MARY RIVER CATCHMENT COORDINATING COMMITTEE

Evaluating the extent of Tilapia (*Orechcromis mossambicus*) in the Lower Mary River Catchment December 2014

Mozambique Tilapia (*Orechromis Mossambicus*)

Prepared by the Mary River Catchment Coordinating Committee

Abstract

A single mature male and 29 juvenile Tilapia were caught in the main trunk of the Mary River in the lower reaches around Tiaro during this survey conducted in December 2014. The adult and juveniles were caught approximately three and nine kilometres respectively upstream of the previously known location in August 2014. Many mature male fish were in Myrtle Creek eight kilometres upstream from the confluence with the Mary River. No Tilapia were detected in Tinana Creek.

Recommendations include education, control and monitoring programs. The presence of Tilapia in the Mary River catchment highlights the importance of implementation of riparian restoration and reinstatement to reduce the carrying capacity of the catchment for Tilapia.

Introduction

Tilapia; the collective name for several species of invasive fish species of the Cichlid family, have not been detected in the Mary River system until recently despite their occurrence in many Queensland river systems. In October 2014 a positive identification of a single fish was made at Tiaro in the Lower Mary River; Mozambique Tilapia (*Oreochromis mossambicus*). Further inspection of the area revealed many individuals of this species. The sightings gave rise to questions regarding the extent and size of the infestation. Discussions between the Mary River Catchment Coordinating Committee (MRCCC) and staff from Wide Bay Water identified that Tilapia may have been inadvertently introduced to the lower Tinana Creek in early 2014 when the pipeline delivering water from the Mary River to Teddington Weir was operational between January and March 2014.

This fish is a highly invasive mouth-brooding species capable of reproducing several times a year. It displays a high tolerance to highly variable water qualities; low dissolved oxygen, high temperatures and high salinity levels. It also has a preference for disturbed waterways. It is highly fecund with a very high hatchling survival; characteristics that cause it to be capable of rapidly infesting river systems and decreasing the success of native fauna species.

Several threatened species supported by the Mary River and its tributaries are likely to be directly threatened by the presence of the Tilapia, such as including the Mary River Turtle. This survey aims to evaluate the extent and size of the infestation in order to develop a strategy to curtail further infestation. The information collected, as well as future research on distribution and abundance, will inform activities and further research projects and may also provide insights into changes in the river ecology due to the presence of this fish.

Figure 1. Confirmed specimen of *Orechromis mossambicus* captured downstream of Tiaro in October 2014.

Scope

This study maps the current range of Tilapia within the lower Mary River and its tributaries, specifically Myrtle, Logging and Tinana Creeks, to inform future research and control measures to reduce the impacts of this noxious fish on the river ecology, targeting species within the Mary River Aquatic Threatened Species Recovery Plan.

Methods

Fyke nets and a cast net were used to undertake this survey.

Five fyke nets of varying mesh sizes and dimensions were deployed at 4 locations over 2 days and nights (8th December and 9th December 2014) within the Mary River barrage pondage area (Figure 2). All nets consisted of a hoop entrance to the holding chamber, two internal funnels and wings at each side to encourage fish to enter the chamber. One wing was always fixed to the bank of the waterway while the other was anchored in the stream channel. Most of the fyke nets were orientated so that the entrance was facing upstream. A float was used in the chamber and the cod end was secured so that it rose above the water surface thereby allowing air-breathing animals to access the air. Nets were checked and emptied 12 hourly.

A cast net with 19mm mesh and 8 foot drop was used at 4 locations on the Mary River, and 5 locations on the lower Tinana Creek. The Mary River cast nets sites were surveyed on Tuesday 9th December, and the Tinana Creek cast nets sites were surveyed on Thursday 11th December. Six sites were surveyed; four along the lower Mary River, 4 sites along Tinana Creek in the Teddington Weir pondage area, one site along Myrtle Creek and one along Logging Creek.

Observations were made in Myrtle Creek due to the interference of instream debris with the use of the cast net.

The sites surveyed during this project are described in Table 1 and the locations are show in Figure 3. All records of Tilapia and other species caught will be entered into the Queensland Government WildNet database.

Figure 2. Inspection of fyke net.

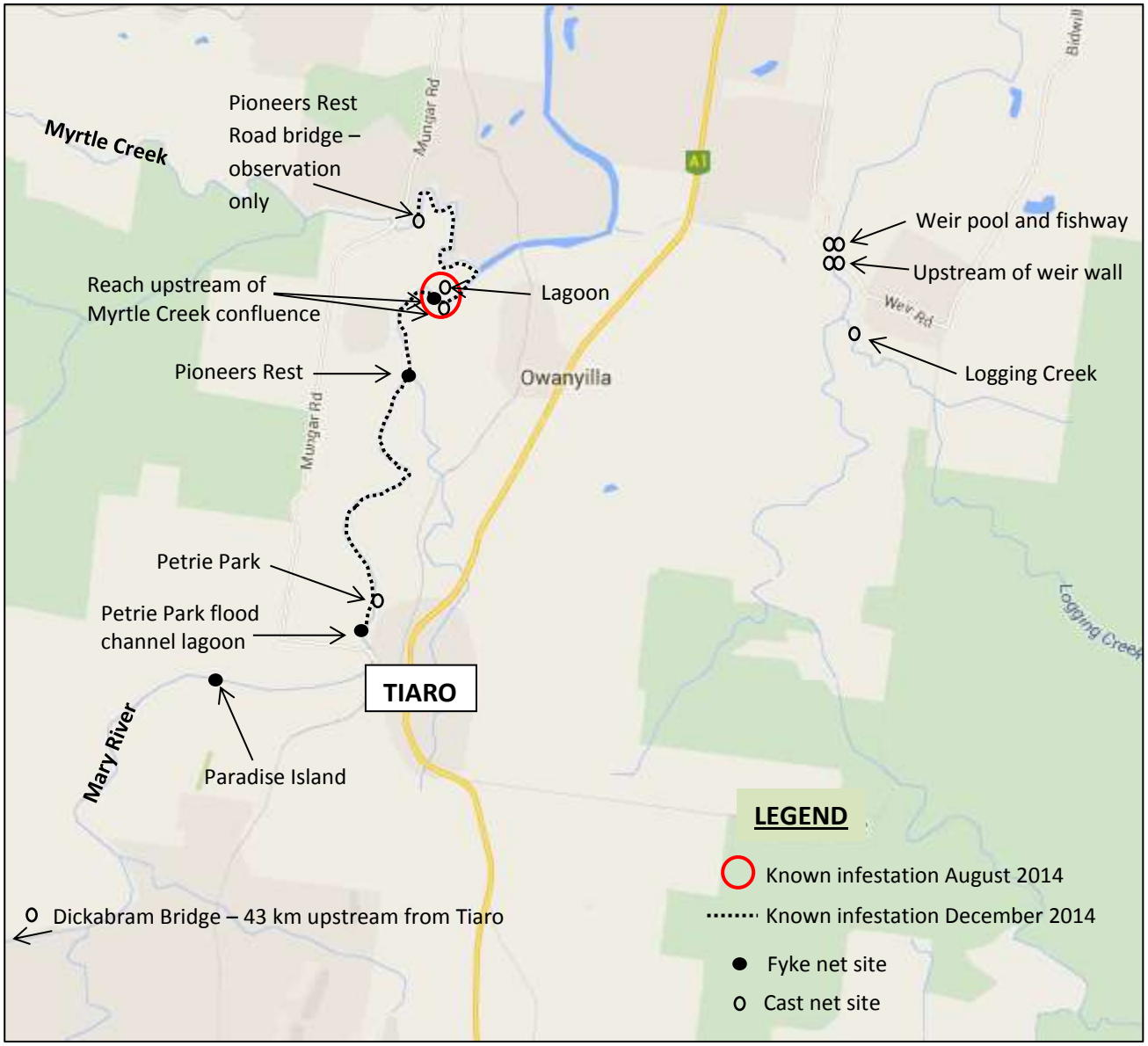


Figure 3. Survey Site locations.

Table 1. Survey locations, equipment used, survey effort and dates.

Site	Latitude	Longitude	Net type	Mesh size	Orientation	Effort	Date/s
Mary River - main trunk at Dickabram Bridge, Miva, right bank	-25° 57' 14.1"	152° 29' 44.7"	Cast	19mm	NA	20 casts	9 Dec 2014
Mary River - Paradise Island, Tiaro – main trunk at upstream end of island, right bank	-25° 43' 27.6"	152° 32' 33.8"	Fyke	3mm	Upstream	46h 0m	8, 9 & 10 Dec 2014
Mary River - Paradise Island, Tiaro - main trunk at upstream end of island, right bank	-25° 43' 27.6"	152° 32' 33.8"	Fyke	3mm	Downstream	22h 15m	8 & 9 Dec 2014
Mary River - Paradise Island, Tiaro - main trunk at upstream end of island, left of middle	-25° 43' 27.6"	152° 32' 33.8"	Fyke	3mm	Downstream	23h 50m	9 & 10 Dec 2014
Mary River - Petrie Park, Tiaro - flood channel lagoon, upstream end	-25° 43' 9.5"	152° 34' 33.7"	Fyke	5mm	Upstream	23h 30m	8 & 9 Dec 2014
Mary River - Petrie Park, Tiaro - flood channel lagoon, middle	-25° 43' 3.4"	152° 34' 33.2"	Fyke	5mm	Upstream	30h 0m	8, 9 & 10 Dec 2014
Mary River - Petrie Park, Tiaro - flood channel lagoon, downstream end	-25° 43' 1.7"	152° 34' 33.1"	Fyke	5mm	Upstream	16h 30m	9 & 10 Dec 2014
Mary River - Petrie Park at boat ramp	-25° 42' 52.3"	152° 34' 36.4"	Cast	19mm	NA	10 casts	9 Dec 2014
Mary River – main trunk at Pioneers Rest	-25° 40' 13.1"	152° 35' 00.1"	Fyke	20mm	Upstream	24h 30m	8 & 9 Dec 2014
Mary River - main trunk upstream of confluence with Myrtle Creek	-25° 39' 26.5"	152° 35' 23.6"	Fyke	20mm	Upstream	18h 30m	9 & 10 Dec 2014
			Cast	19mm	NA	30 casts along both banks	9 Dec 2014
Mary River - lagoon upstream of confluence with Myrtle Creek	-25° 39' 26.5"	152° 35' 23.6"	Cast	19mm	NA	50 casts in lagoon	9 Dec 2014
Myrtle Creek near old bridge	-25° 38' 47.0"	152° 34' 55.6"	nil	nil	NA	2 hours of observations from boat	9 Dec 2014
Logging Creek – downstream reach	-25° 39' 43.4"	152° 40' 08.6"	Cast	19mm	NA	100 casts	9 Dec 2014
Tinana Creek, Teddington Weir, upstream of the wall along the right bank	-25° 39' 01.0"	152° 39' 58.2"	Cast	19mm	NA	20 casts	11 Dec 2014
Tinana Creek, Teddington Weir intake, left bank	-25° 39' 00.5"	152° 39' 55.7"	Cast	19mm	NA	10 casts	11 Dec 2014
Tinana Creek, Teddington Weir downstream fishway entrance	-25° 38' 59.7"	152° 39' 58.2"	Cast	19mm	NA	10 casts	11 Dec 2014
Tinana Creek, pool below Teddington Weir wall and above Weir Road	-25° 38' 58.9"	152° 39' 57.2"	Cast	19mm	NA	20 casts	11 Dec 2014

Results

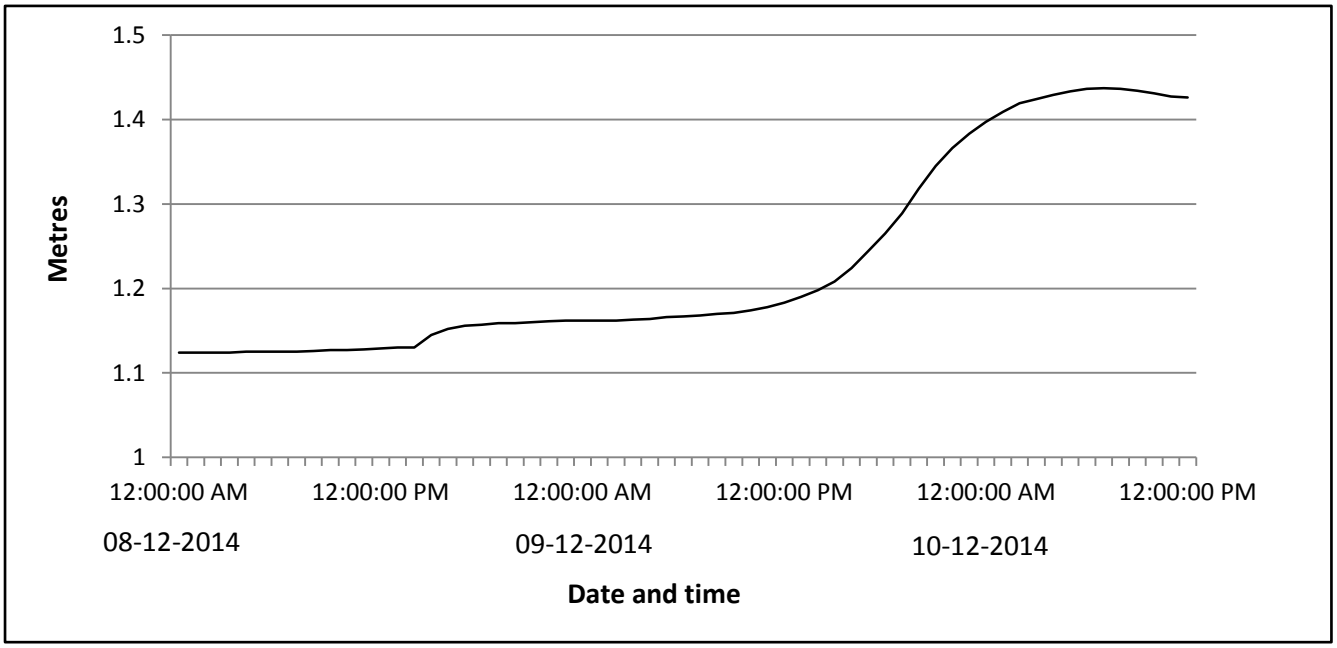
One adult male tilapia was caught in the fyke at Pioneers Rest on 8th December and 29 small Tilapia were caught in the fyke net in the flood channel, upstream of Petrie Park on Tuesday 9th December (see Figure 4). Many male Tilapia were observed from the boat around the Pioneers Rest Road Bridge that crosses Myrtle Creek. No tilapia were caught in the fyke nets at Paradise Island, which is the uppermost extent of the Mary River barrage pondage. Records of fish caught and observed are provided in Appendix A and B.

No Tilapia were caught in the cast nets in either the Mary River or Tinana Creek sites.

Figure 4. Images of fish caught.

The weather conditions during the survey period were warm and unstable with large storms in the area on the 8th and 9th December with falls of 25 and eight millimetres respectively at Home Park. The Mary River rose 15cm overnight on Monday 8th December as can be seen in Figure 5 below. Flows remained relatively unchanged in Tinana Creek during the survey.

Figure 5. Flow heights at the Home Park gauging station during the survey period.



Recommendations

The MRCCC recommends that a program of education be developed and adopted as a matter of urgency and that control measures are investigated and adopted. Community participation will be vital to the success of control measures.

Ongoing annual monitoring will be useful to determine the parameters of spread and preferred habitat types of Tilapia in the Mary River catchment. A review of possible capture and surveillance methods will assist with the development of such a program in the future. For example, baited fish traps may be a more effective method of surveying many sites where use of a fyke or cast net is prohibitive. Visual monitoring for nesting sites may be of value to inform on-ground actions that could reduce the availability of nesting habitat thereby reducing recruitment of Tilapia.

Based on current knowledge of preferred habitat for Tilapia, the MRCCC recommends that increased effort to rehabilitate and reinstate riparian vegetation along the length of the Mary River and its tributaries is paramount to reducing threats such as Tilapia invasion, and increasing the resilience of the waterways and the fauna and flora that utilise this habitat. It is our opinion that this is the highest priority in river management for this system as reflected in the Mary River Aquatic Threatened Species Recovery Plan (Draft).

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Appendix A

Fish caught by fyke net during the survey.

		Site and number caught			
Species	Common name	Paradise Island	Petrie Park	Pioneers Rest	Mary River Upstream of Myrtle Creek confluence
Fish					
Oreochromis mossambicus	Tilapia		29	1	
Ambassis agassizii	Agassiz's glassfish		2		
Anguilla reinhardtii	Long-finned eel	3	3		1
Craterocephalus marjoriae	Marjories hardyhead	80	approx. 550		
Glossamia aprion	Mouth almighty	46	9	1	
Hypseleotris galii	Fire-tailed gudgeon	1	14		
Hypseleotris spp.	Gudgeon spp.	approx. 1150	approx. 575		
Melanotaenia duboulayi	Crimson-spotted rainbowfish	34	approx. 450		
Nematalosa erebi	Bony bream		32	2	1
Philypnodon grandicepts	Flathead gudgeon	1	15		
Philypnodon macrostomus	Dwarf flathead gudgeon	2	1		
Pseudomugil-signifer	Pacific blue eye	126	75		
Retropinna semonii	Australian smelt	1	22		
Tandanus tandanus	Eel-tailed catfish	1	1		3
Hypseleotris compressa	Empire gudgeon	4			
Neosilurus hyrtlii	Hyrtl's catfish	1	3		
Notesthes robusta	Bullrout		1		
Macquaria novemaculeata	Australian bass		1		
Other fauna					
Chelodina expansa	Broad-shelled river turtle	1			1
Elusor macrurus	Mary River turtle	1			
Emydura krefftii	Krefft's turtle	2	1		1
Ornithorhynchus anatinus	Platypus			1	

Appendix B

Fish caught by cast net during the survey.

Cast net location	Effort	Catch
Myrtle Creek near old bridge	2 hours of observations from boat	Observed many large red-finned Tilapia, sea mullet
Mary River, lagoon upstream of Myrtle Creek confluence	50 casts in lagoon from boat	Small bony bream (no Tilapia)
Mary River, main trunk, Pioneers Rest	30 casts on RH & LH banks from boat	Sea mullet
Mary River, Petrie Park boatramp	10 casts	Pacific Blue-eye; gudgeons
Mary River, Dickabram bridge, Miva (RH bank)	20 casts	
Tinana Creek, pool below Teddington Weir wall and above Weir Road	20 casts	Bony bream
Tinana Creek, Teddington Weir fishway entrance	10 casts	none
Tinana Creek, Teddington Weir, RH bank near wall	20 casts	
Tinana Creek, Teddington Weir, LH bank near pipeline entrance	10 casts	Crimson-spotted rainbowfish
Logging Creek, throughout	100 casts	Large numbers of Crimson-spotted rainbowfish