
Attachment G
23010 Inspection of Canning
River at Station St Bridge for
Westralunio carteri - Rev 0, April
2023

MEMORANDUM

To:	Sonam Wangchuk	WSP Australia Pty Ltd	Date: 16 th April 2023
From:	Jesse Wansbrough Dean Thorburn	Indo-Pacific Environmental	
Project ID: 23010 Inspection of Canning River at Station St, Gosnells for <i>Westralunio carteri</i>			
Subject: On-site assessment to determine if <i>Westralunio carteri</i> are present within a section of the Canning River at Station St, Gosnells, WA.			

1 INTRODUCTION

1.1 Purpose and Intent

This memorandum presents the results of an on-site assessment undertaken within the Canning River in the vicinity of Station Street, Gosnells, Western Australia. The primary objective of the assessment was to determine whether *Westralunio carteri* (Carter's Freshwater Mussel - CFM) was present within a 200 m stretch of the Canning River likely to be impacted by the Station Street bridge upgrade project.

1.2 Background

The City of Gosnells is proposing to construct a new dual-carriageway bridge over the Canning River at Station Street in Gosnells. The new bridge will be constructed to the north of the current single-lane bridge, which will be retained for pedestrian access. Construction of the new concrete bridge will require clearing and construction work within the Swan Canning Riverpark and Development Control Area. WSP Australia Pty Ltd was engaged by the City of Gosnells to assist the application for the authorisation of the construction of the Station Street Bridge, and as part of this process, identified the possibility of project impacts on Carter's freshwater mussel *Westralunio carteri*.

Westralunio carteri is known to have historically occurred across the surrounding Swan Coastal Plain. Additionally, data supplied by the Department of Biodiversity, Conservation, and Attractions (2023) from the Threatened and Priority Fauna Database show historical occurrences of *W. carteri* in the Canning River directly downstream from the project works area. This species is listed as 'Vulnerable' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Western Australian Biodiversity and Conservation Act 2016* (BC Act). As such, prior to the commencement of the proposed construction works WSP Australia engaged Indo-Pacific Environmental to perform a preliminary survey aimed to determine whether *W. carteri* occur within the proposed works area so that appropriate management actions can be implemented before and / or during construction. This memorandum presents the findings of that assessment.

2 METHOD

The on-site assessment was conducted on the 4th of April 2023. The area investigated for the presence of *W. carteri* encompassed the area outlined on the Station Street Bridge Clearing Permit Map provided by WSP in addition to ~100 m sections of the Canning River both immediately up- and downstream of the proposed area of works (Figure 1). Noting the largely sessile nature of *W. carteri*, and the shallow, clear water encountered at the time of the survey, a visual survey of the waters with the aid of a bathyscope was determined to be the most appropriate survey method (Figure 2). The relatively small stream width, and shallow water depth, enabled field staff to begin the survey at the downstream end and progress systemically upstream to cover all areas of stream bed within the survey area. In addition, inspection of sediments and along banks was made for CFM shell fragments.

The survey area was divided into four reaches of ~ 50 m length, with two reaches located either side of the bridge works area. In each reach, habitat observations were recorded, and water quality measurements collected via a Hanna HI98194 multi-parameter meter. Parameters measured included; water temperature (°C), salinity (PSU), specific conductivity (µS/cm), pH, ORP (mV) and dissolved oxygen (% and mg/L) (Table 1, Figure 1).

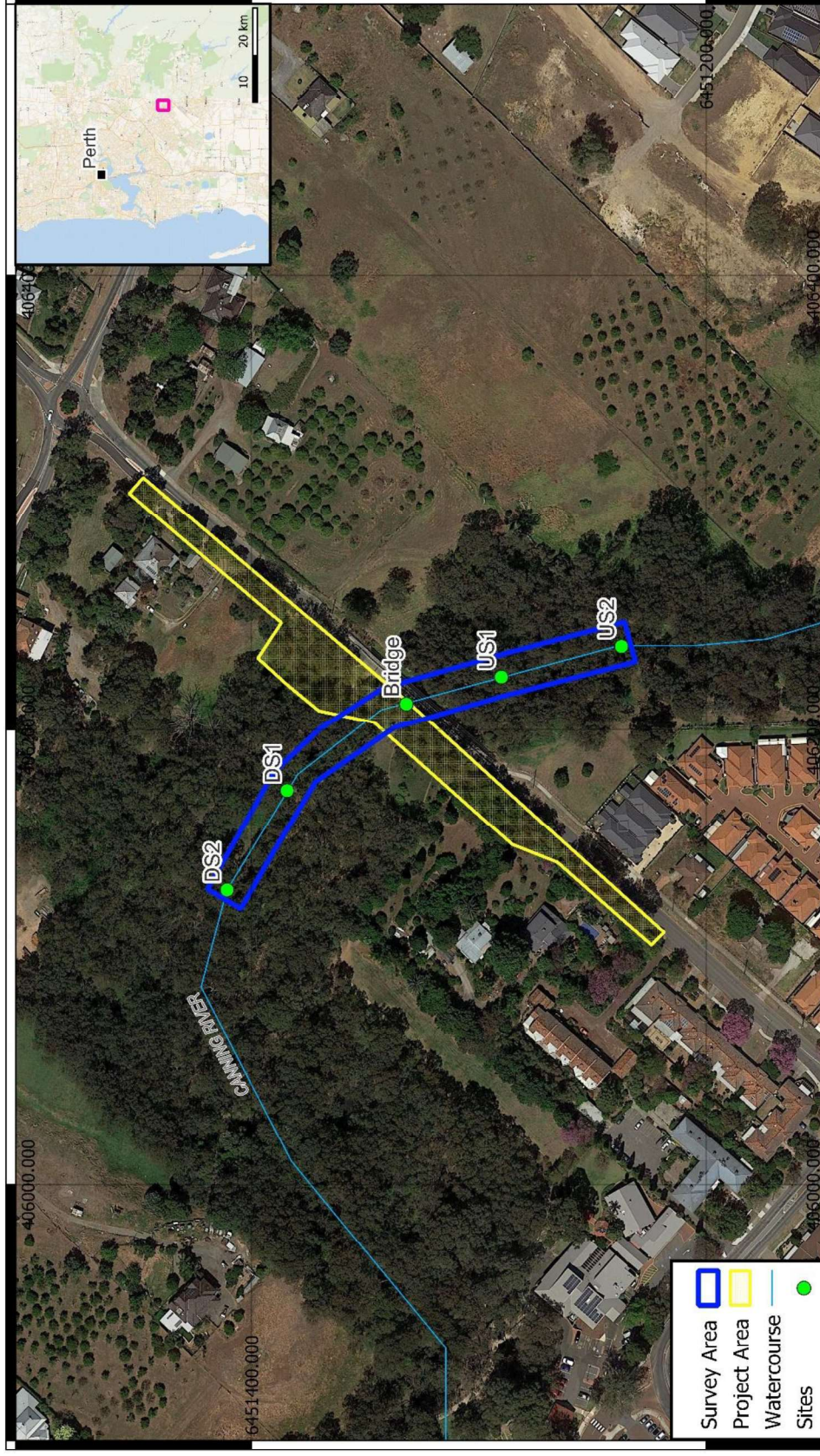


Figure 1. Project location and extent of area which was assessed for the presence of *W.carteri* in the Canning River at Station Street in Gosnells, WA



Figure 2. Inspecting benthic sediments with the aid of a bathyscope for evidence of *Westralunio carteri*.

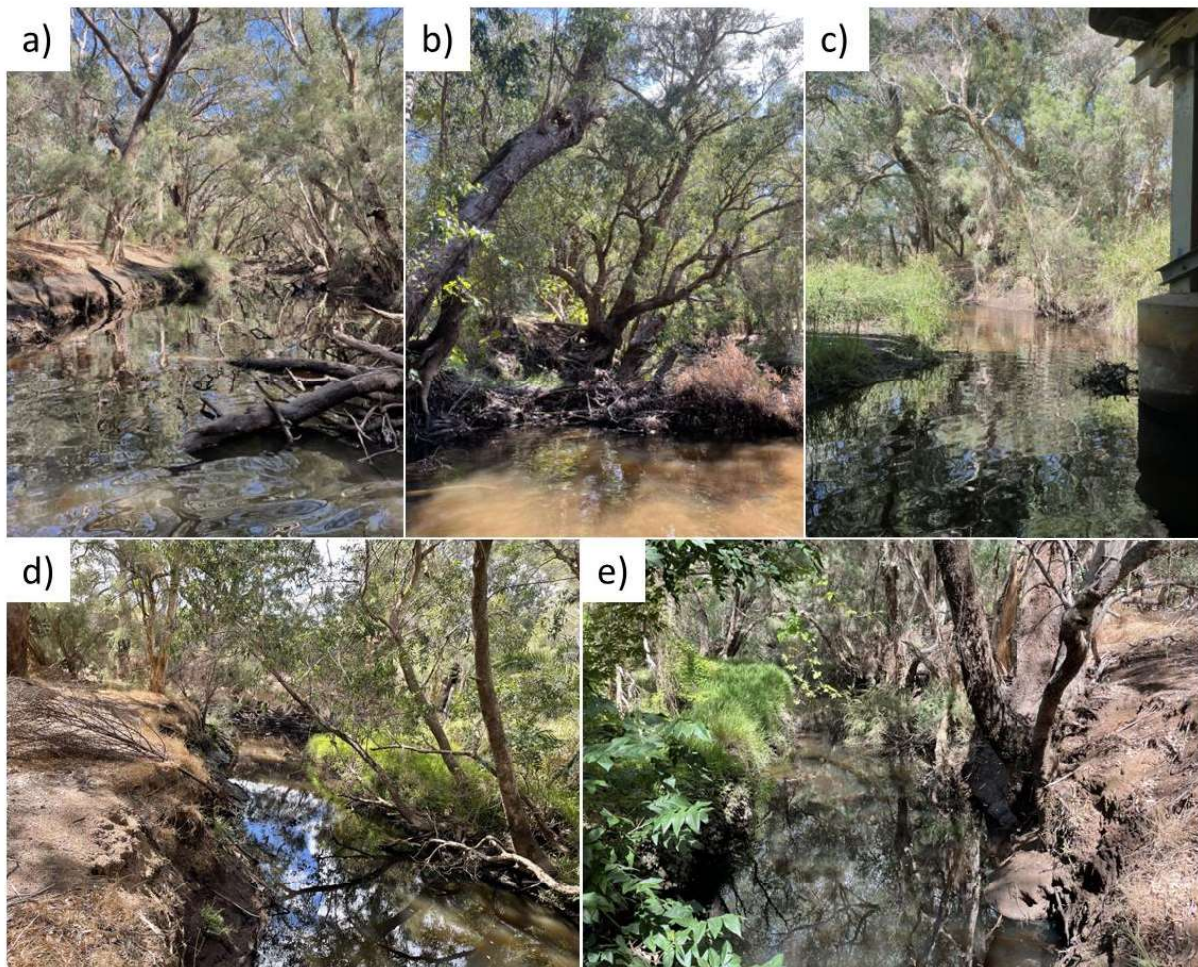


Figure 3. Examples of typical habitat within the Canning River at Station Street including; a) the downstream extent of the survey zone DS2, b) looking across DS1, c) downstream of the bridge, d) upstream of US1, and e) the upstream extent of the survey zone US2.

3 RESULTS

3.1 Habitat and Water Quality

At the time of the survey, water was flowing throughout the survey zone at average depths between 0.1 – 0.5 m with some deeper pools to 1.5 m depth. River width within the investigated area ranged from 1.5 – 6 m, before meeting a steeply sloped bank. In general, the stream bed was 1 – 2 m below bank height (Figure 3). As a whole, the stream bed was well shaded by predominately native riparian vegetation. The benthic substrate within the majority of the area investigated was favourable for *W. carteri* habitation, consisting of a mix of sand, silt and banks with tree roots (Figure 4). Reach US2 contained several deep pools which were not accessible using waders. Measurement of basic surface water quality parameters indicated values to be within the required range for sustaining *W. carteri* and teleost species capable of hosting glochidia (Table 1).

Table 1. In-situ physio-chemical water parameters recorded during site assessment. Sites are presented in from downstream to upstream.

Site	Zone Easting	51 H Northing	Temp (°C)	Sp. Cond. (µS/cm)	pH	Turbidity (FNU)	ORP (mV)	DO %	DO (mg/L)
DS2	406130	6451411	20.14	762	7.61	2.08	8.2	91.1	8.25
DS1	406173	6451384	19.88	793	7.61	0.55	15.8	91.1	8.28
Bridge	406211	6451332	19.78	761	7.73	0.06	30.1	105.1	9.59
US1	406223	6451290	19.82	754	7.4	0.37	49.9	89.5	8.15
US2	406237	6451237	19.96	744	7.39	0.16	55.7	101.6	9.24



Figure 4. Typical benthic habitat of the survey area. Comprising predominantly sand, with some silt and woody debris.

3.2 Presence of *Westralunio carteri*

Westralunio carteri individuals were observed in all reaches surveyed. The distribution of individuals was relatively patchy, with mussels often observed in small groups in areas of favoured habitat. While a precise estimate of abundance was outside the scope of this survey, estimated mussel densities ranged from 0 – 10 individuals m⁻². In total, 648 individual *W. carteri* were observed over the 200 m stream reach surveyed. The lowest abundance was observed in the reach furthest downstream, DS2 with 69 *W. carteri* recorded. While mussels were not disturbed to measure them, *W. carteri* in this reach appeared smaller on average than those observed in the other reaches.

Reach DS1, immediately downstream of the bridge contained the highest abundance of *W. carteri* with 317 individuals recorded in the ~ 50 m stretch. This is the planned location of the new bridge, and mussels in this reach are likely to be heavily impacted by construction works. Reach US1, immediately upstream of the bridge had the second highest abundance observed, with 158 individuals recorded. Finally, reach US2 had 104 *W. carteri* observed. It is important to note that the survey design was a visual survey for presence/absence of *W. carteri* and due to variation in light conditions, the presence of some deep pools,

and habitat complexity it is likely that the abundance of *W. carteri* in the survey zone is substantially higher than recorded here. Multiple size classes of *W. carteri* were observed throughout the survey area, indicating that juveniles are recruiting to the population (Figure 5).



Figure 5. Image showing multiple size classes of *W. carteri*. Large individuals are indicated by red arrows, small individuals by white arrows.

3.3 Native Invertebrates

In addition to *Westralunio carteri* two other native invertebrate species were observed during the survey. Moderate numbers of the south-west glass shrimp *Paleomon australis* (formerly *Paleomonetes*) were observed. In addition, two illegal opera-house traps were removed from the survey area, one of which contained eight smooth marron *Cherax cainii*.

3.4 Teleost Species

Westralunio carteri has an obligate parasitic larval stage, where the larvae, called the glochidia, attaches to passing fish to facilitate dispersal. As such, the presence of fish is a requirement for the successful recruitment of juvenile *W. carteri*. Several species of fish were observed during the survey for *W. carteri*. One native fish species, the Swan River goby *Pseudogobius olorum* was observed in low numbers. The majority of fish biomass and species diversity observed were from a variety of invasive species. The most

numerous species observed was the mosquito fish *Gambusia holbrooki*. Two other species of Poeciliidae were also observed, large numbers of speckled mosquitofish *Phalloceros harpagos* were observed, and a single male guppy *Poecilia reticulata* was spotted. Several large cichlids and many small (~1 cm) juveniles were observed from a distance, which were likely pearl cichlids *Geophagus brasiliensis*. The presence of multiple teleost species and the observation of relatively small mussels indicates that the recruitment of juvenile mussels is likely occurring in the survey location.

4 CONCLUSION

A population of Carter's freshwater mussel *Westralunio carteri* was documented to occur in the Canning River at Station Street Bridge, Gosnells. The investigated area:

- provided appropriate benthic habitat and water quality for the species
- contained an observed 648 individual *W. carteri*
- contained *W. carteri* of multiple size classes, indicating successful recruitment

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