



## Mary River Turtle Conservation Project

### 2008 09 nesting season

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Technical advice	Dr Col Limpus Environmental Protection Agency
Administration	Tiaro & District Landcare Group
Funding	Burnett Mary Regional Group Tiaro & District Landcare Group Inc
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## INTRODUCTION

Tortoises and turtles are amongst the most endangered orders of animals in the world. Analysis by Conservation International, the International Union for Conservation of Nature (IUCN) and partners suggests that at least 40% - possibly more than 60% - of all tortoise and freshwater turtle species are in imminent danger of extinction. Despite this dire situation, few organizations have made concerted efforts to protect tortoises and freshwater turtles ([www.conservation.org](http://www.conservation.org)).

This report details the efforts of one organization to conserve a freshwater turtle species, *Elusor macrurus*, the Mary River turtle. It is listed as endangered by the Queensland government, the Commonwealth government and internationally by the IUCN. The Mary River turtle is number 20 on the international Turtle Conservation Fund list of the top 25 most endangered turtles in the world ([www.turtleconservationfund.org](http://www.turtleconservationfund.org))

By undertaking an in-situ management approach, this project allows the turtles to carry out their life history in the way they have been doing for eons and by minimising human interference it reduces the possibilities of human error (Moll 2004). The work described here builds upon knowledge and skills gained during conservation work undertaken each nesting season since Oct 2001. As in previous years, nest protection was carried out on known nesting banks at Tiaro and in the Traveston reach in the mid catchment. This report briefly describes work undertaken, results and some research recommendations.

## BOOK LAUNCH

In November, we were honoured to have the legendary Australian turtle man, John Cann launch our book, *The Mary River turtle, yesterday, today, tomorrow*. It was great to be able to honour John publicly at Tiaro, given the years he spent in the Mary catchment and throughout Australia during the 1970's and 1980's searching for the 'home' of the 'petshop' turtle, later to be known as the Mary River turtle.

Writing the book was a joint effort by Samantha Flakus and Marilyn Connell. We were pleased to once again work with Sam as she was responsible for introducing Tiaro Landcare to the Mary River turtle almost a decade ago.



Marilyn Connell & John Cann

## MARY RIVER TURTLE SUPPORT SCHOLARSHIP

Mariana A. de M. Campbell, a PhD candidate from the University of Queensland was awarded this scholarship of \$5,000 cash plus in-kind support for the next three years. This will assist with her research on the habitat utilisation of the Mary River turtle. Our scholarship assisted the University in successfully obtaining an Australian Research Council linkage grant of \$60,000 which will assist the University in purchasing field research equipment.



Presenting cheque to Mariana

## WEBSITE

To assist with the dispersal of and access to information of our project and the turtle, a website was created [www.maryriverturtle.com](http://www.maryriverturtle.com).

## INTERNATIONAL VISITORS

Connections were made with the international turtle and tortoise community through a visit in February of a number of highly regarded international chelonian specialists, Dr Peter & Sibille Pritchard from the Chelonian Research Institute in Florida; Dr Peter-Paul van Dijk, Conservation International, Washington DC; Dr Gerald Kutchling, Chelonia Enterprises Perth and Chuck Schaffer editor of international turtle publications.

Landcare members escorted them on a tour of the Mary River, a visit to the Tiaro turtle nesting banks and a day trip to Fraser Island to see the endemic Fraser Island short-necked turtle (*Emydura macquarii nigra*). It was a privilege to listen to and exchange turtle talk with our new friends.



International visitors at Pioneers Rest

Marilyn was invited to give a presentation at the first Australian Freshwater Turtle workshop held in Australia, an adjunct workshop to the 29th Symposium on Sea Turtle Biology and Conservation. The majority of the talks were research focused and her talk titled “Community drives conservation actions for endangered Mary River turtle in South East Queensland” outlined the variety of turtle activities undertaken by Tiaro Landcare members.

The Turtle Survival Alliance invited Marilyn to present two papers and offered Tiaro Landcare a free trade table at the Seventh Annual Symposium on Conservation and Biology of Tortoises and Freshwater Turtles in St Louis, Missouri, August 2009. An international line-up of presentations on freshwater and terrestrial chelonians made for a fascinating and informative 3 days. Following the symposium additional networks were made with visits to zoos, the Georgia Sea Turtle Centre on Jekyll Island, Chelonian Research Institute and an impromptu presentation at the National Reptile Breeders Expo, Daytona.



Symposium delegates St Louis, MO

### Nesting bank description

The height and depth of usable nesting substrate varies in response to flooding events. Due to flood events of previous seasons, sections of Site 1 (eastern bank) were covered in cobblestones. Measurements of Site 1 nesting areas were taken of the section where the majority of the nesting occurs. The angle of the bank ranged between 22 - 24°. Nests were laid at elevations between 1 – 5.2m with a straight line distance from the waters edge of 9.1m (average). Weeds were managed early in the season through application of glyphosphate herbicide by Tiaro Landcare volunteers.

### Rainfall & River Heights

At the start of the season, the Mary River at Home Park Gauging Station was steady at 1.27m<sup>1</sup>, recorded on 13<sup>th</sup> October. As a result of upstream rainfall, the river peak for the season was 3.86m (below minor flood) at Home Park on 22<sup>nd</sup> November. This inundated over half of Site 1. The river rise was triggered by rainfall upstream of Gympie where approx 100mm fell in between the 16<sup>th</sup> – 20<sup>th</sup> November. During the same period Home Park recorded 47mm. Throughout the summer, the river height fell to 1.18m at Home Park. The highest daily rainfall recorded at Home Park was 20mm<sup>2</sup> on 17<sup>th</sup> November.

Following the nesting season two moderate floods occurred on the 6<sup>th</sup> and 14<sup>th</sup> April 2009 which totally covered Site 1 and 2 (western bank) and deposited significant quantities of sand on Site 1. The river rose almost 8m in 12 hours and at Home Park the river peaked at 10m on 14<sup>th</sup> April 2009, 174mm fell in 24hr period on 13<sup>th</sup> April 2009. While this flood didn't affect nesting, it had a significant affect on the maintenance of the nesting bank with deposition of sand and causing the death of some exotic plant species.



April 09 flood at Site 1

<sup>1</sup> [www.bom.gov.au](http://www.bom.gov.au) River height Mary River

<sup>2</sup> [www.bom.gov.au](http://www.bom.gov.au) Daily Rainfall Bulletin

## Predator Control Activities

The first line of defence is the fencing of the nesting bank to keep out cattle, foxes and dogs and reduce the number of goannas accessing the bank. The goannas ability to swim across the river makes it a difficult species to keep off the banks. Fencing designs are limited due to periodic inundation and the ease of access to rescue equipment as the river level rises. Nine Tiaro Landcare members volunteered their time and skills to design and construct the fences at Sites 1 and 2. Site 1 was protected on 3 sides with 900mm high bird wire mesh cable tied to star pickets, buried to a depth of approx 100mm. In addition 2 outrigger electric hot tapes powered by 12volt energiser were placed to target goannas and cattle and dogs. The top of the mesh was kept floppy to make it difficult for goannas to climb. Site 2 was protected by 2 wire hot tape electric fence powered by 4 x D cell energiser. Individual nests were protected by 1m<sup>2</sup> plastic grid pegged with eight x 300mm plastic yellow tent pegs.



Tiaro Landcare members checking their fencing efforts

## Nesting

Following rain events, the Project Officers inspected possible nest chambers by carefully excavating by hand to locate an egg at the top of the clutch. Once the presence of eggs was confirmed, sand was replaced and a 1m<sup>5</sup> plastic grid was placed over each nest. Flagging tape marked with nest number and date was buried in each nest. Nesting in the Tiaro reach began on the 13<sup>th</sup> October 2008. As in previous seasons, the number of turtle tracks was far greater than the number of nests located.

Appendix 1 Table 1 details nesting dates and numbers of protected nests.

Nesting was substantially less than last season when a total of 80 nests were monitored. The main difference occurred on Site 2 and in the Traveston reach. Last year 35 nests were located at Site 2 and 11 in the Traveston Crossing reach.

Nesting was recorded at three new locations, two in the vicinity of Moy Pocket and one near Emerys Crossing.

## Monitoring

A Stealth Cam Digital infrared scouting camera was purchased and trialled as a monitoring tool. The intention was to monitor nesting females. However, no turtles triggered the camera, but images of a crow and a goanna were captured. Crows were not previously considered as a predator, although Cann recorded evidence of ravens (*Corvus coronoides*) eating turtle eggs (Cann 1998).

A digital max/min soil probe was used to record variation in sand temperature at 10cm below the surface. On 19<sup>th</sup> November the minimum temperature recorded was 22.6°C and maximum of 39.0°C adjacent to Nest 1. This nest was in full sun. The incubation time is not known for this season.

As adults, the Mary River turtle is omnivorous, eating primarily water plants and insect larvae associated with the plant material. Aquatic plants found either submerged or on the waters edge at Site 2 include *Bacopa monnieri*, *Myriophyllum verrucosum*, *Ottelia alismoides* and *Vallisneria nana*.

## Nesting results

As the river started rising on 17<sup>th</sup> November, all clutches from Site 2 were relocated to the top of the bank at Site 1. Eggs from nine low elevation nests on Site 1 were collected as a precaution. Every effort was made to maintain the eggs in the same orientation and moisture levels as in the original nest. The river peaked at 3.86m<sup>3</sup> at Home Park on 22<sup>nd</sup> November. As the river peak only covered approx half of Site 1, the clutches were reburied on this nesting bank at the highest elevation possible. From the eleven relocated clutches, the majority of eggs successfully hatched. Two relocated clutches had two undeveloped eggs and four clutches had one undeveloped egg.

<sup>3</sup> [www.bom.gov.au](http://www.bom.gov.au) River height Mary River Home Park.

Approx 60 egg shells were found in goanna scats or predated by an unknown species.

Of the 22 nests protected, no data was able to be collected for 4 nests due to flooding. From the nests where data was able to be collected, a total of 270 eggs successfully hatched.

Nesting results are included in Appendix 1 Table 2.

It is difficult to compare results of nesting seasons as there are so many variables. However it was very unusual not to have such a low number of nesting in the Traveston Crossing reach particularly as turtle tracks were observed on numerous nesting banks. By nature, the Mary River turtle is shy and easily disturbed.

### WHITE-THROATED SNAPPING TURTLE

*Elseya albagula* inhabits the Mary, Burnett and Fitzroy Rivers.

For the first time, Tiaro Landcare's freshwater turtle project expanded to encompass monitoring and protecting nests of this freshwater turtle. Data was collected from three nesting sites on the main trunk of the Mary River, one near Pickering Bridge, one at Tiaro and the other at Pioneers Rest.

### NESTING

#### Site A

A nesting site was discovered on the western bank downstream of Pickering Bridge. Unfortunately all the nests were predated with many torn shells found on the surface.

#### Site B

This nesting cluster was discovered on the western bank of the Mary River at Pioneers Rest. All nests were laid in an area that has been highly disturbed. Decades ago, the riverbank profile was modified to provide vehicular access to the river and a pump site. The substrate is sandy loam with a hard crust forming on the top 30-50mm. Underneath the substrate is moist and friable. The site is adjacent to two rocky instream islands. Ground cover is a mixture of grass and bare earth. While the disturbed area is open, it receives some shade from adjacent Queensland blue gums (*Eucalyptus tereticornis*) and tea tree (*Melaleuca linariifolia*).

#### Site C

This site is on the eastern bank of the Mary River downstream of Petrie Park, Tiaro.

### Rainfall

All nesting occurred after a rainfall event. 40mm was recorded on the first two days of June 2008 at Pioneers Rest site.

### Predator Control Activities

Possible nest chambers were carefully inspected by excavating by hand the clutch overburden. Once the presence of eggs was confirmed, the substrate was returned. Each nest was protected by 1m<sup>5</sup> plastic grid at Tiaro and Pioneers Rest. The Stealthcam PIR camera was installed and recorded a goanna walking over a protected nest.



Goanna & protected nest

### Nesting results

Nests were not protected at Site A as they were all predated prior to being located. No count was made of predated eggs.

Nests observed were laid between 1<sup>st</sup> June and 8<sup>th</sup> June 2008 at Site B and C.

Three clusters of nests were laid at Site B.

Cluster of nests	Distance from waters edge
1 (5 nests)	10-12m
2 (9 nests)	23-28m
3 (2 nests)	49m

Average straight line distance of nests from waters edge was 25.24m.

Nests were monitored on most days at Site B. Some hatchlings emerged in late afternoon to dusk. The hatchlings excavated an almost vertical tunnel through very hard soil crust, in a different place to where the adult female had burrowed to lay the eggs.

The emergence of hatchlings does not appear to be dependant on rainfall or overcast conditions.

Three hatchlings were found at the waters edge at 5.30pm on 15<sup>th</sup> January 2009, each of them having the soft yolk sac evident. Hatchling straight carapace lengths were 55mm, 50mm and 45mm.

Clutch sizes ranged from 5 to 11 eggs. Individual eggs are much larger than the Mary River turtle. The average egg size for white-throated snapping turtle is 51.5 x 28.5mm and 34.8 x 23.6mm for the Mary River turtle (Cann 1998). It is interesting to note that the white-throated snapping turtle adult female is larger (418mm)<sup>4</sup> than the Mary River turtle (326mm)<sup>5</sup> she lays larger but a smaller number of eggs.

A total of 88 hatchlings exited their nest. Further details are included in Appendix 1 Table 3.



Hatchling *Eseya albagula*

Despite efforts to protect the nests at Site C, an animal chewed the mesh and all nests were predated.

## ACKNOWLEDGEMENTS

This project is an example of a rural community which has worked together over the past ten years in caring for and respecting the values of their river and its creatures. The co-operation of each landholder is greatly appreciated. Without their consent, this project would not be possible.

Funding was provided by the Burnett Mary Regional Group and Tiaro Landcare fundraising activities. Turtle Survival Alliance assisted with travel expenses.

Tiario Landcare members and volunteers provided valuable assistance in all project activities including making and selling chocolate turtles.

Technical support and appropriate permits were provided by Dr Col Limpus, QPWS.

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<sup>4</sup> Thomson et al 2006

<sup>5</sup> Cann & Legler 1994

## APPENDIX 1

**Table 1**                      **NESTS PROTECTED AND DATES LAID**

Date Laid	Number of nests protected per Location			
	Traveston reach	Site 1 eastern bank Tiaro reach	Site 2 western bank Tiaro reach	Site 3 Emerys Crossing
13/10/08		3		
17/10/08			2	
18/10/08		3		1
28/10/08	3			
6/11/08		1		
18/11/08			1	
19/11/08		4		
21/11/08		1		
9/12/08		2		
31/12/08		1		
<b>Totals</b>	<b>3</b>	<b>15</b>	<b>3</b>	<b>1</b>

**Table 2**                      **NESTING DATA 2008 09 season – Mary River turtle *Elusor macrurus***

Predated eggs	Empty Shells	Live hatchlings	Dead hatchlings	Unhatched eggs	Undeveloped eggs	Eggs to Mon Repos	Exited nest (wild)	Total eggs
60	0	1	0	2	11	0	270	344

**Table 3**                      **NESTING DATA 2008 09 season – White-throated snapping turtle *Elseya albagula***

Incubation period	Predated eggs	Empty Shells	Live hatchlings	Dead hatchlings	Unhatched eggs	Undeveloped eggs	Exited nest (wild)	Total eggs
Approx 182 days	6	0	12	1	2	0	76	97

## REFERENCES

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