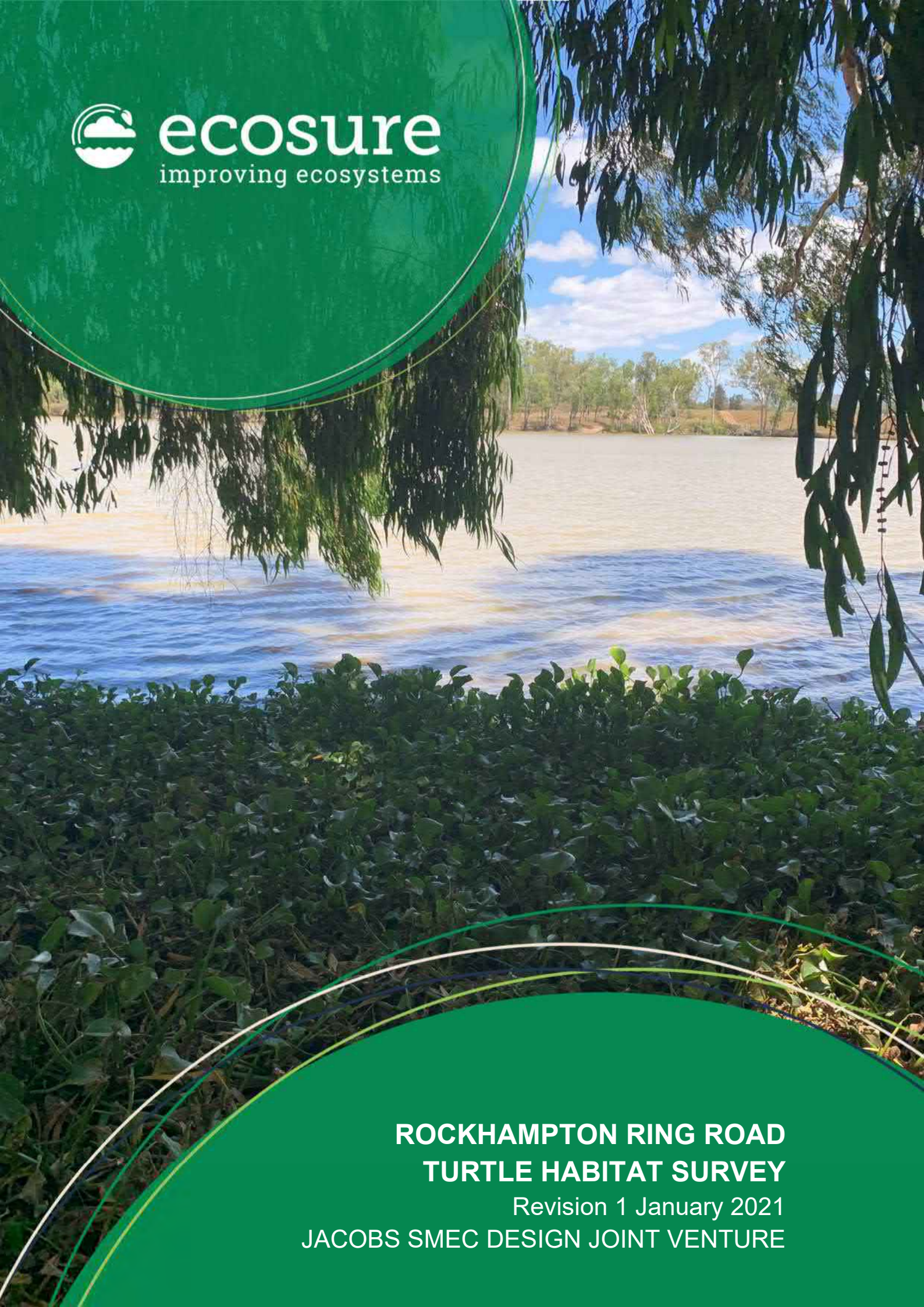

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ROCKHAMPTON RING ROAD
TURTLE HABITAT SURVEY

Revision 1 January 2021

JACOBS SMEC DESIGN JOINT VENTURE

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1 Introduction

Ecosure was engaged by to complete an assessment of turtle habitat, particularly nesting habitat within the footprint for the Rockhampton Ring Road project. There were two locations to be surveyed, including the Fitzroy River and Limestone Creek (Figure 1). These two locations were surveyed at the request of the Jacobs SMEC DJV as they were not surveyed during the pre-construction stage of the project.

1.1 Turtle species

There are two threatened turtle species known to occur within the Fitzroy River and its tributaries:

- white-throated snapping turtle (*Elseya albagula*) listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Nature Conservation Act 1992* (NC Act)
- Fitzroy River turtle (*Rheodytes leukops*) listed as vulnerable under both EPBC Act and NC Act.

1.1.1 Fitzroy River turtle

The Fitzroy River turtle is endemic to the Fitzroy Basin catchment. The species known distribution extends from the Fitzroy Barrage upstream into the tributaries of the Fitzroy River, including the Connors River, Dawson River and Nogoa River.

The Fitzroy River turtle occupies freshwater habitats within the river channel and is most commonly associated with riffle zones. However, the species also inhabits pools, runs and creeks. Undercut banks, root mats, logs and rocks provide important sheltering and foraging habitat. The Fitzroy River turtle is not known to occur in deep water areas (> 5 m), due to very low oxygen levels, little or no light penetration and cold temperatures, or in off-stream habitats such as farm dams, billabongs, or flood plains (Limpus et al. 2011).

The Fitzroy River turtle generally nests 5 to 6 m from the water's edge in alluvial sand/loam banks which are deposited during flood events. Preferred nesting banks have a relatively steep slope, low density of ground/understorey vegetation and partial shade cover. Nesting occurs between August and December (Limpus et al. 2011).

1.1.2 White-throated snapping turtle

The white-throated snapping turtle occurs throughout the Fitzroy, Burnett and Mary River catchments. Within the Fitzroy River this species distribution is known to occur in greater numbers upstream of the Fitzroy River Barrage (Commonwealth of Australia 2017). Preferred species habitat includes permanent flowing sections of the rivers characterised by steep sides, sand-gravel substrate and underwater refuge (e.g. rocks, logs and undercut banks) (Hamann et al. 2007). The species does not generally occur within farm dams, ephemeral swamplands or brackish waters (Hamann et al. 2007). The white-throated snapping turtle is generally found

in deep pools (>6 m) either upstream or downstream from a riffle zone, but will inhabit less productive slow-moving pools during dry periods.

White-throated snapping turtle nesting occurs from autumn to early spring and is primarily restricted to sand and loam alluvial deposits anywhere from 1- 86 m from the water's edge and over 8 m above the water line (Commonwealth of Australia 2017). However, recent studies targeting the white-throated snapping turtle within the Fitzroy River have shown nesting generally occurs at the top of steep slopes in sand and soil substrates approximately 5 m from the water's edge and 3 m above water level (GHD 2016).

Figure 1: Turtle habitat survey locations

SMEC

Turtle Habitat Survey

Fitzroy River
Limestone Creek
Local road
Main road
Highway

ecosure

Job number: PR5788
Date: 14/12/2020

0 0.25 0.5 km

GDA 1994 MGA Zone 56
Projection: Tranverse Mercator
Datum: GDA 1994
Units: Meter

2 Methods

Habitat and nesting assessments were conducted on 3 December 2020. A systematic search of both the left and right bank of each survey site was completed by Dr Natalie Toon (Senior Aquatic Ecologist) and Mitchell Horan (Ecologist). Approximately 360 m was surveyed for Limestone Creek and 180 m for the Fitzroy River, including an additional 200 m of bank on the upstream left back (refer Figure 1).

Surveys recorded the following bank and instream features:

- bank structure
  - height
  - slope
  - substrate
  - vegetation cover
  - presence of other fauna (including cattle and pests such as pigs)
  - evidence of disturbance
  - presence of or signs of nesting, including searches for the following:
    - turtle slides/tracks
    - diggings
    - old pieces of egg shell
    - raided nests
- instream habitat
  - presence of microhabitats (riffles, pools, run)
  - submerged or emergent macrophytes
  - bed substrate
  - debris or root mass
  - depth of pools (where possible).

An assessment of the bank suitability and supporting habitat was completed based on these habitat features and preferred habitats of known turtle species.

3 Results and discussion

Survey data is presented in Appendix 1. Suitable habitat for these two species was identified on the western bank of the Fitzroy River, whereas no suitable habitat was present on the eastern bank of the Fitzroy River. Suitable habitat on the western bank consisted of areas of underwater refuge (undercut banks and woody debris) and flowing sections of the river for white-throated snapping turtle and Fitzroy River turtle (shallow margins only). The Fitzroy River turtle would occur within the shallow edges of the Fitzroy River as the species is known to avoid areas of deep water (>5 m). The eastern bank consisted of underwater refuge areas for these species.

Limestone Creek was not considered suitable habitat for either species as the section of the creek within the project area consisted of primarily shallow isolated pools with little to no undercut banks. There was also no flowing water, or riffle sections within Limestone Creek as preferred by the Fitzroy River turtle, and limited deep water pools or areas of underwater refuge for white-throated snapping turtle.

The banks of both the Fitzroy River and Limestone Creek were considered generally unsuitable of nesting for both species due to the following features:

- Fitzroy River eastern bank:
  - compact loam soils with gravel (2 – 16 mm) and pebbles (16 – 64 mm)
  - low profile with a sharp 90^{o} edge on the bank
- Fitzroy River western bank:
  - compact sandy loam soils
  - low profile
  - highly vegetated and shaded
  - extensive *Melaleuca quinquenervia* root masses that would inhibit nesting.
- Limestone Creek banks:
  - very steep (45 – 90^{o}) high banks (~ 5 m high)
  - compacted loam soil with gravel (2 – 16 mm), pebbles (16 – 64 mm) and cobbles (64 – 256 mm)
  - heavily vegetated with grasses, weeds and large trees.

Preferred nesting banks contain alluvial sand – loam soils that are deposited by floodwaters. No alluvial sand deposited banks were present within the project area at either location. The low-profile banks of the Fitzroy River are unfavourable for nesting due to the likelihood of nests being flooded. While the compact soils, significant vegetation and extensive root masses at both locations are unfavourable due to the difficulty to dig nests (~ 23 cm deep).

The nearest suitable nesting bank with preferred nesting bank conditions (alluvial sand deposits, reduced bank slope, bank height ~ 3-5 m and less than 50 % canopy cover) on the Fitzroy River is approximately 1 km upstream of the survey area (Appendix 2).

Photographs of site assessments are presented in Appendix 2.

References

Commonwealth of Australia (2017). The National Recovery Plan for the White-throated Snapping Turtle (*Elseya albagula*), Draft.

GHD (2016). Gladstone Area Water Board and SunWater, Lower Fitzroy River Infrastructure Project; additional information to the draft environmental impact statement Fitzroy River turtle and white-throated snapping turtle species management program, Brisbane.

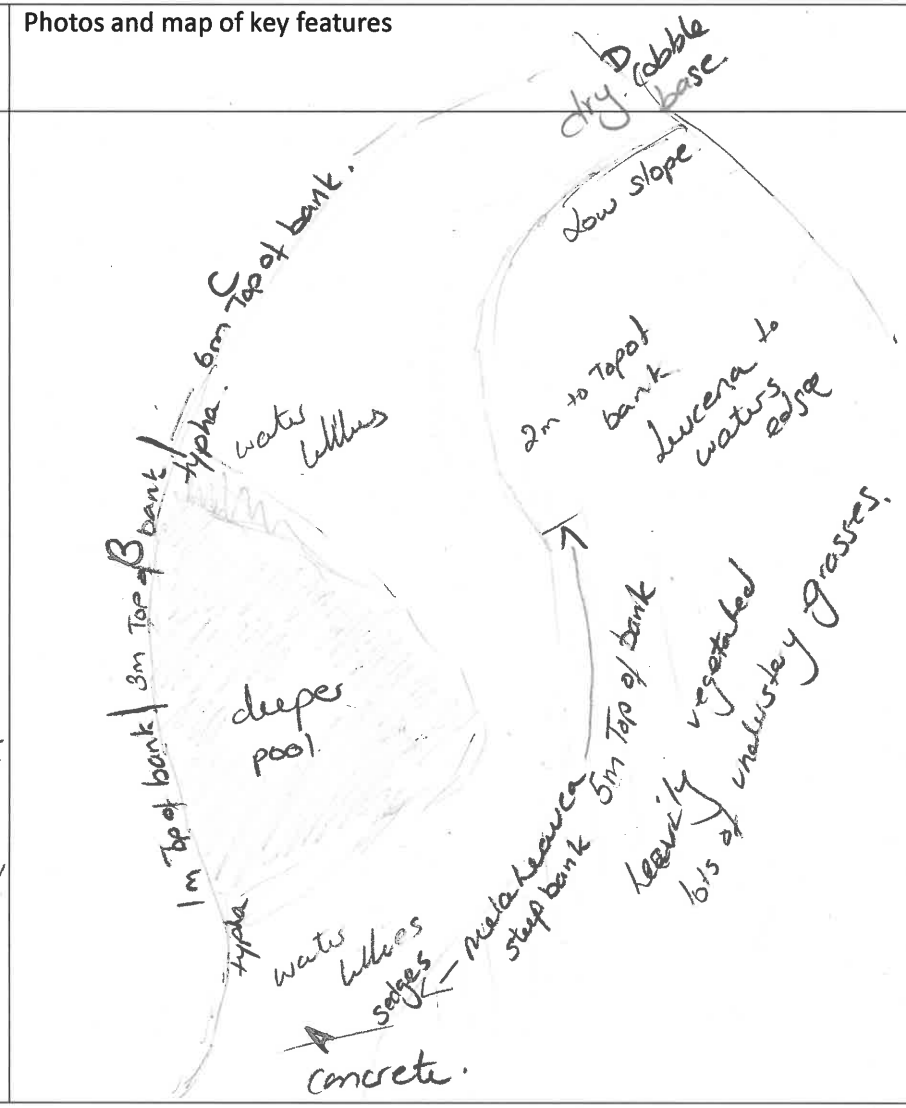
Hamann, M., Schauble, C.S., Limpus, D.J., Emerick, S.P. and Limpus, C.J. (2007). Management plan for the conservation of *Elseya sp*. (Burnett River) in the Burnett River Catchment. Report prepared for the Queensland Environmental Protection Agency.

Limpus, C.J., Limpus, D.J., Parmenter, C.J., Hodge, J., Forrest, M.J., and McLachlan, J. (2011). The biology and management strategies for freshwater turtles in the Fitzroy Catchment, with particular emphasis on *Elseya albagula* and *Rheodytes leukops* – a study initiated in response to the proposed construction of Rookwood Weir and the raising of Eden Bann Weir. Department of Environment and Resource Management, Queensland Government.

Appendix 1 Data survey

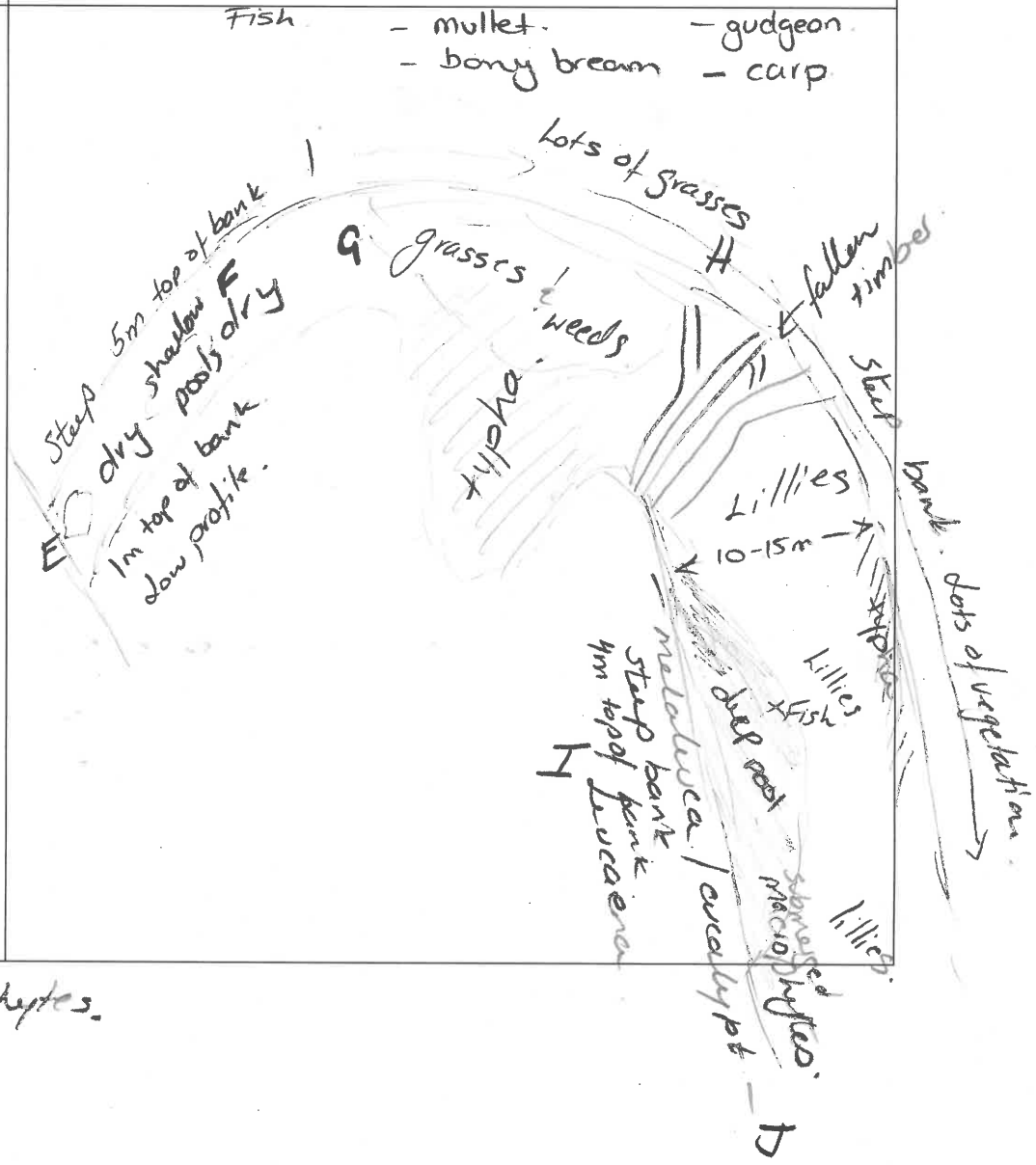
3/12/2020

Photo pts. A-D

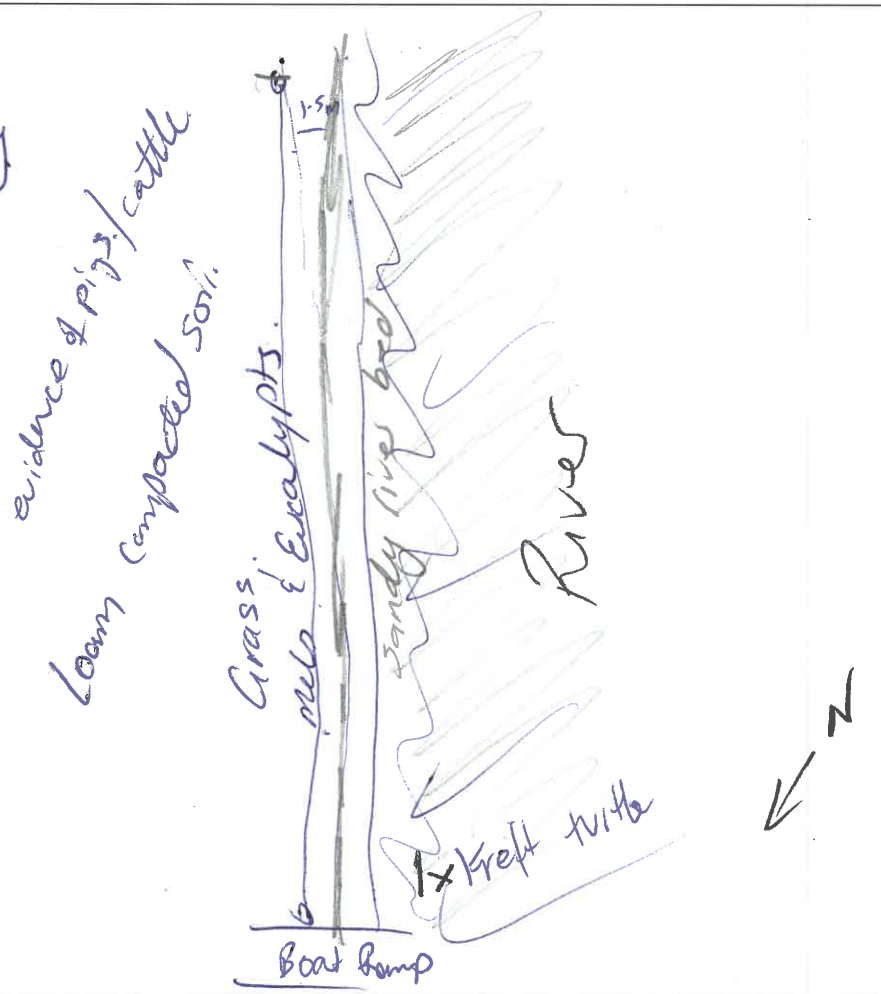
Potential nesting bank site	Nesting habitat suitability rating	Bank description	Photos and map of key features
Limestone Creek South arm.	Right – Very low Left – Low. No suitable - FRT - WTS -maybe Empodisma sp.	Right Bank. -2-5m Top of bank. - Loam soils - Steep slope ~ 60° - heavily vegetated - Casurina - Leucaena - Eucalyptus moluccana Left bank - 3m Top of bank - low slope <45° slope - heavily vegetated - loam soils - some cobbles <20cm	

3/12/2020

photo pts
E - J

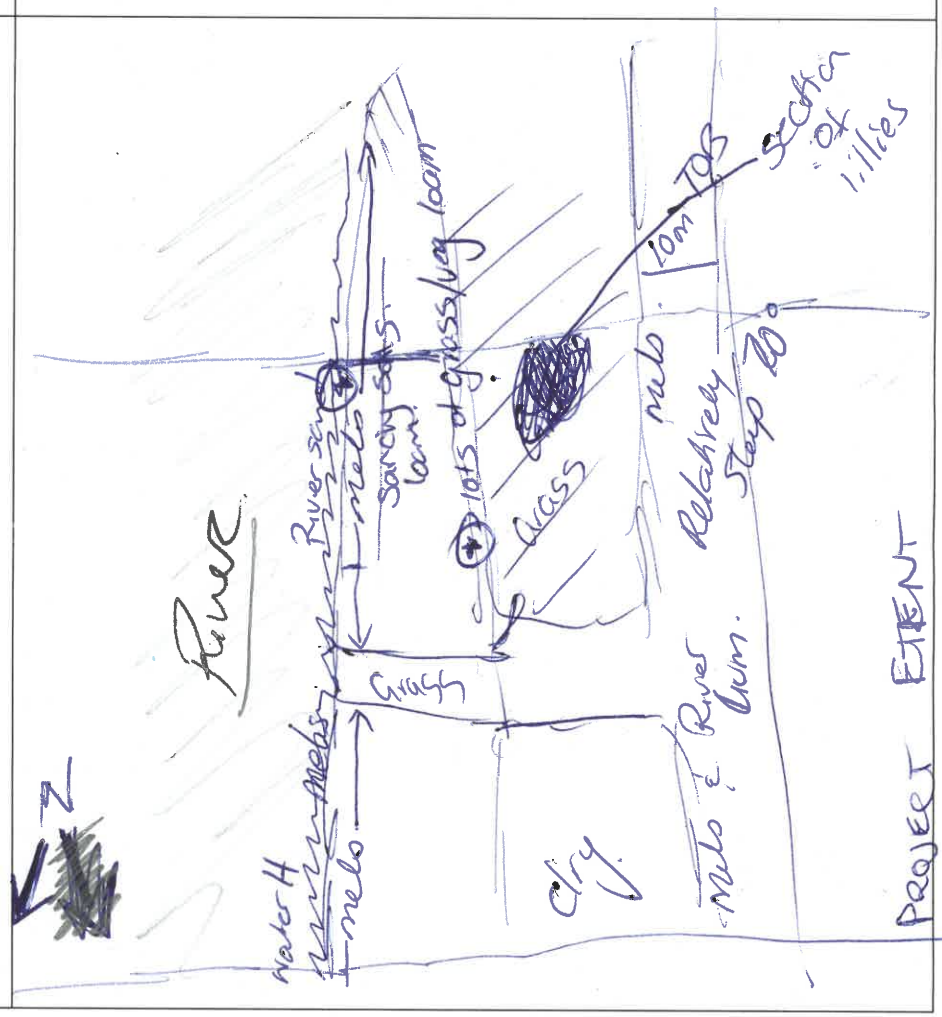
Potential nesting bank site	Nesting habitat suitability rating	Bank description	Photos and map of key features
Limestone creek North arm	Right - low Left - low No suitable - FRT - WTS maybe Emydura sp.	Left bank - Shallow water - typha & lillies - Steep banks ~5m to top of bank. - loam soils & organics - 60° slope Right bank. - 1-3m to top of bank. - loam soils - 90° to 1m & 45° to 3m. - melaleuca - leucaena - deep pool - submerged macrophytes.	

3/12/2020

Potential nesting bank site	Nesting habitat suitability rating	Bank description	Photos and map of key features
Fitzroy River Right Bank	Emydura. krefft. Possible NO FRT. No NTS	River Gum Melaleuca. Cleared industry Loam soils. 1.5m TOB. 45° slope. eroded with lots of root matt. River is Sandy	

only suitable nesting location for WTS approximately 1km upstream.
No suitable habitat for white throated snapping or Fitzroy River turtle.

3/12/2020

Potential nesting bank site	Nesting habitat suitability rating	Bank description	Photos and map of key features
Fitzroy River left Bank.	No suitable FRT / WTS habitat. World support Emydura species	Hard Compacted loam. 30° angle 1m TOB. lots of organic matter. Melaleuca lined along bank. Water hyacynth all along edge.	

only suitable nesting bank approximately 1km upstream, for WTS No habitat for Fitzroy River turtle.

Appendix 2 Photographs of survey

Limestone Creek

Upstream from southern extent of survey area

Facing western bank of southern extent

Isolated pools middle of survey area

Isolated pool facing upstream middle of survey area

Facing upstream to upstream extent of survey area

Upstream extent of survey area

Fitzroy River

Western bank upstream

Western bank downstream

Western bank

Western bank compacted loam soil

Eastern bank upstream

Eastern bank downstream

Suitable sand nesting habitat (1 km upstream on western bank of Fitzroy River; -23.31892,150.48045)

Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed & Approved by
00	14/12/2020	PR5788 Rockhampton Ring Road Turtle Habitat Survey	Natalie Toon, Senior Aquatic Scientist	Heather Richards, Senior Environmental Scientist
01	10/02/2021	PR5788 Rockhampton Ring Road Turtle Habitat Survey	Natalie Toon, Senior Aquatic Scientist	Heather Richards, Senior Environmental Scientist

Distribution List

Copy #	Date	Type	Issued to	Name
1	10/02/2021	Electronic	Jacobs SMEC Design Joint Venture	Mellissa Zulpo
2	10/02/2021	Electronic	Ecosure	Administration

Citation: Ecosure, 2021, *PR5788 Rockhampton Ring Road Turtle Habitat Survey*, Report to . Publication Location – Brisbane

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