

the **COD** Line

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Mt Ubi Riverbank restoration project

Story by Stephen and Ruth Carter

We are privileged to live on the homestead block of the historic Mt Ubi Station at Kenilworth. Originally 3500 acres the property was established in the mid 1850s whilst still a part of New South Wales. Our farm comprises around 100 acres at the confluence of the Mary River and the Obi Obi Creek opposite the Kenilworth Showgrounds. We enjoy almost 360 degree views over most of the local district with beautiful river flats and some treed areas giving us a diversified outlook.

When we first came to live on Mt Ubi some 20 years ago, the property which had been a dairy farm and then a beef raising enterprise was somewhat run down and requiring attention. One of our first (on-going) efforts was to rebuild many of the boundary fences, particular emphasis being placed on those areas where livestock had access to the river and the creek. Riparian protection is probably the most important action that landholders can take to assist impacts on water quality, water flow and integrity of our watercourses. Internal paddock fencing has also been undertaken to allow selected pasture grazing to avoid degradation and slow down possible erosion.

In 2015 representatives of the Mary River Catchment Coordination Committee (MRCCC) were enjoying the ambience of Charles Street Park when they noticed a large blossoming of pretty yellow flowers on the property across the river. (Oh no! The Dreaded Cat's Claw Creeper). Shortly afterwards we received a request from Eva Ford of MRCCC to visit with us to discuss the controlled management of this environmentally invasive weed and rehabilitate the native vegetation areas. Subsequently we were encouraged with assistance from the MRCCC to apply to the Sunshine Coast Council for a Landholder Environment Grant to reduce the impact of the weed on our farm thereby promoting ecologically sustainable management of the region's environmental values.

Maintenance is ongoing, significant reductions are very noticeable, and with the contributions from other nearby landholders we hope to stem the spread of this rainforest pest to other properties and localities.

The Kenilworth Reach of the Mary River has been recognised as a major contributor of sediment discharge into the Great Sandy Strait and the southern section of the Great Barrier Reef Lagoon near Fraser Island. The Mary River and the Obi Obi Creek provide important habitat for several threatened aquatic species including the Mary River turtle, Mary River cod, White-throated snapping turtle, and the Australian lungfish, all of which suffer when severe erosion occurs on degraded river banks.

A range of stakeholders including the Mary River Catchment Coordinating Committee, Burnett Mary Regional Group, Seqwater, Sunshine Coast Council and the Australian



Government developed a restoration plan to restore eroded areas of the Mary River in the Kenilworth Reach. Alluvium Consulting determined appropriate works and have planned and supervised the remediation.

In historical times, clearing of trees and native vegetation, grazing and watering of cattle and extensive sand and gravel extraction have occurred in many parts of the river. These factors, together with recent extreme weather events have accelerated the erosion. Landholders along the Mary River and its tributaries recognise the damage that has been done and fully appreciate the efforts to repair the river for the future.

The river bank at Mt Ubi had been severely eroded for many years with major loss of soil, native vegetation, valuable grazing pasture and fencing, resulting in significant erosional channel change, increased sediment loads to the coast and loss of critical habitat. In parts, there was a 10 metre straight drop to the river. High flows in the river undercut the toe of the bank causing rapid bank collapse with vertical banks remaining along a large section of the river frontage.

Story continued on page 13...

Good News for the Mary River Cod and the Mary River Turtle

is hosted and supported by the Mary River Catchment Coordinating Committee with funding support from the Sunshine Coast Council gratefully acknowledged.



Mary Landcare on Facebook

- Mary River Catchment Coordinating Committee
- Gympie Landcare
- Noosa and District Landcare
- Mary River Turtle Project - Tiaro Landcare
- Noosa Festival of Water
- The Greater Mary Association Inc.
- Lower Mary River Land & Catchment Care Group

'Like' the pages to keep in touch with information and events relating to natural resource management in the Mary River catchment.

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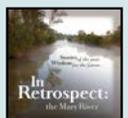
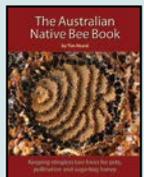
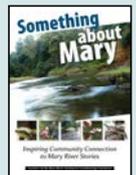
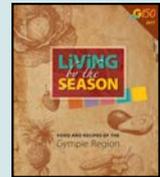
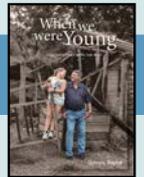
of CODLine please go to www.mrccc.org.au and download our free PDF, either in a low-resolution or high-resolution format.



Do you recognise the old cream shed from 25 Stewart Terrace? Well, it's now successfully converted to a donkey stable.

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For Cod's sake!

It's coming to that time of year when Mary River cod are gearing up to do what Mary River cod have done for millennia, to make babies. Mary River cod are one of Australia's most endangered freshwater fishes, so the success of their efforts is vital for the long term survival of the species. Although abundant at the time of first European settlement, they were seriously overfished, not only with lines but also with nets and even explosives.

This overfishing, combined with destruction of riparian vegetation along the Mary River and tributaries, the only place they are found naturally, has meant their population has plummeted, perhaps to as few as 600 in the wild.

While anglers are generally aware it is a no-take species and that any accidentally caught should immediately and carefully be released, few are aware of total fishing bans to coincide with the breeding season.

There is a total fishing ban (ie all year round) in Obi Obi Creek between Baroon Pocket Dam and Obi Obi Creek crossing 4 (Manuel Hornibrook Bridge).

In addition there is a closed season from the 1st of August to the 31st of October in the Mary River and adjoining waterways upstream of its junction with Six Mile Creek just south of Gympie. The Fisheries website advises that closed season means that **a person must not possess or use a fishing line in those waterways during that three month period, which is timed to coincide with cod breeding.**

Fines apply for those in breach of this regulation. The only sites exempted from this closed season are Baroon Pocket Dam, Borumba Dam and Lake Macdonald.

Another threat to Mary River cod is low water level. While this situation is more likely to occur during summer, the word is that it seems to be commencing early this year.

On a positive note, Darren Knowles reports from his Cooroy Hatchery that the Mary River cod have spawned, and there are fingerlings in the troughs. Darren is quietly confident that there will be more fingerlings available for conservation stocking in the Mary River catchment later this year, and for recreational fish stocking in specified waterways in SEQ. Contact the MRCCC if you would like to be involved in the conservation stocking releases or contact Darren to purchase fingerlings for recreational fish stocking.

IAN MACKAY, MRCCC

Cod rescue

Early in July the Mary River Catchment Coordinating Committee received a call from concerned bushwalkers who had found a large (70 cm) Mary River cod stranded in a very small, shallow waterhole on an anabranch of Amamoor Creek. Photos sent to the MRCCC confirmed that the fish was indeed an endangered Mary River cod, and it appeared to have an injury above its eye – possibly from a bird attack.

The MRCCC sent a team of freshwater aquatic specialists to the location, where the cod was found in a pool less than a metre deep and no more than a metre round. With the aid of two large nets, the team were able to rescue the cod, which was initially reluctant to leave the shelter of the large logs under which it was hiding. The cod was quickly moved approximately 10 metres to the main waterhole on the creek, given an opportunity to acclimatise to the much colder and more oxygenated water, and then released. A short while later, the cod was seen slowly swimming into deeper water, where it will hopefully recover from its ordeal, and live a long and happy life.

It's important to note that the rescuers did have a permit to capture and relocate the cod. With water levels at very low levels in many places in the catchment, it's likely that this will not be an isolated incident. If you come across a cod in a similar situation, please call the MRCCC on 5482 4766 and we will organise for the rescue team to attend.

DEB SEAL, MRCCC



And the rain came - right on cue!

It was suggested that we change the month, or extend the period, for Find a Frog in February after the hottest, driest February on record in 2017.

It happened to be the first time we held FFF and only about 400 records came trickling in over the month. Luckily we didn't have other years to compare the records to, so it seemed perhaps a passable outcome and a good practice run.

Then came 2018, with rain, better preparation and better uptake by the community of the Mary River and coastal catchments. And then came over 2,300 records of our fine froggy friends! In 2019 around 1,300 records were submitted; less due to lower and patchy rain across the program area. But we didn't expect the frog traffic of February 2020! Having finalised the data we can report that a whopping 6165 records (2500 from one person who monitored her property every day during February!) were submitted. We now know that we are generating a useful dataset by sticking to a particular time of the year. The good and bad conditions for frog detection tell their own story of persistence in adversity (we hope) and proliferation when conditions are most favourable.

Most people from this part of the world know that rain = frogs. Or rather, rain = frog noise! We are lucky to live in a sub-tropical region that typically receives good rainfall during the warmer months, where a variety of ecosystems and habitats still remain and where the resultant species richness of frogs is relatively high (around 45 species – compare that to Ireland's two species!). Many of the species we encounter have adapted to variable rainfall conditions and respond quickly to reproduce following events that create temporary water bodies. Not many species rely on waterways with permanent, flowing water however, they too respond to the sniff of rain.

But it's not all about the number of frogs. What's interesting is that this year there was a jump in the number of species reported. Two new species were recorded; the vulnerable *Litoria longgburensis* (Wallum sedgefrog) and *Litoria brevipalmata* (Green-thighed frog). More records (about 380) were also submitted through FrogID from 146 Find a Frog group members through their phone app.

Some interesting submissions:

- *Litoria pearsoniana* along Fat hen Creek west of Gympie
- Many, many, many *Adelotus brevis* at the headwaters of Baxter Creek at Mapleton School
- *Crinia tinnula* at Poona
- *Mixophyes iteratus* found by Noosa High School students on Belli Creek
- Many people wondering what the lovely little toadlets are that have red speckles on their back – Cane toad metamorphs!
- *Litoria longgburensis* east of Gympie and Noosa national park on the Sunshine Coast – a Noosa Councillor submitted that one!
- About six different colour and pattern variations of *Litoria fallax* from the one location near Bauple – colours, spots, lines and different combinations of all.

And it seemed to me that there was a disproportionately high number of *Litoria caerulea* (Green treefrog) metamorph records coming in this year, mostly from the coastal swamp zones; a good year for them.



Perhaps what stirs a coordinator of a citizen science program as much as seeing the resultant great increase in knowledge, is knowing that there are so many people out there, from all quarters who have enthusiasm to go out at night, record what they see or hear and send it in. And even more, this year, was the response from schools and bushcare groups who took up the guided challenge to start a monitoring site and commit to surveying there each year. Four schools and three groups have been the pioneers for the FFF monitoring program and we hope to add to that each year until we have many participating.

The data from monitoring is vital to determine 'normal' responses of populations to seasonal conditions, and being alert to unusual trends. With the breeding and developmental window narrowing with prolonged droughts over the past several years, some species that we consider 'common' may in fact find it hard to persist in the long term. This is especially so for short-lived species.

The local councils of the program area support the MRCCC to deliver Find a Frog in February each year and we are immensely grateful (Sunshine Coast, Noosa, Gympie and Fraser Coast Councils).

Participating schools:

- Mapleton State School
- Noosa District High School
- Gympie East State School
- Tinana State School

Participating groups:

- Belli/Cedar Catchment Care Community
- Peregian Bushcare
- Poona Bushcare



EVA FORD, MRCCC

Turtles



- abundant, rare or both?

Freshwater turtles are frequently observed in urban areas. They readily take food offered by adults and children especially in Lake Alford in Gympie and Ululah lagoon in Maryborough. Both waterbodies are full of Kreffts' turtles. These populations of turtles give the impression that turtles are common. However, this is not the case for every turtle species. Like scrub turkeys, rainbow lorikeets and brushtail possums, Kreffts' turtles are ecological generalists, that is, they are very adaptable and not only survive, but often thrive in modified water bodies found in urban centres. On the other hand, specialist species such as the Mary River turtle and the White-throated snapping turtle are less adaptable, and their populations are under threat.

With 52.2% of the world's turtle species threatened, according to the International Union for Conservation of Nature (IUCN) turtles are amongst those at most risk of extinction within the vertebrate group. Only the nonhuman primates are in a more precarious state, with 61% of species under threat. Turtles saw the great dinosaurs come and go and now they are facing their own extinction crisis.

Two of the six species of turtles found in the Mary River catchment are endangered, the Mary River turtle (*Elusor macrurus*) and the White-throated snapping turtle (*Elseya albagula*). Both species inhabit the main trunk of the Mary River and some of the larger creeks. They are unlikely to be found in farm dams or urban waterbodies. Recent surveys have found very low numbers of young individuals for both species. This is why for the past 20 years, Tiaro Landcare has focused on protecting nests of the Mary River turtle as a means to increase recruitment. Now we are finding that there is a high mortality rate even after the hatchlings reach the river. The Foundation for Australia's Most Endangered (FAME) has partnered with Tiaro Landcare to investigate techniques to help them survive the first year of life.

The nesting season for the White-throated snapping turtle is coming to a close for 2020. Around Tiaro, some nests were laid at the end of July. This nesting was likely to have been triggered by the rain that fell a few days earlier.



White-throated snapping turtle

Interestingly, the development of the embryos pauses for a period of months as the incubation period includes cool and warm months. Eggs are laid during the winter months and won't hatch till December. Sadly, many of the nests are dug up and the eggs predated. Their hard-shelled eggs are white and mostly greater than 45mm in length. Often predated eggs can be seen scattered on the riverbank. As very little is known about nesting patterns of this endangered turtle in the Mary River, we would appreciate your help.

If you come across eggs you think may belong to this turtle, please take a photo, and notify MRCCC of the date and location where it was found.

**A turtle lays a thousand eggs without anyone's knowing it;
a hen lays one egg and the whole town hears.**

A MALAY PROVERB



MARILYN CONNELL
Project Leader, Tiaro
Landcare

Experimenting with geofabric in gully remediation

In October 2019 the MRCCC partnered with John Day, soil conservation technical advisor, to stabilise a quickly eroding gully at Home Park on Netherby Creek. Netherby Creek is an ephemeral creek which meets the Mary River, south of Tiaro. Soils in the area are predisposed to gullying and tunnel erosion due to the high sodium content, especially at depth. The soil structure readily collapses when exposed to water – particularly the fine clay subsoils. Mobilised clay particles, due to their fine nature, are then transported via the Mary River to the Great Sandy Strait and the southern Great Barrier Reef (GBR), impacting on seagrasses and corals.

At this particular site, the lateral gully to Netherby Creek was aggressive and advancing rapidly along the power line easement. It is estimated 8.6 tonnes of fine sediment was released from this gully to the GBR every year at its current rate of erosion. Successful remediation will result in at least 5.2t/yr of soil (fine sediment) saved. Without treatment, this gully would release ~260t fine sediment by 2050 or 22 body trucks!

Given the small catchment area (2ha) and discharge (0.44m³/sec for a 1 in 10 year event), an experimental technique was used to remediate the gully. This included reshaping the gully head, broadcasting a high density of gypsum (10t/ha) followed by placing geofabric material over the entire gully chute. Rock was placed in trenches along the top, sides and bottom of the chute to secure the fabric. In most situations, the fabric would then be covered with rock sized to the calculated discharge.

The first significant rain event was 4 months later in February 2020 where 130mm (6.5 inches) fell over 24 hours. Although this was not a 1 in 10 year event, the timelapse camera was able to capture the extent of flow in Netherby Creek and the overland flow which passes through the gully crest.

Following the first event, some soil movement beneath the geofabric blanket occurred, resulting in two depressions near the top. Rather than retrofitting this gully with rock, it was decided that bentonite (low permeability clay) could be applied as a sealing agent. The depressions could also be filled with gravelly soil from the property to encourage grass growth on the chute – which is naturally occurring.



Continued monitoring with timelapse cameras will allow us to see what happens during the next flow event. Should the structure maintain its integrity during those events and with stock exclusion and grass establishment, geofabric chutes may be an option for landholders to consider in situations where rock is not easily available or accessible, or as a cost-effective solution for small catchment gullies.

Watch this space!

CAITLIN MILL, BEC WATSON, MRCCC



Relief for the Reef – Reducing streambank erosion in the Mary

*There was movement in the catchment,
for the word had passed around,
that the health of our Great Reef
had gone astray...*



As we work together to contain a global pandemic, word is spreading in the Mary River catchment about the local advantages of arresting streambank erosion to benefit the reef. The Reef Trust IV project, which is the final phase of Australian Government funding for the Great Barrier Reef, has just entered its fourth year. The project began in mid-2017 and runs until mid-2022. The aim of the project is to mitigate excess streambank erosion in key areas of the catchment. This will be achieved by providing grants for landholders to undertake activities such as riparian fencing and installation of off-stream watering systems, riparian revegetation and control of weeds such as cat's claw creeper and Chinese elm. The 2019/20 financial year saw a significant amount of project work planned and completed, with more revegetation and weed control planned for the 2020/21 financial year.

Encouragingly, over 50% of Reef Trust IV project participants are first-timers in MRCCC projects. Word of mouth has been a major factor in engaging new project participants, especially the connections between landholders on neighbouring properties. Collaboration with businesses such as HQPlantations, who manage a vast amount of land around the headwaters of key subcatchments, has the potential for the development of a coordinated approach to weed control. Another key engagement opportunity has been the railway corridor managed by the Mary Valley Rattler which travels through Amamoor and other subcatchments. As a community organisation, the Rattler is active in communication with landholders along the railway corridor, and engaging with them has allowed us to connect with these landholders.

The total area of properties undertaking projects is almost 3,000ha. Approximately 40ha of weed control is underway, which aims to protect existing mature riparian vegetation that would take many years and resources to replace. Additionally, 5.7ha of revegetation is being completed in these reaches with a total of over 9,500 trees planted. According to sediment modelling calculations developed by the CSIRO, the projects at these 34 properties will save a total of 11,178 tonnes of streambank sediment that otherwise may have been transported down the Mary River to the Great Sandy Strait and southern Great Barrier Reef.



Stock drinking from a new trough on a Mary Valley property

Belinda employing unconventional weed mapping techniques at Amamoor

Biocontrol releases, particularly in the Amamoor Creek catchment area, will help to keep cat's claw creeper infestations down after physical control is completed. The table below shows the number and type of biocontrol released between July 2017 and July 2020.

Reach	No. of jewel beetles	No. of tingids	No. of madeira beetles
Amamoor Creek	19,100	3,800	1,100
Kandanga Creek	8,130	670	200
Mary Valley	14,410	3,040	0

Future Mary Valley Reef Trust IV projects which are currently in the planning stage will add a further 12 troughs, 1.2km of fencing, 3.3ha of weed control, and 4ha of revegetation resulting in an additional 10,250 trees being planted.

MRCCC expresses our sincere thanks to those landholders who have participated in the Reef Trust IV project to date, and those planning to undertake works in the future. Not only will the Mary catchment's valuable alluvial soil remain where it belongs; the southern Great Barrier Reef will benefit from reduced sediment loads and remain a natural wonder for generations to come.



**SARAH GRIMISH,
BELINDA WEDLOCK,
MRCCC**

Upper Mary Catchment and Kenilworth District Water Quality Results

For this reporting period 21 dedicated Waterwatch volunteers collected 608 samples at 27 sites from 14 streams. Weather has a great influence on water quality and between 2016-19 the upper catchment experienced a severe drought broken by cyclone Debbie, and then another drought that caused the Mary River to stop flowing. Physical chemistry data (pH, dissolved oxygen, electrical conductivity, turbidity and temperature) collected by trained volunteers on a monthly basis were compared to water quality guideline values to produce Water Quality Report Card Grades.

Grade	Compliance with guidelines
A	80% (excellent)
B	66 – 80% (good)
C	50 – 65% (average)
F	<50% (poor)

All Mary River sites have excellent water quality for this reporting period except for newly established site at Beausangs Lane, Conondale (MAR027) and Obi Obi Creek (OBI090 and OBI940) Waterwatch.

Fryers Creek (FRY050) and Bridge Creek (BRD250) at Maleny also have excellent water quality along with Scrub Creek (SUB950) at Crystal Waters. All three sites have low electrical conductivity (<200µS/cm). All Waterwatch sites within Conondale National Park; Booloumba Creek (BOO750 and BOO800), Little Yabba Creek (LYC700, LYC800 and LYC990) and Lobster Creek (LOB990) have excellent water quality. The average dissolved oxygen for sites within the Conondale National Park is ~80% saturation (DO guideline values = 85-110%sat). This is likely due to the lower than normal summer rainfall and creek flows during this reporting period and not seriously detrimental to aquatic life.

Both sites at Skene Creek (SKE010 and SKE011 Russell Family Park, Montville) have good water quality. Skene Creek sites have excellent compliance for electrical conductivity (average ~80uS/cm), good turbidity (average ~7NTU), however low pH, temperature and dissolved oxygen compliance. Coonoongibber Creek (COG450) has good water quality, despite low compliance for pH (pH guidelines = 6.5 – 8.0), with an average pH of 6.36.

Oakey Creek (OAK800) has poor water quality, due to being an ephemeral creek with low to no flows, mostly dry/shallow stagnant pool throughout dry periods of the year. This site has generally low turbidity, however becomes highly turbid during rain events, pH tends to be acidic (pH average 6.05) and very low dissolved oxygen compliance due to the stagnant nature of the stream. Oakey Creek does have good low electrical conductivity (164uS/cm).

Belli Creek (BEL250 and BEL800) sites have good water quality compared to the Belli Creek tributary (BTR400), which has average water quality. This is due to the tributary site having higher electrical conductivity of (>700µS/cm) compared to Belli Ck (200–300µS/cm). Some of these Waterwatch sites have over 150 samples! Overall, 18 of 27 sites have maintained a grade of A between 2016 - 2019.

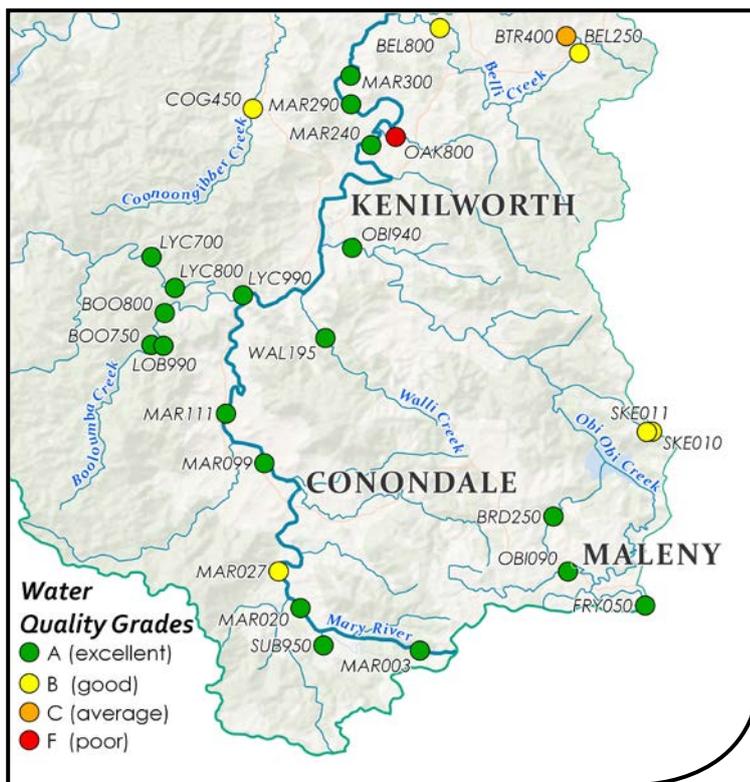


Figure 1 Upper Mary Catchment and Kenilworth District Waterwatch Report Card Results 2016 - 2019



Clint Bevan collecting a sample from Mary River Kenilworth

New Waterwatch sites received either an A, B or C grade. Further data collection is required for all new Waterwatch sites to confirm these results. Every bit of data provides us with greater understanding of the quality of water within the Mary River catchment. Big thank you to each volunteer for their time collecting data and the ongoing support from the Sunshine Coast Council's Partnership Program.

JESS DEAN, MRCCC

Keeping the water clean in Kenilworth –

Working in partnership with Seqwater and Dairy Farmers



Seqwater have water offtakes on the Mary River, at Goomong, Kenilworth and Jimna. They are responsible for the delivery of a safe, reliable and resilient water supply to south-east Queensland. The MRCCC have been working in partnership with Seqwater for over five years. Our focus has been on keeping the water clean. We do this by partnering with landholders and developing projects that help to reduce the amount of pathogens, sediment and nutrients entering the Mary River.

A pathogen is a bacterium, virus or micro-organism that can cause disease in humans. Common pathogens include strains of bacteria like salmonella, listeria and E.coli and viruses such as cryptosporidium. These pathogens can be found in dairy effluent. It is therefore important to ensure appropriate treatment and re-use measures are in place to prevent the pathogens from entering the Mary River.

Earlier this year we partnered with Wendy Jones and her son Rod who have been dairy farmers in the district for generations; currently they are milking 170 cows. Both Wendy and Rod were keen to work in partnership to improve the effluent management on their farm.

The improvements carried out included the formation of a concrete pad with bunded sides which channels the effluent to a grit and solids trap. The liquid effluent then passes to an effluent tank with a macerator pump. The liquid effluent is then used for irrigation at a safe site upslope of the dairy. The solids are removed from the solids trap on an as needs basis and spread to improve soil health.

Reusing the effluent is a win-win situation for the Dairy and the River as it reduces the risk of pathogens entering the water and improves the soil condition and ultimately the pasture.

If you are a Dairy Farmer on the Mary River and would like keep up with the Jones's, please contact Kath at the MRCCC on:

phone 5482 4766 or email kath.nash@mrccc.org.au



KATH NASH, MRCCC

A new resource – River Processes videos

A series of videos is currently in development to be completed by September 2020. The videos will provide a useful resource for landholders; helping to understand the value of rivers, their function and how alluvial waterways react to changes such as flows, alterations to channel dimension and vegetation increase or loss. It is hoped that the material will inform the management decisions of anyone who has an impact on any alluvial river system around the world but, it does have its basis in the Mary River.

We've cornered several of our project landholder with our video camera to let them reflect on what the river means to them and to share this with the world through the videos. It has been heart-warming to see the consideration that has gone into the statements and the emotional links people have with their special part of the river.

We are hopeful that it will eagerly be taken up, not only by landholders, but also by resource practitioners, extension/advisory staff and educational institutions.

The videos will be accessible through the MRCCC website and distributed to our contacts when complete.

This project has been funded by the Sunshine Coast Council under the Environment Levy Partnership program and is being created in partnership with Alluvium consultants and Infografia film makers.



EVA FORD, MRCCC



When the Mary ran dry

Sweltering temperatures and the crackle of dead pasture under foot, had all eyes looking to the blue sky, hoping to see rainclouds during late 2019 and early January 2020. Plenty of records were broken during this dry time. The upper Mary River at the Bellbird gauging station (established 1959), recorded a new low river level of -0.037m on 13 January 2020 (second lowest level: -0.031m 17/12/2009). On the same day, just north of Kenilworth, the Mary River recorded a new low level of 0.253m at the Moy Pocket gauging station (established 1963). The previous low of 0.434m was recorded in November 1991. The gauging station at Fisherman's Pocket, just west of Gympie, has been in operation since the 60's.

It recorded a new low of 1.357m on 13 November 2019. Further downstream at the Miva gauging station (established 1910), the Mary reached 1.481m on 15 January 2020 and although this seems low for this reach of the river, it is higher than the lowest record of 0.693m on the 4th and 9th of February 1937. Just south of Tiaro, Home Park gauging station (established 1982) recorded a new low of 0.736m on 3 January 2020.

Throughout this dry and hot period, Waterwatch volunteers observed fish gasping for air, algal blooms, pools drying up and no water at their Waterwatch sites. Photographs from Home Park show that the mighty Mary River had stopped flowing on 14 January 2020. A common phrase used throughout this unimaginable dry period was "every day, we are a day closer to rain." And rain it did.

Someone out there busted out one hell of a rain dance, causing the Kookaburras to laugh and the Black Cockatoos to fly from the hills to the coast, resulting in the sky opening up late January 2020. Over 200mm drenched the upper and lower western Mary Catchment and between 47mm to 150mm was received in the middle catchment for good measure. This provided relief and recharged the Mary River system, along with all those who rely on our most precious natural resource, water.

IAN MACKAY, MRCCC

Wonga Creek, Lower Wonga



Spangled Perch gasping for air, Amamoor Creek 4.12.2019 photo Cath Robinson



Mary River getting dry at Home Park looking upstream 14.01.2020 photo by Judy Jacobson



No flow at Mary River at Home Park looking downstream 14.01.2020 photo by Judy Jacobson



Flowing at Mary River at Home Park looking upstream 24.01.2020 photo by Tanzi Smith



Flowing at Mary River at Home Park looking downstream 24.01.20 photo by Tanzi Smith

National Pesticide Detectives results



The National Pesticide Detective study by the RMIT University is an Australian wide assessment to determine the impact of pesticides on the natural environment to inform management decisions.

In late February 2020, sediment samples were collected at five strategically selected sites within the Mary River Catchment. Sites were selected by the following land use types: Livestock, Forestry, Horticulture and Urban.

All pesticides tested/screened within the Mary River Catchment were below the detection limit of <0.01mg/kg in the sediment sample, which is fantastic news!

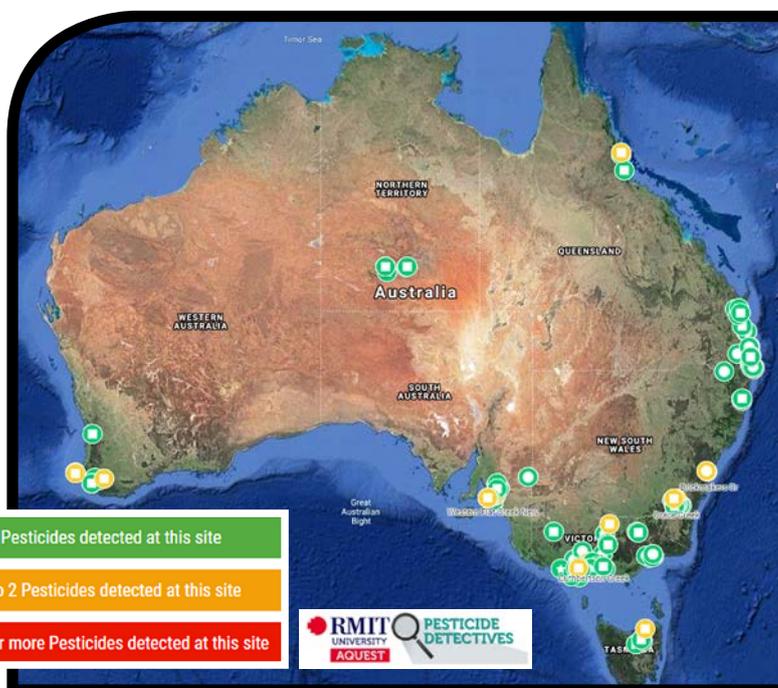
Australia wide, pesticides were detected at 8 out of 79 sites sampled during Feb – March 2020, including a herbicide (*Diuron*), a fungicide (*Iprodione*) and an insecticide (*Bifenthrin*). These were detected at:

Brid River (Tas), Moresby River (Qld), Reedy Swamp (Vic), Christies Creek (SA), the mouth of Barongarook Creek (Vic), West Belconnen Pond (ACT), Brookfield Dam (WA), Tone River (WA).

More information can be found here:

<https://pesticidedetectives.com.au/results-all-rounds/>

JESS DEAN, MRCCC



Top: Caitlin Mill with Obi Obi Creek Gardener's Falls sediment sample.

Above: Australia wide sites.

Right: Mary catchment sites.

Stream and location	Landuse type
Obi Obi Creek, Gardener's Falls	Urban
Mary River, Gympie Weir	Urban
Tinana Creek, Gauging Station	Horticulture
Tinana Creek, Missings Crossing	Forestry
Munna Creek, Glen Echo Bridge	Livestock

Riverbank restoration work in full swing



2017

With the pilefield at Carter's now well-established and plantings there beginning to take hold, a newer, more ambitious project just downstream of the Kenilworth township is currently underway.

If you've motored into Kenilworth from the Eumundi side recently, you couldn't have helped but notice the huge piles of soil and earthmoving activity just upstream of the Kenilworth bridge.

The river in the vicinity of the current site is very different in nature to that just upstream near the Charles Street River Park. Rather than a wide sandy bed, the river is lined with cobbles and includes several riffles.

Part of the design involved moving the low flow channel away from the toe of the new bank and this meant moving also the stone cobbles and re-creating the riffles, both of which took place before the battering of the banks began.

The timing of the works is critical as it has to be outside the nesting times for both the White-throated snapping turtle, earlier in the year, and the Mary River turtle, in a few months' time, both of which are known to nest in the area.

Below: View of activity from drone footage from Charles Street River Park. At first glance you might think it's a return to the days of sand extraction from the bed of the river but fortunately they're long gone. Rather it's the construction of a pilefield to stabilise what had been a 10 metre high, 500 metre long, vertical, eroding bank that had been steadily encroaching, flood by flood, into the fertile flood plain adjacent.

IAN MACKAY, MRCCC



2020

Continued from cover story...

To arrest further damage, bank stabilisation work has been undertaken. This includes sloping the banks, construction of rows of vertical timber piles on the riverbank toe. The aim of the timber piles is to slow the velocity of the stream flow close to the river bank toe, causing fine silt, sand, gravel and seed to drop against the piles reducing the risk of the toe being undercut.

Revegetation is the final component of the recovery process for this site to build resilience and ensure long term stability. After approximately 20 years the timber pile logs will decay to be replaced by semi mature trees. Plant selection considers local climatic conditions including high flow flooding, prolonged dry and severe frost. Eventually we would expect quite a large forest replicating original riparian conditions.

The whole project has been fully fenced including some electric fencing to

discourage feral animals as well as wandering livestock from destroying vegetation and creating erosion problems. An irrigation sprinkler system has been installed to counter serious dry weather conditions. Recently we have nominated as Citizen Scientists with MRCCC's Waterwatch, volunteering to sample and record various aspects of water quality in our reach of the Mary River. As the landholders we have been very involved with the whole process and have been allowed input during the consultation and implementation stages. Both Cats Claw eradication and the River Bank Remedial Project have greatly enhanced the quality of our property and indeed the quality of our lives whilst also contributing to the quality of our local environment and further afield.

Our heartfelt congratulations and thanks must go to all the stakeholders for their ongoing vision and commitment to the betterment of our natural environment.

New technology to help an old problem

Over the years people have asked "how do you work out how much soil is lost when a riverbank collapses". This is pretty easy – measure the width, length and height of the hole left behind on the riverbank to calculate the cubic metres of soil lost. Generally the question then proceeds to "how much soil is lost along the Mary River after a flood?" That is a far more difficult question because we simply can't be out measuring all the slips that have occurred along the Mary River after a flood.

In the old days (1950's and 1990's) to answer this question after a flood we'd compare aerial photography (from one year to another) of certain points along the river to determine the rate of riverbank erosion. This was before Google maps and freely available satellite imagery. But it was still difficult to determine the height of the riverbank because of the 2D nature of the photo. To answer the question of bank height we'd use cool sounding tools like 'stereo-scopes or stereo binoculars' that would project an aerial image in 'stereo' or 3D. This was used extensively in WWII to uncover camouflaged enemy bases, and for our purposes of riverbank height we'd rudimentarily work out if the bank was 'low' or 'high'.

Since the 1990's there has been major advances in satellite technology and Google maps is available to everybody now, but it still doesn't answer the question of "depth" or height of the riverbank, because the imagery is still 2 dimensional.

However, in the past decade a new technology has become more readily available for public use. This technology is called "Lidar" (Light detection and ranging); which still doesn't mean anything to me.... But it works like a sonar on a submarine, or a fish finder in your tinnie, by scattering thousands of laser beams around in the water in the hope that they bounce off something (reflect) that the sonar or fish finder can 'read'.

From this information the shape or in our case the depth of items such as enemy submarines, fish or riverbanks can be calculated.

In the Mary River catchment most of the Mary River was captured by Lidar in 2010 which provides a baseline picture of most riverbanks. In 2018 CSIRO collected in-depth Lidar information of the main trunk Mary River, that now enables detailed comparison of riverbank erosion rates. We've solved the riverbank height issue, so it is now easy to determine how many tonnes of soil has been lost over the years, however....

Soils ain't soils....It is well documented that sediment from floods smother the Great Barrier Reef. It is the "fine sediment fraction" (FSF) that causes the problems to the reef. In the case of this catchment, the riverbanks are providing most of these fine sediments, ie. those soil particles that are so fine that they can easily move

downstream through the river and right out into the ocean, smothering seagrass and coral. However, calculating the FSF is far more difficult to determine, given that riverbanks aren't all uniform in their alluvial soil composition and are laid down at different times, from different sub-catchments or different eroding riverbanks.

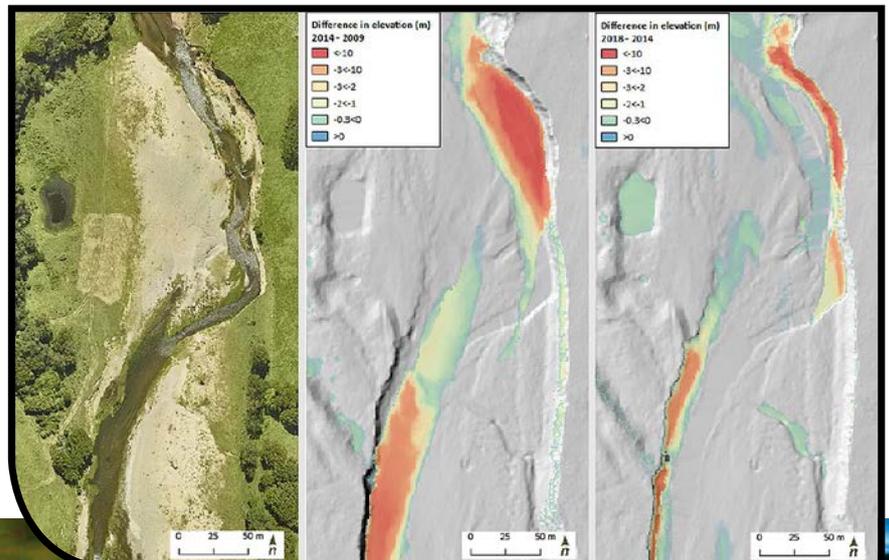
For instance, from studies of the riverbanks in the Kenilworth reach of the Mary River the fine sediment fraction varies between 42-70% (ie some of the riverbanks can be mostly comprised of FSF but it is variable). Therefore determining how much FSF is reaching the mouth and the reef can be difficult.

To gain a better picture of the FSF reaching the river mouth, the MRCCC participates in the Great Barrier Reef catchment sediment loads program. This program aims to determine how much sediment (measured in total suspended solids, TSS) is reaching the mouth by sampling the river during flood events (small and large) at Home Park (upstream of Tiaro) and Fishermans Pocket (downstream of Gympie) gauging stations. These gauging stations allow direct comparisons to be made of flood volume and the FSF load of that flood water during specific stages of the floods.

The MRCCC, BMRG and Alluvium have analysed the entire Mary River using Lidar (2010 to 2018; capturing the 2011 and 2013 floods) to determine locations of major riverbank erosion. Using this technology soil loss has been able to be quantified at these locations.

BRAD WEDLOCK, MRCCC

Illustration below shows change in elevation between 2009 and 2014 (middle) and 2014 and 2018 (right) at Carter's site. The colours display a drop in elevation indicating erosion has occurred.





Cunjevoi



Beautyberry or native *Callicarpa*

A growing concern

When the current MRCCC office came into use in 2015, planting was immediately started to beautify the grounds in keeping with natural values and hide some fairly stark fencing. A few large established trees remained, but through the contribution of Barung, Noosa and Gympie Landcare Groups and volunteers, many dozens of local native trees, shrubs and rushes were planted.

It's been 5 years now, and our focus has been targeted in subsequent plantings to establish a huge diversity of natives, filling every gap we can. Many catchment endemic species are a priority, to mesh with our core business.

We've also taken a broader view of our gardens to include food production, as a model to limit food miles and demonstrate that in only a small proportion of any predominantly native yard you can grow lots of fresh goodies. Staff, members and visitors alike regularly collect seasonal produce for nibbles and meals.

At time of writing, peas, beans, tomatoes, pawpaw and several leafy greens are thriving. The herb garden, with over 20 European or Asian herbs, is becoming a real favourite, as is our emerging collection of native herbs, including quite a variety of native mints, oregano and thyme.

Their food value is appreciated, but between

these and our 16 varieties of native vines, over a dozen different native ground covers and our established trees and shrubs, we are beginning to witness an emergence of diverse flowers and fruits. Soon we should have over 40 varieties of native edibles. With this we have observed more and more animal life.

In keeping with other permaculture principals, we try to minimise inputs including producing our own compost, fertiliser and mulch. We have a lovely relationship with Gympie's Soma Soma Cafe, who gratefully provide their food scraps and coffee grounds. We collect and compost in bins, bays and banana circles. Compost is then used on our gardens, as well as going out into the community, including back to Soma Soma for their own gardens and those of their staff and customers.

Some boxes we've ticked:

- ✓ Food
- ✓ Broad diversity of endemic native plants
- ✓ Covering that fence?
- ✓ Recycling
- ✓ Establishing Native plant propagation stock...well on its way

Some successful propagation outcomes so far include:

- From our one original mother cunjevoi, puppies have enabled 15 healthy plants on-site and 20 more around the community.
- Our collected seeds and harvested seedlings have been shared with local Landcare Nurseries to create stocks of silky oak, hovea, dianella, warrigal greens and fox-tail palms to name a few.
- Countless native runners and cuttings have found their way to nurseries, homes and properties.

Unashamed plug: Any appropriately sourced seeds/seedlings/runners would be greatly appreciated.

We really appreciate the forethought of the designers of this site, especially in the three large rainwater tanks. It's coming along nicely, and when proper rains come again, there'll be noticeably more diversity of native plants with colour, bees, butterflies, birds and humans abounding.

Mary River Month

2020

Spring in the Mary Photo Competition (2019)

Mary River Month

The MRCCC is preparing a suite of activities for this year's Mary River Month, beginning with World Rivers Day on Sunday 27th September, and finishing on Wednesday 11th November – the anniversary of that fateful day when Peter Garrett said “no” to the Traveston Crossing Dam.

Spring in the Mary Photo competition

The MRCCC's highly successful Spring in the Mary Photo competition will be on again, showcasing the amazing talent of some of our local photographers.

Entrants are asked to focus on an aspect of Spring in the Mary, with prizes awarded in the following categories:

- Open • Junior • Wildlife • Rural, and • Saltwater

All entries will be on display on the MRCCC website for voting in the People's Choice award. Thank you to Murray Views in Gympie for being our major sponsor.

MRCCC's annual catchment crawl

The MRCCC's annual catchment crawl will travel the river over the 6th and 7th of October, testing water quality including nutrients and E.coli.

Riparian condition assessment and photo monitoring is also undertaken at each of the 36 sites. The data gathered over 2 days is used to provide a snap shot of water quality in the river, and create base line data which can indicate water quality trends when compared with previous years. Last year, high levels of E. coli were detected at Gympie and Kenilworth and reported to Council. Download a copy of the catchment crawl itinerary from our website and feel free to join in at any of the sites to learn more about water quality monitoring and your Mary River!

MRCCC's AGM and Property Tour

The MRCCC's AGM on the 21st October is heading out of town this year to the Munna Creek Hall. The vast Munna Creek subcatchment is home to the greatest percentage of grazing land in the catchment, as well as providing habitat for a range of endangered species, including the Mary River turtle. The AGM will be followed by a tour of MRCCC Delegate Garth Jacobson's property on the Mary River at Netherby, where Tiaro Landcare's Marilyn Connell will talk about the Mary River turtle and the work their group is doing to ensure the survival of the species.

And although the Mary River Festival won't be taking place this year, there are a host of other events and activities planned for Mary River Month with just about something for everyone!

Contact the MRCCC if you would like your activity included in this year's Mary River Month calendar!

Worlds Deadliest Animal
by Michelle Honey

Early Morning Fog on the Mary
by Ruby Rosenfield

Staring Competition Champion
by Elinor Eaton





*MRCCC get-together
on the River Walk
during our June
Meeting*

STEAMzone online Science Festival 2020



The Gympie Regional STEM Hub hosted the STEAMzone Science Festival during National Science Week on the 22nd August this year, with the entire activity taking place in the virtual world of VirBELA. Participants created an avatar, and navigated the VirBELA Open Campus to access a variety of presentations, activities and even a live rooftop concert from Sunshine Coast's fabulous singer/songwriter Andrea Kirwin.

STEAMzone included presentations from the Queensland Museum's Scott Hucknell who demonstrated how virtual technology is being used to display their extensive collection of fossils and dinosaur bones as well as showing how technology has revolutionised exploration of fossil sites. Other presentations from a range of experts included an in depth look at spiders, making paper from backyard plants, wrangling snakes, extracting DNA, waterbugs, marine turtles, wind farms, water desalination and the delights of a nature refuge.

The whole event was free, and ground breaking for the use of this technology, which has the potential to attract a world wide audience from all walks of life. Future events and activities are now being planned using online platforms, and a range of training programs is proposed which will be available to the wider community. Visit the Goodie Bag page of the STEAMzone website to watch this year's presentations.

www.STEAMzone.org.au