North East Link Project

Studley Park Gum Management Framework

Revision 3

Prepared by Emerge Associates (Cameron Miller) and GHD

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Executive summary

The North East Link Project (a division of the Major Transport Infrastructure Authority), on behalf of the Victorian State government, is currently undertaking the North East Link project (referred to herein as 'the project') to the north-east of the Melbourne Central Business District.

Ecological impact assessments have identified that the project has the potential to impact *Eucalyptus* x *studleyensis* (Studley Park Gum) which is now listed as 'Critically Endangered' on the *Flora and Fauna Guarantee Act 1988 – Threatened List* (FFG Threatened List) (DELWP, 2021). In total, the PER determined that 49 Studley Park gum individuals have the potential to be impacted directly and indirectly by the project. Subsequent to the preparation of the PER, an additional three Studley Park gum have also been identified as being directly impacted by works at Simpson Barracks. This brings the total to 52 Studley Park Gum determined to be directly and indirectly impacted. It is proposed that all impacts be offset in accordance with the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP, 2017).

At the time of assessment and approval, Studley Park Gum was only listed on the Department of Environment, Land, Water and Planning (DELWP)'s *Advisory List of Rare or Threatened Plants in Victoria 2014* (DEPI, 2014). While there were no legislative requirements for additional offsets for the removal of a species on DELWP's advisory list at the time, DELWP requested additional actions to mitigate impacts to the Studley Park Gum.

Studley Park Gum has now been listed as Critically Endangered on the FFG Act Threatened List, however there are still no legislative requirements for additional offsets for the removal of this species.

Impacts to Studley Park gum will be mitigated through two activities:

1. Implementation of the Environmental Performance Requirement FF6 which requires the development and implementation of a Groundwater Dependent Ecosystem Monitoring and Mitigation Plan; and
2. Implementation of this Studley Park Gum Management Framework in accordance with Environmental Performance Requirement FF10 and EPBC Approval 2018/8142 to translocate 104 Studley Park gum trees within an appropriate recipient site.

The goal of this translocation is to initiate and deliver the establishment of a new population of Studley Park gum to ensure their ongoing conservation. To achieve this goal, it is proposed to establish 104 Studley Park gum trees in appropriate recipient sites (i.e. twice the number determined to be directly or indirectly impacted).

The following actions are proposed to be or have been undertaken to achieve the goal:

- Develop and implement a *Seed Collection and Propagation Plan* which provides detailed methods for the collection, storage and propagation of Studley Park gum seeds.
- Identify appropriate recipient site(s) to use for the establishment of a Studley Park gum population.
- Develop and implement a *Management Plan* for the recipient site(s) which includes detailed site-specific management actions.

A summary of the broad actions to be included within each plan is provided in this document.

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Abbreviation Tables

Table A 1 Abbreviations – Organisations

Organisations	
DELWP	Department of Environment, Land, Water and Planning
MTIA	Major Transport Infrastructure Authority
NEL	North East Link
NELP	North East Link Project
Project Co	The private party to be engaged by the State to execute the Project Deed and deliver the Primary Package.

Table A 2 Abbreviations – General terms

General terms	
DBH	Diameter at breast height
EES	Environment effects statement
EVC	Ecological vegetation class
PER	Public environment report
VBA	Victorian biodiversity atlas
VROTS	Advisory list of Victoria Rare and Threatened Species (flora and fauna)

Table A 3 Abbreviations – units of measurement

Units of measurement	
cm	Centimetre
ha	Hectare
m	Metre

1. Introduction

1.1 Project background

The North East Link Project (NELP) (a division of the Major Transport Infrastructure Authority (MTIA)), on behalf of the Victorian State government, is currently undertaking the North East Link (NEL) project (referred to herein as 'the project'). The NEL is a new freeway-standard road connection to the north-east of the Melbourne Central Business District that would complete Melbourne's ring road. Specifically, the NEL will connect the Metropolitan Ring Road (M80) to the Eastern Freeway and includes works along the Eastern Freeway from near Hoddle Street to Springvale Road. The location of the project is shown in **Figure 1**.

The impacts to biodiversity values due to the project have been determined through ecological impact assessments which informed the development of an *Environment Effects Statement* (EES) and *Public Environment Report* (PER). Ecological impact assessments have identified that the project has the potential to impact *Eucalyptus* x *studleyensis* (Studley Park gum) which is now listed as 'Critically Endangered' on the *Flora and Fauna Guarantee Act 1988 – Threatened List* (FFG Act Threatened List) (DELWP, 2021).

1.2 Purpose

Emerge Associates (Emerge) was engaged by GHD on behalf of NELP to produce a strategic management framework to mitigate project impacts to *Eucalyptus* x *studleyensis* (Studley Park gum). Native vegetation impacted by the project will be offset in accordance with clause 52.17 of the Victorian Planning Provisions and *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017). At the time of assessment and approval, Studley Park Gum was only listed on the Department of Environment, Land, Water and Planning (DELWP)'s *Advisory List of Rare or Threatened Plants in Victoria 2014* (DEPI, 2014). While there were no legislative requirements for additional offsets for the removal of a species on DELWP's advisory list at the time, DELWP requested additional actions to mitigate impacts to the Studley Park Gum.

Studley Park Gum has now been listed as Critically Endangered on the FFG Act Threatened List, however there are still no legislative requirements for additional offsets for the removal of this species.

This *Studley Park Gum Management Framework* document provides a broad outline of the actions NELP propose to undertake to compensate for the impacts to Studley Park gum. Finer scale details on proposed actions will be provided in succeeding documents following approval of this management framework by DELWP.

2. Studley Park Gum

2.1 Morphology and taxonomy

Studley Park gum is a fertile hybrid taxon between *E. camaldulensis* subsp. *camaldulensis* (river red gum) and *E ovata* subsp. *ovata* (swamp gum). The leaf, bud and fruit character traits are intermediate between the two parent taxa but often show a closer affinity to one parent (VicFlora 2019).

Studley Park gum is one of eight described eucalyptus hybrids formally accepted by the National Herbarium of Victoria and is one of two named intersectional Victorian hybrids in the genus.

Due to the morphological variation within Studley Park gum, it is notoriously difficult to identify in the field. Genetic analysis is required to provide a definitive conclusion as to the identity of an individual, but is time consuming, costly and impractical.

2.2 Distribution

The majority of Studley Park gum records occur along the lower Yarra River to the north-east of Melbourne in suburbs such as Kew, Ivanhoe, Viewbank, Rosanna, Macleod, Yallambie and Watsonia.

The taxon has also been recorded to the south-east (Nar Nar Goon, near Clayton North, at Lysterfield Park and between Carrum Downs, Hampton Park and Lyndhurst), north-west (Riddells Creek) and south-west (Connewarre on the Bellarine Peninsula) of Melbourne (GHD, 2019a).

2.3 Conservation significance

Studley Park gum is listed as 'Critically Endangered' on the FFG Act Threatened List (DELWP, 2021).. Species on the FFG Act Threatened List require a FFG Act Application to Take Protected (including Threatened) Flora.. Studley Park gum is not listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Studley Park gum is of conservation significance due to scientific and evolutionary reasons (Cameron, Rule and Randall, 1999). The fact that Studley Park gum is a fertile is significant as many hybrids are sterile. Hybrids such as Studley Park gum have significance due to their potential to become new species (Cameron, Rule and Randall, 1999). The significance of Studley Park gum is further discussed in (GHD, 2019a).

2.4 Distribution within project area

Initial flora surveys conducted for the project recorded Studley Park gum within three areas:

- Two individuals were recorded within the project area near Watsonia railway station.
- One incidental record was noted in Banyule Flats outside of the area directly impacted by the project.[1]
- Multiple individuals comprising mature trees and several cohorts of varying age were recorded within Simpson Barracks but numbers not determined.

[1] However, it should be noted that this record is believed to be a misidentified record which is more likely to be another hybrid *E.trabutii* (GHD, 2019b).

Additional surveys were undertaken within Simpson Barracks to determine the number of individuals within the project area (GHD, 2019a). Forty-four Studley Park gum individuals were recorded within the portion of the Simpsons Barracks that lies within the project area. An additional three Studley Park gum were recorded to the east of the project area in an area proposed for associated works (July 2020) that will be impacted by the works. These numbers do not include juvenile eucalypts that were unable to be positively identified due to lack of reproductive material.

The range of size classes recorded throughout the study area suggests that hybridisation may be actively occurring in this area (GHD, 2019a). In addition, field observations also suggested that back crossing to *E. camaldulensis* is likely to be occurring within Simpson Barracks and has occurred throughout the local area in the past (GHD, 2019a).

3. Project impacts

All impacts to native vegetation will be offset in accordance with the *Guidelines for the removal or lopping of native vegetation* (the Guidelines) (DELWP, 2017) as documented in the offset strategy (GHD, 2019b). This report specifically addresses project impacts to Studley Park gum.

3.1 Direct impacts

The following Studley Park gum individuals will be directly impacted by the project:

- Two individuals near Watsonia railway station in Watsonia
- Forty-seven individuals within Simpsons Barracks

Individuals deemed to be directly impacted (assumed to be lost) by the project include whole trees and trees located just outside of the project boundary but where more than 10% of their 'tree protection zone' encroaches into the project boundary.

3.2 Indirect impacts

Indirect impacts to Studley Park gum may occur due to groundwater drawdown during construction and operation of the project. Groundwater modelling undertaken for the project identified potential for groundwater drawdown to impact ecological values within and around Simpson Barracks. The Environmental Effects Statement (EES) states that modelling indicates depth to groundwater at Simpson Barracks is approximately 10 metres at the shallowest point, which would be only accessible by large trees such as Studley Park gum. Two models have been prepared; a 2024 post-construction groundwater depth model, and a 2075 scenario (GHD, 2019c).

Based on the groundwater depth and drawdown modelling it has been estimated that 11 Studley Park gums (DBH>80 cm) under the 2024 model (nine in Commonwealth land and two outside) would have a moderate to high risk of being negatively impacted at the end of construction. However, as presented in Revised GDE Assessment (GHD, 2019c), Environmental Performance Requirement (EPR) FF6 has been modified to account for the potential impacts of groundwater drawdown during construction. A Groundwater Dependent Ecosystem Monitoring and Mitigation Plan would be prepared and implemented, which would specify the requirements to monitor the health of trees and changes to groundwater at GDE's. The plan would include measures to mitigate potential impacts and maintain the health of large trees, or offset impacts to trees that are unlikely to survive in the long term.

Given this, under the 2075 model, currently three Studley Park gums are considered to have the potential to be indirectly impacted permanently, as they would be impacted during operation. Therefore, in total 52 individual Studley Park gums are considered to be impacted by the project.

This assessment was only undertaken for large trees (DBH>80 cm).

4. Mitigation

Impacts to Studley Park gum will be mitigated through 'translocation' to approved recipient sites within Yarra Valley Parklands. The term translocation refers to 'the deliberate transfer of plants or regenerative plant material from an *ex situ* collection or natural population to a new location, usually in the wild' (Commander *et al.*, 2018). According to (Commander *et al.*, 2018) the proposed Studley Park gum translocation can be classified as an 'introduction' as it will involve establishing a population in a site where it has not previously occurred but is within the known range of the species and provides similar habitat to known occurrences. Alternatively, if the recipient site contains an existing population of Studley Park gum this would be classified as 'reinforcement', where individuals are added to enhance the existing population.

4.1 Plan goal

The goal of this translocation is to initiate and deliver the establishment and ongoing management of a new population of Studley Park gum to ensure their conservation. To achieve this goal, it is proposed to establish a minimum of 104 Studley Park gum trees at recipient sites. This goal is based on a replacement ratio of two translocated Studley Park gums established for each individual impacted by the project.

To achieve the establishment goal of 104 plants, it is proposed that a total of 303 Studley Park gum saplings are initially planted at the recipient site(s). This takes into account unavoidable plant loss assuming a 70% survival rate for each year over a three-year period as described below:

- Year 0: 303 saplings planted
- Year 1: 212 saplings (@ 70% survival)
- Year 2: 149 saplings (@ 70% survival)
- Year 3: 104 plants established

Actions proposed to be undertaken include seed collection and propagation**,** selection of a suitable recipient site(s) and planting and management within the recipient site(s). Monitoring and evaluation will determine whether the goal has been met. Refer to Table 3 for further information.

4.2 Associated plans

The following actions are proposed to be or have been undertaken to achieve the goal:

- Develop and implement a *Seed Collection and Propagation Plan* which will provide detailed methodology for collection, storage and propagation of Studley Park gum seeds.
- Identify an appropriate recipient site(s) to use for the Studley Park gum translocation.
- Develop and implement a *Management Plan* for the determined recipient site(s) which includes detailed site-specific management requirements.

4.2.1 Management responsibilities and timing

The management responsibilities for tasks within each of the above actions are detailed in **Table 1**.

Table 1 Management framework program responsibilities

Task No.	Task	Responsibility	Timeframe
Seed collection and propagation			
1.	Seed collection	NELP: Prior to development activities. Project Co: from Studley Park Gum felled for development activities	2019-2021/22
2.	Identify a suitable nursery	NELP	2019
3.	Seed processing, storage and viability testing	NELP, RBGV^ herbarium on behalf of NELP	2020-2021/22
4.	Seed germination, sapling management	RBGV (or qualified) nursery on behalf of NELP	4-8 months prior to planting
Recipient site(s) selection			
5.	Secure suitable recipient sites	NELP	Early to Mid 2020
Recipient site(s) management			
6.	Site preparation (e.g. weed control, access control)	NELP	Within first year of completion of task no. 5
7.	Planting	NELP	First autumn/winter after completion of task no. 6 (aim: June 2021)
8.	Monitoring and evaluation	NELP	For a minimum of 5 years from planting or until objectives are met
9.	SPG reporting to DELWP	NELP	Annually commencing in line with task no. 8
10.	Adaptive management measures	NELP	As needed according to results of task no. 8

^RBGV = Royal Botanic Gardens Victoria

A summary of the broad actions to be included within each plan is provided in Section 4.3-4.5.

4.3 Seed collection and propagation plan

A separate plan which documents the principles and processes for the collection and propagation of vegetative material for the project has been developed. This Plan is entitled *Seed Collection and Propagation Plan, North East Link Project* (Emerge Associates and GHD, 2021). The following sections provide a summary of requirements outlined in the Plan.

4.3.1 Collection

The *Guidelines for the Translocation of Threatened Plants in Australia* (Commander *et al.*, 2018) states that 'for a population to persist in the long term it also needs to possess sufficient genetic diversity to retain its evolutionary potential to adapt to long-term environmental change or infrequent extreme events'.

To maximize genetic diversity in the translocated population seeds will be collected from individuals within the two populations of Studley Park gum impacted by the project (Watsonia and Simpson Barracks). As detailed in **Section 2.4**, the population of Studley Park gum in the Simpson Barracks is considered to be genetically diverse and composed of multiple generations of hybrids. The genetic similarity between the Simpson Barracks population and the other two populations impacted by the project is unknown, but collection of seeds from both populations will result in higher levels of genetic diversity in the translocated population. Furthermore, this management framework aims to mitigate impacts to the two impacted populations of Studley Park gum and therefore it is advantageous to collect seeds from each population.

Once collected, the viability of seeds will be determined and seeds will be labelled and stored appropriately. Seeds from each population will remain separate at all times. Seed collection will occur as described in the Seed Collection and Propagation Plan (refer to Emerge Associates and GHD, 2021, Section 4).

4.3.2 Propagation

Seeds are to be propagated at an accredited nursery. As detailed in **Section 4**, a minimum of 303 Studley Park gum plants will be required to be propagated for planting at the recipient sites. Additional Studley Park gum plants will also need to be propagated and made available for supplementary (infill) planting (if required). Note that propagation will need to occur in advance of planting (approximately 8 to 12 months).

A horticulturalist experienced in native plant propagation will be engaged to undertake all propagation works. The seeds of Studley Park gum are not expected to be dormant and would therefore not require any pre-treatment prior to propagation. Seeds will be grown in a medium specifically designed for propagating native plants.

Correct hygiene measures must be practiced at all times in the nursery, and regular inspection for signs of disease and or/pests are to be undertaken by the horticulturalist. Any plants suspected of being infected with a pathogen or disease will be treated according to nursery guidelines to avoid infection of other plants. The horticulturalist engaged to undertake the propagation will be experienced in native plant propagation to maximise seedling survival and growth. Plants will be grown as tall as possible to facilitate deep planting as outlined in **Section 4.5.1**, however, they should not become pot-bound. It should be recognised that as part of the propagation process the horticulturalist will observe the morphology being expressed by the seedlings. Those plants that are clearly showing a strong tendency to the morphological characteristics of either river red gum or swamp gum will be discarded from the pool considered to be Studley Park gum.

Prior to recipient site planting, plants will be 'hardened off' (gradually exposed to conditions similar to those at the recipient site) and in good condition, free of weeds in the pots and no signs of disease or pathogens. An appropriately experienced botanist, ecologist or horticulturalist will inspect and approve the condition of the plants prior to planting.

4.4 Recipient site(s) selection

4.4.1 Site characteristics

The recipient site(s) must provide appropriate conditions to enable plant survival and subsequent establishment of a population of Studley Park gum. To determine the features of a potentially suitable site, environmental attributes of current populations of Studley Park gum were assessed. These attributes were used in a desktop analysis to determine potentially suitable recipient sites for translocation.

Five primary attributes and two secondary attributes were used to determine potential recipient sites, as listed in **Table 2**. Primary attributes were considered essential for potential sites, and secondary attributes were considered desirable.

Table 2 Attributes used in determining potential Studley Park gum recipient sites

Attribute	Condition
Primary attributes	
Studley Park gum records (VBA)	Within 5 km from Studley Park gum VBA records
EVC (1750 mapping)	EVC 55: Plains Grassy Woodland
	EVC 56: Floodplain Riparian Woodland
	EVC 68: Creekline Grassy Woodland
Watercourses	Within 1 km of a watercourse
Project footprint area	Within 5 km of project footprint area
Size	Greater than 2.0 ha in size
Secondary attributes	
Tenure	Classified as 'public' or 'protected landscape – public' land use
Zoning	Classified as 'public conservation and resource zone' or 'public park and recreation zone'

4.4.2 Recipient sites

Eleven potential recipient sites within three broad areas were identified during the analysis:

- Simpson Barracks
- Yarra Valley Parklands (nine sites)
- Plenty Gorge Park

Of these, only the Yarra Valley Parklands sites, as shown in **Figure 1,** have been deemed by the relevant land manager (and based on feedback from DELWP) to be appropriate recipient sites. Discussions with Parks Victoria determined Westerfolds park and Montpellier Reserve within Yarra Valley Parklands to be suitable available recipient sites.

Yarra Valley Parklands

The nine Yarra Valley Parklands sites range in size from 2.3 ha to 106.8 hectares and lie within close proximity to each other (within approximately 4.5 kilometres). The sites lie alongside the Yarra River and/or its tributary the Plenty River.

These sites predominantly lie within the Gippsland Plain bioregion, except the two easternmost sites which border the Highlands – Southern Fall bioregion. 1750 EVC mapping indicates that all of these sites previously supported EVC 55: Plains Grassy Woodland and/or EVC 68: Creekline Grassy Woodland EVCs. 2005 EVC mapping indicates that all of these sites support some remnant native vegetation but also comprise large areas of agricultural grassland and/or parkland which provide opportunities for restoration. One existing Studley Park gum record occurs near these sites to the north west, and records of *E. camaldulensis* and *E. ovata* occur in the local area.

The environmental attributes of the Yarra Valley Parklands sites are shown in **Figure 2.**

The *Yarra Valley Parklands Management Plan* (Parks Victoria, 2008) indicates that the majority of these sites lie within 'landscape' and 'conservation and recreation' management zones, and one site also includes a portion of 'recreation' management zone. Generally, enhancement of remnant indigenous vegetation is supported within 'landscape' and 'conservation and recreation' management zones.

Discussions with Parks Victoria determined two of the nine Yarra Valley Parklands sites: Westerfolds park and Montpellier Reserve, to be suitable available recipient sites for the Studley Park gum.

Based on availability of Westerfolds Park and Montpellier Reserve, the Yarra Valley Parklands sites are considered the most suitable recipient sites for translocation of Studley Park gum. The landscape, historical vegetation, proximity to the project area and appropriate current management zoning make these sites suitable. Some of these sites are larger than the area required for the Studley Park gum translocation, and an appropriate area for planting such as open areas lacking tree canopy would need to be delineated.

4.5 Recipient site(s) management plan

The ongoing management of the recipient site(s) will be undertaken for a minimum of five years following planting at the recipient site, or until the goal is met (see **Section 4.1**). Management of the recipient site(s) will be required to reduce threats to the translocated plants and maximize survival rates.

This section outlines general management actions which will be incorporated into the detailed management plan.

4.5.1 Planting

Studley Park gum tubestock grown from seed (refer **Section 4.3.2**) will be planted within a suitable area in the recipient site. The 303 plants required to meet the goal (refer **Section 4.1**) will be installed at the same time and within the first year of management of the recipient site(s).

Tubestock will be planted in the recipient site(s) when environmental conditions such as rainfall and temperature are favorable. In the Melbourne region, the optimal time for planting is generally autumn or winter, once the winter rains have started and the ground is sufficiently moist. Planting will be initiated as soon as possible to allow plants the maximum time for establishment before the summer dry period. Planting outside of this period is not recommended as survival rates will likely be reduced.

Planting of Studley Park gum tubestock will be undertaken by an experienced revegetation contractor and will incorporate the following actions:

- Tubestock will be well-watered prior to planting.
- Tubestock from each source population will be installed in a randomised arrangement to facilitate cross-pollination and enhance the genetic diversity within the translocated population.
- Planting holes will be roughly twice as wide and twice as deep as the pot. This will enable plants to be installed as deep as possible, with only the top portion of the plant above the ground. Deep planting positions the roots closer to water supplies and decreases water loss. This type of planting can also help to prevent herbivory from resulting in the death of seedlings, which can easily re-sprout if the top of the plant is removed. The deep planting method may be dependent on the recipient site selected and is subject to advice from the revegetation contractor.
- Planting holes will ideally be spaced approximately 20 m apart to provide sufficient space for mature trees, however depending on the recipient site, planting in small clusters may be more appropriate. A grid formation will provide ease of monitoring but the planting formation will be dependent on the shape of the selected recipient site.
- Care should be taken when removing plants from pots to avoid and minimize damage to the roots.
- Tubestock will be placed in the centre of the hole and backfilled with soil removed from that hole (mixed with an appropriate planting medium if required).
- Weed-free mulch will be spread around each plant, taking care to place mulch away from the stem of each plant to avoid rot.
- Each plant will be watered in immediately after planting, taking care not to displace the surrounding soil.
- Each plant will be labelled with a metal label attached to a metal stake embedded in the ground. The label should contain information regarding the source population.

Reference photos of the planting area should be taken at the time of planting to provide a baseline for future monitoring (see Section 4.5.7).

4.5.2 Watering

Supplementary watering is unlikely to be required if plants are installed during the optimal time (refer **Section 4.5.1**). However, seasonal factors such as rainfall and temperature and site-specific factors such as soil type and topography may induce hydrological stress on plants. If required, the frequency and volume of supplementary watering will be included in the management plan. Contingency watering during extended periods of drought or if plants are found to be suffering from hydrological stress should also be considered for inclusion in the management plan.

4.5.3 Weed control

Weed control will be conducted within the recipient site prior to planting of tubestock. Following planting, an ongoing weed control program will be implemented. At a minimum, the weed control program will include biannual weed control (autumn and spring) for the first three years after initial planting. Following year 4, annual weed control within spring will be undertaken.

The most appropriate method to control weeds in the recipient sites is likely to be chemical (herbicide) but may also include manual (hand weeding) based approaches. Alternative methods may be used if recommended by a licenced pest management technician and/or as determined during survey of the recipient site.

The majority of weed control treatments will be concentrated on the area immediately surrounding planted tubestock. Noxious weeds will be controlled to ensure that cover is less than 1% within a five-metre radius from each installed tubestock. Other weeds will be eliminated or reduced in cover to a level that does not negatively impact tubestock.

4.5.4 Herbivory control

Animals such as rabbits and hares (pests) and kangaroos (native) can impact on plant establishment through herbivory. Consultation with the current management authority of the recipient sites will be undertaken during preparation of the management plan to determine whether pest animals are likely to be a threat to tubestock.

If required, actions such as destruction of rabbit warrens and hare nests, baiting and/or fencing could be undertaken to control pest animals. The suitability of baiting in areas accessible to the public will need to be discussed with the recipient site management authority. Monitoring will be undertaken to assess the impacts of herbivory on pest animals and contingency actions will be undertaken if required (refer **Section 4.5.7**).

4.5.5 Fencing and access control

Fencing of the recipient site(s) would limit public access and may provide protection from herbivores. Consultation with the current management authority of the site(s) will be undertaken during preparation of the management plan to determine the appropriateness of fencing the site, as it is likely dependent on existing infrastructure and management. For example, fencing may be installed around the tubestock planting area or, as the recipient site(s) are located within a larger reserve, around the reserve perimeter.

If monitoring indicates that fencing is not providing sufficient protection to tubestock, additional protection methods will be investigated, such as plant cages or tree guards.

4.5.6 Enhancement planting

Enhancement of the recipient site(s) by planting other native indigenous plants may be considered by the relevant land manager of the recipient site(s) once SPGs have established. Understorey life forms from the appropriate EVC would be suitable. This planting would likely be undertaken by the management authority of the recipient site(s) or a local volunteer group.

4.5.7 Monitoring and evaluation

Monitoring of the translocated plants and the site conditions will be undertaken to assess the performance of the site in relation to the goal, as well as to identify management actions. A suitably qualified or experienced ecologist/botanist will undertake the monitoring.

Methods

Monitoring will involve a physical inspection of the tubestock in the recipient site. During this inspection the botanist will traverse the site and record:

- The total number of living translocated plants
- The condition of translocated plants (e.g. Signs of drought stress/herbivory/disease)
- Types and levels of threats to translocated plants (e.g. Weeds)

- Incidental observations within the recipient site(s)
- Maintenance requirements (e.g. Fencing/signs of unauthorised access)

Photo point monitoring will also be undertaken during the above inspection. Locations for photo point monitoring will be determined at the time of tubestock planting and the spatial coordinates of each location will be recorded. During each photo monitoring event an oblique digital photograph will be taken in the same direction, height and orientation.

The results of each monitoring event will be consistently documented.

Timing

Monitoring will be undertaken frequently during the first three years after planting to determine whether plants are establishing and if contingency actions need to be undertaken to increase plant survival. During this time monitoring will be undertaken quarterly, at approximately the beginning of each season.

After this time, monitoring will be undertaken annually until the goal has been met (up until a maximum of ten years – see Table 3 for further details).

Evaluation and contingency

The results of the quarterly monitoring will be used to inform site management and track the survival of translocated plants.

An annual evaluation will be undertaken to determine progress of the site towards the goal. This will involve comparison of the number of surviving Studley Park gum plants in the recipient site to the goal.

The number of plants to be installed has been calculated based on a 70% survival rate for the first three years, after which the plant survival is likely to be stable. Therefore, the survival rate of Studley Park gum plants established from tubestock will be evaluated each year for at least five years. If the goal is met after five years the translocation can be declared a success and the site handed over to the management authority. Note that plants must have been planted in the recipient site for a minimum of three years to be considered ‘established’.

If plant survival is lower than 70% during the first three years after planting, it is unlikely that the goal will be met without implementation of contingency actions. Actions such as supplementary planting (using additional tubestock propagated from seed) will be implemented in this circumstance.

If the goal of 104 established Studley Park gum plants is not achieved after five years, implementation of the plan will continue until the goal is met, up to a total of ten years. Discussions with the relevant management authority will be undertaken if unforeseen factors impact upon the translocated plants (such as unauthorized access, vandalism or bushfire) or if the prescribed methods are ineffective.

A summary of evaluation process is provided in **Table 3**.

Table 3 Evaluation process for the recipient site

Timing	Measure	Action
Each year for 3 years after planting	>70% SPG survival	None required
	<70% SPG survival	Undertake supplementary planting
End of 4th year after planting End of 5th year after planting	≥104 SPG plants established (which have been planted in recipient site(s) for at least 3 years)	Hand over site to management authority
	<104 SPG plants	Undertake supplementary planting
Years 5-10 (only required if goal is not met prior)	<104 SPG plants	Review management actions to improve success. Undertake supplementary planting

SPG = Studley Park gum plants established from tubestock.

Reporting

A monitoring report will be prepared by NELP at the end of each year. This report will include a summary of management actions undertaken that year and the results of each action. The report will include the results of each monitoring event undertaken that year (including photos form each photo point) and the results of the evaluation against the goal.

Note that this reporting may extend beyond ten years as the seed collection and propagation is likely to occur prior to planting.

5. References

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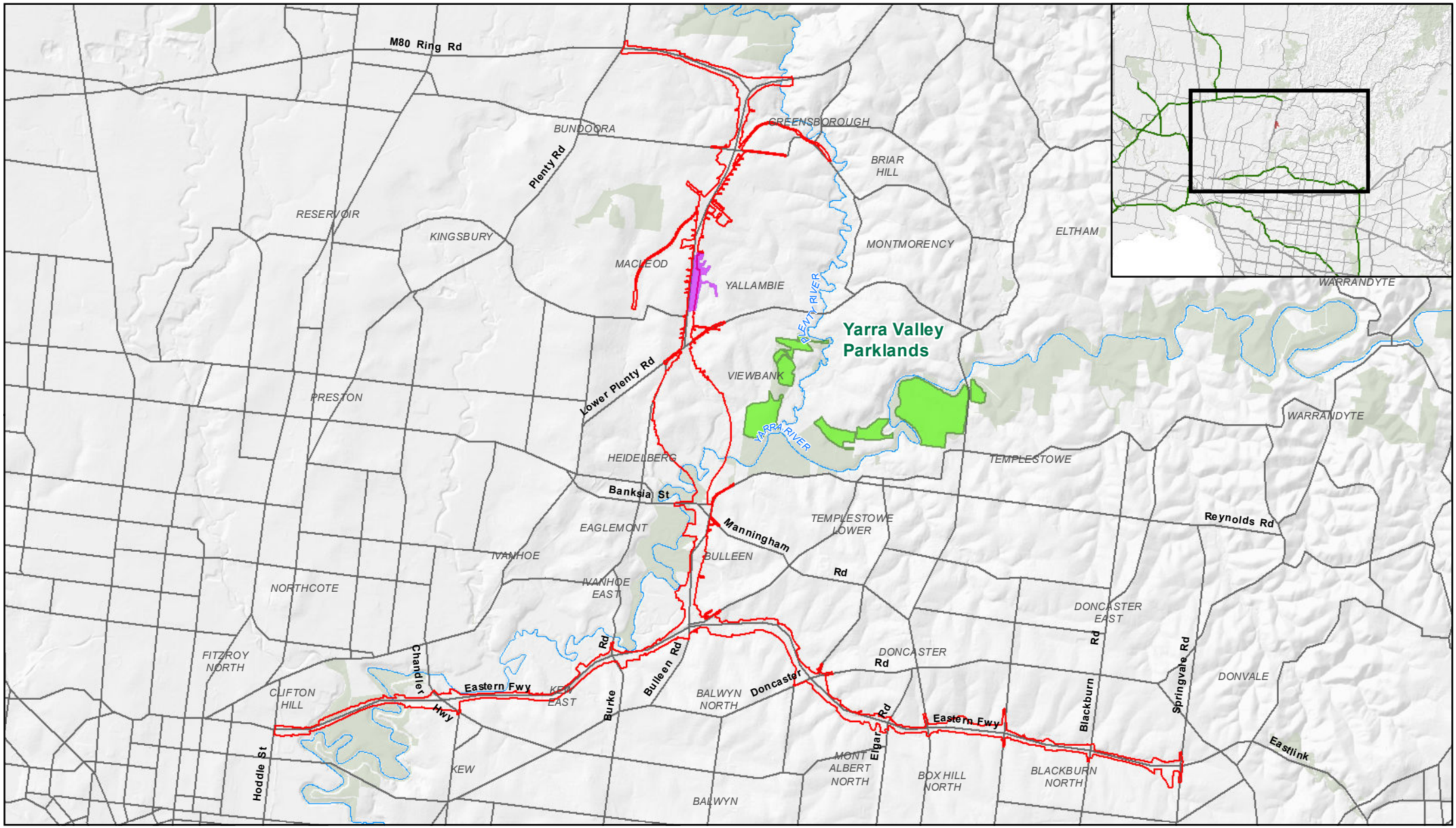
Figures



Paper Size A4

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Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Legend

- 2019 Assessment
- 2020 Assessment

Potential SPG Recipient Sites

- Yarra Valley Parklands

North East Link Authority

Job Number	31-35006
Revision	A
Date	31 Jul 2020

Potential Recipient Sites Overview

Figure 1

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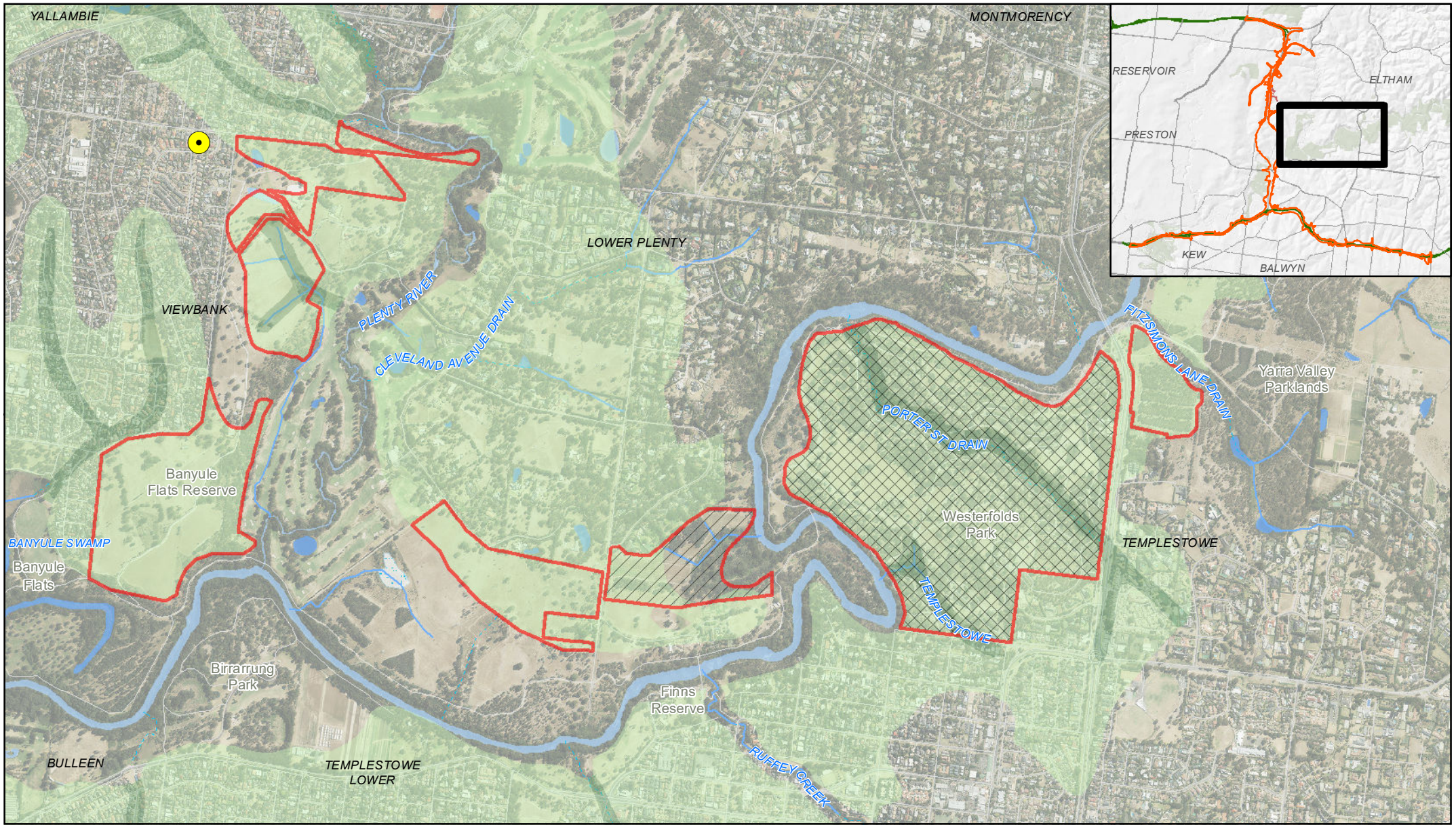

Paper Size A4

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Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Legend

- Roads
- Stream
- Drain/channel/other
- Yarra Valley Parklands
- Montpellier Reserve
- Westerfolds Park

Modelled 1750 Ecological Vegetation Classes

- Creekline Grassy Woodland
- Plains Grassy Woodland
- VBA flora (DELWP): Eucalyptus X studleyensis

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Job Number 31-35006
Revision A
Date 15 Jan 2021

Recipient sites within Yarra Valley Parklands

Figure 2

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GHD

Level 9, 180 Lonsdale Street
Melbourne Victoria 3000
T: 61 3 8687 8000 F: 61 3 8732 7046 E: melmail@ghd.com

Document Status

Revision	Author	Reviewer	Approved for issue		
			Name	Signature	Date
Final Rev 0	D Roocke (Emerge)	C Miller (Emerge)	M Roser (GHD)		29/07/2019
Rev 1	J Harman (GHD)	M Roser (GHD)	M Roser (GHD)		30/07/2020
Rev 2	J. Moyses (GHD)	J. Harman (GHD)	M Roser (GHD)		29/07/2021
Rev 3	J Harman (GHD)	M Roser (GHD)	M Roser (GHD)		11/10/2021

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