

Technical Memorandum

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		Contact No.	
		Email	
		Project No.	12678068
Project Name	Targeted flora survey, Carnarvon		
Subject	Targeted flora survey Technical Memorandum		

Dear Neil and Shelly

1. Introduction

DPIRD is managing the Gascoyne Food Bowl Initiative (GFBI) in Carnarvon. Under the GFBI project in conjunction with DPLH and the Shire of Carnarvon, land was identified and released for agricultural development. The Development Lots have been issued under lease agreements, with the lessee responsible for improvement of the Lots.

Prior to the release of the Lots for horticultural development, in 2017 DPIRD commissioned flora and fauna surveys across the GFBI area. An additional target flora survey was conducted in 2020. The lessee has recently submitted clearing applications to develop the lease Lots:

- Plot 3: Lot 753 on DP420666 (Crown Reserve 53847) ~15.3 ha – CPS 11027/1;
- Plot 4: Lot 51 on DP415051 ~11.3 ha – CPS 11028/1;
- Plot 5: Lot 116 on DP202367 (Crown Reserve 53326) ~8.6 ha – CPS 11025/1

The timeframe between the original dates of the flora and fauna surveys and the current clearing application dates have raised some queries from DWER which need to be addressed to complete assessment of the applications.

1.1 Purpose of this Technical Memorandum

The purpose of this Technical Memorandum is to address DWER's Additional Information Requests (AIR):

- Assess the presence/absence of *Chthonocephalus spathulatus* (Priority 3), *Corchorus congener* (Priority 3) and *Schoenia filifolia* subsp. *arenicola* (Priority 1) onsite
- Map the condition of the native vegetation within the application area using the Trudgen, M.E. (1991) Vegetation condition scale
- Map the percentage of weed cover (particularly of Buffel grass) within the application area.

The Study Area (Plots 3, 4 and 5) was surveyed on 28-29th August 2025 by GHD Senior Botanist Pali Jayasekara and is mapped in Figure 1.

2. Scope and limitations

2.1 Scope of work

The scope of work for this project includes:

- Consider the 2017 and 2020 survey results and then complete a targeted flora and vegetation survey for the proposed clearing area consistent with the Environmental Protection Authority's (EPA) Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (December 2016). The survey is to comprise:
 - An assessment of the presence/absence of *Chthonocephalus spathulatus* (Priority 3), *Corchorus congener* (Priority 3) and *Schoenia filifolia* subsp. *arenicola* (Priority 1) onsite.
 - If these species are found, confirmation of the extent of impacts to the populations of priority flora is to be undertaken.
 - Mapping of the condition of the native vegetation within the application area using the Trudgen, M.E. (1991) Vegetation condition scale.
 - Mapping of the percentage of weed cover (particularly of Buffel grass) within the application area.
 - Draw conclusions on the suitability of habitat for Carnarvon shield-backed trapdoor spider (*Idiosoma incomptum*).
 - Identification of the presence/absence of claypans onsite. If found:
 - Draw conclusions on the suitability of habitat for *Branchinella denticulata* and *Branchinella wellardi*.
 - If any of the identified environmental values above are found, advice is to be provided on potential measures to avoid impacts on these values and/or mitigate the need for clearing.
 - Submit the survey report and data in accordance with the EPA's Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments (IBSA).

2.2 Limitations

This report: has been prepared by GHD for Department of Primary Industries and Regional Development and may only be used and relied on by Department of Primary Industries and Regional Development for the purpose agreed between GHD and Department of Primary Industries and Regional Development as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Department of Primary Industries and Regional Development arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

3. Assumptions

This document assumes that all information requested in the AIR has been provided and has been used to inform this document.

4. Methodology

As per EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016), the total study area is 35.2 ha. was systematically surveyed by using the line transect method (The Space between these transects were 20 m to 40 m) to find the presence /absence of *Schoenia filifolia* subsp. *arenicola*

(P1), *Chthonocephalus spathulatus* (P3) (Asteraceae), and *Corchorus congener* (P3) Malvaceae. Figure 2 maps the survey effort. Further to that, the percentage of weeds cover, especially Buffel grass, and the vegetation condition (Trudgen, 1991) was noted. Attention was also paid to assessing the suitability of potential habitat for the Carnarvon shield-backed trapdoor spider (*Idiosoma incomptum*), *Branchinella denticulata* and *B. wellardi*. The creek line, which is outside the survey area of plot four, was also surveyed to assess for the potential presence/absence of the target species.

5. Results

5.1 Vegetation

The soil type of plots four and five, and part of plot three, is very similar, with each having a clay loam or sandy clay loam soil profile. The similar soil type across the three plots meant that each plot had similar vegetation. None of these plots featured a dominant tree layer. The shrub layer is dominated by *Atriplex bunburyana* and *Alectryon oleifolius*. There is no dominant herbaceous layer in all three plots, but *Trichodesma zeylanicum* var. *grandiflorum* is quite common in plots four and five. The understorey for each of the three plots is dominated by two species of Buffel grass (*Cenchrus ciliaris* and *Cenchrus setiger*), along with a few weed species. Based on Trudgen's (1991) vegetation scale, vegetation in the Study Area was categorised as poor (Figure 3).

Plot three has two habitats, and a small area contains a clay pan. The understorey of the other areas is very dense and dominated by *C. ciliaris* and *C. setiger*., *Vachellia farnesiana* (Fabaceae) and *Rumex vesicarius* (Environmental weed) population were mapped. In addition to the well-established weed population, there was evidence of grazing, attributable to cattle and rabbits.

The clay pan area is not a typical freshwater clay pan; and appears to be relatively saline, as indicated by three different Atriplex species, *Atriplex semilunaris*, *Atriplex holocarpa* and *Atriplex bunburyana* established across the site. There is no herbaceous layer in the claypan area.

The north and eastern boundaries of plot 4 are bordered by a creek line. The creek line to the northern end is wider than the eastern end. The western end of the plot is dominated by *Pluchea rubelliflora* shrubs. *P. rubelliflora* usually grows in clayish creek lines. Having this species in the eastern end suggests that this area is likely to be inundated during the rainy season. In addition to the high density of two different species of Buffel grass, two populations of *Rumex vesicarius* were recorded.

Plot five is the smallest of the plots and has vegetation characteristics similar to plot four. The only difference is that *Rumex vesicarius* and *P. rubelliflora* were not recorded in this plot.

There was no apparent improvement in vegetation structure since the 2017 and 2020 surveys, in fact there appears to have been further degradation. This indicates that while it is possible that vegetation communities can change in 5 years it is very much dependent on local circumstances.



Plate 1 Plot 3 Photo



Plate 2 Plot 5 Photo



Plate 3 Plot 4 Photo 1



Plate 4 Plot 4 Photo 2

5.2 Conservation significant flora species

This survey did not record the occurrence of the target plant species requested by DWER. The dense population of the perennial Buffel grass, provides limited access to sunlight for the annual herbaceous species to germinate and establish. Two of the three conservation-significant species targeted are annuals and grow in direct sunlight. *Chthonocephalus spathulatus* grows in a similar soil type; other environmental factors do not support the existence of this species. Another two conservation-significant species do not grow in clay loamy soils.

Schoenia filifolia subsp. *arenicola* (P1)

Schoenia filifolia subsp. *arenicola* has been collected three times in WA, and two of which were collected near the survey area. The first collection was made in 1959, and the last collection was made in 1977 (Western Australian Herbarium, 1998-). According to Mike Hislop (WA Herbarium), several recent attempts were made to recollect this species but failed, and it is presumed extinct now. This species is confined to the sandhills in the Carnarvon area

and is named *arenicola*, meaning sand dweller (Wilson, 1992). GHD senior botanist Pali Jayasekara is quite confident that this species does not occur in the three study plots as sand hills do not occur across the three plots.

Chthonocephalus spathulatus (P3)

Chthonocephalus spathulatus (P3) is an annual species requires direct sunlight for its growth and prefers reddish brown sandy clay. Similar to the species name, it signifies a distinct spatulate leaf; therefore, is easy to identify this species in the field. All three study plots feature clay loam or sandy clay loam soil. Therefore, it is possible to find this species in the study area. However, Buffel grass density is too high in the area, and therefore does not provide a suitable habitat for the species to become established across these plots. The species was not recorded as occurring at this survey.

Corchorus congener (P3)

Corchorus congener is a woody perennial shrub that grows in open shrubland and hummock grassland communities, mostly on sandy plains and sand dunes but also on loamy soils derived from limestone (Halford, 1996). None of the three plots studied has the above-mentioned soil type. Further, this species has not been recorded in the Carnarvon area before, and the closest place is 250 km north of the study area (WA herbarium).

5.3 Conservation significant fauna species

Assessment of the clay pan and vulnerable crustacean

As mentioned above, plot three has a small patch of clay pan. However, this clay pan doesn't show any signs of short-term water. Therefore, there is no possibility for short-lived crustaceans, *Branchinella denticulata* and *B. wellardi* occurring in this clay pan.

Habitat for Carnarvon shield- backed trapdoor spider (Idiosoma incomptum).

These spiders typically prefer near-coastal habitats. However, extensive searches were carried out to find evidence of their presence. The understorey grass layer reported at these sites is too thick for this spider therefore does not provide a suitable habitat.

5.4 Environmental weeds

Rumex vesicarius

DBCA reports, *R. vesicarius* as an environmental weed. During this survey, three populations of this species were noted: one population in plot three and two populations in plot four (Figure 4). Since this species produces many seeds that remain viable in the soil seed bank for a long time, it is hard to control (Schatral et al., 2008).



Plate 5 *Rumex vesicarius*

6. References

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Appendices

Appendix A

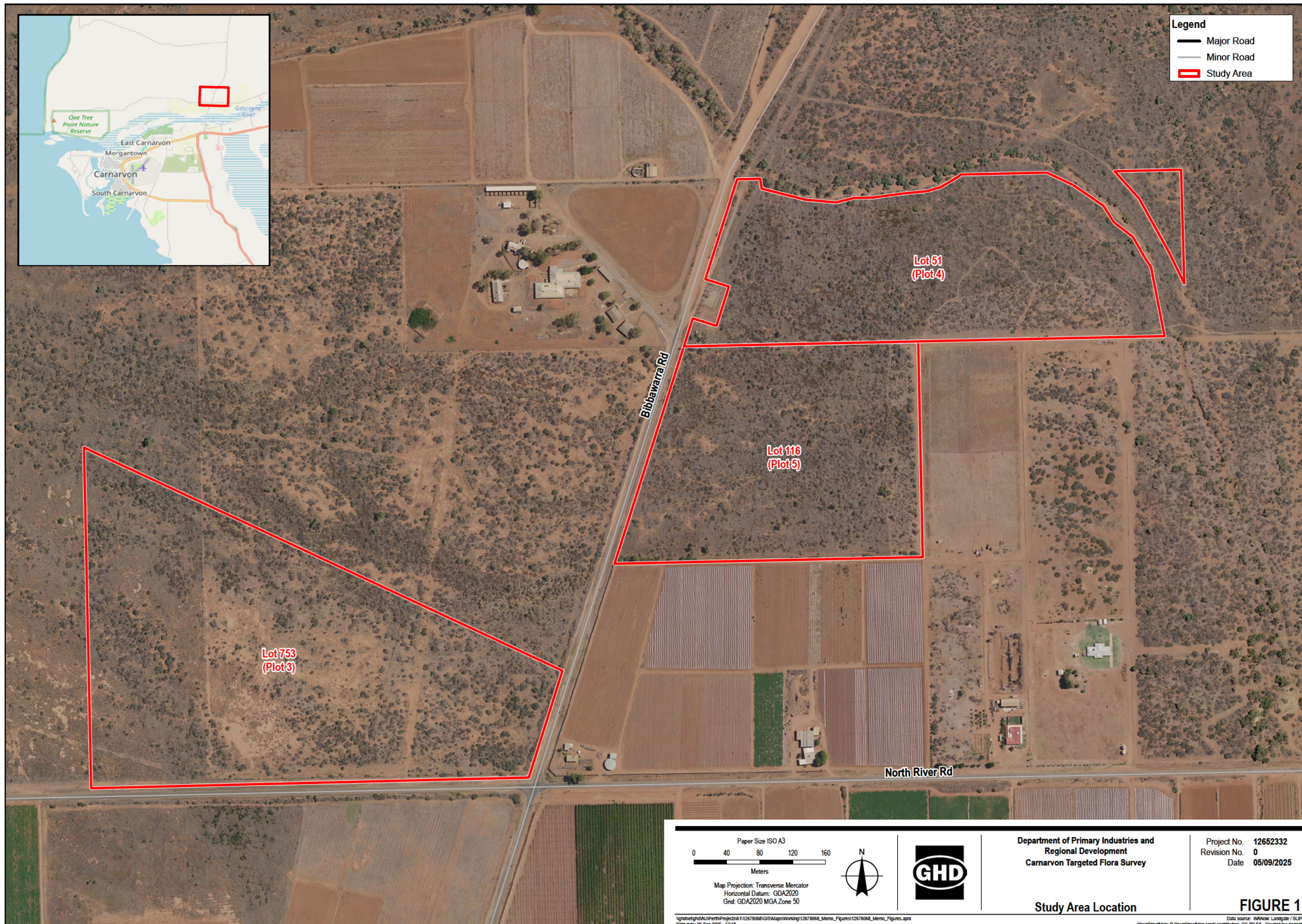
Figures

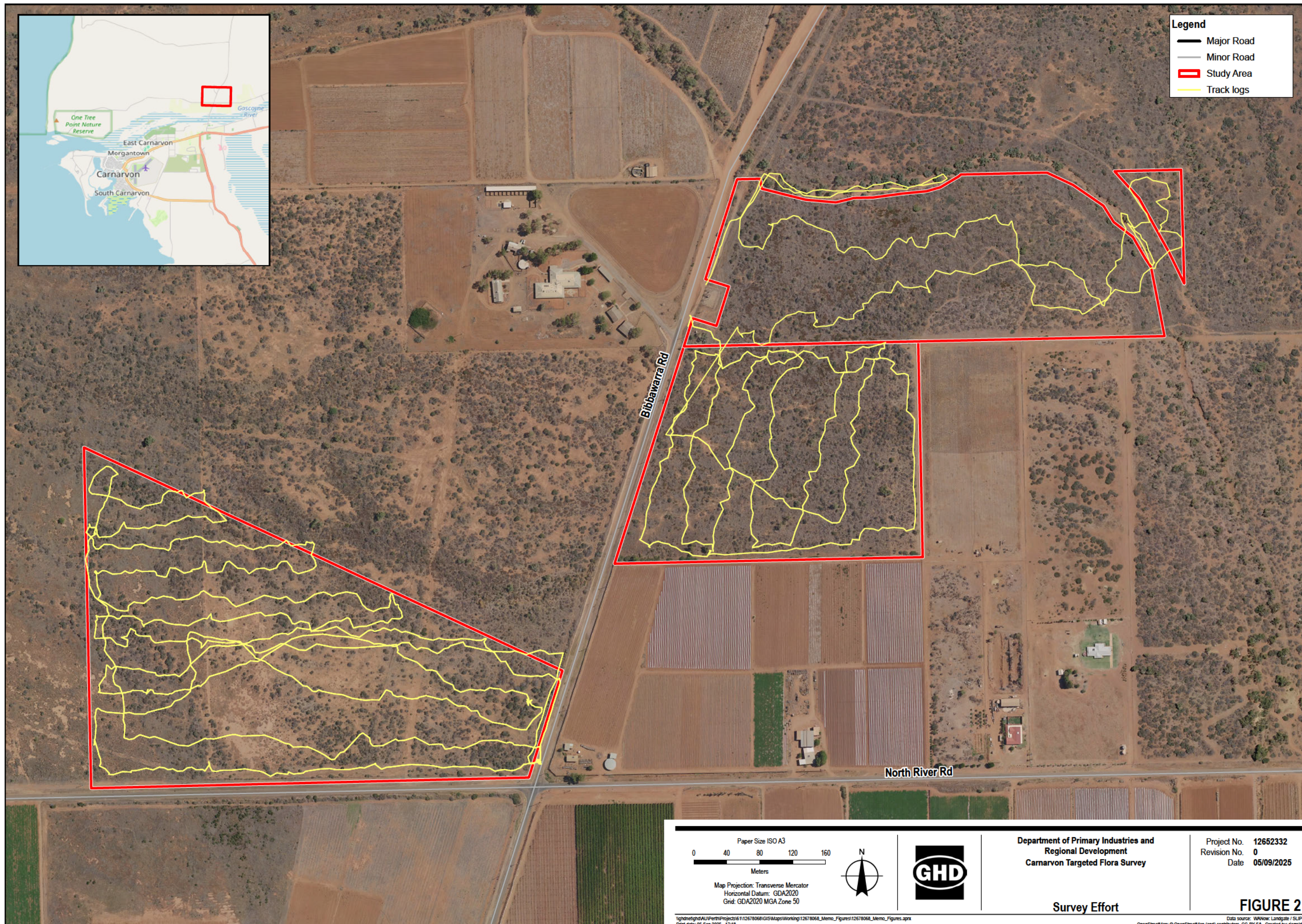
Figure 1 *Study Area Location*

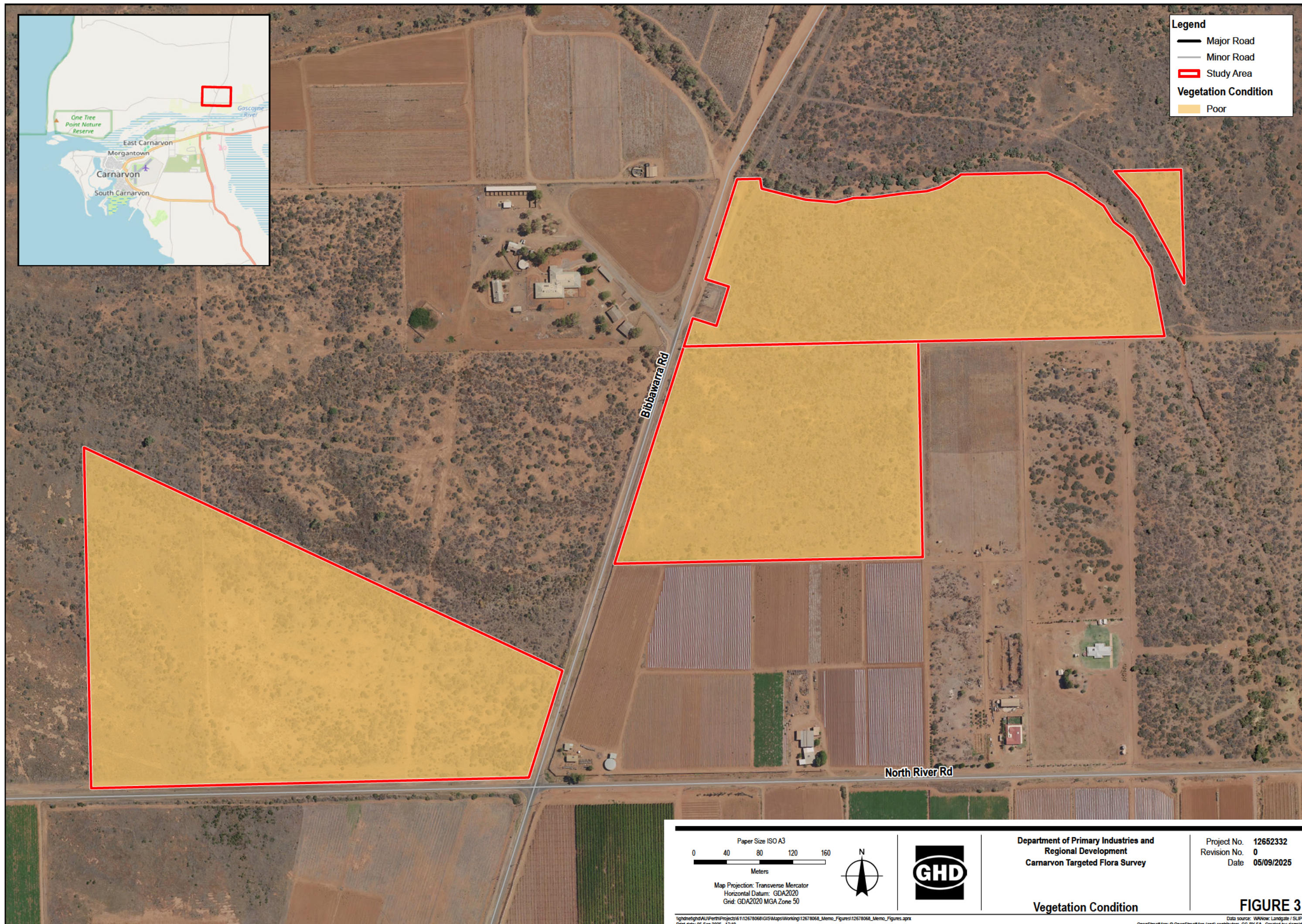
Figure 2 *Survey Effort*

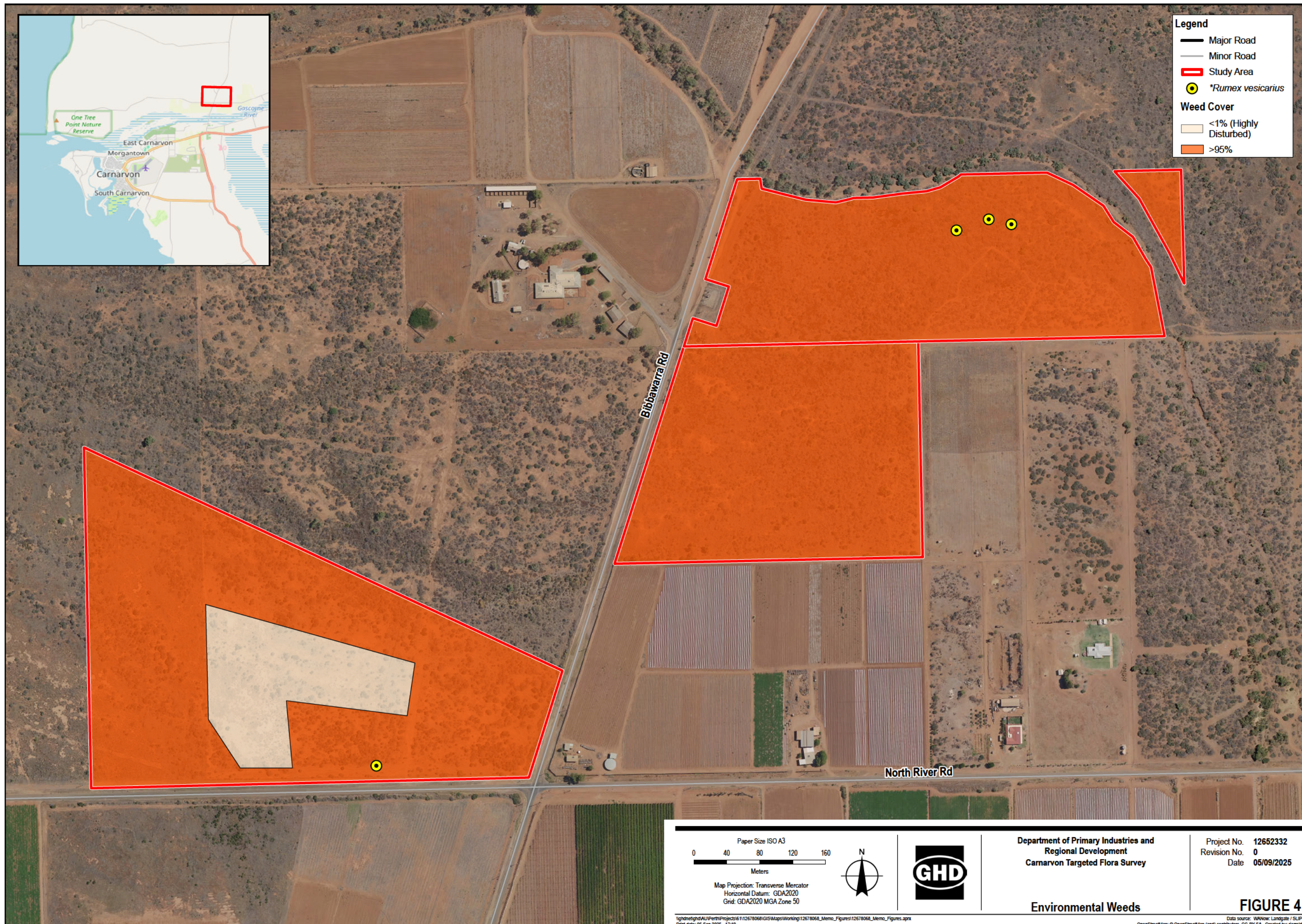
Figure 3 *Vegetation Condition*

Figure 4 *Environmental Weeds*

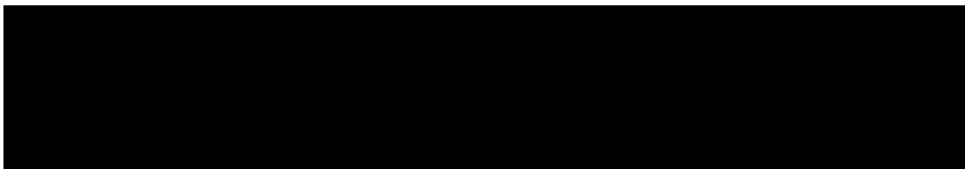
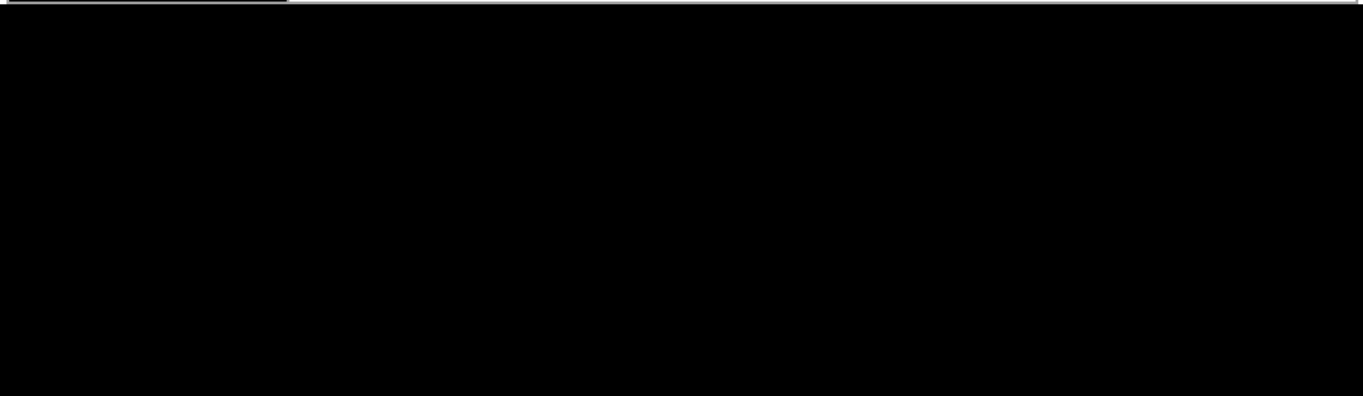








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