TARGETED WESTERN RINGTAIL POSSUM ASSESSMENT – LOT 32 (NO.325) TOM CULLITY DRIVE, WILYABRUP

1 INTRODUCTION

Emerge Associates (Emerge) were engaged by Montague VY No. 1 Pty Ltd ATF Montague Trust (Montague Trust) to assess the *Pseudocheirus occidentalis* (western ringtail possum) values within Lot 32 (No.325) Tom Cullity Drive in Wilyabrup. Montague Trust are proposing to develop part of this lot for additional viticultural and tourism purposes.

Lot 32 (No.325) Tom Cullity Drive in Wilyabrup (referred to herein as the 'site') is located approximately 220 kilometres (km) south-west of the Perth Central Business District within the City of Busselton. The site is approximately 40.1 hectares (ha) in size and is bounded by Tom Cullity Drive to the east and rural lots to the south, west and north. The location and extent of the site is shown in **Figure 1**.

1.1 Purpose and scope of works

The scope of work was specifically to undertake a 'targeted' survey for western ringtail possum (WRTP) with reference to the *Environmental Protection Authority's* (EPA's) technical guidance (EPA 2020) and the *Environment Protection and Biodiversity Conservation Act Survey Guidelines for Australia's Threatened Mammals* (DSEWPaC 2011). This was undertaken as part of addressing a request for further information by the federal Department of Water, Agriculture and Environment (DAWE) to support a referral pursuant to the federal *Environment Biodiversity and Conservation Act 1999*.

Given the large size of the site, the survey was limited to the areas proposed to be impacted (shown in **Figure 1**) and immediately adjacent areas. These areas are herein collectively referred to as the 'survey area' and comprise two portions (western and eastern) as shown in **Figure 1**.

As part of this scope of work, the following tasks were undertaken:

- Desktop assessment of relevant background information pertaining to the site and surrounds.
- Diurnal and nocturnal field surveys to determine evidence of use of the survey area by WRTP.
- Identification of potential habitat for WRTP.
- Documentation of the desktop assessment, survey methodology and results into a letter report.

1.2 Western ringtail possum

The WRTP is listed as critically endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* and under the *Biodiversity Conservation Act 2016* in Western Australia.

The WRTP is an arboreal marsupial species that is endemic to the south west of Western Australia. The species has a fragmented distribution but approximately follows the coastline from Dawesville in the north to Waychinicup National Park in the east. Inland populations occur near Collie, Perup and Manjimup (DPaW 2017).

WRTPs occur in a range of habitats, including *Agonis flexuosa* (peppermint) woodlands, near-coastal heath and forests comprised of *Eucalyptus gomphocephala* (tuart), *Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah) or *Eucalyptus diversicolor* (karri). Habitat critical to the species survival within the Swan Coastal Plain management zone (in which the site lies) is defined as 'long unburnt mature remnant peppermint woodlands with high canopy continuity and high nutrient foliage with minimal periods of summer moisture stress, and habitat connecting patches of remnants' (DPaW 2017).

WRTPs are nocturnal and forage at night. Their diet comprises almost exclusively dominant and co-dominant upper and mid-storey myrtaceous plants such as peppermint, marri and jarrah. Additionally, WRTPs may also forage on some non-native plant species (DPaW 2017).

During the day WRTP utilise diurnal refuge sites which may include dreys (nests built from plant material), platforms, tree hollows, hollow logs, *Xanthorrhoea* spp. (grasstree) skirts, sedges, forest debris, disused rabbit warrens and roof spaces (DPaW 2017).

1.3 Previous survey

Emerge Associates (2020) previously undertook a basic fauna and targeted black cockatoo assessment over the site, which included mapping of fauna habitat and black cockatoo habitat trees (diameter at breast height ≥50 centimetre).

Seven fauna habitat types were identified within the site, of which four occur within the survey area: '**marri and jarrah forest**', '**marri and jarrah forest – limited understorey**', '**scattered trees and shrubs**' and '**predominantly cleared area**', as shown in **Figure 2** (Emerge Associates 2020).

The **marri and jarrah forest** and **marri and peppermint forest** habitats, and to a lesser extent **marri and jarrah forest – limited understorey** habitat were identified as potentially suitable for WRTP. Additionally, Emerge Associates (2020) identified a WRTP drey within the **marri and peppermint forest** habitat, as shown in **Figure 2**.

Emerge Associates (2020) identified 337 black cockatoo habitat trees within a defined 'tree survey area', which comprised part of the WRTP survey area. Three of these trees contained hollow(s) that are 'suitable' for breeding by black cockatoos and two trees contained hollow(s) that were 'potentially suitable' for breeding by black cockatoos. These hollows may also provide suitable habitat for WRTPs. Additional smaller hollows that are too small for black cockatoos but suitable for WRTPs may occur in the site.

2 METHODS

2.1 Field survey

A zoologist and an ecologist from Emerge visited the site on 23 and 25 March 2021 to undertake the field survey. The field survey comprised one diurnal survey and two nocturnal surveys as detailed in **Table 1**.

Table 1: Summary of WRTP surveys undertaken in the site

Date	Duration	Type of survey
23/03/2021	07:00 PM to 11:45 PM	Nocturnal
25/03/2021	09:00 AM to 12:00 PM	Diurnal
25/03/2021	07:00 PM to 11:00 PM	Nocturnal

2.1.1 Weather conditions

The weather conditions on all survey days were warm and mostly dry. Temperatures during the survey period ranged from a daily minimum of 7.6°C to a daily maximum of 22.7°C as recorded by the Witchcliffe weather station (no. 009746), which is the closest temperature recording weather station located approximately 25.7 km south of the site (BoM 2021). The Cowaramup weather station (no. 009636), which is the closest weather station located approximately 4.6 km south-east of the site, recorded 0 millimetres (mm) of rainfall throughout the survey period. However, light rainfall was noted in the site during both nocturnal surveys. The wind speeds at the Witchcliffe weather station during the survey period ranged from 15 km per hour (km/h) to 20 km/h as measured at 3 PM.

The weather records for the survey period are summarised in **Table 2** below.

Table 2: Summary of WRTP surveys undertaken in the site and weather records during the survey period (BoM 2021)

Date	Type of survey	Maximum and minimum temperatures	Rainfall (mm)	Wind (km/h) measured at 3 PM
23/03/2021	Nocturnal	11.3 – 19.1°C	0	20
25/03/2021	Diurnal	10.7 – 20.9 °C	0	17
25/03/2021	Nocturnal	7.6 – 22.7 °C	0	15

2.1.2 Diurnal survey

During the diurnal survey transects were walked across the survey area and active searches for secondary evidence of WRTP presence such as scats, dreys, tracks or skeletal remains were carried out. The locations of secondary evidence of WRTPs were recorded using a handheld GPS unit. Where secondary evidence of WRTP presence was opportunistically observed outside of the survey area but within the site it was also noted.

Notes were also made on the presence of potential WRTP habitat such as known foraging plants and tree hollows, where observed.

2.1.3 Nocturnal survey

The nocturnal survey comprised spotlighting for WRTP individuals. The survey area was traversed on foot and the vegetation was searched using high-powered torches. The torches were used to detect the presence of WRTPs through eye-shine. When eye-shine was observed, the individual was confirmed to be a WRTP using binoculars and the number of WRTP individuals present was noted. Where WRTP individuals were opportunistically observed outside of the survey area but within the site they were also recorded.

The location of each WRTP observed was recorded with a hand-held GPS unit.

2.2 Survey limitations

It is important to note the specific constraints imposed on surveys and the degree to which these may have limited survey outcomes. An evaluation of the survey methodology against standard constraints outlined in the EPA's document *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020) is provided in **Table 3**.

Table 3: Evaluation of survey methodology against standard constraints outlined in the EPA's Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020)

Constraint	Degree of limitation	Details
Level of survey	No limitation	A targeted WRTP survey comprised of one diurnal and two nocturnal surveys was undertaken. The level of survey and effort are considered adequate to assess the WRTP values within the site.
Scope	No limitation	The survey focused on identifying direct and secondary evidence of WRTP presence in the site.
Proportion of fauna identified, recorded and/or collected.	No limitation	All direct and indirect possum sightings were identified to species level. The number of WRTP individuals recorded were considered consistent with the size of the survey area and the habitat conditions present on site. WRTPs were recorded in the western portion of the survey area but no scats were found during the diurnal survey. This may be due to the dense understorey vegetation present, which would have made it difficult to detect scats. However, given that the nocturnal survey was used as the primary mean of detecting WRTP presence is not considered a limitation.
Sources of information e.g. previously available information (whether historic or recent) as distinct from new data.	No limitation	Adequate information was available from previous surveys.
The proportion of the task achieved and further work which might be needed.	No limitation	The task was achieved in its entirety.
Experience level of personnel	No limitation	This fauna assessment was undertaken by a qualified zoologist and a ecologist with over three and 12-years' experience in undertaking fauna surveys in Western Australia, respectively. Both personnel have previously undertaken WRTP surveys. Technical review was undertaken by a senior ecologist with over 10 years' experience in undertaking ecological assessments in Western Australia.
Suitability of timing, weather and season	No limitation	The nocturnal surveys commenced 30 minutes after sunset which is considered ideal as WRTP emerge from their diurnal rest sites as soon as it is dark. The weather conditions during the nocturnal surveys were considered suitable. The weather conditions were mild and relatively still (refer to **Table 2**). While some rain was noted this was minimal and only for a short period and was therefore not considered a limitation. The diurnal survey was undertaken in late summer/early autumn, which would have allowed for secondary evidence such as scats to accumulate over the dry summer period. The dry weather conditions during the diurnal survey provided good visibility and therefore maximised the chance of detecting secondary evidence of WRTP.
Completeness	No limitation	The WRTP survey was completed comprehensively.
Spatial coverage and access	No limitation	The survey area was covered comprehensively (track logged).
	No limitation	All parts of the site and the survey area could be accessed as required.
Survey intensity	No limitation	The survey intensity was adequate given the relatively small size of the survey area.
Influence of disturbance	No limitation	Parts of the site are highly modified due to historical disturbance. However, no recent disturbance was noted that may have affected outcomes of the survey.
Adequacy of resources	No limitation	All resources required to perform the survey were available

3 RESULTS

3.1 Diurnal survey

A total of 6.11 km of transect was traversed over the site during the diurnal survey.

No secondary evidence of WRTP such as scats or drey were recorded within the survey area. The WRTP drey previously recorded by Emerge Associates (2020) was confirmed to still occur and no change to the drey or recent evidence of use such as scats were noted. The locations of the transects walked during the diurnal survey and the WRTP drey are shown in **Figure 3**.

Scats attributed to *Trichosurus vulpecula* (common brushtail possum) was recorded within the eastern portion of the survey area.

The survey area comprises a canopy of predominantly marri and jarrah trees, as well as scattered peppermint trees which provide a potential foraging resource for WRTPs. Potential diurnal refuges for WRTPs, such as multiple tree hollows, hollow logs and grasstrees, were recorded within the survey area.

The western portion of the survey area comprises relatively intact native vegetation with a dense mid and understorey vegetation layers. The eastern portion of the survey area has been compromised by historical disturbance and native mid and understorey vegetation is largely absent.

3.2 Nocturnal survey

A total transect length of 15.24 km on 23 March and 12.75 km on 25 March was traversed over the site during the nocturnal surveys, as shown in **Figure 4**.

One WRTP individual was recorded in the western portion of the survey area during each nocturnal survey. No WRTPs were recorded in the eastern portion of the survey area. One WRTP was also recorded outside of the survey area in the **marri and peppermint forest** habitat along the south-eastern boundary of the site during the nocturnal survey on 25 March. The locations of the WRTPs recorded during the nocturnal survey is shown in **Figure 4**.

The number of WRTPs recorded in the survey area and in the site are detailed in **Table 4**.

Table 4: Summary of WRTP recorded in the survey area and the site during the nocturnal surveys

Survey date	Survey area	No. of WRTP	Total
23/03/2021	Eastern portion	0	**1**
	Western portion	1	
	Opportunistic sighting[#]	0	
25/03/2021	Eastern portion	0	**2** (1 within survey area)
	Western portion	1	
	Opportunistic sighting[#]	1	

[#]denotes location outside of the survey area but within the site.

Multiple common brushtail possums were recorded in the survey area during the nocturnal surveys.

4 DISCUSSION

The majority of the survey area contains potential WRTP foraging, refuge and dispersal habitat of varying quality. The highest WRTP habitat values occur in the western portion of the survey area due to the presence of dense native mid and understorey vegetation. The vegetation in this area represents a small portion of a larger patch of suitable habitat both within and outside of the site.

The habitat in the eastern portion of the survey area is compromised by the lack of under and mid storey vegetation and historical clearing of most of the adjacent native vegetation, which would leave WRTPs exposed to predation. While the tree canopy in this area may be used opportunistically the habitat is considered marginal in quality, particularly in consideration of habitat requirements detailed within the recovery plan (DPaW 2017). The eastern portion of the survey area also includes some **predominantly cleared area** which would not provide habitat for WRTPs. Overall, extensive areas of similar or higher quality habitat occur adjacent to the western portion of the survey area, in particular the **marri and peppermint forest** within and adjacent to the site.

The field survey indicates that the WRTP abundance within the survey area is relatively low, given that only one WRTP was recorded in the western portion of the survey area during two nocturnal surveys, and no secondary evidence of occupation (i.e. scats) was identified. No WRTPs were recorded in the eastern portion of the survey area and WRTP use of this area is considered likely to be opportunistic and infrequent based on the marginal quality of habitat present and the lack of WRTPs evidence.

The fact that no dreys were recorded in the survey area was not surprising, given that the survey area and adjacent areas contain multiple hollow-bearing trees[1] which WRTPs may use for refuge instead of constructing dreys.

The survey area contains scattered peppermint trees but the vegetation structure does not align with that of a peppermint woodland which is listed as habitat critical to the survival of WRTPs in the Swan Coastal Plain management zone (DPaW 2017). Furthermore, vegetation connecting areas of remnant native vegetation may also represent habitat critical to the survival of WRTPs (DPaW 2017). While the vegetation within the western portion of the survey area is connected to areas of remnant native vegetation, this link will not be compromised by development within the proposed impact areas. The vegetation in the eastern portion of the survey area is currently not well connected to other areas of WRTP habitat, with sparse canopy cover between the survey area and roadside vegetation on Tom Cullity Drive. Therefore, the vegetation in the survey area does not meet the criteria of habitat critical to the survival of WRTP.

5 CONCLUSIONS

One WRTP individual was recorded in the western portion of the survey area during the nocturnal survey. No direct or indirect records of WRTP were made in the eastern portion of the survey area. The abundance of WRTPs in the survey area is therefore considered to be relatively low.

The survey area contains potential WRTP foraging, refuge and dispersal habitat of varying quality. The highest WRTP habitat values are associated with the western portion of the survey area where dense understorey vegetation is present. Habitat within the eastern portion of the survey area is of marginal quality given the lack of understorey vegetation. Extensive areas of similar or higher quality WRTP habitat are located adjacent to the survey area, both within and outside the site.

[1] It should be noted that only hollows suitable for use by black cockatoos have been previously mapped within the site. The hollow requirements of WRTP are different to that of black cockatoos. A hollow that is suitable for refuge by WRTPs may not necessarily be suitable for breeding by black cockatoos due to the large size of black cockatoos.

6 SUMMARY AND CLOSING

We trust that this letter and its attachments provide you with sufficient information regarding the western ringtail possum values within the survey area.

Yours sincerely
Emerge Associates

cc: None

Encl: Figure 1: Site Location
Figure 2: Fauna Habitat
Figure 3: Diurnal Survey Effort and Results
Figure 4: Nocturnal Survey Effort and Results

General References

Department of Parks and Wildlife (DPaW) 2017, Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan. Wildlife Management Program No. 58, Perth, WA.

Department of Sustainability, Environment, Water, Population and Communities, (DSEWPaC) 2011, Survey guidelines for Australia's threatened mammals, Canberra, ACT.

Emerge Associates 2020, Basic Fauna and Targeted Black Cockatoo Assessment - Lot 32 (No.325) Tom Cullity Drive, Wilyabrup, EP20-088(02)--004A MS, Version A.

Environmental Protection Authority (EPA) 2020, Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment, Joondalup, Western Australia.

Online References

Bureau of Meteorology (BoM) 2021, *Climate Data Online*, viewed 14 April 2021, <http://www.bom.gov.au/climate/data/>.

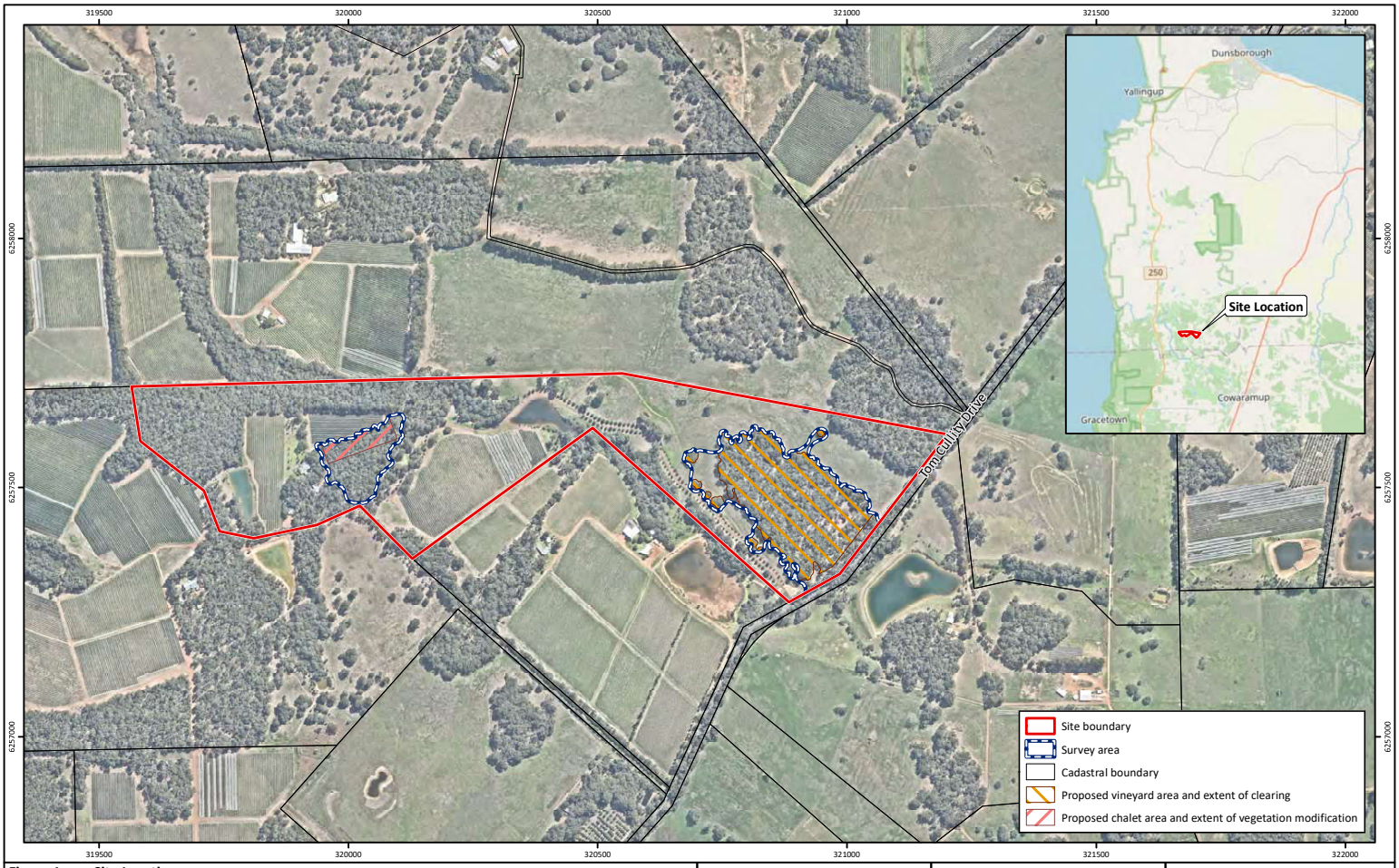

Figure 1: Site Location

Project: Targeted Western Ringtail Possum Assessment
Lot 32 (No.325) Tom Cullity Drive, Wilyabrup
Client: Montague VY No. 1 Pty Ltd ATF Montague Trust

Plan Number:
EP20-088(11)--F54
Drawn: GAR
Date: 08/04/2021
Checked: MS
Approved: RAW
Date: 13/04/2021

N

0 100 200 300
Metres
Scale: 1:10,000@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

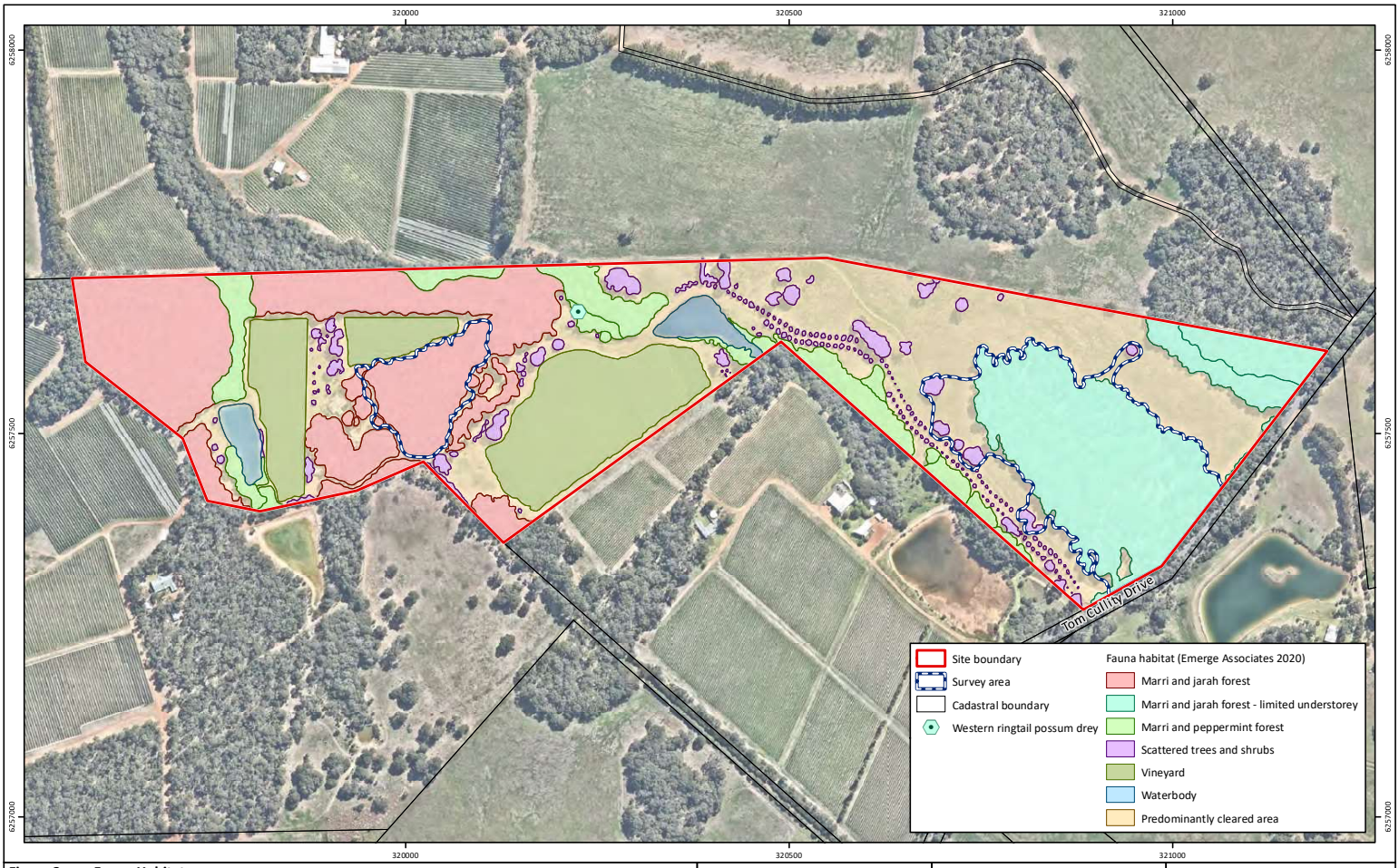

Figure 2: Fauna Habitat

Project: Targeted Western Ringtail Possum Assessment
Lot 32 (No.325) Tom Cullity Drive, Wilyabrup
Client: Montague VY No. 1 Pty Ltd ATF Montague Trust

Plan Number:
EP20-088(11)--F55
Drawn: GAR
Date: 08/04/2021
Checked: MS
Approved: RAW
Date: 13/04/2021

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Metres
Scale: 1:6,500@A4
GDA 1994 MGA Zone 50

emerge ASSOCIATES

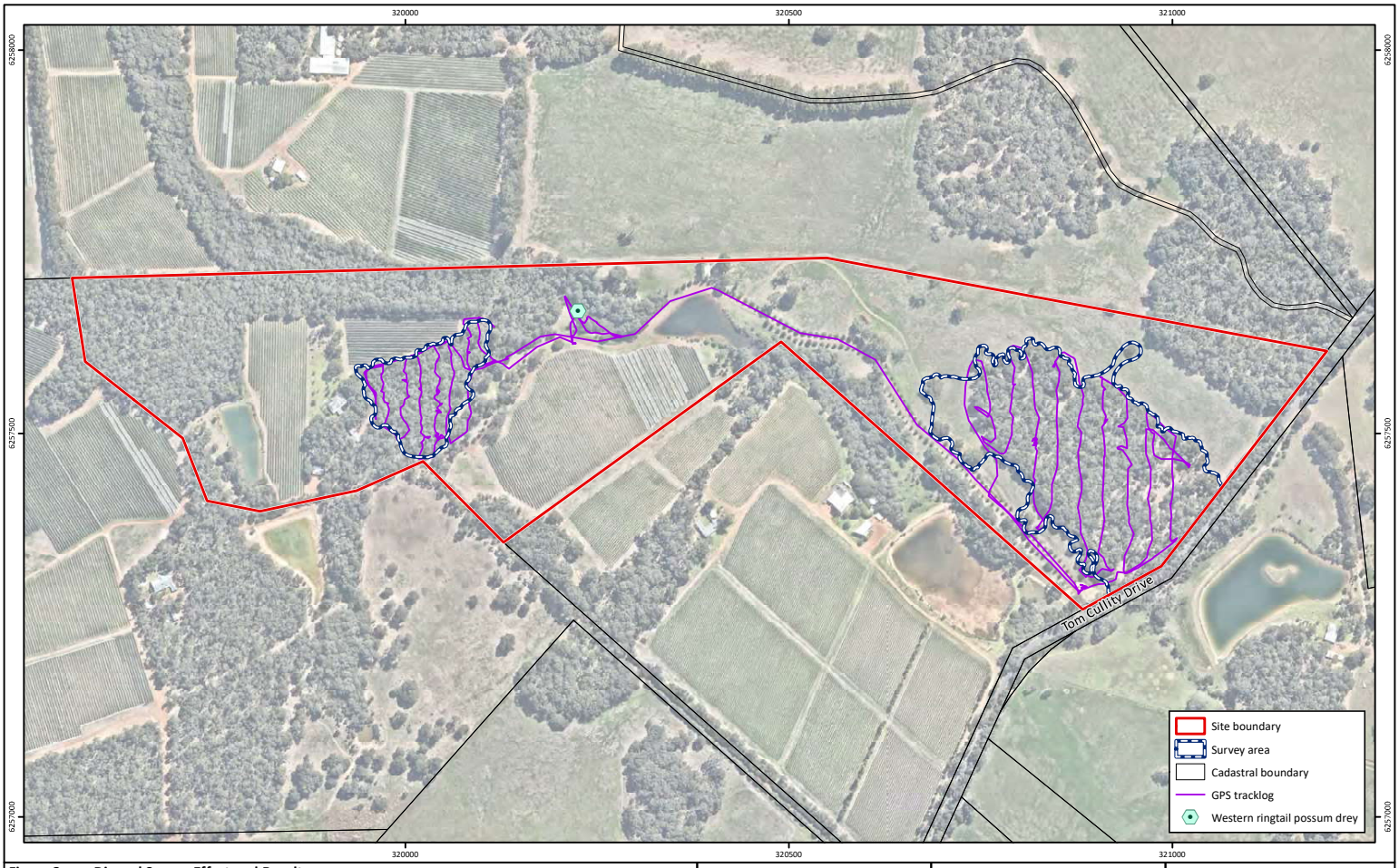

Figure 3: Diurnal Survey Effort and Results

Project: Targeted Western Ringtail Possum Assessment
Lot 32 (No.325) Tom Cullity Drive, Wilyabrup
Client: Montague VY No. 1 Pty Ltd ATF Montague Trust

Plan Number:
EP20-088(11)--F56
Drawn: GAR
Date: 08/04/2021
Checked: MS
Approved: RAW
Date: 13/04/2021

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GDA 1994 MGA Zone 50

emerge ASSOCIATES

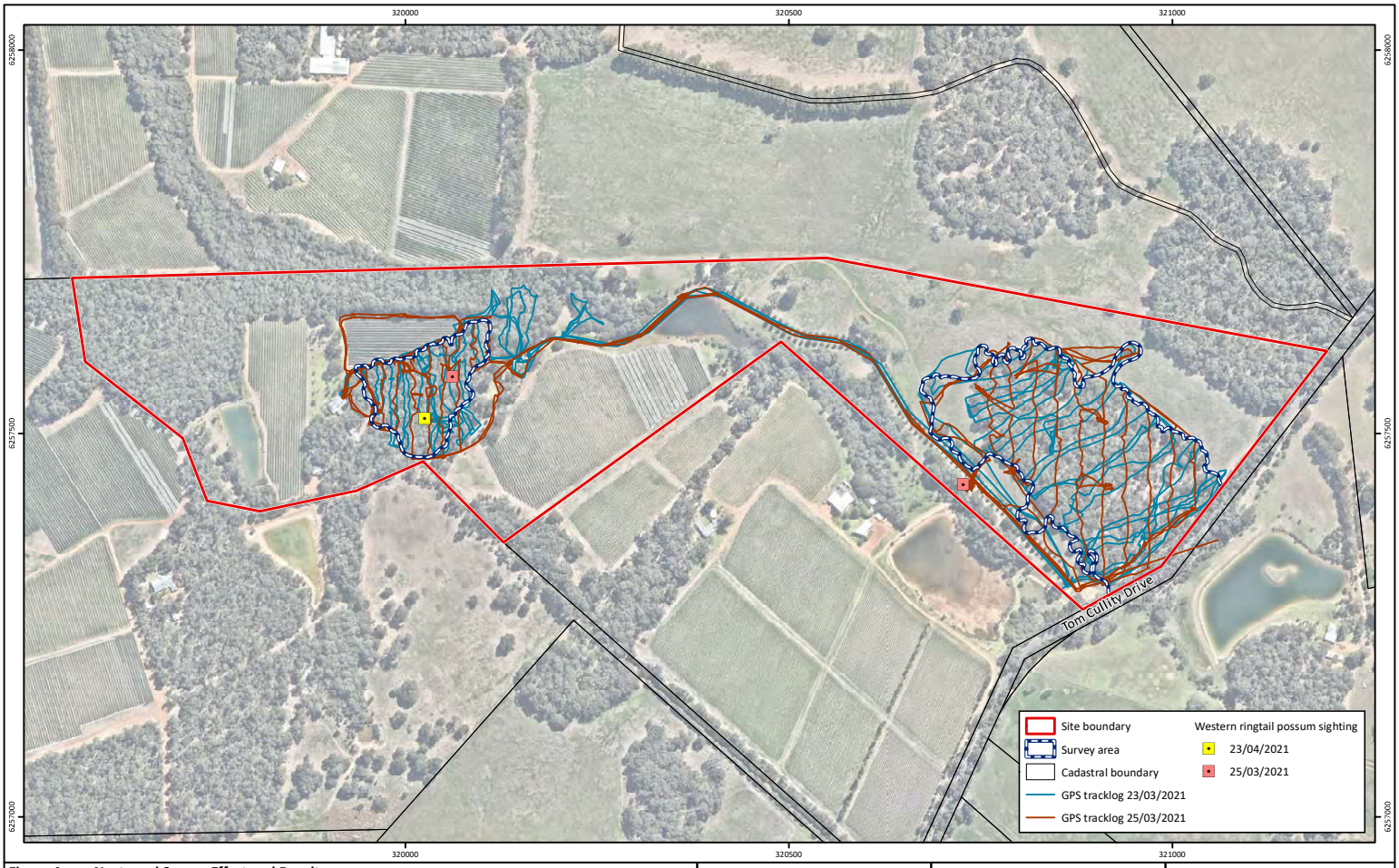

Figure 4: **Nocturnal Survey Effort and Results**

Project: Targeted Western Ringtail Possum Assessment
Lot 32 (No.325) Tom Cullity Drive, Wilyabrup
Client: Montague VY No. 1 Pty Ltd ATF Montague Trust

Plan Number:
EP20-088(11)--F57
Drawn: GAR
Date: 08/04/2021
Checked: MS
Approved: RAW
Date: 13/04/2021

N

0 100 200
Metres
Scale: 1:6,500@A4
GDA 1994 MGA Zone 50

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