

**CLAYTON DRIVE RESERVE, SPREYTON
DEVONPORT CITY COUNCIL**

***ENGAEUS GRANULATUS* MONITORING REPORT**

JULY 2019

EPBC 2011/6095

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Summary

An assessment of the land designated as the Offset Site for project EPBC 2011/6095, known as 'Clayton Reserve', at 39 Clayton Drive Spreyton was conducted on 22 July 2018.

Project EPBC 2011/6095, which was approved by the Department of Sustainability, Environment, Water, Population and Communities, included –

- The translocation of *Engaeus granulatus* from an area of roadworks on Sheffield Road to Clayton Reserve; and
- Habitat improvement works at Clayton Reserve to increase the number of *Engaeus granulatus* at that location.

The following observations were made in the July 2019 assessment -

- *Engaeus* burrows/chimneys were recorded across all areas where habitat had been created and/or improved in 2012.
- Most *Engaeus* burrows were hidden by the dense grass – sedge – rush ground layer.
- There is no evidence of significant erosion (ie erosion that warrants intervention) occurring from areas of created and improved *Engaeus* habitat.
- Areas of created habitat remain wet and/or have surface water for sufficiently long periods of time to support the presence of an aquatic water milfoil species (*Myriophyllum* sp.).
- Plantings have grown very well, and losses remain low – losses are localised to shorter lived perennials (eg *Cassinia aculeata*).
- Some areas of blackberry and intertwined native species were noted to be dead, probably from spraying activities;
- There are several willows in the creekline, especially near areas of habitat created for *Engaeus*, which are almost dead (they had been cut and pasted/stem injected with herbicide since the July 2018 monitoring assessment).
- Natural seedfall and subsequent recruitment of trees and shrubs has been sporadic across the reserve, with the most obvious species being *Cassinia aculeata*, *Acacia dealbata*, *A. melanoxylon*, *Eucalyptus ovata* and *E. viminalis*.

It is recommended that –

1. The two areas identified in June 2016 containing *Engaeus* continue to be physically identified on-ground (eg using wooden stakes with blue tape, comparable to other areas identified in this way) and be left undisturbed from mechanical activities including slashing, mowing etc.
2. Weed spraying be conducted in Spring 2019 to target the few remaining dense blackberry thickets along fencelines. Blackberries within and near waterways and areas occupied by *Engaeus* should not be sprayed.
3. Continue to monitor for caper spurge (*Euphorbia lathyris*) which should be removed as it appears (NB – *Euphorbia* produces a toxic/irritating white liquid when the leaves/stem are damaged. Always wear gloves and wash your hands thoroughly after handling plants).
4. Continue to monitor the willows for regrowth and treat as required.

1. SCOPE OF REPORT

This report compiles the monitoring results from a survey conducted in July 2018 for project EPBC 2011/6095 which was approved by the Department of Sustainability, Environment, Water, Population and Communities on 7 June 2012.

The Offset Management Plan (the 'OMP') prepared and approved for 39 Clayton Drive (Clayton Reserve – Figure 1) outlines the monitoring program.

The project included –

- The translocation of *Engaeus granulatus* from an area of roadworks on Sheffield Road to Clayton Reserve; and
- Habitat improvement works at Clayton Reserve to increase the numbers of *Engaeus granulatus* at that location.

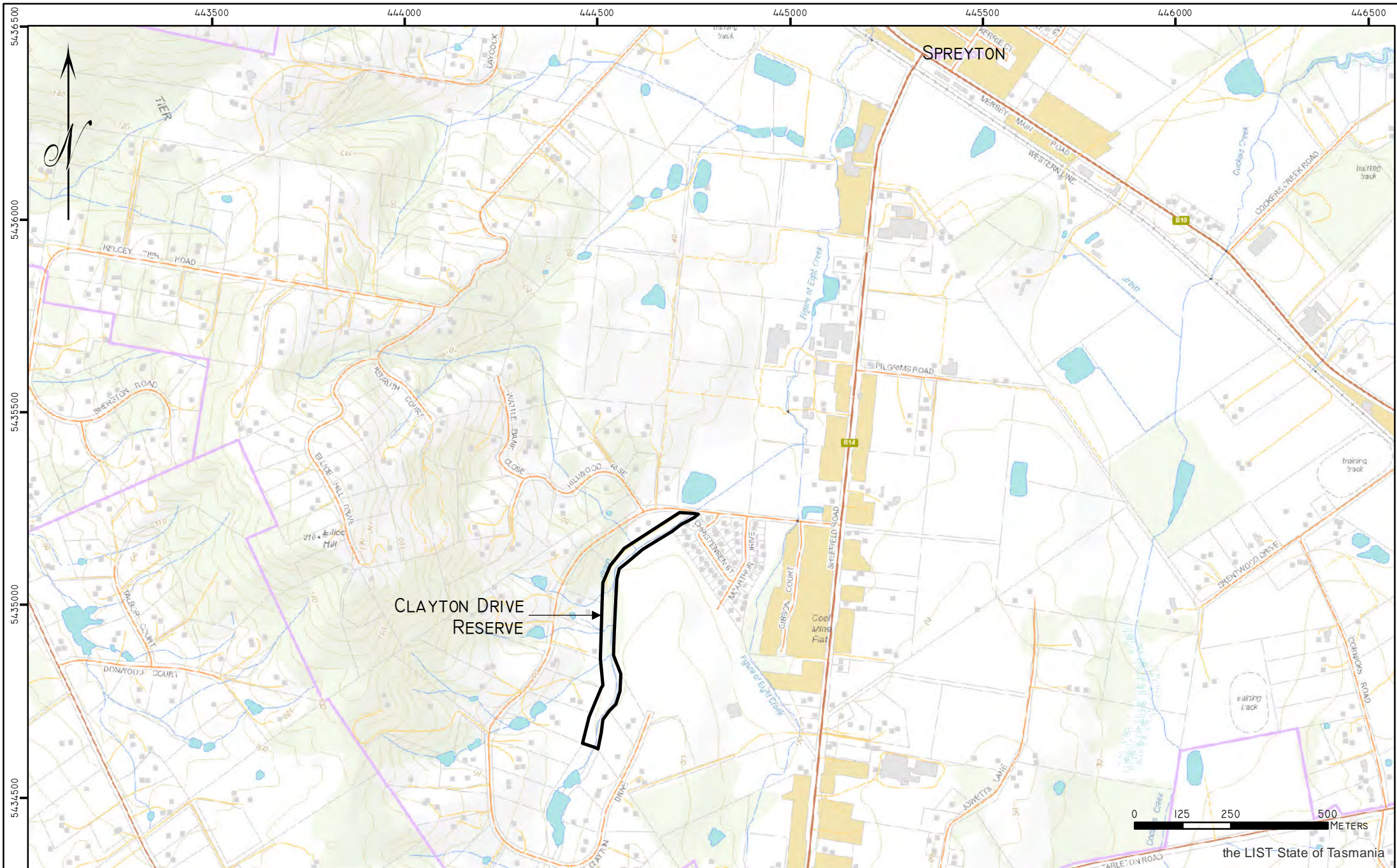
The objectives of the OMP were to;

1. Protect existing Central North burrowing crayfish in the Offset Site;
2. Translocate Central North burrowing crayfish to the Offset Site from the Activity Site to increase the overall number of Central North burrowing crayfish at the Offset Site;
3. Create new habitat for Central North burrowing crayfish within the Offset Site to increase the carrying capacity of the site to accommodate enough animals to compensate for the loss of Central North burrowing crayfish at the Activity Site;
4. Create a geographic area of new habitat for Central North burrowing crayfish within the Offset Site to compensate for the loss of habitat at Sheffield Road;
5. Provide a practical opportunity to investigate the merits and methods of habitat creation and translocation for Central North burrowing crayfish, including information on the techniques to create habitat and the rate of population expansion into created habitats, and the techniques and success of translocation;
6. Improve habitat condition and landscape connectivity in the Offset Site for Central North burrowing crayfish and other species of conservation significance, including Tasmanian devil, swift parrot and eastern barred bandicoot;
7. Manage non-native areas of the site for fuel reduction purposes and passive recreational activities without impacting on the natural values in the Offset Site; and
8. Provide a 'nature conservation' educational resource for community groups, land managers, school groups, visitors and the broader community.

The OMP committed to providing progress reports to DSEWPac and the Policy and Conservation Assessment Branch (DPIPWE) every:

- 6 months from the commencement of the project for 2 years (4 reporting periods); and then
- annually for the next 8 years (8 reporting periods).

Tasks to be completed for each monitoring period are those listed in Table 1.



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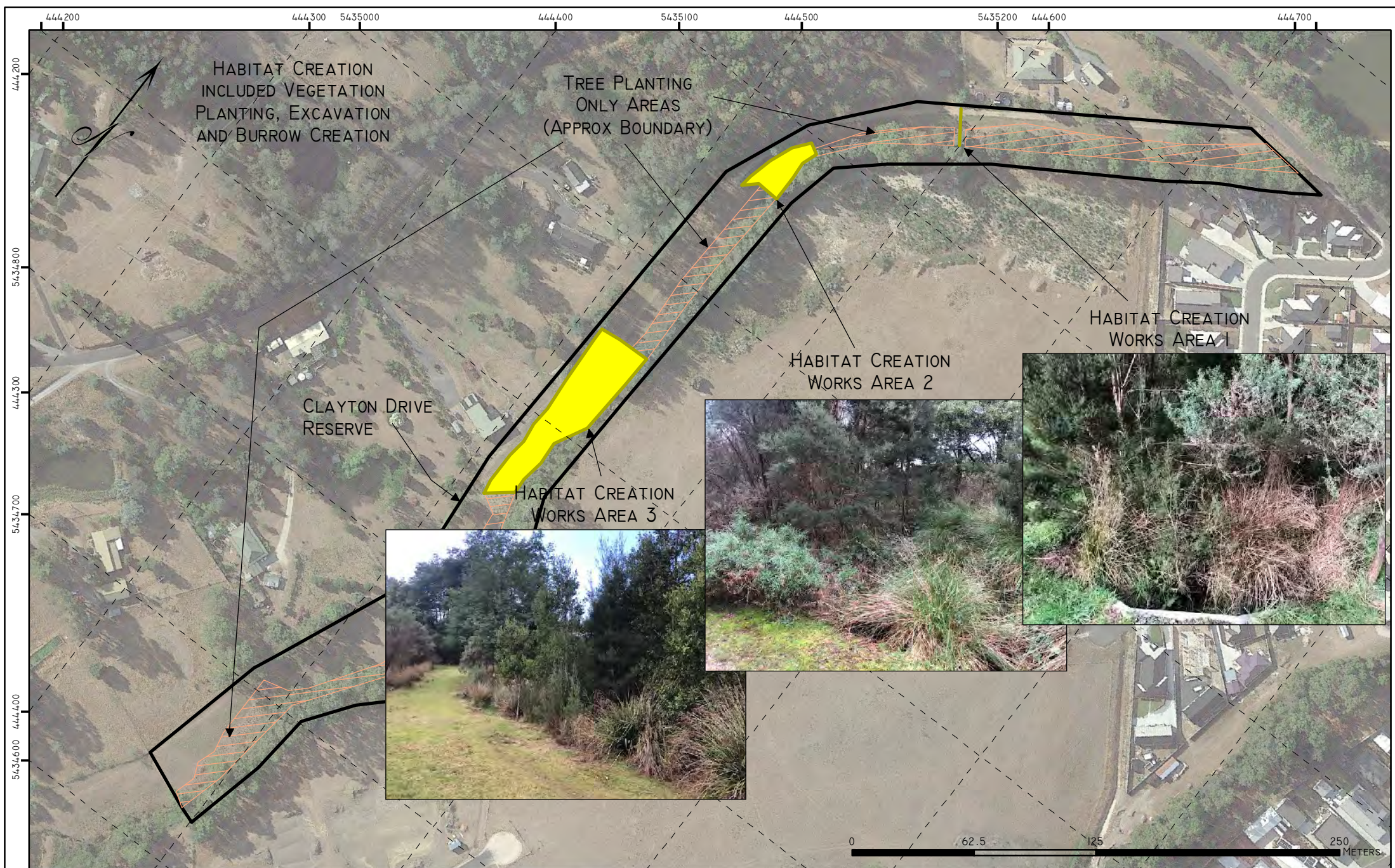
FIGURE I: LOCATION OF CLAYTON DRIVE RESERVE



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FIGURE 2: LOCATION OF WORKS AREAS AT THE CLAYTON DRIVE RESERVE



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Table 1. Monitoring regime for the Offset Site based on project phase

Items in Yellow have reached the Completion Criteria for the project but still require annual assessment until October 2022. Items highlighted in Orange have been completed.

| Parameter | Tasks | Zone and frequency | Responsible |
|----------------------------|---|--|------------------------------|
| Translocation | | | |
| Survivorship | <ul style="list-style-type: none"> Burrow Count Photopoints | Zone 4; 2, 4, 6, 8, 10, 12, 24, 36 and 52 weeks from translocation (1 year monitoring total) | Suitably qualified ecologist |
| Habitat Creation | | | |
| Burrow increase | <ul style="list-style-type: none"> Burrow Count Photopoints | Zone 4; 4, 8, 12, 36 and 52 weeks from translocation then every 12 months (timed for October - November) which is after the breeding and dispersal period of CNBC) for a further 9 years | Suitably qualified ecologist |
| Erosion | <ul style="list-style-type: none"> Photopoints | Zone 4; 4, 8, 12, 36 and 52 weeks from translocation then every 12 months for a further 9 years | Suitably qualified ecologist |
| Wetness | <ul style="list-style-type: none"> Observation of surface flow areas Auger to water table | Zones 1-4; Every 6 months from planting for 5 years, then every 12 months for a further 5 years | Suitably qualified ecologist |
| Plant survival | <ul style="list-style-type: none"> Count Losses Photopoints | Zones 1-4; Every 6 months from planting for 10 years | Suitably qualified ecologist |
| Habitat Improvement | | | |
| Burrow increase | <ul style="list-style-type: none"> Burrow Count Photopoints | Zones 2 and 4; 4, 8, 12, 36 and 52 weeks from translocation then every 12 months (timed for October - November) for a further 9 years | Suitably qualified ecologist |
| Plant survival | <ul style="list-style-type: none"> Count Losses Photopoints | Zones 1-4; Every 6 months from planting for 10 years | Suitably qualified person |
| Other Fauna | <ul style="list-style-type: none"> Den and Nest Search Swift parrot survey* | Zones 2/3; Every 12 months from planting for 10 years (*during peak breeding period for swift parrot; Nov - Feb) | Suitably qualified person |

2. SITE INFRASTRUCTURE AND PLANNING

2.1 SIGNAGE AND SITE ACCESS

Signage and site access were reported in the 12-month report and there have been no changes since then.

No additional signage is required to be installed under the OMP.

2.2 SITE INFRASTRUCTURE

No infrastructure has been established in the reserve.

2.3 PLANNING

THE OMP stated –

The offset site will be appropriately re-zoned (as Environmental Management Zone or similar) for the conservation of fauna at the site under the new planning scheme to be submitted for approval by the Tasmanian Minister for Planning in August 2012.

The site will be managed as Public Open Space in accordance with the DCC Public Open Space Service Level 2011/12 Plan and this Plan. The DCC Public Open Space Service Level 2011/12 (POSSL) Plan is reviewed annually and outlines the type of land and its function; Section 3 Asset Inventory can include the primary function of the Conservation of Flora and Fauna (code CFF in the Function column), such as the Mary Street Wetland and Bridge Road Reserve. A description of CCF is in section 3.3 of the DCC Public Open Space Service Level 2011/12 Plan.

Compliance for DCC Public Open Space Service Level 2011/12 Plan is outlined in Section 9 of the POSSL, whereby legislation and other documents of DCC need to be applied and also the existing Plans for key sites, such as the Don Reserve and Kelcey Tier. The Plan for this project will be added to this list and related to the approvals (conditions etc.) given by the State and Commonwealth Governments.

The site will be added to the GIS layer maintained by Council and Council staff will be advised of the conservation importance of the site and this Plan. DCC is to ensure that no unauthorised DCC works occur at the site. Active management of the site will be performed by the DCC Works Crew in accordance with the OMP with funding and other resources provided through the DCC Annual Works Program.

The Devonport City Council Interim Planning Scheme came into force on 19 October 2013. The reserve is zoned 'Environmental Management' which is consistent with the commitment made by the Devonport City Council during the assessment process under the EPBC Act.

Management of the site, and its associated management plan, were added in to the list of reserves managed by DCC under the DCC Public Open Space Service Level 2014/15 (the current version of the SL) Plan prior to the 6-month monitoring event. Compliance for DCC Public Open Space Service Level 2014/15 Plan is outlined in Section 11.13.

There has been no change to the zoning of the reserve, and it remains on the DCC Public Open Space Service Level Plan.

The management of the reserve has been in accordance with the OMP.

DCC is currently preparing the Local Planning Provisions (zone maps, local area objectives etc) for the new Scheme which must be in accordance with the Tasmanian Planning Scheme. It is likely that this process will see the reserve retain the same zoning of 'Environmental Management' or be assigned a directly comparable zone.

2.4 COMMUNITY AWARENESS AND ADJOINING LANDS

There have been ongoing discussions between DCC staff and adjacent landowners as to the works being undertaken at the site for the CNBC. The Council has discussed with new owners of properties

adjacent to the reserve its' management intent such that they are aware of the values present in the reserve.

Locals continue to frequent the site for recreational activities and are aware of the sites' natural values and significance for *Engaeus granulatus*.

3. CENTRAL NORTH BURROWING CRAYFISH TRANSLOCATION

3.1 HABITAT CREATION FROM THE PROJECT

The habitat created from the on-ground works associated with the project was mapped using a GPS in 2013. Created habitat was assessed (15 months from when the site was 'modified' to create habitat) as being 6,046 square metres. This is more than double the required amount of created habitat by the Completion Criteria (which requires 3,000 square metres).

3.2 *ENGAEUS* OBSERVATIONS

Engaeus burrows were observed in early 2014 in all the areas of created habitat which confirms the suitability of habitat for the species as no *Engaeus* were present in these areas prior to the habitat creation works (mostly drainage works to create wet areas) in mid-2012. *Engaeus* burrows were again observed in these areas, and others, in the assessment conducted in July 2018 and July 2019.

The following images show various stages (2011 to 2018) of rehabilitation since the on-ground works were completed. There has been considerable improvement in the quality and quantity of habitat available for *Engaeus* and for other native fauna, such as bandicoots. In effect, what was pasture in the habitat creation/improvement areas has become, in most parts, damp to wet habitat for *Engaeus* dominated by native plant species – sedges, sagg and trees/shrubs. These areas should continue to improve over time with little intervention and no remedial works.

This assessment in July 2019 conducted a search of area in the reserve where there were plant species indicative of damp soaks and wet areas. It is these areas where *Engaeus* were most likely to colonise without any intervention or translocation by this project. The same assessments were conducted in July 2018 and May 2016, 2015 and 2013.

3.3 ASSESSMENT AGAINST TARGETS

It is important that the success or otherwise of the project be assessed against key criteria. These are:

- No Declared Weeds* or Weeds of National Significance present in or adjacent to the habitat created for CNBC;
- More than 3,000 m² of created habitat (potential or actual);
- More than 430 additional *Engaeus* burrows present in the created habitat**; and
- No moderately to highly erosive surfaces present in the created habitat (indicated by areas of recent sediment accumulation, or sediment removal).

* As defined by the Tasmanian *Weed Management Act* 1999.

** based on the assumptions of survivorship outlined in the Preliminary Documentation for the project.

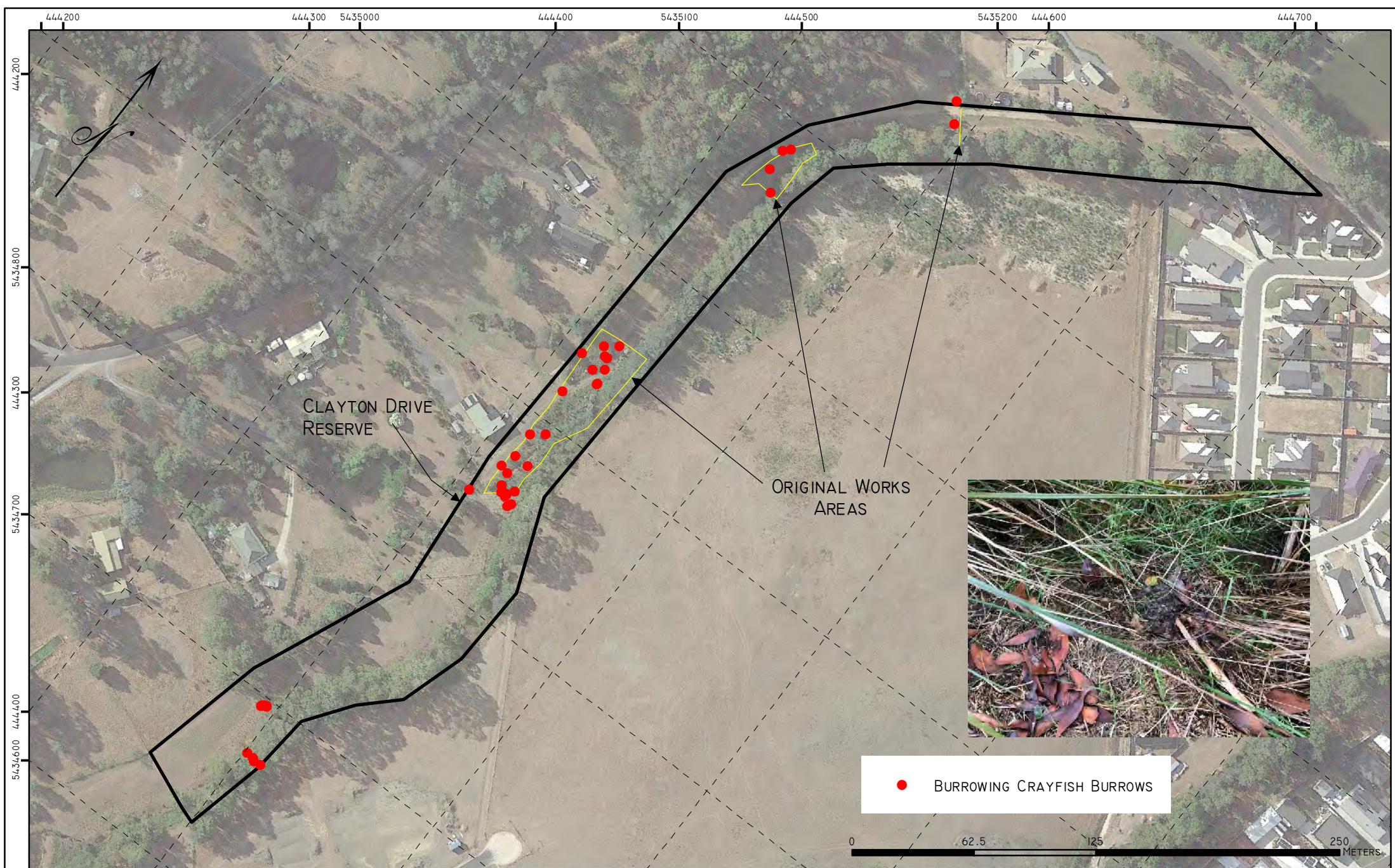
As the project has been successful in achieving the required *Engaeus* survival target and offset number of new burrows (to offset the losses incurred in the translocation process) within the allocated timeframe, a passive approach to locating burrows was again adopted in this monitoring event; a search was conducted for chimneys/burrows without removing much if any of the grass/sedge vegetation cover.

The assessment proved extremely difficult to locate burrows due to the dense grass – sedge sward that covered most of the areas of habitat intentionally created by the project. The images below highlight the dense nature of the sward and the hidden nature of the burrows/chimneys. It quickly became apparent during searching that no matter how much care was applied damage was being caused to the chimneys that had been built underneath or inter-twined with the sward.

On this basis, and in the interest of maintaining chimneys intact and the keep the site as 'functional' as possible as habitat areas were selected to locate burrows to determine the spatial extent of

burrows ('presence') within the areas of habitat created as opposed to trying to generate a number of 'abundance'.

Figure 2 shows the areas where burrows were located during the searching, which shows that *Engaeus* are widespread across the site which is comparable to the results from the previous annual monitoring event.



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FIGURE 3: CENTRAL NORTH BURROWING CRAYFISH BURROWS (OBSERVED JULY 2019)



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Translocation Area 1 Images from 2011, 2012, 2015 and 2016 (Works Areas 1 on Figure 2)



Post-works – 14 May 2016

Adjoining creek with burrows – 14 May 2016



Post-works – 3 July 2018



Post-works – 22 July 2019



Translocation Area 2 (Works Area 2 on Figure 2) * viewed from southern side

Pre-works – October 2011



Post-works - 13 July 2012



Pre-works – 6 July 2013



Post-works – 30 May 2015



Post-works – 14 May 2016



Post-works – 14 May 2016*



Post-works – 5 June 2017



Post-works – 3 July 2018



Post-works – 22 July 2019



Engaeus burrows (right) were observed amongst leaf litter and *Carex appressa* plants



Translocation Area 3 Images from 2011, 2012, 2015, 2016 and 2018 (Works Areas 3 on Figure 2)

Pre-works – October 2011



Post-works - 26 July 2012



Post-works – 30 May 2015



Post-works – 14 May 2016



Post-works – 3 July 2018



Post-works – 22 July 2019



Pre-works – October 2011



Post-works - 26 July 2012



Post-works – 30 May 2015



Post-works – 14 May 2016



Post-works – 22 July 2019



Left Images: Trees including black gum (*Eucalyptus ovata*), silver wattle (*Acacia dealbata*) and blackwood (*A. melanoxylon*) are well established and are now of flowering/seeding age.

Swamp paperbark (*Melaleuca ericifolia*) has started to regenerate by suckers, creating more stems and more habitat complexity.



Far Left: Dolly bush (*Cassinia aculeata*) has become spindly and dropped lots of leaves (predicted to occur) which has added to the leaf layer on the soil surface.

Right: *Engaeus* burrows were observed amongst bulrush (*Typha latifolia*) and *Carex appressa* plants where the plants were helping to support chimneys.

Pre-works – October 2011



Post-works - 26 July 2012



Post-works – 30 May 2015



Post-works – 14 May 2016



Post-works – 5 June 2017



New Habitat Areas in May 2016

The southern-most damp area within the reserve was observed in May 2016 and June 2017 to have been colonised by *Engaeus* species. Six burrows were observed in May 2016.

The same location in July 2019 supported *Engaeus* burrows (right image).

2016



2019



2016



2019



The area to the immediate north of the southern-most damp area within the reserve was observed in May 2016 and June 2017 to be colonised by *Engaeus*.

None were observed in the same location in July 2018 and July 2019 – suitable habitat is present and *Engaeus* are likely to be present but hard to find due to the thick grass cover.

4. PLANTINGS

A visual assessment was made of the number of plant losses for each species that has been planted. There have been no mortalities since the last assessment in 2017. Trees and shrubs have grown well and have become well established. Some blackwood and silver wattles have flower buds which indicates that seed set is likely to occur this summer – further adding to the amount of seed that falls onto the site which may then further perpetuate natural recruitment of tree and shrub species at the reserve.

Many areas have experienced natural recruitment of blackwood (*Acacia melanoxylon*), silver wattle (*Acacia dealbata*) and eucalypts (mainly *E. ovata*). The native shrub 'Dolly bush' (*Cassinia aculeata*) has become dominant in some areas associated with the creek itself – this is an early coloniser and produces huge volumes of seeds.

Some paperbark and blackwood are now over >6 m tall and have in places developed a semi-closed canopy which will further create a micro-climate within which the *Engaeus* at the site should thrive.





5. EROSION

A visual assessment was made of the channels and watercourses that flow through areas of created and improved habitat before entering the main watercourse that flows into Figure of Eight Creek.

Erosion has virtually ceased in the main channel and associated pooling areas as a grass and herb cover has formed which stabilises the surface over which water is flowing. Those areas where grass has not been able to grow are relatively flat and areas where water ponds, enabling sediment to drop out and accumulate – these areas have accumulated silt which has enabled aquatic species to take root and grow, such as water milfoil (*Myriophyllum*).

| | |
|--|---|
|  | <p>Water is ponding in the deepest parts of the drainage system which supports aquatic species such as water milfoil (<i>Myriophyllum</i>)</p> |
|  | <p>Water was free flowing in May 2015, May 2016, June 2017, July 2018 and July 2019 through the main channel of the central portion of the reserve where habitat was created – sediment release into Figure of Eight Creek has been prevented by the dense coverage of vegetation such as grasses, herbs and semi-aquatic species</p> |

6. WATER TABLE

Visual assessments have been made of the approximate water table across those areas where *Engaeus granulatus* were translocated. To date no auger samples have been necessary as all monitoring events

except for 28 January 2013 have had surface water present in the main pools and channels between pools. The water table on 28 January 2013 was assessed as being ‘just below the surface’ as the burrows along the edge of the pools and channels retained water just below their level with natural ground level. Water was flowing well throughout the channels and pools on 30 October 2013 because of good spring rains.

Water was abundant in the watercourses flowing through the created habitat areas, and along Figure of Eight Creek itself. During the May 2015, May 2016, June 2017 and July 2018 monitoring events, water milfoil (*Myriophyllum*) was observed in water ponding areas which demonstrates that water is persistent within the system.

7. OTHER FAUNA

As at May 2015, no nests of terrestrial mammals or dens have been observed within the reserve. A search was undertaken during the May 2015 assessment of the site and none were observed. A search in May 2016 found several grass-modified shelters in and amongst areas where rehabilitation works had occurred for this project. Comparable structures were observed in the June 2017 survey. These structures are likely to be the nests of bandicoots, possibly eastern barred bandicoot which has been seen in the reserve and area generally.

Numerous bandicoot diggings were observed in the reserve in May 2015, May 2016, June 2017 and July 2018, especially in the mown grass areas and moss on slightly elevated areas of the reserve. Diggings were also observed for the first time in July 2018 in areas where trees had been planted and a leaf litter layer had partially formed.

Numerous animal ‘runs’ were observed through the sedge – rush dominated areas of the created habitat in May 2015, May 2016 and June 2017 – demonstrating that there are native animals in the area.



8. WEEDS

Significant weeds observed in the July 2018 survey are shown in Figure 5.

Blackberries remain the dominant weed along fencelines and in some areas of pasture regrowth. They have also started to become locally dominant in areas of created habitat due to the high rainfall and warming temperatures throughout spring. In some areas, as expected, their cover has reduced as the cover of trees,

grasses and shrubs has increased – blackberries are high light requiring plants which do not generally grow or fruit well under a dense cover of grass or shrubbery.

The mature bushes of Montpelier broom that had been recorded near the western boundary in one location all appeared dead in June 2017 and July 2018. The site should continue to be monitored for regrowth as a few seedlings were observed near the dead parent trees (these were removed by hand when the survey was conducted).

There are several willows in the creekline, especially near areas of habitat created for *Engaeus*. It is recommended that these be removed via a cut and paste herbicide technique.

A weed spraying program should be done in spring 2018 to further target thistles and blackberry – care must be exercised when spraying blackberry such that **only** the target plant is sprayed. Blackberry should mainly be sprayed along the edge of the rehabilitated areas where there are high light conditions for their growth and the fencelines along the western boundary. Neighbours should first be advised that the spraying is going to occur such that they are aware of the use of herbicides along the boundary line.



Blackberry

Vines and small thickets of this woody weed occur mainly on the edge of rehabilitated areas and fencelines.

Care should be taken when spraying this weed such that other, desirable plants are not impacted upon.

Cutting and pasting blackberry stems, while time consuming, can minimise secondary impacts to surrounding vegetation.



Willow

A few willows occur on the creekline near the major area of rehabilitation works for *Engaeus*. These have been cut and pasted/stem injected with herbicide.

9. REMEDIAL ACTIONS

No remedial actions are proposed from this monitoring survey.

10. CONTINGENCY

Given the success of the project in terms of survivorship, creation of habitat and recruitment of enough animals to offset the translocated losses a contingency is not needed for the project.