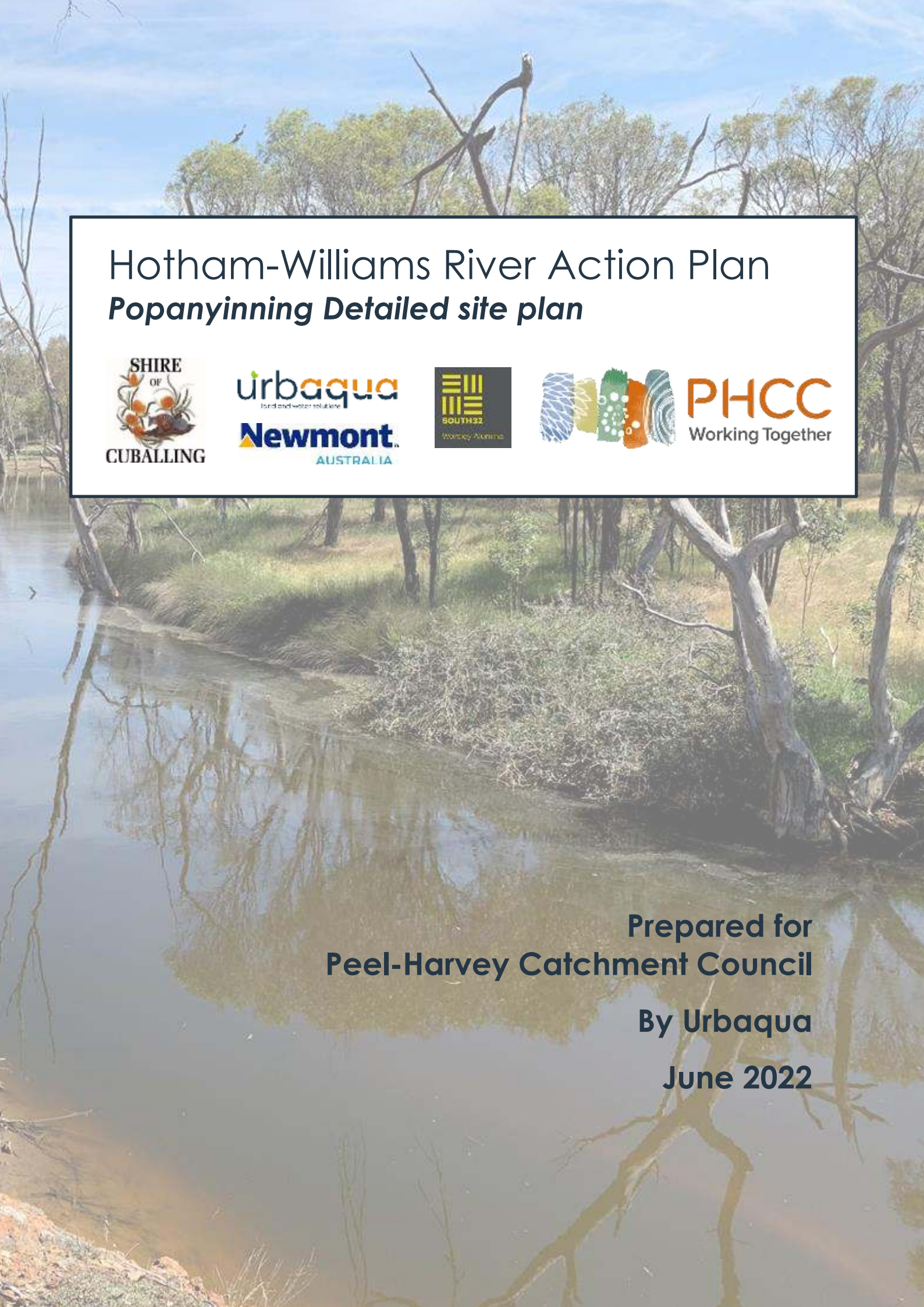
Hotham-Williams River Action Plan

Popanyinning Detailed site plan



Prepared for
Peel-Harvey Catchment Council

By Urbaqua

June 2022

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Acknowledgements

Urbaqua would like to acknowledge the following organisations for their significant contribution to this project:

1. Peel-Harvey Catchment Council.
2. Newmont Boddington.
3. Shire of Cuballing.
4. South32 Worsley Alumina.

Peel-Harvey Catchment Council - Hotham-Williams River Action Plan

Figure 1: Popanyinning Site Concept - Restoration Plan

Changes to access and amenities in this plan may occur and this will be communicated to PHCC by the Shire of Cuballing who will be engaging Urbaqua to update the plans once further information is available

Legend

Revegetation

- Comprehensive restoration of 30m riparian buffer zone
- Spot removal/replacement of weeds and problem exotics

Bank stability

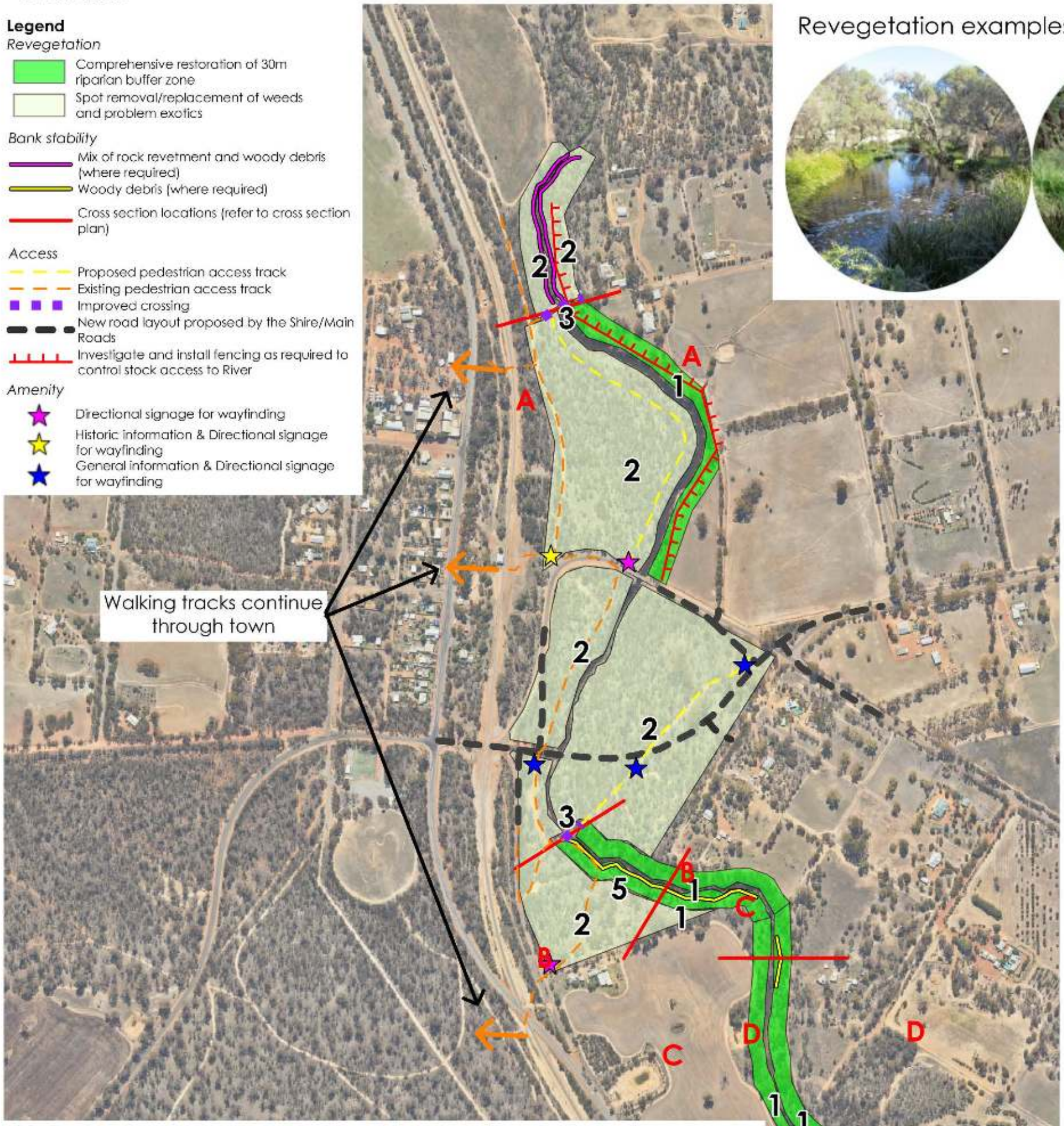
- Mix of rock revetment and woody debris (where required)
- Woody debris (where required)
- Cross section locations (refer to cross section plan)

Access

- Proposed pedestrian access track
- Existing pedestrian access track
- Improved crossing
- New road layout proposed by the Shire/Main Roads
- Investigate and install fencing as required to control stock access to River

Amenity

- Directional signage for wayfinding
- Historic information & Directional signage for wayfinding
- General information & Directional signage for wayfinding



Revegetation examples:

Existing conditions:

Notes:

1 Revegetation – comprehensive weed removal and revegetation of minimum 10m riparian buffer in these areas (30m preferred where tenure and land-use allow).

2 Revegetation – spot removal of weeds and problem exotics, replacement with native species where necessary.

3 Improvements to existing crossings including bank stabilisation and culvert modification as necessary to reduce overtopping & erosion.

4 Revegetation - comprehensive weed removal and revegetation of tributary.

5 Improvements to local drainage outlet to slow flow and prevent local erosion, including channel vegetation to stabilise and treat flows.

Fencing should be located outside of the riparian zone above the top of bank and at least 15m from the high water mark in accordance with PHCC minimum fencing requirements.

Signage will include information to acknowledge Noongar and European history of the River at Popanyinning site and communicating its cultural and historical significance, including the way the Noongar people and Europeans have valued this place throughout history.

Project activities outside of the main focal areas on public land will be in close consultation with neighbouring landholders.

Data source: PHCC. Created by:YY Projection: MGA: zone 50.

0 200 metres

Scale 1:7,000 @ A3

PHCC Working Together Peel-Harvey Catchment Council

Newmont AUSTRALIA

SOUTH32 Worsley Alumina

urbaqua land and water solutions

1 SITE DESCRIPTION

The Popanyinning reach of the Hotham River meanders near the townsite to a wider area of permanent water. Vegetation along the banks and close to the River consists of scattered native trees, exotic and native grasses with a variable shrub layer. Bridal creeper is the dominant weed species and is found throughout the site along the banks and in the adjacent vegetation, in varying degrees of density.

The River is bound by significant areas of native vegetation contained within Shire reserves, which provide an important buffer for the riparian area. The remnant vegetation is relatively clean of weeds and contains several native grass species under wandoo, sheoak and jam wattle. Shrub species are present but limited in numbers and diversity. Local residents actively use and appreciate the natural areas surrounding the River, which include a nature trail encompassing the bushland reserve as well as historical features through the town. A brochure is available to members of the public for wayfinding and information about orchids and other species that can be found in the bushland. The Popanyinning Progress Association has previously carried out an on-ground project to control bridal creeper along the River with funding from the State NRM Program.

The River is influenced by a number of private and public crossings, and the site is affected by issues related to litter, poor water quality, limited fencing, uncontrolled stock and vehicle access, and informal drainage discharging to the river. Bank instability is apparent throughout the reach on both sides though generally minor with little structural impact. Major erosion is associated with the outside of meander bends, or where other factors such as local runoff and/or human and stock access have caused bank slumping and retreat.

2 CONSULTATION

Consultation with key stakeholders and the community commenced in February 2021 and has included the following:

- Site visits with and formal presentation to the Shire of Cuballing, with direct feedback.
- Information session for the local community, with direct feedback.
- Discussions about the proposed Bunmulling Road realignment with the Shire of Cuballing.

Key aspects of interest identified by the consultation include:

- Plans for river crossings including the location of the proposed Bunmulling Rd crossing and the subsequent function of the existing Bunmulling bridge (which is likely to become a foot bridge). The current crossing can be removed once the new bridge is built but works are required to prevent it from functioning like a dam.
- Support for revegetation along the tributary to the river.
- In-stream debris which improves river health.
- Management of weeds, in particular, bridal creeper.
- Use and appreciation of river pools.
- Sediment management.
- Walk trails and linkages.

3 CONCEPT DESCRIPTION

The recommended works (Figure 1) will address issues caused by informal crossings and stock access, as well as bank stability. Bank and channel interventions include stock control via fencing, controlled stock access points, bank and bed stabilisation with revegetation, and profile modification to reduce velocities.

Access by pedestrians and vehicles will be controlled through the establishment of tracks and defined river crossings including the proposed extension of Bunmulling Rd. Wayfinding principles will be implemented to improve amenity through the erection of directional signage and the appreciation and connection of the community to the heritage values of the location will also be improved through signage.

Due to the degree of weeds and degradation of native vegetation, a large portion of the site requires comprehensive weed removal and re-establishment of native species in riparian areas, which will provide a buffer to the adjacent land uses. In some instances, spot weed removal will be sufficient to regenerate native grasses that are present at the site. Additional trees are recommended to enhance canopy and biodiversity, and where appropriate, the addition of mid-storey species will assist with long term weed control.

The Popanyinning Progress Association has carried out projects in the past which have focused on bridal creeper control, and this has had an impact on the upper reaches of the site. The most dense section is currently north of Bunmulling Rd, and the continued control of this weed throughout the site will have a significant impact on the health, regeneration, and enhancement of the native vegetation along and adjacent to the banks.

Where possible, local drainage outlets should be modified to reduce potential for erosion and water quality impacts to the River. This may include cutting back extruding sections of PVC pipes and/or realigning outlets to discharge at approximately 45 degrees to the downstream flow direction. Revegetation and rock stabilisation is also recommended around drainage outlets to provide water quality treatment, stabilise the area and reduce erosion.

4 PROPOSED WORKS

The proposed works are detailed in Figures 1 and 2 as follows.

4.1.1 River restoration

- Comprehensive weed removal in degraded areas with spot weed removal and control of exotics in other areas (see Figure 1).
- Bank stabilisation works as indicated in Figure 1. Where banks are modified but unable to achieve a 1:3 grade, some form of matting is likely to be required. This may also be required where the sediment is sandy or otherwise unstable.
- Revegetation of minimum 10m riparian corridor (where permitted by land tenure and land use).
- Cutting back local drain outlet and provision of rocks and vegetation to provide water quality treatment, stabilise the area and reduce erosion.
- Ongoing communication with the Shire of Cuballing throughout the road realignment, so that activities such as revegetation and weed control are complimentary to the process.

Estimated quantities for river restoration works:

Item	Unit	Amount
Temporary fencing	Length (m)	3,570
Rocks (d50 = 300mm)	Volume (cum)	110
Geofabric	Area (sqm)	630
Revegetation	Area (sqm)	138,360

Notes:

1. Temporary fencing will be installed to protect sections of comprehensive and demonstration revegetation.
2. Rock pitching will be installed to base and sides of steps (as per Figure 1 and Figure 2).
3. Geofabrics will be installed to banks identified for bank stability measures (as per Figure 1).

4.1.2 Public amenity, access and use

The majority of public access and use works are detailed on Figure 1. This includes:

- Creation of a path network that links to the existing path network.
- Information will be displayed to acknowledge Noongar and European history of the River at Popanyinning and communicating its cultural and historical significance, including the way the Noongar people and Europeans have valued this place throughout history (at least 1).
- Signage will also be included to provide information at key entry points to bushland reserves adjacent to the River, which includes information on river restoration (at least 3) and wayfinding (at least 2).
- Construction of the proposed realignment of Bunmulling Rd including a footbridge crossing over the river.
- Improvements to existing crossings (2) including bank stabilisation and culvert modification to reduce damming, overtopping and erosion.
- Planting additional canopy trees in the reserve area.

Signage examples

Access treatment examples

4.1.3 Adjacent landowner management

PHCC works with landholders in offering advice about managing natural areas, and opportunities for access to funding when it is available.

This communication process can occur with owners of properties located next to the Hotham River, with the aim of future on-ground projects such as revegetation, weed control, and protection of existing vegetation, particularly in relation to the River ecosystem.

Fencing is required to control stock access to the eastern bank of the River. Where possible, this should be located outside of the riparian zone above the top-of-bank and at least 15m from the high water mark in accordance with PHCC minimum fencing requirements. Access points for controlled stock access can be included where bank grades and vegetation permit. This may be in the context of water access and crash grazing if and when required, both of which need to be at appropriate locations and durations.

5 NEXT STEPS

Delivery of the plan will be guided by available funding. At this stage, weed control and revegetation can be undertaken without any further investigation, however further detailed design cannot be undertaken without site survey and is required for:

- Bunmulling Rd realignment and bridge.
- Upgrades to crossings.
- Pedestrian path network.
- Bank and bed stabilisation techniques.

Other considerations for the implementation of the works include:

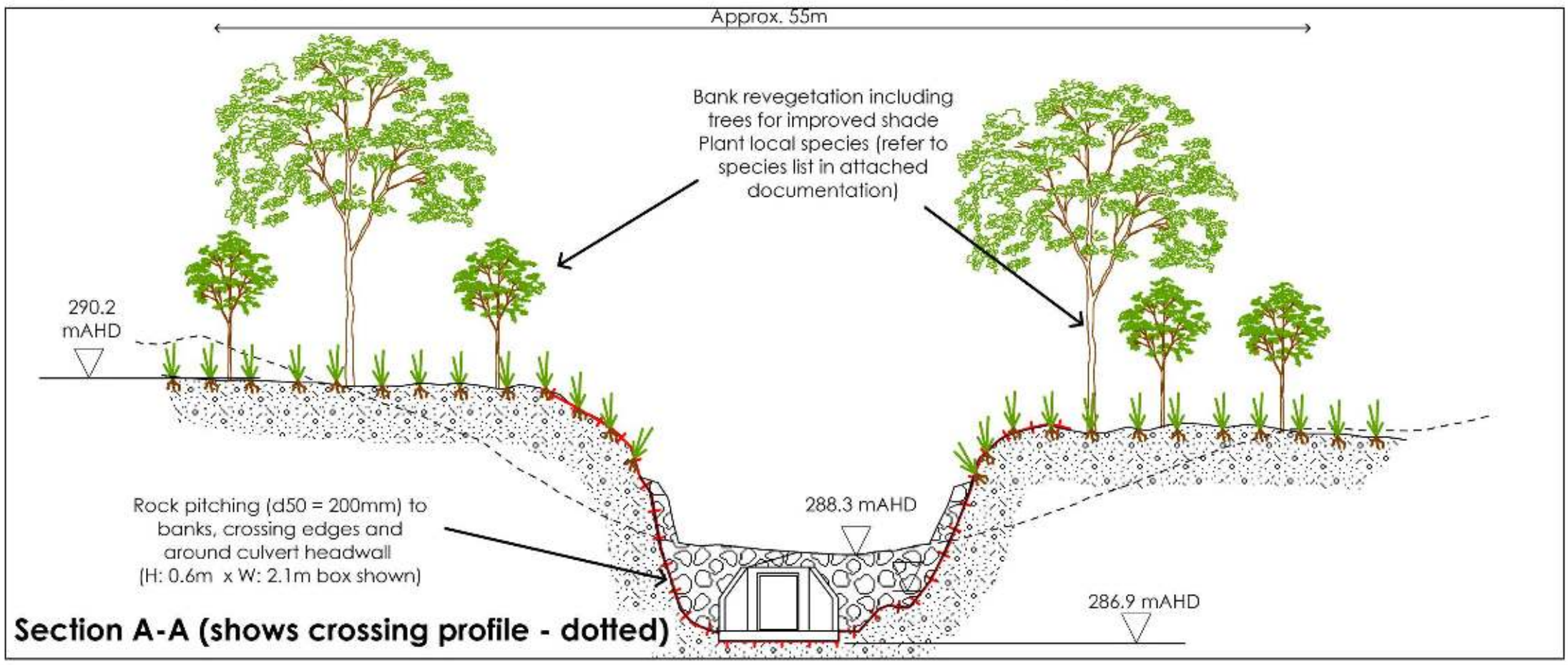
- Prioritisation of environmental restoration aspects of the plan, with secured funding.
- Further funding for restoration activities to be investigated and applied for with project partners.
- Aboriginal Heritage Approvals process through Department of Planning, Lands and Heritage.
- Approvals for modification of bed and banks through Department of Water and Environmental Regulation.
- Implementation of low impact activities such as revegetation, weed control and feral animal control.
- Formal partnership with representatives of the Noongar families connected to Popanyinning.

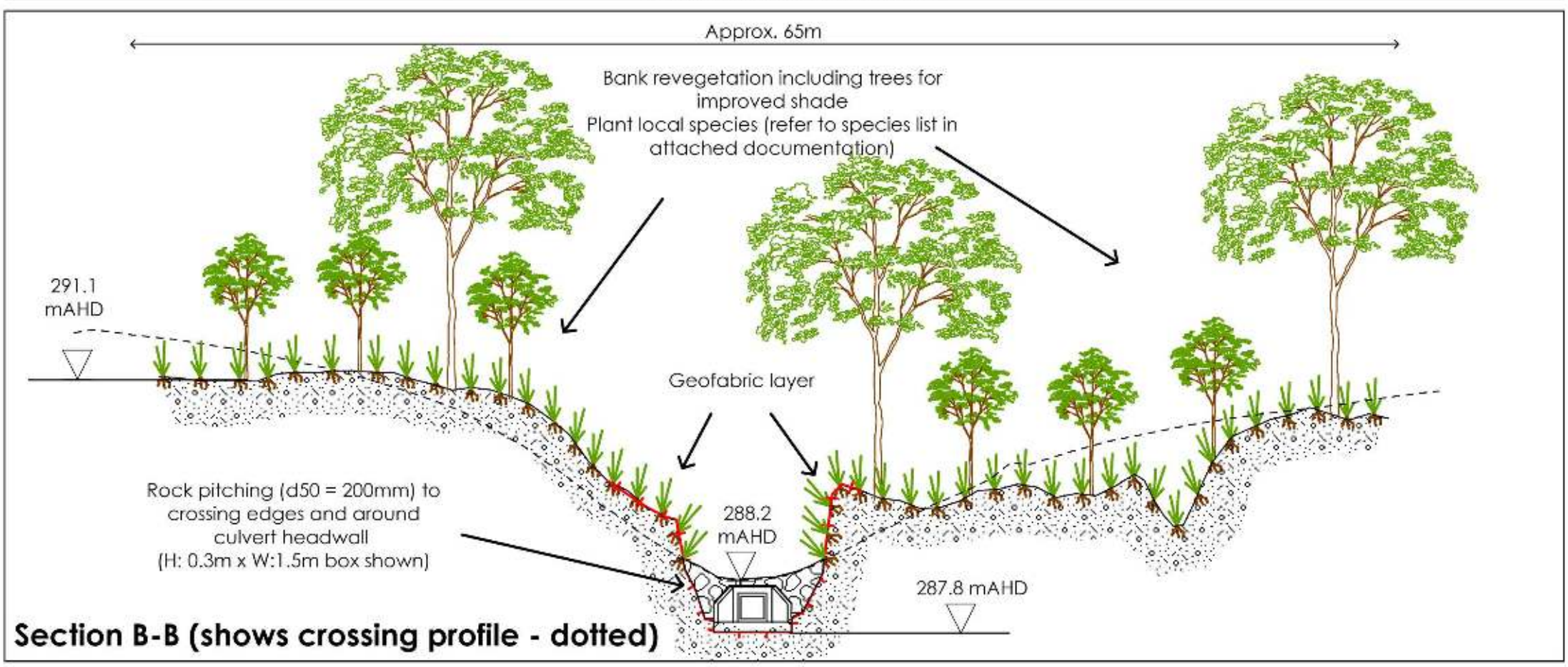
- Formal partnership with Local Governments to seek funding for the parts of the plans involving public amenity.

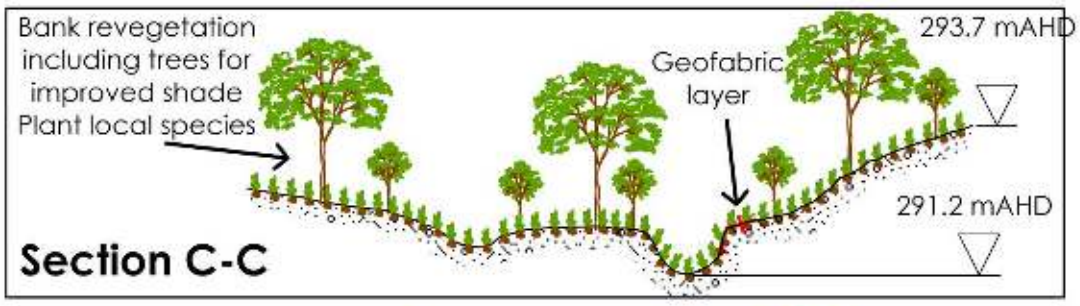
The works can be undertaken collectively or individually, and during further detailed design, consideration should be given to the following:

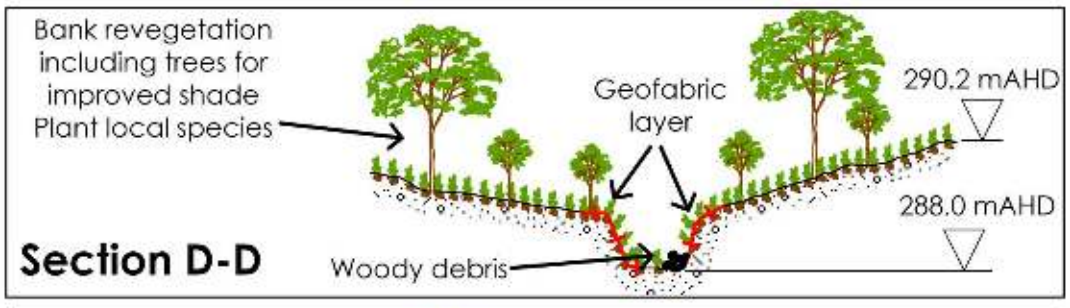
- Materials, quantities and installation of bank stabilisation structures and formal/informal access points for recreation.
- The need, scale and cost of improvements to crossings will be influenced by the timing for construction of the Bunmulling Rd extension and bridge.
- The location of the formal and informal path network, which should be sited in cleared areas, with wayfinding links to other tracks.
- Where banks are modified but unable to achieve a 1:3 grade, some form of matting is likely to be required. This may also be required where the sediment is sandy or otherwise unstable.

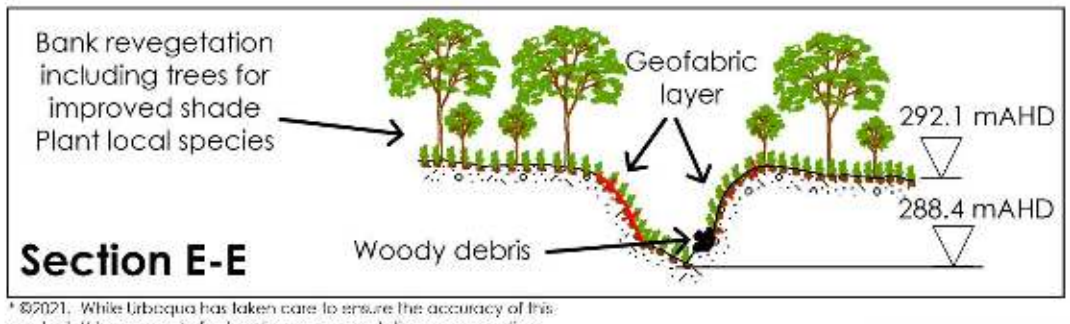
Peel Harvey Catchment Coucil - Hotham-Williams River Action Plan
FIgure 2: Popanyinning site concept - Cross section plan











Notes:

Minor modification of bank shape may be required for vehicle/equipment access and/or local stabilization.

- Geo-fabric (slopes steeper than 1:3):
  - o Install below summer water levels (under rock pitching).
  - o Install around existing vegetation where required.
  - o Laid in direction of flow at base of slopes (to 1m above summer w.l.).
  - o Roll geofabric downslope over remainder of bank.
  - o Bury at top of bank.
  - o Pin as per manufacturer requirements.
  - o Overlap geo-fabric maps by 100mm.
  - o Include slits for planting.
- Rock pitching (on slopes steeper than 1:3 and higher than 1m):
  - o d50 size of 200mm.
  - o Hard, durable rocks that are not susceptible to weathering.
  - o Larger rocks to be installed at the base of the slopes.
  - o Smaller rocks to be used to fill gaps and form tightly packed layer.
  - o Two layers of rocks.
  - o Rock pitching grade >1:2.
  - o Rock pitching to be installed to at least 1m above summer w.l.
  - o Toe trench, up to 400mm (back filled with rocks).
- Woody debris (tree trunks, collapsed trees) may be used instead of rock pitching depending on local conditions, access, or availability of material:
  - o Pinned/anchored to (or buried into) the bank.
  - o Aligned in a downstream direction.
  - o Use only native species.

Not to scale

PHCC Working Together Peel-Harvey Catchment Council | Newmont AUSTRALIA | SOUTH32 Worsley Alumina | urbaqua land and water solutions

Client: Peel-Harvey Catchment Council

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