Tim Howe
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Supplied by email

30 August 2024

Re: Riparian Assessment, 27 North Marshall Mount Road, Marshall Mount, 2530

Dear Tim,

This Riparian Assessment (RA) has been prepared to identify and assess the location and current condition of the mapped watercourses present within the proposed Marshall Mount Neighbourhood Plan. Specifically, this RA has been prepared to consider the following:

- All mapped watercourses that exist on site
- The condition of the identified watercourses following the Rapid Riparian Assessment (RRA) method by Findlay et al (2011)
- Recommendations for each watercourse regarding corridor widths.

This letter has been refined and updated based on Council comments on previous versions of the letter.

The study area for this Riparian Assessment is 27 North Marshall Mount Road, Marshall Mount, 2530, and includes a single cadastral lot (Lot 201 // DP803486) (**Figure 1** and **Figure 2**). The study area is 37.10 ha and is zoned a mixture of C2 - Environmental Conservation, C3 - Environmental Management, C4 - Environmental Living and R2 - Low Density Residential under the Wollongong LEP 2009 (**Figure 3**).

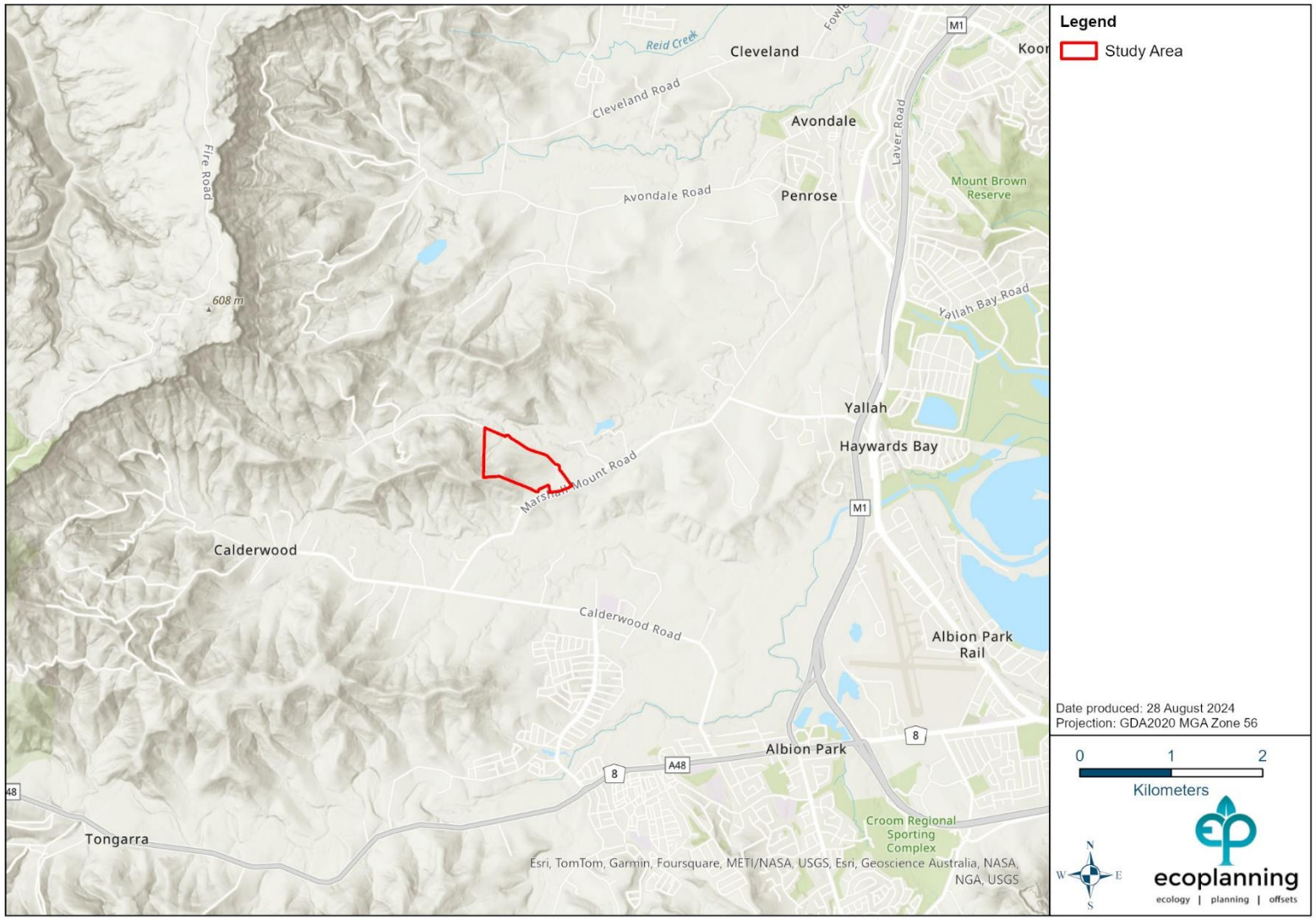

Figure 1: Study area locality.

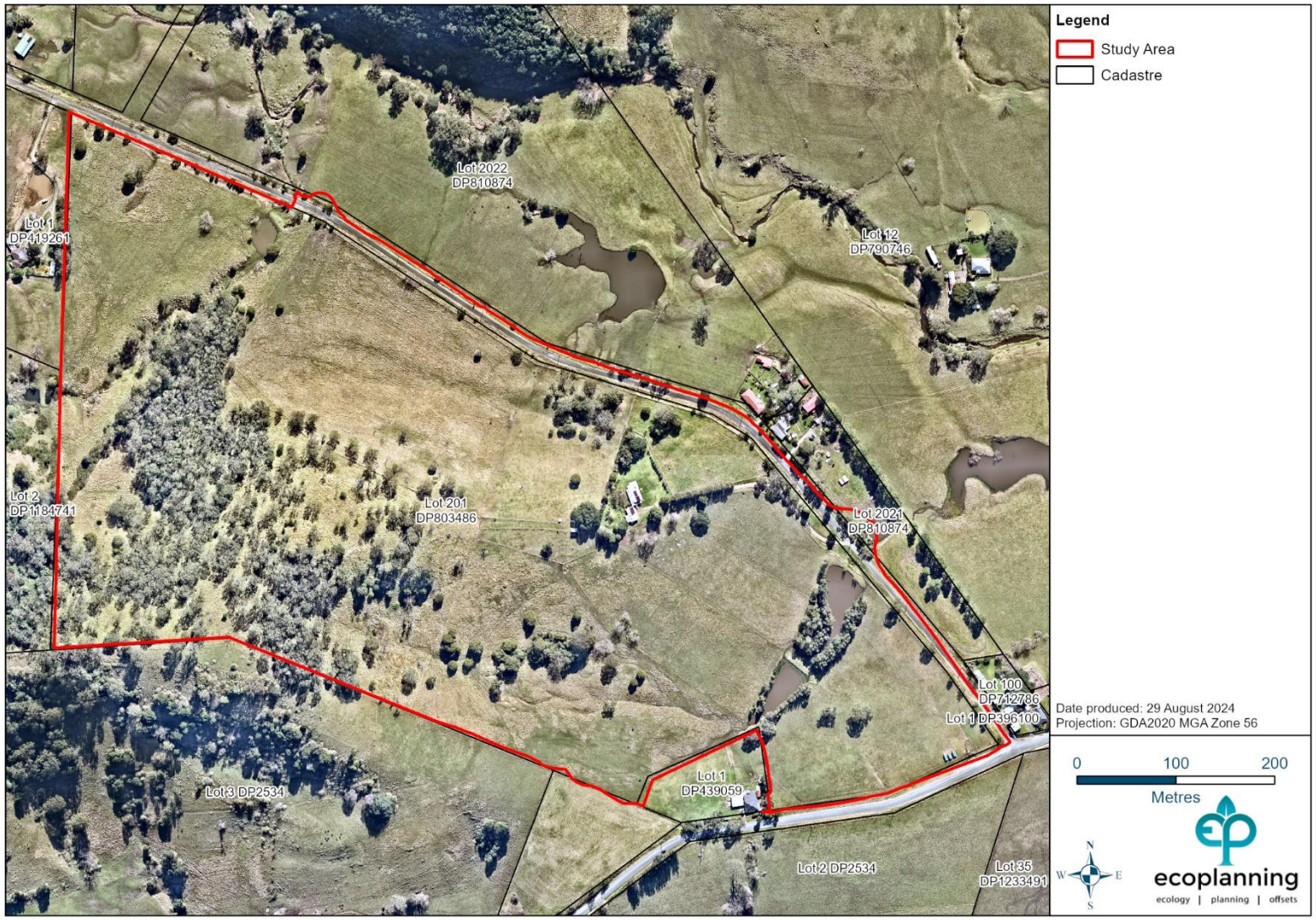

Figure 2: Study area.

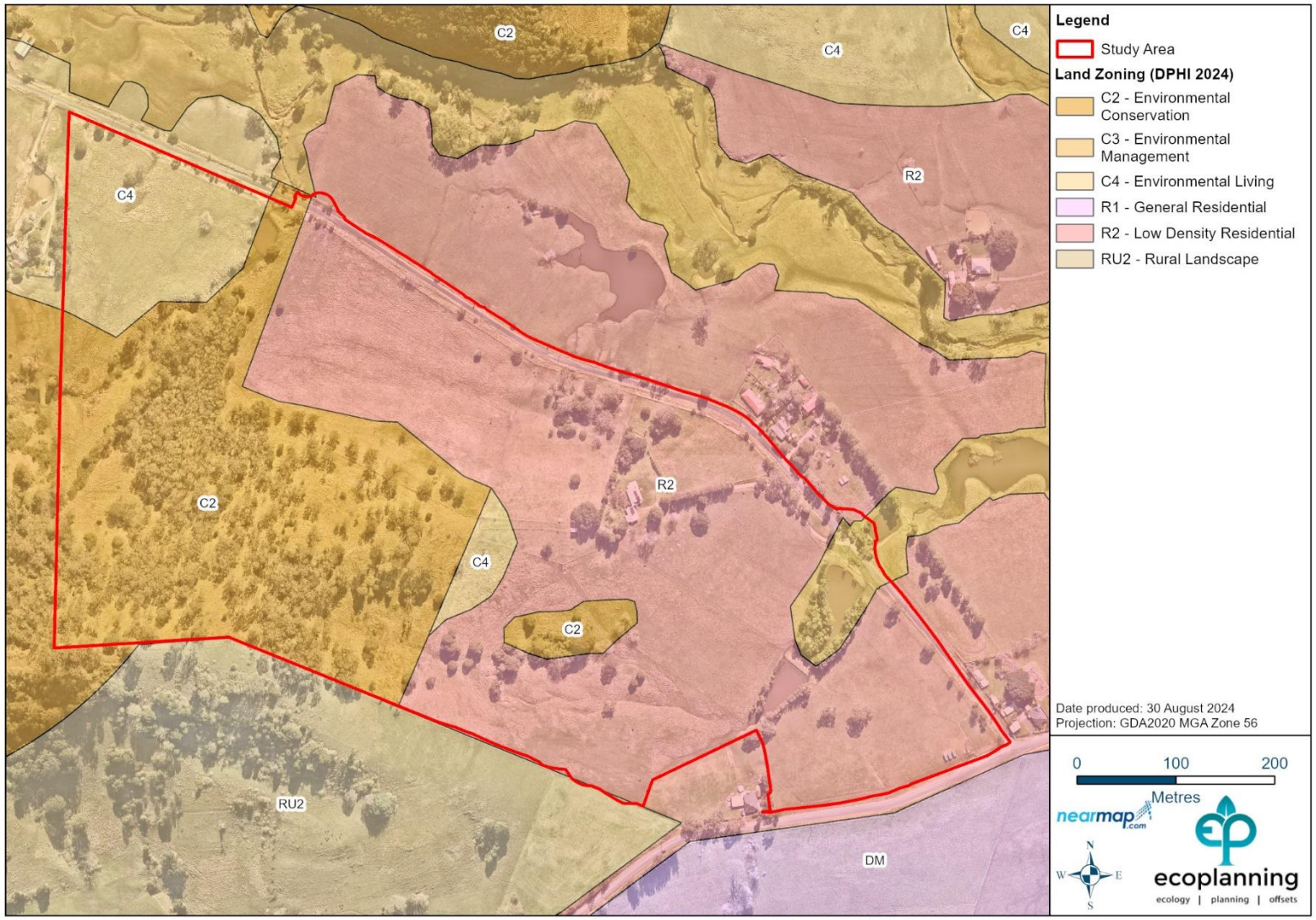

Figure 3: Land zoning - Wollongong LEP 2009

Methods

Literature review

The following key resources were reviewed to inform this report:

- *Water Management Act (2000)* (WM Act)
- Wollongong Local Environmental Plan 2009 (WLEP) – Riparian Land Map
- Wollongong Development Control Plan Chapter E23: Riparian Land Management (2009; 2022)
- Guidelines for controlled activities on waterfront land—Riparian corridors (NRAR 2018)
- Riparian Corridor Management Strategy (DIPNR 2004)

The Riparian Land Map (WLEP 2009) and Strahler stream order map, used for the WM Act, contain six unnamed watercourses within the study area and are shown in **Figure 4**. These have been labelled Reach 1 to Reach 6. This assessment provides advice on the condition and presence of bed and bank for all mapped watercourses within the study area.

Field survey – watercourse and targeted flora survey

A field survey was undertaken within the study area Field Ecologists, Edwin Vaca and Nathan Storch, on 21 October 2022. Approximately 6.5 person hrs of survey were undertaken to inspect the mapped watercourses, with 7.5 person hrs on targeted *Chorizema parviflorum* (Illawarra Flame Pea) survey. The area was traversed on foot to assess the mapped riparian lands and watercourses, according to Wollongong Local Environmental plan (WLEP, 2009) and WM Act to determine the current condition of the mapped watercourses within the study area, as well as areas of potential habitat for *C. parviflorum*.

This work was undertaking to supplement previous field work completed by Lucas McKinnon (Principal Ecologist) on 2 December 2021 for the south-east watercourses within the study area. Lucas McKinnon has undertaken survey on this property on numerous occasions over the previous 10 years, including targeted flora and fauna surveys, and to provide advice on the BioBanking potential of the property (ELA 2012; ELA 2013a,b; ELA (undated); Ecoplanning 2014-2022). Additional surveys were completed for the preparation of the Biodiversity Development Assessment Report (BDAR) on 31 January 2023 and 13 February 2023. Finally, a specific field assessment was also undertaken as part of the Vegetation Management Plan (VMP).

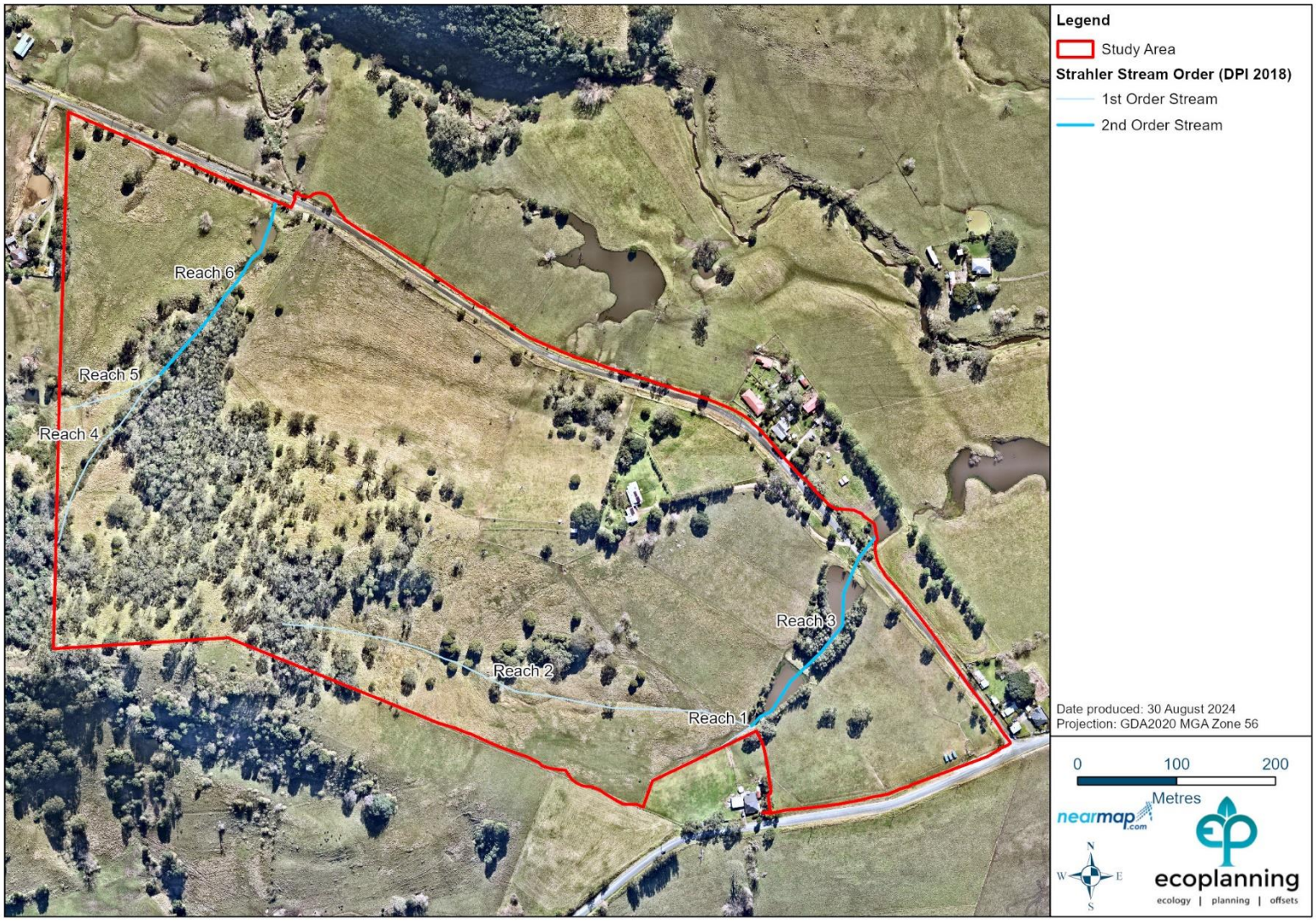

Figure 4: Strahler stream order and reach labels

Top of Bank Mapping

In order to map the recommended corridor widths for each watercourse confirmed as present within the study area, the 'Top of Bank' (ToB) was mapped on 21 October 2022 by Edwin Vaca (Field Ecologist). The location of the ToB was required since: "*The riparian corridor width is measured from the top of a watercourse bank away from the watercourse centreline.*" (WDCP 2009; 2022; NRAR 2018).

The ToB was mapped by walking along the ToB whilst tracking the path using Avenza mapping software. The tracking function on the software was used to plot the walked path along any discernible bed and bank. The recorded tracks were plotted on a Geographical Information System (GIS), smoothed and adjusted, to produce the final ToB mapping.

Top of Bank mapping was done for all mapped watercourses, within the study area, where a discernible bed and bank was evident. It is also noted that for some of the mapped watercourses, and for some areas within a watercourse, it was not possible to identify clear bed and bank structures.

Rapid Riparian Assessment

The method for the Rapid Riparian Assessment (RRA) to assess creek conditions followed that developed by Findlay et al (2011), which is a rapid assessment approach that was designed to assess conditions across urban stream networks. In summary, the method involves scoring a set of riparian and stream features, which are then totalled and categorised into six groups: 'Excellent', 'Good', 'Fair', 'Poor', 'Very Poor' or 'Degraded'. The tool was originally developed by Ku-ring-gai Council, Sydney, to aid environmental decision making and since then has been modified to incorporate land use such as 'pastures' and applied to LGAs across the Sydney Basin (e.g., Dean and Tippler 2016). Knowledge of stream condition prior to future development allows management to guide rehabilitation and remediation, and/or assess the impact of development and the efficacy of management interventions.

The RRA method requires a 'start' point and assesses features downstream from this point, and within a 50 × 50 m area on the left and right bank. Given the overall size of the study area assessment sites were positioned at approximate 80 m intervals to represent discreet sample reaches. For this process, fifteen sites were selected. The start points (and field tracks) are shown in **Figure 5**.

Chapter E23: Riparian Land Management (WDCP 2009; 2022)

This chapter provides Council's requirements for the development of land within or adjacent to any riparian corridor. Watercourses mapped on the Riparian Lands Map (WLEP 2009) are assigned categories for which this chapter details objectives any new development must meet. Additionally, each category is assigned recommended Riparian Corridor Width (RCW) shown in **Table 1**.

A map displaying the current categorisation of lands under the WDCP 2009; 2022 is provided in **Figure 6**. Within the study area the waterways within the west of the site (reaches 4, 5 and 6) have been classified as Category 1 - Environmental corridor whilst the reaches in the east (reaches 1, 2 and 3) have been classified as Category 2 - Terrestrial and aquatic habitat.

Table 1: Riparian Corridor Width requirements (WDCP 2009; 2022)

Creek Category	Core Riparian Zone (CRZ) Recommended Width (m)	Vegetated Buffer (m)	Total Width Requirement for each side of the watercourse (m)
Category 1 - Environmental corridor	40	10	50
Category 2 - Terrestrial and aquatic habitat	20	10	30
Category 3 - Bank stability and water quality	10	-	10

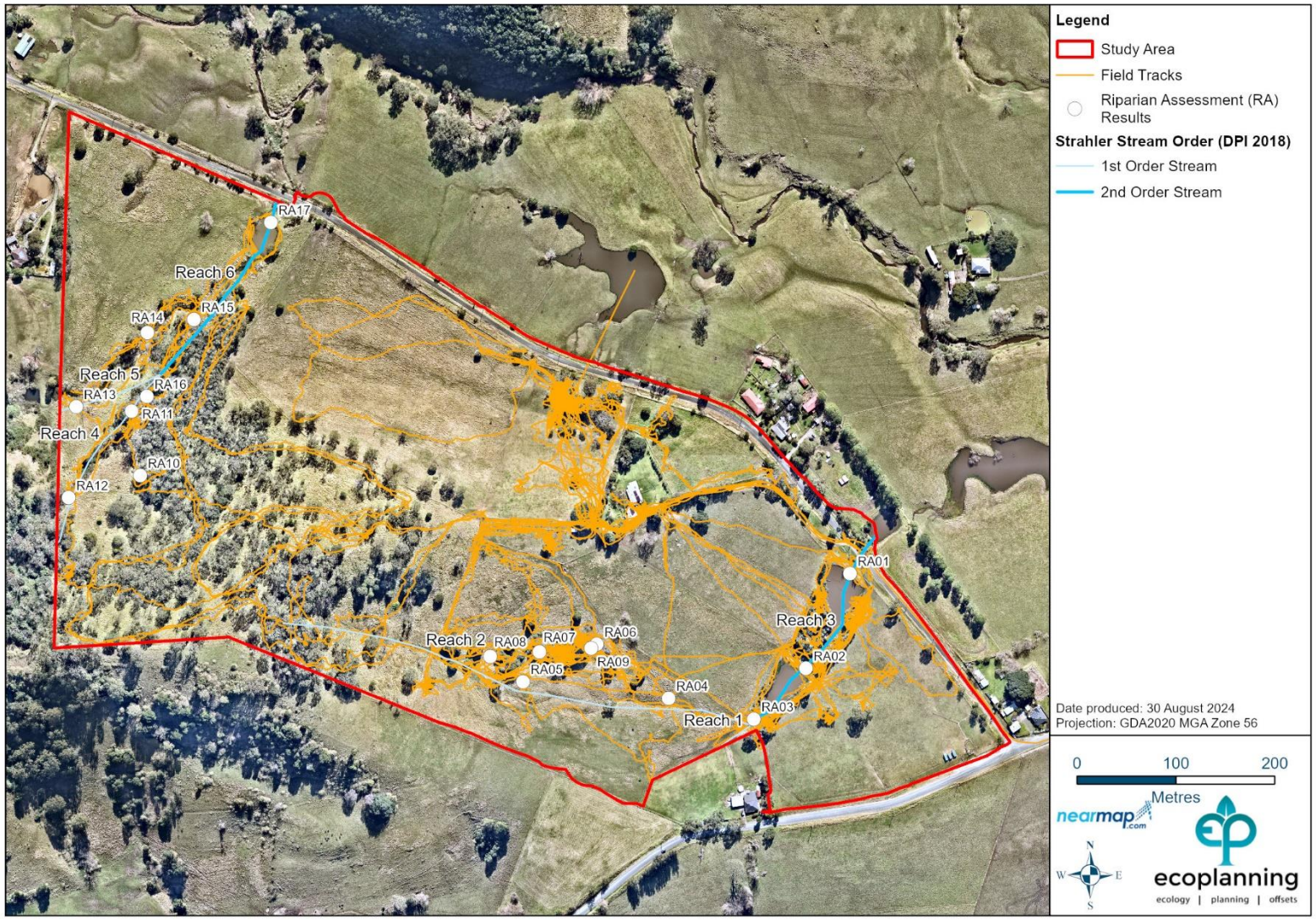

Figure 5: Rapid Riparian Assessment points and field tracks.

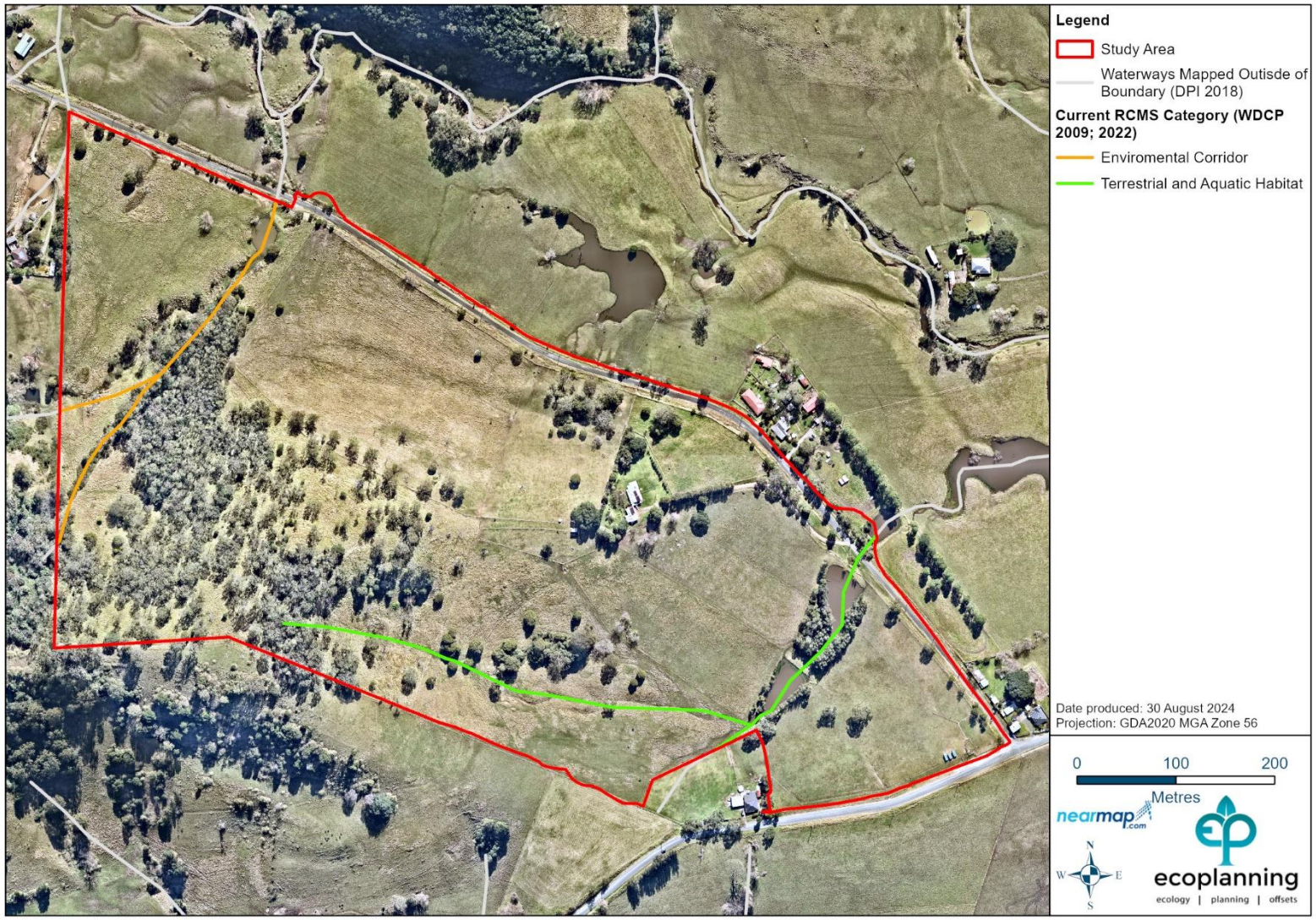

Figure 6: Creek categorisation under WDCP 2009; 2022.

Riparian corridors under the Water Management Act 2000 (WM Act)

The Natural Resources Access Regulator (NRAR) recommends that riparian corridors (or vegetated riparian zone – VRZ) be based on watercourse order as classified under the Strahler system for ordering watercourses (Strahler 1953). The widths of the riparian corridors are to be mapped from the top of the highest bank of the watercourse. **Table 2** provides details of the recommended corridor widths under the WM Act. **Figure 4** displays the mapped Strahler stream order.

Table 2: Riparian Corridor Width recommendations (NRAR 2018)

Strahler stream order	VRZ width (each side of watercourse)	Total riparian corridor width
1st order	10 metres	20 metres + channel width
2nd order	20 metres	40 metres + channel width
3rd order	30 metres	60 metres + channel width
4th order or greater	40 metres	80 metres + channel width

Results

Top of Bank Mapping

Evidence of discernible bed and bank occurred in some mapped watercourses within the study area. It is noted here that in some areas the ToB was difficult to discern due to erosion, impacts of cattle and bank slumping.

For the watercourses in the south-east of the subject site, Reach 1 was not present on site and no bed and bank was identified. This reach is not considered further in this assessment as it has been confirmed as absent.

A small section of bed and bank was identified in Reach 2. The bed and bank is located in an area of native vegetation and mapped as C2 under the WLEP (**Figure 7**). No bed and bank was evident upstream or downstream of this location (**Figure 8** and **Figure 9**). The mapped watercourse on the Statewide topographic map has been dammed in the past, and the overflow diverted into the bushland where the bed and bank are now observable due to erosion. The location of this watercourse is not the natural state of the overland flowpath, and presently (in high flow periods) is eroding the substrate below the extant vegetation in this part of the property.

Reach 3 is comprised of several dams in degraded condition. Some vegetation is present adjacent to the most downstream of the dams (**Figure 10**). Directly upstream of Reach 3 (Reach 2) shows no discernible bed and bank (**Figure 8**). ToB was not mapped for Reach 3 due to the size of the dams present, however a nominal centre line was used to map riparian corridor widths.

Figure 7: Eroded bed and bank, with bank slumping – Reach 2.

Figure 8: No bed and bank - downstream of Reach 2

Figure 9: No bed and bank - upstream of Reach 2

Figure 10: Reach 3 dams

In the western part of the study area Reach 4, Reach 5 and Reach 6 all showed signs of bed and bank, although in all cases the area with defined bed and bank was different to the watercourse mapping of the area shown in previous figures.

Reach 4 had confirmed bed and bank along much of the mapped watercourse length (**Figure 11** and **Figure 12**); however, bed and bank was not identified in the far upper stream component of Reach 4. Bed and bank was also evident in Reach 5; however, as with Reach 4, the upper component of Reach 5 had no mapped bed and bank (**Figure 13**). The confluence of Reach 4 and Reach 5 was confirmed to be further north than previously mapped, with Reach 5 also lying further west than previously identified.

Bed and bank was confirmed in Reach 6, with the reach terminating in a dam on North Marshall Mount Road (**Figure 14**). The results of the ToB mapping within the study area are displayed in **Figure 15**.

Figure 11: Bed and bank - Reach 4

Figure 12: Bed and bank - Reach 4

Figure 13: Bed and bank - Reach 5

Figure 14: Dam - Reach 6

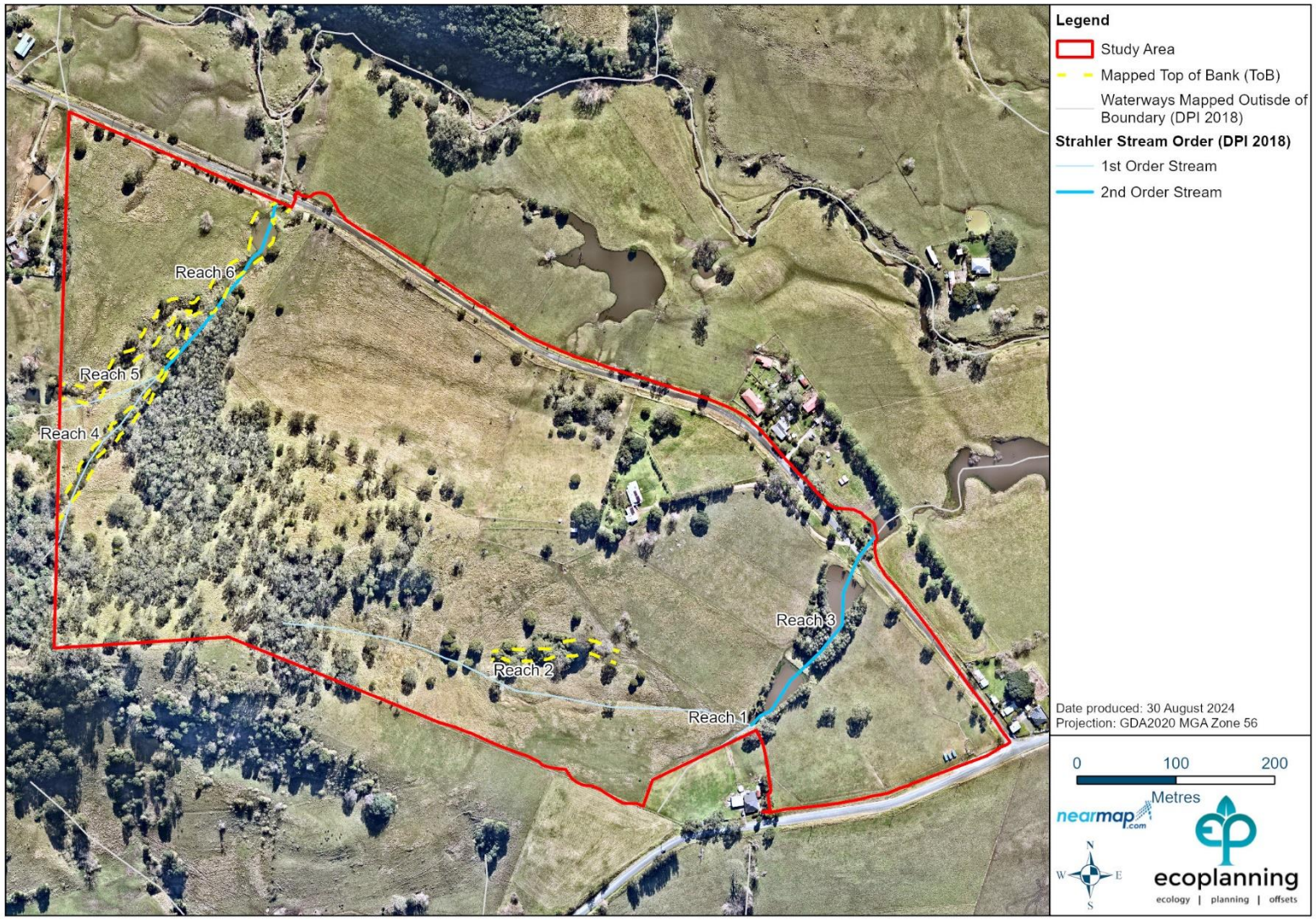

Figure 15: Top of Bank (ToB) mapping

Rapid Riparian Assessment

Overall, the condition of the watercourses within the study area can be described as degraded. This is likely due to a number of factors including land use change, livestock grazing and past land clearing. The normal flow within the study area has been altered due to the construction of dams, removal of native vegetation and the installation of creek crossings for roads and other infrastructure.

Of the 17 RRAs that were completed, the stream condition was found to be in 'Poor Condition' (4/15), 'Very poor condition' (6/17) or 'Degraded Condition' (3/17). Stream condition was found to be 'Fair' at 4 of the 17 sites assessed.

The average score of the 17 sites was 49.6%; however, these results can also be displayed by river reach. When looking at each reach, it is clear that Reach 4 and Reach 5 are in slightly better condition, scoring 57.2% and 52.5% respectively. Reach 2 scores 49%, with Reach 3 and Reach 6 both averaging ~39%. Reach 1 does not receive a score as it was not present on site.

Summary sheets for all 17 RRAs are included in **Appendix A** and Table 3 shows the percentage site score and corresponding category. Site codes on the RRAs in **Appendix A** (e.g., 'RA1' or 'RA2') correspond to numbering shown in Figure 16.

Table 3: Site scores and corresponding category following rapid riparian assessments.

Site Code	Site Score (%)	Category	Reach
RA 1	41	Very Poor	Reach 3
RA 2	39	Degraded	Reach 3
RA 3	39	Degraded	Reach 3
RA 4	43	Very Poor	Reach 2
RA 5	49	Very Poor	Reach 2
RA 6	50	Poor	Reach 2
RA 7	55	Poor	Reach 2
RA 8	44	Very Poor	Reach 2
RA 9	53	Poor	Reach 2
RA 10	52	Poor	Reach 4
RA 11	64	Fair	Reach 4
RA 12	44	Very Poor	Reach 4
RA 13	44	Very Poor	Reach 5
RA 14	61	Fair	Reach 5
RA 15	60	Fair	Reach 4
RA 16	66	Fair	Reach 4
RA 17	39	Degraded	Reach 6

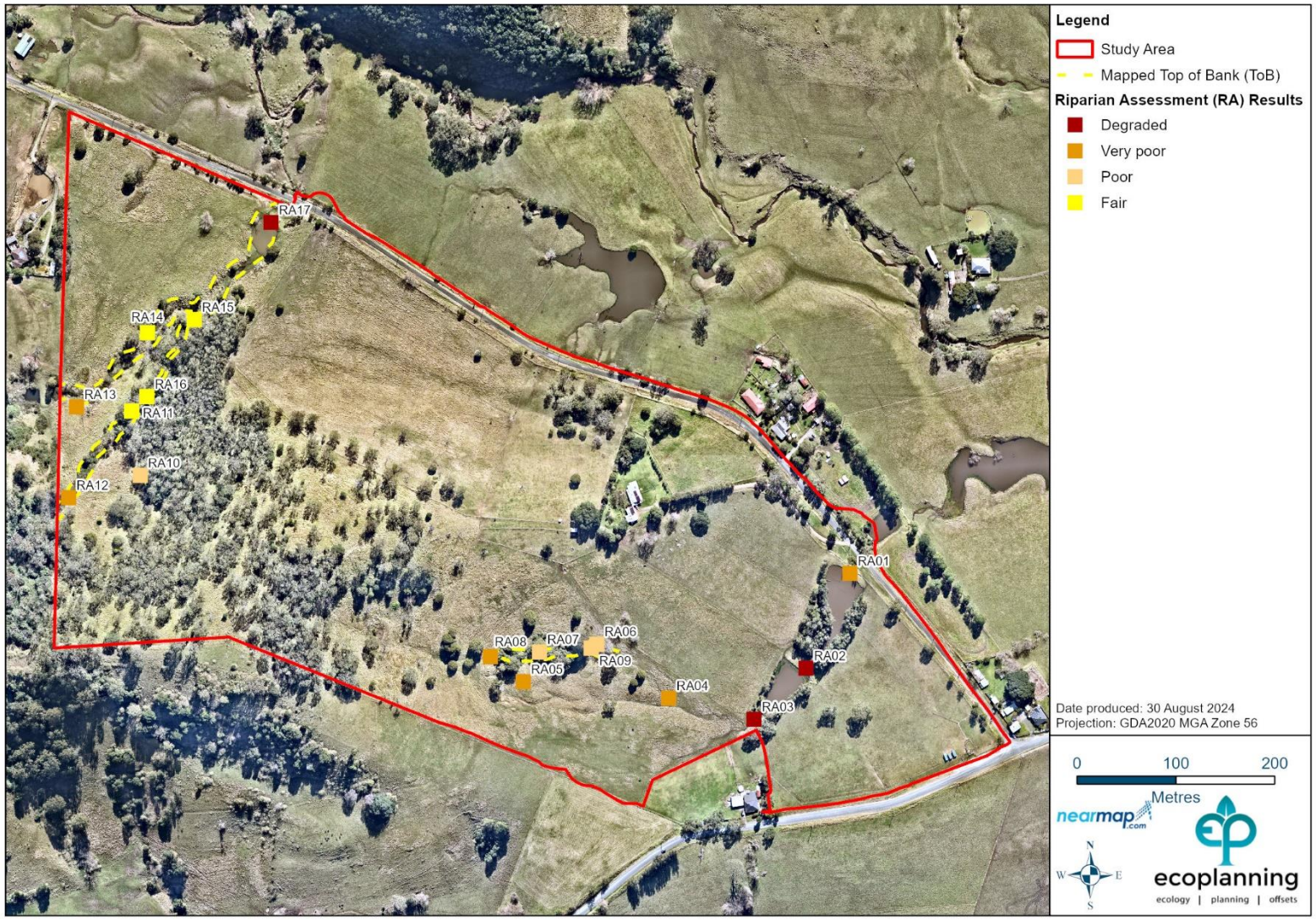

Figure 16: Rapid Riparian Assessment (RRA) results

Variation to the Wollongong Development Control Plan

After the collection and reviewing of field data, and the mapping of ToB, a variation is sought to the WDCP (2009; 2022). As described previously, the WDCP has categorised streams on site as either Category 1 – Environmental Corridor (Reach 4, Reach 5 and Reach 6) or Category 2 – Terrestrial and aquatic habitat (Reach 1, Reach 2 and Reach 3). The review considered the information and data collected against the objectives listed in both Chapter E23: Riparian Land Management (WCC 2009; 2022) and the Riparian Corridor Management Study (RCMS) (DIPNR 2004).

Based on the results of the RRA it is apparent that the watercourses on site are degraded, with most sites classified as either degraded, very poor or poor. This is further reinforced by the lack of a defined ToB for much of the mapped watercourses within the study area, likely caused by land use change, clearing and the impacts of livestock. The watercourses to the east appear to be in poorer condition than those in the west. Therefore, a variation is sought with respect to the riparian corridor widths stipulated in Section 10.2 of the WDCP, based on the following justifications.

The results of the ToB mapping confirmed that Reach 1 is absent from site.

Reach 2 is a 1st order Strahler stream for which the mapped alignment does not reflect the discernible watercourse, as identified by Ecoplanning's field surveys. Reach 3 is a 2nd order Strahler stream. Both reaches are currently identified as Category 2 - Terrestrial and Aquatic Habitat streams, for which the recommended total width requirement for each side of the watercourse is 30 metres. (WDCP 2009; 2022). However, the results of the ToB mapping and RRA showed that both Reach 2 and Reach 3 had general absence of bed and bank, (especially for Reach 2), and the results of the RRA did not exceed 'Poor' across both reaches. The presence of dams within Reach 3, and the classification of Reach 2 as a 1st order stream, provides further justification for a variation where the total width requirement for each side of the watercourse is 10 metres, as recommended for Category 3 - Bank Stability and Water Quality streams.

The western watercourses (Reach 4, Reach 5 and Reach 6) are currently classified as Category 1 – Environmental Corridor. The recommended total width requirement for each side of the watercourse would therefore be 50 metres. (WDCP 2009; 2022). However, a variation is sought to have the buffer of these reaches reduced to 30 metres. This is justified due to the limited connectivity from reaches 4, 5 and 6 to significant areas of habitat downstream (including barriers such as North Marshall Mount Road), and the fact that habitat connectivity will be enhanced through the area of C2 – Environmental Conservation land zoning (WLEP 2009) once realignment of the dam is complete. In addition, the lateral separation of Reaches 4 and 5 is approximately 25 m, meaning the buffers overlap (achieving a broader corridor) and the resultant corridor is larger than 100 m.

Riparian Corridor Widths and proposed riparian offsetting

Riparian corridors were mapped based on the WDCP 2009; 2022 and the mapped ToB, with buffers mapped as proposed above. A proposed plan to offset areas of riparian buffer impacted by development was then prepared. As previously described, no ToB mapping was completed for Reach 3. Therefore, an indicative centreline was used to map the RCW in this location.

The results are displayed in **Figure 17**. A summary of findings for the assessment are provided in **Table 4**. A summary table for each reach is provided in **Table 5**.

The total area of riparian buffer required for the mapped waterways on site is 4.95 ha. Based on the proposed development footprint, a total of 0.38 ha is removed from this buffer area (identified as 'take'). This includes the area adjacent to reach 6 within the lot layout, plus a small area at Reach 2 which will be impacted by development, with the remaining area managed as part of a VMP based on consultation with Council. A structure within the eastern wetland area has also been tagged as removed.

This 0.38 ha of removed riparian buffer has been offset using:

- Land on the eastern side of the western watercourses (Reach 4)
- Land surrounding Reach 3.

In total, 0.89 ha of additional riparian buffer (tagged as 'give) has been mapped. The total area of riparian buffer for the proposal is 5.46 ha, greater than the 4.95 ha required.

The land included in the riparian buffer will be managed as part of the site VMP. It is noted that the western edge of the western riparian area will be managed as a vegetated buffer to reduce fire risk.

Table 4: Proposed riparian offsetting

Riparian buffer type	Area of riparian buffer (ha)
Riparian buffer	4.31
Riparian buffer – vegetated buffer	0.26
Riparian buffer – give (additional riparian buffer)	0.89
Total riparian buffer	**5.46**
Riparian buffer – take (removal of riparian buffer)	0.38

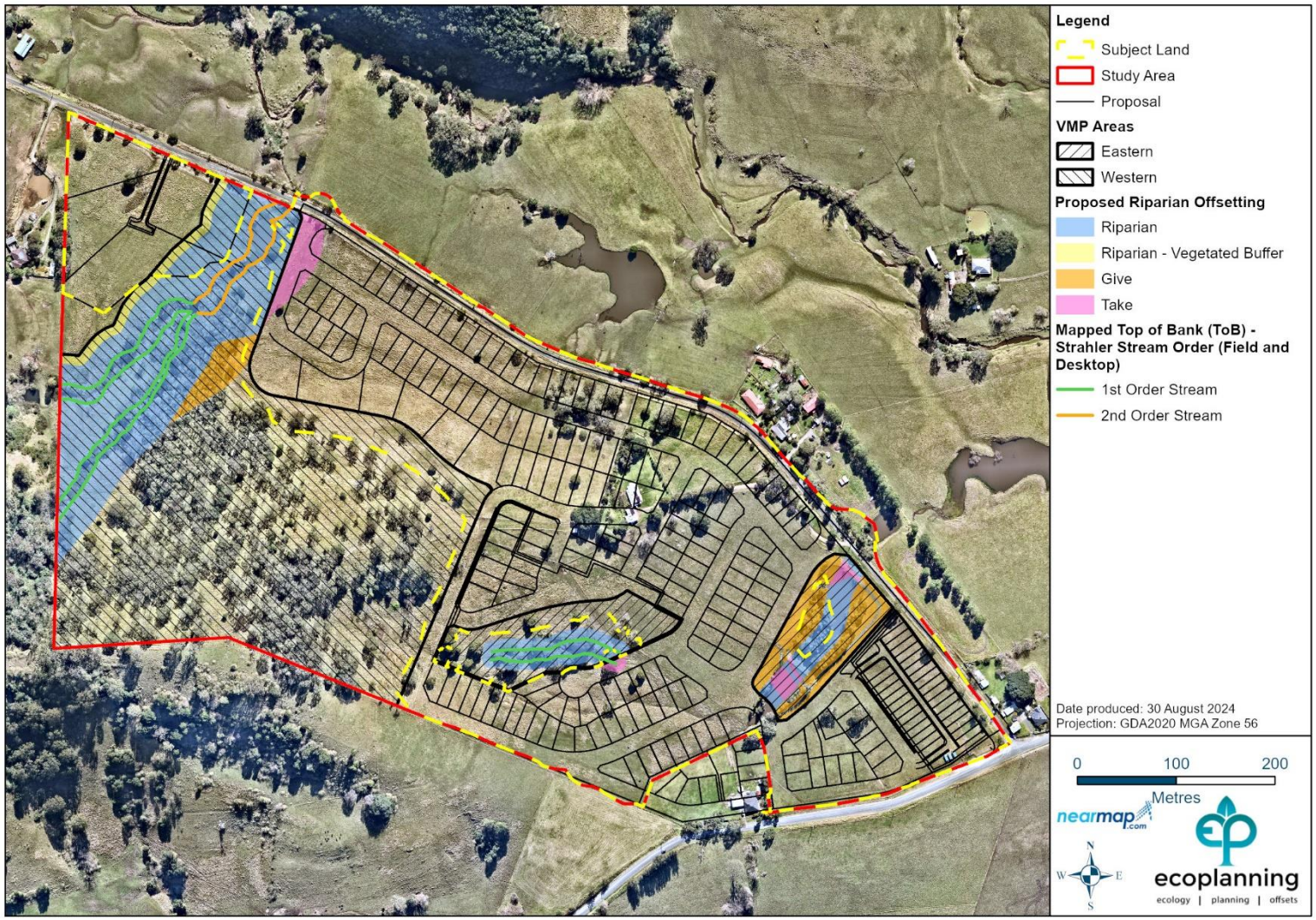

Figure 17: Top of Bank mapping and proposed riparian buffer offsetting

Table 5: Summary of findings and outcomes for each reach assessed

Reach ID	Strahler Stream Order	RCMS category	Notes
1	Strahler order 1	2 - Terrestrial and aquatic habitat	Field assessment confirmed that Reach 1 is not present on site and no bed and bank was identified. No further assessment required.
2	Strahler order 1	2 - Terrestrial and aquatic habitat	Reach 2 was assessed in the field and a small area of bed and bank was confirmed mid-way along the mapped drainage within the existing patch of vegetation. No other bed or bank was identified during the field inspection. Reach 2 is mapped as a Category 2 (Terrestrial and aquatic habitat) watercourse in the RCMS (2004). A variation is sought to have the total width requirement for each side of this watercourse to be 10 metres, as: • No bed and bank was present for the majority of the reach • The Riparian Assessment (RA04 to RA09) demonstrated that the condition of the existing watercourse is Poor and Very Poor/ Piping of this drainage can be considered for the above reasons. As the land around Reach 2 is proposed for open space (and not specifically for conservation) the riparian offsetting plan has mapped this area as 'take'. The area for this riparian land is offset within the lands surrounding Reach 3.

Reach ID	Strahler Stream Order	RCMS category	Notes
3	Strahler order 2	2 - Terrestrial and aquatic habitat	The Riparian Assessment completed for Reach 3 identified the reach as being in Very Poor or Degraded condition (RA01, RA02, RA03). The intent in this area is to remove the 2 farm dams and provide a constructed wetland. Large pockets of vegetation are being retained where feasible with the remainder of the area to be planted out to be ecologically representative of the vegetation communities found in the area. WCC indicated this approach could be supported (noted from pre-lodgement meeting) provided the planting was '*ecologically representative of communities found in the area and also meets flooding requirements'*. Therefore, a variation is sought to have the minimum width requirement from each wetland bank to be 10 metres, and a total corridor width varying from 55 to 85 metres wide (inclusive of the wetland). This variation is suitable as the reach is identified as Very Poor or Degraded in the Riparian Assessment and the value of the watercourse is limited due to historic land use practices. It is noted that Reach 3 is located in an open space corridor in the current layout plan. The lands surrounding Reach 3 will be revegetated using a 'wetland treatment' to provide an offset for impacts to other riparian lands elsewhere on site.
4	Strahler order 1	1 - Environmental corridor	Reach 4 has been assessed as being in Fair to Very Poor condition (RA10, RA11, RA12, RA15, RA16). The reach has a mapped bed and bank for much of its length, with ToB mapped in the field. A variation is sought to have the total width requirement of each side of this watercourse to be 30 metres. This is suitable as the connectivity of this reach to other significant habitat features is restricted by the condition of Reach 6 (and other reaches offsite (downstream). The total combined corridor for Reaches 4 and 5 will be over 100 metres wide, achieving the intent of Chapter E23. The reach is completely contained within land zones C2 - Environmental Conservation.

Reach ID	Strahler Stream Order	RCMS category	Notes
5	Strahler order 1	1 - Environmental corridor	Reach 5 has been assessed as being in Fair to Very Poor condition (RA13, RA14). ToB has been mapped along the drainage line, which placed the stream further west than previously mapped. A variation is sought to have the total width requirement of each side of this watercourse to be 30 metres. This is suitable as the connectivity of this reach to other significant habitat features is restricted by the condition of Reach 6 (and other reaches offsite [downstream]). The total combined corridor for Reaches 4 and 5 will be over 100 metres wide, achieving the intent of Chapter E23. A riparian buffer consistent with WDCP 2009; 2022 was applied. Much of the buffer lies within land zoned C2 - Environmental Conservation. Some of the buffer spills into land zoned C4 - Environmental Living, however it is proposed that this buffer not be impacted by development (**Figure 17**).
6	Strahler order 2	1 - Environmental corridor	The Riparian Assessment identified Reach 6 as being in Degraded condition (RA17). ToB was identified and mapped and a bed and bank is present. A riparian buffer was applied to the current ToB mapping consistent with WDCP 2009; 2022. Whilst much of buffer lies within land zoned C2 - Environmental Conservation some lies within the proposed residential footprint. This area is proposed to be offset to the south within the same broad riparian corridor (**Figure 17**).

Recommendation and Conclusion

The RA was prepared to identify and assess the location and current condition of the mapped watercourses present within the proposed Marshall Mount Neighbourhood Plan, located 27 North Marshall Mount Road, Marshall Mount, 2530 (Lot 201 // DP803486). The study area is 37.10 ha and is zoned a mixture of C2 - Environmental Conservation, C3 - Environmental Management, C4 - Environmental Living and R2 - Low Density Residential under the Wollongong LEP 2009.

In order to complete the RA a field survey was completed which included both ToB mapping and 17 x RRAs. In total, six watercourses (referred to in this assessment as reaches) were assessed.

The field assessment confirmed Reach 1 is not present, with no defined bed and bank and the reach was therefore not assessed further. Bed and bank was confirmed for several reaches across the study area, particularly in the western part of the site (Reach 4, Reach 5 and Reach 6). Where bed and bank was confirmed ToB mapping was completed. For Reach 2, in particular, ToB mapping was only completed for a small part of the reach as bed and bank was confirmed as absent across much of the reach.

The RRAs confirmed that, overall, the condition of the watercourses within the study area can be described as degraded. Of the 17 x RRA's that were completed, the stream condition was found to be in 'Poor Condition' (4/15), 'Very poor condition' (6/17) or 'Degraded Condition' (3/17). Stream condition was found to be 'Fair' at 4 of the 17 sites assessed.

After review of the field data, a variation to the WDCP (2009; 2022) is sought. The results of the ToB mapping and RRA support the reclassification of Reach 2 and Reach 3 as areas of bed and bank were generally absent, especially for Reach 2, and the results of the RRA did not exceed 'Poor' across both reaches. The presence of dams within Reach 3, and the classification of Reach 2 as a 1st order stream, further validates the appropriateness of the proposed variation.

The western watercourses (Reach 4, Reach 5 and Reach 6) are currently classified as Category 1 – Environmental Corridor, and a variation is proposed where the total width requirement for each side of the watercourse is 30 metres, as recommended for Category 2 - Terrestrial and Aquatic Habitat streams. This is due to the poor condition of the reaches and limited connectivity from reaches 4, 5 and 6 to significant areas of habitat downstream (including barriers such as North Marshall Mount Road). In addition, the lateral separation of Reaches 4 and 5 is approximately 25 m, meaning the buffers overlap (achieving a broader corridor) and the resultant corridor is larger than 100 m.

Appropriate buffers under WDCP 2009; 2022 have been applied the Reach 6 based on the Category 1 – Environmental Corridor classification.

Riparian corridors were applied and a riparian offsetting plan prepared. The total area of riparian buffer required for the mapped waterways on site is 4.95 ha. Based on the proposed development footprint a total of 0.38 ha is removed from this buffer area. This has been offset through the addition of 0.89 ha of riparian buffer located on the eastern side of the western

watercourses (Reach 4) and on land surrounding Reach 3. The land identified in the riparian offsetting plan will be managed as part of the site VMP.

If you have any further queries about this assessment, please contact me using the details below.

Yours sincerely

Lucas McKinnon

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BScEnv (Hons), GradCert Ornith. | M: 0421 603 549 | E: lucas.mckinnon@ecoplanning.com.au

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APPENDIX A – Rapid Riparian Assessment

RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 12:25 pm | assessor Edwin Vaca
weather light rain | reach type chain-of- | flow none

41 %

-1.9
-12
-21.7
-12
-28
0

very poor

Unnamed-unnamed trib (RA1)

notes

The site is in very poor condition, with a raw score of -51.6 (41%) overall.

stream order: 2

landuse

Within the 50 metre assessment radius, left bank land use is 5% bushland, 95% pasture, approximately. Right bank land use is 5% bushland, 95% pasture, approximately. This is included in the site features score.

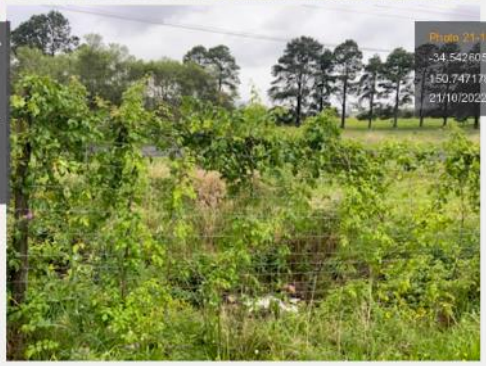
vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 5% under-scrubbed forest/woodland, 80% pasture grassland, 15% weed/exotic, approximately. Right bank vegetation structure is 5% under-scrubbed forest/woodland, 80% pasture grassland, 15% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream



extraction	water
excavation	absent
litter	absent
sewer	absent
stormwater	present
odour	normal/none
turbidity	no flow
Land Use Subtotal	-1.9
Site Features Total	-1.9
channel shape	dam/divert/pipe
pool riffle sequence	absent
meanders	confined no
large woody debris	absent
woody debris size	
overhanging vegetation	low <30%
natural bed detritus	not visible
natural gravel bed	absent
natural rock in-stream	not visible
native macrophyte	not visible
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-28
benches	absent
islands	absent
channel bars	absent
Deposition Total	0
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	40
riparian buffer width left	0-10m
riparian buffer width right	0-10m
Riparian Vegetation Subtotal	-12
Vegetation Structure Subtotal	2.3
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-21.7

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 12:55:34 pm | assessor Edwin Vaca
weather light rain | reach type chain-of- | flow none

39 % degraded

-2.9
-16
-25.7
-12
-25
-1

Unnamed-unnamed trib (RA2)

notes The site is in very poor condition, with a raw score of -54.6 (39%) overall.

stream order 2

landuse Within the 50 metre assessment radius, left bank land use is 5% bushland, 95% pasture, approximately. Right bank land use is 5% bushland, 95% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 5% under-scrubbed forest/woodland, 80% pasture grassland, 15% weed/exotic, approximately. Right bank vegetation structure is 5% under-scrubbed forest/woodland, 80% pasture grassland, 15% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	absent
excavation	present
litter	low 1-5
sewer	
stormwater	absent
odour	normal/none
turbidity	no flow
Land Use Subtotal	-2.9
Site Features Total	-2.9
channel shape	dam/divert/pipe
pool riffle sequence	absent
meanders	confined no
large woody debris	
woody debris size	
overhanging vegetation	low <30%
natural bed detritus	
natural gravel bed	not visible
natural rock in-stream	absent
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-25
benches	
islands	
channel bars	absent
Deposition Total	0
bedrock/clay exposure	absent
undercutting	
bank slumps	minor <10% bank
knick point	
bank erosion	
Erosion Total	-1
riparian corridor WMAct	40
riparian buffer width left	absent
riparian buffer width right	0-10m
Riparian Vegetation Subtotal	-16
Vegetation Structure Subtotal	2.3
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-25.7

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 1:29:19 pm | assessor Edwin Vaca
weather light rain | reach type ephemeral | flow low

39 %

-9
-20
-32.6
-12
-14
0
degraded

Unnamed-unnamed trib (RA3)

notes The site is in very poor condition, with a raw score of -55.6 (39%) overall. The bed type is grass - G. The bank type is grass - G.

stream order 2

landuse Within the 50 metre assessment radius, left bank land use is 100% pasture, approximately. Right bank land use is 100% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 80% pasture grassland, 20% absent/concrete/earth, approximately. Right bank vegetation structure is 40% weed/ exotic, 60% pasture grassland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	present
litter	low 1-5
sewer	
stormwater	present
odour	normal/none
turbidity	low
Land Use Subtotal	-9
Site Features Total	-9
channel shape	straighened/deepened
pool riffle sequence	absent
meanders	unconfined no
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	absent
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-14
benches	absent
islands	absent
channel bars	absent
Deposition Total	0
bedrock/clay exposure	
undercutting	
bank slumps	absent
knick point	
bank erosion	
Erosion Total	0
riparian corridor WMAct	40
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	-.6
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-32.6

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 1:46:54 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow none

43 %

-3
-20
-30.8
-12
-11

very poor

Unnamed-unnamed trib (RA4)

notes The site is in very poor condition, with a raw score of -44.8 (43%) overall. The bed type is grass - G. The bank type is grass - G.

stream order: 1

landuse Within the 50 metre assessment radius, left bank land use is 100% pasture, approximately. Right bank land use is 100% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 60% pasture grassland, 40% weed/exotic, approximately. Right bank vegetation structure is 60% pasture grassland, 40% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	present
odour	normal/none
turbidity	no flow
Land Use Subtotal	-3
Site Features Total	-3
channel shape	straighened/deepened
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-11
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	1.2
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-30.8

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 2:10:35 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow none

49 %

5.2
-16
-26.1
-12
-11
very poor

Unnamed-unnamed trib (RA5)

notes The site is in poor condition, with a raw score of -31.9 (49%) overall. The bed type is grass - G. The bank type is grass - G.

stream order 1

landuse Within the 50 metre assessment radius, left bank land use is 20% bushland, 80% pasture, approximately. Right bank land use is 100% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 10% under-scrubbed forest/woodland, 70% pasture grassland, 20% weed/exotic, approximately. Right bank vegetation structure is 50% weed/exotic, 50% pasture grassland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	absent
excavation	absent
litter	absent
sewer	
stormwater	absent
odour	normal/none
turbidity	no flow
Land Use Subtotal	5.2
Site Features Total	5.2
channel shape	widened/infilled
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-11
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	0-10m
riparian buffer width right	absent
Riparian Vegetation Subtotal	-16
Vegetation Structure Subtotal	1.9
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-26.1

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 2:37:11 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow low

50 % poor

2.1
-12
-21.6
-12
-7
-2

Unnamed-unnamed trib (RA6)

notes The site is in poor condition, with a raw score of -28.5 (50%) overall. The bed type is grass overflow - Go. The bank type is grass - G.

stream order 1

landuse Within the 50 metre assessment radius, left bank land use is 5% bushland, 95% pasture, approximately. Right bank land use is 5% bushland, 95% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 65% pasture grassland, 25% weed/exotic, 10% under-scrubbed forest/woodland, approximately. Right bank vegetation structure is 70% pasture grassland, 5% under-scrubbed forest/woodland, 25% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	absent
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	2.1
Site Features Total	2.1
channel shape	straighened/deepened
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	low <30%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-7
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	moderate 10-30%
knick point	
bank erosion	
Erosion Total	-2
riparian corridor WMAct	20
riparian buffer width left	0-10m
riparian buffer width right	0-10m
Riparian Vegetation Subtotal	-12
Vegetation Structure Subtotal	2.4
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-21.6

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 2:55:22 pm | assessor Edwin Vaca
weather light rain | reach type ephemeral | flow low

55 % poor

3.5
-6
-11.85
-9
-6
-2

Unnamed-unnamed trib (RA7)

stream order: 1

notes
The site is in poor condition, with a raw score of -16.35 (55%) overall. The bed type is grass - G. The bank type is grass - G.

landuse
Within the 50 metre assessment radius, left bank land use is 30% bushland, 70% pasture, approximately. Right bank land use is 20% bushland, 80% pasture, approximately. This is included in the site features score.

vegetation
Within the 50 metre assessment radius, left bank vegetation structure is 15% under-scrubbed forest/woodland, 70% pasture grassland, 15% weed/exotic, approximately. Right bank vegetation structure is 70% pasture grassland, 20% weed/exotic, 10% under-scrubbed forest/woodland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	low 1-5
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	3.5
Site Features Total	3.5
channel shape	straighened/deepened
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	mod <30>60%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-6
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	moderate 10-30%
knick point	
bank erosion	
Erosion Total	-2
riparian corridor WMAct	20
riparian buffer width left	10-20m
riparian buffer width right	0-10m
Riparian Vegetation Subtotal	-6
Vegetation Structure Subtotal	3.15
weed density left bank	moderate 40-70%
weed density right bank	light up to 40%
Weeds Subtotal	-9
Vegetation Total	-11.85

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 3:11:04 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow none

44 %

-1.9
-20
-29.8
-12
-11

very poor

Unnamed-unnamed trib (RA8)

notes

The site is in very poor condition, with a raw score of -42.7 (44%) overall. The bed type is grass - G. The bank type is .

stream order: 1

landuse

Within the 50 metre assessment radius, left bank land use is 5% bushland, 95% pasture, approximately. Right bank land use is 5% bushland, 95% pasture, approximately. This is included in the site features score.

vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 5% under-scrubbed forest/woodland, 80% pasture grassland, 15% weed/exotic, approximately. Right bank vegetation structure is 70% pasture grassland, 25% weed/exotic, 5% under-scrubbed forest/woodland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	low 1-5
sewer	
stormwater	
odour	normal/none
turbidity	no flow
Land Use Subtotal	-1.9
Site Features Total	-1.9
channel shape	widened/infilled
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-11
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	2.2
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-29.8

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 3:39:36 pm | assessor Edwin Vaca
weather overcast | reach type | flow none

53 % poor

5.5
-20
-21.4
-12
-6
0

Unnamed-unnamed trib (RA9)

notes

The site is in poor condition, with a raw score of -21.9 (53%) overall. The bed type is grass - G. The bank type is .

stream order 1

landuse

Within the 50 metre assessment radius, left bank land use is 30% bushland, 70% pasture, approximately. Right bank land use is 20% bushland, 80% pasture, approximately. This is included in the site features score.

vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 75% under-scrubbed forest/woodland, 20% weed/ exotic, 5% pasture grassland, approximately. Right bank vegetation structure is 75% under-scrubbed forest/woodland, 5% pasture grassland, 20% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	no flow
Land Use Subtotal	5.5
Site Features Total	5.5
channel shape	straighened/deepened
pool riffle sequence	absent
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	mod <30>60%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-6
benches	absent
islands	absent
channel bars	absent
Deposition Total	0
bedrock/clay exposure	
undercutting	absent
bank slumps	absent
knick point	
bank erosion	
Erosion Total	0
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	10.6
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-21.4

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 4:03:40 pm | assessor Edwin Vaca
weather overcast | reach type | flow low

52 %

7.7
-20
-26.7
-12
-4
poor

Unnamed-unnamed trib (RA10)

stream order 1

notes The site is in poor condition, with a raw score of -23 (52%) overall.

landuse Within the 50 metre assessment radius, left bank land use is 10% bushland, 90% pasture, approximately. Right bank land use is 60% bushland, 40% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 20% under-scrubbed forest/woodland, 60% weed/exotic, 20% pasture grassland, approximately. Right bank vegetation structure is 50% under-scrubbed forest/woodland, 30% weed/exotic, 20% pasture grassland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	no flow
Land Use Subtotal	7.7
Site Features Total	7.7
channel shape	widened/infilled
pool riffle sequence	absent
meanders	
large woody debris	
woody debris size	
overhanging vegetation	low <30%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-4
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	5.3
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-26.7

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 4:17:17 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow low

64 % fair

16.4 -6 -7 -9 -4 0

Unnamed-unnamed trib (RA11)

notes The site is in poor condition, with a raw score of 5.4 (64%) overall. The bed type is natural bedrock. The bank type is grass - G.

stream order 1

landuse Within the 50 metre assessment radius, left bank land use is 60% bushland, 40% pasture, approximately. Right bank land use is 80% bushland, 20% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 40% under-scrubbed forest/woodland, 30% weed/ exotic, 30% pasture grassland, approximately. Right bank vegetation structure is 70% under-scrubbed forest/woodland, 30% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

extraction		
excavation	absent	
litter	absent	
sewer		
stormwater		
odour	normal/none	
turbidity	low	
Land Use Subtotal		16.4
Site Features Total		16.4
channel shape	straighened/deepened	
pool riffle sequence	present	
meanders	confined yes	
large woody debris	absent	
woody debris size		
overhanging vegetation	mod <30>60%	
natural bed detritus	present	
natural gravel bed		
natural rock in-stream	natural > 500 mm	
native macrophyte		
mapped Key Fish Habitat		
KFH riparian buffer zone		
Aquatic Habitat Total		-4
benches		
islands		
channel bars		
Deposition Total		
bedrock/clay exposure	natural	
undercutting		
bank slumps		
knick point		
bank erosion		
Erosion Total		0
riparian corridor WMAct	20	
riparian buffer width left	0-10m	
riparian buffer width right	10-20m	
Riparian Vegetation Subtotal		-6
Vegetation Structure Subtotal		8
weed density left bank	moderate 40-70%	
weed density right bank	light up to 40%	
Weeds Subtotal		-9
Vegetation Total		-7

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 4:38:39 pm | assessor Edwin Vaca
weather overcast | reach type | flow none

44 % very poor

-.9
-20
-30.55
-12
-11

Unnamed-unnamed trib (RA12)

notes

The site is in very poor condition, with a raw score of -42.45 (44%) overall. The bed type is natural bed mud - Nvm. The bank type is grass - G.

stream order 1

landuse

Within the 50 metre assessment radius, left bank land use is 5% bushland, 95% pasture, approximately. Right bank land use is 5% bushland, 95% pasture, approximately. This is included in the site features score.

vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 5% under-scrubbed forest/woodland, 70% weed/ exotic, 25% pasture grassland, approximately. Right bank vegetation structure is 5% under-scrubbed forest/woodland, 45% weed/exotic, 50% pasture grassland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	
sewer	
stormwater	
odour	normal/none
turbidity	no flow
Land Use Subtotal	-.9
Site Features Total	-.9
channel shape	straighened/deepened
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-11
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	1.45
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-30.55

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 5:00:53 pm | assessor Edwin Vaca
weather overcast | reach type | flow none

44 % | -2 | -20 | -31 | -12 | -11 | very poor

Unnamed-unnamed trib (RA13)

stream order: 1

notes The site is in very poor condition, with a raw score of -44 (44%) overall.

landuse Within the 50 metre assessment radius, left bank land use is 100% pasture, approximately. Right bank land use is 100% pasture, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 60% weed/exotic, 40% pasture grassland, approximately. Right bank vegetation structure is 60% pasture grassland, 40% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	
sewer	
stormwater	
odour	normal/none
turbidity	no flow
Land Use Subtotal	-2
Site Features Total	-2
channel shape	widened/infilled
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-11
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	1
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-31

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 5:30:07 pm | assessor Edwin Vaca
weather overcast | reach type | flow low

61 % fair

13.1
-6
-12.1
-12
-1

Unnamed-unnamed trib (RA14)

notes

The site is in poor condition, with a raw score of 0 (61%) overall. The bed type is natural bedrock. The bank type is grass - G.

stream order: 1

landuse

Within the 50 metre assessment radius, left bank land use is 10% bushland, 90% pasture, approximately. Right bank land use is 100% bushland, approximately. This is included in the site features score.

vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 5% under-scrubbed forest/woodland, 60% pasture grassland, 35% weed/exotic, approximately. Right bank vegetation structure is 70% under-scrubbed forest/woodland, 25% weed/exotic, 5% pasture grassland, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	13.1
Site Features Total	13.1
channel shape	straighened/deepened
pool riffle sequence	present
meanders	
large woody debris	low 1-3
woody debris size	
overhanging vegetation	low <30%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-1
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	0-10m
riparian buffer width right	10-20m
Riparian Vegetation Subtotal	-6
Vegetation Structure Subtotal	5.9
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-12.1

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 5:44:58 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow low

60 % fair

13.1
-6
-12.35
-9
-1
-2

Unnamed-unnamed trib (RA15)

stream order 2

notes The site is in poor condition, with a raw score of -2.25 (60%) overall. The bed type is natural bedrock. The bank type is grass - G.

landuse Within the 50 metre assessment radius, left bank land use is 10% bushland, 90% pasture, approximately. Right bank land use is 100% bushland, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 20% under-scrubbed forest/woodland, 50% absent/ concrete/earth, 30% pasture grassland, approximately. Right bank vegetation structure is 85% under-scrubbed forest/ woodland, 15% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	13.1
Site Features Total	13.1
channel shape	simple
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	mod <30>60%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-1
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	natural
undercutting	
bank slumps	moderate 10-30%
knick point	
bank erosion	
Erosion Total	-2
riparian corridor WMAct	40
riparian buffer width left	0-10m
riparian buffer width right	10-20m
Riparian Vegetation Subtotal	-6
Vegetation Structure Subtotal	2.65
weed density left bank	moderate 40-70%
weed density right bank	light up to 40%
Weeds Subtotal	-9
Vegetation Total	-12.35

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 5:59:55 pm | assessor Edwin Vaca
weather overcast | reach type ephemeral | flow low

66 % fair

13.1
0
-1.9
-9
0

Unnamed-unnamed trib (RA16)

notes The site is in fair condition, with a raw score of 11.2 (66%) overall. The bed type is natural bed (invert) - Nv. The bank type is grass - G.

stream order 1

landuse Within the 50 metre assessment radius, left bank land use is 10% bushland, 90% pasture, approximately. Right bank land use is 100% bushland, approximately. This is included in the site features score.

vegetation Within the 50 metre assessment radius, left bank vegetation structure is 20% under-scrubbed forest/woodland, 35% weed/exotic, 45% pasture grassland, approximately. Right bank vegetation structure is 75% under-scrubbed forest/woodland, 25% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	13.1
Site Features Total	13.1
channel shape	straighened/deepened
pool riffle sequence	present
meanders	
large woody debris	
woody debris size	
overhanging vegetation	high >60%
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	0
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	20
riparian buffer width left	0-10m
riparian buffer width right	20-40m
Riparian Vegetation Subtotal	0
Vegetation Structure Subtotal	7.1
weed density left bank	moderate 40-70%
weed density right bank	light up to 40%
Weeds Subtotal	-9
Vegetation Total	-1.9

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RAPID RIPARIAN SITE ASSESSMENT

DevCore

Unnamed stream unnamed

type Regular | date 21 Oct 2022 | time 6:22:25 pm | assessor Edwin Vaca
weather overcast | reach type permanent | flow low

39 % degraded

.8
-20
-30.4
-12
-26

Unnamed-unnamed trib (RA17)

notes

The site is in very poor condition, with a raw score of -55.6 (39%) overall.

stream order: 2

landuse

Within the 50 metre assessment radius, left bank land use is 95% pasture, 5% road, approximately. Right bank land use is 95% pasture, 5% road, approximately. This is included in the site features score.

vegetation

Within the 50 metre assessment radius, left bank vegetation structure is 20% weed/exotic, 80% pasture grassland, approximately. Right bank vegetation structure is 80% pasture grassland, 20% weed/exotic, approximately. This is reflected in the vegetation structure subtotal.

weeds

upstream

downstream

extraction	
excavation	
litter	absent
sewer	
stormwater	
odour	normal/none
turbidity	low
Land Use Subtotal	.8
Site Features Total	.8
channel shape	dam/divert/pipe
pool riffle sequence	
meanders	
large woody debris	absent
woody debris size	
overhanging vegetation	absent
natural bed detritus	
natural gravel bed	
natural rock in-stream	
native macrophyte	
mapped Key Fish Habitat	
KFH riparian buffer zone	
Aquatic Habitat Total	-26
benches	
islands	
channel bars	
Deposition Total	
bedrock/clay exposure	
undercutting	
bank slumps	
knick point	
bank erosion	
Erosion Total	
riparian corridor WMAct	40
riparian buffer width left	absent
riparian buffer width right	absent
Riparian Vegetation Subtotal	-20
Vegetation Structure Subtotal	1.6
weed density left bank	moderate 40-70%
weed density right bank	moderate 40-70%
Weeds Subtotal	-12
Vegetation Total	-30.4

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