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**ADDENDUM**

**ASSESSMENT OF THREATENED AND PRIORITY FLORA ON  
WORSLEY MINE EXPANSION PRIMARY ASSESSMENT AREA**

**Prepared for**  
**South32 Worsley Alumina Pty Ltd**

**Prepared by**  
**Mattiske Consulting Pty Ltd**

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## Introduction

The following is a summary of information as available at the end of September 2021 and as such supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is always being collected and as there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

Targeted survey effort for the species highlighted in this report has been conducted over an extended timeframe of greater than 30 years. The targeted effort displayed in the figures of this report reflect the survey efforts within the PAA undertaken by Mattiske Consulting between March 2015 and September 2021. All of these species are continually under review and work is still currently underway on the South32 leases. Where applicable, greater localised targeted effort was undertaken in the main habitat and site conditions as known for the different listed species inside and surrounding the PAA.

The addendums have been ordered in the following attachments in **alphabetical order**.

References are summarized at the back of the document.

<b><i>Species and Taxa</i></b>	<b><i>Pages</i></b>
<i>Banksia subpinnatifida</i> var. <i>subpinnatifida</i> (P2)	1 to 4
<i>Banksia subpinnatifida</i> var. <i>imberbis</i> (P3)	5 to 8
<i>Caladenia hopperiana</i> (T)	9 to 16
<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i> (P4)	17 to 21
<i>Calytrix simplex</i> subsp. <i>simplex</i> (P1)	22 to 26
<i>Gastrolobium</i> sp. Prostrate Boddington (P1)	27 to 36
<i>Goodenia katabudjar</i> (P3)	37 to 40
<i>Halgania corymbosa</i> (P3)	41 to 44
<i>Hibbertia ambita</i> (P1)	45 to 48
<i>Isopogon</i> sp. Canning Reservoir (P1)	49 to 52
<i>Lasiopetalum cardiophyllum</i> (P4)	53 to 64
<i>Papistylus intropubens</i> (P1)	65 to 68
<i>Senecio leucoglossus</i> (P4)	69 to 74
<i>Stylidium marradongense</i> (P3)	75 to 78
<i>Synaphea panhesya</i> (P1)	79 to 82
References	83

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**ADDENDUM - *Banksia subpinnatifida* var *subpinnatifida* (P2)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

**State Herbarium records**

*Banksia subpinnatifida* var. *subpinnatifida* (P2) is known from 22 records at the State Herbarium and as such extends from multiple occurrences in the Wheatbelt to the east and an outlier in the southern Wheatbelt.

**Regional and Local Background Knowledge**

This taxon has been recorded in two locations of revegetation within the Boddington Bauxite Mine and other areas of heath and scrub of mixed Proteaceae and Myrtaceae species. The G3 heath communities in the Mt Saddleback areas are dominated by mixed Proteaceae and Myrtaceae species with the occasional emergent *Eucalyptus drummondii* (see also description in Mattiske Consulting Pty Ltd 2021).

This taxon is known from Dryandra State Forest and heath and scrub areas near Narrogin and Popanyinning (WAH 1998) and as such between these locations and the G3 communities (protected by Worsley) the populations are relatively protected. The tall and rounded nature of this taxon is quite unique and is similar to *Banksia subpinnatifida* var. *imberbis* (P3) but differs in the finer features such as its foliage. Previous records in a regional and local context are summarized in Figures 1 and 2.

**Recent Survey Effort**

The occurrence of this taxon in the Boddington area in the areas previously has concentrated the targeted searches to the heath communities in the Mt Saddleback areas.

**Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

**Site-Vegetation Types**

This species has been recorded in rehabilitated areas and nearby heath and scrub communities (Table 1).

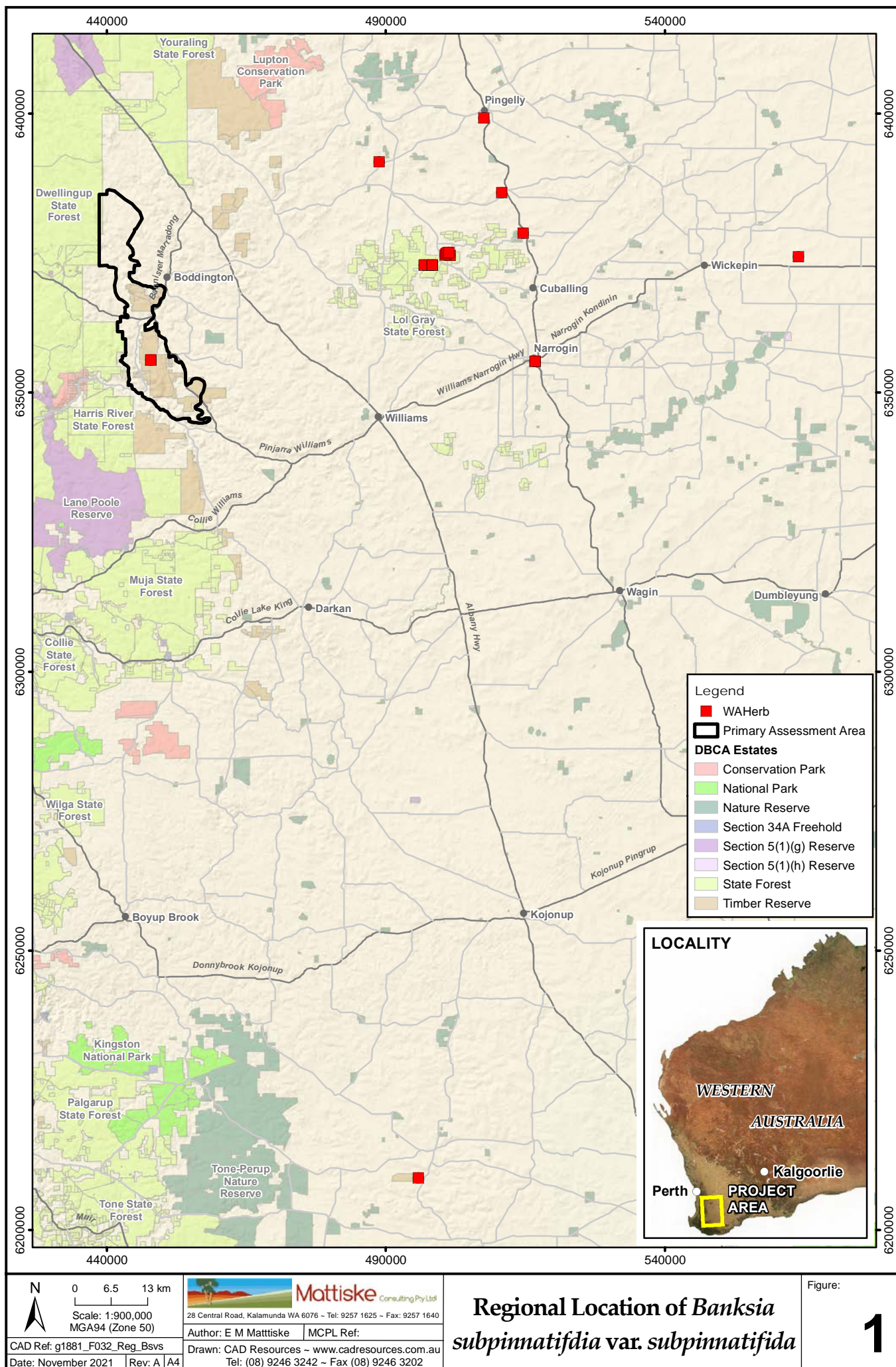
**Summary**

This taxon is known from Dryandra State Forest and heath and scrub areas near Narrogin and Popanyinning (WAH 1998) and as such between these locations and the protected heath communities the populations are relatively protected. The main threat to this taxon is dieback in the lower valley systems.

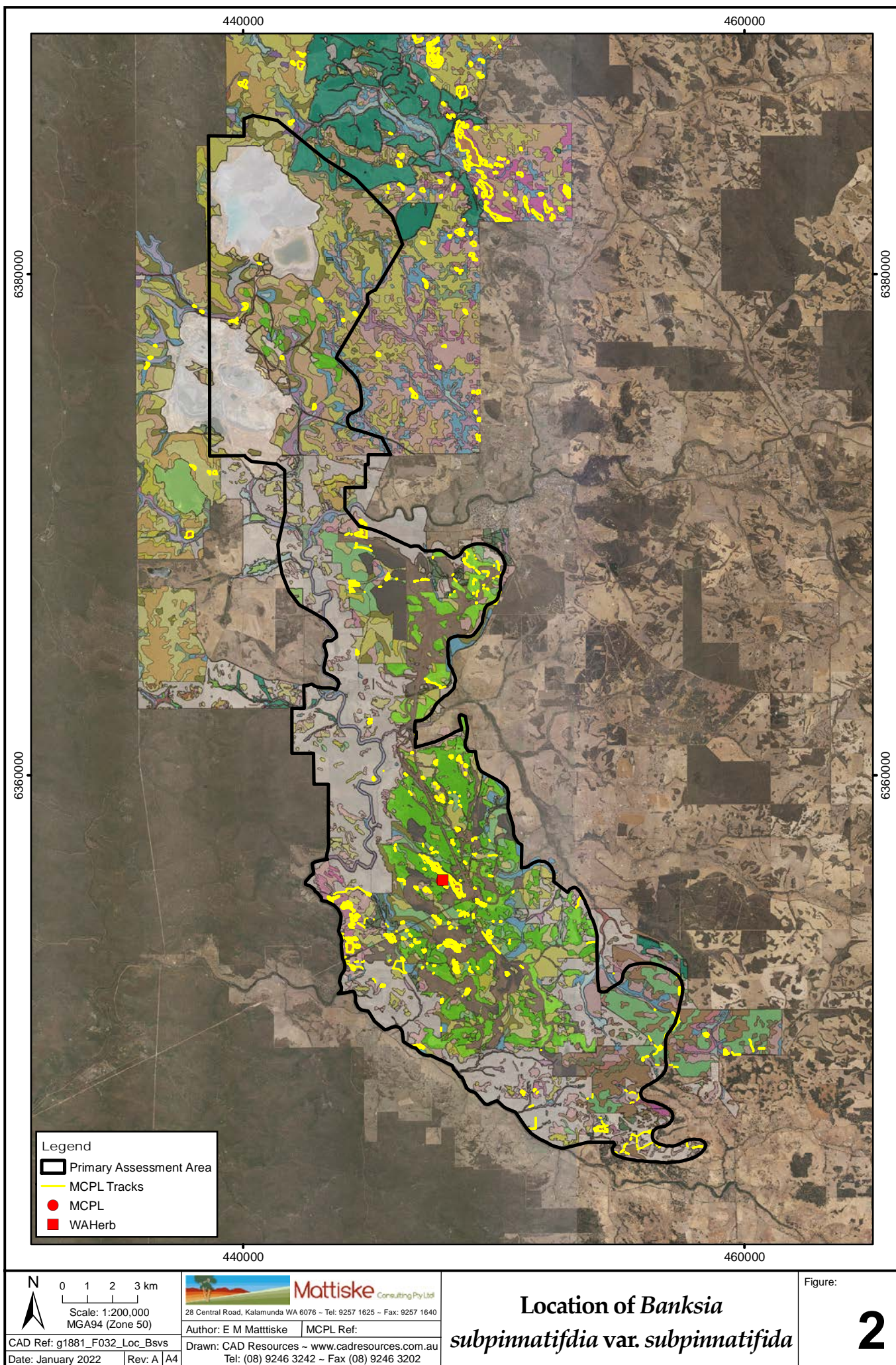
**Table 1: GPS coordinates of records of *Banksia subpinnatifida* var. *subpinnatifida* (P2)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Rehab	447972	6355811	1	South32	Mt Saddleback	Inside
	495857	6209236	1 - 3	WAHerb	Wheatbelt	Outside
	516827	6355572		WAHerb	Wheatbelt	Outside
	516827	6355572		WAHerb	Wheatbelt	Outside
Rehab	447929	6355781		South32	Mt Saddleback	Inside
	496910	6372769	Occasional	WAHerb	Wheatbelt	Outside
	496910	6372769		WAHerb	Wheatbelt	Outside
	498408	6372769		WAHerb	Wheatbelt	Outside
	498408	6372769		WAHerb	Wheatbelt	Outside
	498408	6372769		WAHerb	Wheatbelt	Outside
	563971	6374337	6-20	WAHerb	Wheatbelt	Outside
	501592	6374543	1	WAHerb	Wheatbelt	Outside
	500656	6374654		WAHerb	Wheatbelt	Outside
	500843	6374876	Occasional	WAHerb	Wheatbelt	Outside
	501030	6374986	100's	WAHerb	Wheatbelt	Outside
	501311	6375097	<10 plants - 5 dead.	WAHerb	Wheatbelt	Outside
	514711	6378523	1	WAHerb	Wheatbelt	Outside
	510783	6385845		WAHerb	Wheatbelt	Outside
	488836	6391276		WAHerb	Wheatbelt	Outside
	507605	6399150		WAHerb	Wheatbelt	Outside









## **ADDENDUM - *Banksia subpinnatifida* var. *imberbis* (P3)**

The following is a summary of information as available at the end of September 2021 and as such supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is always being collected and as there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Banksia subpinnatifida* var. *imberbis* (P3) is known from 17 records at the State Herbarium and as such extends from multiple occurrences in the Wheatbelt and northwards along the eastern fringes of the southwest forests. The records at Boddington have been recorded in the heath areas as early as in 1904 through a collection by A. Morrison in a valley near Mt Saddleback on 15<sup>th</sup> November 1904. This collection was followed by two collections during Phase Two flora and fauna studies for Worsley Alumina Pty Ltd (1985) by K.J. Atkins on 27 September 1982 and D.J. Backshall on 14<sup>th</sup> August 1982 and a further collection by Hort, F., Hort, J., Allen, J. and Bullock, P. on 17 October 2007 in the Tunnell Road heath Protected Area.

### **Regional and Local Background Knowledge**

This taxon has been recorded in vegetation monitoring programs of the plots and transects in the Tunnell Road heath Protected Area (particularly on Transect 2 –plants in 2011 and 2019, Mattiske Consulting Pty Ltd 2012, 2020) and plants were also located during recent targeted searches of the Tunnell Road heath Protected Area and other G3 heath habitat types in the period from 2019 to 2020 by Dr Mattiske. The G3 heath communities are dominated by mixed Proteaceae and Myrtaceae species with the occasional emergent *Eucalyptus drummondii* (see also description in Mattiske Consulting Pty Ltd 2021). As this taxon occurs in the Mount Saddleback Heath Communities Priority Ecological Community, the plants are protected under the Worsley Protected Areas procedure; however there has been some decline in extent within the Tunnell Road heath Protected Area likely due to the occurrence of dieback on isolated lower slopes in this valley. There has been an occasional siting in the P site-vegetation type which consists of Jarrah- Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) forests with a defined shrub layer on sandy- gravelly soils in some areas.

This taxon is known from several nature reserves (WAH 1998 including Tone-Perup Nature Reserve, North Kulikup Nature Reserve) and as such between these locations and the Tunnel Road heath Protected Area the populations are relatively protected. The mounded nature of this taxon is quite unique and is similar to *Banksia subpinnatifida* var. *subpinnatifida* (P2) but differs in the finer features such as its foliage.

Previous records in a regional and local context are summarized in Figures 3 and 4.

### **Recent Survey Effort**

The occurrence of this taxon in the Boddington area in the Tunnell Road heath Protected Area and other G3 (heath) and P (Jarrah-Sheoak forest) site-vegetation types has been undertaken in recent years and as such this taxon appears to be restricted to the heaths in the Mt Saddleback areas and near Boddington (E.M. Mattiske and Associates 1993, Mattiske Consulting Pty Ltd 1999, 2004, 2012, 2020, 2021). Accordingly, targeted survey effort has been focussed on these habitat types in the Boddington area.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### Site-Vegetation Types

Although the numbers are relatively low (see Table 2), the numbers are higher in the heath (G3) communities (E.M. Mattiske and Associates 1993, Mattiske Consulting Pty Ltd 1999, 2004, 2012, 2020, 2021).

This taxon has also been recorded in the P site-vegetation type, although in low numbers.

### Summary

This taxon occurs more widely in the Wheatbelt and in several nature reserves (WAH 1998-). Within the PAA, this taxon persists mainly in the Tunnell Road heath Protected Area and some P site-vegetation types (Jarrah-Sheoak forests) on the Mt Saddleback area and is regularly monitored as

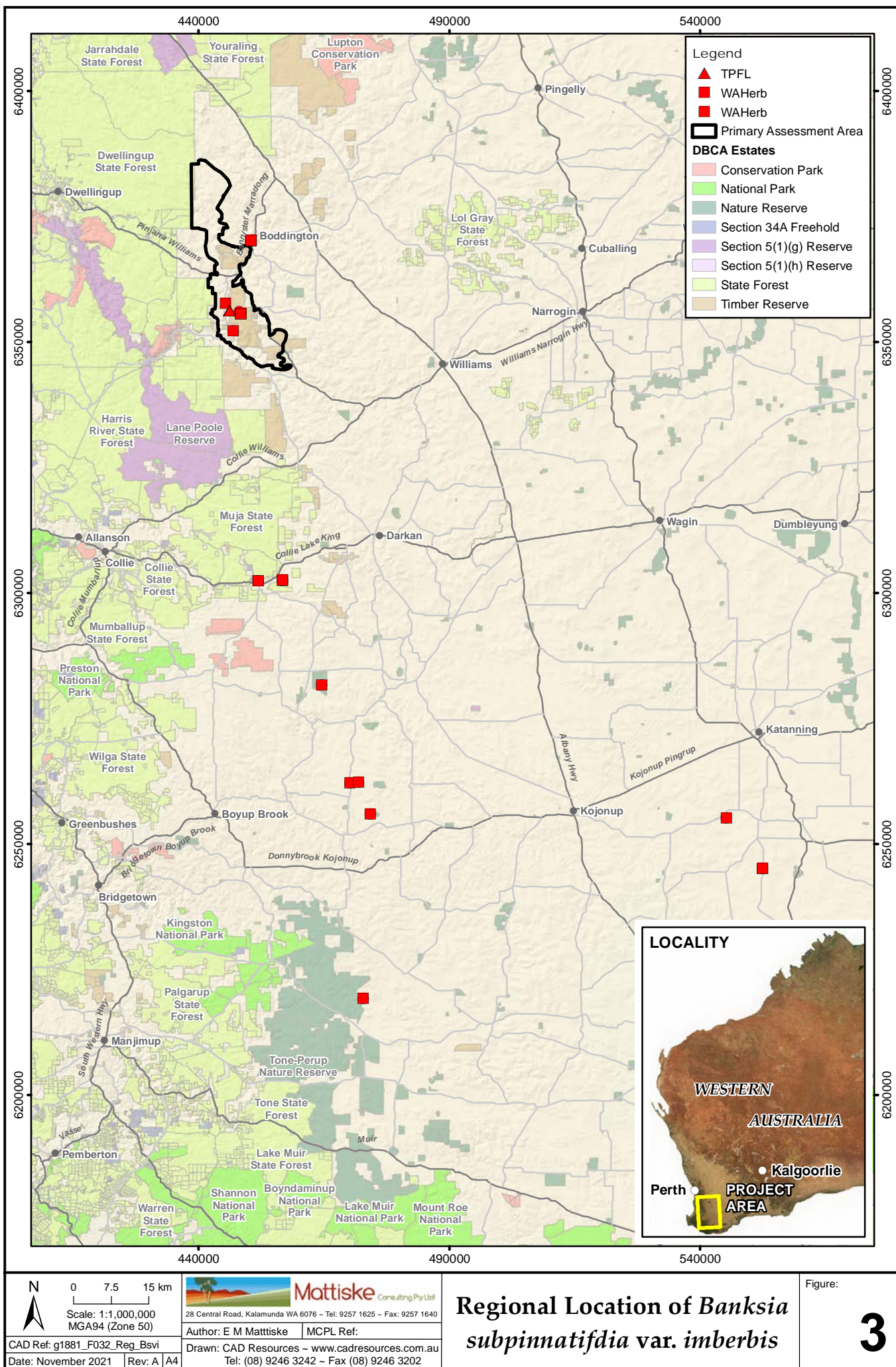
part of Worsley management processes. The main threat to this taxon is dieback in the lower valley systems, which is understood and managed by Worsley for containment and risk of spread.

**Table 2: GPS coordinates of records of *Banksia subpinnatifida* var. *imberbis* (P3)**

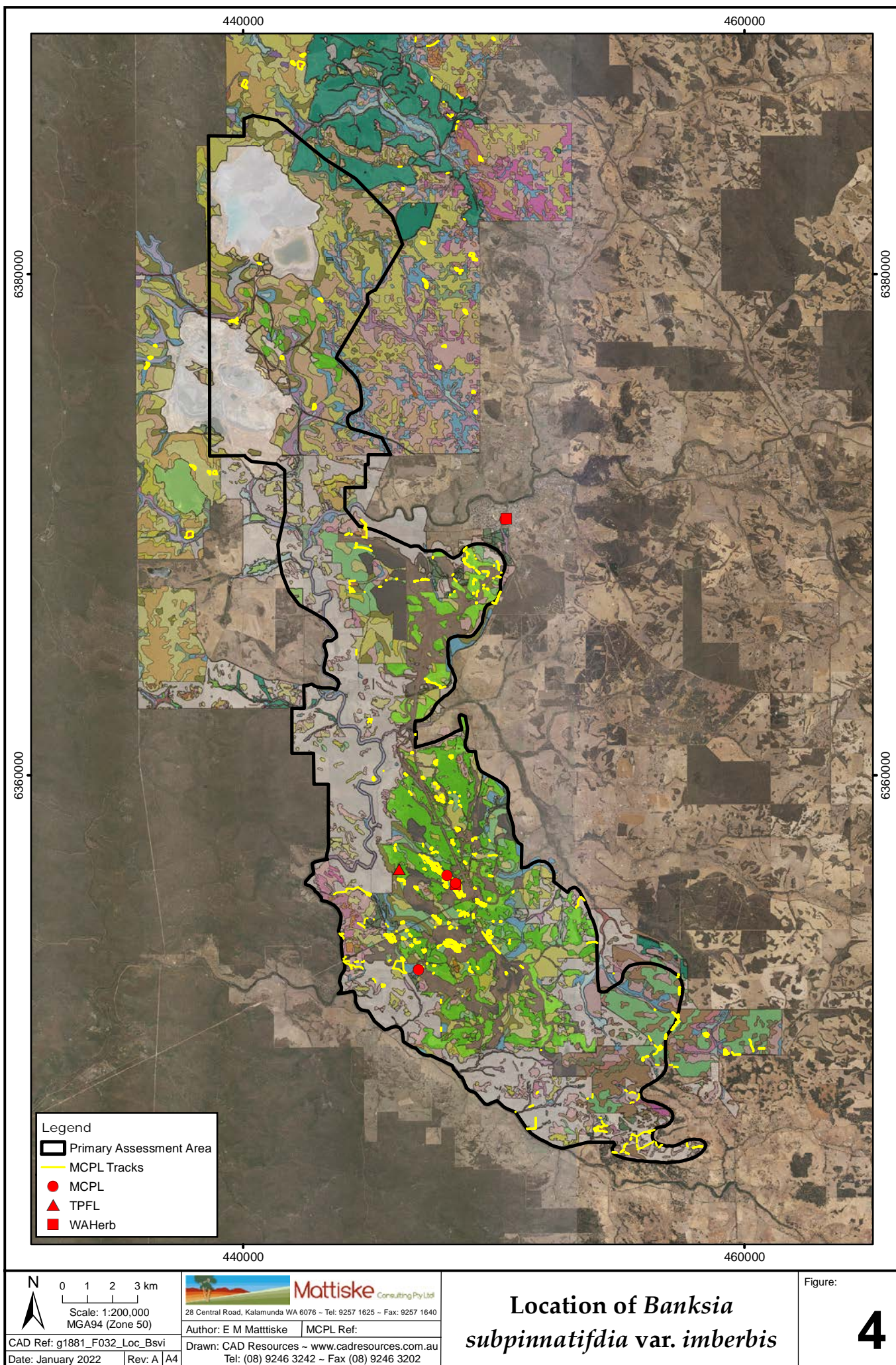
WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

Site_Veget	MGA_East	MGA_North	Popn	Project	Area	PAA
	472903	6219177	locally abundant	WAHerb	Wheatbelt	Outside
	552403	6245128		WAHerb	Wheatbelt	Outside
	545241	6255144		WAHerb	Wheatbelt	Outside
	474278	6255882		WAHerb	Wheatbelt	Outside
	470280	6262190		WAHerb	Wheatbelt	Outside
	471946	6262306		WAHerb	Wheatbelt	Outside
	464560	6281685		WAHerb	Wheatbelt	Outside
	451932	6302363		WAHerb	Wheatbelt	Outside
	456766	6302497	very occasional	WAHerb	Wheatbelt	Outside
	456766	6302608		WAHerb	Wheatbelt	Outside
	450511	6370238		WAHerb	Boddington Gold Mine	Outside
G3	448144	6356004	9	South32	Mt Saddleback	Inside
G3	448480	6355631	1	WAHerb		Inside
	446228	6356246		WAHerb	Boddington Gold Mine	Inside
P	447013	6352229		South32	Mt Saddleback	Inside
G3	448490	6355673	10 & 10 dead	South32	Mt Saddleback	Inside
CL - Ag	445487	6357764		South32	Mt Saddleback	Inside
	450474	6370207		WAHerb	Wheatbelt	Outside











## **ADDENDUM - *Caladenia hopperiana* (T)**

The following is a summary of information as available at the end of September 2021 and as such supplements the information as collated by Mattiske Consulting (2021) and South32 ERD reports. In all projects data is always being collected and as there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

Previously *Caladenia hopperiana* (T) is known from 4 records at the State Herbarium and as such occurs within the Quindanning area and from Mooradung Nature Reserve.

### **Regional and Local Background Knowledge**

This species was initially known as *Caladenia* sp. Quindanning (K. Smith & P. Johns 231) and as such was collected on the 7<sup>th</sup> October 2004 3km east of Quindanning on the Williams – Wundanning Road. This was followed by several additional collections in nearby areas, e.g. *Caladenia hopperiana* was made on 30<sup>th</sup> September 2006 by Brockman, G, 6.4km from Quindanning (WAH 1998-).

The *Caladenia* species are herbaceous perennials, with shoots arising annually from a single, usually spheroid tuber and producing a single, hairy leaf (Dixon and Tremblay 2009). Following a review of root structures and lifeforms of the *Caladenia* species (Dixon and Tremblay (2009), it is apparent that tubers have 3 to 5 attenuated roots produced at the junction between the tuber and the shoot are produced later in the growing cycle and as such are devoid of mycorrhiza suggest that their functional significance relates to water uptake. Mycorrhizal endophytes according to Dixon and Tremblay (2009) are confined to a hypertrophic stem region at the soil surface (collar) subtending the leaf that positions the collar directly in the organically rich zone at the soil surface. The majority of the taxa from this genus remain dry-season dormant from a few to 7 months. Consequently, soil moisture and temperature triggers appear to be the main drivers in the growth from these tubers. In view of the later knowledge as summarized in Dixon and Tremblay (2009) and wider summaries by Pate and Dixon (1982), any changes to the water table at such depths is unlikely to directly impact the *Caladenia hopperiana*. Previous records in a regional and local context are summarized in Figures 5 & 6.

### **Recent Survey Effort**

On several occasions the environmental team from South32 found additional plants in the Quindanning area. In 2019, Mattiske and her team undertook additional targeted searches for *Caladenia hopperiana* in the period between October and November 2019. As a result a total of 312 plants of this orchid have been recorded within the Quindanning Timber Reserve. Other localised populations have been recorded east of Quindanning and also in the Mooradung Nature Reserve.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs. Despite the recommendations for spring data collection, this species flowers in spring and early summer depending on seasonal conditions.

### **Site-Vegetation Types**

This species is concentrated in the lower valleys near swamps and Wandoo Woodlands (AY, Y) and Wandoo woodlands on mid to upper drier slopes (M). There is an occasional plant in the site-vegetation H2; which consists of an open forest of *Eucalyptus marginata* and *Corymbia calophylla* over shrub species on gravel and sandy-gravel soils of slopes and less undulating hills (Mattiske Consulting Pty Ltd 2021). Table 3.



**Table 3: GPS coordinates of records of *Caladenia hopperiana* (T)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Y	454514	6351996	Few	South32	Quindanning	Outside
Y	454587	6352073	1	South32	Quindanning	Outside
Y	454973	6349065	1	South32	Quindanning	Inside
M	455021	6348995	1	South32	Quindanning	Inside
M	455022	6348998	1	South32	Quindanning	Inside
M	455024	6348990	1	South32	Quindanning	Inside
M	455026	6348980	3	WAHerb	Quindanning	Inside
M	455026	6348995	1	South32	Quindanning	Inside
M	455032	6348981	1	South32	Quindanning	Inside
M	455032	6348985	1	South32	Quindanning	Inside
M	455032	6348994	1	South32	Quindanning	Inside
M	455039	6348991	1	South32	Quindanning	Inside
M	455045	6348965	1	South32	Quindanning	Inside
M	455056	6348980	1	South32	Quindanning	Inside
M	455065	6349025	1	South32	Quindanning	Inside
M	455112	6348941	1	South32	Quindanning	Inside
A	455253	6351369	1	South32	Quindanning	Inside
A	455254	6351366	1	South32	Quindanning	Inside
A	455254	6351368	1	South32	Quindanning	Inside
A	455255	6351370	1	South32	Quindanning	Inside
A	455259	6351332	1	South32	Quindanning	Inside
A	455263	6351345	1	South32	Quindanning	Inside
Y	455276	6351310	1	South32	Quindanning	Inside
A	455296	6351323	1	South32	Quindanning	Inside
A	455304	6351305	1	South32	Quindanning	Inside
Y	455312	6351287	1	South32	Quindanning	Inside
A	455334	6351297	1	South32	Quindanning	Inside
A	455334	6351338	1	South32	Quindanning	Inside
A	455340	6351297	1	South32	Quindanning	Inside
A	455342	6351321	1	South32	Quindanning	Inside
A	455384	6351312	1	South32	Quindanning	Inside
A	455387	6351297	1	South32	Quindanning	Inside
A	455400	6351310	1	South32	Quindanning	Inside
A	455403	6351271	1	South32	Quindanning	Inside
A	455406	6351317	1	South32	Quindanning	Inside
A	455432	6351297	1	South32	Quindanning	Inside
A	455452	6351284	1	South32	Quindanning	Inside
A	455747	6351210	1	South32	Quindanning	Inside
A	455753	6351206	2	WAHerb	Quindanning	Inside
Y	455774	6351244	1	South32	Quindanning	Inside
M	456271	6350858	1	South32	Quindanning	Inside
H2	457144	6349293	1	South32	Quindanning	Outside
H2	457164	6349282	1	South32	Quindanning	Outside
H2	457164	6349285	1	South32	Quindanning	Outside
H2	457166	6349284	1	South32	Quindanning	Outside
M	457180	6349286	3	South32	Quindanning	Outside
M	457180	6349289	1	South32	Quindanning	Outside
M	457181	6349287	2	South32	Quindanning	Outside
M	457191	6349302	1	South32	Quindanning	Outside

**Table 3: GPS coordinates of records of *Caladenia hopperiana* (T)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
M	457192	6349300	4	South32	Quindanning	Outside
M	457192	6349303	2	South32	Quindanning	Outside
M	457193	6349298	1	South32	Quindanning	Outside
M	457193	6349303	1	South32	Quindanning	Outside
M	457193	6349307	1	South32	Quindanning	Outside
M	457193	6349308	1	South32	Quindanning	Outside
M	457194	6349302	18	South32	Quindanning	Outside
M	457195	6349299	1	South32	Quindanning	Outside
M	457195	6349302	1	South32	Quindanning	Outside
M	457195	6349303	1	South32	Quindanning	Outside
M	457195	6349304	1	South32	Quindanning	Outside
M	457195	6349307	1	South32	Quindanning	Outside
M	457196	6349301	3	South32	Quindanning	Outside
M	457196	6349302	1	South32	Quindanning	Outside
M	457196	6349304	1	South32	Quindanning	Outside
M	457197	6349303	6	South32	Quindanning	Outside
M	457198	6349303	4	South32	Quindanning	Outside
M	457229	6349280	1	South32	Quindanning	Outside
AY	457231	6349283	1	South32	Quindanning	Outside
AY	457251	6349265	1	South32	Quindanning	Outside
AY	457295	6349211	2	South32	Quindanning	Outside
AY	457302	6349201	2	South32	Quindanning	Outside
AY	457457	6349069	1	South32	Quindanning	Outside
AY	457462	6349070	1	South32	Quindanning	Outside
AY	457463	6349057	1	South32	Quindanning	Outside
AY	457468	6349057	1	South32	Quindanning	Outside
AY	457470	6349056	2	South32	Quindanning	Outside
AY	457470	6349058	1	South32	Quindanning	Outside
AY	457472	6349051	1	South32	Quindanning	Outside
AY	457472	6349059	1	South32	Quindanning	Outside
AY	457472	6349060	1	South32	Quindanning	Outside
AY	457475	6349056	2	South32	Quindanning	Outside
AY	457478	6349051	1	South32	Quindanning	Outside
AY	457479	6349056	1	South32	Quindanning	Outside
AY	457481	6349033	1	South32	Quindanning	Outside
Y	457483	6349027	3	South32	Quindanning	Outside
AY	457483	6349050	1	South32	Quindanning	Outside
AY	457483	6349051	1	South32	Quindanning	Outside
AY	457485	6349053	1	South32	Quindanning	Outside
AY	457489	6349046	1	South32	Quindanning	Outside
AY	457493	6349030	2	South32	Quindanning	Outside
AY	457500	6349034	1	South32	Quindanning	Outside
AY	457500	6349034	2	South32	Quindanning	Outside
AY	457501	6349032	4	South32	Quindanning	Outside
AY	457502	6349028	2	South32	Quindanning	Outside
AY	457502	6349031	2	South32	Quindanning	Outside
AY	457503	6349031	2	South32	Quindanning	Outside
AY	457505	6349035	2	South32	Quindanning	Outside

**Table 3: GPS coordinates of records of *Caladenia hopperiana* (T)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
AY	457506	6349031	4	South32	Quindanning	Outside
AY	457506	6349032	2	South32	Quindanning	Outside
AY	457507	6349031	1	South32	Quindanning	Outside
AY	457507	6349036	1	South32	Quindanning	Outside
AY	457513	6349027	1	South32	Quindanning	Outside
AY	457517	6349030	1	South32	Quindanning	Outside
AY	457519	6349028	18	South32	Quindanning	Outside
AY	457527	6349026	1	South32	Quindanning	Outside
AY	457532	6349022	1	South32	Quindanning	Outside
AY	457533	6349022	1	South32	Quindanning	Outside
AY	457533	6349026	1	South32	Quindanning	Outside
AY	457534	6349027	1	South32	Quindanning	Outside
AY	457538	6349021	3	South32	Quindanning	Outside
AY	457542	6349022	1	South32	Quindanning	Outside
AY	457546	6349018	1	South32	Quindanning	Outside
AY	457550	6349014	6	South32	Quindanning	Outside
AY	457554	6349002	4	South32	Quindanning	Outside
AY	457562	6349007	1	South32	Quindanning	Outside
AY	457565	6349006	1	South32	Quindanning	Outside
AY	457570	6349002	1	South32	Quindanning	Outside
AY	457570	6349005	2	South32	Quindanning	Outside
AY	457570	6349009	2	South32	Quindanning	Outside
AY	457571	6349010	1	South32	Quindanning	Outside
AY	457574	6349010	1	South32	Quindanning	Outside
AY	457579	6349010	1	South32	Quindanning	Outside
AY	457580	6349013	1	South32	Quindanning	Outside
AY	457592	6348980	2	South32	Quindanning	Outside
AY	457605	6348984	1	South32	Quindanning	Outside
AY	457609	6348985	1	South32	Quindanning	Outside
AY	457611	6348983	1	South32	Quindanning	Outside
AY	457623	6348982	1	South32	Quindanning	Outside
AY	457632	6348975	2	South32	Quindanning	Outside
AY	457640.	6348929	1	South32	Quindanning	Outside
AY	457658	6348971	1	South32	Quindanning	Outside
AY	457666	6348961	1	South32	Quindanning	Outside
AY	457666	6348967	3	South32	Quindanning	Outside
AY	457668	6348965	1	South32	Quindanning	Outside
AY	457818	6348916	1	South32	Quindanning	Outside
AY	457837	6348927	1	South32	Quindanning	Outside
AY	457838	6348922	1	South32	Quindanning	Outside
	457838	6359647	4	WAHerb	Mooradung Nature Reserve	Outside
MG	457840	6348984	1	South32	Quindanning	Outside
AY	457843	6348926	1	South32	Quindanning	Outside
AY	457853	6348928	3	South32	Quindanning	Outside
AY	457865	6348930	1	South32	Quindanning	Outside



**Table 3: GPS coordinates of records of *Caladenia hopperiana* (T)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
AY	457890	6348931	1	South32	Quindanning	Outside
AY	457894	6348933	3	South32	Quindanning	Outside
AY	457908	6348936	6	South32	Quindanning	Outside
AY	457912	6348935	1	South32	Quindanning	Outside
AY	457921	6348937	1	South32	Quindanning	Outside
AY	458020	6348922	1	South32	Quindanning	Outside
AY	458021	6348925	1	South32	Quindanning	Outside
AY	458022	6348921	1	South32	Quindanning	Outside
AY	458034	6348928	1	South32	Quindanning	Outside
AY	458037	6348928	1	South32	Quindanning	Outside
A	458525	6349990	1	South32	Quindanning	Outside
A	458525	6349993	1	South32	Quindanning	Outside
A	458526	6350021	2	South32	Quindanning	Outside
A	458528	6350020	1	South32	Quindanning	Outside
A	458528	6350021	1	South32	Quindanning	Outside
A	458530	6350021	1	South32	Quindanning	Outside
A	458531	6350015	1	South32	Quindanning	Outside
A	458531	6350017	1	South32	Quindanning	Outside
A	458531	6350028	1	South32	Quindanning	Outside
A	458532	6350018	1	South32	Quindanning	Outside
A	458534	6350017	1	South32	Quindanning	Outside
A	458535	6350019	2	South32	Quindanning	Outside
A	458572	6349966	1	South32	Quindanning	Outside
A	458573	6349966	1	South32	Quindanning	Outside
A	458573	6349966	1	South32	Quindanning	Outside
A	458573	6349967	1	South32	Quindanning	Outside
A	458575	6349964	1	South32	Quindanning	Outside
A	458578	6349965	1	South32	Quindanning	Outside
A	458579	6349965	1	South32	Quindanning	Outside
A	458581	6349959	1	South32	Quindanning	Outside
A	458591	6349999	1	South32	Quindanning	Outside
A	458604	6349965	1	South32	Quindanning	Outside
A	458613	6349973	2	South32	Quindanning	Outside
A	458623	6349908	1	South32	Quindanning	Outside
A	458623	6349914	1	South32	Quindanning	Outside
A	458626	6349973	1	South32	Quindanning	Outside
A	458628	6349975	1	South32	Quindanning	Outside
Y	458863	6349421	1	South32	Quindanning	Outside
Y	458888	6349335	1	South32	Quindanning	Outside
Y	458923	6349159	1	South32	Quindanning	Outside
Y	458959	6350115	1	South32	Quindanning	Outside
Y	458960	6350116	2	South32	Quindanning	Outside
Y	458999	6350141	2	South32	Quindanning	Outside
Y	459009	6350153	1	South32	Quindanning	Outside
Y	459009	6350153	1	South32	Quindanning	Outside

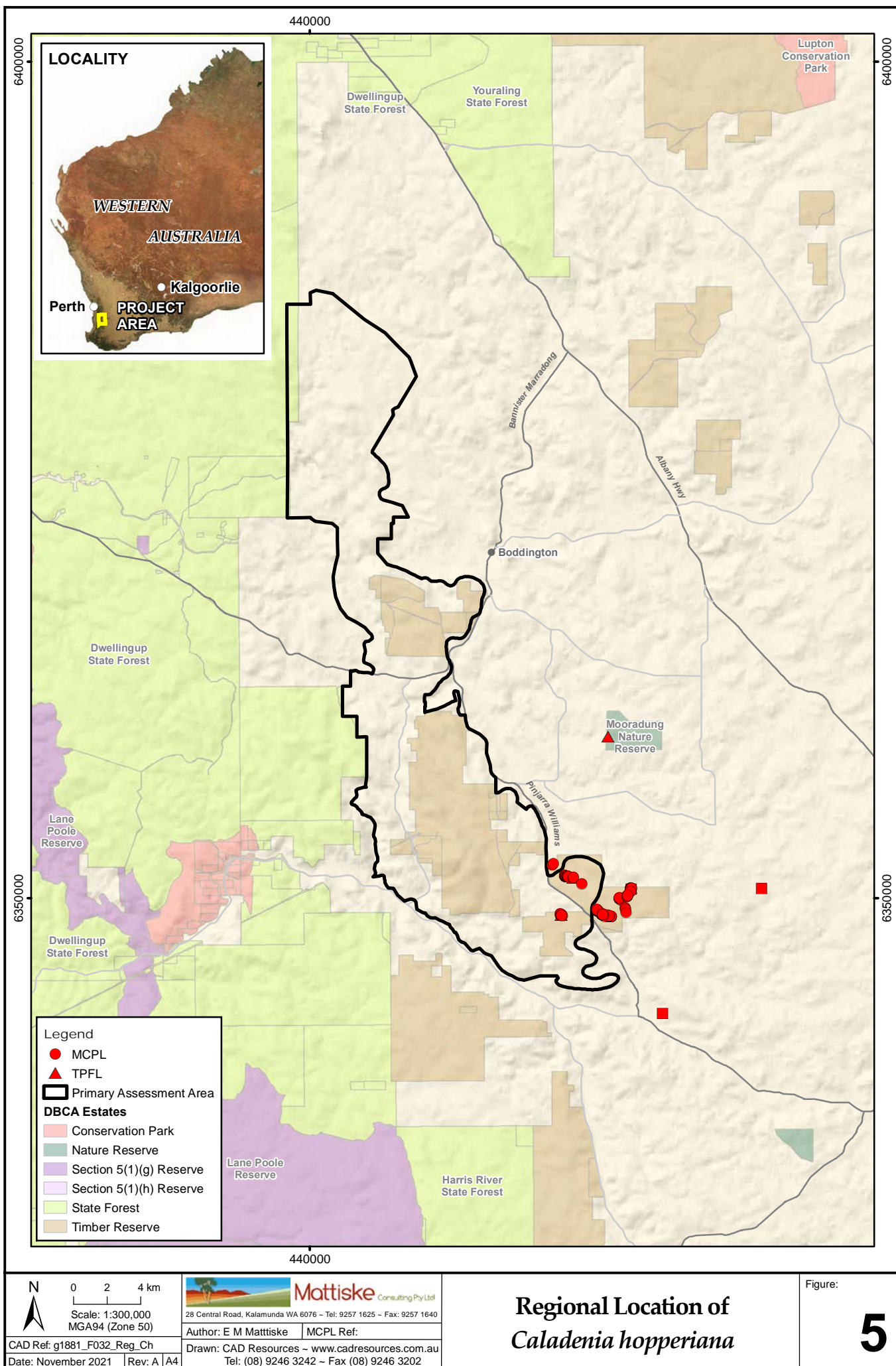
**Table 3: GPS coordinates of records of *Caladenia hopperiana* (T)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

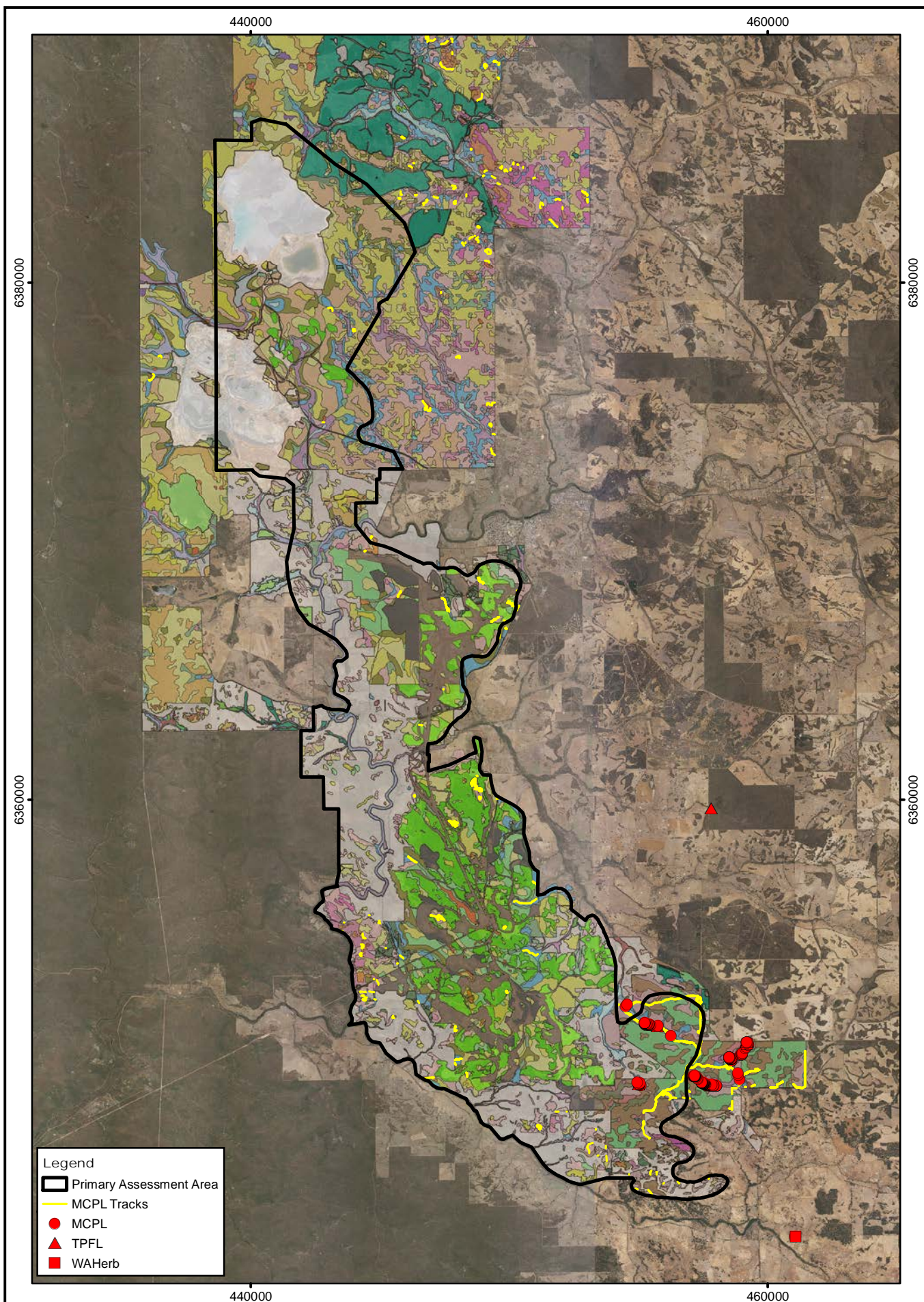
<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Y	459009	6350154	1	South32	Quindanning	Outside
Y	459027	6350181	2	South32	Quindanning	Outside
Y	459028	6350181	1	South32	Quindanning	Outside
Y	459150	6350385	1	South32	Quindanning	Outside
Y	459189	6350418	2	South32	Quindanning	Outside
Y	459195	6350598	1	South32	Quindanning	Outside
Y	459197	6350598	1	South32	Quindanning	Outside
Y	459200	6350602	1	WAHerb	Quindanning	Outside
Y	459201	6350593	1	South32	Quindanning	Outside
Y	459202	6350592	1	South32	Quindanning	Outside
Y	459202	6350607	1	South32	Quindanning	Outside
Y	459208	6350605	1	South32	Quindanning	Outside
Y	459217	6350596	1	South32	Quindanning	Outside
Y	459226	6350538	1	WAHerb	Quindanning	Outside
Y	459239	6350606	1	South32	Quindanning	Outside
A	459262	6350513	scattered and common	South32	Quindanning	Outside
A	459262	6350513	Few	South32	Quindanning	Outside
	461067	6343092	Few	South32	Quindanning	Outside
	461099	6343093	1	WAHerb	Quindanning	Outside
	467012	6350567	1	WAHerb	Quindanning	Outside
	467017	6350542	common	South32	Quindanning	Outside

### Summary

This species is concentrated in the lower valleys near swamps and Wandoo Woodlands (AY, Y) and Wandoo woodlands on mid to upper drier slopes (M). There is an occasional plant in the site-vegetation H2; which consists of open forest of *Eucalyptus marginata* and *Corymbia calophylla* over shrub species on gravel and sandy-gravel soils of slopes and less undulating hills (Mattiske Consulting Pty Ltd 2021). This species has been recorded within and outside the PAA and occurs mainly in Wandoo gullies and valley floors.







## Location of *Caladenia hopperiana*

Figure:

6



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**ADDENDUM - *Calothamnus quadrifidus* subsp. *teretifolius* A.S. George & N. Gibson (P4)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

**State Herbarium records**

*Calothamnus quadrifidus* subsp. *teretifolius* A.S. George & N. Gibson (P4) is known from 43 records at the Western Australian State Herbarium and as such extends from multiple occurrences on the southern Swan Coastal Plain into the Donnybrook Sunklands (known also as the Blackwood Plateau) where the main occurrences occur. The records at Boddington have been recorded in the rehabilitation areas at Mt Saddleback in 2014 (collection by J. Rogers (Mattiske Consulting on 4<sup>th</sup> November 2014)).

**Regional and Local Background Knowledge**

The occurrence at Mt Saddleback was recorded in one of the rehabilitation areas and therefore may reflect seed mixtures for the 1989 areas, rather than a natural occurrence. A specimen from the 1989 areas was submitted to the State Herbarium and confirmed in 2014 by J. Rogers (Mattiske Consulting Pty Ltd).

Previous records in a regional and local context are summarized in Figures 7 and 8.

**Recent Survey Effort**

The occurrence of the species in the Boddington area in the rehabilitation areas raises the issue related to the distribution in the wider south-west areas as the records from the State Herbarium reflect the occurrence of this species in the southern section of the Swan Coastal Plain and the Donnybrook Sunklands (Blackwood Plateau). In consideration of the above, targeted work has been undertaken in parallel with the targeted work against other Priority species.

**Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

**Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded in rehabilitation areas and therefore may reflect seed mixtures for the 1989 areas, rather than a natural occurrence. A specimen from the 1989 areas was submitted to the State Herbarium and confirmed in 2014. Table 4.

**Summary**

The occurrence of the species in the Boddington area in the rehabilitation areas (including records in 2014 and 2019) raises the issue related to the distribution in the wider south-west areas as the records from the Western Australian State Herbarium reflect the occurrence of this species in the southern section of the Swan Coastal Plain and the Donnybrook Sunklands (Blackwood Plateau). Therefore, targeted work was not continued in recent years on this species as it has not been recorded outside the rehabilitation areas in the Mt Saddleback area.

**Table 4: GPS coordinates of records of *Calothamnus quadrifidus* subsp. *teretifolius* A.S. George & N. Gibson (P4)**

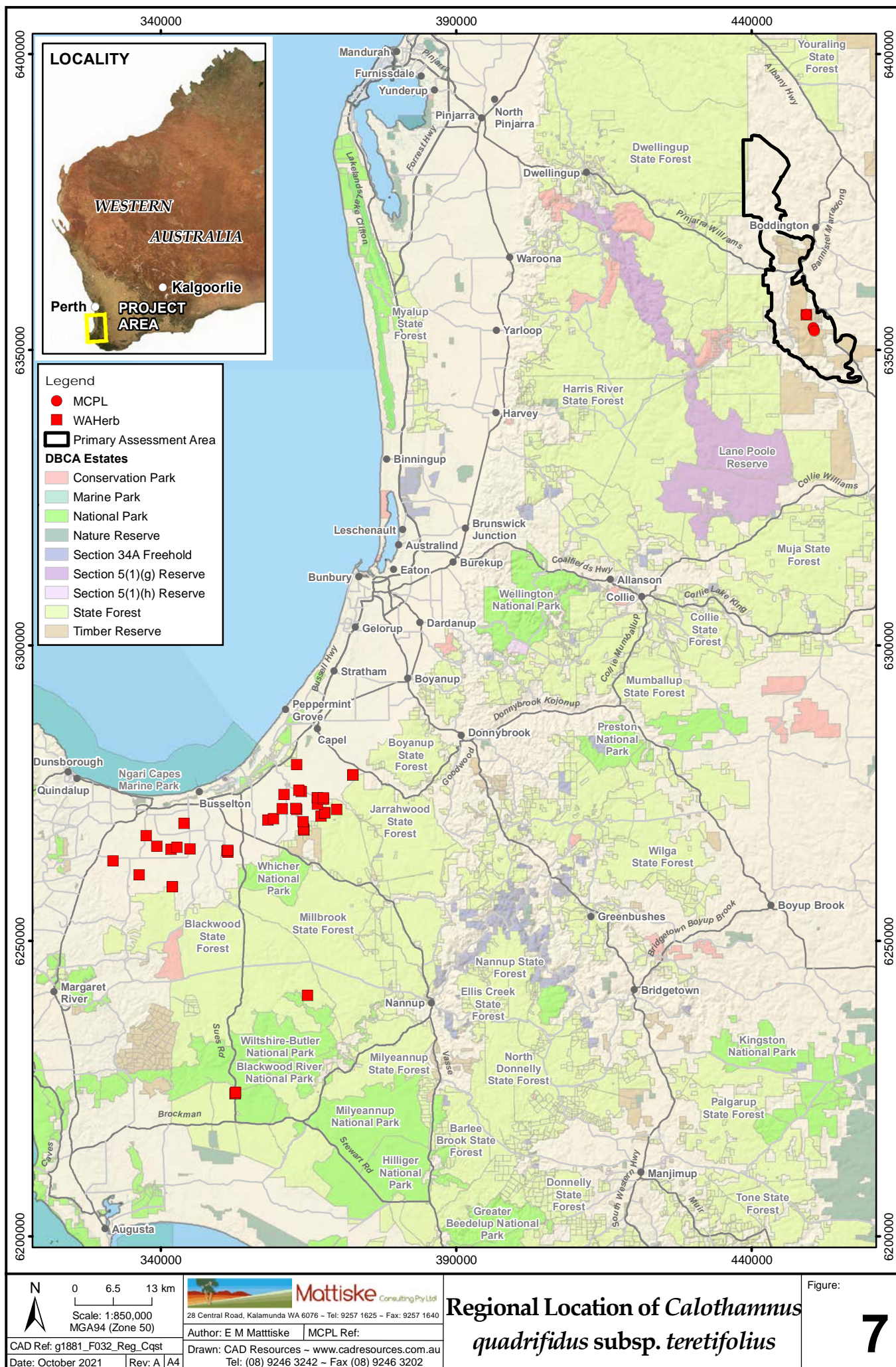
WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Rehab	449331	6355899	2-5 plants	South32	Mt Saddleback	Inside
Rehab	449289	6355950	1	South32	Mt Saddleback	Inside
Rehab	450438	6353751	1	South32	Mt Saddleback	Inside
Rehab	450688	6353227	3	South32	Mt Saddleback	Inside
	352618	6224051		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	352705	6224385	Locally frequent	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	364834	6240760	20-50 plants	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	341977	6259153	Common	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	336386	6261166		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	331991	6263530	locally frequent	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	351425	6264962		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	351237	6265181	ca 100 plants	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	351420	6265295	locally abundant	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	341780	6265473		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	345023	6265526	Frequent	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	342794	6265822		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	339362	6265987		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	337572	6267731		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	364251	6268702	locally abundant	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	364248	6268924	locally frequent	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	344026	6269835	Common	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	364138	6270142		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	358202	6270389	locally abundant	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	359125	6270624		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	367185	6271072	locally abundant	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	367826	6271636		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	369857	6272218	6 plants	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	363089	6272234		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	360584	6272309		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	362902	6272343		WAHerb	Southern Swan Coastal Plain & Forest areas	Outside
	366601	6273060	30 on drainage line	WAHerb	Southern Swan Coastal Plain & Forest areas	Outside

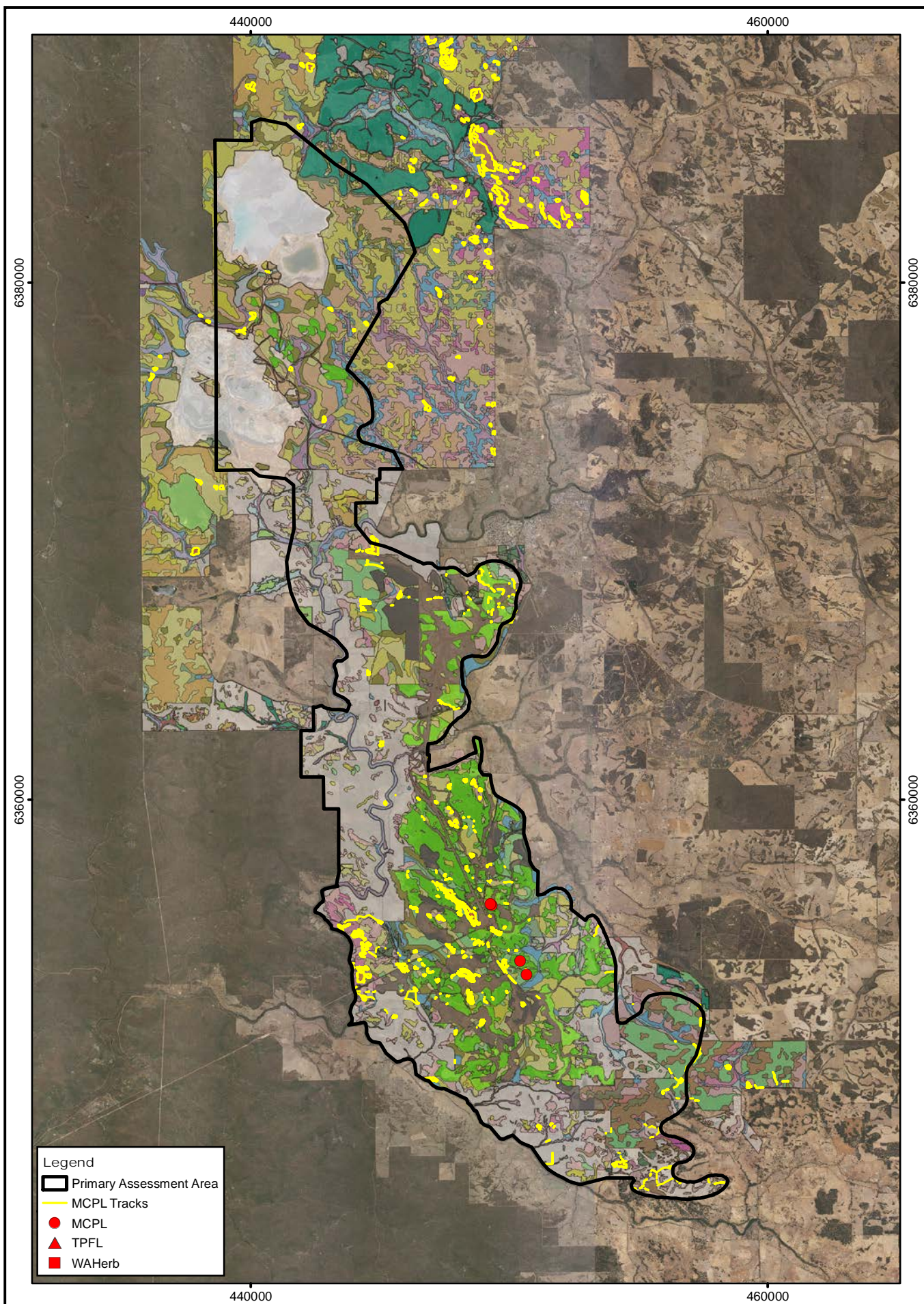


**Table 4: GPS coordinates of records of *Calothamnus quadrifidus* subsp. *teretifolius* A.S.  
George & N. Gibson (P4) (continued)**

<b>Site_Veget</b>	<b>MGA_East</b>	<b>MGA_North</b>	<b>Popn</b>	<b>Project</b>	<b>Area</b>	<b>PAA</b>
	367608	6273962	common	WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	366585	6274169	32 plants	WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	367605	6274183		WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	360919	6274754		WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	363880	6275240		WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	363414	6275455	occasional	WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	372562	6278021	1	WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside
	363074	6279776		WAhHerb	Southern Swan Coastal Plain & Forest areas	Outside







- Legend
- Primary Assessment Area
  - MCPL Tracks
  - MCPL
  - TPFL
  - WAHerb



0 1 2 3 km  
Scale: 1:200,000  
MGA94 (Zone 50)



28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Mattiske

MCPL Ref:

CAD Ref: g1881\_F032\_Loc\_Cqst  
Date: January 2022

Drawn: CAD Resources ~ www.cadresources.com.au  
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Location of *Calothamnus quadrifidus* subsp. *teretifolius*

Figure:

8



### **ADDENDUM - *Calytrix simplex* subsp.*simplex* (P1)**

The following is a summary of information as available at the end of September 2021 and as such supplements the information as collated by Mattiske Consulting (2021) and South ERD reports. In all projects data is always being collected and as there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

#### **State Herbarium records**

*Calytrix simplex* subsp.*simplex* (P1) is known from 5 records at the State Herbarium and as such extends from multiple occurrences on the western fringes of the Darling Scarp near Armadale, Mt Cooke and the Mt Saddleback area.

#### **Regional and Local Background Knowledge**

Two collections by A. Morrison in 1901 of *Calytrix simplex* subsp. *simplex* (P1) were recorded near Armadale and held at the State Herbarium and confirmed by L.A. Craven in 1982 and 1988 respectively. As this species appears to be associated with shallower soils and within heath communities, there remains some question of the specific locations of these collections. It should be noted that earlier records may not be as accurate as more recent records.

*Calytrix simplex* subsp.*simplex* (P1) was recorded near Mt Cooke by N Burrows in 2004 within the northern extent of the Monadnocks Conservation Reserve, there is a high probability that there is an association with more shallow soils associated with granite areas and as such follows the pattern of occurring on the western, northern and eastern fringes of the Darling Ranges. Whilst the current records are concentrated near Armadale, near Mt Cooke and Mt Saddleback areas the latter may in fact reflect the wider survey efforts with more concentrated efforts in specific locations.

The individuals recorded near Forty Hollow Road have been recorded previously by Halford D in 1981 as part of the former Dames and Moore assessments during Worsley Alumina Pty Ltd Phase One (Dames and Moore 1982). Duplicates at the time were collected and sent to Canberra.

Additional collections were made by M. Swinburn and P. Bullock in January 2013 in heath and Jarrah woodland within the Mt Saddleback Timber Reserve, 1700 m NE of the intersection of Lower Hotham Road and Worsley conveyor. Observations extended 450 m S from the Conveyor along both sides of Hatfield Road to the SW Haul Road and within Worsley Bauxite Mine SW6 Mining area. A total of 2000 or more plants were recorded in 2013. Previous records in a regional and local context are summarized in Figures 9 and 10. Note the tracks on Figure 10 near the recent collections and locations reflect the recent additional targeted work since 2018 and not the coverage of all searches which were undertaken over some 40 years.

#### **Recent Survey Effort**

Targeted work in addition to the previous extensive survey and monitoring work was undertaken in recent years. This included an additional 36 plants in 15 locations and also 200 plants in previous efforts by Mattiske Consulting and South32. In view of the dominance of this *Calytrix* in heath communities, the recent effort concentrated and continued to be undertaken in heath communities such as Tunnell Road heath Protected Area and other G and G3 communities.

Mattiske Consulting Pty Ltd undertook additional searches for the priority species *Calytrix simplex* subsp. *simplex* (P1) within the Saddleback mine. A previous historical record of *Calytrix simplex* subsp. *Simplex* (P1) was found 1km to the north-east of the additional search areas. The latter search was undertaken by an experienced botanist, Roger Dharmarajan, from Mattiske Consulting and the environmental specialist, Reghan Mann, at Boddington Bauxite mine in December 2020.



Collections were taken utilising valid collection licences to collect flora for scientific purposes, issued under the *WC Act*. The vegetation community consists of low heathland with no trees (with exception of fringing Jarrah and Sheoak and the occasional *Persoonia longifolia*). The understorey species for the G3 vegetation community consists of an open heath of *Banksia squarrosa* subsp. *squarrosa*, *Hakea incrassata*, *Hakea undulata*, *Petrophile heterophylla* and *Petrophile serruriae* on shallow soils over granite outcrops on slopes with occasional emergent *Eucalyptus drummondii*.

No threatened flora species, pursuant to section 179 of the *EPBC Act* and as listed by DotEE (2019) or pursuant to Part 2, Division 1 and Subdivision 2 of the *BC Act* and as listed by DBCA (2018) were recorded in the *Calytrix* search area. The 2020 search identified 15 occurrences of the *Calytrix simplex* subsp. *simplex* (P1) and all individuals were healthy and flowering at the time of survey which allowed for confirmed identification at the Western Australian Herbarium by Mike Hislop.

**Table 5: GPS coordinates of records of *Calytrix simplex* subsp. *simplex* (P1)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

Site_Veget	MGA_East	MGA_North	Popn	Project	Area	PAA
Rehab	448542	6360754	4	South32	Newmont	Inside
Rehab	447075	6353294	1	South32	Mt Saddleback	Inside
S	448736	6353333	2	South32	Saddleback	Inside
P	449121	6354259	3	South32	Saddleback	Inside
G3	447748	6354228	1	WAHerb	Saddleback	Inside
CL_Ag	445487	6352257	200	WAHerb	Saddleback	Inside
N/A	423073	6434686	1	WAHerb		Outside
N/A	405697	6442500	1	WAHerb		Outside
G3	447657	6360521	200	South32	Mt Saddleback	Inside
Rehab	447708	6360436	3	South32	Mt Saddleback	Inside
G3	447701	6360443	1	South32	Mt Saddleback	Inside
G3	447699	6360447	1	South32	Mt Saddleback	Inside
G3	447701	6360450	1	South32	Mt Saddleback	Inside
G3	447693	6360452	2	South32	Mt Saddleback	Inside
G3	447695	6360457	2	South32	Mt Saddleback	Inside
G3	447692	6360457	2	South32	Mt Saddleback	Inside
G3	447689	6360462	2	South32	Mt Saddleback	Inside
G3	447680	6360463	2	South32	Mt Saddleback	Inside
G3	447674	6360478	3	South32	Mt Saddleback	Inside
G3	447670	6360483	3	South32	Mt Saddleback	Inside
G3	447688	6360442	4	South32	Mt Saddleback	Inside
Rehab	447698	6360432	4	South32	Mt Saddleback	Inside
G3	449606	6354794	4	South32	Mt Saddleback	Inside
G3	449604	6354793	2	South32	Mt Saddleback	Inside
N/A	405697	6442500	N/A	WAHerb	Armada	Outside
PL	444853	6354212	2000	WAHerb	Mt Saddleback	Inside
N/A	423110	6434665	N/A	WAHerb	Mt Cooke	Outside
CL_Ag	445518	6352221	N/A	WAHerb	Mt Saddleback	Inside
G3	448371	6355584	1	South32	Mt Saddleback	Inside
G3	448376	6355594	3	South32	Mt Saddleback	Inside
G3	448388	6355592	1	South32	Mt Saddleback	Inside

**Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

Despite the recommendations for spring data collection, this species flowers in spring and early summer depending on seasonal conditions.

**Site-Vegetation Types**

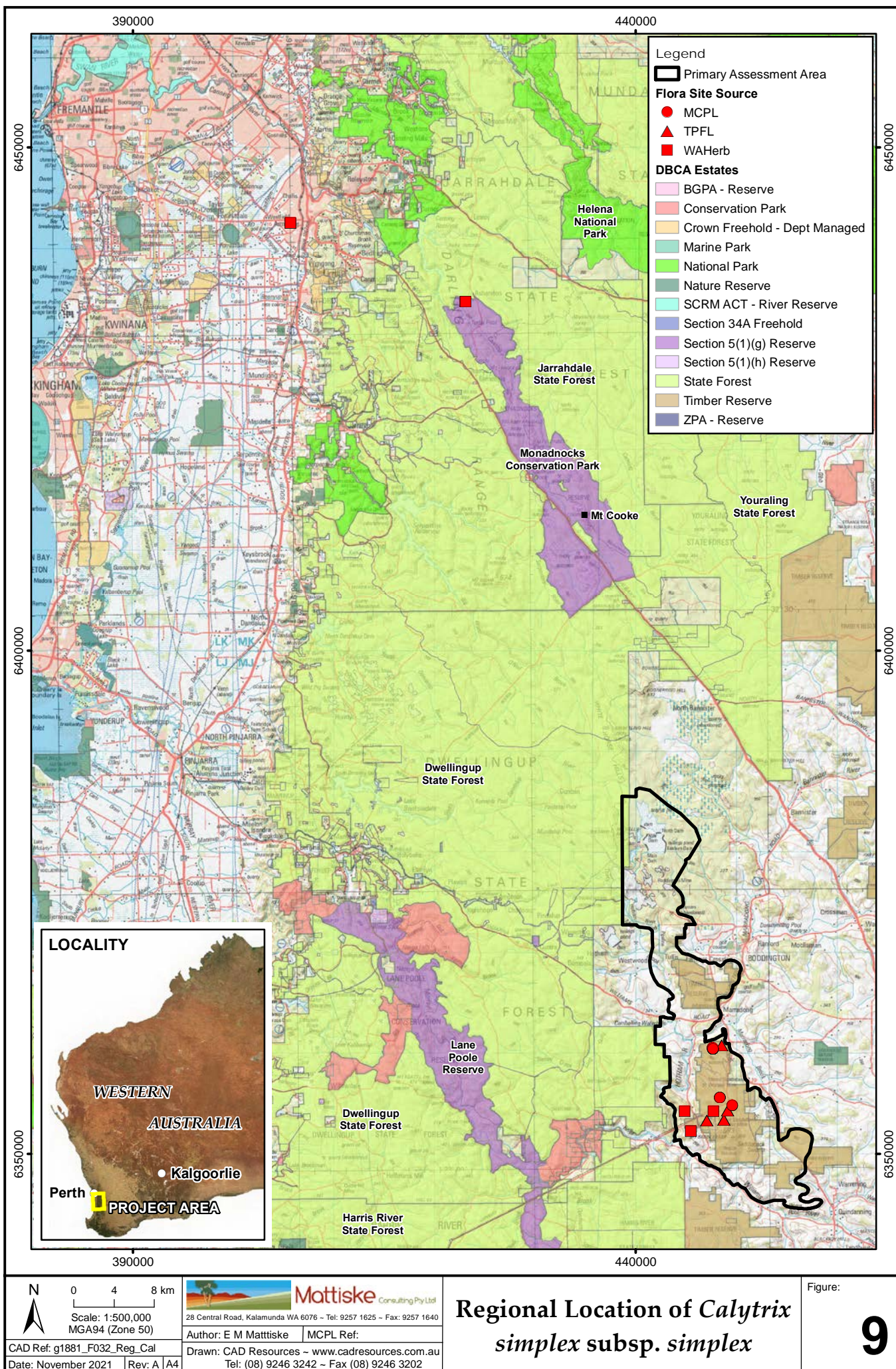
*Calytrix simplex* subsp. *simplex* (P1) in the Boddington area has been recorded in heath communities (G3) and the sandy gravel soil types that support Jarrah (*Eucalyptus marginata*) and Sheoak (*Allocasuarina fraseriana*) communities (P and H) with a range of species that tolerate the sandier soil conditions in the Mt Saddleback areas. The occurrence in the G3 community as defined by Mattiske Consulting aligns with the collection near Mt Cooke in heath areas (which is located within a conservation area). The vegetation communities in the historical records near Armadale are not apparent from the State Herbarium records and it should be recognized that locational data may not be as accurate as collected pre-GPS and potentially may be inaccurate locational data.

**Summary**

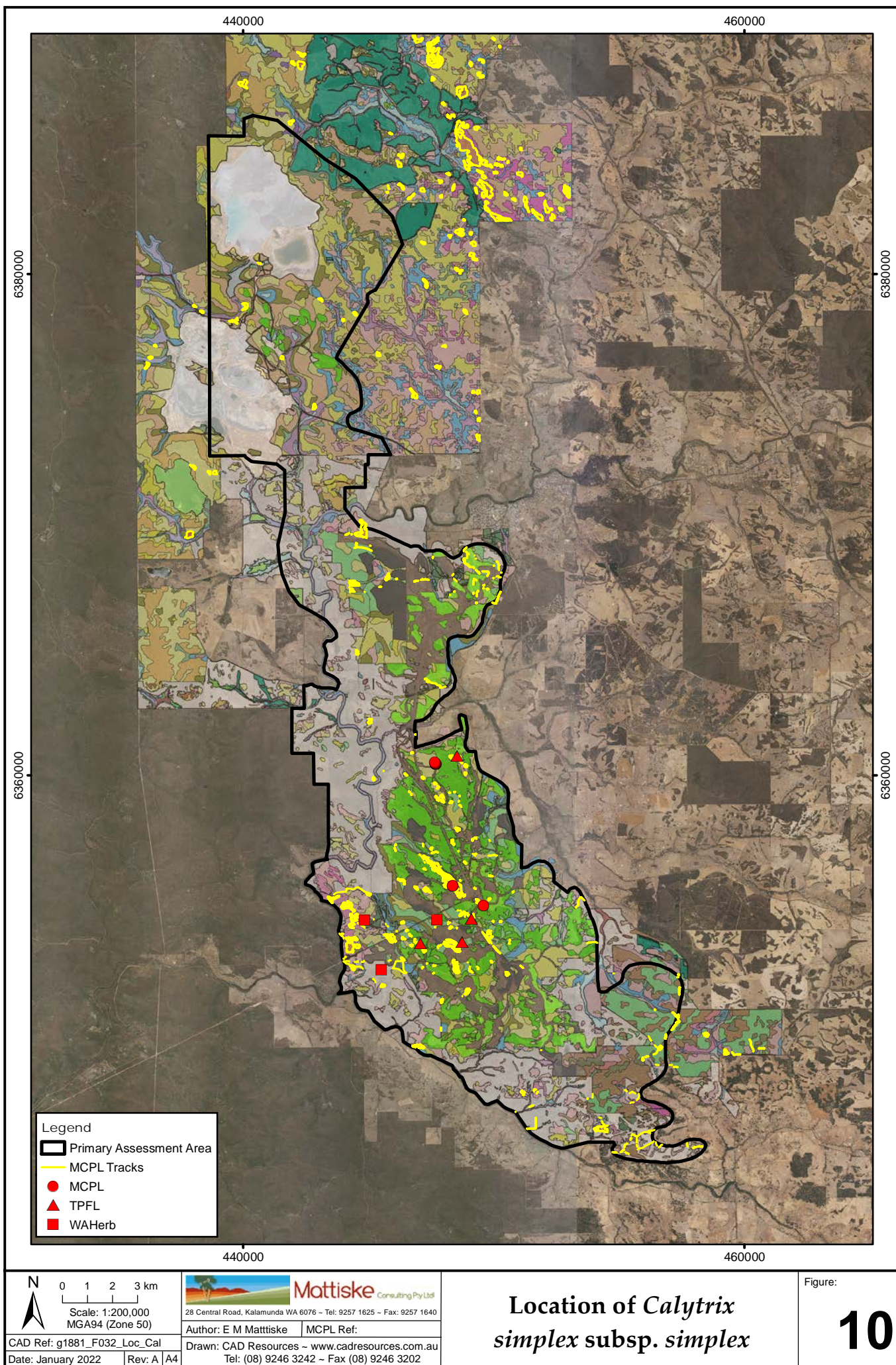
As a result it is important to note that the details summarized above reflect the updated current status of this species and as such survey efforts in several key areas. The occurrence of the species in the Boddington area is mainly in the heath communities and Jarrah woodlands on sandier soils.

Additional surveys are currently underway and as this species has more recently been recorded on the Mt Saddleback areas in December and January this work is intended to be continued within the South32 areas and in particular outside the PAA areas.











## **ADDENDUM – *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130)(P1)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) is known from 6 records at the Western Australian State Herbarium and as such occurs mainly in the Boddington area near the Hotham River and north of the Newmont Boddington Gold mine camp. The initial collection was made by M. Hislop on the Pinjarra-Williams Road in 2000. Since this time, several collections have been submitted by the Mattiske team members for the Boddington area including within the Camballing Reserve and near the Hotham River and within the Marradong area.

### **Regional and Local Background Knowledge**

Local records include locations north of the Newmont Boddington gold mine camp in Wandoo woodlands on lower slopes, on the former railway line from Dwellingup to Boddington near the Hotham River, on the embankments near the Hotham River (tracks below icons on maps), in the Camballing Reserve and Marradong. The main population occurs in the Wandoo Woodlands north of the Newmont mine camp and also along the Hotham River on the lower slopes. Previous records in a regional and local context are summarized in Figures 11 and 12.

### **Recent Survey Effort**

This species occurs as prostrate shrubs and mostly in dense patches. It appears to tolerate some disturbance as it occurs on several road verges. Seed collections were made and submitted to the Department of Biodiversity, Conservation and Attractions following detailed work on the main population by the Newmont environmental team and Dr Mattiske. Recent target efforts included reviewing populations in newer mapping areas and also along the Hotham River (see Table 6; recent survey tracks under the recordings points on the Hotham River areas – see Figure 12).

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback and the Newmont areas to the north was mainly in the D, Y, L and M site-vegetation types which are associated with slopes (M site-vegetation types) and gullies supporting Wandoo (*Eucalyptus wandoo*) (Y, L) as the dominant overstorey (Mattiske Consulting Pty Ltd 2021). The D site-vegetation type supports a forest of Jarrah-Marri (*Eucalyptus marginata* – *Corymbia calophylla*) on the clay-loam slopes particularly near the Hotham River. This species has also been recorded regularly in the rehabilitation areas at South32 operations.

### Summary

This species is relatively restricted to the Boddington area. The majority of the plants occur in the Wandoo valley to the north of the Boddington Gold Mine camp and near the Hotham River. This species is capable of establishing in road side verges and in disturbed areas.

**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
D	442220	6369840	50	South32		Inside
D	442220	6369853	10	South32		Inside
D	442229	6369860	50	South32		Inside
D	442242	6369860	50	South32		Inside
D	442243	6369864	50	South32		Inside
D	442251	6369859	50	South32	Hotham Farms	Inside
D	442261	6369870	50	South32		Inside
D	442270	6369842	50	South32		Inside
D	442270	6369878	50	South32		Inside
D	442278	6369834	50	South32		Inside
D	442281	6369872	50	South32		Inside
D	442287	6369851	50	South32		Inside
D	442293	6369864	50	South32	Hotham Farms	Inside
D	442302	6369858	50	South32		Inside
D	442302	6369897	50	South32		Inside
D	442312	6369901	10	South32		Inside
D	442320	6369854	50	South32		Inside
D	442325	6369844	100	South32		Inside
D	442327	6369820	20	South32	Hotham Farms	Inside
D	442327	6369903	10	South32		Inside
D	442330	6369862	50	South32		Inside
D	442331	6369895	2	South32	Hotham Farms	Inside
D	442334	6369874	50	South32	Hotham Farms	Inside
D	442340	6369862	50	South32		Inside
D	442343	6369888	3	South32	Hotham Farms	Inside
D	442344	6369863	4	South32	Hotham Farms	Inside
D	442347	6369852	20	South32	Hotham Farms	Inside
D	442350	6369892	2	South32	Hotham Farms	Inside
D	442353	6369869	10	South32		Inside
D	442360	6369880	14	South32	Hotham Farms	Inside
D	442368	6369870	1	South32		Inside
D	442369	6369881	16	South32	Hotham Farms	Inside
D	442372	6369890	65	South32	Hotham Farms	Inside
D	442403	6369863	1	South32	Hotham Farms	Inside
D	442497	6369904	18	South32	Hotham Farms	Inside
D	442528	6369897	13	South32	Hotham Farms	Inside
D	442528	6369899	14	South32	Hotham Farms	Inside
D	442531	6369897	10	South32	Hotham Farms	Inside
D	442531	6369902	3	South32	Hotham Farms	Inside
D	442531	6369912	1	South32	Hotham Farms	Inside
D	442533	6369908	6	South32	Hotham Farms	Inside

**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
D	442542	6369906	16	South32	Hotham Farms	Inside
D	442552	6369911	2	South32	Hotham Farms	Inside
D	442596	6369920	1	South32	Hotham Farms	Inside
L	442773	6369765	50	South32	Private Properties	Inside
D	442802	6369592	50	South32	Private Properties	Inside
L	442813	6369714	100	South32	Private Properties	Inside
L	442823	6369839	50	South32	Private Properties	Inside
D	442874	6369224	200	South32	Private Properties	Inside
L	442877	6369870		WAHerb	Boddington Gold Mine	Inside
L	442877	6369870	1	WAHerb	Hotham Valley	Inside
L	442893	6369833		WAHerb	Hotham Valley	Inside
L	442908	6369873	1	South32	Historical Railway Line	Inside
DG	442923	6369896	100	South32	Private Properties	Inside
L	442925	6369873	3	South32	Historical Railway Line	Inside
L	442971	6369877	8	South32	Historical Railway Line	Inside
L	442991	6369870	4	South32	Historical Railway Line	Inside
L	443004	6369887	5	South32	Historical Railway Line	Inside
L	443026	6369894	5	South32	Historical Railway Line	Inside
L	443063	6369916	6	South32	Historical Railway Line	Inside
L	443077	6369931	31	South32	Historical Railway Line	Inside
L	443102	6369959	6	South32	Historical Railway Line	Inside
L	443110	6369964	11	South32	Historical Railway Line	Inside
L	443120	6369989	7	South32	Historical Railway Line	Inside
D	443161	6370051	52	South32	Historical Railway Line	Inside
DG	443172	6370077	10	South32	Historical Railway Line	Inside
D	443185	6370078	100	South32	Private Properties	Inside
DG	443197	6370103	14	South32	Historical Railway Line	Inside
DG	443216	6370139	34	South32	Historical Railway Line	Inside
L	443228	6370157	50	South32	Historical Railway Line	Inside
L	443248	6370173	1	South32	Historical Railway Line	Inside
L	443257	6370187	21	South32	Historical Railway Line	Inside
L	443270	6370196	1	South32	Historical Railway Line	Inside
L	443295	6370220	25	South32	Historical Railway Line	Inside
L	443317	6370220	1	South32	Private Properties	Inside
L	443318	6370241	27	South32	Historical Railway Line	Inside
L	443346	6370265	94	South32	Historical Railway Line	Inside
L	443362	6370183	200	South32	Private Properties	Inside
L	443375	6370296	1	South32	Historical Railway Line	Inside
L	443392	6370301	34	South32	Historical Railway Line	Inside
L	443392	6370301	130	South32	Historical Railway Line	Inside
M	443397	6370000	1	South32	Private Properties	Inside
M	443402	6369900	1	South32	Private Properties	Inside
L	443475	6370294	200	South32	Private Properties	Inside
M	443483	6370010	1	South32	Private Properties	Inside
L	443507	6370346	1	South32	Historical Railway Line	Inside
L	443509	6370346	34	South32	Historical Railway Line	Inside
L	443515	6370350	130	South32	Historical Railway Line	Inside
L	443573	6370392	100	South32	Private Properties	Inside
M	443597	6370004	1	South32	Private Properties	Inside



**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
M	443597	6370095	1	South32	Private Properties	Inside
Y	443598	6370201	1	South32	Private Properties	Inside
Y	443606	6370344	1	South32	Historical Railway Line	Inside
L	443611	6370346	28	South32	Historical Railway Line	Inside
Y	443649	6363310	9	South32	Private Properties	Inside
Y	443651	6363325	9	South32	Private Properties	Inside
Y	443653	6363297	7	South32	Private Properties	Inside
L	443661	6370348	152	South32	Private Properties	Inside
Y	443669	6363300	1	WAHerb	Boddington Gold Mine	Inside
M	443696	6370098		WAHerb	Hotham Valley	Inside
M	443697	6370198		WAHerb	Hotham Valley	Inside
M	443704	6370296	1	South32	Historical Railway Line	Inside
L	443715	6370346	1	South32	Private Properties	Inside
L	443727	6370345	1	South32	Historical Railway Line	Inside
L	443727	6370345	58	South32	Historical Railway Line	Inside
Y	443746	6363346	9	South32	Historical Railway Line	Inside
Y	443773	6363297	1	South32	Historical Railway Line	Inside
CL - Ag	443959	6363409	1	South32	Historical Railway Line	Inside
Z	444268	6367530	100	South32	Boddington	Inside
G1	444268	6367601	100	South32	Boddington	Inside
Z	444270	6367559	100	South32	Boddington	Inside
Z	444270	6367570	200	South32	Boddington	Inside
Z	444271	6367460	50	South32	Boddington	Inside
Z	444273	6367471	200	South32	Boddington	Inside
G1	444274	6367611	100	South32	Boddington	Inside
Z	444300	6367513	100	South32	Boddington	Inside
Z	444304	6367506	100	South32	Boddington	Inside
Z	444304	6367519	50	South32	Boddington	Inside
G1	444310	6367622	16	South32	Boddington	Inside
G1	444316	6367620	100	South32	Boddington	Inside
G1	444317	6367609	100	South32	Boddington	Inside
Z	444319	6367563	100	South32	Boddington	Inside
Z	444320	6367544	50	South32	Boddington	Inside
G1	444320	6367587	50	South32	Boddington	Inside
G1	444320	6367597	100	South32	Boddington	Inside
G1	444320	6367629	50	South32	Boddington	Inside
G1	444320	6367643	100	South32	Boddington	Inside
Z	444322	6367552	200	South32	Boddington	Inside
Z	444325	6367453	50	South32	Boddington	Inside
G1	444325	6367577	200	South32	Boddington	Inside
Z	444328	6367495	350	South32	Boddington	Inside
Z	444328	6367503	10	South32	Boddington	Inside
P	444329	6367441	10	South32	Boddington	Inside
Z	444330	6367488	200	South32	Boddington	Inside
G1	444366	6367607	200	South32	Boddington	Inside
G1	444367	6367586	100	South32	Boddington	Inside
G1	444367	6367620	350	South32	Boddington	Inside
G1	444369	6367569	10	South32	Boddington	Inside
<b>G1</b>	444369	6367626	100	South32	Boddington	Inside

**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
G1	444370	6367572	50	South32	Boddington	Inside
G1	444370	6367597	100	South32	Boddington	Inside
G1	444370	6367634	100	South32	Boddington	Inside
Z	444373	6367550	10	South32	Boddington	Inside
Z	444426	6367564	10	South32	Boddington	Inside
Z	444428	6367548	10	South32	Boddington	Inside
G1	444467	6367598	350	South32	Boddington	Inside
G1	444470	6367610	100	South32	Boddington	Inside
G1	444470	6367640	200	South32	Boddington	Inside
Z	444471	6367535	10	South32	Boddington	Inside
Z	444471	6367569	100	South32	Boddington	Inside
G1	444472	6367585	100	South32	Boddington	Inside
G1	444472	6367620	200	South32	Boddington	Inside
G1	444472	6367630	200	South32	Boddington	Inside
Z	444473	6367528	10	South32	Boddington	Inside
Z	444474	6367547	50	South32	Boddington	Inside
D	444475	6367577	350	South32	Boddington	Inside
Z	444476	6367556	100	South32	Boddington	Inside
G1	444514	6367633	100	South32	Boddington	Inside
G1	444517	6367643	200	South32	Boddington	Inside
Z	444521	6367527	10	South32	Boddington	Inside
D	444521	6367580	350	South32	Boddington	Inside
G1	444521	6367593	100	South32	Boddington	Inside
G1	444521	6367604	200	South32	Boddington	Inside
G1	444521	6367622	200	South32	Boddington	Inside
D	444522	6367562	50	South32	Boddington	Inside
Z	444524	6367535	50	South32	Boddington	Inside
Z	444524	6367552	50	South32	Boddington	Inside
D	444524	6367569	100	South32	Boddington	Inside
G1	444525	6367612	200	South32	Boddington	Inside
Z	444553	6367518	10	South32	Boddington	Inside
G1	444568	6367622	100	South32	Boddington	Inside
G1	444570	6367645	50	South32	Boddington	Inside
G1	444571	6367611	50	South32	Boddington	Inside
D	444572	6367540	50	South32	Boddington	Inside
D	444572	6367553	50	South32	Boddington	Inside
D	444572	6367558	100	South32	Boddington	Inside
D	444572	6367563	100	South32	Boddington	Inside
G1	444573	6367592	100	South32	Boddington	Inside
Z	444574	6367526	50	South32	Boddington	Inside
G1	444575	6367602	350	South32	Boddington	Inside
Z	444580	6367496	200	South32	Boddington	Inside
G1	444581	6367584	200	South32	Boddington	Inside
Z	444582	6367488	100	South32	Boddington	Inside
G1	444583	6367647	50	South32	Boddington	Inside
G1	444591	6367633	50	South32	Boddington	Inside
Z	444593	6367518	50	South32	Boddington	Inside
G1	444595	6367603	50	South32	Boddington	Inside
G1	444599	6367594	100	South32	Boddington	Inside

**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Z	444601	6367439	100	South32	Boddington	Inside
D	444604	6367563	50	South32	Boddington	Inside
D	444617	6367553	50	South32	Boddington	Inside
D	444634	6367519	50	South32	Boddington	Inside
D	444640	6367516	50	South32	Boddington	Inside
D	444658	6367477	200	South32	Boddington	Inside
D	444667	6367467	50	South32	Boddington	Inside
D	444694	6367437	200	South32	Boddington	Inside
Z	444700	6367425	10	South32	Boddington	Inside
Z	444736	6367391	50	South32	Boddington	Inside
P	444891	6367258	10	South32	Boddington	Inside
P	444937	6367204	10	South32	Boddington	Inside
Y	445389	6367969	1	South32	Marradong	Inside
Y	445431	6367963		WAHerb	Boddington	Inside
Y	448293	6374098	1	South32	Boddington Gold Mine	Outside
M	448295	6374004	2	South32	Boddington Gold Mine	Outside
Y	448378	6374337	1	South32	Boddington Gold Mine	Outside
Y	448396	6373998	24	South32	Boddington Gold Mine	Outside
Y	448399	6374198	500	South32	Boddington Gold Mine	Outside
Y	448402	6374301	1	South32	Boddington Gold Mine	Outside
Y	448404	6373903	150	South32	Boddington Gold Mine	Outside
Y	448405	6373804	200	South32	Boddington Gold Mine	Outside
M	448429	6373105	1	South32	Boddington Gold Mine	Outside
M	448486	6374520		WAHerb	Boddington Gold Mine	Outside
Y	448496	6373102	202	South32	Boddington Gold Mine	Outside
Y	448497	6374301	45	South32	Boddington Gold Mine	Outside
Y	448499	6374099	1	South32	Boddington Gold Mine	Outside
AY	448501	6373802	150	South32	Boddington Gold Mine	Outside
Y	448501	6374000	205	South32	Boddington Gold Mine	Outside
Y	448501	6374201	500	South32	Boddington Gold Mine	Outside
Y	448503	6373900	250	South32	Boddington Gold Mine	Outside
M	448533	6373001	1	South32	Boddington Gold Mine	Outside
Y	448536	6373151	1	South32	Boddington Gold Mine	Outside
Y	448541	6373004	1	South32	Boddington Gold Mine	Outside
Y	448545	6373018	1	South32	Boddington Gold Mine	Outside
Y	448548	6373016	1	South32	Boddington Gold Mine	Outside
Y	448596	6373903	125	South32	Boddington Gold Mine	Outside
Y	448597	6372997	100	South32	Boddington Gold Mine	Outside
Y	448598	6372902	165	South32	Boddington Gold Mine	Outside
Y	448599	6373301	140	South32	Boddington Gold Mine	Outside
Y	448600	6374200	45	South32	Boddington Gold Mine	Outside
AY	448601	6373403	5	South32	Boddington Gold Mine	Outside
Y	448602	6374100	165	South32	Boddington Gold Mine	Outside
H	448603	6377599	1	South32	Boddington Gold Mine	Outside
M	448610	6373162	1	South32	Boddington Gold Mine	Outside
Y	448625	6373003	10	South32	Boddington Gold Mine	Outside
	448630	6372845	1	South32	Boddington Gold Mine	Outside
M	448638	6373179	1	South32	Boddington Gold Mine	Outside

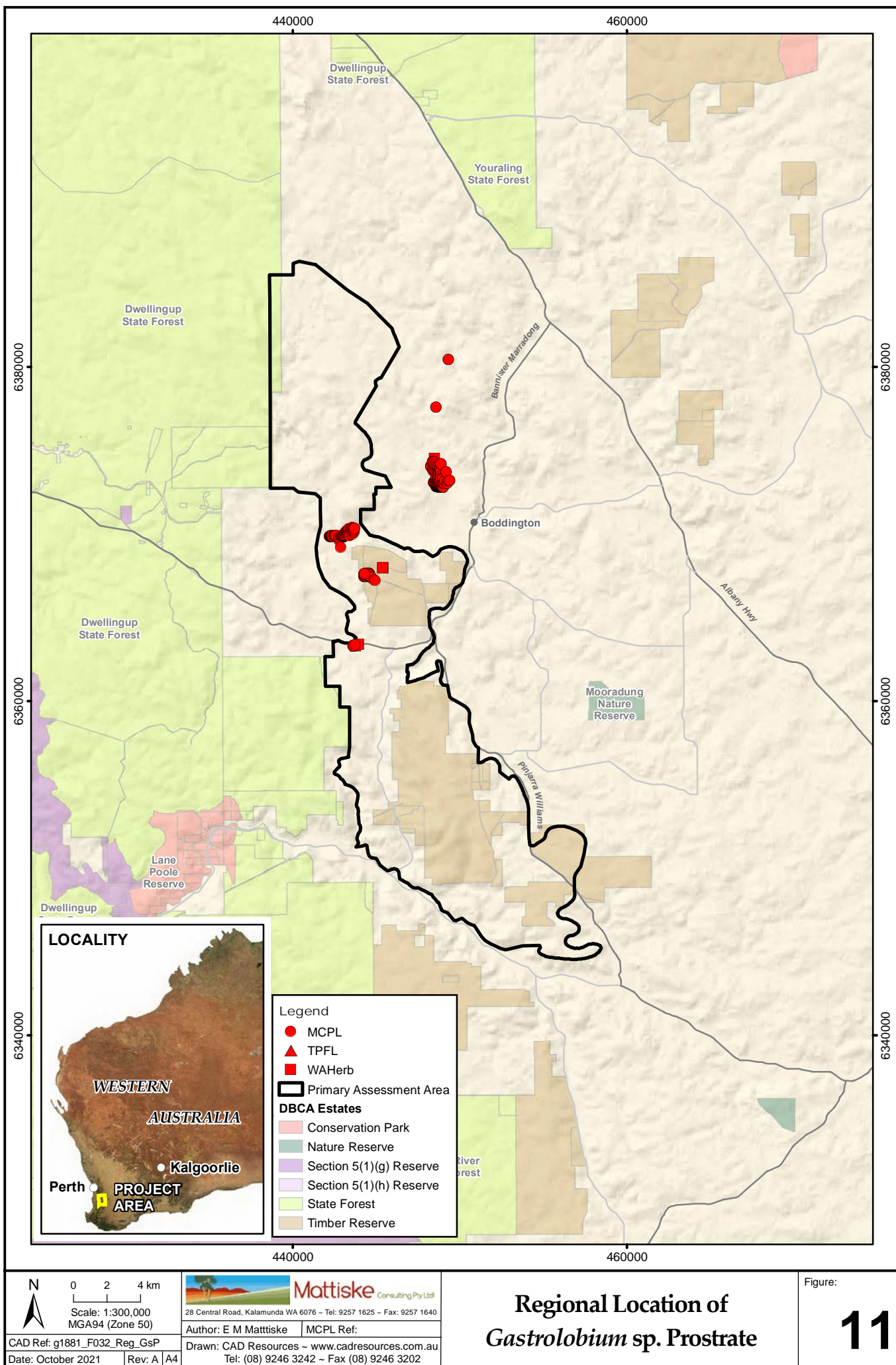


**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

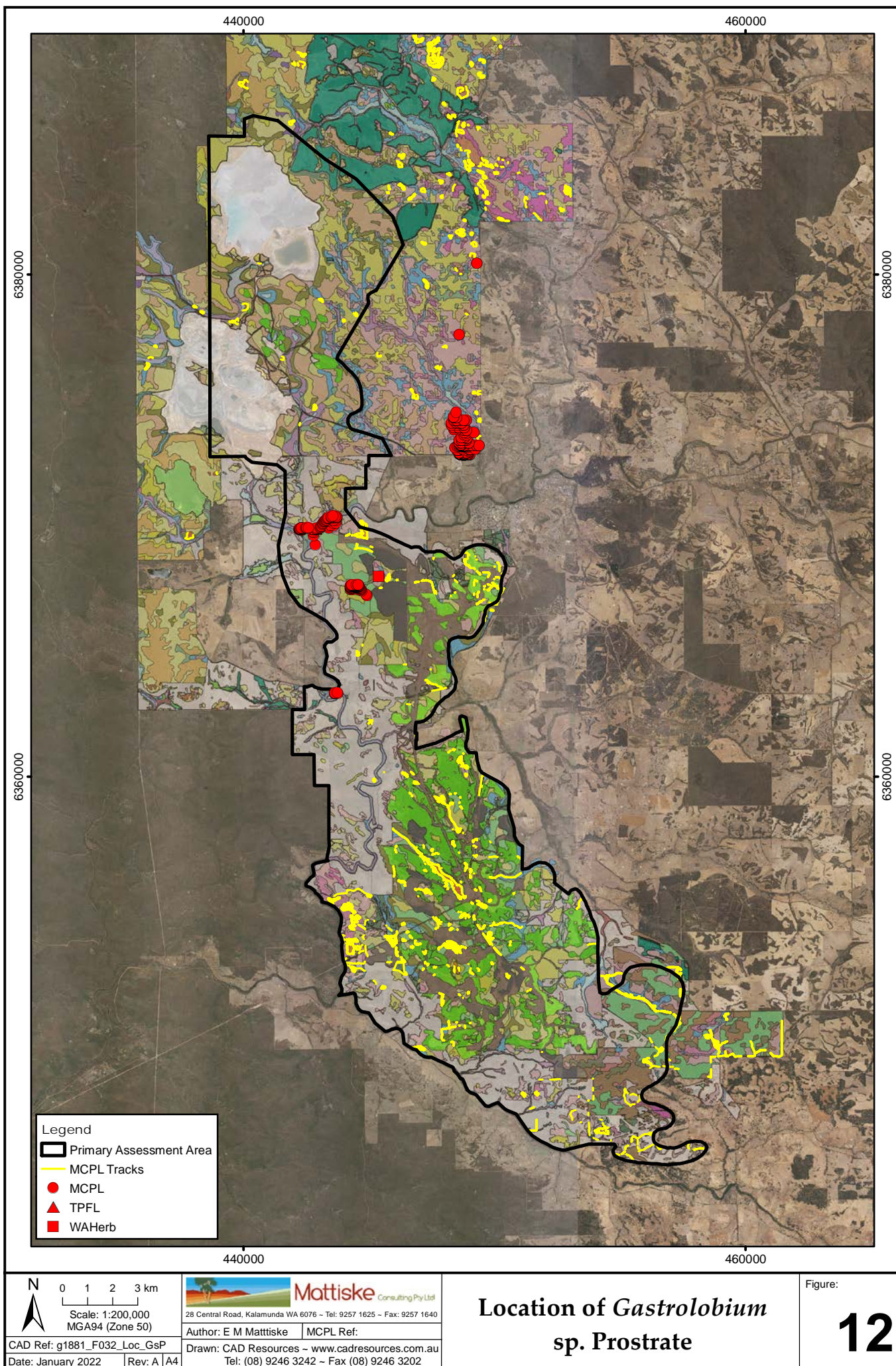
<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
	448652	6372845	1	South32	Boddington Gold Mine	Outside
Y	448666	6373201	2	South32	Boddington Gold Mine	Outside
	448666	6373216	4	South32	Boddington Gold Mine	Outside
	448670	6372836	1	South32	Boddington Gold Mine	Outside
Y	448686	6373178	1	South32	Boddington Gold Mine	Outside
	448690	6372836	0	South32	Boddington Gold Mine	Outside
Y	448693	6373192	12	South32	Boddington Gold Mine	Outside
Y	448697	6373159	1	South32	Boddington Gold Mine	Outside
Y	448698	6373503	227	South32	Boddington Gold Mine	Outside
Y	448700	6372896	250	South32	Boddington Gold Mine	Outside
Y	448700	6373403	200	South32	Boddington Gold Mine	Outside
Y	448701	6373902	20	South32	Boddington Gold Mine	Outside
Y	448703	6373998	1	South32	Boddington Gold Mine	Outside
AY	448703	6374101	50	South32	Boddington Gold Mine	Outside
Y	448706	6373209	30	WAHerb	Boddington Gold Mine	Outside
	448709	6372836	1	South32	Boddington Gold Mine	Outside
Y	448709	6373161	3	South32	Boddington Gold Mine	Outside
Y	448709	6373183	1	South32	Boddington Gold Mine	Outside
Y	448709	6373302	15	South32	Boddington Gold Mine	Outside
	448731	6372836	1	South32	Boddington Gold Mine	Outside
	448734	6372817	1	South32	Boddington Gold Mine	Outside
Y	448741	6373158	1	South32	Boddington Gold Mine	Outside
	448749	6372838	1	South32	Boddington Gold Mine	Outside
Y	448751	6373136	1	South32	Boddington Gold Mine	Outside
AY	448758	6373061	13	WAHerb	Boddington Gold Mine	Outside
	448767	6372845	1	South32	Boddington Gold Mine	Outside
Y	448770	6373162	2	South32	Boddington Gold Mine	Outside
Y	448775	6373174	2	South32	Boddington Gold Mine	Outside
	448790	6372845	1	South32	Boddington Gold Mine	Outside
	448791	6372798	1	South32	Boddington Gold Mine	Outside
AY	448794	6374009	1	South32	Boddington Gold Mine	Outside
AY	448796	6373799	2	South32	Boddington Gold Mine	Outside
Y	448798	6374201	45	South32	Boddington Gold Mine	Outside
Y	448800	6372897	1	South32	Boddington Gold Mine	Outside
Y	448801	6373499	7	South32	Boddington Gold Mine	Outside
Y	448801	6373598	200	South32	Boddington Gold Mine	Outside
Y	448802	6373003	200	South32	Boddington Gold Mine	Outside
Y	448802	6373401	100	South32	Boddington Gold Mine	Outside
Y	448803	6373706	212	South32	Boddington Gold Mine	Outside
Y	448806	6372851	1	South32	Boddington Gold Mine	Outside
Y	448808	6372849	1	South32	Boddington Gold Mine	Outside
Y	448808	6372855	1	South32	Boddington Gold Mine	Outside
Y	448808	6372856	1	South32	Boddington Gold Mine	Outside
	448809	6372832	1	South32	Boddington Gold Mine	Outside
	448809	6372844	1	South32	Boddington Gold Mine	Outside
Y	448809	6372854	1	South32	Boddington Gold Mine	Outside
Y	448809	6372857	1	South32	Boddington Gold Mine	Outside
Y	448809	6372858	1	South32	Boddington Gold Mine	Outside
	448810	6372838	1	South32	Boddington Gold Mine	Outside

**Table 6: GPS coordinates of records of *Gastrolobium sp. Prostrate Boddington* (M. Hislop 2130) (P1) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
	448810	6372842	1	South32	Boddington Gold Mine	Outside
	448812	6372836	2	South32	Boddington Gold Mine	Outside
Y	448813	6372851	1	South32	Boddington Gold Mine	Outside
	448814	6372812	1	South32	Boddington Gold Mine	Outside
Y	448815	6373203	4	South32	Boddington Gold Mine	Outside
AY	448815	6373905	210	South32	Boddington Gold Mine	Outside
	448823	6372833	1	South32	Boddington Gold Mine	Outside
	448826	6372809	1	South32	Boddington Gold Mine	Outside
	448845	6372837	4	South32	Boddington Gold Mine	Outside
AY	448851	6373126	1	South32	Boddington Gold Mine	Outside
	448860	6372816	1	South32	Boddington Gold Mine	Outside
	448867	6373192		WAHerb	Boddington Gold Mine	Outside
Y	448888	6373598	500	South32	Boddington Gold Mine	Outside
AY	448890	6373098	40	South32	Boddington Gold Mine	Outside
Y	448892	6373698	28	South32	Boddington Gold Mine	Outside
	448896	6372823	1	South32	Boddington Gold Mine	Outside
Y	448899	6373799	200	South32	Boddington Gold Mine	Outside
Y	448900	6373397	110	South32	Boddington Gold Mine	Outside
Y	448901	6372897	34	South32	Boddington Gold Mine	Outside
AY	448901	6374200	225	South32	Boddington Gold Mine	Outside
	448906	6372818	1	South32	Boddington Gold Mine	Outside
Y	448906	6373493	150	South32	Boddington Gold Mine	Outside
Y	448908	6373298	250	South32	Boddington Gold Mine	Outside
	448909	6372816	1	South32	Boddington Gold Mine	Outside
	448912	6372824	1	South32	Boddington Gold Mine	Outside
	448919	6372823	2	South32	Boddington Gold Mine	Outside
	448922	6372839	4	South32	Boddington Gold Mine	Outside
Y	448922	6372888	1	South32	Boddington Gold Mine	Outside
	448926	6372822	1	South32	Boddington Gold Mine	Outside
	448960	6372825	1	South32	Boddington Gold Mine	Outside
	448967	6372824	1	South32	Boddington Gold Mine	Outside
	448969	6372822	7	South32	Boddington Gold Mine	Outside
Y	448993	6372995	49	South32	Boddington Gold Mine	Outside
AY	448999	6373198	28	South32	Boddington Gold Mine	Outside
AY	449003	6373302	25	South32	Boddington Gold Mine	Outside
Y	449009	6372957	31	South32	Boddington Gold Mine	Outside
	449025	6372822	1	South32	Boddington Gold Mine	Outside
AY	449026	6373037	8	South32	Boddington Gold Mine	Outside
AY	449037	6373023	1	South32	Boddington Gold Mine	Outside
AY	449068	6373031	5	South32	Boddington Gold Mine	Outside
YG	449109	6373201	3	South32	Boddington Gold Mine	Outside
M	449201	6373702	10	South32	Boddington Gold Mine	Outside
AY	449256	6373045	1	South32	Boddington Gold Mine	Outside
YG	449298	6373201	67	South32	Boddington Gold Mine	Outside
MG	449324	6380448	1	South32	Boddington Gold Mine	Outside
YG	449401	6373201	1	South32	Boddington Gold Mine	Outside









## **ADDENDUM – *Goodenia katabudjar* (P3)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Goodenia katabudjar* (P3) is known from 12 records at the Western Australian State Herbarium and as such extends from multiple occurrences on the eastern fringes of the Northern State Forest and as such extends into the Wheatbelt. One specimen from the Mt Saddleback area was collected by A Ruschmann (Mattiske Consulting) on the 6<sup>th</sup> October 2005 and one specimen by V. Yeomans (Mattiske Consulting) in December 2002 in George forest block to the west of Mt Saddleback.

### **Regional and Local Background Knowledge**

One record was from the Mt Saddleback area and George block to the west of Mt Saddleback. The record from Mt Saddleback was in site-vegetation type S on the sandy-gravel within the Jarrah-Bull Banksia (*Eucalyptus marginata* – *Banksia grandis*) forests.

This species has been recorded in the Wandering Conservation Park (WAH 1998 - ).

Previous records in a regional and local context are summarized in Figures 13 and 14.

The occurrence of the species in the Boddington area was recorded in site-vegetation type S on the sandy-gravel within the Jarrah-Bull Banksia (*Eucalyptus marginata* – *Banksia grandis*) forests. Targeted survey efforts have been undertaken on mid and upper slopes which support the gravelly soils of the S and ST site-vegetation types as well as the forests of Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) on the sandy gravels of the P site-vegetation type.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded in the S site-vegetation types, during vegetation studies in the forest areas.

### **Summary**

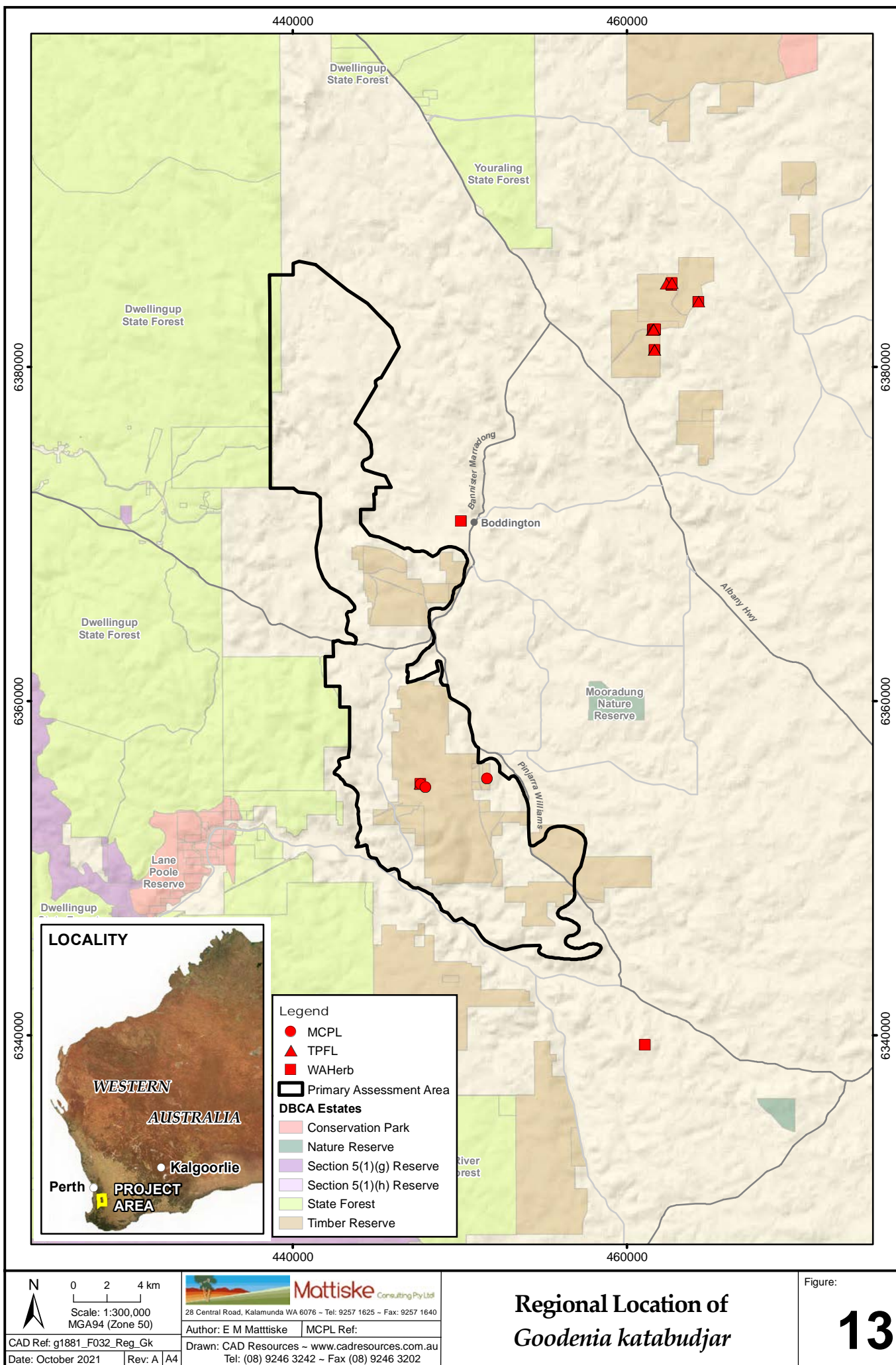
The occurrence of the species in the Boddington area is within the range from the George block (west of Mt Saddleback) to the Wheatbelt areas. This species occurs on mid and upper slopes and in a range of forest communities (including S, ST and P site-vegetation types as defined in Mattiske Consulting Pty Ltd 2021).

**Table 7: GPS coordinates of records of *Goodenia katabudjar* (P3)**

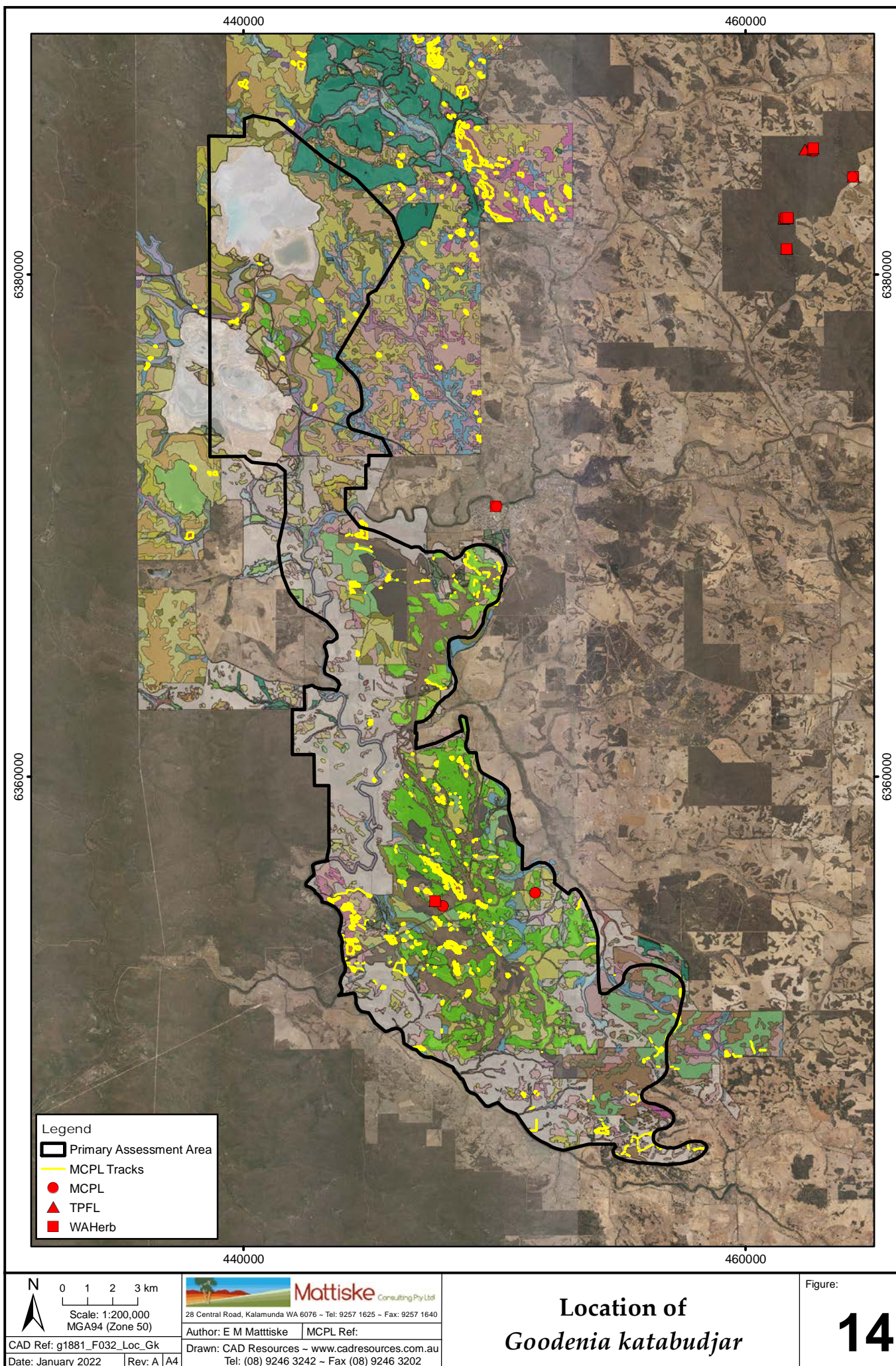
WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<b>Site_Veget</b>	<b>MGA_East</b>	<b>MGA_North</b>	<b>Popn</b>	<b>Project</b>	<b>Area</b>	<b>PAA</b>
ST	447644	6355042	1	WAHerb	Mt Saddleback	Inside
ST	447645	6355041	5	WAHerb	Mt Saddleback	Inside
S	447653	6355004	1	South32	Mt Saddleback	Inside
ST	447670	6355037	1	South32	Mt Saddleback	Inside
P	447968	6354842	1	South32	Mt Saddleback	Inside
	450066	6370759	1	South32	George Block	Outside
	450097	6370759		WAHerb	George Block	Outside
Rehab	451636	6355351	1	South32	Mt Saddleback	Inside
	461082	6339434		WAHerb	Eastern areas of Jarrah Forest and Wheatbelt	Outside
	461113	6339398	1	WAHerb	North Quindanning	Outside
	461553	6382216	1	WAHerb	Wandering Conservation Park	Outside
	461562	6382207	1	WAHerb	Boddington Gold Mine	Outside
	461569	6382229	2480	WAHerb	North Bannister	Outside
	461631	6382247	1	WAHerb	Wandering Reserve	Outside
	461631	6382248	1	WAHerb	NW Boddington	Outside
	461662	6381015	2	WAHerb	Wandering	Outside
	461662	6381016	1	WAHerb	Wandering	Outside
	461663	6382229		WAHerb	Wandering	Outside
	461667	6381010	Rare	WAHerb	Wandering	Outside
	461709	6382247	1	WAHerb	Wandering	Outside
	461709	63822258	1	WAHerb	Wandering	Outside
	462376	6384960	3	WAHerb	Wandering	Outside
	462672	6384947	1	WAHerb	Wandering	Outside
	462673	6384946	1	WAHerb	Wandering	Outside
	462683	6385004	405	WAHerb	Wandering	Outside
	462684	6384893	875	WAHerb	Wandering	Outside
	462714	6385023	3	WAHerb	Wandering	Outside
	462716	6385030	3	WAHerb	Wandering	Outside
	462717	6385029	3	WAHerb	Wandering	Outside
	464281	6383902	405	WAHerb	Wandering	Outside
	464307	6383889	4	WAHerb	Wandering	Outside
	464317	6383883	3	WAHerb	Wandering	Outside
	464317	6383884	3	WAHerb	Wandering	Outside









### **ADDENDUM – *Halgania corymbosa* (P3)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

#### **State Herbarium records**

*Halgania corymbosa* (P3) is known from 18 records at the State Herbarium and as such extends from the Darling Scarp on the eastern edge of the Swan Coastal Plain to the areas north of the Northern Jarrah Forest to the Wheatbelt.

#### **Regional and Local Background Knowledge**

Local records include locations on Mt Saddleback and in the Newmont Boddington Gold Mine areas.

Previous records in a regional and local context are summarized in Figures 15 and 16.

#### **Recent Survey Effort**

The occurrence of the species in the Boddington area was recorded in site-vegetation type G2 (Mosaic of Rock Sheoak (*Allocasuarina huegeliana*) and closed heath to lithic complex on exposed or shallow granite outcrops), in granite heath communities (G1) on shallow soils over granite and in Wandoo (*Eucalyptus wandoo*) woodlands on valley floors (AY site-vegetation type) and lower slopes (Y) and in open forests of Jarrah-Marri (*Eucalyptus marginata* – *Corymbia calophylla*) (H site-vegetation type) to Jarrah – Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) on sandy gravels to gravels (PS site-vegetation type) (Mattiske Consulting Pty Ltd 2021). In addition, searches have been ongoing in rehabilitation areas.

#### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

#### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded during vegetation studies on shallow soils associated with granite and the Wandoo woodlands as well as in sandy gravels and gravelly soils of Jarrah-Marri and Jarrah-Sheoak communities.

#### **Summary**

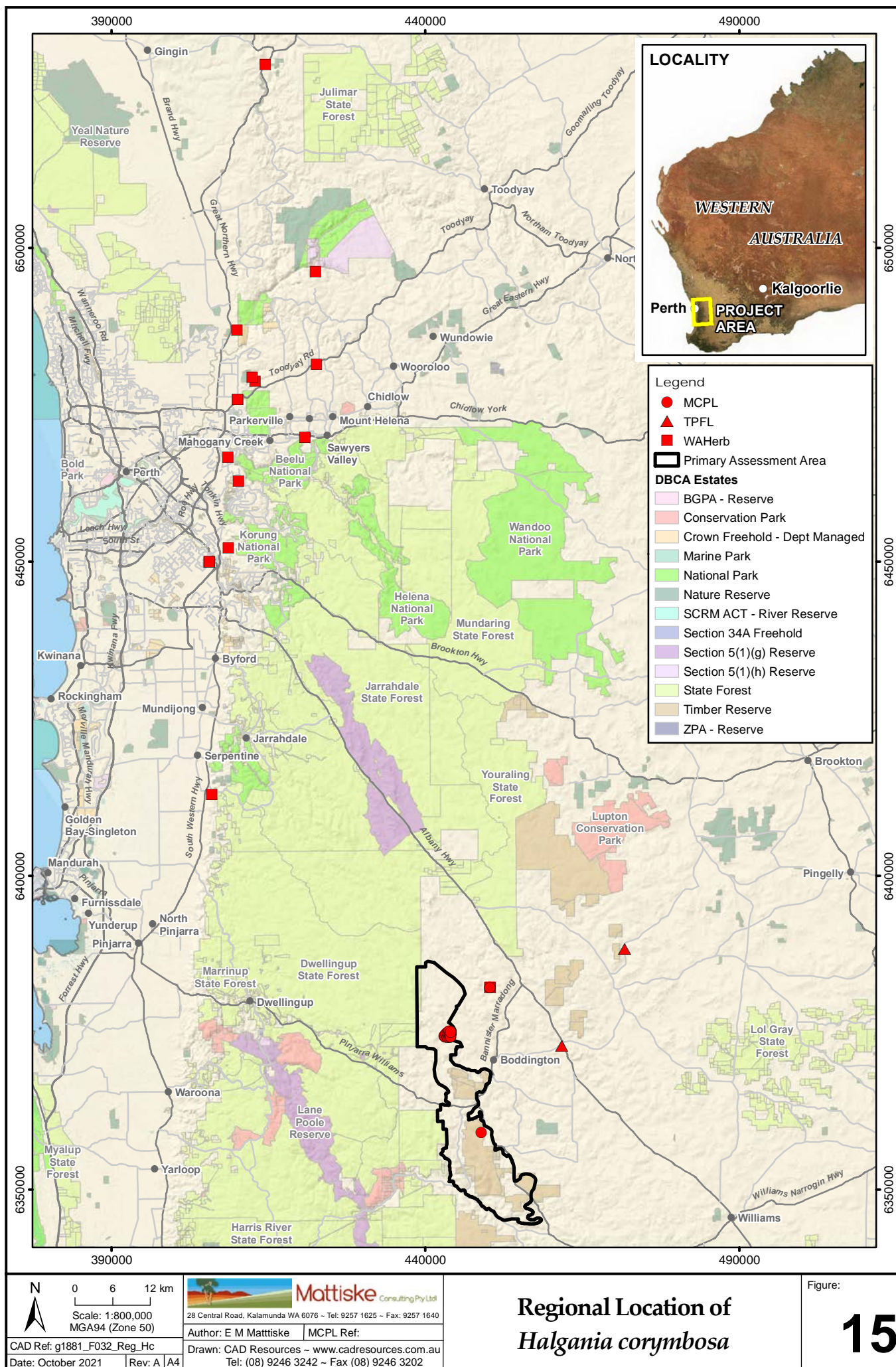
The occurrence of the species in the Boddington area is on the fringes of the Mt Saddleback slopes, and in the areas north of the Hotham River in the Boddington Gold Mine areas and in the more recent studies in the Saddleback Tree Farm.



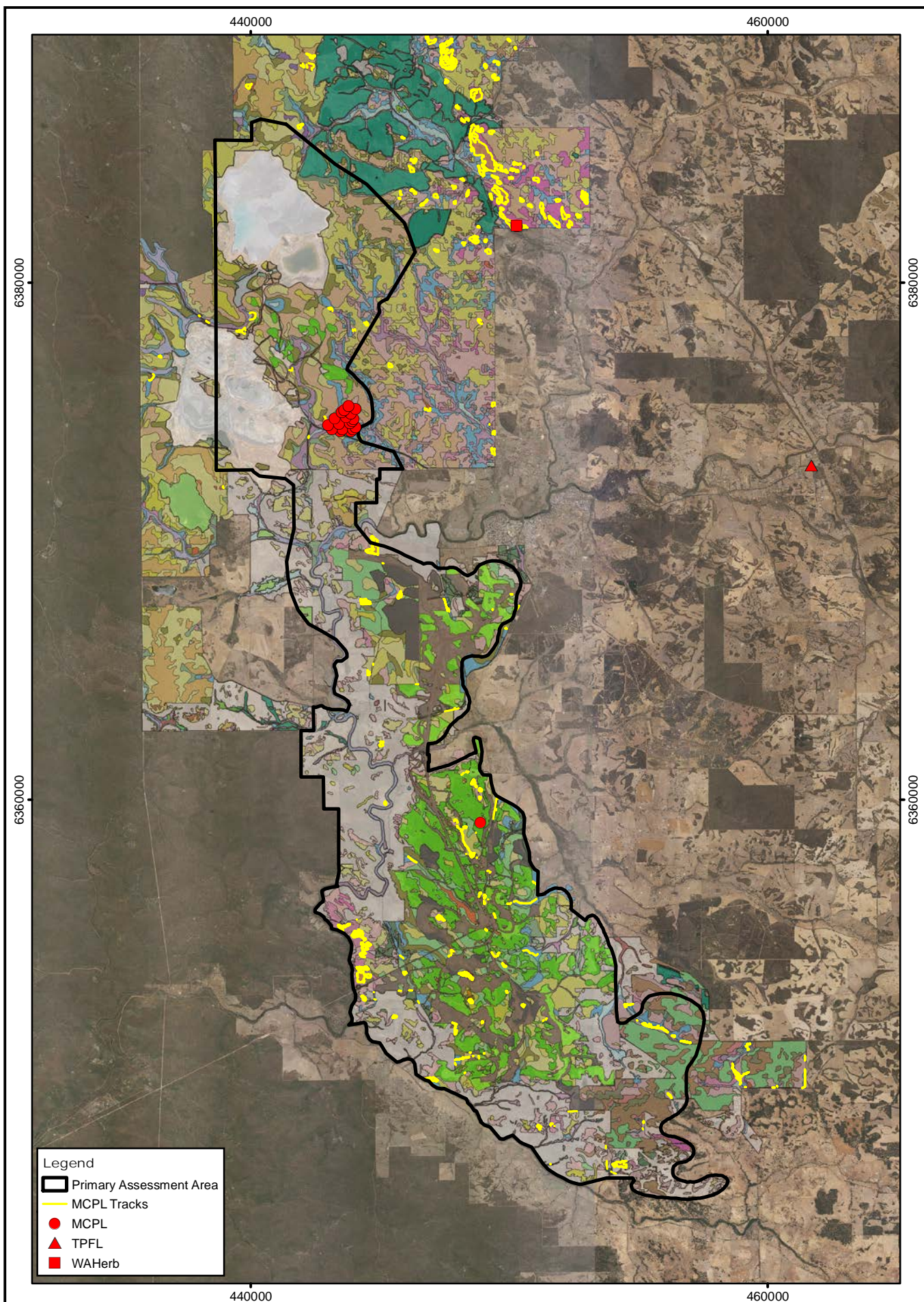
**Table 8: GPS coordinates of records of *Halgania corymbosa* (P3)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

Site_Veget	MGA_East	MGA_North	Popn	Project	Area	PAA
	405628	6449927		WAHerb	Gosnells	Outside
	405973	6412902		WAHerb	Darling Scarp	Outside
	408593	6466583		WAHerb	Helena Valley	Outside
	408628	6452171		WAHerb	Ellis Brook	Outside
	410023	6486882		WAHerb	Susannah Brook, Millendon	Outside
	410120	6475797		WAHerb	Red Hill	Outside
	410233	6462828		WAHerb	Darling Scarp	Outside
	412455	6479365		WAHerb	Red Hill	Outside
	412934	6478704		WAHerb	Red Hill	Outside
	414507	6529153		WAHerb	Red Hill	Outside
	420858	6469789		WAHerb	Mundaring	Outside
	422551	6496184		WAHerb	Smiths Mill	Outside
	422662	6481442		WAHerb	Gidgeganup	Outside
AY	443011	6374488	1	South32	Boddington Gold Mine	Inside
PS	443161	6374338	1	South32	Boddington Gold Mine	Inside
AY	443261	6374738	1	South32	Boddington Gold Mine	Inside
H	443431	6374538	1	South32	Boddington Gold Mine	Inside
PS	443481	6374248	1	South32	Boddington Gold Mine	Inside
H	443531	6374988	1	South32	Boddington Gold Mine	Inside
H	443561	6374328	1	South32	Boddington Gold Mine	Inside
H	443631	6375068	1	South32	Boddington Gold Mine	Inside
Y	443701	6374788	1	South32	Boddington Gold Mine	Inside
PS	443801	6375228	1	South32	Boddington Gold Mine	Inside
Y	443841	6374568	1	South32	Boddington Gold Mine	Inside
H	443881	6374248	1	South32	Boddington Gold Mine	Inside
H	443891	6374948	1	South32	Boddington Gold Mine	Inside
Y	443931	6374638	1	South32	Boddington Gold Mine	Inside
H	443971	6374328	1	South32	Boddington Gold Mine	Inside
Y	443991	6374728	1	South32	Boddington Gold Mine	Inside
Y	444061	6374408	1	South32	Boddington Gold Mine	Inside
PS	444071	6375108	1	South32	Boddington Gold Mine	Inside
G2	450321	6382179	2-5	South32	Mt Saddleback Tree Farm	Outside
Rehab	448896	6359098		South32	Mt Saddleback	Inside
G1	450300	6382202	10	South32	Mt Saddleback Tree Farm	Outside
	461714	6372905		WAHerb	Crossman	Outside
	471730	6388252		WAHerb	Bannister	Outside









## **ADDENDUM – *Hibbertia ambita* (P1)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Hibbertia ambita* (P1) is known from 15 records at the Western Australian State Herbarium. *Hibbertia ambita* (P1) occurs in a range of sites from lower valley slopes to rehabilitated areas. The recent taxonomic studies by Thiele (2019) re-classified a range of species previously identified as *Hibbertia commutata*. Further field studies and collections of *Hibbertia* species have been undertaken in 2020 since this publication was released. The records in Table 9 are based on confirmed locations and it is expected that more locations will be confirmed in coming years. The *Hibbertia commutata* group of plants has been recorded regularly in the northern Jarrah Forest and in the Boddington and Collie areas. A primary constraint relates to the need to have flowering material to separate this species. Several of the recording locations (e.g. east of the Hotham River) are within Worsley Protected areas and outside of operation areas.

### **Regional and Local Background Knowledge**

This species has been recorded in the forest areas on the fringes of Hotham Road, near Quindanning, south of Boddington and in forest and rehabilitation areas within the South32 lease areas at Mt Saddleback. As *Hibbertia commutata* has been one of the dominant plants in the Boddington area it is expected that numbers will increase markedly in future years both within the forest areas and also rehabilitation areas. The main constraint is that it is difficult to differentiate without flowering material which restricts identification. Additional collections are still being processed and each year additional locations are expected to be added to the current locations.

Previous records in a regional and local context are summarized in Figures 17 and 18.

### **Recent Survey Effort**

Recent targeted survey effort has focussed on the habitat types where the species is expected to be recorded in a broad range of forest habitat types ranging from H site-vegetation type on the sandy-gravel soils with the Jarrah – Marri – Sheoak (*Eucalyptus marginata* – *Corymbia calophylla* – *Allocasuarina fraseriana*) forests and woodlands to the P site-vegetation type on sandy-gravels with the Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) forests to Wandoo (*Eucalyptus wandoo*) woodlands on the upper clay-loam – gravelly soils of the M site-vegetation type (Mattiske Consulting Pty Ltd 2021).

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs. Further, delineating this species is dependent on full flowering material.

### Site-Vegetation Types

The occurrence at Mt Saddleback was recorded in the H, P and M site-vegetation types, during vegetation studies in the forest areas and also through targeted searches. This species has also been recorded in the rehabilitation areas, including a recent collection in 2021 and as more assessment work is being undertaken in November the distribution and numbers is constantly being updated.

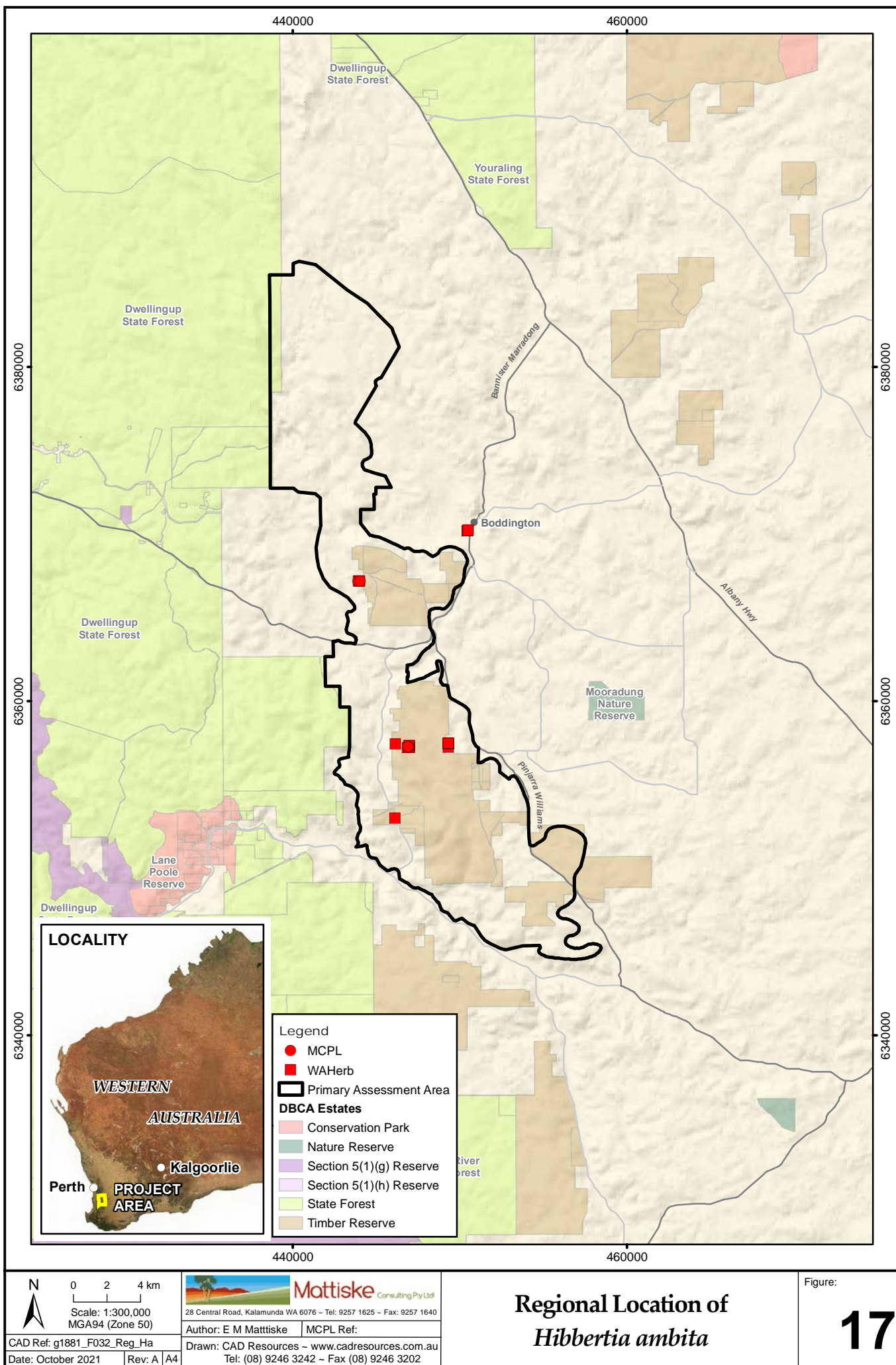
### Summary

This species has been recorded in the forest areas on the fringes of Hotham Road, near Quindanning, south of Boddington and in forest and rehabilitation areas within the South32 lease areas at Mt Saddleback. As *Hibbertia commutata* has been one of the dominant plants in the Boddington area it is expected that numbers will increase markedly in future years both within the forest areas and also rehabilitation areas. The main constraint is that it is difficult to differentiate without flowering material which restricts identification. Collections in rehabilitation areas are awaiting completion of rehabilitation assessments in November 2021.

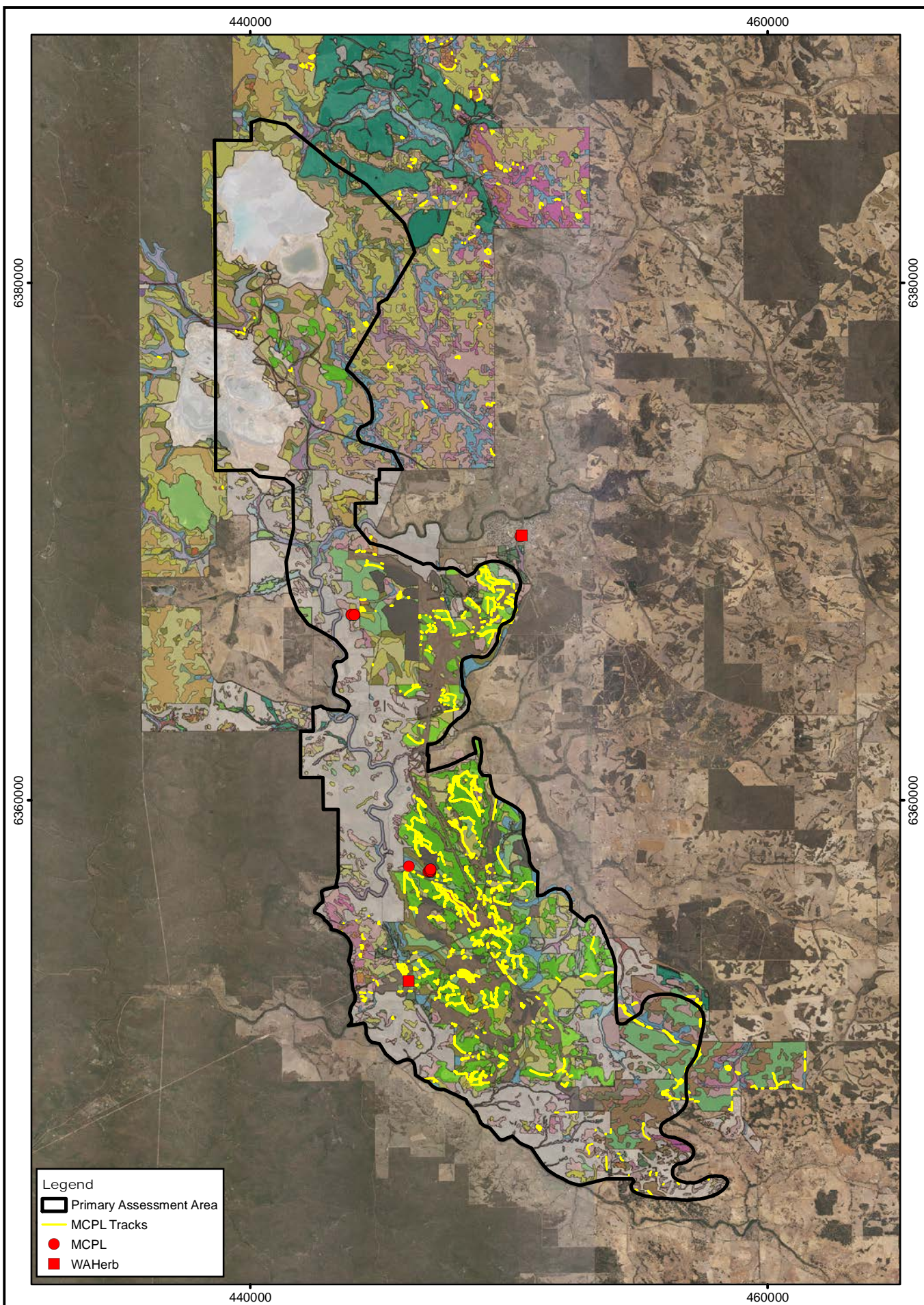
**Table 9: GPS coordinates of records of *Hibbertia ambita* (P1)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

Site_Veget	MGA_East	MGA_North	Popn	Project	Area	PAA
H	443917	6367166	1	South32	Mt Saddleback	Inside
H	443938	6367178	1	WAHerb	West of Quindanning	Inside
H	444031	6367179	1	WAHerb	West of Quindanning	Inside
H	444055	6367167	1	South32	Mt Saddleback	Inside
D	446142	6352988	11	WAHerb	Mt Saddleback	Inside
M	446144	6357435	Frequent	South32	Mt Saddleback	Inside
Rehab	446893	6357217	2-5	South32	Mt Saddleback	Inside
Rehab	446924	6357251	2	South32	Mt Saddleback	Inside
P	446960	6357279	11	South32	Mt Saddleback	Inside
P	446973	6357267	6	South32	Mt Saddleback	Inside
P	446986	6357328	11-25	South32	Mt Saddleback	Inside
Rehab	446986	6357218	6-10	South32	Mt Saddleback	Inside
CL	449323	6357452	11-25	South32	Mt Saddleback	Inside
CL	449324	6357230	11-25	South32	Mt Saddleback	Inside
	450474	6370207	Frequent	WAHerb	Near Hotham River	Outside
	450511	6370238	1	WAHerb	Near Hotham River	Outside







Legend

- Primary Assessment Area
- MCPL Tracks
- MCPL
- WAHerb



0 1 2 3 km

Scale: 1:200,000  
MGA94 (Zone 50)



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CAD Ref: g1881\_F032\_Loc\_Ha

Date: January 2022 Rev: A A4

## Location of *Hibbertia ambita*

Figure:

# 18



## **ADDENDUM –*Isopogon* sp. Canning Reservoir (M.D. Tindale 121 & B.R. Maslin) (P1)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Isopogon* sp. *Canning Reservoir* (M.D. Tindale 121 & B.R. Maslin) (P1) is known from 8 records at the Western Australian State Herbarium. *Isopogon* sp. *Canning Reservoir* (P1) occurs in a range of sites from fringes of heath communities to Jarrah forests to slopes to rehabilitated areas. The records in Table 10 are based on confirmed locations.

### **Regional and Local Background Knowledge**

This species has been recorded in the forest areas south of the Brookton Highway, south-east of Dwellingup and south of Boddington and in forest and rehabilitation areas within the South32 lease areas at Mt Saddleback.

Previous records in a regional and local context are summarized in Figures 19 and 20.

### **Recent Survey Effort**

As indicated above this species occurs in a range of heath and forest types ranging from south of Brookton Highway to Mt Saddleback areas. In the South32 areas to date it has been recorded in the P site-vegetation type on sandy-gravels with the Jarrah-Sheoak (*Eucalyptus marginata* –*Allocasuarina fraseriana*), in heath areas (G3) dominated by Proteaceae and Myrtaceae species and in rehabilitated areas. Recent targeted survey effort has focussed on these habitat types. Additional collections are being located in rehabilitation areas and therefore locations and numbers are regularly under review.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded in the P and near the G3 site-vegetation types to the south of Boddington. This species has also been recorded in the rehabilitation areas, including a recent collection in 2021.

### **Summary**

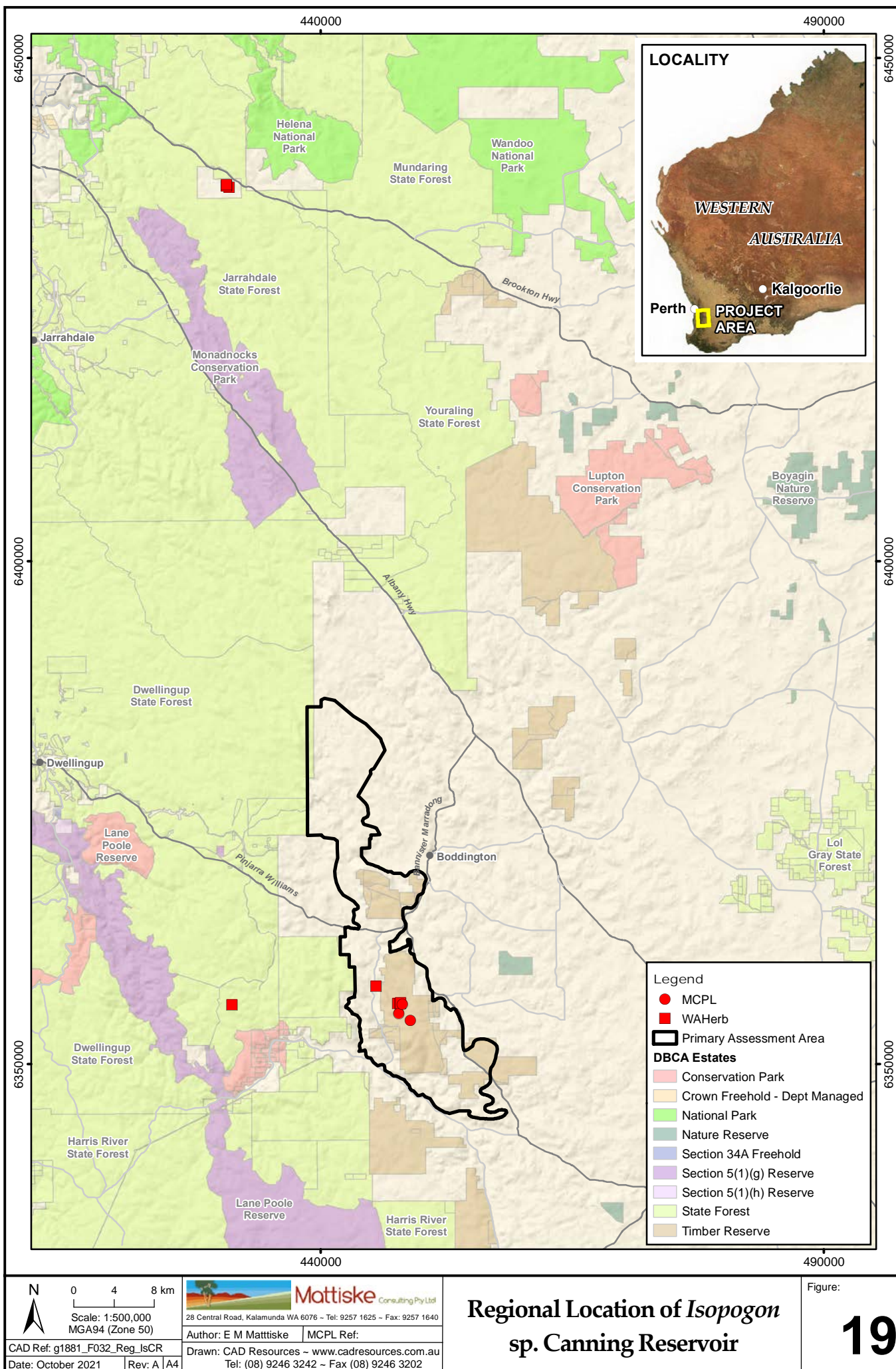
This species has been recorded south of Brookton Highway, south-east of Dwellingup and in the South32 lease areas. The occurrence at Mt Saddleback was recorded in the P and near the G3 site-vegetation types to the south of Boddington. Additional collections are being located in rehabilitation areas and therefore locations and numbers are regularly being under review.

**Table 10: GPS coordinates of records of *Isopogon sp.* Canning Reservoir (M.D. Tindale 121 & B.R. Maslin) (P1)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
	430630	6437380		WAHerb	South of Brookton Highway	Outside
	430631	6437269	<b>110</b>	WAHerb	South of Brookton Highway	Outside
	430914	6437160		WAHerb	South of Brookton Highway	Outside
	431193	6355900		WAHerb	Canning River, south Brookton Highway	Outside
G3	445487	6357764		South32	Mt Saddleback	Inside
Rehab	447647	6356002	1	South32	Mt Saddleback	Inside
Rehab	447790	6355001	<b>1</b>	South32	Mt Saddleback	Inside
P	447928	6356003		South32	Mt Saddleback	Inside
G3	447935	6356042	<b>1</b>	South32	Mt Saddleback	Inside
G3	448115	6355951	<b>2</b>	South32	Mt Saddleback	Inside
Rehab	448924	6354308	<b>1</b>	South32	Mt Saddleback	Inside





0 4 8 km  
Scale: 1:500,000  
MGA94 (Zone 50)



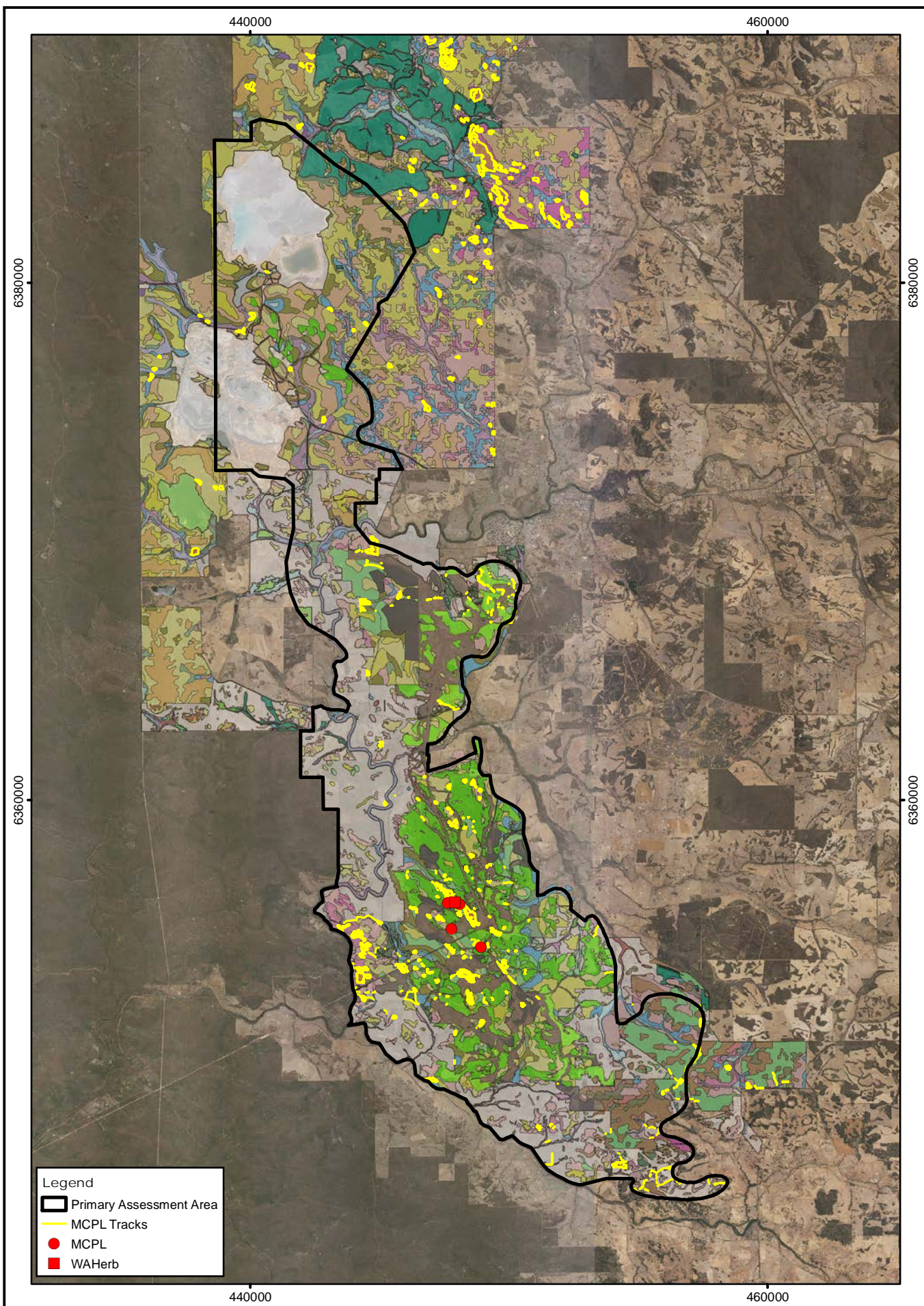
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Author: E M Mattiske MCPL Ref:  
Drawn: CAD Resources ~ www.cadresources.com.au

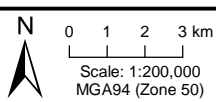
CAD Ref: g1881\_F032\_Reg\_IsCR  
Date: October 2021 Rev: A A4

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- Legend
- Primary Assessment Area
  - MCPL Tracks
  - MCPL
  - WAHerb



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CAD Ref: g1881\_F032\_Loc\_IsCR  
 Date: January 2022 Rev: A A4

## Location of *Isopogon* sp. Canning Reservoir



## **ADDENDUM – *Lasiopetalum cardiophyllum* (P4)**

The following is a summary of information as available up until September 2021 and as reported in the Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Lasiopetalum cardiophyllum* (P4) is known from 34 records at the Western Australian State Herbarium and as such occurs mainly on the eastern fringes of the Northern Jarrah Forest and has been recorded in areas in the Wheatbelt south of Boddington. The earliest collections in the Mt saddleback area were by A. Morrison on 13<sup>th</sup> November 1904. This collection was followed by specimens collected during Phase I of Worsley Alumina by Dames and Moore (1982) by D. Halford on 3<sup>rd</sup> November 1980. Later specimens included those by J.M. Koch on 20<sup>th</sup> January 1982 and by K.J. Atkins on 22<sup>nd</sup> December 1981 as part of the Phase II botanical studies on Mt Saddleback (Worsley Alumina Pty Ltd 1985).

### **Regional and Local Background Knowledge**

Local records include locations on Mt Saddleback including specimens collected by botanists regularly since 1980's in forests, woodlands, heath and swamp areas, Table 11. More recent collections near Boddington include specimens submitted to the Western Australian State Herbarium by Hort, F.; Hort, J.; Allen, J.; Bullock, P. in 2007 (collected 4 October 2007). This species has been recorded in the Wandering and Dongolocking Reserves. This species was known to dominate the local P and PS site-vegetation types (which are dominated by Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*)) but has more recently been recorded outside the PAA areas and as such information is continually being updated. Previous records in a regional and local context are summarized in Figures 21 and 22.

### **Recent Survey Effort**

This species occurs as a dominant shrub species in local forest areas and the numbers on Table 11 are a very conservative number as in most previous studies the numbers would easily exceed 11-25 plants in local areas. As this species is relatively well known, less recent effort was allocated to this species. This species is regularly recorded in rehabilitation areas and forest control monitoring areas of the annual rehabilitation and control plot monitoring program.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback and the Newmont areas to the north of the PAA was mainly in the S, PS and P site-vegetation types (variants of Jarrah – Marri and Jarrah -Sheoak forests of *Eucalyptus marginata*, *Corymbia calophylla* and *Allocasuarina fraseriana*)) and to a lesser extent in the ST, H, D and Z Jarrah types and AY, YG, M and M2 which are associated with slopes and gullies supporting Wandoo (*Eucalyptus wandoo*) as the dominant overstorey (Mattiske Consulting Pty Ltd 2021). This species has also been recorded regularly in the rehabilitation areas at South32 operations.



### Summary

This species is relatively restricted to the Boddington and Wheatbelt areas. The results in part reflect the intensity of study and surveys in the area and as such this species occurs in a range of site-vegetation types and in several reserves where this species is relatively well protected.

**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Rehab	440052	6379245	1	South32	Boddington Gold Mine	Inside
PS	440076	6378996	1	South32	Boddington Gold Mine	Inside
Rehab	440082	6379137	1	South32	Boddington Gold Mine	Inside
H	440086	6378464	1	South32	Boddington Gold Mine	Inside
PS	440113	6379029	1	South32	Boddington Gold Mine	Inside
H	440123	6378498	1	South32	Boddington Gold Mine	Inside
H	440160	6378532	1	South32	Boddington Gold Mine	Inside
S	440175	6377328	1	South32	Boddington Gold Mine	Inside
Rehab	440197	6378565	1	South32	Boddington Gold Mine	Inside
PS	440212	6377361	1	South32	Boddington Gold Mine	Inside
Rehab	440230	6379272	1	South32	Boddington Gold Mine	Inside
S	440232	6377785	1	South32	Boddington Gold Mine	Inside
Rehab	440234	6378599	1	South32	Boddington Gold Mine	Inside
ST	440237	6379413	1	South32	Boddington Gold Mine	Inside
H	440247	6378882	1	South32	Boddington Gold Mine	Inside
PS	440249	6377395	1	South32	Boddington Gold Mine	Inside
Rehab	440261	6379164	1	South32	Boddington Gold Mine	Inside
Rehab	440271	6378633	1	South32	Boddington Gold Mine	Inside
PS	440280	6377287	1	South32	Boddington Gold Mine	Inside
PS	440284	6378915	1	South32	Boddington Gold Mine	Inside
PS	440286	6377429	1	South32	Boddington Gold Mine	Inside
H	440308	6378666	1	South32	Boddington Gold Mine	Inside
H	440315	6378808	1	South32	Boddington Gold Mine	Inside
PS	440317	6377321	1	South32	Boddington Gold Mine	Inside
PS	440321	6378949	1	South32	Boddington Gold Mine	Inside
PS	440323	6377462	1	South32	Boddington Gold Mine	Inside
PS	440340	6377072	1	South32	Boddington Gold Mine	Inside
PS	440345	6378700	1	South32	Boddington Gold Mine	Inside
PS	440352	6378841	1	South32	Boddington Gold Mine	Inside
PS	440354	6377355	1	South32	Boddington Gold Mine	Inside
S	440360	6377496	1	South32	Boddington Gold Mine	Inside
PS	440391	6377388	1	South32	Boddington Gold Mine	Inside
PS	440401	6376857	1	South32	Boddington Gold Mine	Inside
PS	440413	6378626	1	South32	Boddington Gold Mine	Inside
D	440417	6380254	1	South32	Boddington Gold Mine	Inside
PS	440419	6378767	1	South32	Boddington Gold Mine	Inside
PS	440421	6377281	1	South32	Boddington Gold Mine	Inside
S	440426	6378909	1	South32	Boddington Gold Mine	Inside
PS	440449	6378660	1	South32	Boddington Gold Mine	Inside

**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
S	440456	6378801	1	South32	Boddington Gold Mine	Inside
S	440458	6377314	1	South32	Southwest Forest	Inside
Z	440458	6379615	1	South32	Southwest Forest	Inside
S	440464	6377456	1	South32	Southwest Forest	Inside
PS	440485	6380180	1	South32	Southwest Forest	Inside
S	440495	6377348	1	South32	Boddington Gold Mine	Inside
S	440508	6377631	1	South32	Boddington Gold Mine	Inside
PS	440541	6378337	1	South32	Boddington Gold Mine	Inside
S	440545	6377664	1	South32	Boddington Gold Mine	Inside
S	440560	6378761	1	South32	Boddington Gold Mine	Inside
S	440575	6377557	1	South32	Boddington Gold Mine	Inside
S	440582	6377698	1	South32	Boddington Gold Mine	Inside
A	440593	6389184	1	South32	Boddington	Outside
Z	440597	6376494	1	South32	Boddington Gold Mine	Inside
S	440597	6378795	1	South32	Boddington Gold Mine	Inside
PS	440604	6378936	1	South32	Boddington Gold Mine	Inside
S	440612	6377590	1	South32	Boddington Gold Mine	Inside
S	440619	6377732	1	South32	Boddington Gold Mine	Inside
S	440621	6376245	1	South32	Boddington Gold Mine	Inside
A	440624	6389221		WAHerb	NW Boddington	Outside
PS	440625	6377873	1	South32	Boddington Gold Mine	Inside
D	440626	6380174	1	South32	Boddington Gold Mine	Inside
Z	440634	6376528	1	South32	Boddington Gold Mine	Inside
PS	440634	6378828	1	South32	Boddington Gold Mine	Inside
PS	440638	6378156	1	South32	Boddington Gold Mine	Inside
PS	440646	6380597	1	South32	Boddington Gold Mine	Inside
PS	440647	6376810	1	South32	Boddington Gold Mine	Inside
S	440656	6377765	1	South32	Boddington Gold Mine	Inside
S	440658	6376279	1	South32	Boddington Gold Mine	Inside
Z	440664	6376420	1	South32	Boddington Gold Mine	Inside
PS	440669	6378048	1	South32	Boddington Gold Mine	Inside
PS	440671	6378862	1	South32	Boddington Gold Mine	Inside
Z	440678	6379003	1	South32	Boddington Gold Mine	Inside
S	440686	6377658	1	South32	Boddington Gold Mine	Inside
S	440697	6377126	1	South32	Boddington Gold Mine	Inside
PS	440699	6377940	1	South32	Boddington Gold Mine	Inside
PS	440713	6380523	1	South32	Boddington Gold Mine	Inside
PS	440714	6376736	1	South32	Boddington Gold Mine	Inside
S	440723	6377692	1	South32	Boddington Gold Mine	Inside
PS	440726	6380806	1	South32	Boddington Gold Mine	Inside
S	440727	6377019	1	South32	Boddington Gold Mine	Inside
PS	440732	6376346	1	South32	Boddington Gold Mine	Inside
PS	440734	6379461	1	South32	Boddington Gold Mine	Inside
PS	440736	6377974	1	South32	Boddington Gold Mine	Inside
Z	440738	6376487	1	South32	Boddington Gold Mine	Inside
S	440749	6375956	1	South32	Boddington Gold Mine	Inside
PS	440751	6376770	1	South32	Boddington Gold Mine	Inside
S	440755	6376097	1	South32	Boddington Gold Mine	Inside

**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
S	440756	6378398	1	South32	Boddington Gold Mine	Inside
S	440758	6376911	1	South32	Boddington Gold Mine	Inside
PS	440768	6376380	1	South32	Boddington Gold Mine	Inside
S	440771	6377194	1	South32	Boddington Gold Mine	Inside
Z	440775	6376521	1	WAHerb	Boddington Gold Mine	Inside
Rehab	440780	6378149	1	South32	Boddington Gold Mine	Inside
PS	440782	6376662	1	South32	Boddington Gold Mine	Inside
PS	440788	6376804	1	South32	Boddington Gold Mine	Inside
PS	440790	6377618	1	South32	Boddington Gold Mine	Inside
S	440795	6376945	1	South32	Boddington Gold Mine	Inside
Rehab	440817	6378183	1	South32	Boddington Gold Mine	Inside
S	440823	6378324	1	South32	Boddington Gold Mine	Inside
S	440825	6376837	1	South32	Boddington Gold Mine	Inside
S	440830	6378465	1	South32	Boddington Gold Mine	Inside
Rehab	440832	6376979	1	South32	Boddington Gold Mine	Inside
PS	440834	6377793	1	South32	Boddington Gold Mine	Inside
PS	440836	6376306	1	South32	Boddington Gold Mine	Inside
S	440836	6378607	1	South32	Boddington Gold Mine	Inside
S	440838	6377120	1	South32	Boddington Gold Mine	Inside
Rehab	440843	6378748	1	South32	Boddington Gold Mine	Inside
S	440853	6375916	1	South32	Boddington Gold Mine	Inside
Rehab	440854	6378216	1	South32	Boddington Gold Mine	Inside
PS	440858	6377544	1	South32	Boddington Gold Mine	Inside
PS	440864	6377685	1	South32	Boddington Gold Mine	Inside
PS	440871	6377826	1	South32	Boddington Gold Mine	Inside
Rehab	440873	6378640	1	South32	Boddington Gold Mine	Inside
PS	440875	6377154	1	South32	Boddington Gold Mine	Inside
PS	440879	6376481	1	South32	Boddington Gold Mine	Inside
S	440890	6375950	1	South32	Boddington Gold Mine	Inside
S	440897	6378391	1	South32	Boddington Gold Mine	Inside
PS	440901	6377719	1	South32	Boddington Gold Mine	Inside
Rehab	440908	6377860	1	South32	Boddington Gold Mine	Inside
Rehab	440912	6377187	1	South32	Boddington Gold Mine	Inside
S	440921	6375842	1	South32	Boddington Gold Mine	Inside
PS	440927	6375983	1	South32	Boddington Gold Mine	Inside
Rehab	440929	6376797	1	South32	Boddington Gold Mine	Inside
Rehab	440936	6376938	1	South32	Boddington Gold Mine	Inside
PS	440940	6376266	1	South32	Boddington Gold Mine	Inside
Rehab	440945	6377894	1	South32	Boddington Gold Mine	Inside
PS	440957	6375876	1	South32	Boddington Gold Mine	Inside
PS	440969	6377645	1	South32	Boddington Gold Mine	Inside
Rehab	440973	6376972	1	South32	Boddington Gold Mine	Inside
PS	440977	6376299	1	South32	Boddington Gold Mine	Inside
Rehab	440979	6377113	1	South32	Boddington Gold Mine	Inside
Rehab	440982	6377927	1	South32	Boddington Gold Mine	Inside
PS	440982	6380228	1	South32	Boddington Gold Mine	Inside
PS	440994	6375909	1	South32	Boddington Gold Mine	Inside
Rehab	440995	6378210	1	South32	Boddington Gold Mine	Inside



**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
PS	441006	6377678	1	South32	Boddington Gold Mine	Inside
PS	441008	6376192	1	South32	Boddington Gold Mine	Inside
Rehab	441008	6378492	1	South32	Boddington Gold Mine	Inside
Rehab	441010	6377006	1	South32	Boddington Gold Mine	Inside
PS	441014	6376333	1	South32	Boddington Gold Mine	Inside
S	441032	6378244	1	South32	Boddington Gold Mine	Inside
PS	441044	6376225	1	South32	Boddington Gold Mine	Inside
S	441045	6378526	1	South32	Boddington Gold Mine	Inside
Rehab	441047	6377039	1	South32	Boddington Gold Mine	Inside
Rehab	441056	6377995	1	South32	Boddington Gold Mine	Inside
S	441069	6378277	1	South32	Boddington Gold Mine	Inside
PS	441081	6376259	1	South32	Boddington Gold Mine	Inside
PS	441093	6378028	1	South32	Boddington Gold Mine	Inside
PS	441099	6375869	1	South32	Boddington Gold Mine	Inside
S	441112	6378452	1	South32	Boddington Gold Mine	Inside
PS	441130	6378062	1	South32	Boddington Gold Mine	Inside
S	441132	6376575	1	South32	Boddington Gold Mine	Inside
PS	441136	6375903	1	South32	Boddington Gold Mine	Inside
PS	441167	6378096	1	South32	Boddington Gold Mine	Inside
PS	441173	6375936	1	South32	Boddington Gold Mine	Inside
PS	441186	6378520	1	South32	Boddington Gold Mine	Inside
PS	441223	6376253	1	South32	Boddington Gold Mine	Inside
PS	441223	6378553	1	South32	Boddington Gold Mine	Inside
PS	441249	6376818	1	South32	Boddington Gold Mine	Inside
PS	441264	6377914	1	South32	Boddington Gold Mine	Inside
PS	441284	6378338	1	South32	Boddington Gold Mine	Inside
Rehab	441286	6376851	1	South32	Boddington Gold Mine	Inside
PS	441304	6378762	1	South32	Boddington Gold Mine	Inside
PS	441320	6376071	1	South32	Boddington Gold Mine	Inside
PS	441321	6378372	1	South32	Boddington Gold Mine	Inside
PS	441344	6375822	1	South32	Boddington Gold Mine	Inside
PS	441377	6376529	1	South32	Boddington Gold Mine	Inside
PS	441401	6378580	1	South32	Boddington Gold Mine	Inside
PS	441414	6376562	1	South32	Boddington Gold Mine	Inside
PS	441444	6374154	1	South32	Boddington Gold Mine	Inside
Z	441466	6375392	1	South32	Boddington Gold Mine	Inside
PS	441473	6377834	1	South32	Boddington Gold Mine	Inside
PS	441529	6375991	1	South32	Boddington Gold Mine	Inside
PS	441560	6375883	1	South32	Boddington Gold Mine	Inside
PS	441596	6375917	1	South32	Boddington Gold Mine	Inside
AY	441831	6376401	1	South32	Boddington Gold Mine	Inside
Z	441851	6378868	1	South32	Boddington Gold Mine	Inside
AY	441868	6376435	1	South32	Boddington Gold Mine	Inside
S	441871	6378528	1	South32	Boddington Gold Mine	Inside
AY	441892	6376186	1	South32	Boddington Gold Mine	Inside
PS	441931	6378938	1	South32	Boddington Gold Mine	Inside
Z	441996	6376146	1	South32	Boddington Gold Mine	Inside
Z	442010	6376429	1	South32	Boddington Gold Mine	Inside

**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Z	442033	6376180	1	South32	Boddington Gold Mine	Inside
PS	442077	6376355	1	South32	Boddington Gold Mine	Inside
Z	442138	6376139	1	South32	Boddington Gold Mine	Inside
Z	442141	6379118	1	South32	Boddington Gold Mine	Inside
PS	442150	6374121	1	South32	Boddington Gold Mine	Inside
Z	442205	6376065	1	South32	Boddington Gold Mine	Inside
H	442231	6378858	1	South32	Boddington Gold Mine	Inside
Z	442281	6379258	1	South32	Boddington Gold Mine	Inside
AY	442292	6374115	1	South32	Boddington Gold Mine	Inside
Rehab	442331	6378138	1	South32	Boddington Gold Mine	Inside
Rehab	442491	6378438	1	South32	Boddington Gold Mine	Inside
PS	442501	6383628	1	South32	Boddington Gold Mine	Inside
Z	442521	6379478	1	South32	Boddington Gold Mine	Inside
PS	442531	6376748	1	South32	Boddington Gold Mine	Inside
S	442591	6377128	1	South32	Boddington Gold Mine	Inside
Rehab	442591	6378508	1	South32	Boddington Gold Mine	Inside
PS	442601	6376828	1	South32	Boddington Gold Mine	Inside
Z	442611	6379198	1	South32	Boddington Gold Mine	Inside
PS	442931	6375778	1	South32	Boddington Gold Mine	Inside
Z	443041	6377528	1	South32	Boddington Gold Mine	Inside
Rehab	443041	6378218	1	South32	Boddington Gold Mine	Inside
Rehab	443091	6376588	1	South32	Boddington Gold Mine	Inside
PS	443091	6383278	1	South32	Boddington Gold Mine	Inside
S	443101	6375948	1	South32	Boddington Gold Mine	Inside
Y	443201	6377698	1	South32	Boddington Gold Mine	Inside
Z	443291	6377778	1	South32	Boddington Gold Mine	Inside
PS	443301	6375118	1	South32	Boddington Gold Mine	Inside
PS	443391	6375188	1	South32	Boddington Gold Mine	Inside
H	443900	6381803	1	South32	Sotico	Inside
PS	444051	6375788	1	South32	Boddington Gold Mine	Inside
Y	444108	6382334	1	South32	Sotico	Inside
PS	444197	6374902	1	South32	Boddington Gold Mine	Inside
PS	444202	6376003	1	South32	Boddington Gold Mine	Inside
PS	444299	6375899	1	South32	Boddington Gold Mine	Inside
YG	444700	6378499	20	South32	Boddington Gold Mine	Inside
M	444998	6376001	1	South32	Boddington Gold Mine	Outside
M	445002	6375900	1	South32	Boddington Gold Mine	Outside
M	445398	6378597	1	South32	Boddington Gold Mine	Outside
CL - Ag	445487	6357764		WAHerb	Boddington Gold Mine	Inside
M	445510	6377499	1	South32	Boddington Gold Mine	Outside
Z	445595	6382902	1	South32	Sotico	Outside
M	445699	6383101	20	South32	Sotico	Outside
PS	445708	6381798	1	South32	Sotico	Inside
Y	446308	6393227	1	South32	Sotico	Outside
S	446310	6393288	1	South32	Sotico	Outside
D	446315	6352662	1	WAHerb	Boddington	Inside
G3	446357	6352669	1	WAHerb	Boddington	Inside
G3	446393	6352632	1	WAHerb	Boddington	Inside

**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
M	446402	6378102	100	South32	Boddington	Outside
Rehab	446623	6364305	1	South32	Boddington	Inside
Rehab	446640	6356850	1	South32	Boddington	Inside
M	446801	6378698	1	South32	Boddington	Outside
Z	446811	6394105	1	South32	Boddington	Outside
M	446902	6389598	1	South32	Boddington	Outside
H	446999	6381402	1	South32	Boddington	Outside
Rehab	447000	6352892	1	South32	Boddington	Inside
P	447013	6352229	1	WA Herb	Boddington	Inside
P	447080	6354531	1	South32	Boddington	Inside
Rehab	447143	6356198	1	South32	Boddington	Inside
G3	447193	6381247	1	South32	Sotico	Outside
H	447201	6390402	1	South32	Sotico	Outside
S	447202	6381597	1	South32	Sotico	Outside
H	447203	6381405	1	South32	Sotico	Outside
H	447205	6381300	1	South32	Sotico	Outside
H	447302	6381302	1	South32	Sotico	Outside
Rehab	447342	6352601	1	South32	Boddington	Inside
M	447392	6373255	1	South32	Boddington Gold Mine	Outside
Y	447399	6383000	1	South32	Sotico	Outside
M	447404	6373225	1	South32	Boddington Gold Mine	Outside
M	447411	6373264	1	South32	Boddington Gold Mine	Outside
Rehab	447421	6353157	1	South32	Boddington	Inside
Z	447436	6353789	1	South32	Boddington	Inside
M	447443	6377400	50	South32	Boddington Gold Mine	Outside
Rehab	447480	6356066	1	South32	Boddington	Inside
Rehab	447493	6356169	1	South32	Boddington	Inside
H	447497	6392601	1	South32	Sotico	Outside
H	447534	6378607	10	South32	Boddington Gold Mine	Outside
P	447551	6356407	2	WAHerb	Mt Saddleback	Inside
Rehab	447591	6357013	1	South32	Mt Saddleback	Inside
Rehab	447613	6352293	1	South32	Mt Saddleback	Inside
G3	447616	6356377	1	South32	Mt Saddleback	Inside
Rehab	447684	6355506	1	South32	Mt Saddleback	Inside
Rehab	447694	6352954	1	South32	Mt Saddleback	Inside
Rehab	447698	6356042	1	South32	Mt Saddleback	Inside
M	447698	6382903	1	South32	Sotico	Outside
M	447698	6382992	300	South32	Sotico	Outside
M	447701	6383595	1	South32	Sotico	Outside
PS	447715	6372867	1	WAHerb	Boddington Gold Mine	Outside
PS	447779	6372867	1	South32	Boddington Gold Mine	Outside
Rehab	447790	6355001	1	South32	Boddington	Inside
PS	447847	6372862	1	South32	Boddington Gold Mine	Outside
	447865	6372806	1	South32	Boddington Gold Mine	Outside
M2	447895	6383902	1	South32	Sotico	Outside
Rehab	447896	6352852	1	South32	Boddington	Inside
PS	447908	6372857	1	WAHerb	Boddington Gold Mine	Outside



**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
G3	447935	6356042	1	WAHerb	MGA	Inside
PS	447971	6372863	1	WAHerb	Boddington Gold Mine	Outside
M	447996	6383802	1	South32	Sotico	Outside
H	448003	6388597	1	South32	Sotico	Outside
M	448004	6392803	50	South32	Sotico	Outside
M	448099	6392499	30	South32	Sotico	Outside
M	448100	6391800	1	South32	Sotico	Outside
Rehab	448145	6357569	1	South32	Boddington	Inside
Rehab	448184	6349475	1	South32	Boddington	Inside
M	448200	6377599	20	South32	Boddington Gold Mine	Outside
M	448205	6389194	50	South32	Sotico	Outside
Rehab	448209	6352340	1	South32	Boddington	Inside
M	448300	6389497	1	South32	Sotico	Outside
Rehab	448352	6349748	1	South32	Boddington	Inside
H	448397	6392396	1	South32	Sotico	Outside
H	448404	6392304	1	South32	Sotico	Outside
S	448413	6382808	50	South32	Sotico	Outside
P	448453	6359247	1	South32	Boddington	Inside
M	448494	6382600	1	South32	Sotico	Outside
M	448496	6382702	1	South32	Sotico	Outside
H	448501	6389396	1	South32	Sotico	Outside
M2	448504	6383099	1	South32	Sotico	Outside
H	448504	6392400	1	South32	Sotico	Outside
Rehab	448553	6361513	1	WAHerb	Boddington	Inside
M	448553	6361550	1	WAHerb	Boddington	Inside
M	448555	6382793	50	South32	Sotico	Outside
M	448599	6382799	5	South32	Sotico	Outside
H	448601	6392401	1	South32	Sotico	Outside
G4	448602	6352237	1	WAHerb	Boddington	Inside
G4	448602	6352274	1	WAHerb	Boddington	Inside
H	448604	6392303	1	South32	Sotico	Outside
Rehab	448639	6356669	1	South32	Boddington	Inside
H	448699	6392298	1	South32	Sotico	Outside
G3	448699	6393002	1	South32	Sotico	Outside
H	448798	6392994	1	South32	Sotico	Outside
S	448801	6392498	1	South32	Sotico	Outside
Rehab	448839	6354201	1	South32	Boddington	Inside
Y	448896	6393101	1	South32	Sotico	Outside
M2	448902	6385596	1	South32	Sotico	Outside
Rehab	448924	6354308	1	South32	Boddington	Inside
Rehab	449007	6357866	1	South32	Boddington	Inside
Rehab	449013	6356682	1	South32	Boddington	Inside
P	449069	6354611	1	South32	Boddington	Inside
M	449093	6391300	300	South32	Sotico	Outside
M	449098	6387798	1	South32	Sotico	Outside
M2	449206	6385254	1	South32	Sotico	Outside
M2	449206	6385298	1	South32	Sotico	Outside
Rehab	449214	6354851	1	South32	Boddington	Inside

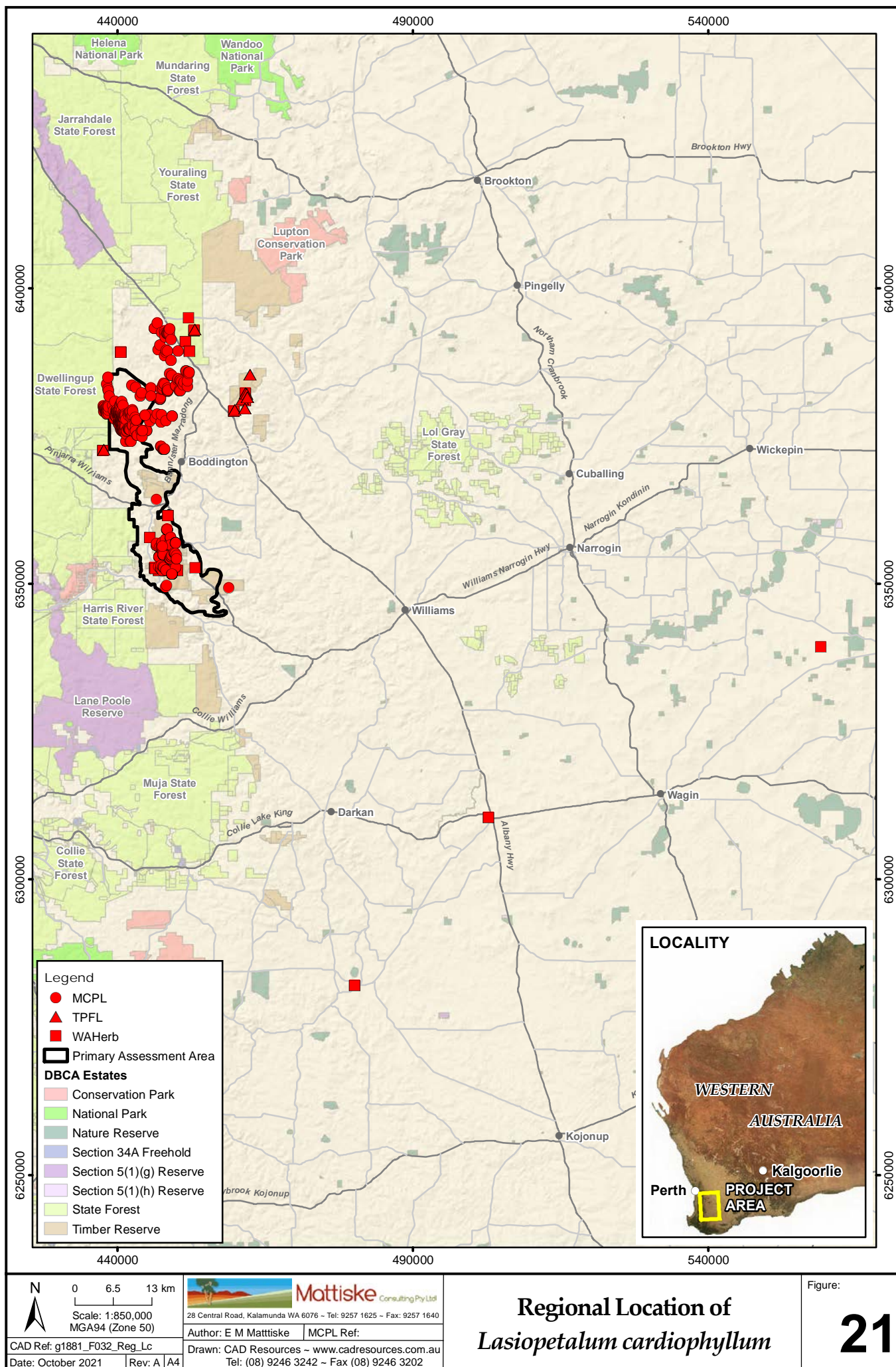
**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
Rehab	449244	6351704	1	South32	Boddington	Inside
PS	449300	6378402	40	South32	Boddington Gold Mine	Outside
PS	449308	6378403	20	WAHerb	Boddington Gold Mine	Outside
Rehab	449688	6355251	1	South32	Boddington	Inside
Rehab	449838	6355201	1	South32	Boddington	Inside
Rehab	449849	6352810	1	South32	Boddington	Inside
P	449869	6356960	1	South32	Boddington	Inside
M2	449896	6383502	1	South32	Sotico	Outside
M2	449910	6383550	1	South32	Sotico	Outside
Rehab	450035	6354835	1	South32	Boddington	Inside
Rehab	450039	6354301	1	South32	Boddington	Inside
CL	450191	6352245	1	WAHerb	Boddington	Inside
M2	450206	6384498	20	MCPL	Sotico	Outside
S	450293	6389397	1	MCPL	Sotico	Outside
PS	450304	6384703	0	MCPL	Sotico	Outside
M2	450497	6382798	1	MCPL	Sotico	Outside
M2	450504	6382695	0	MCPL	Sotico	Outside
M2	450614	6384506	0	MCPL	Sotico	Outside
M	450692	6384499	50	MCPL	Sotico	Outside
M2	450700	6382696	100	MCPL	Sotico	Outside
M2	450804	6384199	0	MCPL	Sotico	Outside
M2	451193	6383701	0	MCPL	Sotico	Outside
M2	451305	6384092	0	MCPL	Sotico	Outside
	451502	6390998	0	WAHerb	Sotico	Outside
PS	451603	6385998	12	MCPL	Sotico	Outside
PS	451699	6386004	0	MCPL	Sotico	Outside
M2	451900	6383400	0	MCPL	Sotico	Outside
PS	451901	6384400	0	MCPL	Sotico	Outside
	452000	6395000	0	WAHerb	Sotico	Outside
PS	452002	6385804	0	MCPL	Sotico	Outside
PS	452095	6385805	1	MCPL	Sotico	Outside
PS	452098	6385595	0	MCPL	Sotico	Outside
	452164	6389364	0	WAHerb	Boddington	Outside
PS	452197	6385808	0	MCPL	Sotico	Outside
	452284	6389307	0	WAHerb	Boddington	Outside
	452989	6392834	Frequent	WAHerb	Boddington	Outside
	453004	6392883	0	WAHerb	Boddington	Outside
	453005	6392884	0	WAHerb	Boddington Gold Mine	Outside
	453092	6393019	13	WAHerb	Boddington	Outside
H	453179	6352703		WAHerb	Boddington	Inside
AY	458877	6349290	0	MCPL	Boddington	Outside
	459706	6379265	0	WAHerb	Boddington	Outside
	459706	6379228		WAHerb	Boddington	Outside
	459845	6379468	5	WAHerb	Boddington	Outside
	461192	6381168	6	WAHerb	Boddington	Outside
	461615	6379629	9	WAHerb	Boddington	Outside
	461662	6381015	0	WAHerb	Boddington	Outside
	461709	6382247	14	WAHerb	Boddington	Outside

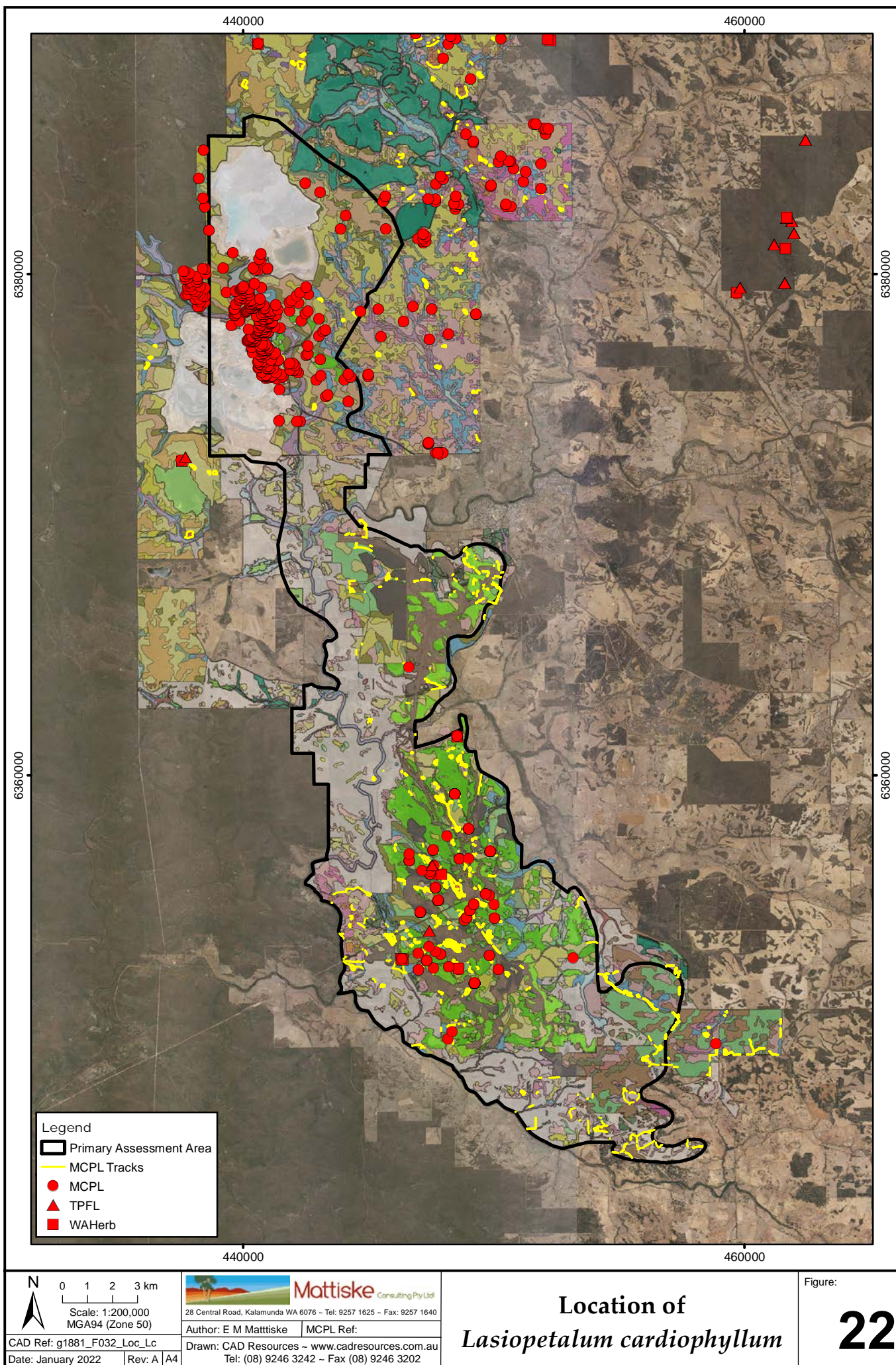
**Table 11: GPS coordinates of records of *Lasiopetalum cardiophyllum* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
	461918	6382094	8	WASerb	Boddington	Outside
	461998	6381633	7	WASerb	Boddington	Outside
	462452	6385360	12	WASerb	Boddington	Outside
	480146	6282062		WASerb	Boddington	Outside
	502792	6310465		WASerb	Boddington	Outside
	559077	6339333		WASerb	Boddington	Outside











## **ADDENDUM – *Papistylis intropubens* (P1)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Papistylus intropubens* (P1) is known from 1 records at the Western Australian State Herbarium and as such is restricted to the Tunnell Road heath Protected Area. The species was also recorded in Department of Biodiversity Conservation and Attractions database records as occurring west of the Mt Saddleback area in cleared agricultural lands. This record is difficult to track down as the only known location is from the Tunnell Road heath Protected Area and this location does not align with the location of Tunnell Road as defined in the database record.

### **Regional and Local Background Knowledge**

*Papistylus intropubens* (P1) was recorded by K J Atkins during the Worsley Alumina Phase II studies (Worsley Alumina Pty Ltd 1985) within the G3 site-vegetation type supporting heath. The G3 heath communities are dominated by mixed Proteaceae and Myrtaceae species with the occasional emergent *Eucalyptus drummondii* (see also description in Mattiske Consulting Pty Ltd 2021).

Previous records in a regional and local context are summarized in Figures 23 and 24.

### **Recent Survey Effort**

The occurrence of the species in the Boddington area was restricted to Tunnell Road heath Protected Area. Despite searching by botanists including in recent years by seed collectors and Dr Mattiske in 2019 and 2020 in the Tunnell Road heath Protected Area and other heath areas, this species has not been relocated.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded as part of the Worsley Alumina Phase II studies (Worsley Alumina Pty Ltd 1985) within the G3 site-vegetation type supporting heath. The G3 heath communities are dominated by mixed Proteaceae and Myrtaceae species with the occasional emergent *Eucalyptus drummondii* (see also description in Mattiske Consulting Pty Ltd 2021).

### **Summary**

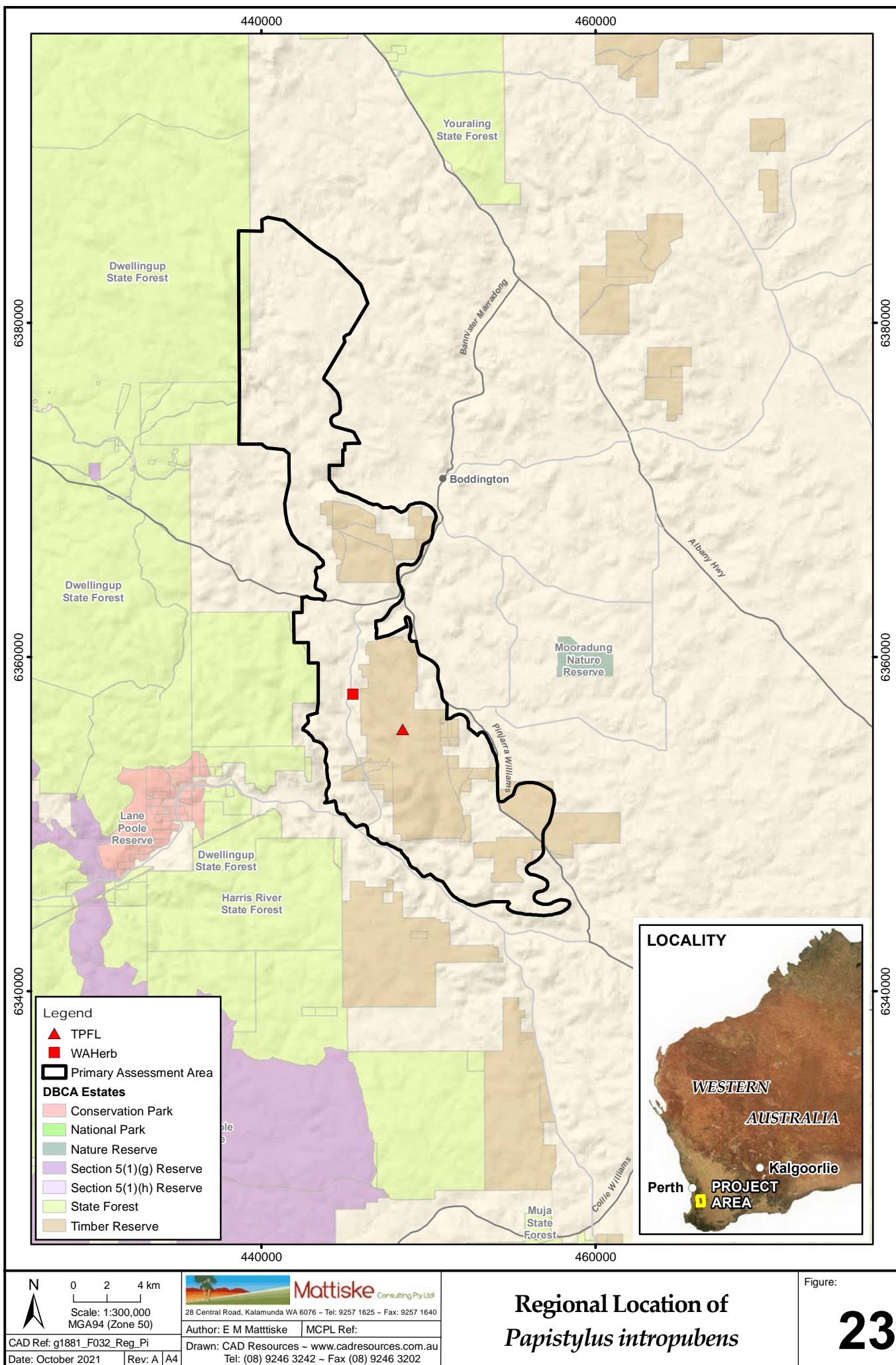
Little is known about this species and it appears that the State Herbarium record does not align with previous information from Tunnell Road heath Protected Area. Despite searching this species has not been identified or located since the initial identification during the Worsley Alumina Phase II studies (Worsley Alumina Pty Ltd 1985).



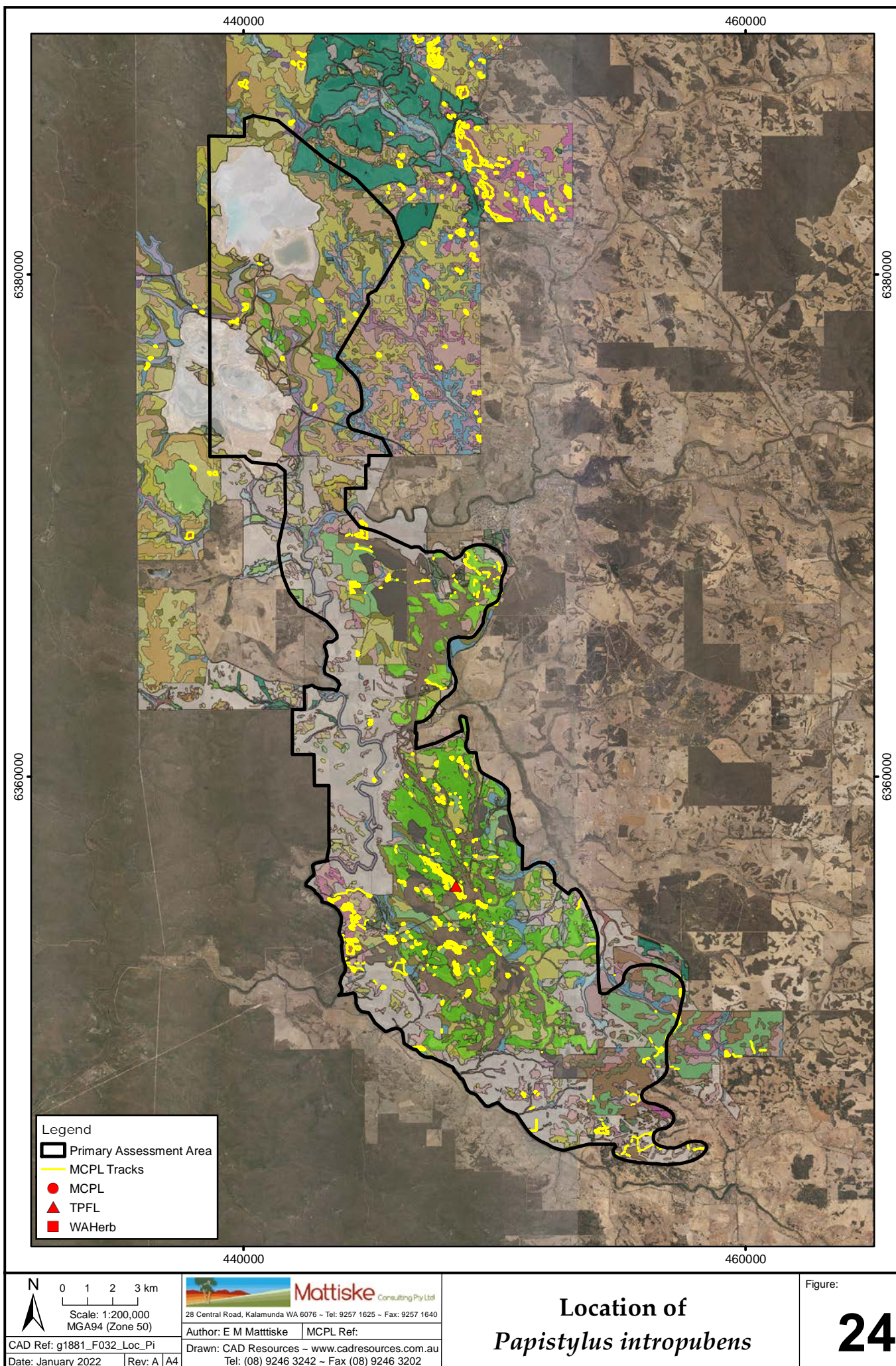
**Table 12: GPS coordinates of records of *Papistylus intropubens* (P1)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<b>Site_Veget</b>	<b>MGA_East</b>	<b>MGA_North</b>	<b>Popn</b>	<b>Project</b>	<b>Area</b>	<b>PAA</b>
CL-Ag	445487	6357764		WAHerb	Mt Saddleback	Inside
G3	448464	6355642	1	South32	Mt Saddleback	Inside









### **ADDENDUM – *Senecio leucoglossus* (P4)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

#### **State Herbarium records**

*Senecio leucoglossus* (P4) is known from 45 records at the Western Australian State Herbarium and as such occurs throughout the northern Jarrah forest and southwards to the Collie Basin and also south of Collie in the southern forests. Early records at Mt Saddleback were made by A.S. Weston during Phase One studies for Worsley Alumina (Dames and Moore 1982) on 29 August 1980 and by K.J. Atkins during the Phase Two studies (Worsley alumina Pty Ltd 1985) on 25<sup>th</sup> October 1982.

#### **Regional and Local Background Knowledge**

Local records include locations on Mt Saddleback and in the Newmont Boddington Gold Mine areas. One of the records was a collection by S. Chalwell (Mattiske Consulting Pty Ltd) from rehabilitation areas on 11 November 2005 in the Mt Saddleback area. This species has been recorded in the Lesmurdie Falls National Park, the Lane Poole Conservation Reserve, the Wellington National Park and the Modanocks Reserve associated with Jarrahdale area. The main occurrences occur on the Darling Range, although several occur on the western fringes of the Swan Coastal Plain. Previous records in a regional and local context are summarized in Figures 25 and 26.

#### **Recent Survey Effort**

This species occurs primarily on the slopes supporting open forests of Jarrah, Marri and Sheoak (site-vegetation types S, ST and P) in the Boddington area. In other areas of the Darling Ranges this species extends to heath and Jarrah-Blackbutt (*Eucalyptus marginata*-*Eucalyptus patens*) forest communities. As this species is widespread less recent effort was allocated to this species.

#### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

This species requires review as a Priority species in view of its extent and frequency in the Jarrah forests and in the conservation reserve system.

#### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded during vegetation studies in the S, H, ST, Z, M and P site-vegetation types which range from Jarrah forests to Wandoo woodlands on mid and upper slopes (Mattiske Consulting Pty Ltd 2021) as well as regularly in the rehabilitation areas at South32 operations.

#### **Summary**

This species is relatively widespread and as such extends from forests and woodlands into rehabilitation areas. The latter is expected as this species of daisy would shed seed readily after flowering and as such would be spread by wind. As this species is widespread less recent effort was allocated to this species.

**Table 13: GPS coordinates of records of *Senecio leucoglossus* (P4)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
	395240	6342943		WAHerb	Southwest Forest	Outside
	396490	6339519		WAHerb	Southwest Forest	Outside
	396527	6339513	1	South32	Southwest Forest	Outside
	399574	6330675	1	South32	Southwest Forest	Outside
	400393	6304853		WAHerb	Southwest Forest	Outside
	400629	6299976		WAHerb	Southwest Forest	Outside
	401841	6327266		WAHerb	Southwest Forest	Outside
	401847	6327228	1	South32	Southwest Forest	Outside
	402244	6224364		WAHerb	Southwest Forest	Outside
	402816	6418415		WAHerb	Southwest Forest	Outside
	403065	6326059		WAHerb	Southwest Forest	Outside
	403217	6386710		WAHerb	Southwest Forest	Outside
	406297	6329306		WAHerb	Southwest Forest	Outside
	406307	6329305	1	South32	Southwest Forest	Outside
	407022	6401159		WAHerb	Southwest Forest	Outside
	408240	6340856		WAHerb	Southwest Forest	Outside
	408482	6354939		WAHerb	Southwest Forest	Outside
	409521	6457944		WAHerb	Southwest Forest	Outside
	410152	6472139		WAHerb	Swan View	Outside
	410696	6399973		WAHerb	Southwest Forest	Outside
	412556	6467504		WAHerb	Southwest Forest	Outside
	416676	6381178		WAHerb	Southwest Forest	Outside
	418237	6324515	1	South32	Southwest Forest	Outside
	419052	6342947		WAHerb	Southwest Forest	Outside
	419145	6331749		WAHerb	Southwest Forest	Outside
	419176	6331750	1	South32	Southwest Forest	Outside
	420413	6347836		WAHerb	Southwest Forest	Outside
	420858	6469789		WAHerb	Southwest Forest	Outside
	421119	6376447		WAHerb	Southwest Forest	Outside
	425382	6345547		WAHerb	Southwest Forest	Outside
	429216	6331938		WAHerb	Southwest Forest	Outside
	429761	6371048	1	South32	Southwest Forest	Outside
	429777	6371079		WAHerb	Southwest Forest	Outside
	431341	6334836	Occasional	WAHerb	Southwest Forest	Outside
	435219	6412689		WAHerb	Southwest Forest	Outside
	437380	6382882		WAHerb	Southwest Forest	Outside
	437401	6382873	1	South32	Southwest Forest	Outside
S	438173	6383756	1	South32	Southwest Forest	Outside
H	438375	6383534	1	South32	Southwest Forest	Outside
ST	438483	6382821	1	South32	Southwest Forest	Outside
ST	438490	6382963	1	South32	Southwest Forest	Outside
S	438510	6383386	1	South32	Southwest Forest	Outside
ST	438525	6382182	1	South32	Southwest Forest	Outside
ST	438551	6382747	1	South32	Southwest Forest	Outside

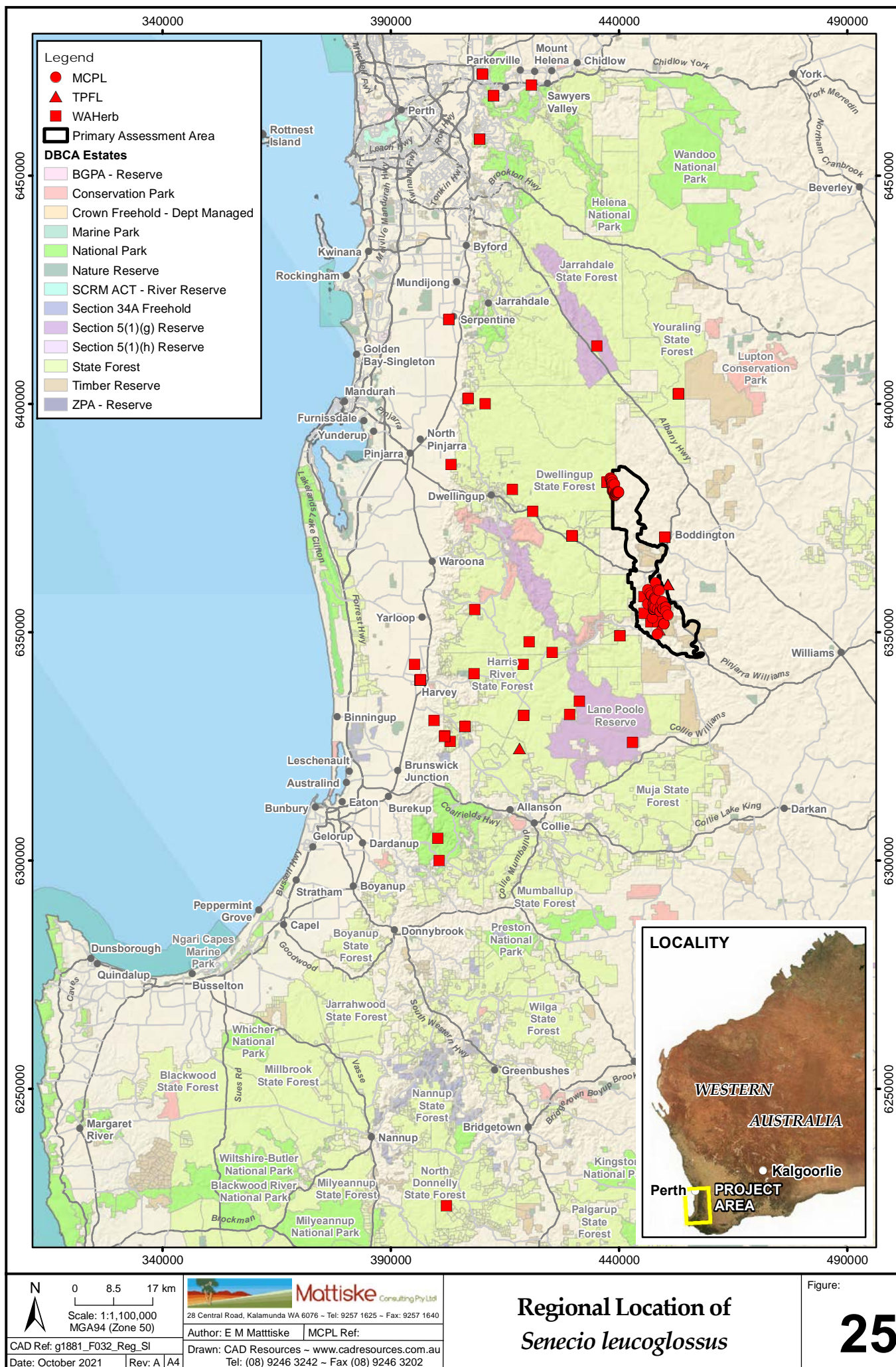
**Table 13: GPS coordinates of records of *Senecio leucoglossus* (P4) (continued)**

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
ST	438557	6382889	1	South32	Southwest Forest	Outside
S	438585	6381967	1	South32	Southwest Forest	Outside
ST	438599	6382250	1	South32	Southwest Forest	Outside
ST	438607	6380904	1	South32	Southwest Forest	Outside
ST	438746	6382384	1	South32	Southwest Forest	Inside
H	438755	6381039	1	South32	Southwest Forest	Inside
H	438822	6380965	1	South32	Southwest Forest	Inside
H	438829	6381106	1	South32	Southwest Forest	Inside
ST	438903	6381174	1	South32	Southwest Forest	Inside
S	439029	6382371	1	South32	Southwest Forest	Inside
Z	439126	6379889	1	South32	Southwest Forest	Inside
PS	439207	6380098	1	South32	Southwest Forest	Inside
PS	439281	6380165	1	South32	Southwest Forest	Inside
ST	439287	6380306	1	South32	Southwest Forest	Inside
ST	439294	6380448	1	South32	Southwest Forest	Inside
ST	439361	6380374	1	South32	Southwest Forest	Inside
ST	439368	6380515	1	South32	Southwest Forest	Inside
Z	439422	6380159	1	South32	Southwest Forest	Inside
ST	439441	6380582	1	South32	Southwest Forest	Inside
ST	439509	6380509	1	South32	Southwest Forest	Inside
ST	439583	6380576	1	South32	Southwest Forest	Inside
Z	439650	6380502	1	South32	Southwest Forest	Inside
S	439731	6380711	1	South32	Southwest Forest	Inside
S	439798	6380637	1	South32	Southwest Forest	Inside
S	439872	6380704	1	South32	Southwest Forest	Inside
S	439939	6380630	1	South32	Southwest Forest	Inside
	440184	6349147	1	South32	Southwest Forest	Outside
	440209	6349196		WAHerb	Southwest Forest	Outside
	443054	6325931		WAHerb	Southwest Forest	Outside
CL - Ag	445487	6357764		WAHerb	Mt Saddleback	Inside
M	445507	6354105		WAHerb	Mt Saddleback	Inside
Rehab	446339	6359299	1	South32	Mt Saddleback	Inside
Rehab	446404	6356154	1	South32	Mt Saddleback	Inside
Rehab	446843	6358517	1	South32	Mt Saddleback	Inside
P	447013	6352229	1	WAHerb	Mt Saddleback	Inside
Rehab	447065	6358150	1	South32	Mt Saddleback	Inside
Rehab	447421	6353157	1	South32	Mt Saddleback	Inside
Rehab	447540	6356150	1	South32	Mt Saddleback	Inside
ST	447670	6355037	1	South32	Mt Saddleback	Inside
Rehab	447684	6355506	1	South32	Mt Saddleback	Inside
Rehab	447790	6357320	1	South32	Mt Saddleback	Inside
Rehab	447939	6357500	1	South32	Mt Saddleback	Inside
Rehab	447942	6355515	1	South32	Mt Saddleback	Inside
Rehab	447993	6357248	1	South32	Mt Saddleback	Inside
Rehab	448076	6360849	1	South32	Mt Saddleback	Inside
Rehab	448401	6349581	1	South32	Mt Saddleback	Inside
Rehab	448485	6354997	1	South32	Mt Saddleback	Inside
G4	448602	6352237		WAHerb	Mt Saddleback	Inside

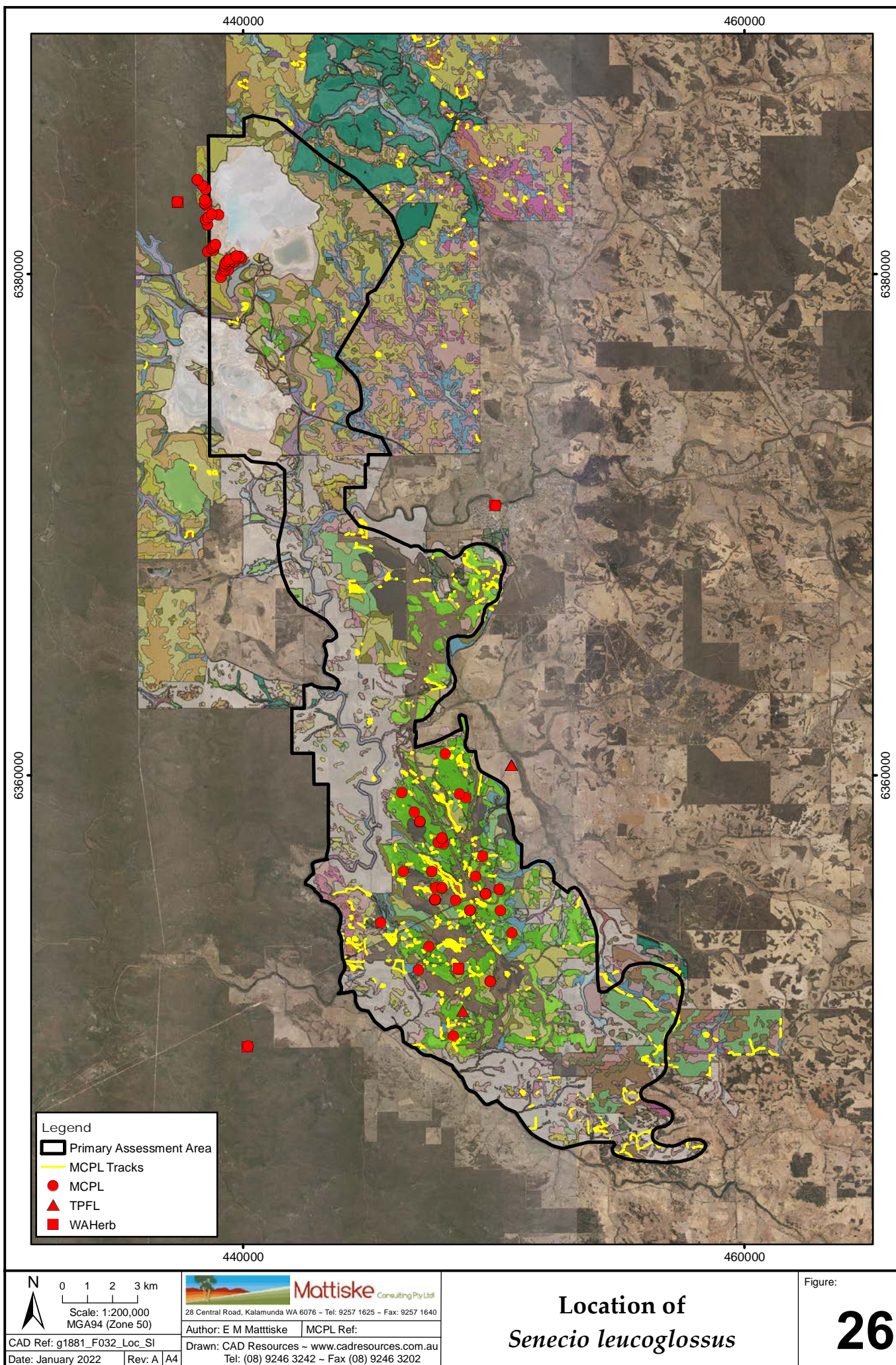


**Table 13: GPS coordinates of records of *Senecio leucoglossus* (P4) (continued)**

<b>Site_Veget</b>	<b>MGA_East</b>	<b>MGA_North</b>	<b>Popn</b>	<b>Project</b>	<b>Area</b>	<b>PAA</b>
G4	448602	6352274	1	South32	Mt Saddleback	Inside
Rehab	448639	6359249	1	South32	Mt Saddleback	Inside
Rehab	448776	6350593	1	South32	Mt Saddleback	Inside
Rehab	448896	6359098	1	South32	Mt Saddleback	Inside
P	449069	6354611	1	South32	Mt Saddleback	Inside
Rehab	449289	6355950	1	South32	Mt Saddleback	Inside
S	449568	6356759	1	South32	Mt Saddleback	Inside
Rehab	449688	6355251	1	South32	Mt Saddleback	Inside
ST	449872	6351764	1	South32	Mt Saddleback	Inside
	450066	6370759	1	South32	Boddington	Outside
	450097	6370759		WAHerb	Boddington	Outside
Rehab	450239	6355451	1	South32	Mt Saddleback	Inside
Rehab	450288	6354601	1	South32	Boddington	Inside
	450726	6360396	1	South32	Boddington	Outside
Rehab	450738	6353702	1	South32	Boddington	Inside
	453039	6402146		WAHerb	Southwest Forests	Outside
	453039	6402183	1	WAHerb	Southwest Forests	Outside
	453039	6402184	1	WAHerb	Southwest Forests	Outside









## **ADDENDUM - *Stylidium marradongense* (P3)**

The following is a summary of information as available, up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects, data is continually being collected and from this increase in information and knowledge, there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Stylidium marradongense* (P3) is known from 15 records at the State Herbarium and as such extends from multiple occurrences on the eastern fringes of the Jarrah forest and in the Wheatbelt.

### **Regional and Local Background Knowledge**

*Stylidium marradongense* (P3) was recorded and collected in the Forty Hollow Road area in the Mt Saddleback area by D. Halford during the Worsley Alumina Phase One studies (Dames and Moore 1982) within the P site-vegetation type dominated by an open forest of Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) on sandy-gravelly soils.

Previous records in a regional and local context are summarized in Figures 27 and 28.

### **Recent Survey Effort**

The occurrence of the species in the Boddington area has extended into Jarrah-Marri-Sheoak (*Eucalyptus marginata* – *Corymbia calophylla* – *Allocasuarina fraseriana*) (H site-vegetation type), Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) (P site-vegetation type) and Jarrah – Bull Banksia – Marri (*Eucalyptus marginata* – *Banksia grandis*, *Corymbia calophylla*) (S site-vegetation type) forests on sandy-gravelly to gravelly soils, Figure 28, with minor occurrences in G3 and Y. Targeted survey effort undertaken in the spring months of 2019 until January 2020 has focussed on these habitat types (refer to Figure 28). This species has also been recorded in rehabilitation areas during the Worsley annual monitoring on rehabilitation established in 1999 and 2001.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded as part of Phase One for South32 by Dames and Moore (1982) and the Mattiske teams within mainly the H, P and S site-vegetation types.

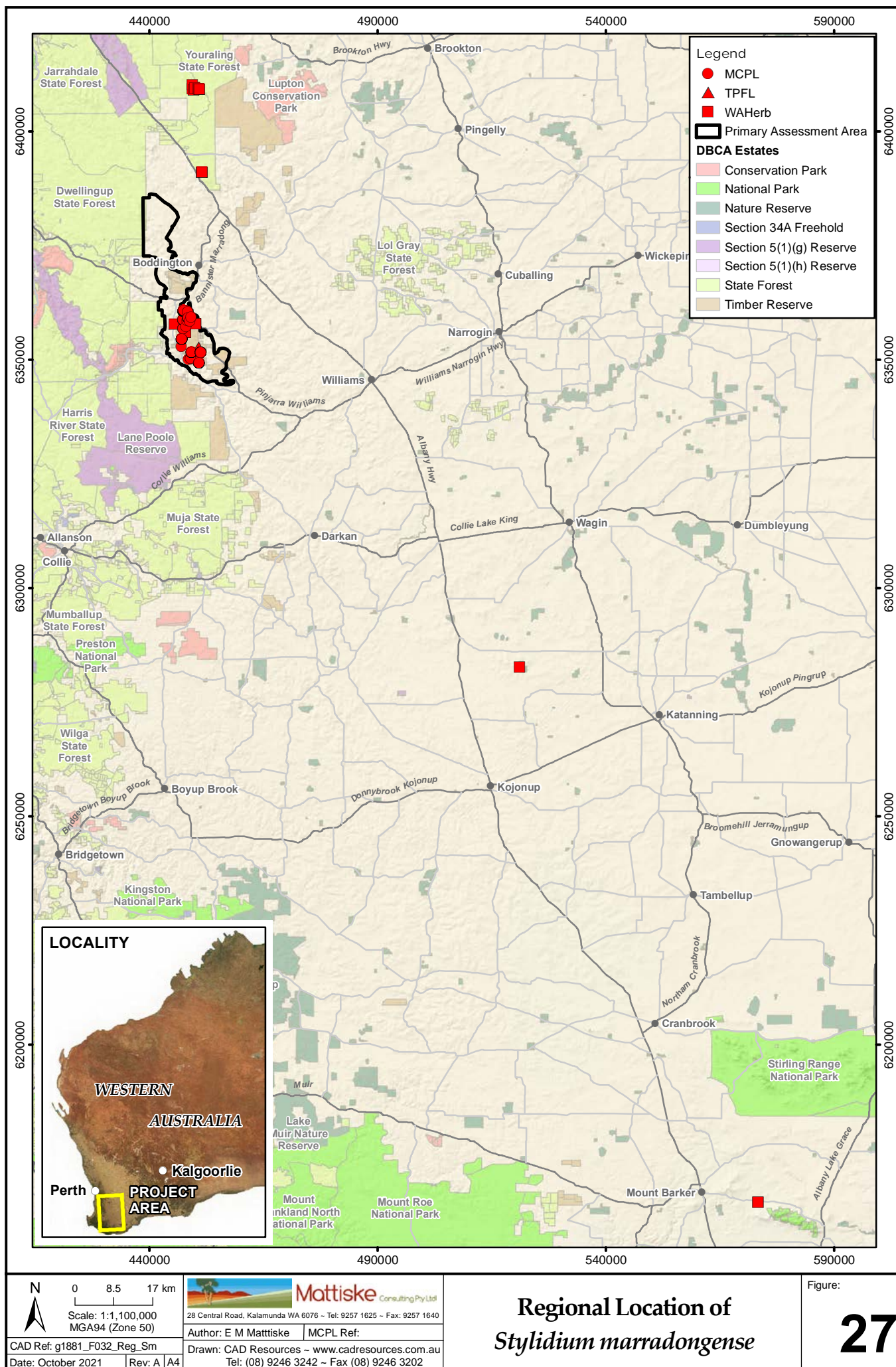
### **Summary**

*Stylidium marradongense* (P3) is known from 15 records at the State Herbarium and as such extends from multiple occurrences on the eastern fringes of the Jarrah forest and in the Wheatbelt. The concentration of recordings within the PAA reflect the survey effort in the area and the establishment of the species in rehabilitation areas. With further regional efforts it is expected that this species will be recorded northwards of Albany Highway on the eastern fringes of the State Forest.

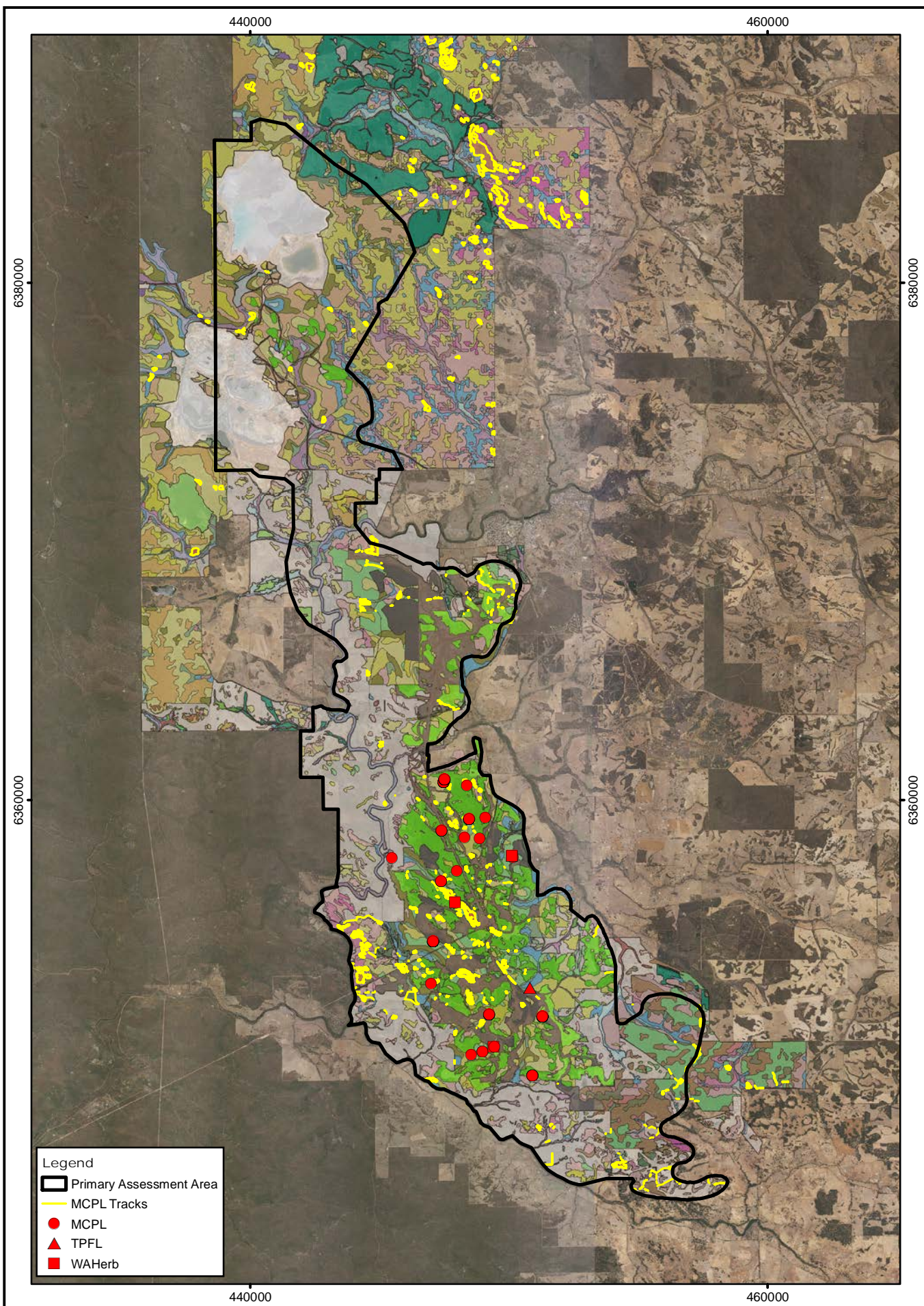
**Table 14: GPS coordinates of records of *Stylidium marradongense* (P3)**

WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
CL-Ag	445487	6357764	1	WAHerb	Mt Saddleback	Inside
Rehab	447000	6352892	1	South32	Mt Saddleback	Inside
P	447080	6354531	1	South32	Mt Saddleback	Inside
P	447390	6356850	1	South32	Mt Saddleback	Inside
Rehab	447408	6358809	1	South32	Mt Saddleback	Inside
S	447481	6360690	1	South32	Mt Saddleback	Inside
S	447519	6360797	1	South32	Mt Saddleback	Inside
P	447928	6356003	20	South32	Mt Saddleback	Inside
G3	447935	6356042	1	WAHerb	Mt Saddleback	Inside
Rehab	447993	6357248	1	South32	Mt Saddleback	Inside
H	448302	6358540	1	South32	Mt Saddleback	Inside
Rehab	448389	6360559	1	South32	Mt Saddleback	Inside
P	448463	6359276	1	South32	Mt Saddleback	Inside
H	448558	6350147	1	South32	Mt Saddleback	Inside
Rehab	448879	6358509	1	South32	Mt Saddleback	Inside
Rehab	449000	6350271	1	South32	Mt Saddleback	Inside
Rehab	449095	6359322	1	South32	Mt Saddleback	Inside
Rehab	449244	6351704	1	South32	Mt Saddleback	Inside
Rehab	449415	6350445	1	WAHerb	Mt Saddleback	Inside
	449430	6410110	30	WAHerb	North Bannister	Outside
	449434	6409334	100	WAHerb	Youraling State Forest	Outside
CL	449452	6350468	1	South32	Mt Saddleback	Inside
	449717	6409114		WAHerb	State Forest	Outside
	449726	6409170	1	WAHerb	Boddington Gold Mine	Outside
	449902	6409558		WAHerb	State Forest	Outside
	449933	6409510	1	WAHerb	Boddington Gold Mine	Outside
S	450131	6357825	1	WAHerb	Mt Saddleback	Inside
S	450131	6357826	1	WAHerb	Boddington Gold Mine	Inside
S	450162	6357788		WAHerb	Marradong	Inside
	450739	6409287	1	WAHerb	Boddington Gold Mine	Outside
	450749	6409341		WAHerb	State Forest	Outside
Y	450816	6352728	Frequent	WAHerb	Mt Saddleback	Inside
Rehab	450920	6349336	1	South32	Mt Saddleback	Inside
	450938	6409231		WAHerb	State Forest	Outside
	450944	6409225	1	WAHerb	Boddington Gold Mine	Outside
	450953	6409238	1	WAHerb	Boddington Gold Mine	Outside
H	451307	6351623	1	South32	Mt Saddleback	Inside
	451496	6391053		South32	Mt Saddleback	Outside
	451527	6391090		WAHerb	Mt Saddleback	Outside
	451527	6391091		South32	Boddington Gold Mine	Outside
	521062	6282725		WA Herb	Wingedyne Nature Reserves	Outside
	573312	6165478		WAHerb	Porongurups	Outside







- Legend
- Primary Assessment Area
  - MCPL Tracks
  - MCPL
  - ▲ TPFL
  - WAHerb

N  
0 1 2 3 km  
Scale: 1:200,000  
MGA94 (Zone 50)

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CAD Ref: g1881\_F032\_Loc\_Sm  
Date: January 2022 Rev: A A4

## Location of *Stylidium marradongense*

Figure:

# 28

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## **ADDENDUM - *Synaphea panhesya* (P1)**

The following is a summary of information as available up until September 2021 and as reported in Assessment of Flora and Vegetation on Worsley Mine Expansion Primary Assessment Area (Mattiske, 2021). This Addendum supplements the information as collated by Mattiske Consulting (2021) and South32 Environmental Review Document (ERD). In all projects data is continually being collected and from this increase in information and knowledge there will be shifts regularly in local and regional datasets. This extends to the currency of available data from State and Federal datasets which are regularly updated and reviewed.

### **State Herbarium records**

*Synaphea panhesya* (P1) is known from 16 records at the State Herbarium and as such extends from multiple occurrences located on the northern fringes of the Jarrah forest, to the north of the Julimar State Forest.

### **Regional and Local Background Knowledge**

*Synaphea panhesya* (P1) was recorded and collected in the Forty Hollow Road area in the Mt Saddleback area by D. Halford during the Worsley Alumina Phase One studies (Dames and Moore 1982) within the P site-vegetation type, dominated by an open forest of Jarrah-Sheoak (*Eucalyptus marginata* – *Allocasuarina fraseriana*) on sandy-gravelly soils.

Previous records in a regional and local context are summarized in Figures 29 and 30.

### **Recent Survey Effort**

The occurrence of the species in the Boddington area was restricted to a localised area near the Forty Hollow Road heath areas within the Jarrah forest. Recent work in nearby areas including the P site vegetation type, heath and forest areas (Jarrah, Wandoo and Powder Wandoo) in close proximity to the P site vegetation type during 2019 and 2020 have not located additional plants.

### **Limitations**

Previous State Herbarium records do not delineate the population numbers as this requirement is a recent introduction on data collection needs.

### **Site-Vegetation Types**

The occurrence at Mt Saddleback was recorded as part of Phase One for South32 by Dames and Moore (1982) within the P site-vegetation type on the fringes of heath areas.

### **Summary**

The occurrence of the species in the Boddington area is a range extension from the main occurrences on the northern fringes of the Northern Jarrah Forest. Table 15. Despite additional searching in Jarrah-Sheoak, Wandoo and Powder Wandoo woodlands, as well as in nearby heath areas no additional plants have been recorded.

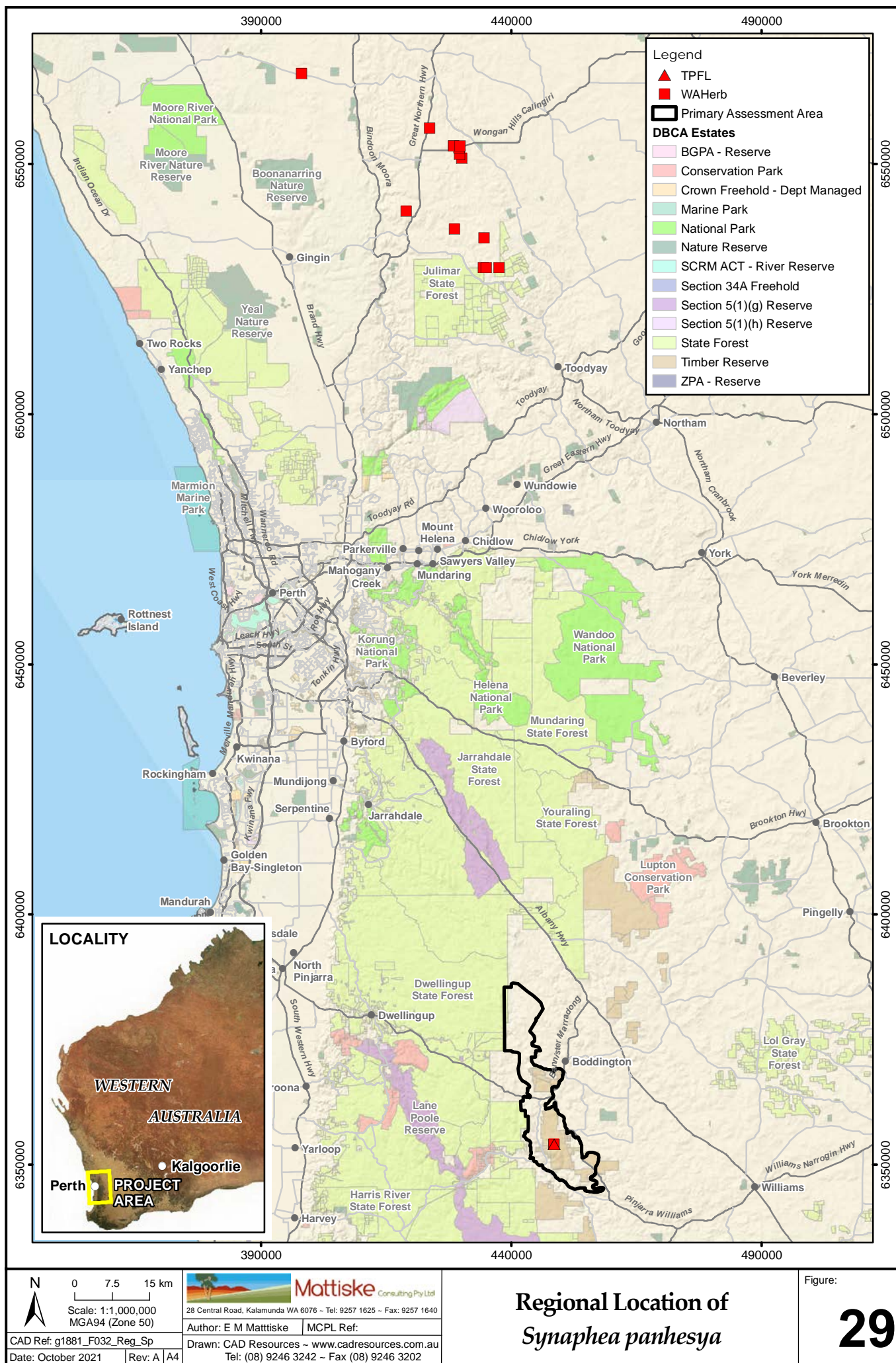


**Table 15: GPS coordinates of records of *Synaphea panhesya* (P1)**

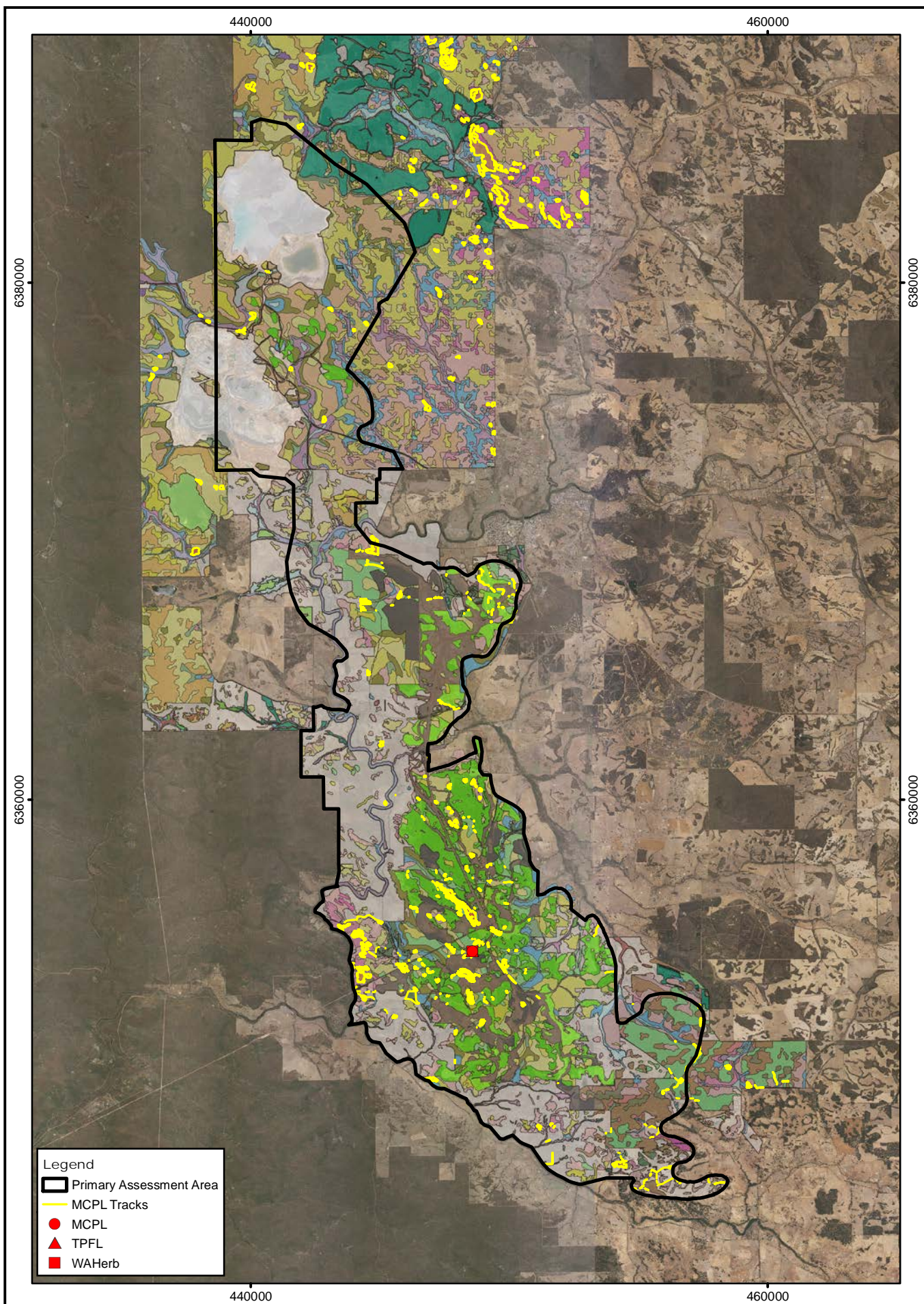
WAHERB – includes data from Florabase (WAH 1998-) and also DBCA databases managed and supplied from WH Herbarium. South32 includes plants collected during Phase One (Dames and Moore 1982) and Phase Two (Worsley Alumina Pty Ltd 1985), by site personnel or seed collectors and through regular work by the Mattiske teams.

<i>Site_Veget</i>	<i>MGA_East</i>	<i>MGA_North</i>	<i>Popn</i>	<i>Project</i>	<i>Area</i>	<i>PAA</i>
P	448592	6354122	<b>3</b>	South32	Mt Saddleback	Inside
	434478	6529297	common-scattered	South32	Northern areas of Jarrah Forest	Outside
	435048	6529301	common, scattered	South32	Northern areas of Jarrah Forest	Outside
	437616	6529317	estimated 15000 plants	South32	Northern areas of Jarrah Forest	Outside
	434631	6535173		WAHerb	Northern areas of Jarrah Forest	Outside
	428719	6537019		WAHerb	Northern areas of Jarrah Forest	Outside
	419079	6540496		WAHerb	Northern areas of Jarrah Forest	Outside
	430148	6551105	scattered but common over a wide area.	WAHerb	Northern areas of Jarrah Forest	Outside
	429761	6551989	ca 100+ plants	WAHerb	Northern areas of Jarrah Forest	Outside
	429658	6553207	Occasional	WAHerb	Northern areas of Jarrah Forest	Outside
	428512	6553532		WAHerb	Northern areas of Jarrah Forest	Outside
	429846	6553541	Occasional	WAHerb	Northern areas of Jarrah Forest	Outside
	423719	6557156		WAHerb	Northern areas of Jarrah Forest	Outside
	398153	6568025		WAHerb	Northern areas of Jarrah Forest	Outside











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