Warringal Conservation Society

# Submission to the Inquiry and Advisory Committee on the Environmental Effects Statement for the North East Link Project

**AUGUST 2019**

# Contents

# PART 1: INTRODUCTION AND OVERVIEW

## ABOUT WARRINGAL CONSERVATION SOCIETY (WCS)

### History of WCS and our goals

The society was founded in 1970 by concerned community members to save Banyule Flats from being developed into sports fields. The broad goal was to rehabilitate the cleared farm paddocks with indigenous plants and trees to encourage wild birds and animals to return, and to create a beautiful space for all to enjoy. This has been remarkably successful, with major credit going to our 50 year collaboration with Banyule City Council. WCS is a not for profit incorporated organisation with members from all walks of life.

### Our Aims

- To restore and enhance indigenous vegetation to provide habitat and carbon control in Banyule's local parks adjacent to the Yarra River, these being Banyule Flats Reserve and Warringal Parklands (this project's conditional no-go zone)
- To share information about conservation and natural history
- To promote sustainable living and use of resources
- To encourage our local community to be active in conservation
- To interact with governments at all levels to keep them accountable for environmental decision making.

### Our Activities

- We continue to plant and weed on a monthly basis in our heartland, and also support other local groups with their habitat restoration
- We hold monthly meetings to inform about local, state and national issues and events, with guest speakers presenting on a wide range of topics, including natural history, conservation, ecology and sustainable living.
- We advocate with government at all levels on local to global environmental issues, and we add our voice to the chorus of those calling for a sustainable future.

### Our Successes

- Banyule Flats Reserve and Warringal Parklands, largely cleared of vegetation in the 1840s, have been rehabilitated to the extent that the parks now support Eastern Grey Kangaroos, Swamp Wallaby, echidnas, wombats, platypus and many bird species.
- Banyule Flats is now acknowledged as being of State Ecological and Conservation Significance (Practical_Ecology 2017)
- WCS has collated and published three books:
    - Birds of Heidelberg 1981
    - Significant Trees in Heidelberg 1982
    - Beautiful Banyule, A Register of our City's Natural Assets 1999

- WCS regularly makes submissions to Banyule City Council, Members of Parliament, State and National enquiries and the Victorian Civil Administrative Tribunal.
- WCS and its members have received many acknowledgements for contributions to the local environment. Several individual members of WCS have achieved national and local awards for their environmental work, including the late Reg Johnson OAM and Robert Bender OAM.
- In 1982 the Conservation Council of Victoria awarded WCS the Annual Victorian Conservation Prize for "…consistent and enduring contribution to the protection of the regional environment and to understanding the environment's unique character."
- In 2010 WCS received a Certificate of Appreciation Award from Craig Langdon, State Member for Ivanhoe.
- In 2012 Banyule City Council awarded WCS the Sustainability Award for Volunteer Groups.

**Our involvement in the NELP**

Since the announcement of the North East Link Project (NELP) The Society and its members has:

- been actively involved in discussions with the North East Link Project (Authority), Banyule City Council, state and local environment groups and local community groups.
- met with and written to local, State and Federal MPS to discuss our concerns.
- welcomed the opportunity to be represented on three of NELP's Community Liaison Groups: CLG (North), CLG (Environment) and the Walking and Cycling Group.
- attended many of the NELP information sessions and workshops and met with NELP staff and specialists on many occasions.
- made submissions to both NELP EPBC Referral and the NELP Public Environment Report. (Refer to Appendix B for our submission to the CLG. Note that this was completed before release of the NELP EES).

## WCS SUBMISSION

**WCS strongly opposes the proposed North East Link (NEL) in its current form and calls for increased mitigation of environmental impacts and alterations to design.**

WCS wishes to acknowledge the potential health and social impacts of this project, including:

- the environmental cost at both a local and global level of continued /growing vehicle use
- that large toll-roads will not solve Melbourne's medium and long-term transport needs, and will divert funds from other much needed public transport and rail freight initiatives

Our submission relates to the North-South section of the NEL between the M80 Ring road and the Eastern Freeway at Bulleen, with particular focus on the environment.

### Project design

**We do not agree with the conclusions stated by NELP in Section 28.3 of the EES with regard to meeting the Evaluation Objectives:**

*28.3.1 'Evaluation objective – To increase transport capacity and improve connectivity to, from and through the north-east of Melbourne, particularly freight movement via the freeway network instead of local and arterial roads, while managing the effects of the project on the broader and local road, public transport, cycling and pedestrian transport networks.'*

- No consideration has been made of a northern tunnel extension, in particular the SMART taxpayers design proposed by Frederick Buono (Submission 646).
- The only integration with public transport infrastructure is additional parking at Watsonia railway station and an enhanced Doncaster bus service. Walking and cycling paths are not a transport solution for a large proportion of the community.

*28.3.2 'Evaluation objective – To minimise adverse air quality, noise and vibration effects on the health and amenity of nearby residents, local communities and road users during both construction and operation of the project.'*

- We do not believe that the wellbeing of the public is served by using outdated state standards for air quality, noise and vibration

*28.3.3 'Evaluation objective – To manage effects of the project on land use and the social fabric of the community with regard to wellbeing, community cohesion, business functionality and access to goods, services and facilities.'*

- The trench adjacent to Greensborough road will further dissect the communities of Watsonia and Macleod/Yallambie.

*28.3.4 'Evaluation objective – To minimise adverse effects on landscape values, visual amenity, recreational and open space values and to maximise the enhancement of these values where opportunities exist.'*

- There will be an overall net-loss of green open space within the corridor, impacting on amenity and mental health, in a city with increasing housing density
- We argue that the natural environment will be degraded, not maintained and certainly not enhanced. One cannot replace what has gone.

*28.3.5 'Evaluation objective – To avoid or minimise adverse effects on vegetation (including remnant, planted and regenerated) listed rare and threatened species and ecological communities, habitat for listed threatened species, listed migratory species and other protected flora and fauna, and address offset requirements for residual environmental effects, consistent with relevant State policies.'*

- The reference design does not adequately consider loss of habitat. Although the loss of individual Matted Flax-lily plants may be mitigated, there will be loss of the habitat that supports this endangered species (EPBC Act 1999).
- We believe that the impact on surface and ground water in the Banyule Flats area is uncertain and this could impact habitat for Latham's Snipe.
- We argue that biodiversity and ecological integrity will be significantly affected with the loss of Studley Park Gum, arguably the loss of this Gum's best viable population, and loss of Matted Flax-lily habitat.
- We do not believe that the objectives of the EPBC Act or the spirit of the Fauna and Flora Guarantee Act have been met. (Australian Government 1999; State of Victoria 1988)
- 26.3.6 'Evaluation objective – To avoid or minimise adverse effects on Aboriginal and historical cultural heritage values.'
- The River Red Gum at the corner of Bridge Street and Manningham Road will be lost. This tree is of significant community value and was recently voted as the National Trust's 2019 Victorian Tree of the Year (National Trust 2019).

*23.3.7 'Evaluation objective – To avoid or minimise adverse effects on land stability from project activities, including tunnel construction and river and creek crossings.'*

- There is an acknowledged risk of land subsidence at Banyule Flats.

*23.3.8 'Evaluation objective – To manage excavated spoil and other waste streams generated by the project in accordance with the waste hierarchy and relevant best practice principles.'*

- There is insufficient detail on how water from the northern section of Banyule Creek, combined with intercepted ground water and road surface run off will be treated and released.

*28.3.9 'Evaluation objective – To avoid or minimise adverse effects on the interconnected surface water, groundwater and floodplain environments.'*

- There are acknowledged risks of water mounding, interception of groundwater and flooding, and plans for modification of open creeks into covered drains.

*28.3.10 'Evaluation objective – To demonstrate that the project will contribute to the need for an effective, integrated and climate change-resilient transport system that provides a wide range of travel choices for all Victorians.'*

- We contend that building tollways/freeways will only add to the effects of climate change with increased dark road surface and reduced tree canopy.
- The travel choices are car focused and the tollway does nothing towards an integrated transport system. Train and bus transport is hardly improved by the Doncaster Busway.

## Net loss of Public Open Space

We contend that a net loss of public open space is not acceptable. Those areas permanently lost after construction should be compensated by purchase of land within nearby areas and then converted to active or passive recreational space. We propose that this may be achieved via the Draft Yarra River – Bulleen Precinct Land Use Framework Plan.

New green land bridges across the northern section of the NEL are part of the design and not adequate compensation for permanent loss of Public Open Space. We acknowledge that the land bridges provide some visual relief and connectivity, however we dispute the notion that they provide recreational space because of the exposure to vehicle noise and emissions.

## Insufficient evaluation of alternatives

WCS does not believe that the alternate route options were rigorously assessed.

The Society believes that the project fails to meet its objectives and is a waste of public money. The Grattan Institute has asserted that 'we should be sceptical of the idea that big new roads are 'congestion busters', they cost a fortune, take years to build, and can often fill up with new traffic of their own.' (Terrill 2017). The NELP will not be completed in the short term, and is not a solution for medium to long-term transport issues in the North East of Melbourne.

## Corridor A design options

**WCS believes that alternative design developments within Corridor A have not been fully considered.**

Several options within Corridor A do not appear to have been fully considered in the development of the design. These include:

- the extension of the tunnel 2.5k north of Lower Plenty Road using a combination of tunnel boring machine (TBM), mined and cut and cover tunnel construction methods. The cost of extending the tunnel could be balanced against the savings from eliminating Lower Plenty interchange. Advantages would be:
    - reduction in overall gradient (and therefore reduction in fuel consumption, emissions and noise from trucks using air brakes in the steeper trench),
    - reduction of the volume of hard surfaces and associated run-off.
- remove tolls from the north-south component of NEL, encouraging its use and discourage rat-running on local roads especially Rosanna Road

## WCS supports the S.M.A.R.T. Taxpayer design for extension of the tunnel northward

**WCS also supports the alteration of the Manningham interchange, in order to:**

- avoid removal of the 300+ year old River Red Gum, the Caltex Tree, on the corner of Bridge Street. We are very concerned at the proposed loss of this large River Red Gum necessitated by the current design of this interchange.
- retain businesses and jobs
- reconsider the alternative retrieval site location for the Northern TBM launch site, north west of Banksia Street/Bridge Street intersection, which encroaches on highly valued parkland, in proximity to the Yarra River. There would be potential for silt run-off into the Yarra with reduction of water quality.

## Public and integrated transport systems

Improving public transport services and integration has not been fully considered. Although a stated response of the NELP is 'Improved utilisation of existing transport infrastructure', (NEL EES Table 2-1), there is no mention of public transport improvements other than increased parking at Watsonia Station and enhancement of the existing bus service on the Eastern Freeway.

The reference design of the NELP therefore does not match the objectives of the action or indeed the vision statement of the Transport Integration Act 2010 (State of Victoria 2010), which states: 'The Parliament recognises the aspirations of Victorians for an integrated and sustainable transport system that contributes to an inclusive, prosperous and environmentally responsible State.' If the NEL is completed residents in the North East will still have no feasible alternative to driving. Walking and cycling are not appropriate options for many in the community due to age and security issues e.g. at night. Much more could be done to enhance bus and train services in the north-east to reduce non-freight road use.

We acknowledge that the dedicated lanes and increased park-and-ride facilities will enhance the current Doncaster bus service route. However, to provide an integrated transport system more connection with public transport is needed to avoid commuters driving to the Busway and therefore increasing traffic on local roads.

## WCS submission focus: the natural environment

WCS is opposed to current plans for the North East Link through Banyule. If the North East Link is to be constructed, we believe that extensive changes should be made to the plan detailed in the reference design to reduce the environmental impacts of construction and operation.

NELP will result in loss of habitat, impacting the viability of several federal, migratory and state listed species, and reducing local biodiversity. WCS is concerned about the cursory description of the loss of large trees and habitat, and the uncertainty due to potential groundwater drawdown and surface water management.

Our concerns include:

- Removal of trees to enable construction
- Alteration to ground water and surface water resulting in further loss of trees and habitat
- Impact on threatened fauna and flora and local biodiversity
- Loss of 10.98 hectares of Plains Grassy Woodland, including a number of Studley Park Gums
- Impact on water quality and water flow of Plenty River, Banyule Creek, Koonung Creek and the Yarra River

We note the concurrent assessment of the *Draft Yarra River – Bulleen Precinct Land Use Framework Plan*, (Department of Environment, Land, Water & Planning 2019). This parallel assessment process is not mentioned in the EES although the area of these projects over-lap with and are adjacent to NELP works north and south of the Manningham Road interchange. The Society is making a separate submission to the Bulleen Precinct Advisory Committee.

## Works at Banyule Flats and Warringal Parklands

The NELP EPBC Referral included Banyule Flats in a designated 'conditional no-go zone' area for the purpose of unspecified surface works (NELP EPBC Referral 2018, p5). In the EES there is no clear identification of this zone or description of works that are permitted or prohibited at Banyule Flats.

The NEL EES p. 8-18 states that 'The decision to build a significant portion of North East Link as tunnels has enabled direct impacts on property and areas of ecological and heritage value to be reduced. Direct impacts on Banyule Flats, the Warringal Parklands, the Yarra River as well as the Heide Museum of Modern Art and other residential properties have been avoided.' We appreciate the efforts taken to avoid above ground works in these sensitive areas, thus avoiding direct impacts, but there is no certainty that Banyule Flats and Warringal Parklands will not be used as staging or water treatment areas. We have concerns about potential indirect effects related to ground and surface water, contamination and vibration, addressed later.

This area deemed to be of State Ecological and Conservation Significance (Practical Ecology 2017), could be impacted by water drawdown, subsidence and flooding with contaminated water, threatening this habitat of migratory Latham's Snipe.

## Macleod Railway Station

Works at Macleod Railway Station are not included in the list of works in the Project Description, (EES ch 8, 8.3), although they are described elsewhere indicating that it may be necessary to remove or prune trees which are Swift Parrot habitat (EES Ecology, Ch 25 p25-33). Due to the critically endangered status of the Swift Parrot we believe that their known foraging habitat at Macleod Station should be designated a 'no-go zone'.

## Yarra Bend

The Grey-headed Flying Fox camp is very close to the Eastern Freeway at Yarra Bend. In the absence of details of works to be conducted in this area the extent of the 'no-go zone' deserves consultation with stakeholders.

## Simpson Army Barracks

The western margin of the Simpson Army Barracks supports endangered Matted Flax-lily and a unique cohort of Studley Park Gum, and should be designated a 'no-go zone.' We expand on this later.

## Banyule Creek and Koonung Creek

The design impacts adversely on both these local waterways, effectively placing the northern section of Banyule Creek into pipes and 1 kilometre of Koonung Creek into a covered culvert. We contend that it is no longer acceptable to exclude light from natural waterways and should be avoided (Natural Water Retention Measures 2013; City of Ipswich 2018). We enlarge on Surface Water impacts later.

## Historical Caltex Tree

The 300+ year old River Red Gum on the corner of Bridge Street and Manningham Road is protected by a Manningham Council Heritage Overlay, HO24. Although dismissed in chapter 20 as of no Aboriginal Cultural Heritage value, we read in the EES submission of the Wurrundjeri Woi-wurrung Cultural Heritage Aboriginal Council that they do indeed wish for it to be preserved as a remnant of pre-European settlement (EES submission No. 700.2019).

Although there is no evidence of cultural scarring (EES Ch 20, p 20-17), the tree is considered to be an important songline marker, and sister to the 'Yingabeal' scar tree located nearby at Heide. (History Teachers Association of Victoria 2016).

It is of considerable social value also to the local and wider community. This is evidenced by Manningham Council's commitment to protecting the tree and to the recent announcement that it is the National Trust's Victorian Tree of the Year, receiving an impressive 28.5% of the votes (Manningham Council 2019; National Trust 2019). The proposed written, oral and photographic records are no compensation for the loss of this valued tree. Alternative designs for the interchange should be developed so that it can be protected.

## Bolin Bolin Billabong

Bolin Bolin Billabong is a no-go zone due to its significance to the Wurundjeri Woi-wurrung people, and as a remnant intact riverine River Red Gum habitat. Even without the NELP the billabong is challenged by controlled Yarra River flows causing less inundation. We agree with the submission of the Wurundjeri Corporation (EES Submission 700), and endorse its concern for groundwater impacts, potential dewatering in the area of the southern portals, and impacts to the groundwater dependant ecosystem encompassing the deep water pool and surrounding River Red Gums.

## PART 2: WATER, CLIMATE AND HABITAT

### Impacts on Groundwater

The key findings in Technical Report N – Groundwater, are bespattered with terms such as "potential, possible, many, most, considered to be low" giving an overall impression of uncertainty and speculation. WCS does not claim to have any expertise in hydrogeology, but we were surprised that modelling was based on one data set at 69 bores (Clause 3.2.1 p18). Besides possible water drawdown there are possibilities of altered salinity, exposure of acid-sulphate soils, incursion into contaminated soils, particularly during construction. We are concerned that there will be drawdown at Simpson Barracks, Banyule Flats and Bolin Bolin Billabong. This will impact on long term habitat viability. In addition, we believe that the potential effects of climate change have been underestimated (EES Tech Rep. Q Ecology, Appendix C pg. 155). Our concerns are not ameliorated by Chris Smitt in his expert witness report (Document 30a).

Impacts to groundwater have been noted throughout our EES submission and do not need repetition. We agree with EPR GW2 that monitoring of groundwater must be monitored prior to, throughout and post construction 'throughout the study area', which we trust will include at Banyule Flats, a 'no-go zone'.

### Impacts on Surface Water

Clarification is required regarding the design to replace 1.4 km of the northern section of Banyule Creek. We are concerned about the culverting of the upper reaches, this proposal being contrary to Melbourne Water's guidelines in relation to waterways design. The same applies to Koonung Creek. There are no details of water sensitive urban design occurring in Borlase Reserve and we question whether there is sufficient area for a waterbody at this site.

We have concern for contaminated stormwater runoff from road surfaces in the trench and vehicle spill in the northern section and wonder how this will be collected, treated and disposed of. We are not confident that the risk of flood has been adequately addressed. A primary concern is that Banyule Flats could be inundated by contaminated water.

Water management is not only of concern with regard to quality, we are concerned that water from the local catchment will be lost from the area and this will have a cumulative and long-term impact on local ecology.

### NELP and climate change

*'The Victorian Government is responsible for managing climate change risks to its own assets, services and operations. The government will also need to embed climate change considerations into policy and regulation decisions concerning industry, community services and infrastructure.'*

(Department of Environment, Land, Water & Planning 2018, page 9)

The Victorian Commissioner for Environmental Sustainability concludes that climate change is having a serious impact on Victoria's environment right now and predicts that Victoria is set for more frequent and intense droughts, fires, heatwaves, extreme rainfall events and coastal inundation. (Commissioner for Environmental Sustainability Victoria 2019)

**WCS believes NELP's sustainability commitment to climate change misses the point.**


Source: NELA 2018 Sustainability Factsheet

Achieving Victoria's emission reduction targets by reducing carbon emissions during construction of NELP or preparing for the challenges of climate change through resilient design is only half the story. Neither of these NELP commitments speak to mitigation of vehicle emissions from future NELP users. (North East Link Authority 2018)

With Victoria's population increasing, congestion and overcrowding on roads and public transport are already growing issues. There will be more congestion within and adjacent to the Project boundary during construction. An effective transport network that includes all types of transport is essential for a sustainable, liveable and prosperous Victoria. However, pollution from transport, predominantly motor vehicles, increases greenhouse gas emissions and negatively affects air quality. The Department of Environment and Energy's own statistics show that Australia's greenhouse gas pollution is at record high levels after rising for more than 4 years.

The Project also severely negates other actions taken by all levels of Government. Victoria's Climate Change Framework describes a shared vision for a net zero emissions and a climate-resilient Victoria in 2050. (Department of the Environment, Land, Water & Planning 2018)

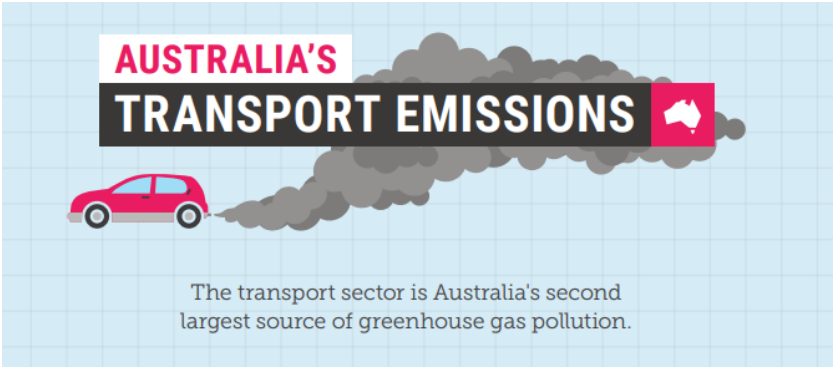
WCS believes that NELP's sustainability commitments must also include new approaches and new ways of thinking to better integrate with public transport, minimise the adverse impacts of vehicle emissions, increasing carbon capture and increasing tree canopy to reduce surface temperatures.

## Vehicle emissions

*'Road based transport accounts for an even greater share of transport emissions in Australia than the global average, at around 85%'*

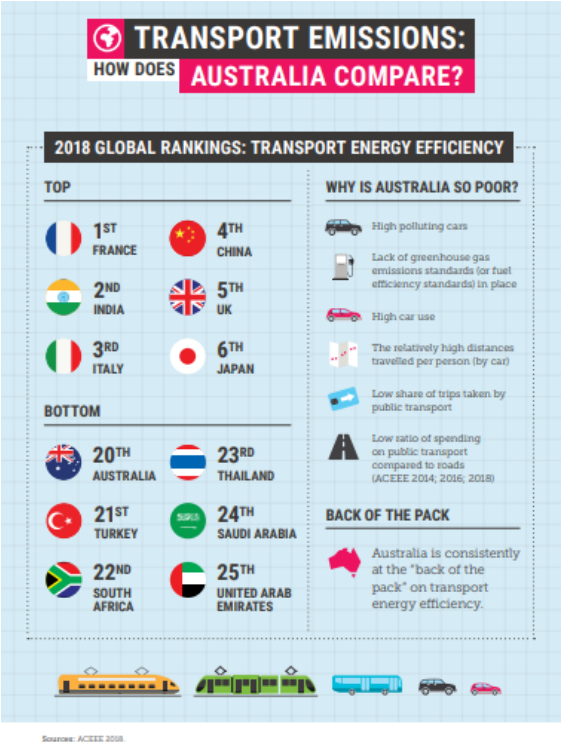
(Department of the Environment and Energy 2017, cited in Climate Council 2018a)

The transport sector is Australia's second largest source of greenhouse gas pollution.



The Australian Climate Council's publication Waiting for the Green Light reports that Australia rates poorly on transport emissions, being ranked at 20th in the world for transport energy efficiency. Reasons for this include (Climate Council 2018b):

- no greenhouse gas emissions standards for vehicles
- high car use
- relatively high distances travelled per person by car
- low share of trips taken by public transport
- low ratio of capital spending on public transport compared to roads.
  (Climate Council 2018b)




(Climate Council 2018b)

It is not realistic to assume that Melbourne's entire fleet of cars and freight vehicles will be electric by the completion of the NELP. There was a level of disagreement on issues at the Air Quality Expert Witness Conclave (IAC Doc 131) and WCS does not have scientific expertise in this area. WCS does believe however that the NELP tunnel offers an opportunity to harvest and filter vehicle emissions, thereby mitigating some of the NELP contribution to greenhouse gas. The present design of the tunnel ventilation stacks does not include filtration equipment, or the capability to retrofit to mitigate emissions in the future. The Society supports the EPR AQ2 amendment proposed by the Environment Protection Authority (EES submission 600) to add the words 'the design should include provision for retrofitting of tunnel ventilation pollution control equipment if subsequently required'.

## Loss of canopy

While the loss of trees has a huge impact on habitat as discussed earlier in this document, the loss also has a significant impact on other environmental factors. Trees sequester carbon, reduce urban heat island effects, and absorb pollution from transport emissions; all of these mitigating climate change. (Ghosh and Yung 2017) (Environment Protection Agency 2016)

Despite local measures to prevent tree loss and to increase vegetation, a recent report has shown that Banyule and many other local Councils already have decreasing levels of vegetation. (Hurley, Saunders et al. 2019)

The EES has estimated that the project will cause removal or death of approximately 26,000 mature trees, and that these will be replaced by planting 30,000 trees. (North East Link Project April 2019). In her expert witness statement Meg Caffin describes a NELP commitment 2:1 replacement of amenity trees (IAC Doc 24u).Time is needed for new trees to become mature and provide the benefits of canopy, many decades after the completion of the NELP. We are pleased that the amended EPR AR3 reflects our comments.

Meg Caffin's expert witness statement (IAC Doc 24u) estimates that only 30 to 40 per cent of trees lost because of the Project can be replaced within the project boundary. This loss will result in significant deterioration of the environment for all who live in Banyule and other impacted areas. Replacement trees must be located within or adjacent to the locations where tree losses occur to counteract the climate change impacts of NELP previously described. The replacement planting should commence as soon as the project commences.

*'Support a cooler Melbourne by greening urban areas, buildings, transport corridors and open spaces to create an urban forest', aiming to mitigate the impact of climate change.'*

Source: Plan Melbourne 2017 policy point 6.4.1 (Department of Environment Land Water and Planning 2017)

**WCS believes that the NELP has ignored the many local Council and Victorian policies incorporating the importance of preserving and increasing tree canopy to improve air quality, mitigate climate change and increase the liveability of our cities.**

(Banyule City Council 2014) (Resilient Melbourne and Nature Conservancy Australia 2019).

At a time when science and government policies urge the importance of increasing tree canopy, it makes no sense to either reduce the number of existing trees, or to not replace trees lost because of government infrastructure projects.

It appears to the Society that the construction of the NELP is actually inconsistent with the state government's aim of transitioning to zero growth emissions to meet Victoria's Climate Change Act 2017. (State of Victoria 2017a)

## PART 3: ECOLOGY

### RISK TO THREATENED SPECIES

| Species | Status | | | NELP position | WCS Comment |
|---|---|---|---|---|---|
| | EPBC | FFG | advisory | | |
| Matted Flax-lily *Dianella amoena* | E | E | | No residual impact after translocation | Translocation unlikely to be successful. |
| Studley Park Gum *Eucalyptus* X *studleyensis* | | | E | General offsets & management plan | Will not ensure ongoing survival of taxon. |
| Clover Glycine *Glycine latrobeana* | Vu | Th | | Suitable habitat but not detected. | Insufficient data. Precautionary principle should apply. |
| River Swamp Wallaby-grass *Amphibromus fuitans* | Vu | | | Suitable habitat but not detected. | Insufficient data. Precautionary principle should apply. |
| Swift Parrot *Lathamus discolour* | Cr E | Th | | Effort to preserve priority habitat at Macleod Station. Simpson Barracks not significant habitat. Impacts negligible | No commitment to protection of priority habitat. Insufficient data for Simpson Barracks, but likely to be significant habitat. |
| Powerful Owl *Ninox strenua* | | Th | | Impacts negligible | Insufficient data in EES. Additional information suggests significant impacts. |
| Latham's Snipe *Gallinago hardwickii* | M | | Near Th | Impacts unlikely | Impacts in tunnelled part of project not considered in detail. Precautionary principle should apply. |
| Grey-headed Flying-fox *Pteropus poliocephalus* | Vu | Th | | Impacts negligible | Tree loss will be a significant contributor to cumulative habitat loss threatening this species. |
| Macquarie Perch *Macquaria australasica* | E | Th | E | No significant effects | Effects of reduced water quality in the Yarra River not considered |
| Australian Grayling *Prototroctes maraena* | Vu | Th | Vu | No significant effects | Effects of reduced water quality and flow regime in the Yarra River not considered |

**Table 1. Summary of concerns regarding threatened species.** E = endangered; Vu = vulnerable; Th = threatened Cr E = Critically endangered ; M = Migratory

# FLORA

## Matted Flax-lily *Dianella amoena*

The Matted Flax-lily is listed as endangered under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and is listed under the Flora and Fauna Guarantee Act 1988 (FFG Act). 1,400-2,500 Matted Flax-lily are thought to exist and a major threat to their survival is habitat destruction or disturbance (Carter 2010). The Simpson Army Barracks supports one of the largest known populations of Matted Flax-lily. Habitat supporting 83 Matted Flax-lilies within the Barracks and 12 plants/patches elsewhere in the NEL project area will be destroyed during the construction of the NEL.

The 95 Matted Flax-lily impacted by habitat destruction will be translocated to sites assessed to constitute suitable alternative habitat. This follows the pattern of recent decades where Matted Flax-lily have been widely translocated to make way for development. The 2010 National Recovery Plan for the Matted Flax-lily notes that translocated plants represent approximately 46% (810 of 1776) of plants at the 21 most significant sites (Carter 2010).

Since 2010 Matted Flax-lily translocation has continued, placing a great deal of faith in this approach to ensure the long term survival of an endangered species. However, the Department of Environment does not specifically list translocation under “management practices required to conserve the species” (Department of the Environment 2019a). The National Recovery Plan for the Matted Flax-lily (Carter 2010) suggests translocation to “bolster existing populations or establish new populations”, but does not mention translocation to completely mitigate the loss of existing populations as proposed by NELP. Approximately 3.8%-6.7% of the total known existing Matted Flax-lily population will be translocated due to the NEL project meaning that failure at any stage of the process will have serious consequences for this species. Additionally, losses of remaining Matted Flax-lily are likely to occur when the Army reinstates perimeter fences, border tracks, fire breaks and drainage.

While individual Matted Flax-lily survive relocation in the short to medium term due to their rhizomatous nature, translocation of this species is a relatively new approach and whether it recreates populations that are viable in the long term is an open question. Previous Matted Flax-lily translocations are cited as evidence of the effectiveness of this approach in the EES and Mr Miller’s expert witness report. However, examining recently reported outcomes for Matted Flax lily translocation projects raises concerns.

A report from the Sugarloaf Pipeline translocation project notes losses of between 5-30% at five of six translocation sites over a five year period (Carr & Kershaw 2014). This indicates a steady decline that will see the complete loss of Matted Flax-lily at the majority of translocation sites over several decades. It is also noted that invasion of translocation sites by introduced weeds and indigenous plants presents a major issue that is difficult to manage and will threaten the survival of translocated Matted Flax-lily for many decades.

A recent report details monitoring translocated and retained Matted Flax-lily after 9 years at a development site in Epping North (Campbell & White 2019). When compared to untranslocated plants in adjacent areas, translocated plants were in poorer health, had less leaves and flowers, and had altered flowering regimes. Mr Miller’s responses to questions following his expert witness presentation indicated that he was unaware of these publically accessible data and did not consider them in his report.

Michael Goddard (Tabled doc 142) noted that translocations for Melbourne Wholesale Market have resulted in poor outcomes.

DELWP refers to "the current low success rates of other Matted Flax-lily translocations in Melbourne" (Tabled doc 93).

There are also questions regarding the suitability of translocations sites. The qualities that make the Simpson Barracks excellent habitat for the Matted Flax-lily have not been determined. Proposed translocation sites either do not have an existing Matted Flax-lily population, or have a depleted population, indicating the presence of factors detrimental to the viability of Matted Flax-lily. It is highly unlikely that proposed translocation sites have the combination of attributes required to replace key Matted Flax-lily habitat that will be lost in the Simpson Barracks.

In summary, the translocation plan proposed by NELP is unlikely to succeed. It does not represent genuine mitigation and is being used as a mechanism to facilitate the destruction of some of the very best remaining Matted Flax-lily habitat.

## Studley Park Gum *Eucalyptus* X *studleyensis*

The Studley Park Gum Eucalyptus X studleyensis is a rare natural and fertile hybrid of the River Red Gum Eucalyptus camaldulensis and the Swamp Gum Eucalyptus ovata. This taxon predates European settlement and is listed as endangered on the Advisory list of rare and threatened plants in Victoria (Department of the Environment & Primary Industries 2014).

Viable populations of Studley Park Gum exist in the context of a hybrid swarm with balanced contributions from parental River Red Gum and Swamp Gum species. It is found at 26 locations in Melbourne, either as scattered trees, or small pockets or groves, along the Middle to Lower Yarra (Cameron & Rule et al. 1999). Cameron and Rule noted that "The Simpson Army Barracks east of Greensborough Road supports the largest and most extensive, and possibly the most secure, hybrid swarm of Eucalyptus X studleyensis known to us ..."

NELP's most recent Studley Park Gum survey confirms the that Studley Park Gum population in the Army Barracks is predominantly within or immediately adjacent to the NEL project area (Tabled doc 104). The cut and cover construction of the NEL and water drawdown will compromise this important population on the western edge of the Barracks. DELWP note that the project "will potentially eliminate most if not all of the last surviving habitat where active recruitment is still observed" (Tabled doc 93). Further losses of Studley Park Gum are likely to occur when the Army reinstates fences, border tracks, fire breaks and drainage. Thus the true impact upon the Studley Park Gum population in the Barracks will be more severe than outlined in the EES (Technical Report Q) and the updated Studley Park Gum survey report (Tabled doc 104).

General native vegetation offsets are proposed to compensate for losses of Studley Park Gum but, as noted by DELWP (Tabled doc 93), this does not take into account its advisory list status. As a consequence, DELWP has requested an EPR to ensure the mitigation of impacts to Studley Park Gum. The "Studley Park Gum Mitigation Framework" (Tabled doc 140) that Mr Miller was satisfied with in his expert witness report (Tabled doc 24c) has been watered down in most recent iteration which is titled "Studley Park Gum Management Framework" (Tabled doc 104). The original goal to "establish a new self-sustaining population of Studley Park Gum that is capable of surviving in the long term", has been changed to the less ambitious "initiate and deliver the establishment of a new population of Studley Park Gum to ensure their conservation." This change presumably recognises that the Studley Park Gum is a hybrid that exists in a specific hybrid swarm context (Cameron & Rule et al. 1999) and that planting propagated Studley Park Gum outside their natural

range will not mitigate their loss in the Simpson Barracks. Plans to "Secure an appropriate recipient site" have also been reduced to "Identify an appropriate recipient site." As such, the current "Studley Park Management Framework" fails to adequately mitigate the loss of Studley Park Gum because it does not commit to delivering a secure and self-sustaining population capable of surviving in the long term.

### Clover Glycine *Glycine latrobeana*

Clover Glycine is listed and vulnerable under the EPBC act and threatened under the FFG Act.

NELP states that "areas with a higher potential to support Clover Glycine include Simpson Barracks, Banyule Reserve and some elevated flats along the Koonung Creek valley." The assessment concluded that Clover Glycine has a moderate likelihood of occurring within the project boundary due to the potentially suitable habitat, however no individuals were observed during targeted surveys' (Technical Report Q, pg 107).

Clover Glycine seed is likely to remain dormant in the soil for many years until disturbance by fire or flooding triggers germination (Carter & Sutter 2010). These cues were not present prior to targeted surveys, and thus observations presented do not provide a clear indication of whether Clover Glycine exists in the project area. The precautionary principle should apply in this case.

### River Swamp Wallaby-grass *Amphibromus fuitans*

River Swamp Wallaby Grass is listed as vulnerable under the EPBC Act.

NELP states: 'it is assumed that River Swamp Wallaby-grass occurs within the project boundary' (EES Technical Report Q, pg 104). It is noted that "River Swamp Wallaby-grass is not expected to be significantly impacted", but later concluded that "groundwater drawdown (0.1 to 0.5 metres) in the vicinity of the southern portal due to tunnelling activities under the Yarra River may reduce water available to wetlands reliant on groundwater to some degree, and subsequently have the potential to affect population viability" (ESS Technical Report Q, pg 211).

Indeed, altered water regimes are a key threatening process for this species (Department of Environment 2019b) and this will be a factor at Bolin Bolin Billabong and nearby Trinity wetlands.

## FAUNA

### Swift Parrot *Lathamus discolour*

The Swift Parrot is listed as critically endangered under the EPBC Act (Department of the Environment 2019c). Less than 2000 wild birds are thought to remain (Department of the Environment 2016) and they should be afforded the highest level of protection possible. NELP's efforts to identify Swift Parrot habitat and develop appropriate planning/management strategies have been inadequate.

Plans outlined in the EES do not specifically preclude work that may damage acknowledged priority Swift Parrot habitat at Macleod Station. Eucalypts at Macleod Station supported around 30 Swift Parrots for 5 weeks in 2015 (eBird, https://ebird.org/ and personal observation by WCS member Daphne Hards). This area is important habitat for overwintering Swift Parrots, with the three predominant eucalypt species, River Red Gum, Red Ironbark and Yellow Gum, flowering in succession, and/or supporting lerps, providing a valuable food source.

With reference to Swift Parrot habitat trees and Macleod station, it is noted that “Every effort would be made to avoid all impacts on the trees within the project boundary at this location” (Technical report Q, pg 214). However map 4 in  Tabled doc 93a indicates “areas of proposed native vegetation removal” in this locality. The ambiguous and non-binding nature of statements and plans provided by NELP is not acceptable. A firm commitment should be made that Swift Parrot habitat trees at Macleod Station will not be pruned, harmed or otherwise diminished by construction works.

The Simpson Barracks will be heavily impacted by the construction of the NEL and contains an abundance of eucalypts that also potentially support Swift Parrots. The Barracks is connected to the Macleod Station priority habitat area by widespread mature eucalypt street plantings (mainly Red Ironbark Eucalyptus sideroxylon). Bird records in the Simpson Army Barracks are limited because there is no public access, and NELP did not specifically survey this area for Swift Parrot. However, sightings of Swift Parrot at Simpson Barracks were made in the 2000s (Gary French, pers. comm.). In the local area Swift Parrots have also visited the Latrobe University Campus (2014, 2016, 2018 eBird) and Greensborough (2016, 2017 eBird). Thus habitat close to Simpson Barracks has sustained Swift Parrots in recent years. Swift Parrots vary their foraging sites from year to year due variation in flower and lerp abundance. They require a range of habitat options to be resilient and Simpson Barracks is likely to be an important component of the local network of habitat that regularly sustains Swift Parrots in Banyule.

NELP argue that the region of the Barracks that lies in the project area is lower quality Swift Parrot habitat because it is dominated by River Red Gum, rather than the preferred forage tree Yellow Box (Technical Report Q, pg 162). Photographs taken by three observers in Macleod on separate days during 2015 show Swift Parrots feeding on lerp in River Red Gum (eBird, https://ebird.org/)(Fig 1), highlighting the local importance of this eucalypt species for the Swift Parrot.

***Figure 1.*** *A Swift Parrot feeding on lerp in a River Red Gum at Macleod Station. Photo: Adam Fry, 13th June 2015, Macleod, Banyule, Victoria, eBird.*

We contend that NELP has underestimated possible impacts to the Swift Parrot due to loss of habitat at Macleod Station and the Simpson Barracks.

## Powerful Owl *Ninox strenua*

The Powerful Owl is listed as threatened under the FFG Act, and is an apex predator that preferentially feeds on possums. Sightings by a number of observers (Lyn Easton, several WCS members, eBird https://ebird.org/) confirm that the NEL project area supports the Powerful Owl. NELP surveys failed to detect Powerful Owls indicating limitations of survey techniques used and/or insufficient survey effort. Deakin University GPS tracking data (Carter et al. 2019) provided insight into the territory of a male owl (Fig 2) that roosts in vicinity of Banyule Flats and the Yarra Valley Country Club. This owl's territory includes the western part of Simpson Army Barracks, Banksia Park, the Heide Gallery grounds and the Yarra River corridor adjacent to Bulleen Industrial Park and former drive–in site (Figure 3). These areas will be lost or disrupted by construction of the NEL, reducing Powerful Owl hunting opportunities and increasing disturbance. Proposals to redevelop and modify Powerful Owl habitat as part of the "Yarra River-Bulleen Precinct Land Use Framework Plan" may further reduce hunting opportunities and increase disturbance.

***Figure 2.*** *The Banyule Flats male Powerful Owl with part of a bird. Photo: J. Deane.*

The Banyule Flats male owl was tracked by Deakin university researchers for 34 days around April 2016. It is known that this male shares territory with a female (Fig 4) and that they have successfully raised young (Lyn Easton pers. comm.). April is outside the breeding period and the male would have been hunting primarily for his own sustenance.

Later in the year (June to September) the male must hunt to sustain the female during a 38 day incubation, and then provide for two rapidly growing owlets. Powerful Owls roost with partially eaten prey allowing their hunting success to be monitored. While breeding and raising young, the male spends more time in the vicinity of preferred nesting sites near Banyule Flats and makes more intensive use of his hunting territory as seen for successful breeding in 2016 (Fig 5). Observations over 17 years (Lyn Easton pers. comm.) indicate that the failure of the male to regularly capture possums while owlets are being raised coincides with breeding failure (no fledglings seen) as seen for an unsuccessful breeding year in 2019 (Fig 6). Thus the loss of or disturbance of hunting territory is expected to reduce the likelihood of breeding success and threaten the long term viability of the local population.

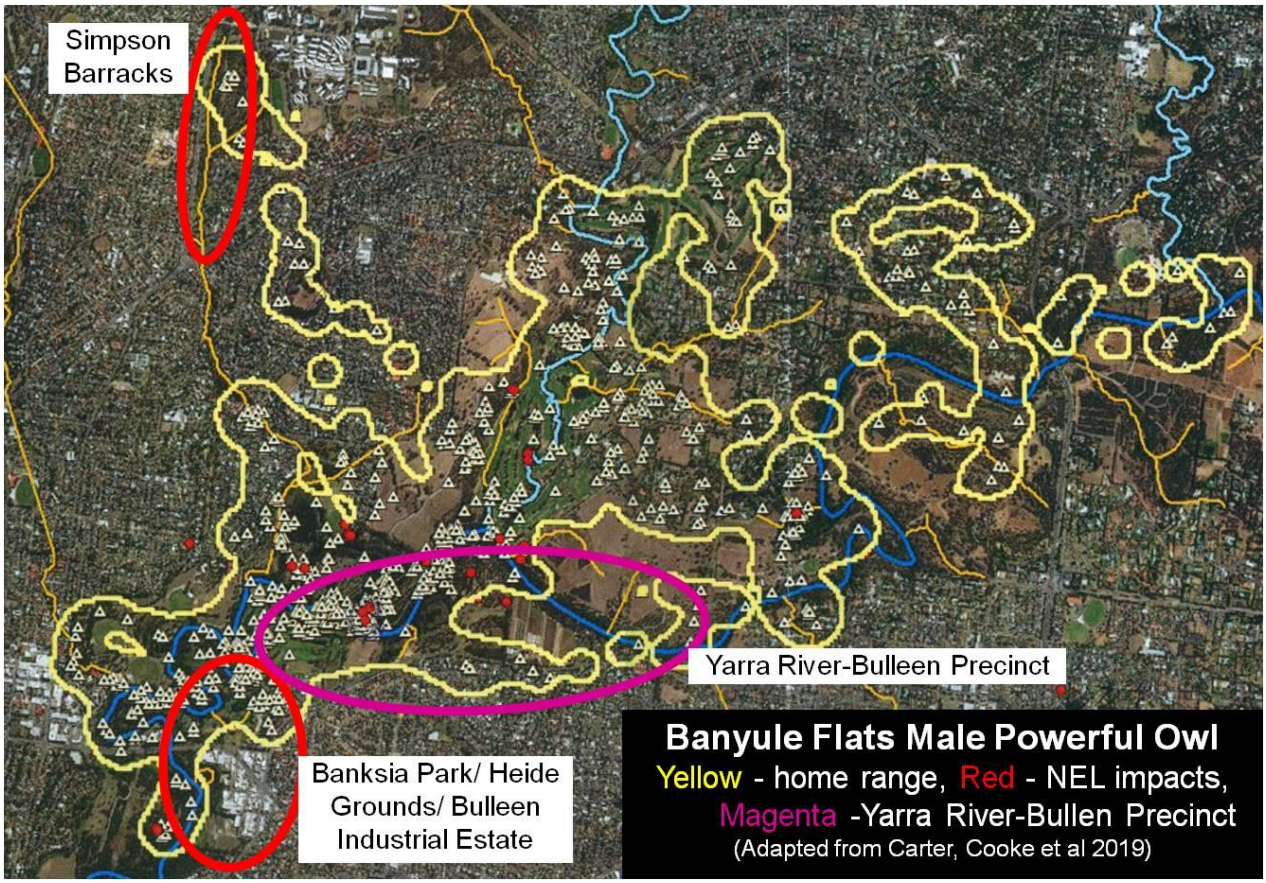



***Figure 3.*** *Banyule Flats male Powerful Owl territory (yellow outline) determined by GPS tracking for 34 days around April 2016. Areas outlined in red indicate surface impacts due to the North East Link. The area outlined in magenta indicates potential modification and development due to the Yarra River-Bulleen Precinct Plan. Adapted from Carter et al 2019.*

***Figure 4.*** *The Banyule Flats female Powerful Owl with part of a Brush-tail Possum. Photo: J. Deane.*

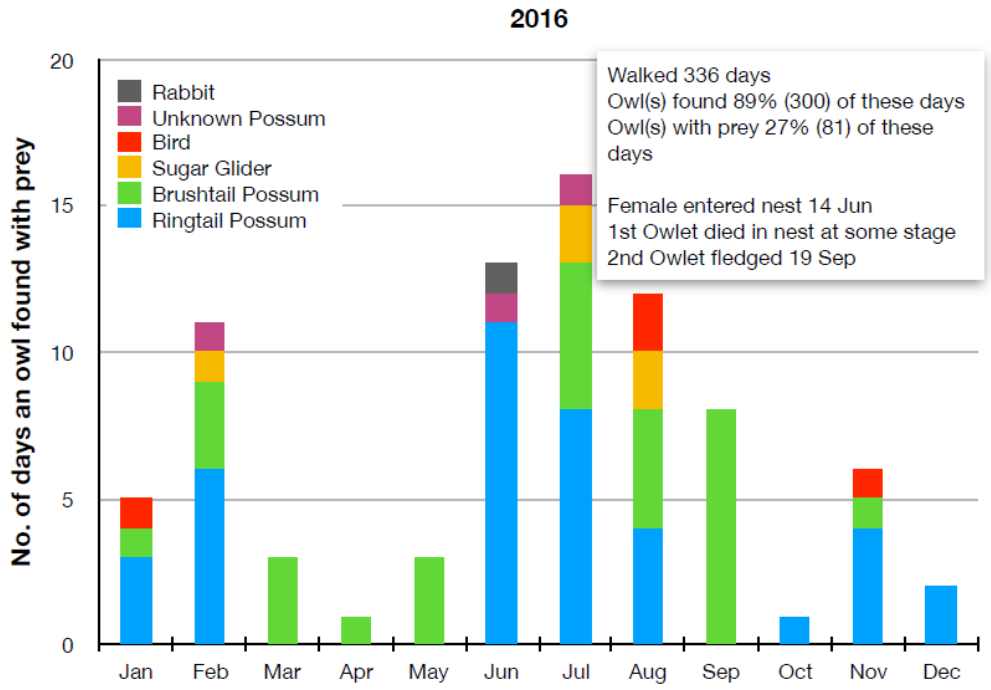



***Figure 5.*** *Prey records during a successful breeding year. 2016 Prey records for the Banyule Flats breeding pair of Powerful Owls. Data was gathered by observation on 336 days throughout the year. The female entered nest 14th June and 1 Owlet fledged on 19th of September. Courtesy of Lyn and Geoff Easton.*

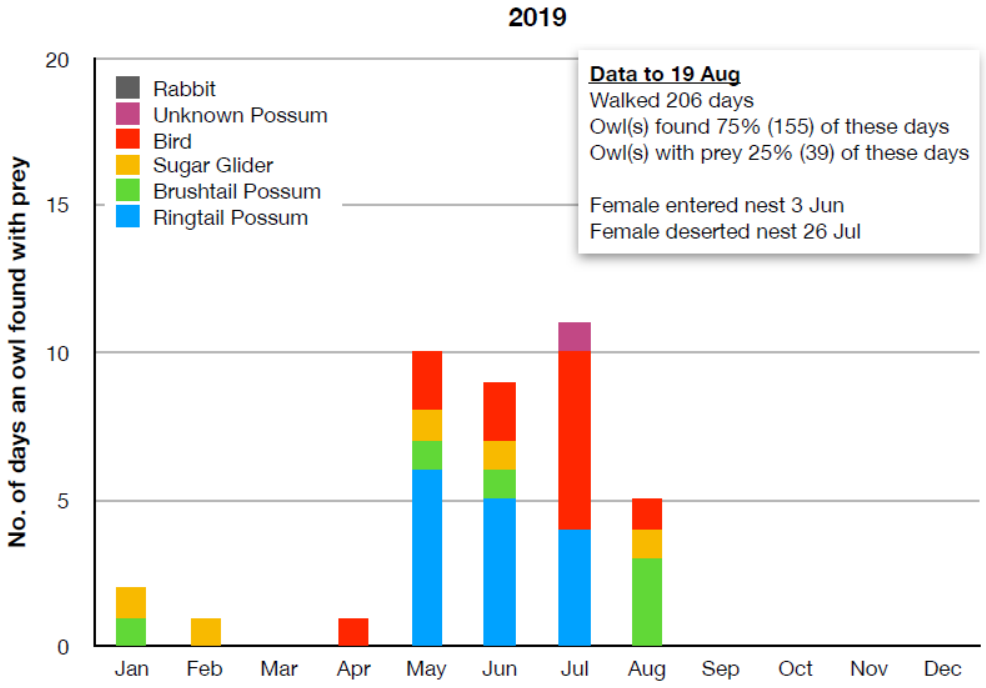



***Figure 6.*** *Prey records during an unsuccessful breeding year. 2019 Jan-Aug Prey records for the Banyule Flats breeding pair of Powerful Owls. Data was gathered by observation on 206 days from January to August. The female entered nest 3rd June and deserted the nest on 26th July. Courtesy of Lyn and Geoff Easton.*

Powerful Owl breeding may also be limited by the availability of suitable large nesting hollows. They have been observed using the same hollow in successive years which is not normal practice for this species. In the Banyule Flats area, Sulphur-crested Cockatoos, Kookaburras and Australian Wood Ducks have all been observed to compete with Powerful Owls for hollows. Large hollow-bearing trees are present within the project area at Simpson Barracks, but the EES concludes that "No Powerful Owls or trees with apparently suitable hollows were detected in the project boundary during the targeted surveys" (EES Technical Report Q, pg 161). However, examining the limited publicly accessible part of the Barracks along Banyule Creek indicates the presence of at least one large hollow that could potentially support Powerful Owl nesting (Fig 7). The loss of hollow bearing trees may limit future nesting opportunities for the Powerful Owl and will increase competition with other birds that use tree hollows.

***Figure 7.*** *A large hollow-bearing River Red Gum within the NEL project area at the Simpson Barracks. Photo: J. Deane.*

The EES does not provide sufficient information to assess whether impacts from the construction and operation of the NEL represent a significant threat to the ongoing existence of Powerful Owls. Taken together, GPS tracking data and local field observations suggest that the NEL will significantly reduce the chances of Powerful Owls persisting at Banyule Flats and the surrounding area.

### Latham's Snipe *Gallinago hardwickii*

Latham's Snipe is EPBC listing as a migratory species and listed as near threatened in Victoria. A population of birds visits Banyule Flats wetlands annually to feed in the reed beds and mud flats. The impact on this species is not adequately considered based on the assumption that a tunnel under this area will avoid all impacts to wildlife. Groundwater reports indicate the possibility of

water drawdown at Banyule Swamp and potential subsidence at the outlet. The Banyule Swamp is a shallow body of water where relatively small variations in its level can dramatically change the opportunities it offers water birds. Details of water sensitive urban design and runoff treatment for Banyule Creek are yet to be finalised. Banyule Creek may receive more frequent and larger volumes of polluted waste water that will negatively impact Banyule Swamp and reed beds inhabited by Latham's Snipe.

### Grey-headed Flying-fox *Pteropus poliocephalus*

The Grey-headed flying Fox is listed as vulnerable under the EPBC Act and threatened under the FFG Act. It has low fecundity and is threatened by habitat loss and heat-related mortality over summer. Loss of forage trees due the NEL will be a significant contributor to the cumulative loss of habitat that threatens this species.

### Macquarie Perch *Macquaria australasica* and Australian Grayling *Prototroctes maraena*

No data are presented on populations of the EPBC listed Macquarie Perch and Australian Grayling in the Yarra River. Polluted runoff from road surfaces and muddy water from construction sites will be an issue for both species. Suspended solids that will enter tributaries of the Yarra are a critical issue for Macquarie Perch which is a visual feeder. Macquarie Perch in the Yarra are considered to be an insurance population because of their genetic diversity and relative security (Department of Environment and Energy 2018). As populations decrease elsewhere the Yarra population may be an essential source for reintroduction to former habitat. Australian Grayling undertake seasonal breeding migration triggered by water flows in the Yarra (Department of the Environment 2019d). How changes in water flow due to construction and operation will affect this migration is unclear.

## PART 4: CONCLUSION

### Our main concerns are:

- potential impacts on sensitive areas. Banyule Flats (including the Banyule Escarpment), Warringal Parklands and Bolin Bolin Billabong are at risk even though designated 'no-go zones'
- there was insufficient consideration of alternatives which would have less environmental impact: public transport; other routes; the tunnel extension; use of tunnel boring machine or mined tunnel instead of cut and cover tunnel; freeway instead of tollway, the loss of vegetation and tree canopy.
- the loss of 7000 large trees will reduce tree canopy and significantly impact wildlife habitat in the corridor for many decades
- the uncertainty around changes to surface and ground water, and the potential for water drawdown
- the increased risks for threatened species. Australia has a poor record of species extinction (Silcock & Fensham 2018); and yet the EES is dismissive of the significant impact on Matted Flax-lily, Studley Park Gum and Swift Parrot
- the loss of 11 hectares Plains Grassy Woodland at Simpson Barracks
- a net loss of green open space for passive an active recreation
- the contribution of NELP to climate change
- the impact on wildlife during construction
- the loss of open waterways including the impacts of putting Banyule and Koonung Creeks into barrel drains.
- the environmental offsets proposed are not adequate compensation for the loss of vegetation and wildlife habitat.

### Should NELP be approved for construction we seek the following broad conditions:

1. An independent committee, to include representatives of community, local government and environmental monitoring experts to receive and review regular reports of air quality, water quality, hydrology, noise levels, flora and fauna outcomes, construction incidents and issues raised by the public. Issues should be referred to the relevant authority requesting action. All reporting should be transparent and available to the community.
2. The adoption of international best-practice standards for construction and monitoring (e.g. minimum levels for noise and air emissions including particulates), thus affording better protection than current Australian standards and Victorian policies.
3. Removal of the Lower Plenty road interchange
4. Bored extension of the tunnel north of Lower Plenty Road and removal of the Lower Plenty Road interchange to protect the Studley Park Gum and Matted Flax-lily habitat at Simpson Barracks
5. Identification of Simpson Barracks as a 'no-go' zone.

6. Identification of the River Red Gum (2019 National Trust Tree of the Year) at the corner of Bridge Street and Manningham Road as a 'no-go' zone
7. Re-development of the works area south of the Manningham interchange (current industrial estate and drive-in site) as open public green space to compensate for the overall loss of conservation, and passive and active space within the north-south corridor of the NELP.
8. Additional 2 for 1 tree planting within the corridor rather than the virtual 'no net loss' proposal of 30,000 replacement for 26,000 lost and with offsets outside the area. Re-vegetation of understory and ground cover species be undertaken. These plants should be additional to the 2:1 trees.
9. Recognition of the significance of the habitat trees used by Swift Parrots at Macleod Railway Station as a 'no-go zone' and a commitment to minimise impacts.
10. Retention of Banyule Creek and Koonung Creek as open, unlined waterways
11. Protection of Banyule Flats wetland habitat from overflow from water treatment facility north of Lower Plenty Road, and water drawdown
12. Protection and enhancement of the quality of water entering Banyule Creek, Koonung Creek and the Yarra River.
13. Measures to prevent the loss of large trees due to groundwater drawdown

## Environment Performance Requirements (EPR)

**We agree with the EPR suggestions submitted by Friends of Banyule, Doc 226a.**

WCS wishes the EPRs to reflect the following provisions:

1. that weed control must be maintained throughout sites of planting, mitigation and translocation for the life of the project

2. that groundwater monitoring extends to the project's no -go zones, viz. Banyule Flats, Warringal Parklands and Bolin Bolin Billabong.

30 August 2019

## REFERENCES


Australian Government (1999). Environment Protection and Biodiversity Conservation Act (EPBC Act).

Banyule City Council. (2014). Urban forest strategic Plan.

Banyule City Council (2019). 20th May Minutes of the Ordinary Meeting of Council. Item 5.2.

Cameron D, Rule K and Robinson R (1999). Reassessment of the botanical values of Streeton Views Estate stage 11 with particular reference to the significance of the natural hybrid Eucalyptus Xstudleyensis Studley Park gum and the endangered species Dianella amoena Matted Flax-lily. Banyule City Council.

Campbell K and White D (2019). Annual monitoring of Matted Flax-lily: Aurora, Epping (year 9: 2017–18). Report to Lendlease Communities (Australia) Limited. 2019, Biosis: Melbourne.

Carr G and Kershaw J (2014). Sugarloaf Pipeline Matted Flax-lily (*Dianella amoena*) Translocation: Monitoring Spring 2014. Report prepared for Melbourne Water Corporation, Ecology Australia: Fairfield.

Carter N, Cooke R, White JG, Whisson DA, Isaac B and Bradsworth N (2019). Joining the dots: How does an apex predator move through an urbanizing landscape? Global Ecology and Conservation, 2019. 17: p. e00532.

Carter O (2010). National Recovery Plan for the Matted Flax-lily *Dianella amoena*., Department of Sustainability and Environment: East Melbourne.

Carter O and Sutter G (2010). National Recovery Plan for Clover Glycine *Glycine latrobeana*., Department of Sustainability and Environment: Melbourne.

City of Ipswich (2018). Big Plans for Small Creek https://www.ipswich.qld.gov.au/__data/assets/pdf_file/0007/75733/Big-Plans-for-Small-Creek-public-document_B574.pdf

Climate Council. (2018a). "What's the deal with transport emissions?", from https://www.climatecouncil.org.au/resources/transport-emissions-and-climate-solutions/.

Climate Council. (2018b). "Waiting for the green light." from https://www.climatecouncil.org.au/wp-content/uploads/2018/09/CC_MVSA0154 -Report-Transport_V5-FA_Low-Res_Single-Pages.pdf.

Commissioner for Environmental Sustainability Victoria (2019). State of the Environment Report 2018.

Department of the Environment (2016). Conservation Advice *Lathamus discolor* Swift Parrot. http://www.environment.gov.au/biodiversity/threatened/species/pubs/744-conservation-advice-05052016.pdf

Department of Environment and Primary Industries (2014). Advisory list of rare or threatened plants in Victoria.

Department of the Environment (2019a). *Dianella amoena* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Mon, 3 Jun 2019 01:08:45 +1000.]

Department of the Environment (2019b). *Amphibromus fluitans* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Wed, 21 Aug 2019 20:33:46 +1000.

Department of the Environment (2019c). *Lathamus discolor* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Wed, 21 Aug 2019 20:42:09 +1000.

Department of the Environment (2019d). *Prototroctes maraena* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Mon, 26 Aug 2019 10:13:54 +1000.

Department of Environment and Energy (2018). National Recovery Plan for Macquarie Perch (*Macquaria australasica*).

Department of Environment, Land, Water & Planning. (2017). "Plan Melbourne 2017-2050: Metropolitan Planning Strategy." from planmelbourne.vic.gov.au

Department of Environment, Land, Water & Planning (2018). "Victoria's Climate Change Framework " Retrieved 23 July 2019, from https://www.climatechange.vic.gov.au/victorias-climate-change-framework.

Department of Environment, Land, Water & Planning (2019). Draft Yarra River – Bulleen Precinct Land Use Framework Plan.

Environment Protection Agency (2016). Using trees and vegetation to reduce heat islands. from https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands.

Ghosh S and Yung S (2017). Carbon and economic benefits of urban trees in two Sydney transport corridor case studies. https://pdfs.semanticscholar.org/e023/10c46920f108109846f3edb02d3512de46df.pdf?_ga=2.58751597.1957983025.1566176799-1080575392.1566176799.

History Teachers Association of Victoria (2016). Yingabeal: The Wurundjeri Scarred Tree at Heide Museum of Modern Art.

Hurley J, Saunders A, Both A, Sun C, Boruff B, Duncan J, Amati M and Caccetta P (2019). Urban Vegetation Cover Change in Melbourne 2014 - 2018. https://cur.org.au/cms/wp-content/uploads/2019/07/urban-vegetation-cover-change.pdf.

Manningham Council (2019). Council's committed to protecting Bulleen's historical River Red Gum. http://www.manningham.vic.gov.au/councils-committed-to-protecting-bulleens-historical-river-red-gum

National Trust (2019). Victorian Tree of the Year. https://www.nationaltrust.org.au/treeoftheyear/

Natural Water Retention Measures (2013). http://nwrm.eu/measure/stream-bed-re-naturalization

North East Link Project (2018). EPBC Act Referral.

North East Link Project (2019). Tree planting program: Fact sheet.

North East Link Authority. (2018). Sustainability: Fact Sheet.

Practical Ecology (2017). Warringal Parklands and Banyule Flats Ecological and Conservation Values Assessment. Banyule, Banyule Council.

Resilient Melbourne and Nature Conservancy Australia (2019). Living Melbourne: A metropolitan urban forest strategy.

State of Victoria (1988). Fauna and Flora Guarantee Act.

State of Victoria (2010). Transport Integration Act.

State of Victoria (2017a). Climate Change Act.

State of Victoria (2017b). Yarra River Protection (Willip-gin Birrarung Murron) Act.

Silcock JL and Fensham RJ (2018). Using evidence of decline and extinction risk to identify priority regions, habitats and threats for plant conservation in Australia. Australian Journal of Botany 66(7): 541.

Terrill M (2017). Stuck in traffic: road congestion in Sydney and Melbourne. Grattan Institute, Melbourne