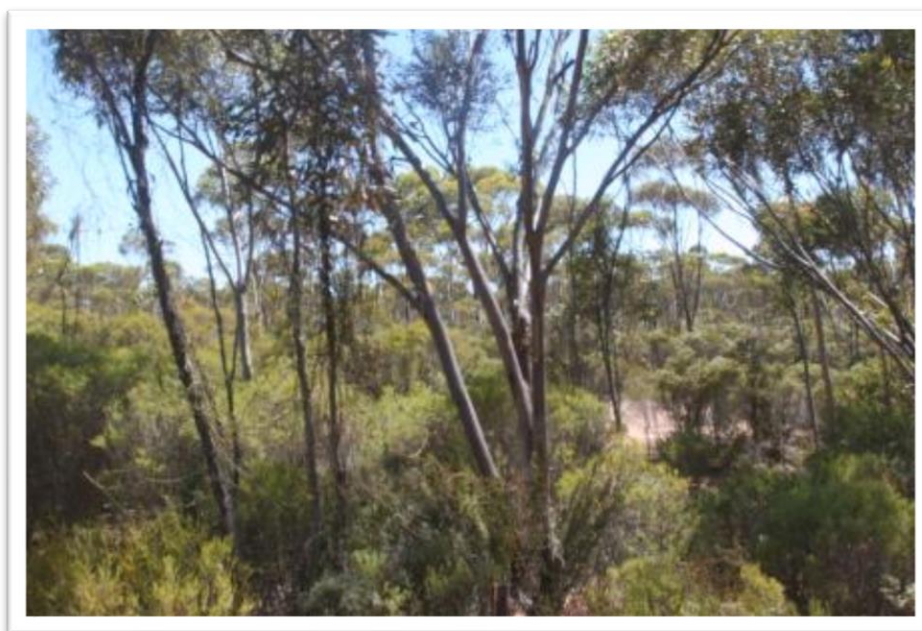


***Eucalyptus steedmanii* Population Census  
Monitoring Report  
Version 1  
August 2019**



**Prepared by:**  
**Botanica Consulting**  
**PO Box 2027**  
**Boulder WA 6432**  
**(08) 9093 0024**



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**Document Job Number:** 2019/51

**Prepared by:** Lauren Pick  
Senior Environmental Consultant  
Botanica Consulting

**Reviewed by:** Andrea Williams  
Director  
Botanica Consulting

**Approved by:** Jim Williams  
Director  
Botanica Consulting

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## **Executive Summary**

Western Areas Limited (WSA) tenements at the Forrestania Nickel Operations are located approximately 170 km south of Southern Cross, 80km east of Hyden and stretch 80km along the Forrestania Nickel Province.

From the 26<sup>th</sup> to 28<sup>th</sup> of May 2019 Botanica Consulting (BC) conducted population census monitoring of eight *Eucalyptus steedmanii* (Threatened Flora) populations. Population census monitoring of *E. steedmanii* is to be conducted every four years in accordance with the WSA Steedman's Gum Management Plan (WSA, 2019). The population census was due in January 2018; however, this was postponed due to the discovery of Dieback occurrence (*Phytophthora boodjera*) within population seven from annual monitoring undertaken by WSA during 2017/18. Investigations have been undertaken, with the assistance of expert consultants to identify the occurrence of Dieback occurrence mapping and implement a management plan in order to manage this newly discovered environmental risk. The current monitoring program is the third year of monitoring, with the results of the current monitoring compared against baseline results obtained in 2009/2010.

Twenty-six transects were monitored within the eight populations. Along each 50m transect, *Eucalyptus steedmanii* were identified and given a health rating (0-3 rating: 0=Dead, 1= poor health, 2= moderate health and 3= very healthy) and the maturity level of the fruit on each individual tree was identified (sterile, immature and mature). The extrapolated population and average percentage cover of *Eucalyptus steedmanii* for each transect was identified.

Average percentage of plants with mature fruits has increased in five out of the eight populations (Populations 1, 3, 4, 6 and 7), since the 2009/2010 census monitoring, which has resulted in a decrease in the average percentage of plants with immature fruits and sterile plants for the corresponding populations. Population 2 and 8 have maintained a constant level of sterile, immature and mature fruits. Population 5 recorded a decrease in average percentage of plants with mature and immature fruits, with the percentage of sterile plants increasing by 20% since 2009/2010.

Average percentage cover of *E. steedmanii* along the transects has increased in six of the eight populations since 2009/2010 (ranging from 0.9% to 6.1% increase). Population 4 maintained a relatively constant percentage cover (0.11% increase) and Population 7 recorded a 4.6% decrease since 2009/2010. Population 7 was impacted by Dieback in 2017/2018, resulting in decreased cover within the transect. The main effects observed from the Dieback appeared to be present within the plants along the transect itself and there was minimal impact observed to the plants outside of the transect.

Five of the eight populations have recorded an increase in extrapolated population size since 2009/2010 including Population 1, 2, 3, 6 and 8. The increase in Population 1, 2 and 8 is a result of the increased population area since the 2009/2010 monitoring as these populations have not shown an increase in plant per 100m<sup>2</sup> since 2009/2010. Population 3 and 6 however has maintained the same population area and has shown an increase in plants per 100m<sup>2</sup> since 2009/2010. The remaining three populations (4, 5 and 7) recorded a decrease in extrapolated population size since 2009/2010. Population 4 and 5 (two of the analogue populations) recorded the highest decrease since 2009/2010, reducing by 15,2905 and 18,966 plants respectively since 2009/2010. In the current monitoring period, many of the juvenile plants in exposed areas (without upper canopy cover) had died off. Population 7 was impacted by Dieback in 2017/2018, resulting in plant deaths within the transect. The main effects observed from the Dieback appeared to be present within the plants along the transect itself and there was minimal impact observed to the plants outside of the transect.

There were some individual *E. steedmanii* trees amongst each population which were in poorer health condition (Health Condition Rating 2-moderate health) than most other trees within close vicinity. This was due to either the parasitic creeper *Cassytha melantha* (Large Dodder-laurel), leaf damage by insects or excess exposure/ absent canopy cover. Majority of trees had a Health Condition Rating of 3-very healthy.

With the exception of the Dieback damage at Population 7, the populations closer to the Spotted Quoll mine operation (Population 1, 2, 3 and 7), have shown no ascertainable difference in individual tree health assessments, percentage cover of *E. steedmanii* or the overall population estimations in the 2019 monitoring period, when compared to the analogue population's (Populations 4, 5, 6 and 8). The most notable evidence of decline since the baseline monitoring was recorded for the analogue sites with Population 4 and 5 showing an increase in sterile plants and decrease in plant numbers since the baseline monitoring period. Population 6 showed a decrease in average percentage cover of *E. steedmanii* since the 2009/2010 monitoring. Exposure from limited canopy cover and increased disturbance from parasitic creeper *Cassytha melantha* (Large Dodder-laurel) have impacted the analogue populations.

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## **1 Introduction**

### **1.1 Project Description**

Western Areas Limited (WSA) tenements at the Forrestania Project are located approximately 170 km south of Southern Cross, 80km east of Hyden and stretch 80km along the Forrestania Nickel Province (Figure 1).

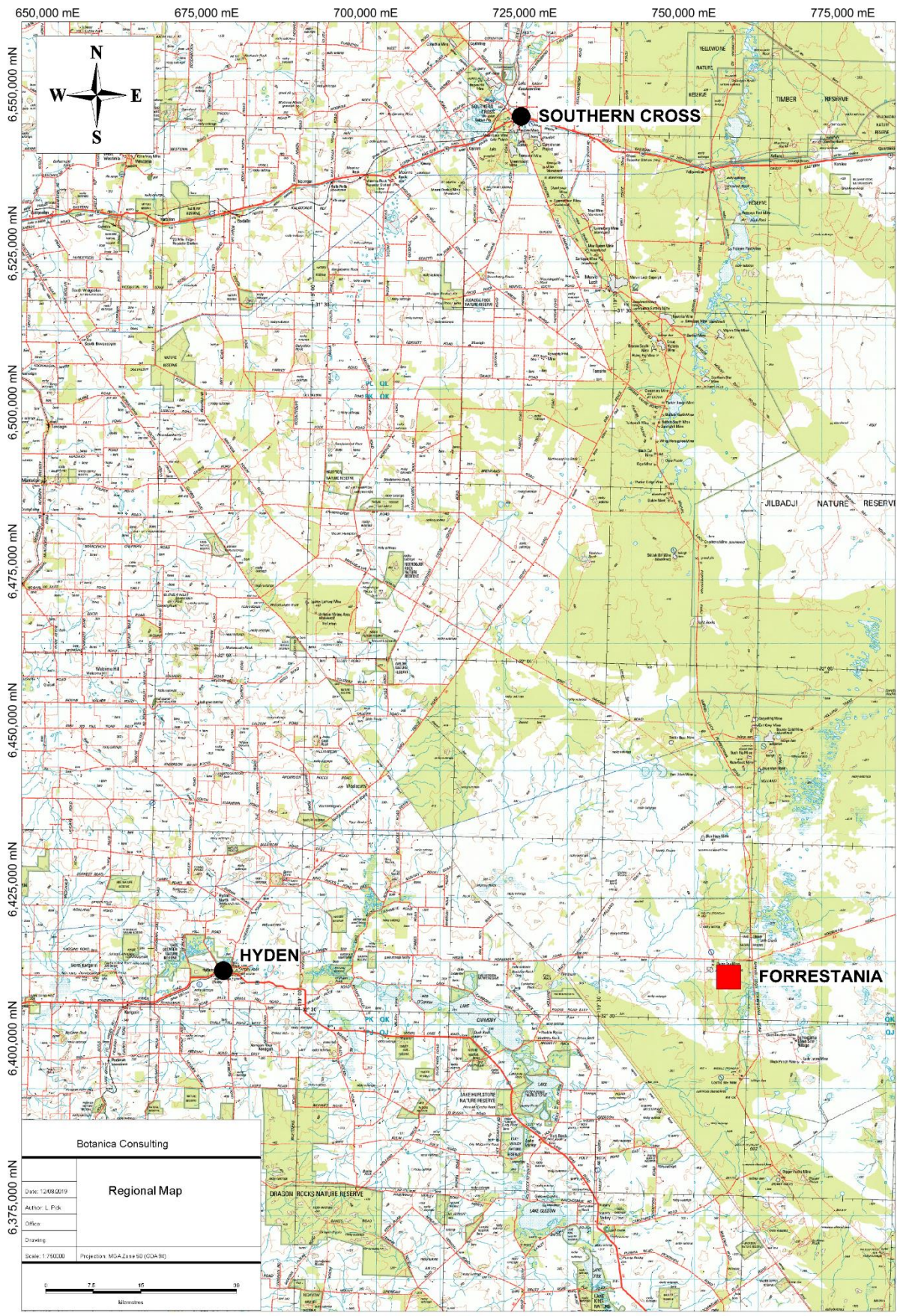


Figure 1: Regional Location of Western Areas Limited-Forresteria Project



WSA have received ministerial approval for the Spotted Quoll Mine which is situated on Mining Leases 77/583 and 77/545. Construction/ operation of the Spotted Quoll Mine commenced in 2014. Additional approvals are currently being sought for the proposed New Morning mine (shown in Figure 3). Both operations are located within close proximity to the *E. steedmanii* populations as shown in Figure 3. The area of the proposed New Morning Project shown in Figure 3 is indicative only and subject to change following further determination on the site layout for the Project.

Population census monitoring of *E. steedmanii* is to be conducted every four years in accordance with the WSA Steedman's Gum Management Plan (WSA, 2019). The population census was due in January 2018; however, this was postponed due to the discovery of Dieback occurrence (*Phytophthora boodjera*) within population seven from annual monitoring undertaken by WSA during 2017/18. Investigations have been undertaken, with the assistance of expert consultants to identify the occurrence of Dieback occurrence mapping and implement a management plan in order to manage this newly discovered environmental risk. The current monitoring program is the third year of monitoring, with the results of the current monitoring compared against baseline results obtained in 2009/2010.

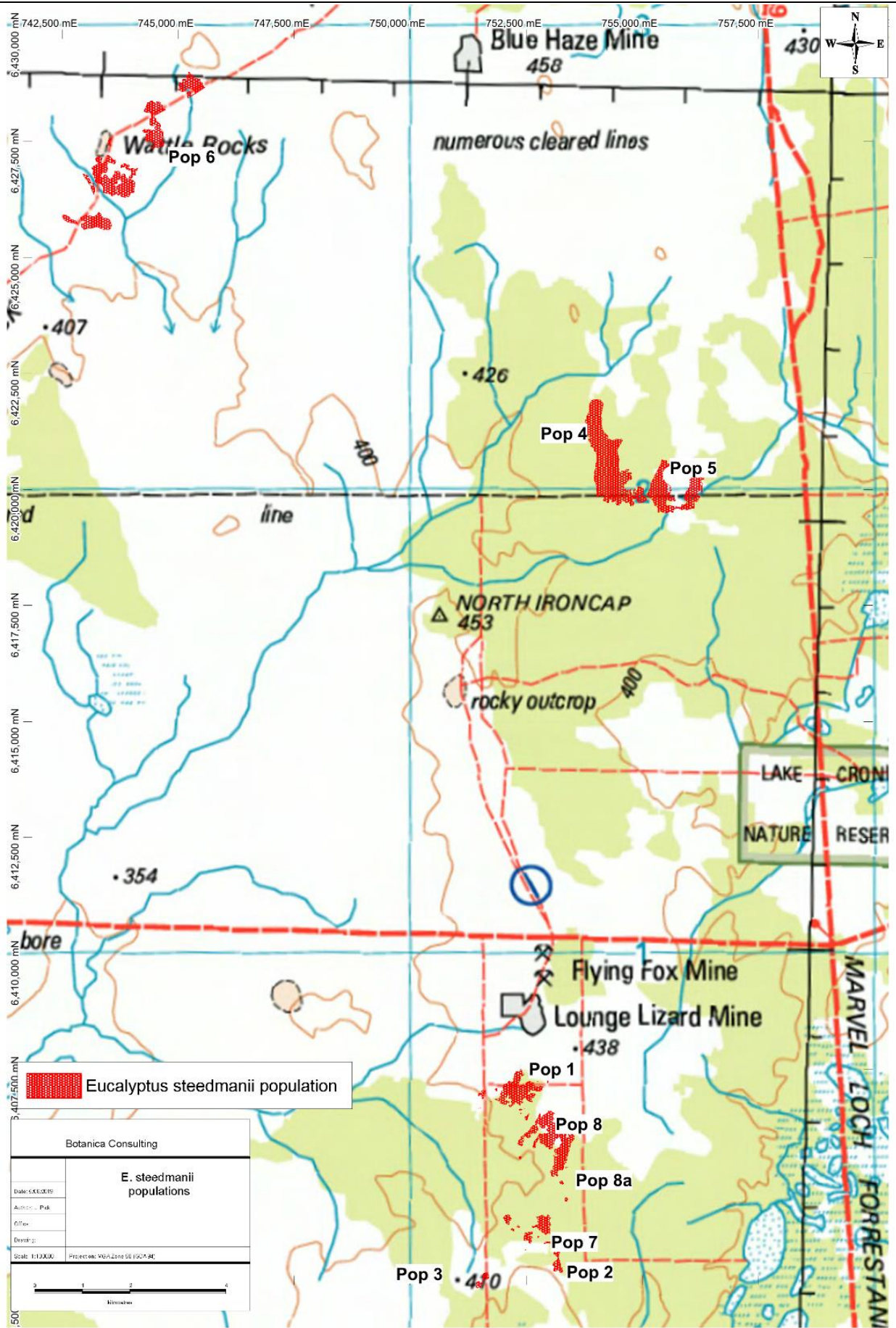


Figure 2: Location map of all *E. steedmanii* populations

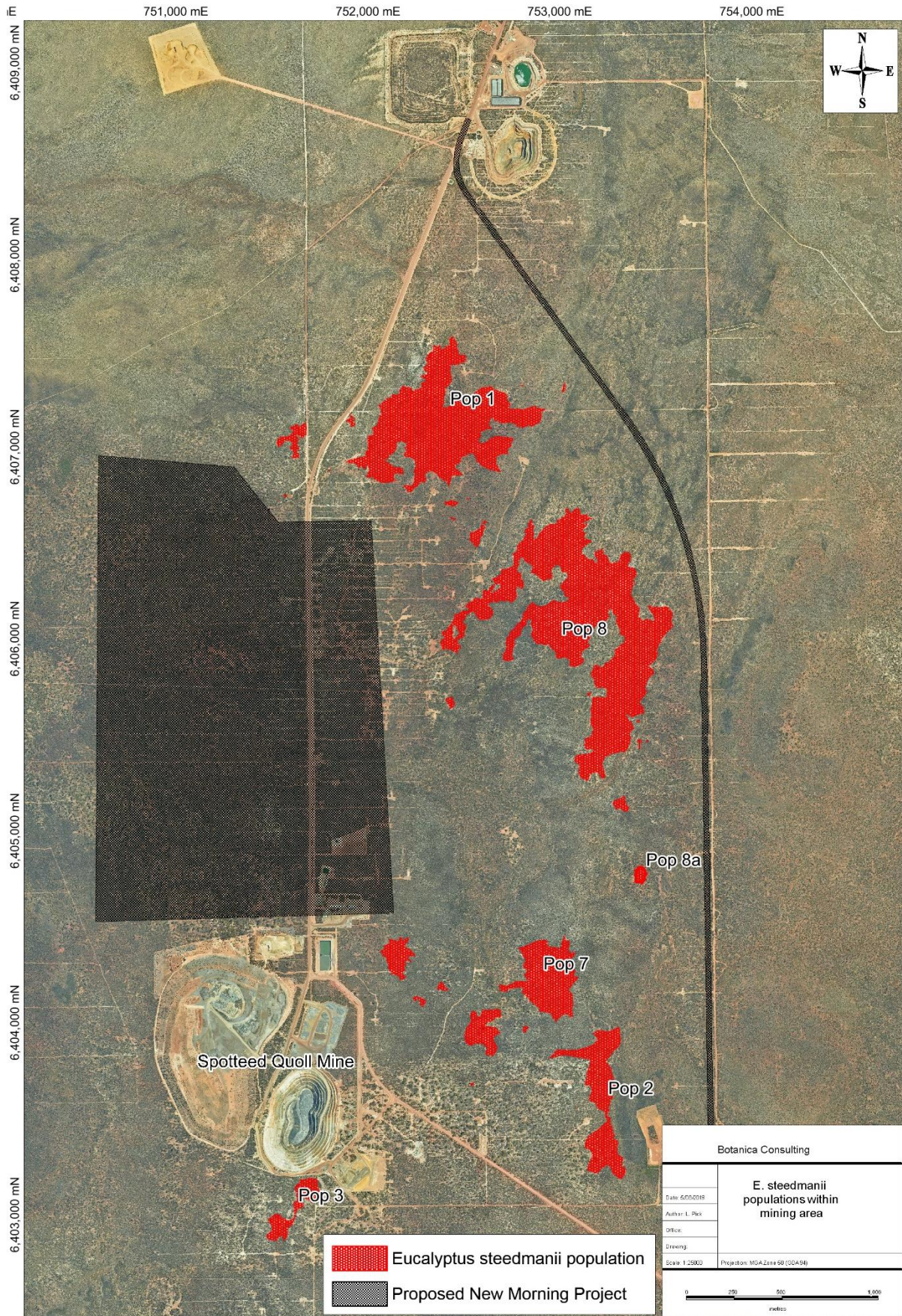


Figure 3: Location map of *E. steedmanii* populations in relation to current/ proposed mining

## 1.2 Species Description

*E. steedmanii* was first collected in 1928 by H. Steedman at Forrestania which was originally an agricultural settlement. A second collection was made in 1929 by L. Teake and in the same year C.A. Gardner collected the specimen. H. Steedman collected a specimen again in 1938. It was named after Harry Steedman of the Zoological Gardens Perth who was an interested collector of botanical specimens in Western Australia. A description was placed in the Royal Society of Western Australia journal in 1934.

**Description:** This species is described as a mallee tree which grows up to 12 m tall. It does not have a lignotuber. Its bark is smooth throughout, satiny, and ranges from light pink to rich red-brown and grey. The branchlets have oil glands in the pith. Adult leaves are characterised as alternate, petioles 0.2-0.8 cm long; blade narrowly oblong-elliptic, 3-8.5 cm long, 0.6-1.5 cm wide, base tapering to petiole, margin entire of distantly indented, apex rounded or pointed, concolorous, glossy, green, surface appearing "glazed", side veins acute or obscure, reticulation and intramarginal vein obscure, oil glands numerous.



**Plate 1: Image of *Eucalyptus steedmanii***

*Eucalyptus steedmanii* is a somewhat atypical species in *Eucalyptus* subgenus *Symphyomyrtus* section *Bisectae* subsection *Glandulosae* because the outer operculum of the buds does not shed (hence no operculum scar is formed), however the cotyledons are bisected and branchlets have oil glands in the pith. *E. steedmanii* belongs to a sub-group further characterized by having buds with erect stamens, series *Erectae*, and is distinguished from most other species in this group by the four-winged appearance of the relatively large buds and fruit and by the pyramidal inner operculum." (Centre for Plant Biodiversity Research, 2006)

**Distribution:** *Eucalyptus steedmanii* is a geographically restricted and endemic species to Western Australia. It occurs in undulating country roughly 80km east of Hyden (Brooker and Kleinig, 1990)



Figure 3: Distribution of *E. steedmanii* (WAHERB, 2019).

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## **2 Regional Biophysical Environment**

### **2.1 Regional Environment**

The survey area lies on the border of the Mallee Region - Roe Botanical District of South-West Province of Western Australia, and the Coolgardie Botanical District of the Southwest Interzone (Beard, 1990). The general cover is mallee with *Eucalyptus eremophila* the most consistent species. Patches of *Eucalyptus* woodland occur on lower ground, and scrub heath and *Casuarina* thickets on residual plateau soils (Beard, 1990). The Roe Botanical District is further divided into subregions, with the WSA survey area located within the Mallee 2- Western Mallee (MAL2), South of the Southern Cross subregion (COO2) (IBRA, 2014). The Western Mallee subregion consists mainly of mallee over myrtaceous-proteaceous heaths on duplex (sand over clay) soils, while the Southern Cross subregion itself is a major geographic Interzone with exceptionally rich communities of *Acacia* on sand plains and valley floors and ephemeral plants on Tertiary sand plains and in valley floor woodlands (Cowan, 2001).

### **2.2 Topography & Soils**

The Forrestania system is developed on the greenstone belt, which extends from Mt Holland in the north to Hatters Hill in the south. This system encompasses a variety of communities related to the underlying geology and occurs in a mosaic form (Beard, 1990). The Mallee region is a gently undulating country of low relief with duplex mallee soils i.e. sand overlying clay (Beard, 1990).

### **2.3 Climate**

The climate is characterised as being arid to semi-arid Mediterranean with mainly winter rainfall (Beard, 1990). The South West Interzone is the inter-zone between Australia's damp cooler southwest corner and the dry desert region. This means that the inter-zone has elements overlapping from both these climatic zones, which is believed to help create conditions to allow for the evolutionary formation of the present biological abundance. The Interzone receives on average between 300-400 mm of annual rainfall. Average rainfall and temperature for the Hyden weather station (#10568), which is located approximately 80km north-east of the Spotted Quoll Mine is provided in Figure 5 (BoM, 2019). Annual rainfall data for the Lake Carmody weather station (#10670) located approximately 30km west of the Spotted Quoll Mine is shown in Figure 6 (BoM, 2019).

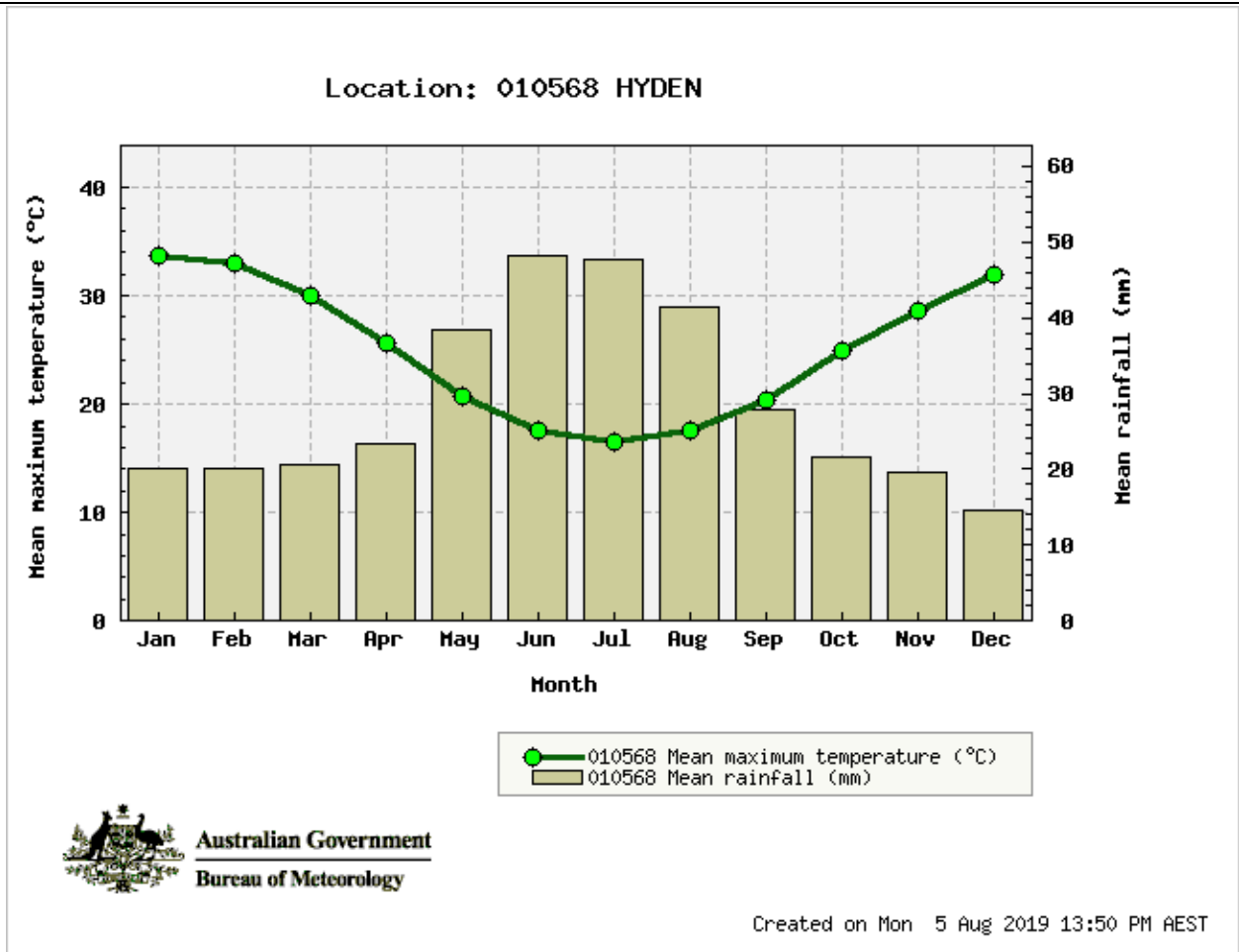


Figure 4: Mean rainfall and temperature for the Hyden weather station #10568 (BoM, 2019)

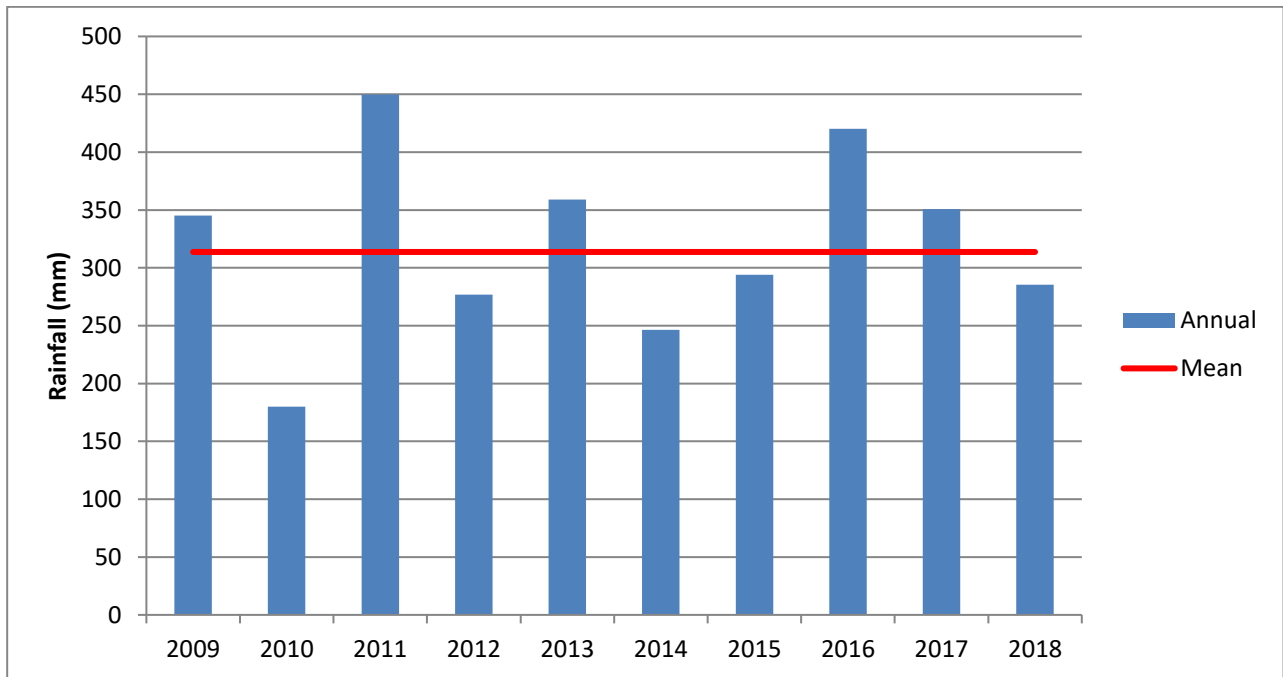


Figure 5: Annual rainfall from 2009 to 2018 and mean annual rainfall for the Lake Carmody weather station #10670 (BoM, 2019).

## 2.4 Vegetation Groups

Vegetation of the Forrestania System includes *Eucalyptus* woodlands and small salt lakes on the heavy soils and mallees on the elevated lateritic soils inhabit weathered greenstones. The North, Middle and South Ironcap hills break up the relatively flat topography and comprise ridges of banded ironstone supporting distinctive heath and thicket associations (Beard 1990). A large watershed extends along the Ironcap hills; with expansive *Banksia*, *Grevillea* and *Hakea* sand plain mallee heaths occurring west to the Rabbit Proof Fence and *Eucalyptus* woodlands and mallee mosaics to the east. Encompassed within the sand plain heaths, eucalypt woodlands and mallee heaths inhabit the drainage lines trending south and west (Aquila, 1989).

## 2.5 Land Use

The dominant land use of the Western Mallee subregion is mainly dry-land agriculture, with lesser areas of conservation, UCL and Crown reserves, roads and other easements (Cowan, 2001). Prior to European settlement the Beard Vegetation Group 511- *Medium woodland; salmon gum* and morrel within the region covered an area of 153,641 ha, and retains approximately 99.58% of its pre-European vegetation extent (DBCA, 2017).

## 2.6 Monitoring Objectives

The objective of this work was to conduct population census monitoring in accordance with the requirements of the Western Areas Steedman's Gum Management Plan (WSA, 2019). The census is to be conducted every four years to record numbers of plants in each population, plant health, reproductive status and location. Census monitoring is conducted during all three phases of the mine life which are described as follows:

- Prior to commencement of construction and operation;
- During construction and operation; and
- Post closure.

The August 2009 and January 2010 monitoring is indicative of pre-commencement of construction and operation monitoring. Population 1 however was not identified until after the development of the nearby haul road, with monitoring of this population occurring post-construction. The 2014 and 2019 monitoring was conducted during the construction/ operation stage of the Spotted Quoll Mine and provides pre-commencement data for the proposed New Morning Project.

This report aims to document the results of the 2019 monitoring results and compare the results to the baseline data which was carried out in 2009/ 2010.



### **3 Monitoring Methodology**

#### **3.1 Sampling and Analysis Methods**

In August 2009 BC was commissioned to complete baseline level vegetation monitoring of six *E. steedmanii* populations. The boundary of all populations have been previously assessed and reported to DBCA.

The monitoring transects were positioned to be incorporated by these boundaries. In January 2010 a further two populations of *Eucalyptus steedmanii* were monitored; one known to DBCA (Population 6) and one new population discovered by BC in October 2009 (Population 8). The monitoring program is detailed below:

(1) Background (Analogue):

- (a) Analogue transects (50m length) were established in *E. steedmanii* populations 4, 5, 6 and 8. Populations 4 and 5 were first monitored in Spring 2009 with Population 6 and 8 initially monitored in January 2010.
- (b) A minimum of 2 monitoring transects were chosen per population. Populations 4, 5, 6 and 8 were allotted 2 transects each.

(2) Potentially Impacted Populations:

- (a) Monitoring transects (50m length) were established in *E. steedmanii* populations 1, 2, 3 and 7, which according to “*Ministerial Statement 808*” are within close proximity to the main Spotted Quoll mine activities; (Population 1 has plants within 27m of the associated haul road).
- (b) A minimum of 2 monitoring transects were chosen per population. Populations 1, 2, 3 and 7 were allotted 8, 3, 4 and 3 transects respectively.

(3) Monitoring of each Transect:

- (a) 50m Transects with GPS points recorded and fence droppers used to mark each end;
- (b) Individual Tree Health (0-3 rating: 0=Dead, 1=poor health, 2=moderate health and 3=very healthy) of trees intersected by the transect;
- (c) Percentage Cover of *E. steedmanii* trees intersecting the transect;
- (d) A 10m x 10m quadrat established with fence droppers at each end of the transect on the left hand side while looking down the transect;
- (e) *E. steedmanii* identification, density and abundance within each 10m x 10m quadrat;
- (f) General Vegetation Health Assessment (Keighery, 1994) of each transect; and
- (g) 1 x Photographic Image taken from each end of the Transect looking down the line.

(4) Individual Monitoring Quadrats (Appendix 2)

- (a) Either 10m x 10m or 15m x 15m quadrats were established with fence droppers and GPS coordinates incorporating known individual *E. steedmanii* trees outside of the population boundaries;
- (b) *E. steedmanii* identification, Density and Abundance within each 10m x 10m quadrat;
- (c) Individual Tree Health (0-3 rating: 0=Dead, 1=poor health, 2=moderate health and 3=very healthy) of trees within the quadrats; and
- (d) 1 x Photographic Image taken from one corner of each quadrat.

The locations of transects, individual quadrats and relevant GPS coordinates are included in Appendix 1.

It should be noted that each population of *Eucalyptus steedmanii* was carefully checked while walking and establishing the population boundaries. Due to this and the additional survey efforts applied to the Spotted Quoll project area, BC is confident that all *E. steedmanii* trees have been identified within the vicinity of the Spotted Quoll open pit mine disturbance footprint (Figure 2); however as there are several sterile Eucalypts within the area, population boundaries may change.

### 3.2 Personnel Involved

Lauren Pick-Senior Environmental Consultant (BSc Conservation Biology)

Bill Van Hassel-Environmental Technician

### 3.3 Limitations and Constraints

Due to spatial limitations of some populations, 100m transects could not be established as recommended in the 2009 *Eucalyptus steedmanii* Management Plan (Coffey, 2009). Instead, multiple 50m transects were utilised throughout all populations.

## 4 Results

A summary of the results for each Population are provided in Table 1. The raw data and photographs of each transect are provided in Appendix 3 and 4.

**Table 1: Mean Summary results for Populations-2009/2010, 2014 & 2019 monitoring**

Population	Average Sterile			Average Immature Fruits			Average Mature Fruits			Average Cover			Total Average Extrapolated Population Size		
	2009/10	2014	2019	2009/10	2014	2019	2009/10	2014	2019	2009/10	2014	2019	2009/10	2014	2019
Population 1	33.25%	23.40%	18.11%	11.29%	7.38%	0.66%	55.47%	69.22%	81.23%	15.75%	16.33%	19.16%	94,764	95,508	<b>105,691</b>
Population 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	32.73%	33.66%	35.94%	7060	7060	<b>18,727</b>
Population 3	36.83%	31.83%	10.94%	10.27%	6.35%	3.13%	52.90%	61.83%	85.94%	12.15%	14.05%	18.22%	8110	8343	8344
Population 4	40.00%	35.23%	41.43%	17.50%	15.90%	5.56%	42.50%	48.88%	53.02%	27.90%	28.40%	28.01%	1,139,575	1,139,575	986,670
Population 5	25.61%	24.42%	45.66%	8.54%	7.56%	1.35%	65.85%	68.03%	52.99%	26.05%	26.05%	27.67%	406,425	405,070	387,459
Population 6	9.09%	9.09%	0.00%	0.00%	0.00%	0.00%	90.91%	90.91%	100.00%	37.60%	37.60%	38.50%	514,848	517,396	517,397
Population 7	39.81%	32.66%	40.41%	7.14%	0.00%	0.00%	53.05%	67.34%	59.58%	18.00%	18.00%	13.43%	10,584	10,584	10,125
Population 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	6.80%	6.80%	12.23%	193,699	193,699	<b>202,275</b>

**Bold text**-indicates populations that have recorded an increase in area (ha) since 2009/2010 monitoring.

#### **4.1 Population 1**

Since 2009/2010, Population 1 has shown an increase in total average extrapolated population size increasing from 94,764 plants in 2009/2010 to 105,691 plants in 2019. The increase in Population 1 however is a result of the increased population area since the 2009/2010 monitoring (increased to 32.9 ha) rather than increased number of plants as this population has not shown an increase in plant per 100m<sup>2</sup> since 2009/2010. Average percentage cover increased by 3.41% in 2019, increasing from 15.75% in 2009/2010 to 19.16% in the 2019 survey.

Population 1 has shown a decrease in both sterile plants and plants with immature fruit decreasing by 15.14% and 0.66% respectively between the 2009/2010 baseline survey and the 2019 survey. Plants with mature fruit in the current survey has increased from 55.47% in 2009 to 81.23% in 2019, increasing 25.76% since the 2009/2010 baseline survey. Majority of the individual trees recorded within the eight Population 1 transects had a 'very healthy' (Rating 3) condition, with only two individual trees recording a moderate health (Rating 2) condition.

#### **4.2 Population 2**

Since 2009/2010, Population 2 has shown an increase in total average extrapolated population size increasing from 7060 plants in 2009/2010 to 18,727 plants in 2019. The increase in Population 2 however is a result of the increased population area since the 2009/2010 monitoring (increased to 9.21 ha) rather than increased number of plants as this population has not shown an increase in plant per 100m<sup>2</sup> since 2009/2010. Average percentage cover increased by 3.21% in 2019, increasing from 32.73% in 2009/2010 to 35.94% in the 2019 survey.

Fruit maturity in Population 2 has remained constant since the baseline monitoring, with all plants recording mature fruits over the entire monitoring program. Majority of the individual trees recorded within the Population 2 transects had a 'very healthy' (Rating 3) condition, however one tree had died (Rating 0) since the 2009/2010 monitoring.

#### **4.3 Population 3**

Since 2009/2010, Population 3 has shown an increase in total average extrapolated population size increasing from 8110 plants in 2009/2010 to 8344 plants in 2019. Population 3 has maintained the same population area and has shown an increase in plants per 100m<sup>2</sup> since 2009/2010. Average percentage cover increased by 3.21% in 2019, increasing from 32.73% in 2009/2010 to 35.94% in the 2019 survey.

Fruit maturity in Population 3 has increased since 2009/2010, with the average percentage of plants with mature fruits increasing by 33.04% and sterile plants/ plants with immature fruits decreasing by 25.89% and 7.14% respectively. Majority of the individual trees recorded within the

Population 3 transects had a 'very healthy' (Rating 3) condition, however two trees had died (Rating 0) since the 2009/2010 monitoring.

#### **4.4 Population 4**

Total average extrapolated population size of Population 4 has decreased since 2009/2010, reducing from 113,9575 to 986,670 plants, which is the largest decrease of all the populations. In the current monitoring period, many of the juvenile plants in exposed areas (without upper canopy cover) had died off. Average percentage cover has remained relatively constant since 2009/2010 (0.11% increase) at approximately 28%.

Average sterile plants has increased by 1.43% since 2009/2010, however fruit maturity has also increased since 2009/2010 with average percentage of plants with mature fruits increasing by 10.52% and plants with immature fruits decreasing by 11.94%. Majority of the individual trees recorded within the Population 4 transects had a 'very healthy' (Rating 3) condition, however sixteen individual trees are rated as 2 'moderate health' and nineteen trees have died since the 2009/2010 monitoring period. These were juvenile plants located within exposed areas (without upper canopy cover). Trees have also died off/ showed signs of stress from the parasitic creeper *Cassytha melantha* (Large Dodder-laurel).

#### **4.5 Population 5**

Since 2009/2010, average extrapolated population size of Population 5 has decreased, reducing from 406,425 to 387,459 plants. In the current monitoring period, many of the juvenile plants in exposed areas (without upper canopy cover) had died off. Average percentage cover however has shown a slight increase since 2009/2010 (1.62% increase), increasing from 26.05% to 27.67% in 2019.

Average sterile plants has increased by 20.05% since 2009/2010, with an average percentage of plants with immature and mature fruits decreasing by 7.19% and 12.86% respectively. Majority of the individual trees recorded within the Population 5 transects had a 'very healthy' (Rating 3) condition, however eleven individual trees are rated as 2 'moderate health' and eight trees have died since the 2009/2010 monitoring period. These were juvenile plants located within exposed areas (without upper canopy cover). Trees have also died off/ showed signs of stress from the parasitic creeper *Cassytha melantha* (Large Dodder-laurel).

#### **4.6 Population 6**

Since 2009/2010, average extrapolated population size of Population 6 has increased from 514,848 to 517,397 plants. Average percentage cover has also shown a slight increase since 2009/2010 (0.90% increase), increasing from 37.6% to 38.5% in 2019.

Average sterile plants has decreased by 9.09% since 2009/2010 (no sterile plants in the current monitoring period), with all trees having mature fruits. All the individual trees recorded within the Population 6 transects had a 'very healthy' (Rating 3) condition.

#### **4.7 Population 7**

Total average extrapolated population size has decreased for Population 7, reducing from 10,584 in 2009/2010 to 10,125 plants in 2019 (reduction of 459 plants). Average percentage cover has also decreased since 2009/2010 (4.57% increase), reducing from 18% to 13.43% in 2019. This is the only population to record a decrease in percentage cover since the baseline monitoring. Population 7 is the only population that has been impacted by Dieback in 2017/2018, resulting in decreased cover within the transect. The main effects observed from the Dieback appeared to be present within the plants along the transect itself and there was minimal impact observed to the plants outside of the transect.

Average sterile plants has increased since 2009/2010 by 0.6% (currently 40.41% of the plants are sterile), however the average percentage of plants with mature fruits has increased (6.53% increase) to 59.58%. None of the plants currently have immature fruits. Despite the Dieback disturbance noted in 2017/2018, majority of the individual trees (15 trees) recorded within the Population 7 transects had a 'very healthy' (Rating 3) condition, however ten individual trees are rated as 2 'moderate health' and eight trees have died since the 2009/2010 monitoring period.

#### **4.8 Population 8**

Since 2009/2010, Population 8 has shown an increase in total average extrapolated population size increasing from 193,699 plants in 2009/2010 to 202,275 plants in 2019. The increase in Population 8 however is a result of the increased population area since the 2009/2010 monitoring (increased to 52.2 ha) rather than increased number of plants as this population has not shown an increase in plants per 100m<sup>2</sup> since 2009/2010. Average percentage cover increased by 5.43% in 2019, increasing from 6.8% in 2009/2010 to 12.23% in the 2019 survey.

Fruit maturity in Population 8 has remained constant since the baseline monitoring, with all plants recording mature fruits over the entire monitoring program. Majority of the individual trees recorded within the Population 8 transects had a 'very healthy' (Rating 3) condition, however one tree had died (Rating 0) since the 2009/2010 monitoring.

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#### **4.9 Individual Monitoring Quadrats**

A summary of the results for the four quadrats are provided in Table 2. The photographs and raw data for the quadrats are provided in Appendix 3 and 4 respectively.

**Table 2: Quadrat results-2009/2010, 2014 & 2019**

Quadrat	2009/2010				2014				2019			
	No. of Trees	Sterile	Immature fruit	Mature fruit	No. of Trees	Sterile	Immature fruit	Mature fruit	No. of Trees	Sterile	Immature fruit	Mature fruit
P1Q1	9	77.78	0.00	22.22	9	77.78	0.00	22.22	9	22.22	44.44	33.33
P1Q2	1	0.00	0.00	100.00	1	0.00	0.00	100.00	1	0.00	0.00	100.00
P1Q3	2	0.00	0.00	100.00	2	0.00	0.00	100.00	2	0.00	0.00	100.00
P1Q4	10	30.00	10.00	60.00	10	30.00	10.00	60.00	10	0.00	30.00	70.00



#### **4.9.1 P1Q1**

P1Q1 contains nine *E. steedmanii* all of which have a health rating of 3 (very healthy). The number of plants with immature and mature fruits has increased for P1Q1 since the 2009 baseline monitoring, increasing by 44.4% and 11.1% respectively. The number of sterile plants reduced by 55.6%.

#### **4.9.2 P1Q2**

P1Q2 contains one *E. steedmanii* with a health rating of 3 (very healthy). The tree has mature fruit which is in flower and of very good health and there has been no variation since the 2009 baseline survey.

#### **4.9.3 P1Q3**

P1Q3 contains two *E. steedmanii*. In 2009 both trees had a health rating of 3 (very healthy), however due to the detrimental effect of the *Cassythia melantha*, health condition of one of the trees reduced to rating of 1 (poor health) in 2014. In 2019, this tree has shown improvement and increased to rating 2 (moderate health) with the other tree still maintaining a health rating of 3. Both individual trees have mature fruit.

#### **4.9.4 P1Q4**

P1Q4 contains ten *E. steedmanii* all of which have a health rating of 3. The fruit maturity of quadrat P1Q4 has increased since monitoring began in 2009 with trees with immature and mature fruits increasing by 20% and 10% respectively. No trees are sterile in the 2019 monitoring period

## **5 Discussion**

### **5.1 Fruit Maturity**

Average percentage of plants with mature fruits has increased in five out of the eight populations (Populations 1, 3, 4, 6 and 7), since the 2009/2010 census monitoring, which has resulted in a decrease in the average percentage of plants with immature fruits and sterile plants for the corresponding populations. Population 2 and 8 have maintained a constant level of sterile, immature and mature fruits. Population 5 recorded a decrease in average percentage of plants with mature and immature fruits, with the percentage of sterile plants increasing by 20% since 2009/2010.

An increasing trend in the number of plants with mature fruit combined with a decreasing trend of plants with immature fruits and sterile plants show that more individual trees are increasing in maturity providing more trees per transect that are at the reproductive stage. Populations 1 and 3 showed the largest increase in plants with mature fruit in 2019, increasing by 25.76% and 33.04% respectively since the 2009/2010 baseline monitoring. Population 5 was the only population to record a decrease in the number of plants with mature fruit since the baseline monitoring. In 2019, Populations 2, 6 and 8 all have plants with mature fruits (no sterile or immature fruits).

### **5.2 Average Percentage Cover**

Average percentage cover of *E. steedmanii* along the transects has increased in six of the eight populations since 2009/2010 (ranging from 0.9% to 6.1% increase). Population 4 maintained a relatively constant percentage cover (0.11% increase) and Population 7 recorded a 4.6% decrease since 2009/2010. Population 7 was impacted by Dieback in 2017/2018, resulting in decreased cover within the transect. The main effects observed from the Dieback appeared to be present within the plants along the transect itself and there was minimal impact observed to the plants outside of the transect.

### **5.3 Average Extrapolated Population Numbers**

The total average extrapolated population size was determined by multiplying density of plants recorded in the 10m x 10m quadrats at each transect by the spatial area of each population and then averaging these numbers. Five of the eight populations have recorded an increase in extrapolated population size since 2009/2010 including Population 1, 2, 3, 6 and 8. The increase in Population 1, 2 and 8 is a result of the increased population area since the 2009/2010 monitoring as these populations have not shown an increase in plant per 100m<sup>2</sup> since 2009/2010. Population 3 and 6 however has maintained the same population area and has shown an increase in plants per 100m<sup>2</sup> since 2009/2010. The remaining three populations (4, 5 and 7) recorded a decrease in

extrapolated population size since 2009/2010. Population 4 and 5 (two of the analogue populations) recorded the highest decrease since 2009/2010, reducing by 15,2905 and 18,966 plants respectively since 2009/2010. In the current monitoring period, many of the juvenile plants in exposed areas (without upper canopy cover) had died off. Population 7 was impacted by Dieback in 2017/2018, resulting in plant deaths within the transect. The main effects observed from the Dieback appeared to be present within the plants along the transect itself and there was minimal impact observed to the plants outside of the transect.

Despite the decrease in extrapolated population size in 2019, Population 4 has the largest population with 986,670 plants. The lowest population size was recorded at Population 3 with 8344 plants. The spatial area of each population correlates with these population sizes with Population 4 having the largest spatial area of 115.4ha and Population 3 having the smallest population area (2.67ha). Maps showing population boundaries and transect locations in Appendix 2.

#### **5.4 Health Condition**

The individual tree health ratings recorded along each transect are provided in Appendix 4, which displays all of the raw data for each transect and quadrat.

There were some individual *Eucalyptus steedmanii* trees amongst each population which were in poorer health condition (Health Condition Rating 2-moderate health) than most other trees within close vicinity. This was due to either leaf damage by insects (Plate 2), the parasitic creeper *Cassytha melantha* (Large Dodder-laurel) (Plate 3) or excess exposure/ absent canopy cover. Majority of trees had a Health Condition Rating of 3-very healthy.



**Plate 2: Leaf damage caused by insects**



**Plate 3: *Cassytha melantha* on *E. steedmanii***

## **6 Conclusion**

The 2009/2010 monitoring results provide baseline survey data for comparison of future monitoring results. The 2019 monitoring represents the construction/ operation stage of the Spotted Quoll Mine and provides pre-commencement data for the proposed New Morning Project.

With the exception of the Dieback damage at Population 7, the populations closer to the Spotted Quoll mine operation (Population 1, 2, 3 and 7), have shown no ascertainable difference in individual tree health assessments, percentage cover of *E. steedmanii* or the overall population estimations in the 2019 monitoring period, when compared to the analogue population's (Populations 4, 5, 6 and 8). The most notable evidence of decline since the baseline monitoring was recorded for the analogue sites with Population 4 and 5 showing an increase in sterile plants and decrease in plant numbers since the baseline monitoring period. Population 6 showed a decrease in average percentage cover of *E. steedmanii* since the 2009/2010 monitoring. Exposure from limited canopy cover and increased disturbance from parasitic creeper *Cassytha melantha* (Large Dodder-laurel) have impacted the analogue populations.

## 7 **Recommendations**

Current monitoring requirements for managing *E. steedmanii* is listed under the WSA Steedman's Gum Management Plan (2019) are summarised in Table 3 below.

**Table 3: Summary of monitoring requirements during operations and closure (WSA, 2019)**

Monitoring Type	Parameters	Populations	Frequency
Census	<ul style="list-style-type: none"> <li>Plant density</li> <li>Plant condition rating</li> <li>Reproductive status</li> </ul>	1 to 8	Four yearly.
Steedman's Gum Health Monitoring – Observation	<ul style="list-style-type: none"> <li>Visual observations and photographs</li> </ul>	1, 3A/3B and plants identified by Botanica (2009).	Quarterly.
Steedman's Gum Health Monitoring – Ratings	<ul style="list-style-type: none"> <li>Plant condition rating</li> <li>Presence of seed</li> <li>Seed development</li> <li>Recruitment</li> </ul>	1,2, 3A/3B and 7. 4, 5 and 6.	Quarterly. Annually.
Dust Deposition – Gauges	<ul style="list-style-type: none"> <li>Weight per unit area per unit time</li> </ul>	At-risk populations and control areas*	Quarterly.
Dust Deposition – Steedman's Gum	<ul style="list-style-type: none"> <li>Deposition rating</li> </ul>	At-risk populations and control areas*	Quarterly.
Fuel Load	<ul style="list-style-type: none"> <li>Unspecified</li> </ul>	Areas surrounding Spotted Quoll operations.	Annual.
Other potential risks	<ul style="list-style-type: none"> <li>Unintentional clearing</li> <li>Spillage of saline water</li> <li>Fire and fire management</li> <li>Uncontrolled vehicle access</li> </ul>	Areas surrounding Spotted Quoll operations.	Concurrent with above monitoring activities and opportunistic surveillance at other times.

\*At-risk populations with respect to dust deposition are those adjacent to the haul road and those to the south of the pit; therefore, Population 1, 3a and 3b. Dust gauges and Steedman's Gum monitoring transects at population 2 and 7 are therefore assumed at present to be controls (that is, sites where no impact of dust from operations is expected).

A determination on the site layout/ operations for the proposed New Morning Project has not been made at this stage, therefore recommendations on further monitoring programs to manage *E. steedmanii* are indicative only.

It is recommended that additional monitoring transects be established within Population 8, concentrated within the western extent of the population (nearest to the proposed New Morning Project). Additional dust monitoring gauges are also recommended to be established at the western extent of Population 8 (nearest to the proposed New Morning Project) and the eastern extent of Population 8 (nearest to the proposed Haul Road). A map showing the indicative locations of the proposed transects/ dust deposition gauges is provided in Figure 6. Final locations

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will be determined in the field, following determination of the New Morning Project site layout/operation.

These additional transects/ dust deposition gauges should be incorporated into the quarterly/ annual monitoring schedule specified in Table 3 above.

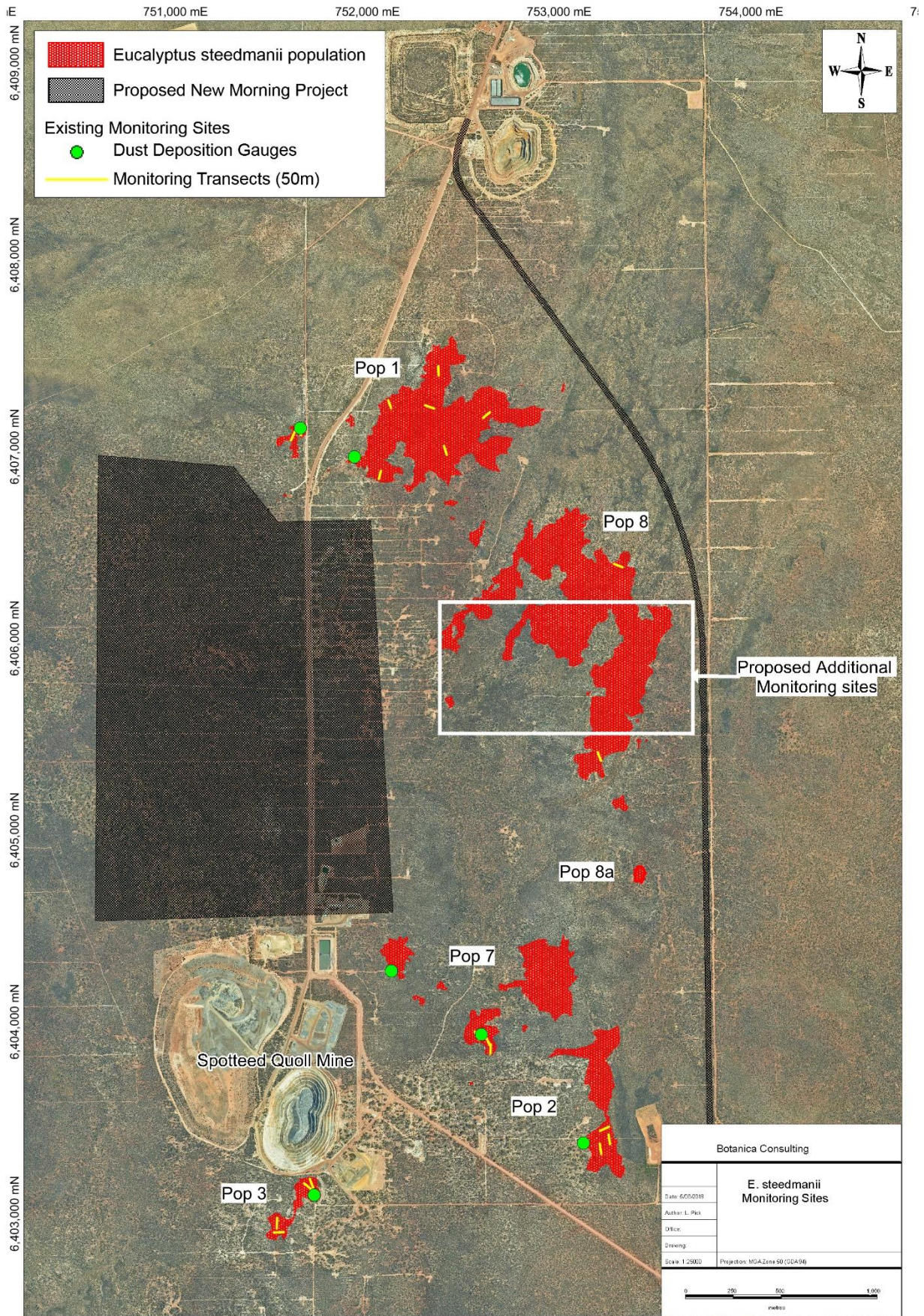


Figure 6: Existing and proposed *E. steedmanii* monitoring locations

## 8 **References**

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Accessed on 05/08/2019

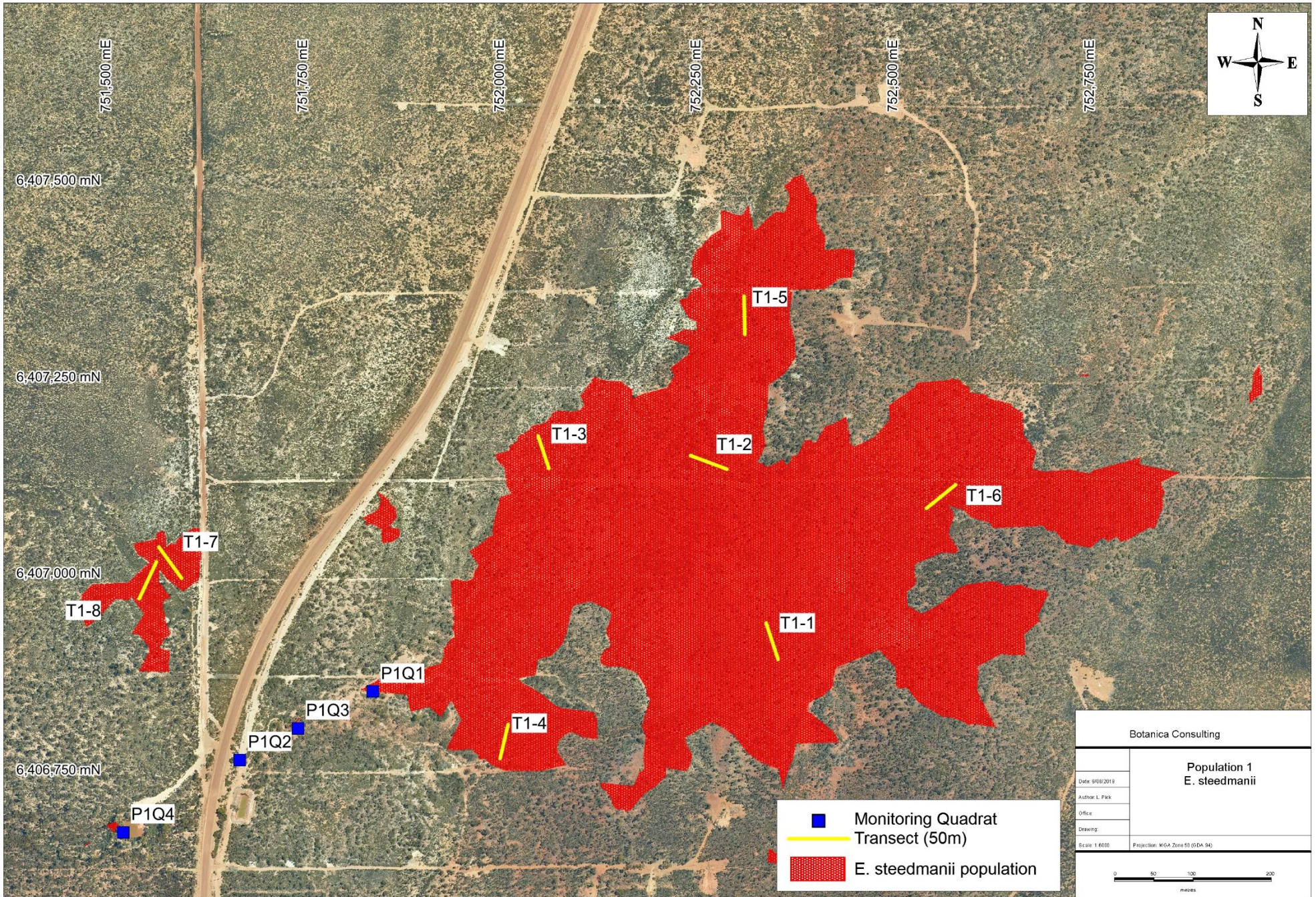


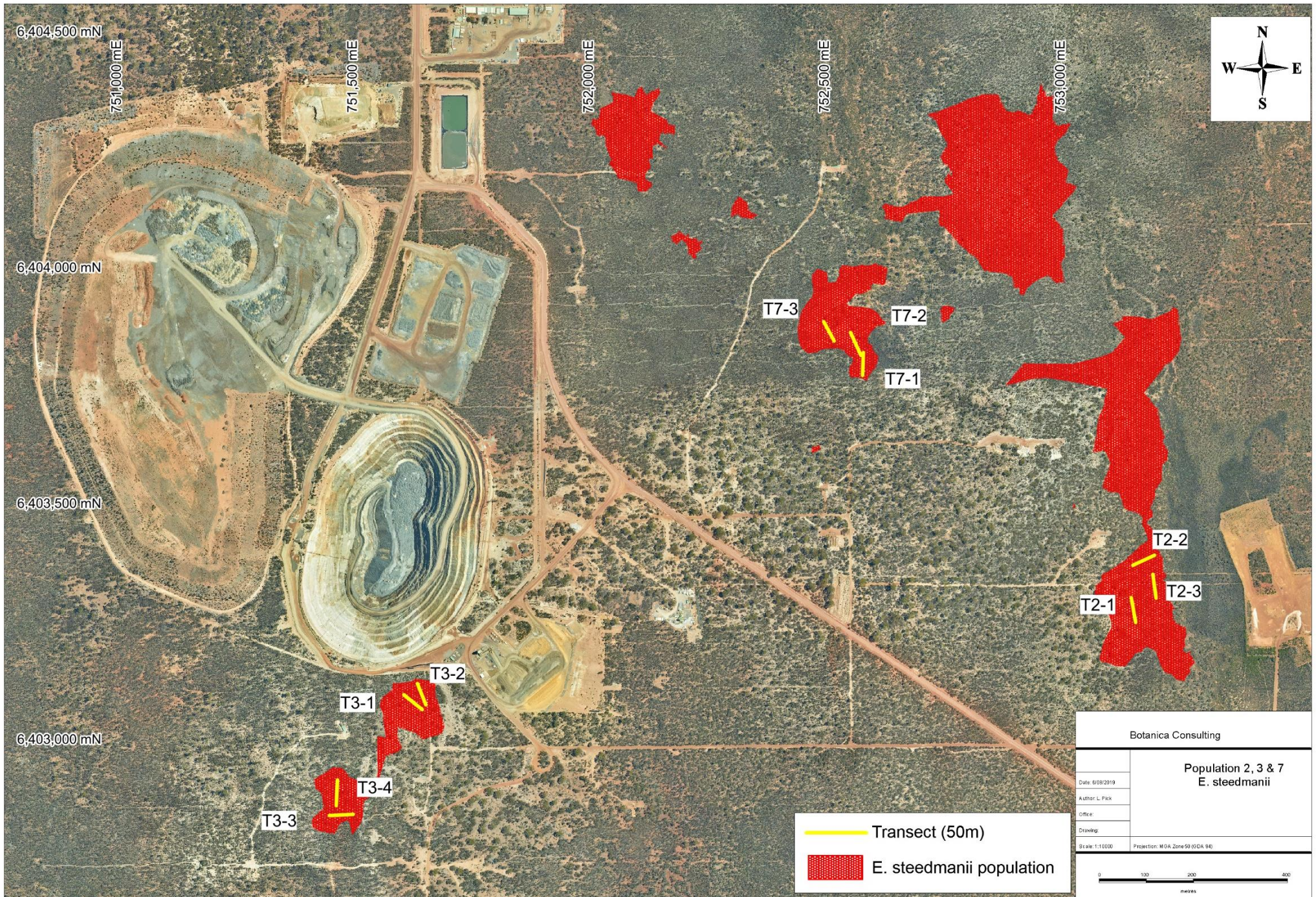
**Appendix 1: Locations of Transects and Individual Monitoring Quadrats**

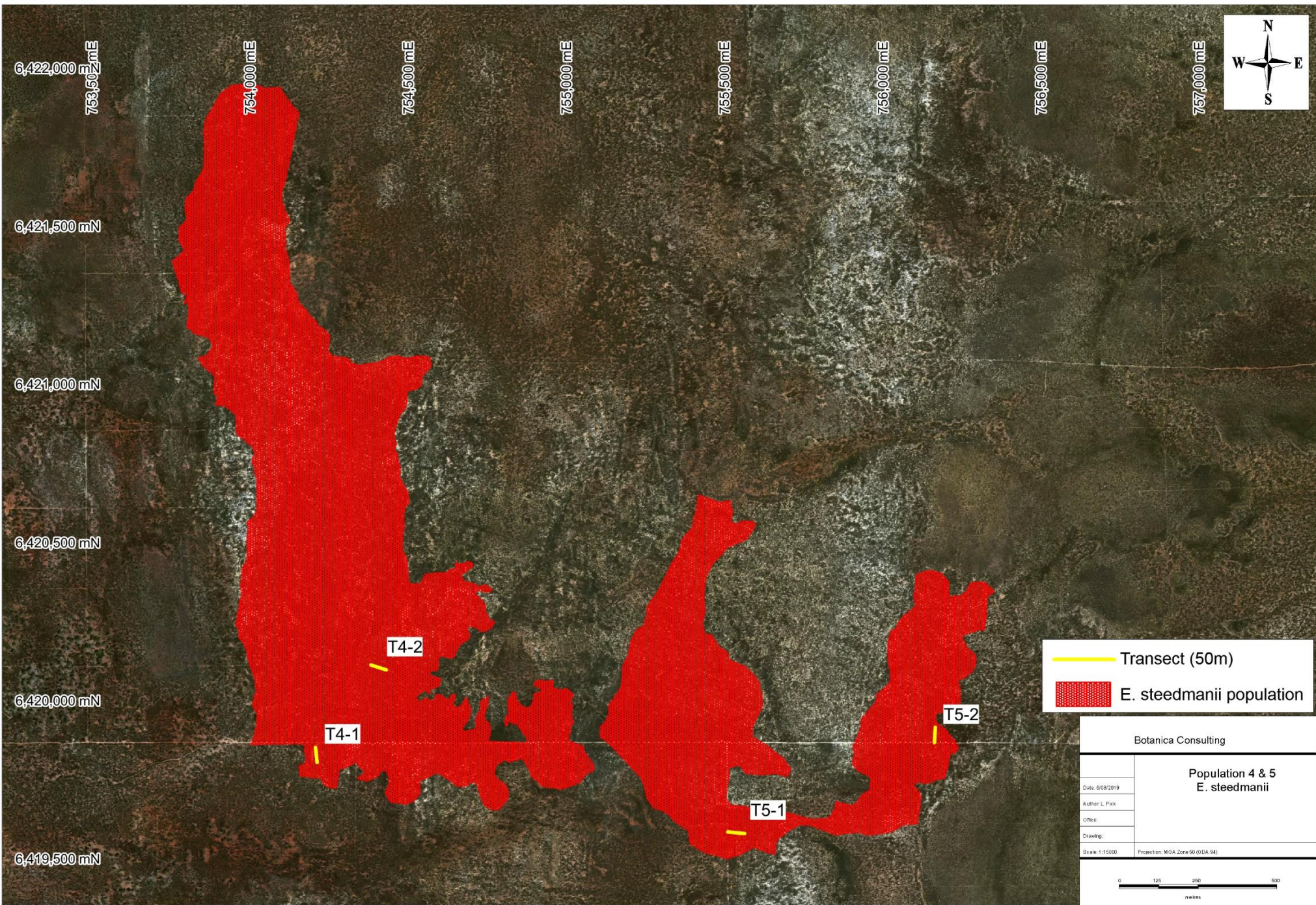
<b>GDA94</b>					
<b>Population</b>	<b>Transect</b>	<b>Zone</b>	<b>Easting (m)</b>	<b>Northing (m)</b>	<b>Altitude</b>
1	T1-1 end	50 H	752357	6406887	415 m
	T1-1 start	50 H	752342	6406933	419 m
	T1-2 end	50 H	752246	6407146	407 m
	T1-2 start	50 H	752292	6407129	408 m
	T1-3 end	50 H	752052	6407171	432 m
	T1-3 start	50 H	752066	6407130	422 m
	T1-4 end	50 H	752014	6406804	398 m
	T1-4 start	50 H	752004	6406761	399 m
	T1-5 end	50 H	752315	6407300	413 m
	T1-5 start	50 H	752314	6407349	413 m
	T1-6 end	50 H	752546	6407079	416 m
	T1-6 start	50 H	752583	6407109	415 m
	T1-7 end	50 H	751570	6407030	405 m
	T1-7 start	50 H	751599	6406990	402 m
	T1-8 end	50 H	751567	6407011	402 m
	T1-8 start	50 H	751545	6406964	402 m
	P1Q1	50 H	751842	6406846	401 m
	P1Q2	50 H	751673	6406759	399 m
	P1Q3	50 H	751747	6406799	402 m
	P1Q4	50 H	751525	6406667	398 m
2	T2-1 end	50 H	753207	6403293	407 m
	T2-1 start	50 H	753201	6403343	408 m
	T2-2 end	50 H	753204	6403384	411 m
	T2-2 start	50 H	753158	6403363	406 m
	T2-3 end	50 H	753164	6403242	406 m
	T2-3 start	50 H	753155	6403294	411 m
3	T3-1 end	50 H	751613	6403088	411 m
	T3-1 start	50 H	751652	6403057	408 m
	T3-2 end	50 H	751642	6403112	401 m
	T3-2 start	50 H	751660	6403067	404 m
	T3-3 end	50 H	751506	6402835	409 m
	T3-3 start	50 H	751456	6402832	407 m
	T3-4 end	50 H	751473	6402908	409 m
	T3-4 start	50 H	751470	6402854	409 m
4	T4-1 end	50 H	754218	6419797	416 m
	T4-1 start	50 H	754213	6419844	420 m
	T4-2 end	50 H	754437	6420089	423 m
	T4-2 start	50 H	754389	6420105	420 m
5	T5-1 end	50 H	755570	6419572	430 m
	T5-1 start	50 H	755516	6419577	428 m

GDA94					
Population	Transect	Zone	Easting (m)	Northing (m)	Altitude
	T5-2 end	50 H	756172	6419908	424 m
	T5-2 start	50 H	756169	6419859	427 m
6	T6-1 start	50 H	745250	6428501	443 m
	T6-1 end	50 H	745219	6428539	440 m
	T6-2 start	50 H	743212	6426676	425 m
	T6-2 end	50 H	743276	6426672	422 m
7	T7-1 end	50 H	752587	6403813	410 m
	T7-1 start	50 H	752585	6403765	407 m
	T7-2 end	50 H	752560	6403856	412 m
	T7-2 start	50 H	752582	6403808	408 m
	T7-3 end	50 H	752503	6403879	413 m
	T7-3 start	50 H	752525	6403838	406 m
8	T8-1 start	50 H	753161	6405293	409 m
	T8-1 end	50 H	753144	6405336	409 m
	T8-2 start	50 H	753274	6406301	417 m
	T8-2 end	50 H	753230	6406318	421 m

Appendix 2: Maps of *E. steedmanii* populations and population census monitoring sites







6,422,000  
753,500 mE

6,421,500 mN

6,421,000 mN

6,420,500 mN

6,420,000 mN

6,419,500 mN

754,000 mE

754,500 mE

755,000 mE

755,500 mE

756,000 mE

756,500 mE

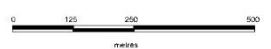
757,000 mE

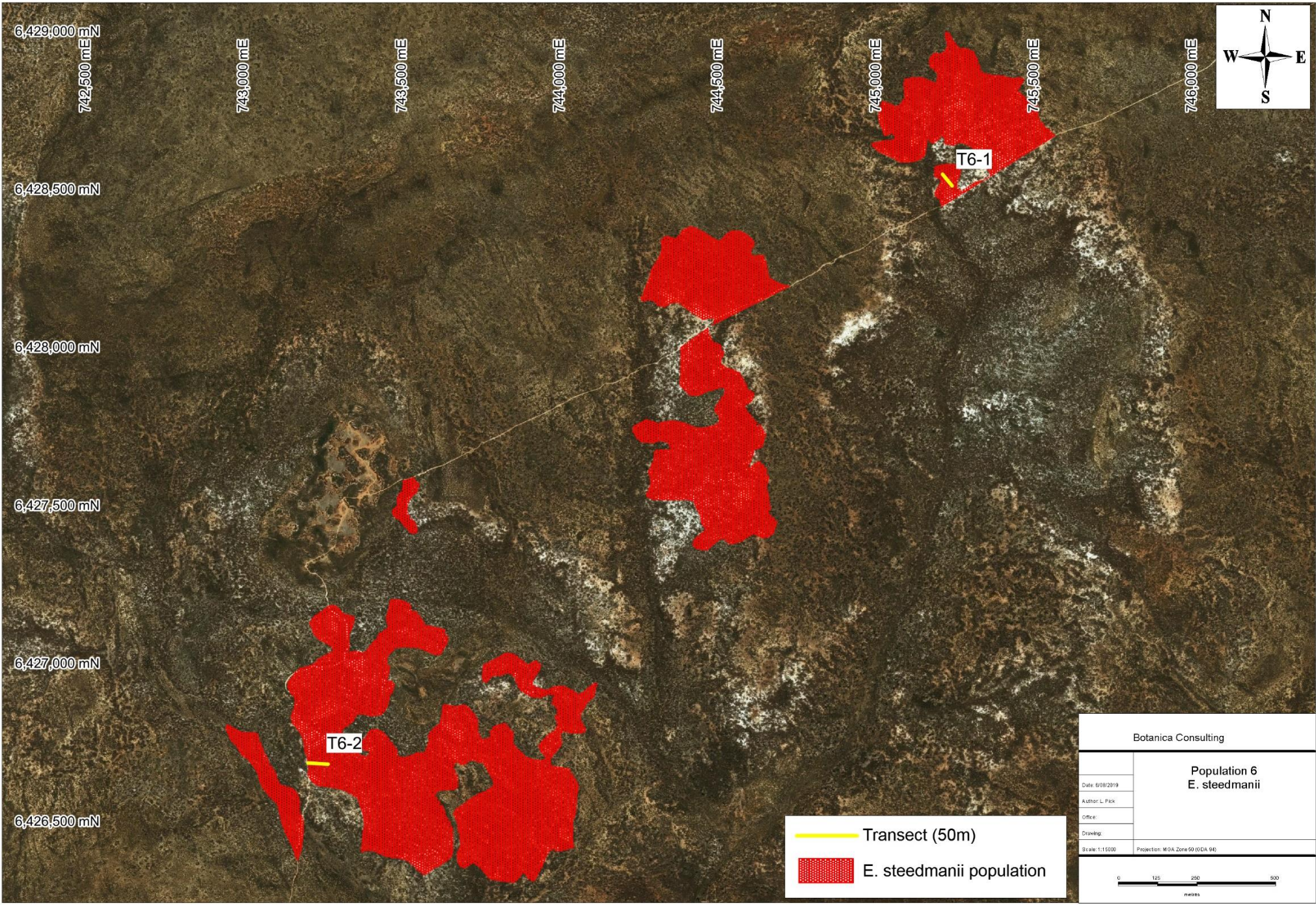


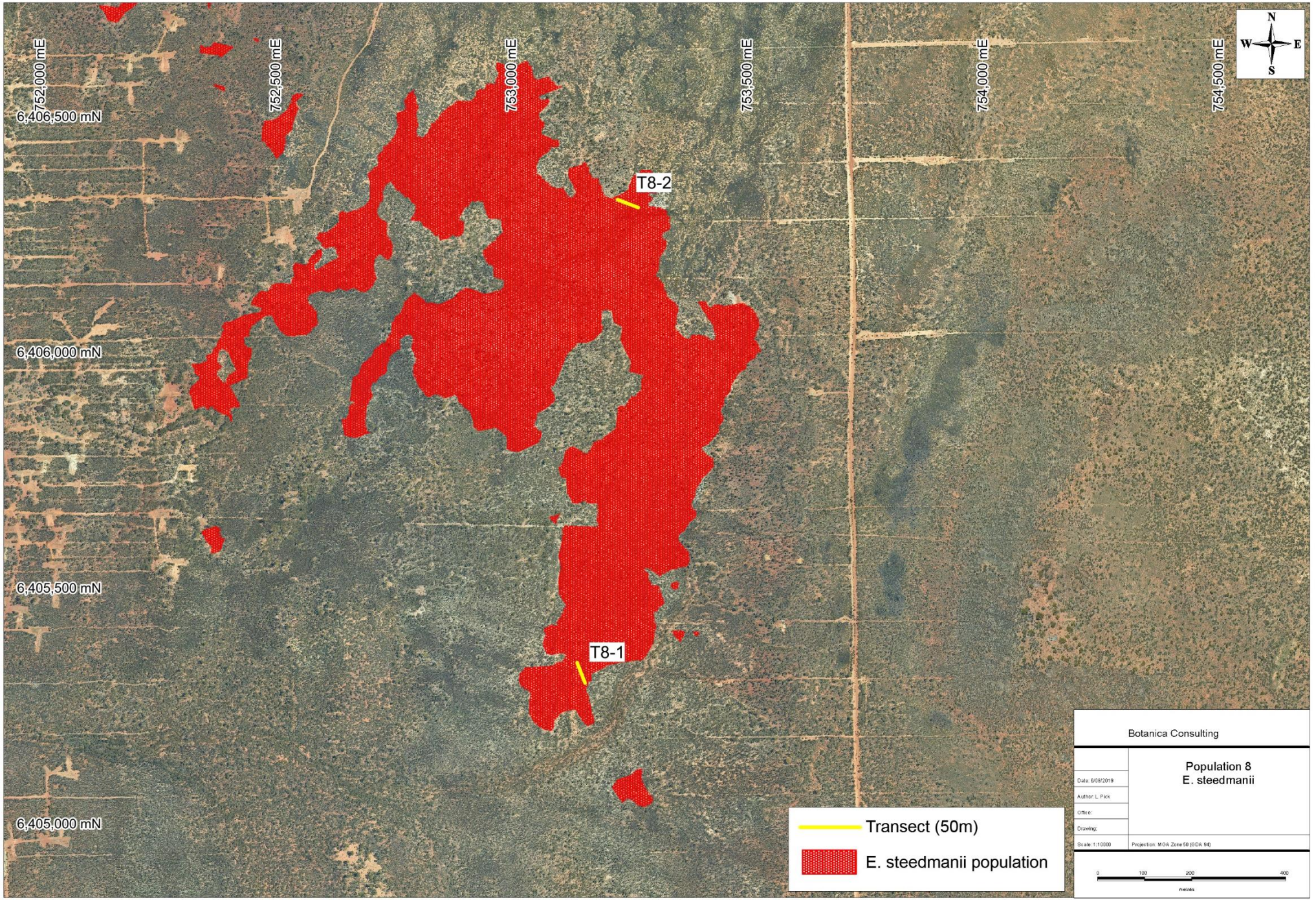
— Transect (50m)

▨ E. steedmanii population

Botanica Consulting	
<b>Population 4 &amp; 5 E. steedmanii</b>	
Date: 6/09/2019	
Author: L. Pick	
Office:	
Drawing:	
Scale: 1:15000	Projection: MGA Zone 50 (GDA 94)







Appendix 3: 2019 Photographs of *E. steedmanii* population census monitoring sites



T1-1 start



T1-1 end





T1-2 start



T1-2 end



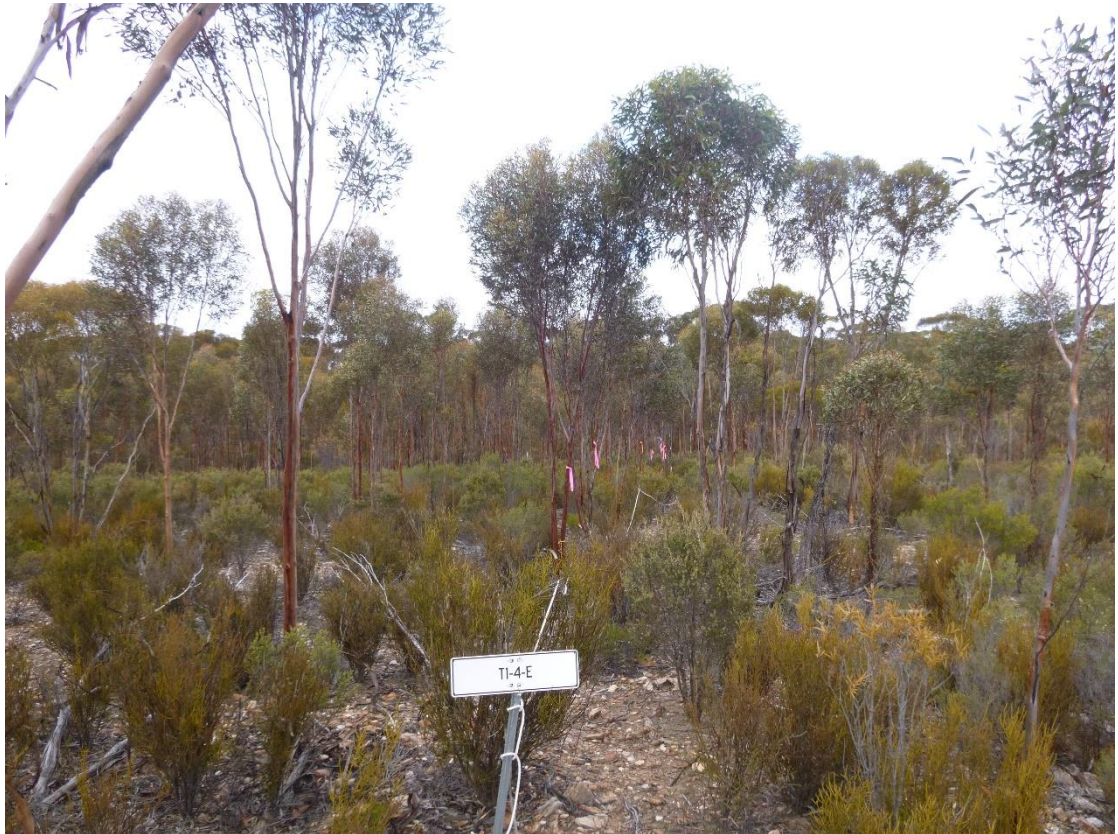
T1-3 start



T1-3 end



T1-4 start



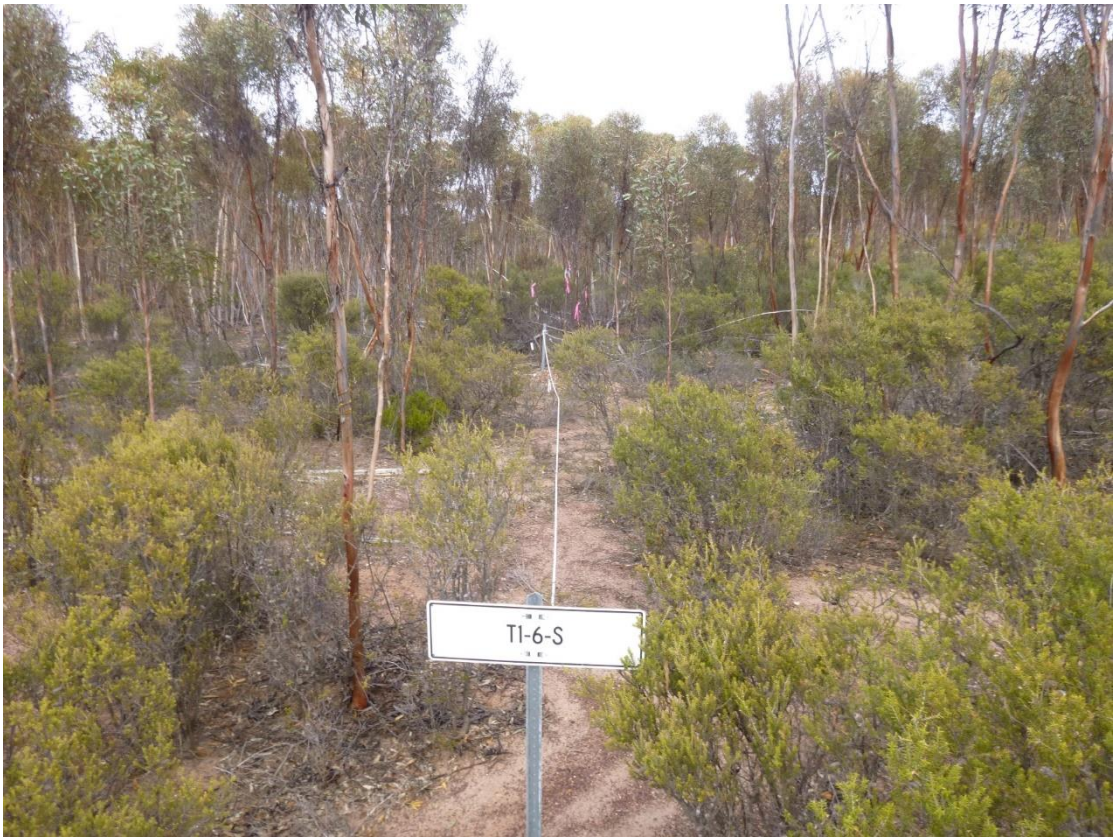
T1-4 end



T1-5 start



T1-5 end



T1-6 start



T1-6 end



T1-7 start



T1-7 end



T1-8 start



T1-8 end



P1Q1



P1Q2





P1Q3



P1Q4



T2-1 start



T2-1 end



T2-2 start



T2-2 end



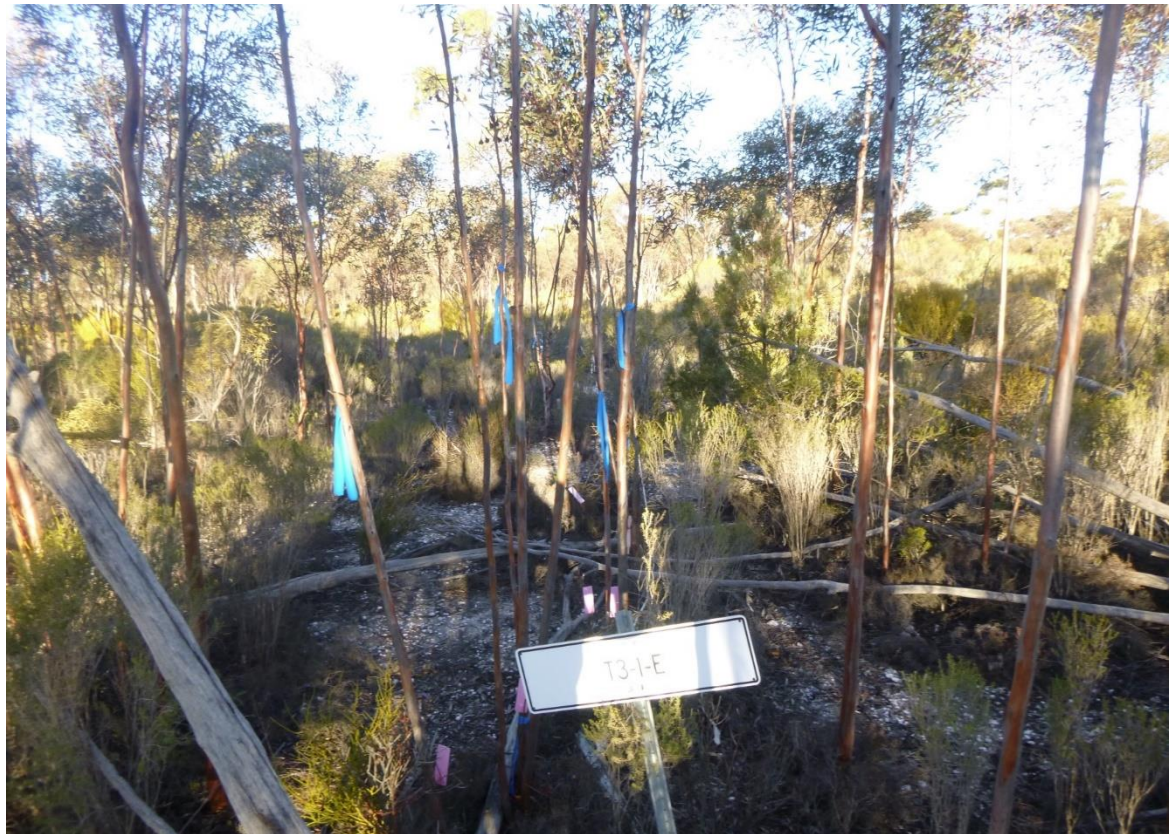
T2-3 start



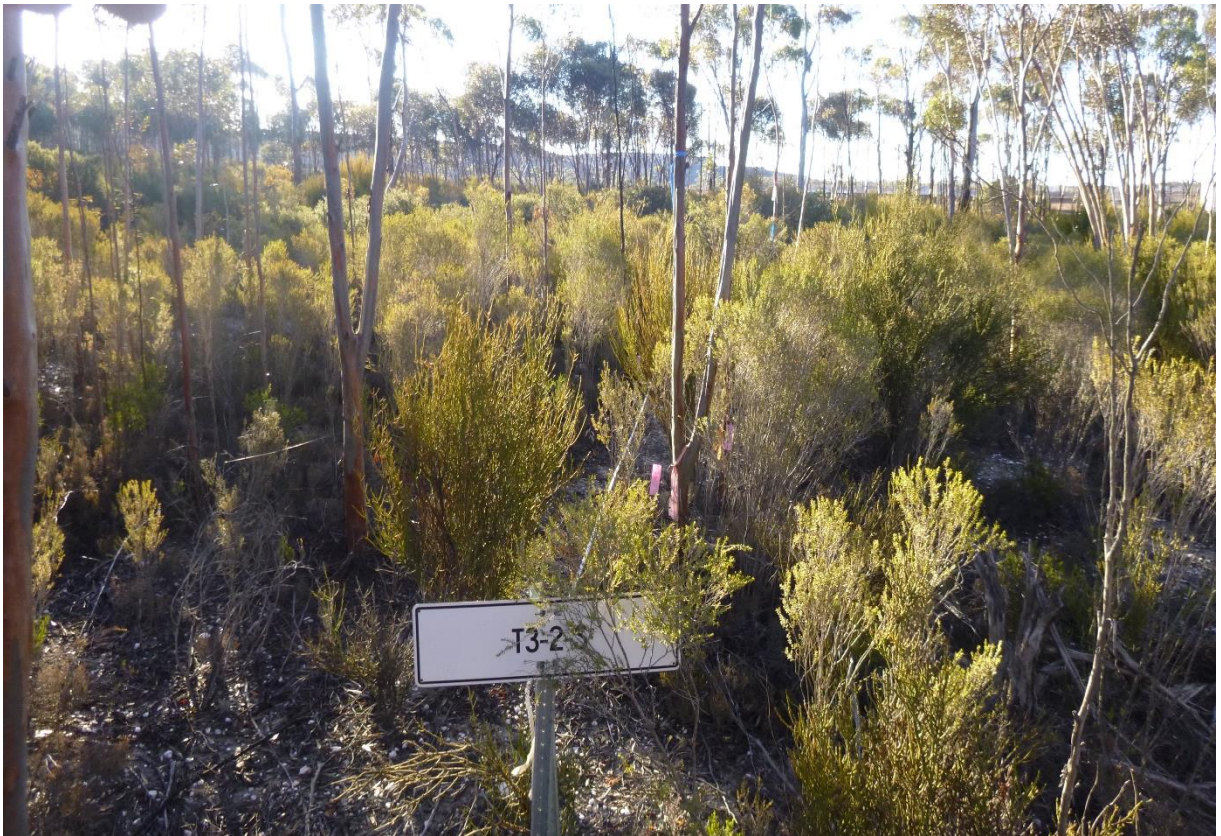
T2-3 end



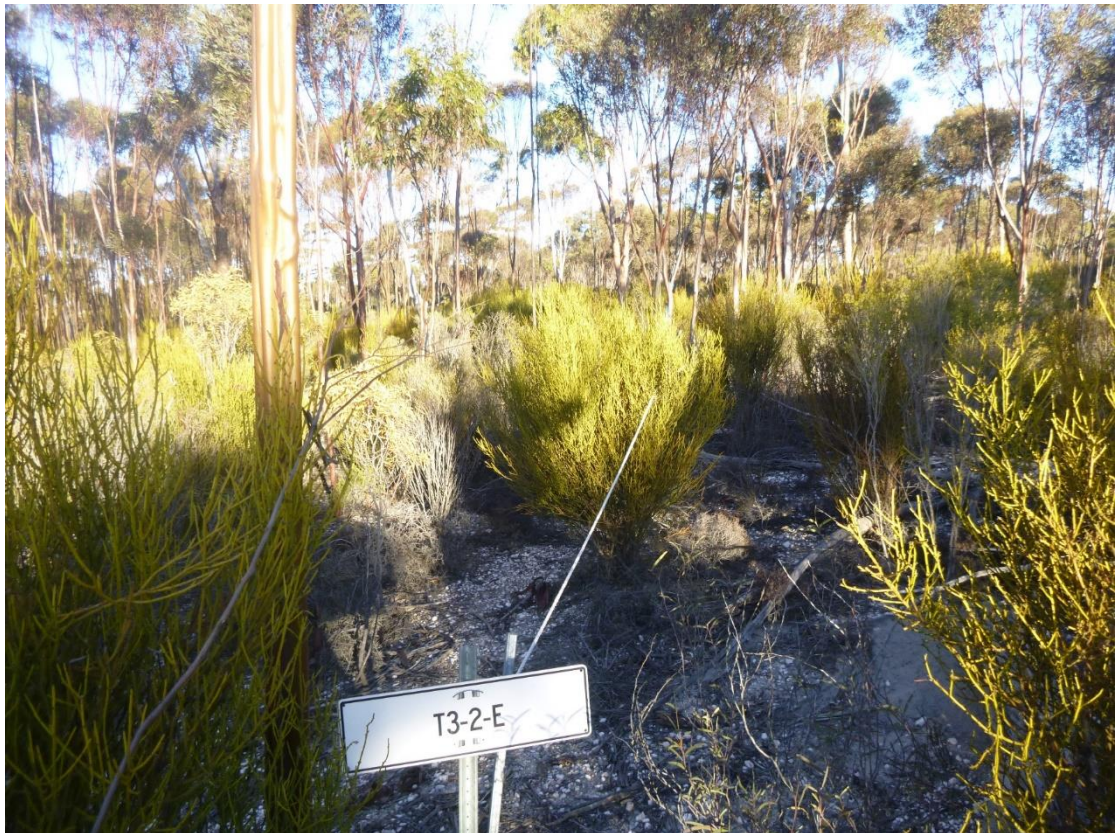
T3-1 start



T3-1 end



T3-2 start



T3-2 end



T3-3 start



T3-3 end



T3-4 start



T3-4 end





T4-1 start



T4-1 end



T4-2 start



T4-2 end



T5-1 start



T5-1 end



T5-2 start



T5-2 end



T6-1 start



T6-1 end



T6-2 start



T6-2 end



T7-1 start



T7-1 end



T7-2 start



T7-2 end





T7-3 start



T7-3 end



T8-1 start



T8-1 end



T8-2 start



T8-2 end

Appendix 4: *E. steedmanii* population census monitoring data-2019

T1-1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF Tree Health	Distance covered (m)
0			
1.8	other veg		1.8
3	X 1 mature fruit	3	1.2
8.6	other veg		5.6
9.6	X 3 no fruit	2	1
10.1	other veg		0.5
10.5	X 1 no fruit	3	0.4
12.6	other veg		2.1
14.8	X 1 mature fruit	3	2.2
19.3	other veg		4.5
19.7	X 1 no fruit	3	0.4
20.5	other veg		0.8
21.5	X 1 mature fruit	3	1
22.8	other veg		1.3
24.8	X 2 mature fruit, X 1 no fruit	3	2
25.4	other veg		0.6
26.3	X 2 no fruit	3	0.9
27.2	other veg		0.9
27.6	X 1 no fruit	3	0.4
31.6	other veg		4
33.1	X 4 mature fruit	3	1.5
35.4	other veg		2.3
36.4	X 1 mature fruit	3	1
38.2	other veg		1.8
40.4	X 4 mature fruit, X 1 dead	3	2.2
45	other veg		4.6
46	X 1 mature fruit (Cassyth melantha)	3	1
48.2	other veg		2.2
48.7	X 1 no fruit (Cassyth melantha)	3	0.5
50	other veg		1.3

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	11	0	10	21
%	52.38%	0.00%	<b>47.62%</b>	100.00%

Cover	other veg	<i>Euc steedmanii</i>	total
Total distance covered (m)	34.3	15.7	50
(% of distance)	68.60%	<b>31.40%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	38	32.9	<b>125020</b>
quadrat 2	27	32.9	<b>88830</b>
average	32.5	32.9	<b>106925</b>

T1-2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
4	other veg		4
5.5	X 2 mature fruit	3	1.5
6.8	other veg		1.3
8.8	X 1 mature fruit	3	2
12.2	other veg		3.4
14.2	X 2 mature fruit	3	2
14.8	other veg		0.6
17.3	X 1 mature fruit	3	2.5
23	other veg		5.7
24.5	X 3 mature fruit	3	1.5
50	other veg		25.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	9	9
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	40.5	9.5	50
(% of distance)	81.00%	19.00%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	20	32.9	65800
quadrat 2	0	32.9	0
average	10	32.9	32900

T1-3

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
0.5	other veg		0.5
1	X 1 mature fruit	3	0.5
22.9	other veg		21.9
24	X 1 mature fruit	3	1.1
24.6	other veg		0.6
26.1	X 2 mature fruit	3	1.5
26.8	other veg		0.7
27.7	X 2 no fruit	3	0.9
32.1	other veg		4.4
32.7	X 1 mature fruit	3	0.6
32.9	other veg		0.2
34.4	X 2 mature fruit	3	1.5
34.8	other veg		0.4
35.1	X 1 no fruit	3	0.3
37.1	other veg		2
38.7	X 1 mature fruit	3	1.6
44.8	other veg		6.1
47.3	X 3 mature fruit	3	2.5
50	other veg		2.7

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	3	0	11	14
%	21.43%	0.00%	<b>78.57%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	39.5	10.5	50
(% of distance)	79.00%	<b>21.00%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	28	32.9	<b>92120</b>
quadrat 2	47	32.9	<b>154630</b>
average	37.5	32.9	<b>123375</b>

T1-4

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
1.6	other veg		1.6
2.3	X 1 mature fruit	3	0.7
14.4	other veg		12.1
16	X 7 mature fruit	3	1.6
18.1	other veg		2.1
18.6	X 1 mature fruit	3	0.5
20.4	other veg		1.8
21	X 1 no fruit	3	0.6
21.1	other veg		0.1
21.7	X 1 mature fruit	3	0.6
22.3	other veg		0.6
22.9	X 1 mature fruit	3	0.6
23.5	other veg		0.6
24.1	X 1 mature fruit	3	0.6
32.4	other veg		8.3
34	X 2 mature fruit	3	1.6
35.9	other veg		1.9
37.3	X 2 no fruit	3	1.4
42.5	other veg		5.2
43.4	X 1 mature fruit	3	0.9
44.1	other veg		0.7
44.8	X 1 mature fruit	3	0.7
50	other veg		5.2

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	3	0	16	19
%	15.79%	0.00%	<b>84.21%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	40.2	9.8	50
(% of distance)	80.40%	<b>19.60%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	77	32.9	<b>253330</b>
quadrat 2	11	32.9	<b>36190</b>
average	44	32.9	<b>144760</b>

T1-5

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
22.7	other veg		22.7
24.2	X 1 mature fruit (Cassythamelantha)	3	1.5
29.1	other veg		4.9
30.1	X 1 mature fruit	3	1
43.1	other veg		13
44.1	X 1 mature fruit (Cassythamelantha)	3	1
50	other veg		5.9

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	3	3
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	46.5	3.5	50
(% of distance)	93.00%	7.00%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	20	32.9	65800
quadrat 2	25	32.9	82250
average	22.5	32.9	74025



T1-6

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
4.5	other veg		4.5
4.8	dead	0	0
10.3	other veg		5.5
11.7	X 1 no fruit (Cassytha melantha)	2	1.4
12.3	other veg		0.6
13.1	X 1 no fruit(Cassytha melantha) X 2 mature fruit (Cassytha melantha) X 2 mature fruit	3	0.8
16.9	other veg		3.8
19.4	X 2 mature fruit (Cassytha)	3	2.5
20.3	other veg		0.9
21.6	X 2 fruit (Cassytha)	3	1.3
22.7	other veg		1.1
23.1	X 1 mature fruit (Cassytha)	3	0.4
34.2	other veg		11.1
34.5	X 1 no fruit (Cassytha)	3	0.3
50	other veg		15.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	3	0	9	12
%	25.00%	0.00%	<b>75.00%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	43	6.7	49.7
(% of distance)	86.52%	<b>13.48%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	21	32.9	<b>69090</b>
quadrat 2	8	32.9	<b>26320</b>
average	14.5	32.9	<b>47705</b>

T1-8

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
0.7	other veg		0.7
1.3	X 1 no fruit	3	0.6
15.2	other veg		13.9
15.7	X 1 no fruit	3	0.5
15.8	other veg		0.1
18	X 1 mature fruit	3	2.2
21.6	other veg		3.6
22.7	X 1 mature fruit	3	1.1
32.7	other veg		10
34.2	X 2 mature fruit	3	1.5
36.8	other veg		2.6
38	X 1 mature fruit	3	1.2
39.8	other veg		1.8
40.8	X 1 mature fruit	3	1
50	other veg		9.2

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	2	0	6	8
%	25.00%	0.00%	75.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	41.9	8.1	50
(% of distance)	83.80%	16.20%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	9	32.9	29610
quadrat 2	28	32.9	92120
average	18.5	32.9	60865

<b>Quadrat name</b>	P1Q1
<b>Quadrat size</b>	15m x 15m

	<b>GDA94</b>
<b>Corner 1:</b>	50 H 751823 6406856
<b>Corner 2:</b>	50 H 751838 6406859
<b>Corner 3:</b>	50 H 751842 6406846
<b>Corner 4:</b>	50 H 751826 6406840

<b>Number of Trees</b>	<b>Individual tree health</b>
9	3

	<b>no fruit</b>	<b>immature fruit</b>	<b>mature fruit</b>	<b>total</b>
<b>number</b>	2	4	3	9
<b>%</b>	22.22%	44.44%	<b>33.33%</b>	100.00%

<b>Quadrat name</b>	P1Q2			
<b>Quadrat size</b>	10m x 10m			
	<b>GDA94</b>			
<b>Corner 1:</b>	50 H 751669 6406766			
<b>Corner 2:</b>	50 H 751659 6406760			
<b>Corner 3:</b>	50 H 751667 6406753			
<b>Corner 4:</b>	50 H 751673 6406759			
<b>Number of Trees</b>	<b>Individual tree health</b>			
1	3			
	<b>no fruit</b>	<b>immature fruit</b>	<b>mature fruit</b>	<b>total</b>
<b>number</b>	0	0	1	1
<b>%</b>	0.00%	0.00%	<b>100.00%</b>	100.00%

<b>Quadrat name</b>	P1Q3
<b>Quadrat size</b>	10m x 10m

	<b>GDA94</b>
<b>Corner 1:</b>	50 H 751735 6406806
<b>Corner 2:</b>	50 H 751738 6406797
<b>Corner 3:</b>	50 H 751747 6406799
<b>Corner 4:</b>	50 H 751744 6406809

<b>Number of Trees</b>	<b>Individual tree health</b>
1	3
1	2

	<b>no fruit</b>	<b>immature fruit</b>	<b>mature fruit</b>	<b>total</b>
number	0	0	2	2
%	0.00%	0.00%	<b>100.00%</b>	100.00%

<b>Quadrat name</b>	P1Q4
<b>Quadrat size</b>	15m x 15m

	<b>GDA94</b>
<b>Corner 1:</b>	50 H 751525 6406667
<b>Corner 2:</b>	50 H 751512 6406666
<b>Corner 3:</b>	50 H 751505 6406678
<b>Corner 4:</b>	50 H 751522 6406681

<b>Number of Trees</b>	<b>Individual tree health</b>
10	3

	<b>no fruit</b>	<b>immature fruit</b>	<b>mature fruit</b>	<b>total</b>
<b>number</b>	0	3	7	10
<b>%</b>	0.00%	30.00%	<b>70.00%</b>	100.00%

T2-1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
4.5	X 6 mature fruit	3	4.5
5.2	other veg		0.7
7.4	X 1 mature fruit	3	2.2
7.6	other veg		0.2
8.9	X 1 mature fruit	3	1.3
12.9	other veg		4
14.3	X 1 mature fruit	3	1.4
18	other veg		3.7
19	X 1 mature fruit	3	1
24	other veg		5
26	X 2 mature fruit	3	2
27	other veg		1
30.5	X 2 mature fruit	3	3.5
32.1	other veg		1.6
35.4	dead	0	0
38.2	other veg		2.8
39.5	X 3 mature fruit	3	1.3
45.8	other veg		6.3
46.8	X 2 mature fruit	3	1
49.5	other veg		2.7
50	X 1 mature fruit	3	0.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	19	19
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	28	18.7	46.7
(% of distance)	59.96%	<b>40.04%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	14	9.21	12894
quadrat 2	72	9.21	66312
<b>average</b>	<b>43</b>	<b>9.21</b>	<b>39603</b>

## T2-2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
6	other veg		6
8.9	X 2 mature fruit	3	2.9
15.6	other veg		6.7
16.8	X 1 mature fruit	3	1.2
20.8	other veg		4
22.4	X 2 mature fruit	3	1.6
26.7	other veg		4.3
29	X 2 mature fruit	3	2.3
30.5	other veg		1.5
32.2	X 2 mature fruit	3	1.7
36	other veg		3.8
37	X 1 mature fruit	3	1
37.8	other veg		0.8
43	X 4 mature fruit	3	5.2
50	other veg		7

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	13	13
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	27.1	15.9	43
(% of distance)	63.02%	36.98%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	1	9.21	921
quadrat 2	4	9.21	3684
average	2.5	9.21	2302.5



T2-3

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
0.6	other veg		0.6
8.2	X 2 mature fruit	3	7.6
27.7	other veg		19.5
28.8	X 1 mature fruit	3	1.1
35.1	other veg		6.3
36.5	X 1 mature fruit	3	1.4
37.4	other veg		0.9
38.6	X 1 mature fruit	3	1.2
39.7	other veg		1.1
42.7	X 2 mature fruit	3	3
45.4	other veg		2.7
46.5	X 1 mature fruit	3	1.1
50	other veg		3.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	8	8
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	34.6	15.4	50
(% of distance)	69.20%	<b>30.80%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	4	9.21	3684
quadrat 2	27	9.21	24867
average	<b>15.5</b>	<b>9.21</b>	<b>14275.5</b>

T3-1

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
1.3	other veg		1.3
1.9	X 1 mature fruit	3	0.6
3.3	other veg		1.4
3.8	X 1 mature fruit	3	0.5
4.1	other veg		0.3
5.3	X 2 mature fruit	3	1.2
8.6	other veg		3.3
9.2	X 1 mature fruit	3	0.6
16.3	other veg		7.1
17	X 1 mature fruit	3	0.7
17.7	other veg		0.7
18.5	X 1 mature fruit	3	0.8
18.9	other veg		0.4
19.2	X 1 no fruit	3	0.3
41.2	other veg		22
42.7	X 1 no fruit	3	1.5
46.9	other veg		4.2
47.7	X 1 no fruit, X 1 mature fruit	3	0.8
48	other veg		0.3
50	X 5 mature fruit	3	2

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	3	0	13	16
%	18.75%	0.00%	81.25%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	41	9	50
(% of distance)	82.00%	18.00%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	13	2.67	3471
quadrat 2	57	2.67	15219
average	35	2.67	9345

T3-2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
0.1	other veg		0.1
2.4	X 2 mature fruit	3	2.3
3.4	other veg		1
5.6	dead	0	0
6.1	other veg		0.5
7.2	X 1 mature fruit	3	1.1
9.8	other veg		2.6
11.1	X 1 mature fruit	3	1.3
13.1	other veg		2
14.5	X 1 mature fruit	3	1.4
22.8	other veg		8.3
24	X 1 mature fruit	3	1.2
25.5	other veg		1.5
26.9	X 1 mature fruit	3	1.4
38.4	other veg		11.5
40.2	X 1 mature fruit	3	1.8
40.5	other veg		0.3
42.9	X 1 mature fruit	3	2.4
50	other veg		7.1

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	8	8
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	34.9	12.9	47.8
(% of distance)	73.01%	26.99%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	45	2.67	12015
quadrat 2	16	2.67	4272
average	30.5	2.67	8143.5

T3-3

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
5.1	other veg		5.1
5.5	X 1 mature fruit	3	0.4
5.9	other veg		0.4
6.9	X 1 no fruit, X 1 mature fruit	3	1
7	other veg		0.1
7.4	X 1 mature fruit	3	0.4
7.6	other veg		0.2
8.4	X 1 mature fruit	3	0.8
10.1	other veg		1.7
10.4	X 1 no fruit	3	0.3
21.5	other veg		11.1
23.3	X 1 immature fruit	3	1.8
42.8	other veg		19.5
44.8	X 1 mature fruit	3	2
50	other veg		5.2

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	2	1	5	8
%	25.00%	12.50%	<b>62.50%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	43.3	6.7	50
(% of distance)	86.60%	<b>13.40%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	56	2.67	<b>14952</b>
quadrat 2	1	2.67	<b>267</b>
average	28.5	2.67	<b>7609.5</b>

T3-4

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
2.1	other veg		2.1
3.3	X 1 mature fruit	3	1.2
7.9	other veg		4.6
8.2	dead	0	0
11.1	other veg		2.9
13.3	X 3 mature fruit	3	2.2
19.3	other veg		6
19.8	X 1 mature fruit	3	0.5
26.2	other veg		6.4
27	X 1 mature fruit	3	0.8
36.9	other veg		9.9
37.9	X 1 mature fruit	3	1
46.9	other veg		9
48.4	X 1 mature fruit	3	1.5
50	other veg		1.6

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	8	8
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	42.5	7.2	49.7
(% of distance)	85.51%	14.49%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	26	2.67	6942
quadrat 2	36	2.67	9612
average	31	2.67	8277

T4-1

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
2.7	other veg		2.7
3.5	X 2 no fruit	2	0.8
8.4	other veg		4.9
8.9	X 2 no fruit, X 9 dead	2	0.5
9	other veg		0.1
10.9	X 1 mature fruit, X 1 dead, X 2 no fruit	3	1.9
20.2	other veg		9.3
23.7	X 4 mature fruit, X 1 no fruit	3	3.5
29.4	other veg		5.7
33.1	X 4 mature fruit, X 2 dead, X 5 no fruit	3	3.7
34.1	other veg		1
34.7	X 1 mature fruit	3	0.6
34.8	other veg		0.1
37.1	X 4 mature fruit	3	2.3
37.3	other veg		0.2
38.6	X 2 mature fruit	3	1.3
41	other veg		2.4
42.1	X 2 mature fruit	3	1.1
45.6	other veg		3.5
46	X 1 dead, X 1 no fruit	2	0.4
48	other veg		2
49.4	X 1 mature fruit, 1 no fruit, X 3 dead	2	1.4
50	other veg		0.6

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	27	7	29	63
%	42.86%	11.11%	<b>46.03%</b>	100.00%

Cover	other veg	Euc stedmanii	total
Total distance covered (m)	32.5	17.5	50
(% of distance)	65.00%	<b>35.00%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	102	115.4	<b>1177080</b>
quadrat 2	128	115.4	<b>1477120</b>
average	115	115.4	<b>1327100</b>

## T4-2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
15.5	other veg		15.5
16.2	X 1 no fruit, X 1 mature fruit	3	0.7
19.8	other veg		3.6
20.3	dead	0	0
25.3	other veg		5
25.7	X 1 no fruit (Cassytha melantha stress)	2	0.4
31.6	other veg		5.9
32.9	X 2 mature fruit (Cassytha melantha stress)	2	1.3
33	other veg		0.1
34.3	X 3 mature fruit (Cassytha melantha stress)	2	1.3
35.2	other veg		0.9
36.2	X 2 mature fruit (Cassytha)	3	1
36.8	other veg		0.6
37.4	X 2 mature fruit	3	0.6
39.4	other veg		2
43.4	X 5 mature fruit, X 4 no fruit, X 4 dead	3	4
46.8	other veg		3.4
47.4	X 1 no fruit	3	0.6
49.5	other veg		2.1
50	X 3 no fruit	2	0.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	10	0	15	25
%	40.00%	0.00%	60.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	39.1	10.4	49.5
(% of distance)	78.99%	21.01%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population	extrapolated population numbers
quadrat 1	12	115.4	138480
quadrat 2	100	115.4	1154000
average	56	115.4	646240

## T5-1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
1	other veg		1
1.2	X 1 no fruit	2	0.2
1.6	other veg		0.4
2.2	X 1 no fruit, X 1 mature fruit	3	0.6
2.3	other veg		0.1
3.2	X 1 no fruit, X 1 mature fruit	2	0.9
6.6	other veg		3.4
6.7	X 1 no fruit, X 1 dead	2	0.1
12	other veg		5.3
12.8	X 1 mature fruit	3	0.8
15.2	other veg		2.4
16.1	X 2 dead	0	0
18.7	other veg		2.6
19.5	X 2 dead, X 3 no fruit	2	0.8
21.2	other veg		1.7
25.5	X 26 no fruit, X 1 dead	3	4.3
25.9	other veg		0.4
26.5	X 4 no fruit, X 1 dead	3	0.6
26.6	other veg		0.1
28.6	X 2 no fruit, X 4 mature fruit	3	2
36	other veg		7.4
36.4	X 2 no fruit (Cassytha stress)	2	0.4
39.5	other veg		3.1
39.7	X 2 no fruit	2	0.2
40.1	other veg		0.4
40.7	X 4 no fruit	3	0.6
40.8	other veg		0.1
41.6	X 2 immature fruit, X 1 no fruit, X 1 dead	3	0.8
41.8	other veg		0.2
42.8	X 3 no fruit	3	1
44.8	other veg		2
45.6	X 3 no fruit, X 2 mature fruit	3	0.8
46.4	other veg		0.8
48.1	X 3 no fruit, X 4 mature fruit	3	1.7
49.5	other veg		1.4
50	X 2 mature fruit	3	0.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	57	2	15	74
%	77.03%	2.70%	20.27%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	32.8	16.3	49.1
(% of distance)	66.80%	33.20%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	114	54.19	617766
quadrat 2	142	54.19	769498
average	128	54.19	693632



T5-2

Distance (m)	# of DRF trees with Fruit/vegetation	Individual DRF tree health	Distance covered (m)
0			
1.8	other veg		1.8
2.6	X 1 no fruit	3	0.8
5.8	other veg		3.2
8.7	X 2 mature fruit	3	2.9
13.5	other veg		4.8
16.5	X 1 mature fruit	3	3
20.2	other veg		3.7
21	X 1 mature fruit	3	0.8
31.9	other veg		10.9
33.6	X 1 mature fruit	3	1.7
41.1	other veg		7.5
42.6	X 1 mature fruit	3	1.5
50	other veg		7.4

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	1	0	6	7
%	14.29%	0.00%	<b>85.71%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	27.1	7.7	34.8
(% of distance)	77.87%	<b>22.13%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	29	54.19	<b>157151</b>
quadrat 2	1	54.19	<b>5419</b>
average	15	54.19	<b>81285</b>

Pop 6 -T1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
2.6	other veg		2.6
3.2	X 1 mature fruit	3	0.6
4.1	other veg		0.9
4.6	X 1 mature fruit	3	0.5
5.1	other veg		0.5
6.1	X 2 mature fruit	3	1
8	other veg		1.9
8.5	X 1 mature fruit	3	0.5
8.9	other veg		0.4
9.7	X 1 mature fruit	3	0.8
11.7	other veg		2
13.1	X 4 mature fruit	3	1.4
16.1	other veg		3
16.3	X 1 mature fruit	3	0.2
16.7	other veg		0.4
17.5	X 2 mature fruit	3	0.8
18.2	other veg		0.7
18.8	X 2 mature fruit	3	0.6
20.2	other veg		1.4
20.7	X 1 mature fruit	3	0.5
25	other veg		4.3
26	X 1 mature fruit	3	1
28.8	other veg		2.8
29.5	X 1 mature fruit	3	0.7
33.5	other veg		4
35	X 3 mature fruit	3	1.5
37	other veg		2
38.2	X 1 mature fruit	3	1.2
48.3	other veg		10.1
48.8	X 1 mature fruit	3	0.5
50	other veg		1.2

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	23	23
%	0.00%	0.00%	<b>100.00%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	38.2	11.8	50
(% of distance)	76.40%	<b>23.60%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	22	101.95	224290
quadrat 2	102	101.95	1039890
average	<b>62</b>	101.95	<b>632090</b>

Pop 6-T2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
0.6	X 1 mature fruit	3	0.6
3.6	other veg		3
5.2	X 5 mature fruit	3	1.6
5.7	other veg		0.5
6.3	X 1 mature fruit	3	0.6
8.6	other veg		2.3
9.4	X 1 mature fruit	3	0.8
10.7	other veg		1.3
11.6	X 1 mature fruit	3	0.9
14	other veg		2.4
14.7	X 1 mature fruit	3	0.7
15.3	other veg		0.6
15.7	X 1 mature fruit	3	0.4
19	other veg		3.3
20.5	X 2 mature fruit	3	1.5
21.8	other veg		1.3
22.5	X 1 mature fruit	3	0.7
26.9	other veg		4.4
32.1	X 3 mature fruit	3	5.2
33.2	other veg		1.1
35.1	X 1 mature fruit	3	1.9
35.5	other veg		0.4
37.6	X 1 mature fruit	3	2.1
37.9	other veg		0.3
45.4	X 1 mature fruit	3	7.5
45.9	other veg		0.5
47	X 1 mature fruit	3	1.1
48.1	other veg		1.1
49.2	X 1 mature fruit	3	1.1
50	other veg		0.8

Fruit Maturity	no fruit	immature fru	mature fruit	total
number	0	0	22	22
%	0.00%	0.00%	100.00%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	23.3	26.7	50
(% of distance)	46.60%	53.40%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	48	101.95	489360
quadrat 2	31	101.95	316045
<b>average</b>	<b>39.5</b>	101.95	<b>402703</b>

T7-1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
2.8	other veg		2.8
4.8	dead	0	0
7.2	other veg		2.4
7.8	dead	0	0
10.5	other veg		2.7
11.5	X 1 mature fruit	3	1
12.3	other veg		0.8
14.3	X 4 mature fruit	3	2
16.6	other veg		2.3
17.8	X 1 no fruit	2	1.2
19.7	other veg		1.9
20.7	X 2 no fruit	2	1
22	other veg		1.3
22.3	X 1 no fruit	2	0.3
26.6	other veg		4.3
27.9	X 1 no fruit	2	1.3
28.2	other veg		0.3
28.7	dead	0	0
32.6	other veg		3.9
33.5	dead	0	0
43.3	other veg		9.8
44.3	X 1 no fruit	2	1
50	other veg		5.7

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	6	0	5	11
%	54.55%	0.00%	45.45%	100.00%

Cover	other veg	Euc stedmanii	total
Total distance covered (m)	38.2	7.8	46
(% of distance)	83.04%	16.96%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	20	2.7	5400
quadrat 2	40	2.7	10800
average	30	2.7	8100

T7-2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
3.4	other veg		3.4
3.8	dead	0	0
4.5	other veg		0.7
5.1	dead	0	0
7.1	other veg		2
7.5	X 1 no fruit	2	0.4
16.7	other veg		9.2
17.4	X 2 no fruit	2	0.7
32.6	other veg		15.2
33.5	X 1 no fruit	2	0.9
39.1	other veg		5.6
39.5	X 1 mature fruit	3	0.4
43.2	other veg		3.7
43.7	X 1 mature fruit	3	0.5
50	other veg		6.3

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	4	0	2	6
%	66.67%	0.00%	33.33%	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	46.1	2.9	49
(% of distance)	94.08%	5.92%	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	49	2.7	13230
quadrat 2	4	2.7	1080
average	26.5	2.7	7155

T7-3

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
1.6	other veg		1.6
3.1	X 1 mature fruit	3	1.5
4.2	other veg		1.1
5.5	X 2 mature fruit	3	1.3
19.8	other veg		14.3
20.6	dead	0	0
39.2	other veg		18.6
44.7	X 5 mature fruit	3	5.5
45.6	other veg		0.9
47.1	dead	0	0
50	other veg		2.9

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	8	8
%	0.00%	0.00%	<b>100.00%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	39.4	8.3	47.7
(% of distance)	82.60%	<b>17.40%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	66	2.7	<b>17820</b>
quadrat 2	46	2.7	<b>12420</b>
average	56	2.7	<b>15120</b>

Pop 8-T1

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
2.1	other veg		2.1
3.2	X 1 mature fruit, X 1 no fruit	3	1.1
6.3	other veg		3.1
6.8	X 1 mature fruit	3	0.5
16.5	other veg		9.7
17.5	X 1 no fruit	3	1
40.6	other veg		23.1
42.2	X 1 mature fruit, X 1 no fruit	3	1.6
47	other veg		4.8
47.4	X 1 no fruit	3	0.4
48.4	other veg		1
49.5	X 1 mature fruit, X 2 no fruit	3	1.1
50	other veg		0.5

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	6	0	4	10
%	60.00%	0.00%	<b>40.00%</b>	100.00%

Cover	other veg	Euc stedmanii	total
Total distance covered (m)	44.3	5.7	50
(% of distance)	88.60%	<b>11.40%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	53	52.2	276660
quadrat 2	68	52.2	354960
average	<b>60.5</b>	52.2	<b>315810</b>

Pop 8-T2

Distance (m)	# of DRF trees with Fruit/ vegetation	Individual DRF tree health	Distance covered (m)
0			
0.4	other veg		0.4
0.9	X 1 mature fruit	3	0.5
3.8	other veg		2.9
4.3	X 1 mature fruit (Cassytha)	3	0.5
13.2	other veg		8.9
13.8	X 2 mature fruit	3	0.6
14.1	other veg		0.3
14.3	dead	0	0
15.3	other veg		1
15.7	X 1 mature fruit	3	0.4
15.8	other veg		0.1
17.4	X 2 mature fruit	3	1.6
20.7	other veg		3.3
21.2	X 1 mature fruit	3	0.5
33.8	other veg		12.6
36.2	X 1 mature fruit	3	2.4
50	other veg		13.8

Fruit Maturity	no fruit	immature fruit	mature fruit	total
number	0	0	9	9
%	0.00%	0.00%	<b>100.00%</b>	100.00%

Cover	other veg	Euc steedmanii	total
Total distance covered (m)	43.3	6.5	49.8
(% of distance)	86.95%	<b>13.05%</b>	100.00%

Density	Plants per 100m <sup>2</sup>	estimated area of population (ha)	extrapolated population numbers
quadrat 1	31	52.2	161820
quadrat 2	3	52.2	15660
average	<b>17</b>	52.2	<b>88740</b>