Translocation Plan for Spiny Rice-flower to be salvaged from Elfield Industrial Estate, Ajax Road, Altona

May 2012

Biosis Research Pty. Ltd.

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RESEARCH

Report for
Axxcel Management Services

Translocation Plan for Spiny Rice-flower to be salvaged from Elfield Industrial Estate, Ajax Road, Altona

May 2012 (updated April 2015)

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ABBREVIATIONS

DELWP	Department of Environment, Land, Water and Planning (Victoria)
DEPI	Department of Environment and Primary Industries (now DELWP)
DSE	Department of Sustainability and Environment (now DELWP)
DoE	Department of the Environment (Commonwealth)
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
EVC	Ecological vegetation class
FFG	*Flora and Fauna Guarantee Act 1988* (Vic.)
FIS	Flora Information System (DELWP)

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1.0 INTRODUCTION

1.1 Project Background

1.1.1 Ajax Road

Approval for the development of Lot H at Ajax Road Altona (Figure 1) was referred to the Australian Minister for Conservation in 2014 (Referral 2014/7208). Assessed as a controlled action, approval of the project is subject to a number of conditions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These are outlined in the approval document provided by the Department of Environment (DoE). These conditions include the salvage and translocation of Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* in accordance with protocols outlined in this translocation plan.

The flora and fauna assessment of the Ajax Road site (Biosis 2014) included a targeted search for this species and identified 33 individuals of Spiny Rice-flower within the proposed development footprint (Figure 2). These plants have not been examined to determine their sex (Spiny Rice-flower is generally dioecious).

1.1.2 Receptor Site

The Department of Environment, Land, Water and Planning (DELWP) have identified a Receptor Site as the preferred location to receive plants salvaged from Ajax Road, Altona. The Receptor Site is located approximately XX kilometres north/south/east/west of the Melbourne CBD, and XX kilometres north/south/east/west of existing urban development in the township of YYYY (Figure 3). It is approximately XX km north/south/east/west of the Ajax Road site.

The flora and fauna of the Receptor Site have been documented by Biosis (201X). A Conservation Management Plan (CMP) has been prepared for the receptor site which provides detail on the management methods which will be employed to improve the condition of the receptor site (Biosis 201X).

Spiny Rice-flower within the development footprint at Ajax Road will be translocated into areas of the Receptor Site which will be managed as a conservation reserve.

1.2 Summary of Translocation Proposal

Details of the translocation proposal are provided in this plan, with key points summarised below:

All 33 plants identified within the Ajax Road development area will be translocated to a conservation reserve at The Receptor Site.

Prior to physical translocation, plants will be examined to determine their sex. This information will be used to determine priorities for salvage and the configuration of planting at the receptor site.

Prior to the physical translocation plants seed will be collected from all female plants. Only seed from one flowering season will need to be collected.

Physical translocation of entire plants will be undertaken using a tractor mounted tree-spade. The nature of the machinery means that soil conditions at the receptor site must be such that soil disturbance from machinery movements will be minimal. This is generally in summer when soils are hard and structurally resilient to compaction.

Salvaged plants within soil plugs will be placed into hessian lined steel baskets and transported to the approved receptor site, ideally on the same day. Plants will be removed from the baskets and placed into holes dug by the tree-spade.

Translocated plants will be intensively monitored for the first summer/autumn period to determine the need for watering. Watering may occur weekly for the first three months and sporadically thereafter for up to two years depending on rainfall.

Plants will be monitored for a total of five years to determine survival and recruitment rates at the receptor site.

The receptor site will be managed in perpetuity for conservation and the protection and enhancement of the grassland environment supporting the translocated population.

1.3 Timeframe

The translocation program will commence as soon as this plan is approved (anticipated to be September to October 2012) and follow the timetable outlined in Table 1. Preparation of the proposed recipient sites within the selected receptor site will also begin as soon as this plan is approved, with selection of specific recipient locations and initial weed control.

Table 1. Summary of actions and timing

Timing	Action
June 2015	Identify the sex of plants to be translocated.
June 2015	Liaise with DELWP to identify a receptor site, survey as required and initiate pre-translocation management as soon as possible.
June 2015	Start seed collection procedures.
November 2015	Initial preparation of receptor site completed.
December 2015 to February 2016 (when soil moisture conditions are appropriate)	Undertake physical translocation after approval under the EPBC Act and from DELWP has been provided.
December 2015 to February 2016	Conduct intensive monitoring of translocated plants to ensure plants are watered as required.
March/April 2016	Sow seed (direct drilling) into defined seed germination site within the Receptor site.
Post translocation (up to five years post translocation)	Ongoing weed control, monitoring and other management actions as specified continue in the receptor site.
Annual post translocation (up to five years post translocation)	Report on the outcome of translocation process. Submit annual report to DoE and DELWP (December).

2.0 TRANSLOCATION REQUIREMENTS

This translocation plan must be approved by the Australian Government Minister for Conservation prior to its implementation.

The translocation process must be consistent with the details outlined by this plan.

The receptor site will be approved by DELWP. Basic requirements for this site include:

- The site needs to be managed on an ongoing basis to maintain the translocated population for as long as translocated individuals survive.
- Long term management arrangements need to be documented and approved.
- The site will ideally be located on the Victorian Volcanic Plain.
- The site should be on public land or land with a sympathetic management agency or structure.
- The site should be of gentle relief (plains) with well-drained or moderately draining soils (surface rocks should not be a dominant feature and gilgai terrain should be avoided).
- Vegetation should be Plains Grassland (Ecological Vegetation Class 132).
- Grazing by domestic stock will be excluded.
- Sites should be fenced for protection. This will be either a broader site subject to conservation management or the receptor site as a whole.
- Weed control is a requirement for site preparation and is also an ongoing management requirement. Weed levels will be managed to be no greater than 5% of total vegetation cover.
- Ecological burning is a requirement for ongoing site management to maintain an open tussock grassland structure. Burning of the defined receptor site will occur every second year unless otherwise determined by a recommendation provided by the *Pimelea spinescens* Recovery Team.

3.0 TRANSLOCATION PROPOSAL

Translocation of plants salvaged from the Ajax Road site will be undertaken as follows:

Sound and detailed translocation planning

Details of the translocation plan are provided in Section 4.

Commitment and Expertise

Biosis Pty. Ltd. (or an equivalent consultant) will provide ecological expertise to the translocation project from the initial planning stages through to ongoing monitoring and site management. All work will be undertaken by qualified ecologists, supervised by senior staff with previous experience in translocation and vegetation management.

Biosis has designed and supervised a number of projects for translocation and management of threatened flora including Spiny Rice-flower. These projects include:

- Salvage of Spiny Rice-flower and ongoing management and monitoring at Williams Airfield (now Williams Landing) (Mueck 2000, Biosis Research 1999);
- Salvage of Matted Flax-lily, re-establishment of propagules, and ongoing management and monitoring at Larundel Grassland reserve, Bundoora (Mueck 2004, Brown and Mueck 2006);
- Salvage, direct translocation and ongoing management of Matted Flax-lily at South Morang Flora and Fauna Reserve, South Morang (Yugovic 2006);
- Machine salvage of Spiny Rice-flower within the Deer Park Bypass and direct translocation to the Ravenhall Grassland, Laverton (Biosis Research 2006);
- Treespade salvage and direct translocation of Spiny Rice-flower and mixed grassland species at Cairnlea, the former Albion Explosives Factory (Biosis Research unpublished data);
- Salvage by hand and propagation of rare or threatened cranesbills (*Geranium* sp. 1, *Geranium* sp. 3, *Geranium* sp. 14, *Geranium solanderi*) and Arching Flax-lily *Dianella* sp. aff. *longifolia* (Benambra), from the Broadmeadows to Craigieburn Railway Reserve, Broadmeadows (Costello 2004, Costello and Koehler 2004);

- Salvage by hand for direct translocation and propagation of grassy wetland species and tree-spade salvage and direct translocation of Smooth Rice-flower *Pimelea glauca* and mixed grassland/grassy wetland species into Epsom Conservation Reserve, Mordialloc (Costello 2000, 2002, 2005)

On-ground aspects of the project will be undertaken by indigenous vegetation management specialists and will include ecological burning, weed control and the control of pest animals. Appointment of these management specialists is via a tender process. Biosis has managed this process for a number of protected sites and specialist contractors used to date have included Australian Ecosystems Pty. Ltd., Grey Box and Grasslands Indigenous Nursery (GAGIN) and Merri Creek Management Committee. Tenders are requested periodically and appointees selected on both cost and reliability criteria.

Funding

The translocation process, receptor site preparation and follow-up management and monitoring will require input for a period of five years. This will be funded by the proponent of the approved development for the Ajax Road industrial site.

Costs for this project include:

- Preparation for translocation (sexing and marking plants, seed collection);
- Assessment of the receptor site (identification of specific planting locations and defining ongoing management protocols);
- Preparation of the receptor site for the translocation (pest plant and animal management and access control);
- Conduct and supervision of the physical translocation;
- Ongoing management of the receptor site including monitoring, pest plant and animal management, ecological supervision, biomass management and reporting.

While the some of these tasks will be performed by the developer (i.e. sexing, marking, seed collection, and direct translocation) ongoing tasks may be performed by a third party depending on the ownership of the receptor site. Funding for the longer term tasks may be required as a lump sum payment to the land owner/manager of the receptor site. If an upfront payment from the developer eventuates then the land owner/manager of the receptor site will be responsible for the relevant components of this plan.

Removal and ongoing control of threatening processes

The most immediate threats to the viability of the receptor site are likely to include:

- Weed invasion, particularly by tall-growing perennial grasses such as Toowoomba Canary-grass *Phalaris aquatica* and Chilean Needle-grass *Nassella neesiana*;
- Inappropriate burning regimes/biomass control (i.e. biomass accumulation);
- Trampling and trafficking by vehicles and people; and
- Grazing by domestic stock, rabbits and hares. Rabbits and hares will be controlled by baiting while grazing will be controlled by fencing.

In the longer term, seedling regeneration of the species may be limited due to a number of factors relating to flowering, seed set and seedling establishment and survival.

Management of the Receptor Site is detailed in Biosis (201X) and summarised in Section 4. This active ecological management will continue to be undertaken by experienced native vegetation management contractors.

Management actions include fencing of the site, installation of signage and pathways for controlled public access (as appropriate and approved by DELWP), weed control and biomass control.

Management of the Receptor Site is an ongoing and permanent requirement.

Duration

This translocation plan will apply until five years after the completion of the physical translocation and the provision of a final report on the survivorship of the translocated population. However management of the Receptor Site and the salvaged plants will continue in perpetuity, albeit at a lower intensity. After plants are established, management will comprise periodic biomass reduction as needed, weed control and maintenance of fencing, gates, pathways and signage.

4.0 TRANSLOCATION PROCESS

4.1 Introduction

Spiny Rice-flower is a small sub-shrub that grows to a height of about 30 cm. Endemic to Victoria, it generally grows in grasslands or open shrublands on basalt-derived soils west of Melbourne. This habitat is mapped by the DELWP as the Ecological Vegetation Class (EVC) Plains Grassland (EVC 132) which is also listed under the State's *Flora and Fauna Guarantee Act 1988* as Western (Basalt) Plains Grassland Community.

Individuals of Spiny Rice-flower are dioecious (i.e. unisexual) and have a large taproot which extends to a depth of a metre or more. They are also thought to be slow growing and long lived, reaching ages of up to a century. In contrast to other grassland species, it flowers in mid-winter (Entwisle 1996).

The recovery plan for the species is currently being updated (Blue Devil Consulting in prep).

Most populations observed appear to consist of relatively mature plants and there is little evidence of recruitment. Seed production appears limited and seed longevity is unknown (Mueck 2000). Germination of seed or seedling survival is often not observed in the field but has been observed in association with significant summer rainfall events in open (recently burnt) grassland environments (Mueck, pers. obs.). Like many other long lived, slow recruiting species, Spiny Rice-flower is likely to be vulnerable to a sudden population crash when existing plants become senescent (Mueck 2000).

Spiny Rice-flower will resprout from its tough rootstock and is therefore tolerant of fire, slashing, mowing or grazing. It will even resprout after shallow soil scalping although to what depth it can tolerate such harsh treatment is unknown. To allow plants to reproduce they need to be able to flower and set seed in most years and therefore burning or slashing should be appropriately timed and not too frequent. Spiny Rice-flower is sensitive to herbicides and therefore weed control works need to be certain of avoiding contact with this species.

4.2 Receptor Site

The Receptor Site has yet to be defined but will be identified and approved by DELWP. Pest plant and animal control works are likely to be required prior to the salvaged individuals of Spiny Rice-flower being planted at the receptor site.

If an ecological management plan is not available for the receptor site then one will be prepared.

4.3 Translocation Stages

The following stages and issues in translocation are discussed below:

- Locating plants
- Sexing plants
- Seed collection
- Site preparation
- Physical salvage and replanting
- Receptor site management
- Monitoring and reporting
- Performance targets

4.3.1 Locating Plants

While the locations of the 33 plants identified for translocation are recorded as GPS waypoints, plants will need to be clearly marked to allow for surveys to identify the sex of plants and to collect seed. Marking also allows the efficient salvage of plants using the tree-spade.

Plants will be marked to allow for the rapid location of individuals by workers implementing this translocation plan. However markers visible to the public typically attract attention and such markers are often removed. Markers will therefore be visible from about five metres to an observer who knows what to look for but will otherwise be discrete or invisible to the general public.

4.3.2 Sexing Plants

Individual Spiny Rice-flower plants are either male or female (dioecious) although some plants may have bisexual flowers or both male and female flowers. The sex of plants is considered important as concentrations of single sex plants in a translocated population may produce an outcome which constrains or inhibits seed production. The configuration of plants to be salvaged is also likely to mean that not all plants are able to be salvaged. Close aggregations of plants often mean that the salvage of one plant will damage another. In such circumstances knowing the sex of each plant allows for a more informed decision to be made during salvage. Female plants are considered significantly more valuable than male plants as a single male can provide pollen for many female plants.

Plants will be examined during the 2015 flowering season and their sex recorded in a manner that allows individual plants to be recognisable during the physical translocation process.

4.3.3 Seed Collection

Seed will be collected from all female plants within the development footprint prior to the start of the physical translocation process. Collection of seed will be guided by the existing seed collection protocol (*Pimelea spinescens* Recovery Team 2008).

Seed collection involves covering the seed bearing branches with a fine mesh stocking to catch the seeds as they fall.

4.3.4 Site preparation

Identification and preparation of recipient site(s) will begin within one month of the approval of this translocation plan and the approval of a site by DELWP. Any site will be large enough to allow a group of plants to be replanted, for ease of monitoring and ongoing management and to provide for potential cross-pollination. Site(s) will be selected such that access for planting, management and monitoring is possible without trafficking more intact sections of the site. The specific planting sites will be marked with star pickets or similar to allow translocated plants to be found.

Weed control in the planting areas will be satisfactorily completed before plants are installed. The cover of perennial weeds within a minimum one metre radius of each planting site will be <1%. Ideally the receptor site will be burnt in the weeks or few months prior to the translocation exercise.

Planting of the collected seed will be completed in a manner suitable for monitoring. This will involve techniques not necessarily suitable to the establishment or management of high quality native vegetation. This process is somewhat experimental as no direct seeding using Spiny Rice-flower has been conducted in the past.

The selected seed planting area will be direct seeded in a manner in which seed is buried to a depth of a few millimetres and supports vegetation with the potential to be burnt in the autumn after seeding.

4.3.5 Physical salvage and replanting

Physical translocation of entire plants will be performed using a tractor mounted tree-spade (Mueck 2000). Timing for the physical translocation of selected plants by tree spade is typically during summer as soils during this period are normally dry. It is essential that soils are dry during this process to avoid any unnecessary soil disturbance in the translocation receptor site. Seasonal conditions may also allow this process to occur during other seasons (i.e. early to late autumn).

Salvaged plants will be moved to a relatively remote location and therefore the translocation process will involve removal of the salvaged soil plugs from the tree-spade before they are planted. As the soil at the salvage site will most likely be dry, plants to be salvaged need to be watered before the tree spade extracts them. The tree-spade will only be deployed when the soil around the plant to be salvaged is wet. The tree spade blades should always be well lubricated with water when being inserted or withdrawn from soil.

Once plants are removed from the soil the tree-spade will place the salvaged soil plugs supporting each plant into a hessian lined steel basket. Full baskets will then be transported to the approved receptor site, ideally on the same day. Plants will be removed from the baskets and placed into holes dug by the tree-spade. Any gaps between the planted soil plug and the planting hole will be filled with washed sand to slow desiccation. Once planted, salvage plants will be watered.

4.3.6 Receptor site management

Once the receptor site has been planted out the site will be managed as a conservation reserve guided by a conservation management plan (CMP) specifically prepared for that area and approved by DELWP. This CMP will include requirements for pest plant and animal control, biomass management and any other management requirements to ensure the species richness of the site and that natural ecosystem processes are maintained.

The area around each translocated plant will be subject to intensive hand weeding to prevent the accidental application of herbicides. Hand weeding will occur every six months. Weed cover within one metre will be less than 1%.

The presence of translocated plants will not prevent the ecological management of the site. Translocated plants will benefit from pest plant and animal control works and regular burning (every two years is anticipated). Translocated plants may be protected from burning if seedlings less than six months old are present.

It is also likely that the translocated plants will require regular watering to ensure they do not die from drought stress while their root system recovers from the disruption associated with translocation. There are a number of ways to water the receptor site but no water carting contractor should be allowed to have unsupervised access to the site. Any works must be conducted under the supervision of a person(s) experienced in the management of native grassland. The installation of a tank fed drip watering system is recommended.

The direct seeding component of this translocation plan will attempt to establish plants through the natural recruitment of seedlings. This has been observed in natural populations, typically after fire and during relatively high rainfall years. Seed collected from Ajax Road will be sown in autumn and burnt shortly

afterwards if long range weather forecasts suggest normal to above normal winter rainfall. If this is not the case burning will be delayed for a maximum of one year and the site will be burnt in the following autumn.

4.3.7 Monitoring and Reporting

The location of the recipient site will be recorded using GPS and the data transferred onto a map. A detailed map identifying the configuration and relative location of plants will be prepared. This will accurately identify the distance between translocated plants to ensure the precise location of each plant can be identified in future. Each translocated plant will be labelled (with a durable metal label) and numbered for record keeping and monitoring purposes. This will allow monitors to follow the survivorship of plants and to determine if translocation impacts male or female plants differently.

The monitoring exercise for translocated Spiny Rice-flower will initially involve very regular inspections of translocated plants. This frequent monitoring is to ensure plants do not die from drought stress as a result of disturbance to their root systems and changes to the surrounding soil structure caused by the translocation process. As translocation is expected to occur during dry soil conditions (in summer), plants need to be inspected weekly until soil moisture conditions are naturally moist. Plants are likely to require watering during this period. This initial monitoring may therefore involve weekly inspections for three or more months depending on seasonal conditions. Once soil moisture conditions improve, monthly visits would be adequate until the plants and translocated soil become well integrated into the existing soil matrix. More frequent monitoring visits (potentially weekly) will be required as dry soil moisture condition return for the next summer after translocation. After this summer period they would be examined every second month until they have survived to the beginning of their third autumn break. After this they would be monitored annually until five years post translocation.

Data to be collected during monitoring inspections include:

- a general indication of the health of each plant;
- how well the soil plug is integrating into the translocation site's soil;
- whether the plant is actively growing;
- has the plant flowered or if any recruitment of new plants is evident; and
- any management issues that need to be addressed (i.e. localised weed control).

These details will be recorded on a recording/evaluation sheet. Plants will be recorded as either healthy (normal unstressed plant), alive (unhealthy plant suffering stress) or dead.

If monitoring identifies the requirement for any management response (i.e. low soil moisture levels with plants needing watering, elevated biomass levels and the receptor site needs to be burnt, elevated pest plant or animal levels and control works required) then these issues must be dealt with promptly. Any request for watering must occur as soon as possible but definitely within 2 days. Any pest plant or animal problems must be dealt with within two weeks and any elevated biomass issues must be alleviated within two months or the next available burning opportunity.

The germination of seedlings may be stimulated by the watering program and therefore additional watering may be required to maintain seedlings. Watering will occur if it is considered that seedlings would not otherwise survive.

The progress of the translocation program will be reported every six months for the first year and annually until five years post translocation.

The direct seeding site will be clearly marked and systematically searched for seedlings in mid to late winter after the autumn burn. Any seedlings will be marked and monitored to determine survival. Monitoring will occur every six months for as long as the other translocated plants are monitored (i.e. five years post physical translocation).

The results of the translocation program will be adequately documented and reported to DSE and the Spiny Rice-flower Recovery Team on an annual basis.

4.3.8 Performance Targets

Plants are considered established and independent after surviving for three years. Translocation is an inherently unpredictable process and while there is an expectation (based on experience) that about 60% of translocated plants will survive for two years after translocation, a performance target is not considered appropriate in this instance.

All management actions are targeted to maximise the survival of translocated plants and if conducted in a manner consistent with this plan will be considered satisfactory.

Translocated plants may not survive in the short term but seed moved with the translocated plug may germinate and become established. This is considered a successful outcome. Conversely, a translocated plant could survive indefinitely but not reproduce. This would be considered a failure.

The only measure of success will be the establishment of a new generation of Spiny Rice-flower plants in response to natural climatic conditions and the broader ecological management of the receptor site. The five year management program seeks to detect this outcome.

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FIGURES

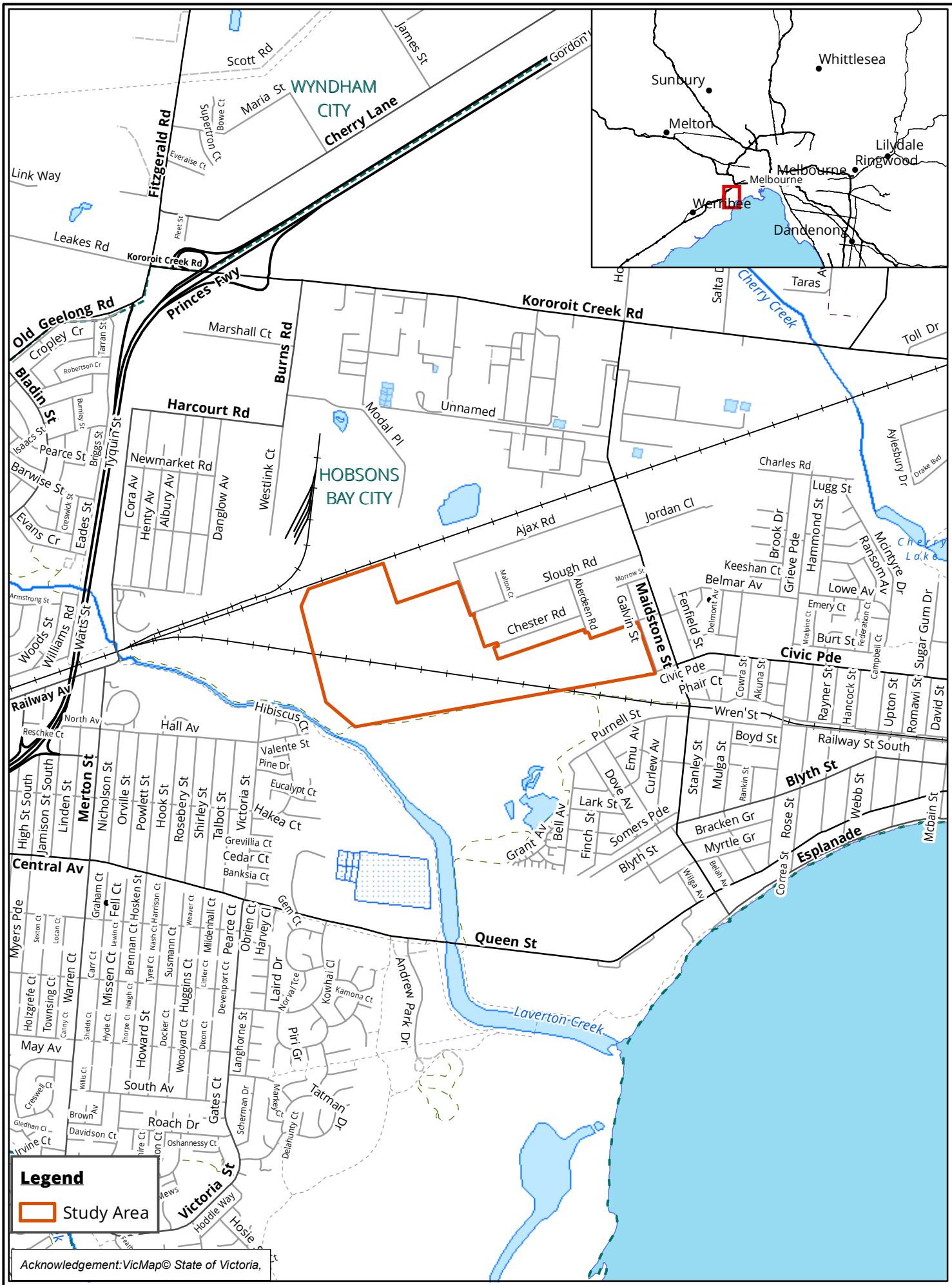

Figure 1: Location of the Study Area - Ajax Road, Altona, Victoria

Matter: 16344,
Date: 13 March 2014,
Checked by: SGM, Drawn by: SKM, Last edited by: smitchell
Location:P:\16300s\16344\Mapping\16344_F1_Locality.mxd

0 250 500 750 1,000
Metres
N

Scale 1:25,000 @ A4, GDA 1994 MGA Zone 55

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

Legend

- Study Area

Spiny Rice-flower (gender)

- Female
- Male
- Unassigned

Figure 2: Location of Spiny Rice-flower plants recorded within the area

0 20 40 60 80 100

Metres

Scale: 1:3,557 @ A3
Coordinate System: GDA 1994 MGA Zone 55

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Matter: 14681
Date: 19 July 2012,
Checked by: KS, Drawn by: PMA
Location:P:\14600s\14681\Mapping\14681_Fig1_SRF_loc_sex.mxd

Figure 3: Conservation Reserves designated as translocation receptor sites.