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Ginninderry – Pink-tailed Worm-lizard survey and habitat mapping of NSW land

Capital Ecology project no. 2866

Dear Mr Maxwell,

This letter-report provides the results of the 2018 and 2019 Pink-tailed Worm-lizard *Aprasia parapulchella* (PTWL) targeted survey and habitat mapping undertaken by Capital Ecology encompassing the NSW portion of the Ginninderry project area (hereafter termed the 'study area', approx. 606 ha). This survey was performed to reconfirm the extent and condition of the PTWL habitat as mapped by Osborne and Wong[1] in 2011/12. Figure 1 shows the study area in the Ginninderry and West Belconnen locality.

Osborne and Wong (2013) combined fine-scale GIS-based mapping of potential PTWL habitat with an extensive field survey program to ground-truth the habitat mapping and determine the presence/absence of the species within each patch of mapped potential habitat. The PTWL habitat was catergorised as either *"Suitable Habitat (moderate and high quality habitat combined as a mapping unit)"* or "*Low Quality Habitat (highly disturbed and degraded habitat that is likely to no longer support the species)"*. Across the whole Ginninderry project area, a total of 162.8 ha of PTWL habitat was mapped comprising 152.1 ha of suitable habitat and 10.7 ha of low quality habitat (Figure 2). As detailed in the Strategic Assessment Report[2], the development area for Ginninderry has been designed to retain

[1] Osborne and Wong (2013). *The extent of habitat for the vulnerable Pink-tailed Worm Lizard (Aprasia parapulchella) in the West Belconnen – Ginninderra Creek investigation area - confirmatory distribution surveys and mapping.* Institute for Applied Ecology University of Canberra. 10 May 2013.
[2] Umwelt (2017). *West Belconnen Project Strategic Assessment – Strategic Assessment Report*. March 2017.

and conserve 146.4 ha of the mapped PTWL habitat within the West Belconnen Conservation Corridor. The remaining 16.4 ha (10.2 ha of suitable habitat and 6.2 ha of low quality habitat) is located within the development area.

In 2017, Capital Ecology[3] re-confirmed the accuracy of the survey and habitat mapping completed by Osborne and Wong in sections of the ACT portion of the Ginninderry project area. Capital Ecology's study indicated that the Osborne and Wong mapping is likely to provide a valid and accurate reflection of the current PTWL habitat extent and condition throughout the Ginninderry project area.

Notwithstanding the above, this survey and mapping project has been commissioned to reassess the extent and quality of the PTWL habitat in the section of the Ginninderry project area which occurs in NSW (i.e. the PTWL habitat in the NSW portion of the development area and the NSW portion of the West Belconnen Conservation Corridor). This will ensure that the forthcoming decision-making process for the NSW rezoning proposal (submitted in 2014) is informed by the best available information.

Methods

The targeted surveys occurred on Friday 19 October 2018 (a sunny day with minimum temperature of 5.5 °C and maximum of 27.8 °C[4]), Wednesday 20 March 2019 (a sunny day with minimum temperature of 12.2 °C and maximum of 28.8 °C), and Friday 22 March 2019 (a partly cloudy day with minimum temperature of 16.7 °C and maximum of 22.5 °C). As search success appears to be greatest following rain, the surveys were timed to occur following light to moderate rain received across the west Belconnen locality during the week preceding each survey. These conditions were considered appropriate for PTWL survey. Approximately 80 person-hours were spent during the survey (three to four ecologists for approximately 24 hours).

Prior to the on-ground inspection of the previously mapped PTWL habitat, Capital Ecology analysed 2018 aerial imagery in order to identify additional potential habitat (i.e. areas containing surface rock) across the study area.

All previously mapped patches of PTWL habitat and identified additional patches of potential PTWL habitat in the study area were inspected to assess the following.

1. The habitat quality using the classification/categorisation detailed by Osborne and Wong (2013), under 'Habitat Classification' in that report. Using the same habitat classification/categorisation ensures that any differences in the mapping are due to on-ground habitat change or mapping corrections, rather than differences in classification etc.

2. The current extent of the patch. Any observed differences were mapped in the field directly onto high resolution field maps.

The remainder of the study area was also inspected during the field survey to ensure that all patches of rocky habitat were identified and included in the above described habitat assessment.

Each previously mapped patch of PTWL habitat, and any identified additional patches of potential PTWL habitat, were surveyed for PTWL individuals or sloughed skins. The survey intensity and method were consistent with that used by Osborne and Wong (2013) and involved the following.

[3] Capital Ecology (2018). *Ginninderry – Pink-tailed Worm-lizard survey and habitat mapping*. Project 2772. 29 May 2018.

[4] Bureau of Meteorology records for nearest weather station, Canberra Airport.

- Searches for PTWL by carefully turning rocks over and then placing them back into position.
- Turning a minimum of 500 rocks per patch (considered adequate for confirming occurrence at large sites based on averages for detection presented in Jones 1999[5]), or until a PTWL individual or sloughed skin was found and thus presence in the patch confirmed. Where it was not possible to turn 500 rocks because of a shortage of surface rock, all possible rocks were turned.

When discovered, each PTWL was classified as either an adult (≥12 cm total length), juvenile (≤12 cm total length), or soughed skin, and the position recorded via a handheld GPS.

The above survey methodology is consistent with the Commonwealth Survey Guidelines[6].

Results

PTWL Habitat Mapping

Plates 1 and 2 show representative patches of suitable (comprising moderate and high) and low quality PTWL habitat. In total across the NSW portion of the Ginninderry project area (i.e. including both the development area and West Belconnen Conservation Corridor), 39.85 ha of suitable habitat and 4.50 ha of low quality habitat were recorded, which is in contrast to the 16.64 ha of suitable habitat and 2.89 ha of low quality habitat recorded by Osborne and Wong in 2011/12 (Figure 3 and 4, Table 1).

With respect to the NSW portion of the development area only, 5.09 ha of suitable habitat and 2.63 ha of low quality habitat were recorded, in contrast to the 0.54 ha of suitable habitat and 2.06 ha of low quality habitat recorded by Osborne and Wong in 2011/12 (Figure 3 and 4, Table 1). All of the suitable PTWL habitat was confined to the western section of the development area, as was the majority of the low quality habitat.

With respect to the NSW portion of the West Belconnen Conservation Corridor only, 34.76 ha of suitable and 1.87 ha of low quality habitat were recorded, which is in contrast to the 16.11 ha of suitable habitat and 0.82 ha of low quality habitat recorded by Osborne and Wong in 2011/12 (Figure 3 and 4, Table 1). 95% of the habitat in the NSW portion of the West Belconnen Conservation Corridor was classified as suitable.

Of the 44.35 ha of PTWL habitat within the NSW portion of the Ginninderry project area, 82.6% (36.63 ha) occurs in the West Belconnen Conservation Corridor and 17.4% (7.72 ha) in the development area.

PTWL Targeted Survey

Figure 4 illustrates the location of the PTWL recorded during the 2018/19 surveys. In total, 57 PTWL were detected, comprised of 29 live PTWL and 28 PTWL sloughed skins (refer Plate 3 to 5, Figure 4). Of the 29 live PTWL recorded, three were juveniles (≤12 cm total length). Of the 57 total PTWL records (i.e. individuals plus sloughed skins), 41 were found a substantial distance from habitat as mapped by Osborne and Wong (2013). Of the remaining records, six were found in habitat mapped by Osborne and Wong (2013) as suitable habitat and one in habitat mapped as low quality habitat.

[5] Jones, S.R. (1999). *Conservation biology of the pink-tailed worm lizard (Aprasia parapulchella)*. PhD thesis Applied Ecology research group, University of Canberra.
[6] Department of Sustainability Environment, Water, Population and Communities (2011). *Survey guidelines for Australia's threatened reptiles.* Commonwealth of Australia, Canberra.

Table 1. The area of mapped PTWL habitat in the study area, as recorded by Osborne and Wong in 2011/12 and Capital Ecology in 2018/19

Assessment area	Habitat quality	2011/12 (Osborne and Wong)	2018/19 (Capital Ecology)	Percent change in mapped habitat
Ginninderry project area (NSW only)	Suitable	16.64 ha	39.85 ha	+ 140 %
	Low	2.89 ha	4.50 ha	+ 56 %
	Total	**19.53 ha**	**44.35 ha**	**+ 127 %**
Development area (NSW only)	Suitable	0.54 ha	5.09 ha	+ 843 %
	Low	2.06 ha	2.63 ha	+ 28 %
	Total	**2.60 ha**	**7.72 ha**	**+ 197 %**
West Belconnen Conservation Corridor (NSW only)	Suitable	16.11 ha	34.76 ha	+ 116 %
	Low	0.82 ha	1.87 ha	+ 128 %
	Total	**16.93 ha**	**36.63 ha**	**+ 116 %**

Discussion

Capital Ecology (2018) highlighted the accuracy of the survey and habitat mapping completed by Osborne and Wong in the ACT portion of the Ginninderry project area. In contrast, while the general location of PTWL habitat identified by Osborne and Wong in the NSW portion of the Ginninderry project area is generally consistent with Capital Ecology's 2018/19 surveys, the habitat extent is not. As a result, in the NSW portion of the Ginninderry project area the current study has identified an additional 23.21 ha of suitable habitat and 1.61 ha of low quality habitat. This is comprised of an additional 4.55 ha of suitable habitat and 0.57 ha of low quality habitat in the development area, and an additional 18.65 ha of suitable habitat and 1.05 ha of low quality habitat in the West Belconnen Conservation Corridor. It is important to note that Dr David Wong (co-author of Osborne and Wong [2013]) has previously expressed doubts on the classification of some of the mapped patches of PTWL habitat in NSW. It is unclear why Dr Wong expressed these doubts; however, it does help explain why there is such a discrepancy in mapped PTWL habitat in the NSW portion of the Ginninderry project area, but not in the ACT portion.

Due to its steep topography the land throughout the West Belconnen Conservation Corridor has been historically disturbed to a lesser degree than the land in the development area. This has resulted in reduced impacts from pasture improvement, cultivation, and stock. It is reasonable to assume that this would be true in both NSW and the ACT. The previous mapping by Osborne and Wong (2013) showed a marked decrease in the amount of suitable habitat in the steeply sloping areas of the NSW portion of the West Belconnen Conservation Corridor. This is somewhat unexpected given that the landscape features across these areas are similar to those in the ACT. As such, the difference in the mapped PTWL habitat between the NSW portion and the ACT portion of the West Belconnen Conservation Corridor as shown in Osborne and Wong (2013) is surprising.

As shown in Figures 3 to 5, the revised mapping as detailed in this report indicates that the prevalence, distribution and quality of PTWL habitat in the steeply sloping areas of the NSW portion of the West Belconnen Conservation Corridor are indeed similar to that in the ACT portion of the West Belconnen Conservation Corridor. As discussed, this observation concurs with the topography of the land and its land use history.

In light of the above, the habitat quality and extent mapping described in this report should supersede the Osborne and Wong (2013) mapping for the NSW portion of the Ginninderry project area.

Taking into account the PTWL habitat mapping from Capital Ecology (2018), Osborne and Wong (2013)[ACT only], and this report, the revised PTWL habitat across the whole of the Ginninderry project area (i.e. both the ACT portion and NSW portion of the project area) can be determined (Figure 5). A total of 188.3 ha of PTWL habitat is mapped, comprising 175.5 ha of suitable habitat and 12.8 ha of low quality habitat. Of that, 167.5 ha will be retained and conserved within the West Belconnen Conservation Corridor and 20.8 ha (14.5 ha of suitable habitat and 6.3 ha of low quality habitat) is located within the development area. This represents an impact to conservation ratio of 1 to 8.05, which is broadly consistent with the previous ratio of 1 to 8.93 that was based on the Osborne and Wong (2013) mapping and approved via the West Belconnen Project Strategic Assessment (Umwelt 2017). Importantly, with reference to the requirements of the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012[7]) and associated Offsets Assessment Guide (i.e. the offsets calculator), the revised impact to conservation ratio is substantially in excess of that which is required to offset the impacts associated with the proposed development (i.e. approximately 393%).

We trust that this letter-report provides the information required. If, however, you should have any questions relating to this letter-report, please do not hesitate to contact us.

Yours sincerely,

Robert Speirs

Director / Principal Ecologist

Dr Sam Reid

Consultant Ecologist

Attachments:

Plates 1 to 5. Photographs of PTWL habitat and PTWL recorded during the 2018/19 survey

Figure 1. Locality Plan

Figure 2. PTWL habitat in the Ginninderry Project Area (Osborne & Wong 2013)

Figure 3. 2018/19 PTWL habitat mapping - overview

Figure 4. 2018/19 PTWL habitat mapping and survey results – detail

Figure 5. Revised PTWL habitat mapping – Ginninderry project area

[7] Commonwealth of Australia (2012). *EPBC Act Environmental Offsets Policy*. Commonwealth Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Plates 1 to 5. Photographs of PTWL habitat and PTWL recorded during the 2018/19 survey

Plate 1: Suitable habitat. Note: the groundcover is dominated by native grasses, particularly Kangaroo Grass *Themeda triandra* and Red-leg Grass *Bothriochloa macra*.

Plate 2: Low quality habitat. Note: the groundcover is dominated by exotic pasture grasses, particularly Phalaris *Phalaris aquatica*.

Plate 3: PTWL found during the 2018/19 survey.

Plate 4: PTWL found during the 2018/19 survey.

Plate 5: PTWL and PTWL sloughed skin found during the 2018/19 survey.

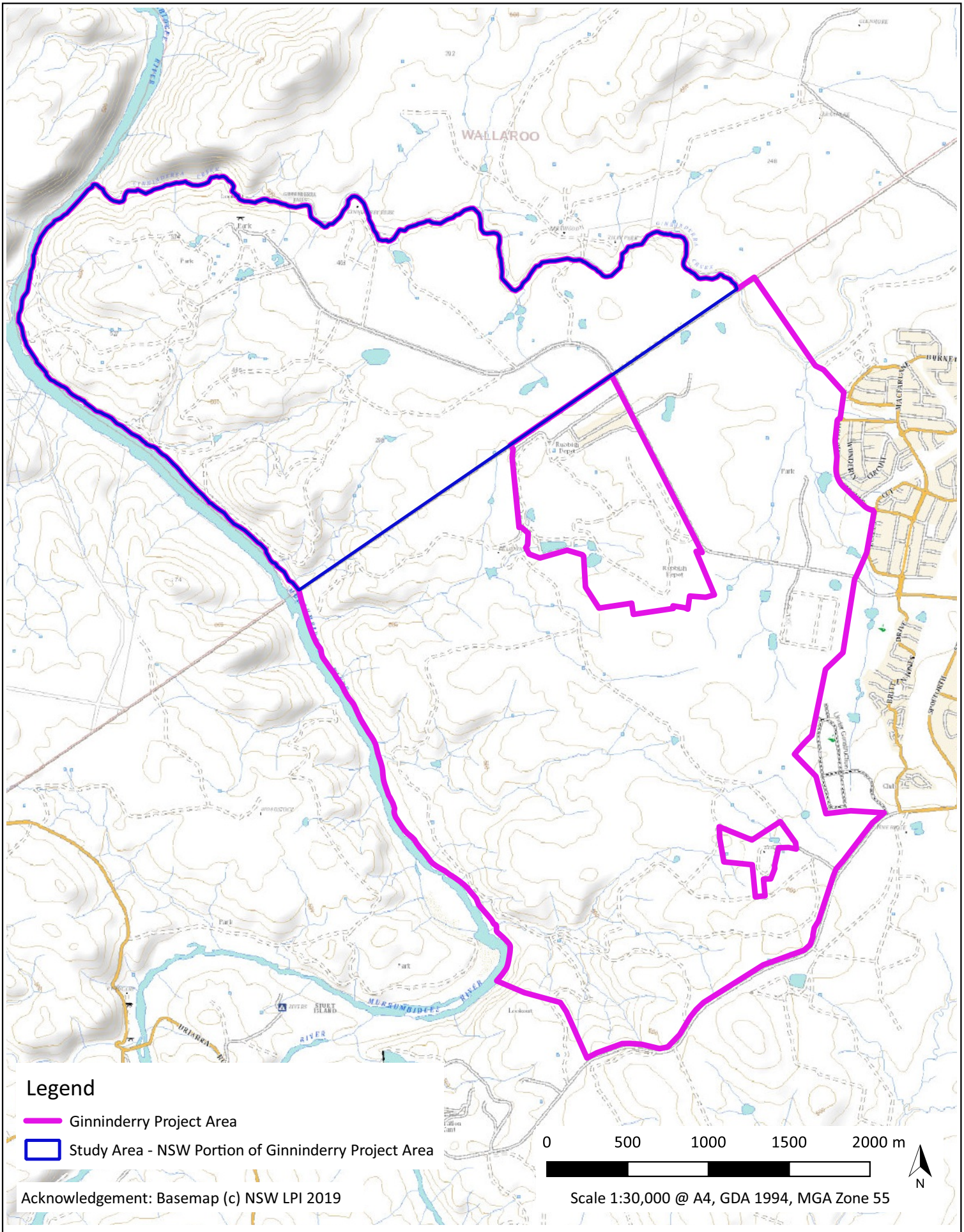

Figure 1. Locality Plan

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Drawn by: S. Reid
Date: 28 March 2019

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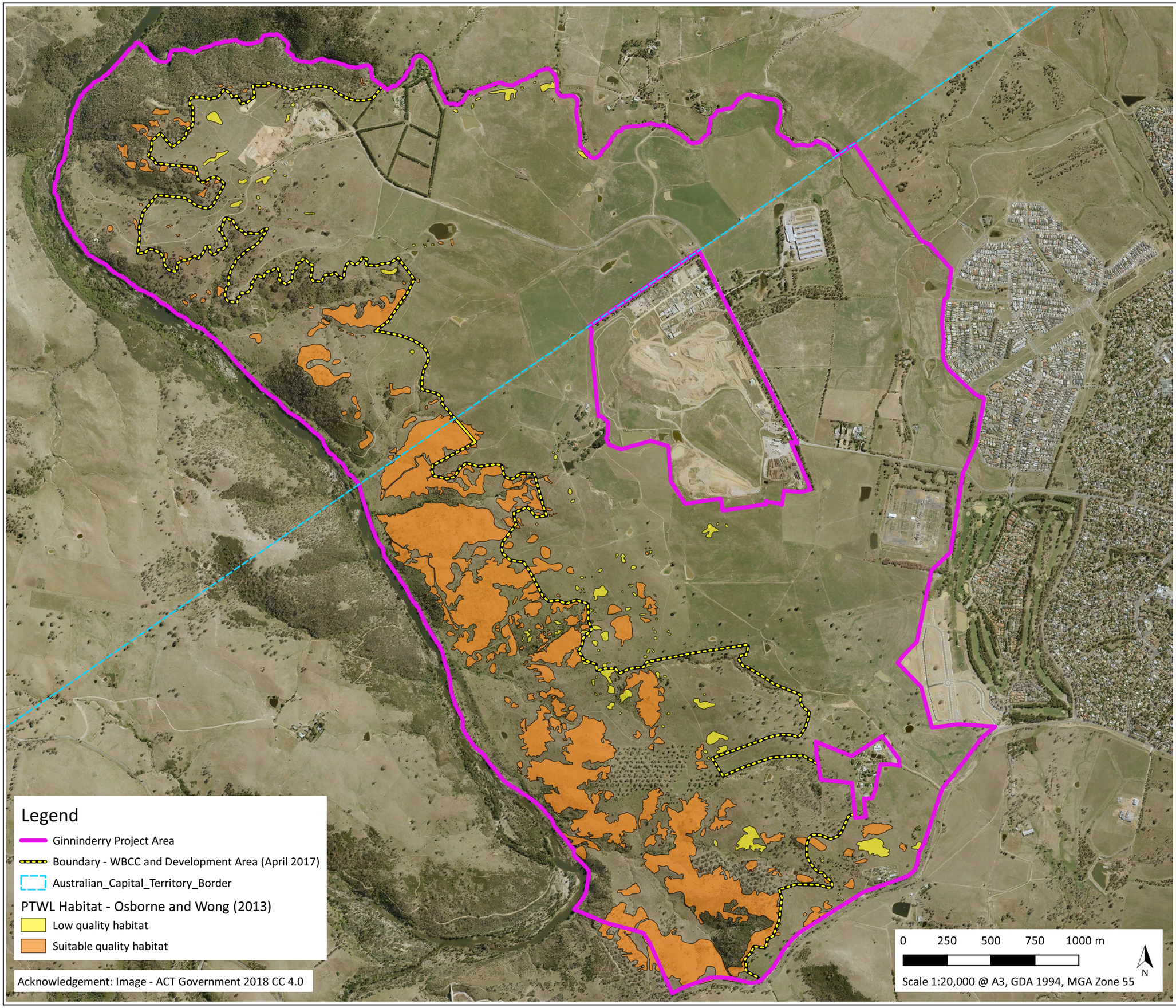

Figure 2. PTWL Habitat in the Ginninderry Project Area (Osborne & Wong 2013)

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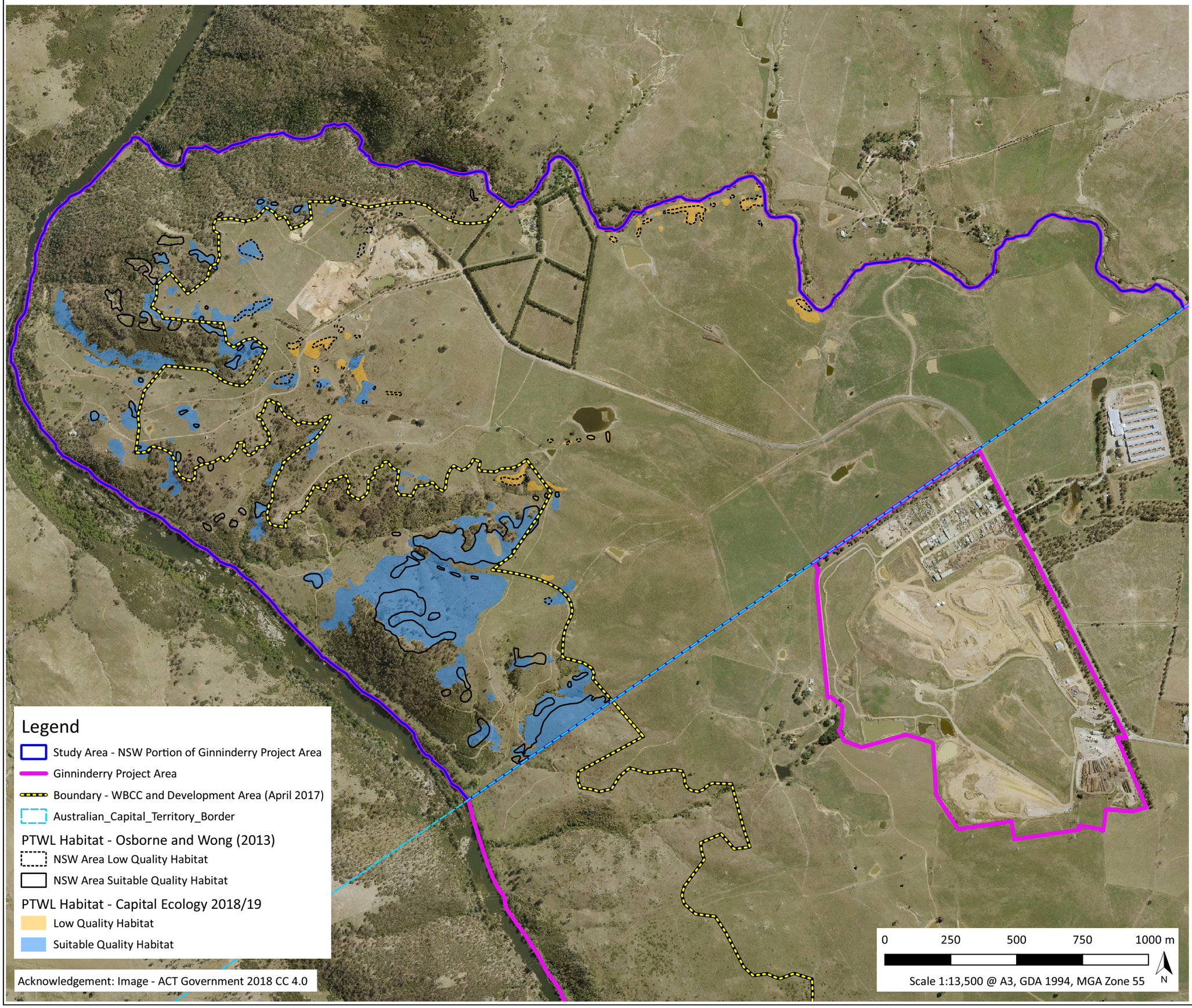

Figure 3. 2018/19 PTWL habitat mapping - overview

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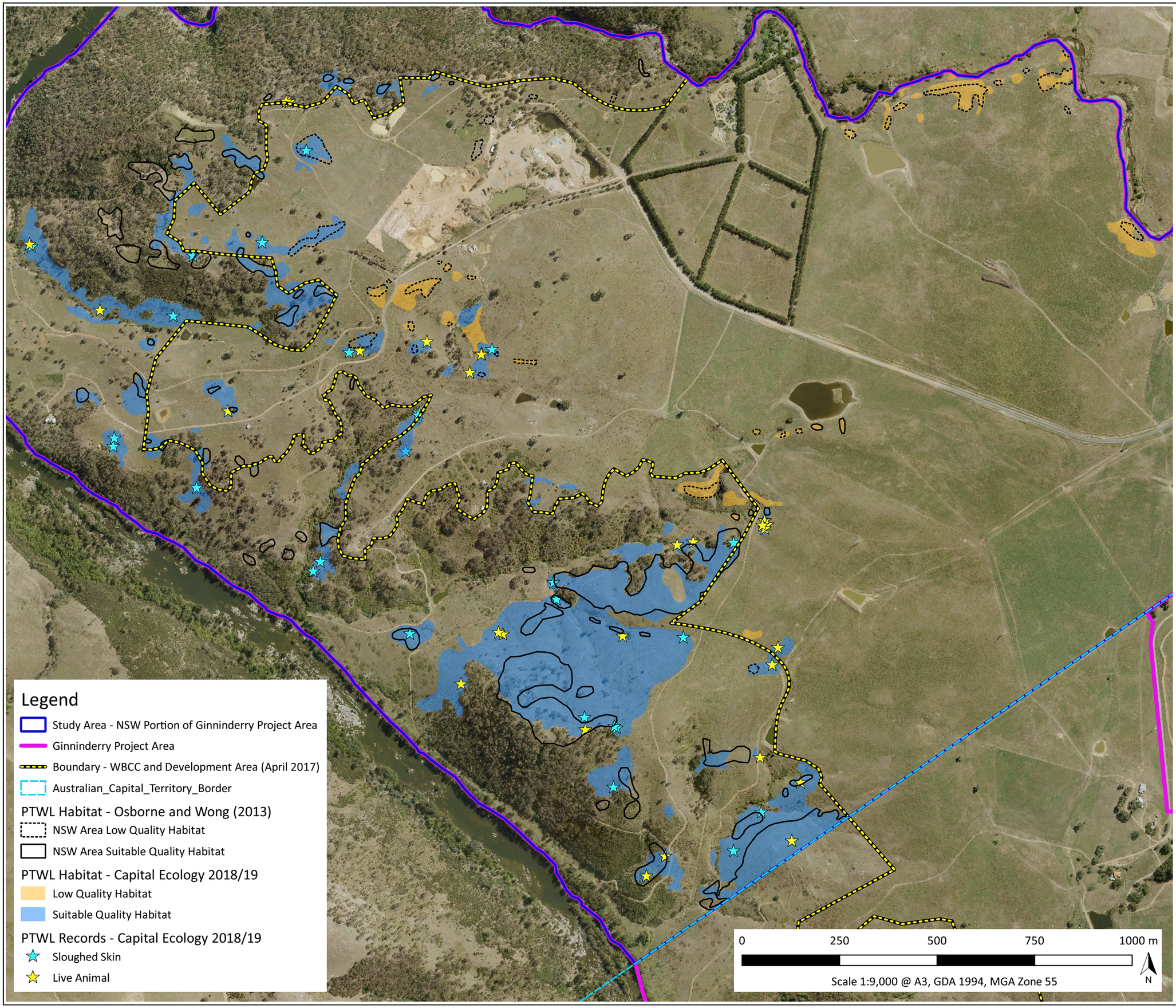

Figure 4. 2018/19 PTWL habitat mapping and survey results – detail

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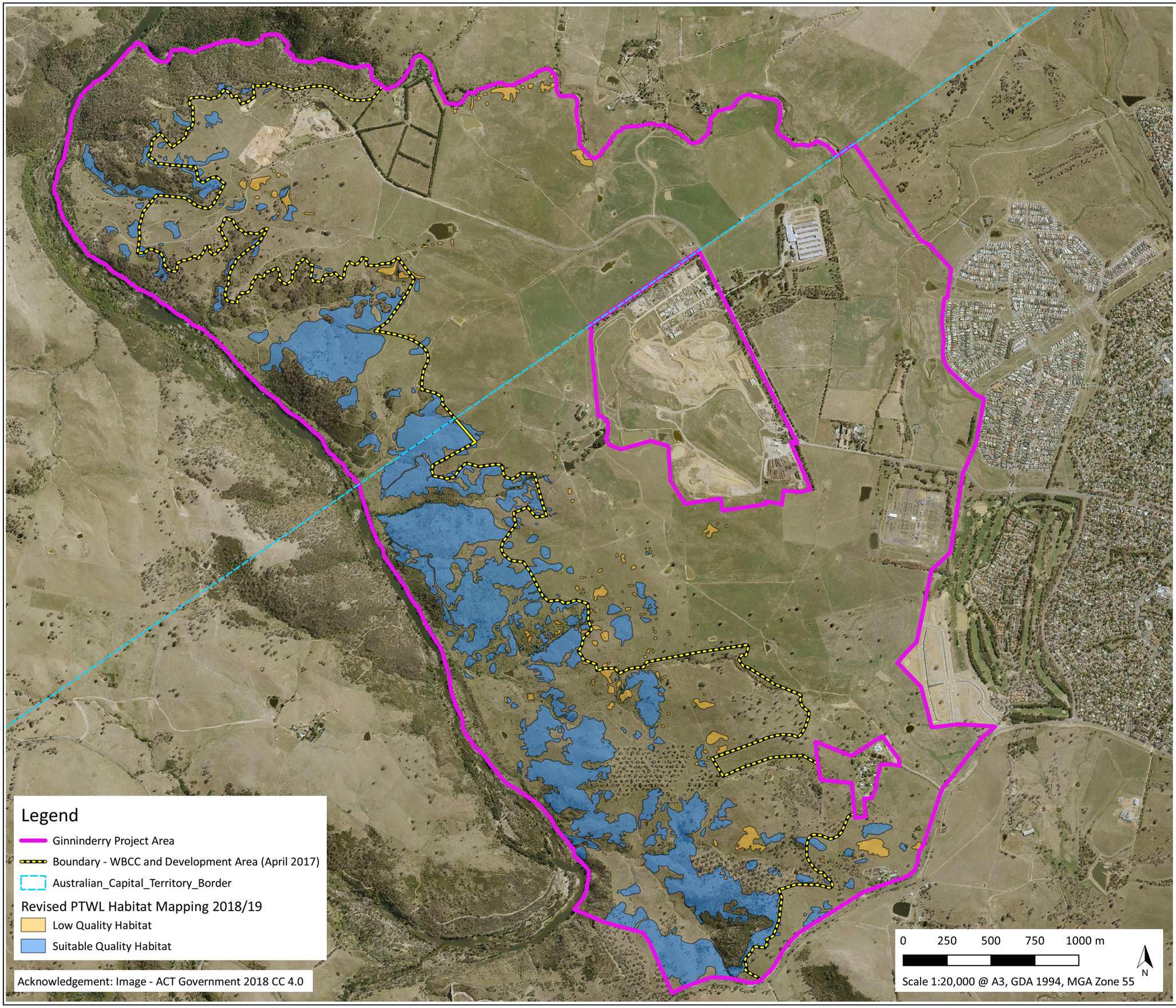

Figure 5. Revised PTWL habitat mapping – Ginninderry project area

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