



Tiaro & District Landcare Group



Mary River Turtle Conservation Project

2010 11 nesting season

Project Officers	Marilyn Connell Noel Dean Glenda Pickersgill
Technical advice	Dr Col Limpus Dept Environment & Resource Management
Administration	Tiaro & District Landcare Group
Funding	Mohamed bin Zayed Species Conservation Fund Tiaro & District Landcare Group Inc
Report prepared by	Marilyn Connell

INTRODUCTION

The Mary River turtle (*Elusor macrurus*) is a river specialist which to date has not been found in dams, billabongs and ephemeral creeks. Its world wide geographic range is restricted to the Mary River in south east Queensland in particular the river trunk and lower reaches of creeks. This makes it a very unique aquatic creature of our region and one of the reasons the Fraser Coast Regional Council have included it in their promotional logo. On an Australian scale, the Mary River is significant for the diversity of freshwater turtles. Six different species are found in the Mary, which is amongst the most diverse river turtle communities in Australia.

The Mary River turtle is listed as endangered by the Queensland government, the Commonwealth government and internationally by the International Union for Conservation of Nature (IUCN). Turtles are in serious trouble. They are among the world's most endangered vertebrates with about half of their more than 300 species threatened with extinction¹. In 2011, the Turtle Conservation Coalition (an alliance of international organisations) assessed the Mary River turtle as being at 'high risk of extinction' (www.iucn-tftsg.org/trouble/).

Part of our responsibilities in caring for our land and the creatures which live in it, Tiaro Landcare Group manage a multi faceted project aimed at reducing the threat of extinction of this unique species and its habitat, the Mary River. This report details the efforts of this Landcare group and their partners to conserve this freshwater turtle species. This season's project activities included:

- ◆ increasing awareness of the turtle
- ◆ fund raising
- ◆ supporting new research
- ◆ predator control
- ◆ conservation activities

INCREASING AWARENESS of the Mary River Turtle

Four of our members visited the Queensland Museum in August to collect an articulated skeleton of a female Mary River turtle. Thanks to the expertise of Patrick Couper, Curator Biodiversity (Reptiles & Amphibians), this impressive skeleton is now a feature of our Mary River display at the Tiaro Arts & Crafts & Information Centre, Bruce Highway Tiaro. Over 10,000 visitors each year visit this Centre.

We had the honour of hosting international visitors from France and introducing them to the Mary River. Frank Bonin is part of La Station d'Observation et de Protection des Tortues des Maures and one of the authors of *Turtles of the World*.



French visitors Frank Bonin & Anne-Sophie Cappio

The Mary River turtle will feature on a new ABC television documentary, "Two on the Great Divide" featuring Tim Flannery and John Doyle produced by Cordell Jigsaw Productions. It was a great experience for two of our members to work with Tim, John and the production team for this segment of the documentary.



Filming ABC documentary "Two and the Great Divide" with Tim Flannery & John Doyle

Public presentations during the year included:

- ◆ Presentation at General meeting of the Mary River Catchment Committee
- ◆ Theebine State School

Marilyn conducted a community workshop on the turtles of the Mary River at Kenilworth organised by the Sunshine Coast Regional Council.

Sales continue of our publication, *The Mary River turtle, yesterday, today & tomorrow*.

¹ IUCN Red List of Threatened Species 2010
Mary River Turtle Project 2010 11

To assist with the dispersal of and access to information of our project; blogs, reports and information are regularly posted to our website www.maryriverturtle.com.

An identification key was developed by Eva Ford, Mary River Catchment Co-ordinating Committee and Marilyn Connell, Tiaro Landcare which will assist in identifying the turtles of the Mary River. It can be downloaded for free from www.mrccc.org.au and www.maryriverturtle.com.au with a hard copy available from both organisations.

The Tiaro Catch & Release Fishing Competition is a family focused event which attracts enthusiastic fishermen from south east Queensland. This year four species of turtles were brought in for identification. The turtles were placed in a special recovery tank prior to being released in the River. This provides an excellent opportunity to educate the public on differences between turtle species.



Tiara Catch n Release Fishing Competition

Bauple Bulletin continues to publish bi-monthly articles on our projects. Other media outlets to publish articles included The Codline, Wambaliman, The Courier Mail, The Gympie Times and the Fraser Coast Chronicle.

A DVD, *Sharing Mary, a long fat turtle tale* is expected to be finalised by August 2011. John Wilson has spent many hours filming Landcare's conservation work, the University research team and turtles in the wild.

Joolie Gibbs, Co-ordinator Gympie Regional Gallery, designed a new Mary River turtle logo which will assist with branding of our project activities.

FUND RAISING

Our conservation project was substantially funded through a grant from the Mohamed bin Zayed Species Conservation Fund. A case study of our

project was included in the 2011 Annual Report of this Fund.

The Easter chocolate turtle drive continues as a major fundraiser with support from Ergon Energy and their Green Teams throughout the State. Funds raised allowed us to purchase 10 acoustic tags which will assist in tracking juvenile turtles.

Proceeds from the Tiara Catch 'n Release Fishing Competition were allocated to our Mary River turtle conservation project.

MARY RIVER TURTLE RESEARCH

On 17th July 2010, thirty-five people travelled to Brisbane to see first hand the laboratory research being conducted on the Mary River turtle at the University of Queensland.



Tiara Landcare visit to The University of Qld

The current recipient of the Mary River turtle support scholarship is Mariana Micheli-Campbell, a Ph.D. candidate from The University of Queensland. Her research includes investigating the impacts of incubation temperatures on the behaviour and performance of the hatchlings. Her work is not restricted to the laboratory. Field work includes researching the movement and habitat selection of juvenile turtles. Tracking devices have been attached to juvenile turtles and underwater listening receivers have been deployed.



Tagged juvenile Mary River turtle



Releasing tagged turtles

On 27th May, Tiaro Landcare members joined with the researchers from The University of Queensland to release the tagged juveniles into the river.

Another two University of Queensland post graduate students, Kathryn Rudland and Zackary Severino undertook research projects on the Mary River turtle. The University gave a presentation to Landcare members and other interested people in June 2011 in Tiaro on their research activities. SCOPE, a Channel 10 children's science television program featured a segment on Mariana, Kathryn and Zack's research. Mariana presented a paper at the Society for Experimental Biology Annual conference in Glasgow in July 2011. Her research findings will be published in the international Journal of Zoology.



University of Queensland researchers & volunteers

CONSERVATION ACTIVITIES

Tiara Landcare's conservation activities take an in-situ management approach to nest protection. By minimising human interference it reduces the possibilities of human error². This way the turtles

can carry out their life history in the way they have been doing for eons. The work described here builds upon knowledge and skills gained during project work undertaken each nesting season since Oct 2001.

Nesting bank monitoring and nest protection was carried out on known nesting banks in the Tiara reach Emerys Bridge reach and in the Traveston reach in the mid catchment. A new site was monitored for part of the season in the Kenilworth reach. Due to access difficulties it was not possible to thoroughly monitor each of the 22 nesting banks which were checked at least once this season. By conserving wild nests in this many locations, it will assist with recruitment through a greater range of the turtles' habitat.

PREDATOR CONTROL ACTIVITIES

From the observations of our Project Officers, nests which are not protected from predators are predated. In order to reduce predation of eggs and developing embryos, individual nests were protected by 1m² plastic grid pegged with eight x 300mm plastic tent pegs. The mesh size is large enough to allow hatchlings to pass through it during their emergence from the nest.

Evidence of goanna tracks and scats and dog/fox tracks were observed in most nesting banks throughout the season. On Site 1 (east bank Tiara reach), a fox had dug a tunnel under the plastic grid towards the clutch. Most of the eggs were taken, however 2 eggs remained in the clutch.

WATER SAMPLING OBSERVATIONS

Periodically, water clarity was measured using a Transparency tube. Reduced light levels may affect photosynthetic capacity of water plants and algae, visual range of aquatic creatures and solar radiation.

Throughout November, NTU (Nephelometric turbidity units) were consistently between 9 and 12.5. However readings of 85 NTU were recorded in October and January when river height was elevated. This reading was not taken during the flood peaks.

During January 2011 floods, levels of over 1,000 NTU were recorded in the water column in the mid catchment as part of the Mary River Turbidity Monitoring Program conducted by the Mary River Catchment Co-ordinating Committee (MRCCC). This is

² Moll, D. & Moll, E.O. 2004. *The Ecology, Exploitation, and Conservation of River Turtles*, Oxford University Press, London.

the highest known reading for the Mary River. The usual readings are less than 50 NTU.

RAINFALL & RIVER HEIGHTS

Like many freshwater turtles, nesting for the Mary River turtle is triggered by precipitation. The first storms occurred on the 4th and 5th October with falls of 45mm and 53mm recorded by our Project Officer in the Emerys reach. Heavy rain upstream caused minor flooding in the Mary River. At the Home Park Gauging Station the river peaked at 7.11m on the 14th October, 2010. This is in direct contrast to the previous year when October and November were either the driest or second driest in the last decade³. One of the lowest river height recordings for this season was 1.56m on 1st December 2010 at Home Park. The river peaked on multiple occasions throughout December. All records are from Home Park Gauging Station.

An extremely wet period was experienced by Queensland from late November 2010 to January 2011 causing major floods throughout Queensland. Indications are that this was the strongest La Nina event since the mid 1970's and one of the strongest in the last century⁴. One of the highest rainfall records within a 24hour period in the Mary Catchment was 304mm at Miva on 8th January 2011. The river rose to 18.7m at Home Park Gauging Station. Four days later, the river peaked again at a similar height, amplifying and prolonging the impacts on the system.

The frequency of river peaks and river height between October 2010 and March 2011 is represented on the graph in Appendix 2.

Flooding had a major impact in relation to availability of nesting substrate, access to nesting banks; the volume and location of nesting material for next season. All nesting banks were submerged for days on more than one occasion throughout the season. Turtles were observed in minor gullies and backwaters while the river was in flood. In addition, basking platforms were frequently submerged.



Flood deposition and erosion

NESTING BANKS

The height and depth of usable nesting substrate varies in response to flooding events. Due to depositions during flood events of the previous season the majority of nesting banks were covered with suitable nesting material. For many years, very little nesting had occurred on Site 1, however, unlike previous years, this season there was a good quantity of nesting material and consequently many nests. In the mid catchment, some banks were noticeably different to last season. Some had eroded, others covered with gravel and sand deposited on others.

MONITORING

As part of the University research, three Reconix® infra-red time-lapse cameras were installed. Temperature loggers (iButton®) were placed adjacent to the clutch in many nests as part of Mariana Campbell's research. The loggers measured temperatures throughout the incubation period.

However, due to frequent rises in the height of the river, the Reconyx® cameras had to be removed. The iButtons® were collected part way through the season with some being unable to be retrieved prior to flooding.

BASKING

For three months (July – Sept), a Reconyx® camera was mounted on the river bank to monitor turtle basking usage of a large log which is not connected to the river bank. The time-lapse camera was set to take a photograph every 10mins between 10am & 4pm each day. Due to the distance between the camera and the log it was difficult to accurately identify species of turtles; however male Mary River turtles were distinguishable. On the 3rd September, 13 turtles were photographed on the log.

³ www.bom.gov.au/climate/data-weather.shtml

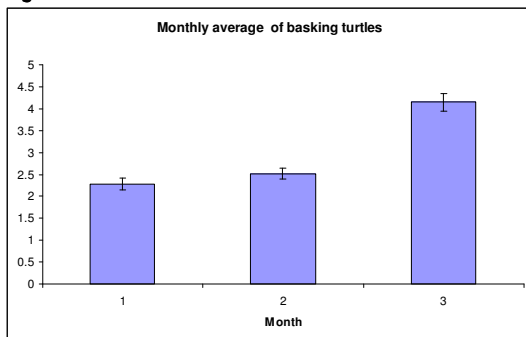
⁴ Australian Government Bureau of Meteorology Special Climate Statement 24
Mary River Turtle Project 2010 11



Basking

The basking information was collated and input into a spreadsheet where the maximum number of turtles basking at any one time within each 30mins period was recorded (Refer to Appendix 3). As can be seen from the figure below, the number of turtles basking in September (3) was noticeably greater than July (1).

Figure 1



Basking continued even at times when there were minor rises in river height. However, the basking records are prior to the minor floods which occurred from October to January.

On many occasions this log and all other basking platforms were submerged due to flooding. On 30th April, 2011, two male Mary River turtles were observed basking just above the height of the water on known nesting banks. This was during a period when all basking platforms were submerged.

NESTING

Following rain events, the Project Officers inspected possible nest chambers by carefully excavating by hand until the egg at the top of the clutch was discovered. Once the presence of eggs was confirmed, sand was replaced and a 1m² plastic grid was placed over each nest. Flagging tape marked with nest number and date was buried in each nest. As in all previous seasons, the number of turtle

tracks was far greater than the number of nests located in all reaches of the river.

Nesting began earlier than had been previously recorded. In the Tiaro reach, the first turtle tracks were observed on the 5th October 2010 and the first nest laid on the 7th October. The number of turtle tracks varied throughout the season. However when there are more than 15 tracks, it becomes difficult to distinguish individual tracks. Four nests were laid when the floodwaters were lapping just below the top of the nesting bank. The last nest to be laid was on 3rd January 2011.

Due to elevated river heights throughout the season, it was unsafe to cross the river and therefore a nesting bank on the western side of the river which is always monitored was not included this season. Periodically access to other sites was restricted by rising river levels.

River rises also affected monitoring in the Traveston reach. It was unsafe for the Project Officer to check the nesting banks until the 24th October. Many of the banks were submerged by river rises throughout the season. Tracks were observed on 11 sites, with nesting on 6 sites. On the 24th October, twenty tracks were observed on Site 8, the most productive nesting bank in this reach (4 nests). The nature of the river rises in this part of the river make it very difficult to rescue and relocate clutches threatened by floodwaters.

Part way through the season, a new site was monitored for part of the season in the Kenilworth reach. Turtle tracks were observed, however no nests were located.

In the Tiaro reach, nests were laid with a straight line distance from the water's edge on the date laid between 0.75 to 28.5m.



hatchlings

The number of clutches was much higher than last season with a total of 82 nests located, 69 in the Tiaro reach and 13 in the Traveston reach. 31 eggs were recorded from a single clutch. This is the highest number of eggs recorded by Tiaro Landcare. On one nesting bank, 7 clutches were laid on one night. From the nests where data was able to be collected, a total of 547 eggs successfully hatched. These figures do not include any figures from 28 clutches which were washed away by the floods. Clutches were only relocated when threatened by inundation from floodwaters. Every effort was made when rescuing eggs not to rotate nor roll the egg. Frequently the timing of relocation was determined by rising floodwaters. Nesting details are included in Appendix 1.

Each season egg shells are found on the surface throughout the nesting season. The predator is unknown. Predation by goannas was greatly reduced with approx 18 egg shells being found in lace monitor scats.

All nesting banks were modified as a result of flooding this year. Some banks were replenished and others eroded. One nesting bank in the Tiaro reach was so severely eroded that it may be unsuitable for nesting in the next season. However, small river rises in the coming months may cause minor changes to all banks.

Monitoring of nesting patterns in future years may indicate if there has been any significant impact on the adult Mary River turtle population as a result of this year's flood events.

OBSERVATIONS of other turtle species

Periodically throughout the summer, adult turtles were observed crossing roads or deceased on the road edge as a result of injuries received from vehicles. Between December and March, eleven turtles were observed in Tiaro district, ten were the broad-shelled turtles (*Chelodina expansa*) and one the eastern snake-necked turtle (*Chelodina longicollis*). Except for one broad-shelled turtle observed crossing the road, they were all victims of road kill.

ACKNOWLEDGEMENTS

Tiaro Landcare wishes to acknowledge the important role many partners play in the implementation of this project and thank them for their participation.

Co-operative and supportive landholders who allowed us access to their private properties so that the project activities could be carried out. Without their co-operation, the conservation activities would not be possible.

Mohamed bin Zayed Species Conservation Fund who contributed funds which assisted in purchasing materials and offset labour costs.

Dr. Col Limpus - Dept of Environment and Resource Management provided technical support and appropriate permits.

The University of Queensland, School of Biological Sciences staff and students, who, in partnership with Tiaro Landcare are undertaking valuable new research into this endangered species.

Ergon Energy Green team who are a major supporter of our Easter chocolate turtle project.

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

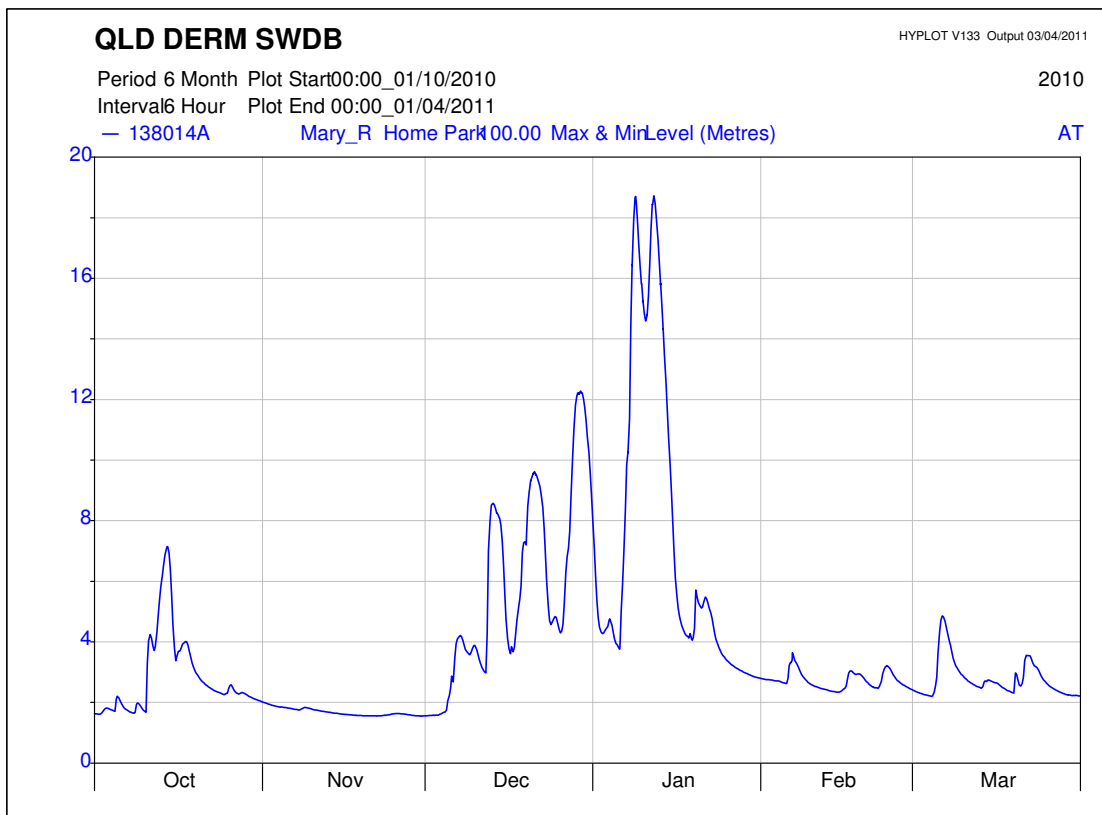
APPENDIX 1

Site Nesting Records

Date Protected	Number of clutches protected per Location					
	Site 1 Tiaro reach east bank	Site 2 Tiaro reach east bank	Site 3 & 4 Emerys Crossing west	Site 5 Emerys Crossing east	Site 6 Emerys Crossing	Sites 6 – 12 Traveston reach
7 th Oct 10			3			
8 th Oct 10	1	2	1			
24 th Oct 10				1		
25 th Oct 10			1			
26 th Oct 10	2	2	5		2	
27 th Oct 10		1	1			
5 th Nov 10	1					
8 th Nov 10			1			
15 th Nov 10	2		1	1	1	
19 th Nov 10	2	1	7	2	4	
20 th Nov 10	1		1		1	2
22 nd Nov 10			2			
23 rd Nov 10	2					
24 th Nov 10	1		1			4
25 th Nov 10			1			
26 th Nov 10			1			
28 th Nov 10	1					2
29 th Nov 10						2
30 th Nov 10						1
1 st Dec 10	2					
2 nd Dec 10			2			2
3 rd Dec 10			1		1	
4 th Dec 10			2			
8 th Dec 10			1			
18 th Dec 10			1			
25 th Dec 10			1			
3 rd Jan 11			1			
Totals	15	6	35	4	9	13

APPENDIX 2

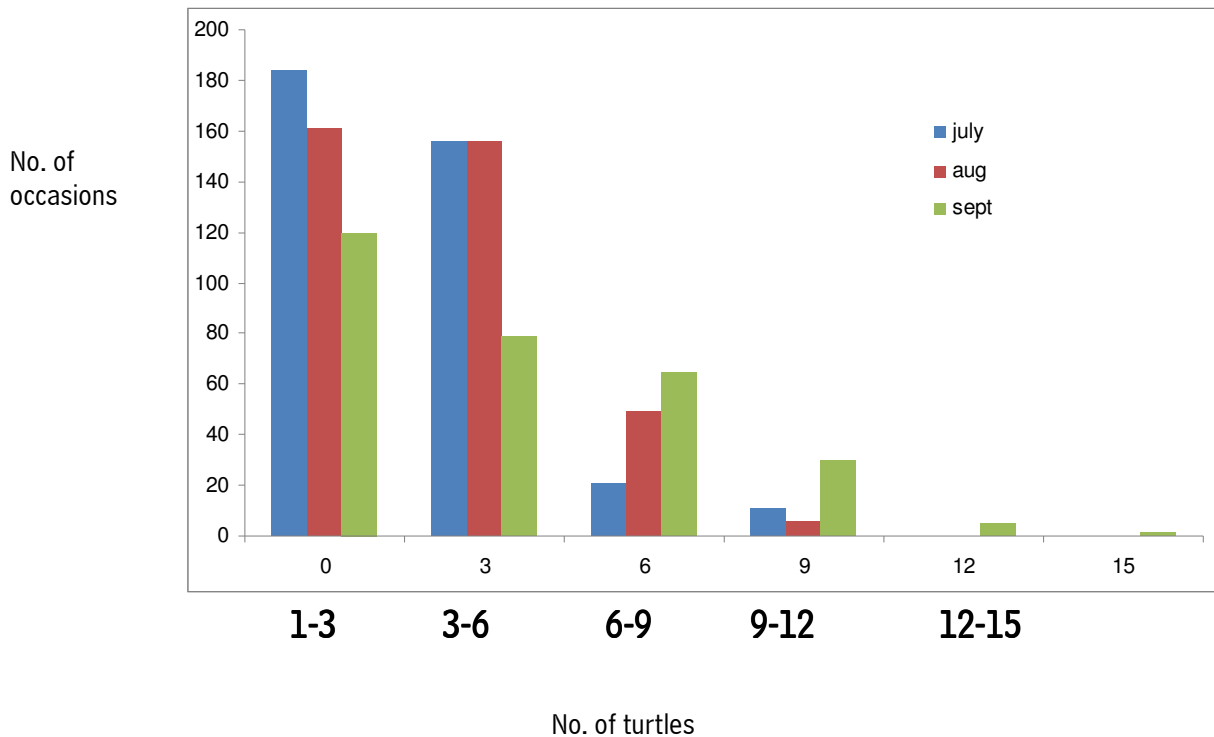
River Heights Home Park Gauging Station 1/10/2010 – 1/4/2011



© The State of Queensland (Department of Environment and Resource Management) [2011]

APPENDIX 3

No. of turtles on one basking log per 30min period between 10am – 4pm



This project is an example of a rural community which has worked together over the past eleven years in caring for and respecting the values of their river and its creatures.

This report is produced by Tiaro & District Landcare Group Inc
P O Box 6, Tiaro Qld 4650

July 2011

For more information

Visit: www.maryriverturtle.com