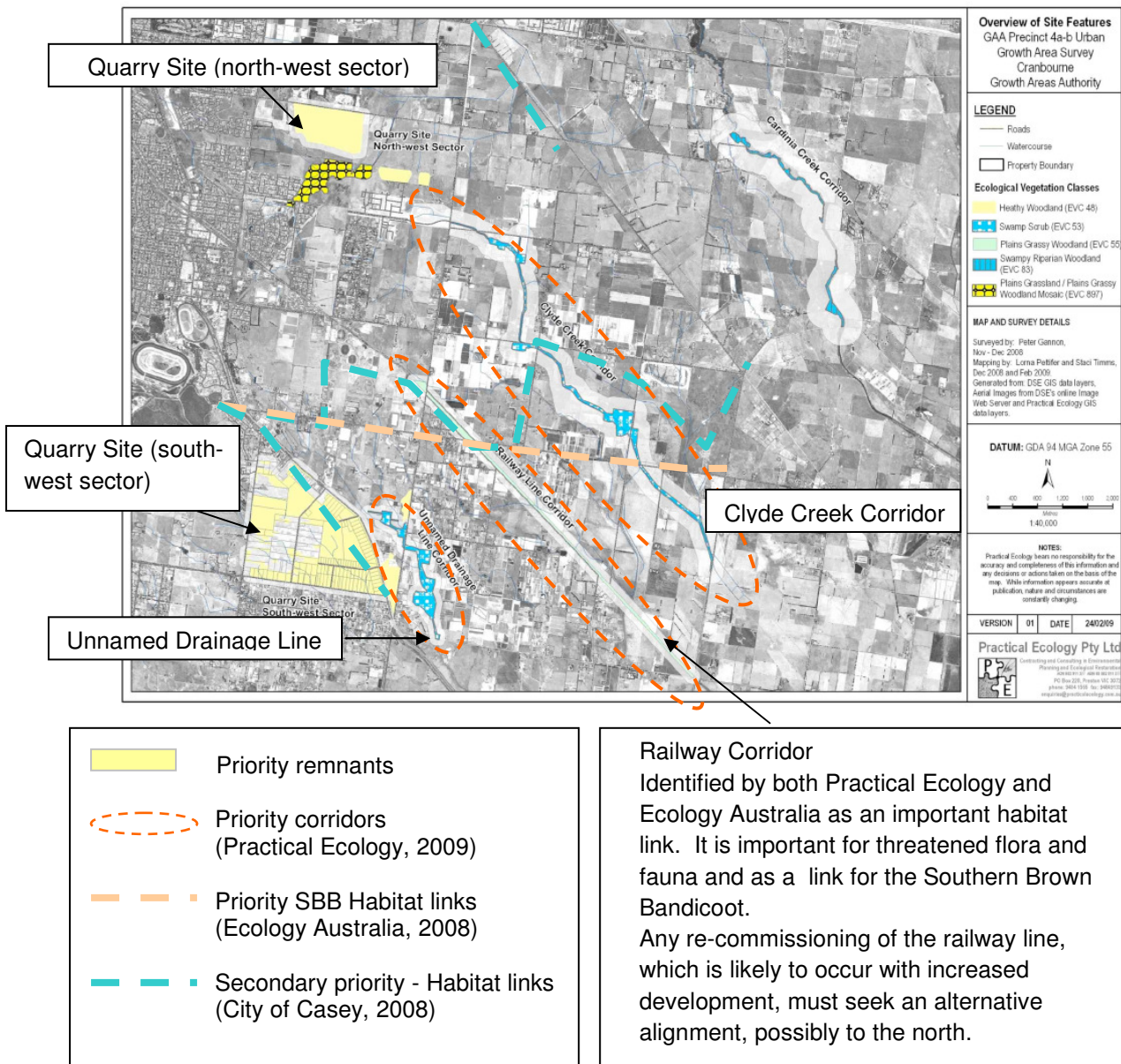
- The area delineated within the South-East Growth Zone provides a strategically important east-west link between the Koo Wee Rup Swamp and Royal Botanic Gardens Cranbourne (RBGC), and from the north to the Ramsar site of Port Phillip Bay. It is vitally important for facilitating movement of species between different habitat patches. Development of this area without appropriate corridors and natural areas will prevent such movements and isolate remaining habitat patches, leaving populations prone to genetic inbreeding and greater risk of extinction through local disturbances.
- Locations within the South-East provide habitat for the Nationally listed Southern Brown Bandicoot and Growling Grass Frog. Flora species include River Swamp Wallaby-grass, Maroon Leek-orchid and Swamp Everlasting among others.
- If any offsets are required for development within the expanded UGB, they should occur within the boundary of the expansion area to enhance the important habitat connectivity for which this Zone is vital.
- The Urban Growth Boundary Review, Report for Public Consultation, June 2009 indicates that wetland habitat is proposed for development within the UGB but will be offset to the south and east of the zone. The habitat within the zone is not transferable. Wetlands should not be offset outside the South-East Zone.
- This area contains important links along creeks, drainage lines and other easements that have already seen improvement through restoration efforts. There are four properties with Landcare revegetation projects within or immediately adjacent the proposed area. If development is allowed, the value of this potential for future restoration is lost.

3.5.3 Areas that must be protected

Priority locations that will assist in delivering improved connectivity and habitat values are shown in the Figure shown below and discussed further below.

Figure 15- Areas that must be protected and actively managed in South East

Base map sourced from Practical Ecology, 2009.



Primary areas for protection should align with the recommended locations, widths and alignments identified by Practical Ecology (2009). This includes three corridors (Clyde Creek, railway line and Unnamed Drainage Line) and two sites of significance (Quarry site NW and Quarry site SW), shown above. These areas should be protected and enhanced as a minimum to allow biodiversity movements and ecological functions within the landscape.

The disused South Gippsland Railway line presents an excellent opportunity to link bandicoot populations in the Dalmore-Koo Wee Rup (and Cardinia) areas to RBGC, by making use of an existing, partially vegetated, landscape corridor leading directly north-east to Cranbourne.

Conserving this corridor for use as a habitat link also provides a good opportunity to conserve and enhance substantial remnants of vegetation in a depleted landscape, including BioSites of National and Regional significance, at Manks Road, Clyde and between Dalmore and Koo Wee Rup.

Biosis (2008) has assessed this corridor and regards it to be a critical link for the Southern Brown Bandicoot. Although this option makes use of an existing corridor, the link may require the inclusion of some roadside vegetation along Ballarto Road to link directly to RBG Cranbourne.

Ecology Australia (2009) has mapped potential habitat corridors for the Southern Brown Bandicoot (SBB). In their report they also identify the importance of the Railway Corridor.

Another primary link which should be established prior to the precinct planning process includes the Ballarto Road link from Cardinia Creek (but within the proposed UGB extension from Clyde Creek) to the RBG. Ecology Australia (2009) identified Ballarto Road as a strategic link to the Koo Wee Rup Swamp.

This biolink alignment is supported by the Cardinia Environment Coalition, and the Department of Sustainability and Environment has requested its consideration by the Growth Areas Authority (GAA) when preparing the Cranbourne East Precinct Structure Plan. The 70m wide corridor has implications for adjoining private land, and also for growth area planning and open space allocations (Biosis 2008c). It is noted that this link would require further research and design to be effective.

Secondary habitat corridors include those identified within the City of Casey's Revegetation Strategy (2008). There are a number of these within the proposed UGB expansion zone (see Figure 3 on pg 10 of that document). Unfortunately they are not individually named or described in the document.

3.6.0 E6 Transport corridor and revised grassland reserve design

3.6.1 E6 Corridor Alignment

The current scenario for the E6 transport corridor will see 655 ha of grassland removed. The area was only subject to desktop assessment completed by Brett Lane & Associates Pty Ltd, which estimated the area of significant native vegetation to be cleared and a high conservation value wetland at Deans Marsh/Western Wetland. The report itself notes: *“The current assessment was strictly limited to a desktop study and some threatened species may have been missed due to minimal previous research in some areas”* (p2). The consultants recommend that a broader 2 km search area be undertaken and detailed field assessment undertaken, and this should be done before a final alignment is decided on.

We propose that the Outer Metropolitan Ring Road be realigned to avoid grasslands of high quality. These include sites to the west of Mt Cottrell Road. The current alignment has not been subject to an on-ground ecological assessment, and this needs to be done before any final alignment can be considered.

The E6 corridor should be realigned within the section immediately to the north of Leakes Road. We strongly suggest that it should be moved east along the alignment shown in Figure x below. This would ensure the protection of four known sites of highly significant grassland, also shown in the Figure below. It would also allow for the protection of Deans Marsh and associated wetlands, a site not only of State Significance but also of high community interest.

Figure 16- Western Wetland to be destroyed by current E6 corridor alignment



OMR plowing through a site of significance
(graphic courtesy of Giorgio De Nola/ CSONGrass 2009)

Protect this swamp soon to have OMR
built through it
(photo courtesy Colleen Miller taken July 09)

Recommendation: That the Outer Metropolitan Ring Road be realigned to avoid high conservation significance grasslands, wetlands and associated ecosystems and a detailed on-ground fauna and flora assessment be undertaken before any final alignment is decided.

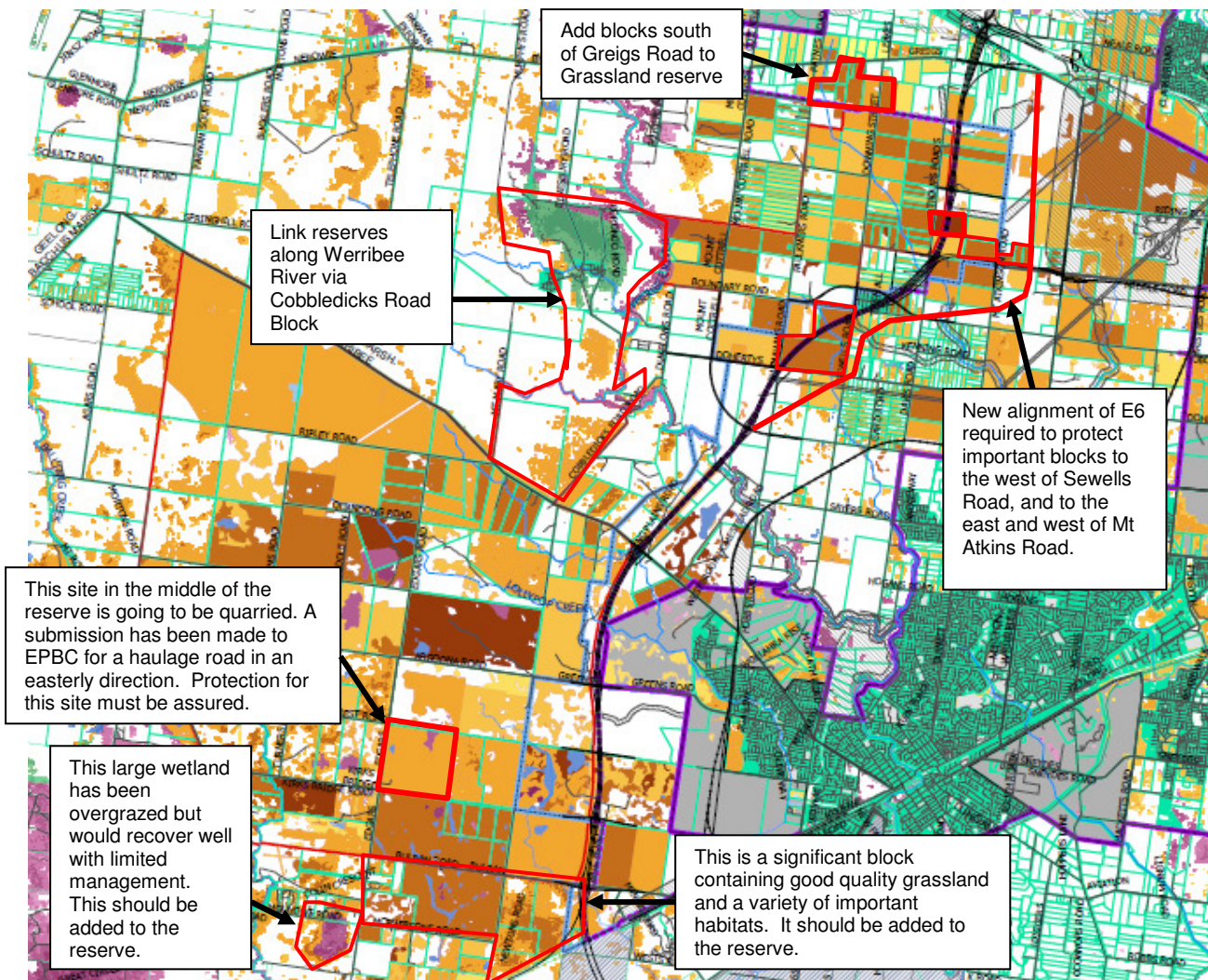
3.6.2 Western Grassland Reserves

The Figure below shows high conservation areas which should be added to the reserve system.

Recommendation: The proposed Western Grassland reserves should be reconfigured to include:

- Addition of blocks south of Greigs Road to Grassland reserve
- Link the two reserves along Werribee River via Cobbledicks Road Block
- New alignment of E6 to protect important blocks to the west of Sewells Road, and to the east and west of Mt Atkins Road.
- The large wetland to the east of the proposed current areas has been overgrazed but would recover well with limited management. This should be added to the reserve.
- A significant block containing good quality grassland and a variety of important habitats, between the current proposed reserve and Geelong Road, should be added to the reserve.

Figure 17 - Recommended improvements to Western Grasslands Reserve design.



3.6.2.1 Ideas for Reserve management structures

- A series of management committees should be established. They should have paid membership and include members who have recognised skills in science and education as well as key community members.

- The Southern Reserve should be divided into four areas and the north into two, with six corresponding committees which would practice adaptive management. Reviews between committees would occur annually.
- Committees would be accountable to Parks Victoria and would work to a Business Plan and Management Plan with pre-determined outcomes and accountabilities.
- Management should have grassland conservation as the highest priority, and not be directed to 'managing an old farm'. These are some of the last areas of native grasslands and this attempt at their conservation should not be squandered.
- Research and learning should be actively encouraged in the reserves and incorporated into the objectives/accountabilities of the business/management plans.
- A dedicated (perhaps shared) specialist grassland management unit be established to manage and monitor grasslands. \

4.0 Recommendations for Ecological communities and species

4.1.0 Introduction

An analysis of the Strategic Impact Assessment Report undertaken included comparing consultants' reports with information in the report, and then included assessing the Mitigation Objectives, Strategy, Outcomes and associated prescriptions with Strategic Impact Guidelines for EPBC species and communities. General comments have been made earlier regarding the comprehensiveness of the report. This section summarises the VNPA's alternative recommendations for Mitigation for where a significant impact would be likely.

Three species identified to be present and potentially significantly impacted by the Program have their own significant impact guidelines (Golden Sun Moth, Growling Grass Frog and Spiny Rice Flower). These guidelines specify impact thresholds.

All other communities and EPBC listed species (excepting Grassy Wetland of the Victorian Volcanic Plain, which is not yet listed) are addressed by the EPBC Act Policy Statement 1.1 Significant Impact Guidelines (May 2006). The relevant criteria are listed below.

4.1.2 Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat introduce disease that may cause the species to decline

interfere with the recovery of the species.

4.1.3 Issues & Recommendations

The majority of the mitigation activities rely on undertaking surveys for almost all species on a precinct-by-precinct basis prior to developing each Precinct Structure Plan.

We propose that these surveys be undertaken upfront before the Precinct Structure Planning process to guide an upfront planning process for entire Growth Areas, rather than piecemeal during successive Precinct Structure Planning. The process should employ best expert advice and optimal survey techniques. This would be more efficient and allow for more upfront discussion and negotiation on a strategic level through the establishment of an 'Ecological Structure Plan', which would inform the precinct planning process.

We also recommend that survey data be combined with relevant expert opinion to develop strategic plans for the management of all ecosystems of national significance. In the table below, we identify that a plan should be developed for each species, but naturally there are locations where species share habitat, and these should be addressed by an overall plan that meets all their life-cycle requirements and then drives the Precinct Structure Planning - not the other way around.

We recommend the protection of all the priority locations contained in this submission, and further to this the following:

- Protect all waterways with a minimum of 200m buffers on each side of the waterway
- Protect all wetlands with minimum buffers as prescribed by Birds Australia (2009)
- Protect all grassy woodland remnants; allow 100m buffers and optimise links.

Recommendation: *That all high conservation significant priority locations be retained and that there be specific prescriptions developed for all ecosystems and species of national significance in line with Significant Impact Guidelines and best available ecological advice where guidelines do not exist, including, but not limited to:*

- *Protecting all waterways with a minimum of 200m buffers on each side of waterways*
- *Protecting all wetlands with minimum buffers as prescribed by Birds Australia (2009)*
- *Protecting all grassy woodland remnants; allow 100m buffers and optimise links.*

Recommendation: *That a more detailed 'ecological structure plan' be developed based on detailed on-ground surveys to proceed and inform any precinct structure plans*

Table 7 Threatened fauna species listed under the EPBC Act identified as potentially occurring within the study area & Recommendations

Matter for Target	EPBC listing	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Natural Temperate Grassland of the Victorian Volcanic Plain	Crit. End.	<p>Actions associated with Melbourne @ 5 million are likely to have a significant impact on the natural temperate grasslands of the Victorian Volcanic Plain, particularly in Melbourne's west. It is likely that up to 6918 ha could be cleared... Mitigation objectives are: 1. Retain 15,000ha of the largest and best areas of habitat in grassland reserves. 2. Manage native grassland reserves. This will generate gain to offset the loss from clearing. 3. Monitor and manage adaptively. A Prescription is only provided for within the current urban growth boundary which states that 'retention of grassland areas will be determined on a case by case basis but any retained remnants must be manageable and demonstrably able to retain their values in the long term - that is, part of a contiguous area of native vegetation under the same type of management typically of at least 150 ha including adjacent areas outside the precinct and priority will be given to areas that support other nationally significant species....</p>	<p>The prescriptions for grasslands are not in line with current science or policy for the protection of biodiversity and communities and need to be revised to allow key high value sites within the urban growth boundary to be retained as part of the 'urban conservation network'. Grassland sites irrespective of size should be retained within the proposed and existing UGB, particularly if they have multiple values and can be logically managed as part of the urban conservation network. We have recommended a series of high priority sites to be incorporated into an enforceable 'ecological' structure plan, which outlines an urban conservation network for the growth areas and informs Precinct Structure Planning.</p>
Grassy Eucalypt Woodland of the Victorian Volcanic Plain.	Crit. End.	<p>The actions associated with the Program are likely to result in significant impact on grassy woodlands of the Victorian Volcanic Plain at some sites in the north. It is likely that up to 924 ha will be cleared. Mitigation objectives are: 1. Retain large and better quality areas in a network of areas within the Melbourne North Growth Area ensuring maximum connectivity between reserves and private land; 2. Progressively secure the long-term protection of retained areas on private land within the Melbourne North Growth Area by donation to the Crown or private land management agreements; 3. Investigate establishing a large reserve south-west of Whittlesea and a larger contiguous area further east and linking it with the proposed Quarry Hill reserve area; 4. Manage retained and reserved Grassy Eucalypt Woodlands; 5. Monitor and manage adaptively. A prescription has been developed to guide the precinct structure planning process.</p>	<p>Retain all locations of Grassy Woodland identified for each Growth Area in this submission. Ensure Grassy woodland locations have a buffer of 100m within areas subject to urban development. Optimise links between patches. Minimum widths required are 600m where feasible.</p>
Temperate Lowland Plains Grassy Wetland	Nominated for listing	<p>The likely extent of unavoidable impact is not yet known with certainty (as it is thought difficult to map given its dependence on seasonal conditions). Further survey will be undertaken during the Precinct structure planning process. It is likely that the primary mechanism for mitigating impacts will be through offsetting.</p>	<p>No loss of wetland habitat. Apply appropriate buffers to edge of wetland habitat: Nationally Significant wetlands; 100m with a 1.5m fence at edge of buffer. Urban development to be >200m from edge of wetland. Other wetlands: 50m buffer with a 1.5m fence at edge of buffer. Urban development to be >100m from edge of wetland.</p>

Mammals	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	Vulnerable	Can be assumed to be an occasional visitor in suitable foraging habitat in study area. Refer text for discussion.	The study area does not contain the two existing colonies, any known satellite sites or any specific foraging areas that are important for this species. The actions associated with the Program are unlikely to impact upon Grey-headed Flying-fox habitats and extant populations.	Retain all locations of Grassy Woodland identified for each Growth Area in this submission. Ensure Grassy Woodland locations have a buffer of 100m within areas subject to urban development. Optimise links between patches. Minimum widths required are 600m where feasible.
Southern Brown Bandicoot (SBB) <i>Isodon obesulus obesulus</i>	Endangered	Recent records south-east of Melbourne including in Cranbourne area. Importance of particular sites will need to be determined.	Impacts on SBB will only occur within the Melbourne South-East Investigation Area. Direct impacts resulting from future urban development inside the new UGB are likely but will be of a relatively local scale if key mitigation measures are taken. Mitigation Objectives: 1. Exclude major areas of suitable habitat from development; 2. Retain, upgrade and connect existing habitats within proposed precincts and outside UGB, including the important population at the Royal Botanic Gardens Cranbourne; 3. Secure and manage retained habitat and linkages to conserve SBB; 4. Monitor retained habitat and new habitat and adjust management accordingly; 5. Carefully plan and construct urban development within precincts to minimise impacts on species. A mitigation Strategy has been developed which states that one quarry site will be retained after quarrying operations cease. Minimising will be addressed through precinct structure planning and a prescription is provided.	Targeted survey is required in the South-east Growth Area in spring. Locations identified for protection and habitat links identified for the south-east in this submission should be protected and enhanced. Management and enhancement plan to be developed and implemented before (not as part of) the Precinct Planning Process, addressing wider landscape links and habitat management.

Birds	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
<p>Wetland specialist migratory EPBC - listed. Australasian Shoveller; Australian Pelican; Australian Reed-warbler; Australian White Ibis; Blue-billed Duck; Cape Barren Goose; Cattle Egret; Crested Tern; Eastern Great Egret; Fairy Tern; Hardhead; Musk Duck; Pied Cormorant; Purple Swamphen; Royal Spoonbill; Straw-necked Ibis</p>	Migratory		<p>It is possible that nationally significant numbers of shorebirds use some of the wetlands on and adjacent to the Investigation Areas, particularly those within the western grassland reserves and those associated with Merri Creek in the north. The actions associated with the Program may impact on migratory bird species either through direct loss of wetland habitat or the disturbance and modification of habitat that may occur from increased urban development. However, current knowledge of bird usage and habitats within the study area indicate that it is not likely that impacts on migratory species will be significant. It is estimated that 342 ha of wetland habitat may be lost as a result of the Program. Mitigation Objectives: 1. Avoid loss of wetlands where possible, including ephemeral wetlands and surrounding habitat; 2. Provide buffers of 100m around key wetlands; 3. Limit indirect disturbances (such as dogs) within 200m of identified wetlands; 4. Retain and manage a variety of wetland types throughout the urban and non-urban areas of Melbourne; 5. Recreate new wetlands for multiple objectives including bird habitat; 6. Limit run-off pollution to wetlands. A prescription has been prepared.</p>	<p>No loss of wetland habitat. Apply appropriate buffers to edge of wetland habitat: Nationally Significant wetlands; 100m with a 1.5m fence at edge of buffer. Urban development to be >200m from edge of wetland. Other wetlands: 50m buffer with a 1.5m fence at edge of buffer. Urban development to be >100m from edge of wetland.</p>
Australasian Bittern	Migratory		Addressed via response to migratory species above.	<p>A high level of impact is expected if buffers are not retained. Habitat buffer and disturbance buffer - 100m. Requires 1.5 m fence around wetland. Urban development buffer 200m.</p>
Australian Painted Snipe	Vulnerable	Previously recorded within the study area	<p>Three locations within the study area where Australian Painted Snipe have been recorded will be excluded from the UGB and included within the proposed western grasslands reserve. It is possible that the species uses other areas within the proposed UGB.... however, suitable habitats for the species in this area are few and are generally more likely to be present further west (or elsewhere). Overall significant impacts on the Painted Snipe are not likely to result from actions under the Program, assuming that known or newly discovered habitat for the species is protected and managed appropriately. No mitigation strategy or prescription is provided.</p>	<p>Suitable habitat found in Investigation Areas, particularly Cane Grass Wetland, Lignum Wetland and Plains Grassy Wetland. These EVCs are mainly south of Ballan Road. Survey is recommended but only when seasonal conditions fill the wetlands (Biosis 2009). A high level of impact is expected if buffers are not retained. Habitat buffer and disturbance buffer - 100m. Requires 1.5 m fence around wetland. Urban development buffer 200m.</p>

Birds	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Latham's Snipe <i>Gallinago hardwickii</i>	Migratory		Addressed via response to migratory species above.	A high level of impact is expected if buffers are not retained. Habitat buffer including reeds and long grass - 100m. Disturbance buffer of 100m including a 1.5 m fence around long grass. Urban development buffer 100m.
Plains Wanderer <i>Pedionomus torquatus</i>	Vulnerable	Previously recorded within the study area. Preferred habitat is grassland vegetation.	It is not considered likely that actions under the Program will cause a significant impact on the Plains Wanderer. No prescription provided.	Recorded across the Investigation Area. A previous study indicated large clusters south of Ballan Road in Live Bomb Range region breeding successfully. Also north of Bulban Road. Rumours of its extinction locally without data are unfounded. A specimen was collected in 2008 from the Werribee area north of Ballan Rd. Targeted survey recommended (Biosis, 2009). Ensure the Western Grassland Reserves are established and reserved within the National Reserve System. Targeted survey for this species in the North and West is required.
Woodland Specialist, EPBC migratory species: Black-faced Cuckoo-shrike; Brown Goshawk; Flame Robin; Horsfield's Bronze-cuckoo; Little Raven; Pallid Cuckoo; Rufous Fantail; Sacred Kingfisher; Silvereye; Tree Martin; Welcome Swallow; Whistling Kite. Migratory			Not addressed.	
Swift Parrot <i>Lathamus discolor</i>	Endangered/ Low Low-	Suitable foraging habitat present in the area but only very few individuals observed during annual surveys.	The Melbourne North Investigation area contains habitat and the species has been recorded in the area. The key impact from the Program will be the removal of red gum grassy woodland in the south of the Melbourne North Investigation Area as urban development progresses. Creating a grassy woodland reserve in the north and protecting extensive adjacent woodland areas further east will be a positive action for the Swift Parrot. No mitigation strategy or prescription provided.	Retain all locations of Grassy Woodland identified for each Growth Area. Ensure Grassy Woodland locations have a buffer of 100m within areas subject to urban development. Optimise links between patches. Minimum widths required are 600m where feasible.

Reptiles	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
<p>Grassland Earless Dragon <i>Tympanocryptis pinguicollis</i></p>	<p>Endangered</p>	<p>The last confirmed sightings in Victoria were from the Rockbank area in 1968 and the Geelong area in 1969 (Robertson and Evans 2004). Sightings between 1988 and 1990 not confirmed despite survey effort.</p>	<p>Actions under the Program are not likely to cause a significant impact on the Grassland Earless Dragon. It is also unlikely the species will be detected during urban development. However, if the species is found during Precinct Structure Planning or during construction, animals will be caught and translocated to secure habitat elsewhere under the direction of DSE.</p>	<p>Few surveys have ever been conducted for this species within the Investigation Areas. Likely to be restricted to high quality grassland areas, although possibly widespread (Biosis, 2009). According to the National Recovery Plan, an unpublished sighting was recorded in Holden Flora and Fauna Reserve. Protection of all high priority grassland sites identified in this submission is required as a minimum. Targeted survey is required as a high priority. Any locations containing this species require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide this process.</p>
<p>Striped Legless Lizard <i>Delmar impar</i></p>	<p>Vulnerable</p>	<p>Can be assumed to be present as resident or regular user of suitable habitat. Relatively easily detected during general/standard field assessments.</p>	<p>The actions associated with the Program are likely to impact directly on Striped Legless Lizard habitats and extant populations, particularly in the west and possibly in the north. Although current knowledge indicates that significant impacts on important populations are unlikely, they cannot be ruled out.</p>	<p>Likely to be widespread. Native and exotic grassy vegetation that has not been subject to substantial disturbance/rock removal (Biosis, 2009). Protection of all high priority grassland sites identified in this submission is required as a minimum. Targeted survey is required as a high priority. Any locations containing this species require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide this process.</p>

Amphibians	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
<p>Growing Grass Frog (GGF) <i>Litoria raniformis</i></p>	<p>Vulnerable</p>	<p>Can be assumed to be present as resident or regular user of suitable habitat. Relatively easily detected during general/standard field assessments. Management protocol still required should additional populations be found during precinct planning surveys.</p>	<p>Significant impacts on some important populations are expected, particularly in the short to medium term, as well as local scale impacts at some sites. The degree and scale of such impacts will depend on how well habitat connectivity is maintained and enhanced in key areas and on ensuring that this connectivity is in place before major new developments start. Mitigation objectives include: 1. Protect Merri Creek's important population; 2. Retain, upgrade and connect or buffer some existing habitats within proposed precincts with 200m buffers around waterbodies and 100m buffers along connecting waterways; 3. Create new habitat within precincts; 4. Manage suitable habitat within proposed western grassland reserves specifically for GGF; 5. Manage hydrology and aquatic vegetation carefully to avoid the introduction of predatory fish; 6. Monitor retained and new habitat, and adjust management accordingly. The mitigation strategy includes the extension of a sub-regional strategy for GGF in the South-east Growth Area. A prescription has been developed to guide the precinct structure planning.</p>	<p>Suitable habitat is found throughout the Investigation Area (Cane Grass Wetland, Lignum Wetland and Plains Grassy Wetland and associated drainage lines of Lollypop and Kororoit Creeks). Most extensive habitat is south of Ballan Road, Kororoit Creek drainage system of the Desktop Investigation Areas and the North section of the Native Vegetation Investigation Area (Biosis, 2009).</p> <p>In line with the Impact Thresholds provided in EPBC Draft Policy Statement 3.1.4, all creeks require a conservation buffer of 200m on each side (total at least 400m). No removal of suitable wetland habitat (this combines with supporting migratory shorebird/wetland dependent bird species). Wetlands should be subject to appropriate buffers (as prescribed for birds above). Targeted survey for GGF is required in spring in appropriate habitat across all growth areas. Sub-regional conservation plans be developed for all known locations of GGF. Habitat and water quality considerations be addressed in conservation planning and implementation commenced prior to any development.</p>

Fish	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Australian Grayling <i>Prototroctes maraena</i>	Vulnerable	This species has been recorded within the Melbourne South-East Investigation Area in Cardinia Creek (Backhouse et al. 2008).	It is not expected that the Program will result in a significant impact to the Australian Grayling.	All creeks require a conservation buffer of 200m on each side (total at least 400m). A sub-regional strategy is required for management of Australian Grayling, Dwarf Galaxias and GGF. Recommendations for water quality and habitat management are to be addressed in the strategy and implemented prior to the commencement of development.
Dwarf Galaxias <i>Galaxiella pusilla</i>	Vulnerable	Likely to occur in creeks within the Melbourne South-East Investigation Area.	DSE fish experts believe it may be present in swamps and wetlands within the Melbourne South-east Investigation Area. Surveys will be conducted during the Precinct Structure Planning Investigation.	All creeks require a conservation buffer of 200m on each side (total at least 400m). A sub-regional strategy is required for management of Australian Grayling, Dwarf Galaxias and GGF. Recommendations for water quality and habitat management are to be addressed in the strategy and implemented prior to the commencement of development.
Invertebrates				
Golden Sun Moth <i>Synemon plana</i>	Critically endangered	Can be assumed to be present as resident or regular user of suitable habitat. Importance of particular sites will need to be determined.	Actions associated with Melbourne @ 5 Million are likely to have significant impact on the Golden Sun Moth at some sites, particularly in the west, and possibly in the north. Up to 6918 ha of grasslands and 1015 ha of grassy woodlands are likely to be cleared. Populations at small isolated sites are not likely to persist in the long term without intensive management inputs. Mitigation proposed: Retain largest (best) habitat areas in grassland reserves, plus a proportion of smaller sites scattered across the range according to the following statewide target: Protection (through appropriate agreed management) of at least 80% of the total area of places where 'high contribution to species persistence' and 'confirmed habitat' intersect. Manage retained areas of native grassland to improve the quality and connectivity of existing habitat, such as by removing barriers, and actively manage open-tussock grassland structure. Connect suitable unoccupied habitat to occupied habitat. Monitor and manage adaptively, and Undertake broader targeted surveys for the species across its historic range to provide context for land-use decisions.	Recorded at a number of locations in the Investigation Areas. Probably widespread but patchily distributed throughout (Biosis, 2009). Protection of all high priority grassland sites identified in this submission is required as a minimum. For a large or contiguous habitat area (>10 ha): There should be no habitat loss, degradation or fragmentation >0.5 ha. For a small or fragmented habitat area (<10 ha): No habitat loss, degradation or fragmentation, where fragmentation of a population refers to the introduction of a barrier to dispersal. Barriers to dispersal could include: breaks in habitat of >200 m; structures that prohibit movement (e.g. buildings, solid fences). Targeted surveys are recommended in grassland areas in spring.

Plants	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Adamson's Blown-grass <i>Lachnagrostis adamsonii</i>	Endangered	Some recent records from Greater Melbourne area, but no recent records in study area.	Actions under the Program are not considered likely to cause a significant impact on this species.	A targeted survey is recommended in the North and West Investigation Areas in locations likely to contain habitat. Locations containing Adamson's Blown Grass require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide the process.
Button Wrinklewort <i>Rutidosia leptorrhynchoides</i>	Endangered	Some recent records from within the study area.	Actions under the Program are unlikely to cause a significant impact on this species and populations are unlikely to be detected during more detailed surveys for Precinct Structure Planning.	A targeted survey is recommended in the North and West Investigation areas in locations likely to contain habitat. Locations containing Button Wrinklewort require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide this process.
Clover Glycine <i>Glycine latrobeana</i>	Vulnerable	Grows mainly in grasslands and grassy woodlands (Jeanes 1996). Found in Greater Melbourne area.	Current information indicates that actions under the Program are not likely to significantly impact this species, unless additional populations are located during detailed surveys for Precinct Structure Planning.	A targeted survey is recommended in the North and West Investigation areas in locations likely to contain habitat. Locations containing Clover Glycine require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide this process.
Cream Spider-orchid <i>Arachnorchis orientalis</i> (syn. <i>Caladenia fragrantissima</i> ssp. <i>orientalis</i>)	Endangered	Previous range extended from the eastern shores of Port Phillip Bay to Wilsons Promontory. Grows in coastal environments. Now known at Rosebud, Wonthaggi, Cape Patterson and Walkerville (Todd 2000). No recent records from the study area, but may potentially occur in Cranbourne area.	This orchid could potentially be present within the Cranbourne area, although this is not considered very likely. Searches for this species will take place as part of Precinct Structure Planning investigations. Suitably qualified botanists will need to search for the species at the appropriate time of year. If found a protocol will be developed.	Targeted survey required in spring. Focus on areas of likely habitat. Ensure conservation of all sites and implement appropriate management as suggested in recovery plan.

Plants	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Curly Sedge <i>Carex tasmanica</i>	Vulnerable	Is now known in only nine sites of remnant grassland in Victoria: at Craigieburn; Lake Condah; and near Portland (DSE 2004a). Recent records within the Greater Melbourne area but not the study area. Importance of particular sites will need to be determined.	In Melbourne it is only associated with Curly Sedge Creek which runs though the Craigieburn Grasslands Reserve. Important population sites within the Melbourne North Investigation Area will be protected from development. Management arrangements will also be put in place to ensure the ongoing conservation of Curly Sedge along the creek and its margins. This will require monitoring and appropriate hydrological and vegetation management. If these management measures are taken it is unlikely that Curly Sedge will be significantly impacted by actions under the Program.	DSE appear to have missed many other sites known to contain Curly Sedge. A targeted survey is recommended in the North and West Investigation areas in locations likely to contain habitat. Locations containing Curly Sedge require protection and a management plan should be developed and implemented prior to Precinct Planning, in order to guide this process.
Green-striped Greenhood <i>Pterostylis chlorogramma</i>	Vulnerable	Grows in moist areas in open forest. No records from the study area (see Fig 35), but may potentially occur in Cranbourne area.	This orchid could potentially be present within the Cranbourne area, although this is not considered very likely. Searches for this species will take place as part of Precinct Structure Planning investigations. Suitably qualified botanists will need to search for the species at the appropriate time of year. If found a protocol will be developed.	Targeted survey required in Spring. Focus on areas of likely habitat. Ensure conservation of all sites and implement appropriate management as suggested in recovery plan.
Large-fruit Groundsel <i>Senecio macrocarpus</i>	Vulnerable	Found in grasslands and grassy woodlands west of Melbourne (Department of Sustainability and Environment 1996). Recent records from within the study area.	Within the Melbourne West Investigation area it has been found within the Melbourne-Bendigo Railway Reserve and on one private land site on the north side of the railway at Tockbank, where it is scattered through rocky native grassland. This site will not be excluded from development and further investigation will be required at the Precinct Structure planning stage...it is quite possible that a significant impact may occur on this species if removal of a substantial proportion of this population is unavoidable. Additional populations of this species are not likely to be located on private land within the study area.	Recorded on one property in investigation area. No targeted survey was undertaken, insufficient information on its distribution (Biosis, 2009). Protection of all high priority grassland sites identified in this submission is required as a minimum. Targeted survey required in known and likely habitat. Protect all known locations with appropriate buffers. Develop and implement a management plan for Large-fruit Groundsel to strategically guide the Precinct Planning process.

Plants	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
<p>Maroon Leek-orchid <i>Prasophyllum frenchii</i></p>	<p>Endangered</p>	<p>Known from Clyde near Cranbourne. Cranbourne area must be surveyed in October.</p>	<p>One site is known, on the railway reserve near Clyde in the South-east Investigation area. A conservation management plan will be prepared before adjacent Precinct Structure Plans are finalised. As the site containing the Maroon Leek-orchid will be excluded from development it is not likely that the Program will result in significant impacts to this species. However, this assumes the ongoing implementation of management in line with the conservation management plan....</p>	<p>Targeted survey required in spring. Focus on the old South Gippsland Railway line and other areas of likely habitat. Ensure conservation of the entire length of rail reserve as a habitat link for flora and the Southern Brown Bandicoot. Implement appropriate management as suggested in recovery plan.</p>
<p>Matted Flax-lily <i>Dianella amoena</i></p>	<p>Endangered</p>	<p>Many records from within the Greater Melbourne area, including the Melbourne South-East Investigation Area (see map).</p>	<p>Current knowledge of Matted Flax-lily and application of the Commonwealth's Significant Impact Guidelines indicate that actions under the Program are likely to result in significant impact at some sites in the north. It is assumed that such impacts would be on very small populations in degraded habitat. Further detailed information would be collected to determine the extent of the impact. A prescription has been developed for applying within the Precinct Structure Planning Process.</p>	<p>Protection of all high priority grassland sites identified in this submission is required as a minimum. Targeted survey required in known and likely habitat. Protect all known locations with appropriate buffers. Develop and implement a management plan for Matted Flax-lily to strategically guide the Precinct Planning process.</p>
<p>Metallic Sun-orchid <i>Thelymitra epipactoides</i></p>	<p>Endangered</p>	<p>Known with certainty from eight main populations in Victoria in the southwest and in Gippsland (Coates et al. 2003). There are no recent records from the study area (see map), but it may potentially occur in Cranbourne area, based on habitat requirements.</p>	<p>This orchid could potentially be present within the Cranbourne area, although this is not considered very likely. Searches for this species will take place as part of Precinct Structure Planning investigations. Suitably qualified botanists will need to search for the species at the appropriate time of year. If found a protocol will be developed.</p>	<p>Targeted survey required in spring. Focus on areas of likely habitat. Ensure conservation of all sites and implement appropriate management as suggested in recovery plan.</p>

Plants	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
River Swamp Wallaby-grass <i>Amphibromus fluitans</i>	Vulnerable	Recent records in Greater Melbourne area, including the study area. Importance of particular sites will need to be determined.	This species has only been recorded in one location within the Melbourne West Investigation Area, but may be present elsewhere. It is most likely within the proposed western grassland reserve, but could appear within the Melbourne West Investigation Area and potentially in the South-east and North Investigation areas in farm dams or permanent swamps. Based on current information, actions under the Program are not likely to result in a significant impact on this species unless additional populations are located during detailed surveys for Precinct Structure Planning.	A single population was found outside the investigation areas. No targeted survey was undertaken, insufficient information on its distribution. Further survey recommended. Most likely to occur in the wetlands south of Ballan Rd (Biosis, 2009). Targeted survey required in known and likely habitat (eg. south of Ballan Road). Protect all known locations with appropriate buffers (suggest buffers prescribed for migratory wetland-dependent birds). Develop and implement a management plan for River Swamp Wallaby-grass to strategically guide the Precinct Planning process.
Small Golden Moths <i>Diuris basaltica</i>	Endangered	Recent records from the Greater Melbourne area, including the study area.	Known in only two populations, both in Melbourne (Laverton Airbase and Clarkes Road Grasslands). Clarkes Road Grasslands is located within the Investigation Area. It will be excluded from urban development, permanently protected and managed to maintain this critically important population. If these arrangements are put in place, actions under the Program are not likely to result in a significant impact on this species.	Other populations are known along the railway line easement west of Werribee and also along the railway line between Donnybrook and Craigieburn. This location has not been acknowledged in the Strategic Impact Assessment report. Targeted survey required in known and likely habitat (e.g. along the railway easement west of Werribee). Protect all known locations with appropriate buffers. Develop and implement a management plan for Small Golden Moths to strategically guide the Precinct Planning process.
Spiny Rice-Flower <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Critically endangered	Recent records from study area (see Map). Relatively easily detected during general/standard field assessments.	The actions associated with the program are likely to result in a significant impact at some sites in the west, although further information is needed to determine the extent of the impact. As populations close to Melbourne are at the south-eastern extent of the species' range, any loss would be considered a significant impact. Mitigation objectives: 1. Retain largest (best) habitat areas in grassland reserves, plus a proportion of smaller sites scattered across the range; 2. Manage retained areas of native grassland to improve quality and connectivity of existing habitat by removing barriers and actively managing open-tussock grassland structure. Connect suitable unoccupied habitat with occupied habitat; 3. Monitor and manage adaptively; 4. Undertake broader targeted surveys for the species across its historic range to provide context for land use decisions. A mitigation strategy is proposed. A prescription has been developed.	Protection of all high priority grassland sites identified in this submission is required as a minimum. Recorded in scattered populations throughout Investigation Area, particularly in areas of high-quality grassland. This study highlighted that the current known extent of this species is not well documented. Higher density locations were south of Ballan Rd and directly south of Melton Desktop investigation area (Biosis, 2009). Avoid any fragmentation of a population. Avoid any loss of >5 individuals. Retain all individuals from any population which occurs on the edge of the Spiny Rice-flower's current known distribution.

Plants	EPBC status	DSE comments	DSE Assessment of Program and Mitigation Measures	VNPA Recommendation
Swamp Everlasting <i>Xerochrysum palustre</i>	Vulnerable	A few recent records from Greater Melbourne area, including in the study area near Cranbourne.	One site is known to be located within the rail reserve in the South-east Investigation area, but the species may potentially be present in shallow wetlands elsewhere, including within the other Investigation Areas. Current information indicates that actions under the Program are unlikely to result in a significant impact on this species unless additional populations are located during surveys for Precinct Structure Planning. A conservation management plan will be prepared for the population in the South-east before adjacent Precinct Structure Plans are finalised.	Targeted survey required in spring. Focus on areas of likely habitat, including known site in the Upper Merri Catchment. Protect all known locations with appropriate buffers (suggest buffers prescribed for migratory wetland dependent birds). Develop and implement a management plan for Swamp Everlasting to strategically guide the Precinct Planning process.
Swamp Fireweed <i>Senecio psilocarpus</i>	Vulnerable	Scattered populations across western Victoria including one to the north of Melbourne.	This species has only been recorded at one location (Hearne Swamp) within the Northern Investigation Area,. However, it may well be present elsewhere. It is most probably within areas of grassy wetland to the north and west of Melbourne. The OMR/E6 corridor passes through one of the sites within the swamp where this species has been recorded. It is likely that some of the population at Hearne Swamp will be affected. The likely extent of unavoidable impact is not yet known and further investigation will be required prior to commencement of construction. No prescription has been developed.	Apply buffers to wetlands in Growth Areas as prescribed for migratory species. Develop and implement a management plan for Swamp Fireweed ready for implementation at any sites where it is found through future survey. Conduct any survey in accordance with best times for Swamp Fireweed identification.

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