



Flood Damage from Tropical Cyclone Marcia Update Report for the Burnett Region



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Summary

Tropical Cyclone Marcia had a significant impact on the wider Upper Burnett catchment, covering almost 800,000 ha.

It is estimated that this flooding event caused the agricultural industry in this area approximately \$30M which will have devastating consequences on these small communities. This obviously does not include the significant impact to the road and bridge system. The flooding event has been made significantly more difficult for landholders as it has come so closely to the flooding events of 2010/11 and 2013. Landholders were only just starting to recover from these events.

Major issues and funding required for the flood affected region are as follows:

- Paddock erosion/scouring – top soil loss so laser levelling will be required
- Creek crossing repairs
- Irrigation infrastructure repair and replacement (particularly if Category C disaster funding is not activated)
- Fencing repair/replacement (particularly if Category C disaster funding is not activated)
- Natural creek levee break outs need repair
- Weed seed spread – more funding for chemical required – particularly parthenium
- Replanting costs, particularly for Lucerne
- Riparian revegetation projects – loss of lower zone plants planted in the last 6-9 months
- Extension staff to provide assistance and manage funding.

Key costs of repair for the affected area of the North Burnett:

- **Overall cost = \$2.963M** (repairs to fencing, paddock scouring, creek crossings, dams, irrigation infrastructure etc)
- **Cost to repair Flood Recovery Projects = \$557,670** (Floodplain and Land Productivity projects \$460,000, Revegetation Restoration projects - \$62,670, Invasive Species Mitigation projects - \$35,000)

Overall, the flooding event caused by TC Marcia has caused significant damage across the North Burnett in particular and has significantly damaged and set back our Flood Recovery efforts from the last 18 months. Extensions for current projects will be required as well as additional funding.

Background

On Friday 20 March 2015, Tropical Cyclone Marcia affected the upper Burnett Region; arriving as a category one cyclone dumping over 200mm of rain on the upper parts of the catchment in a short, intense period of time causing significant flooding. The subcatchments most affected by this flooding event within the Burnett were Three Moon Creek, the majority of the Upper Burnett River, Baywulla Creek, Nogo River, Reid Creek and the Mundubbera to Gayndah section of the Lower Burnett (see figure 1). This area equates to 791,162 ha.

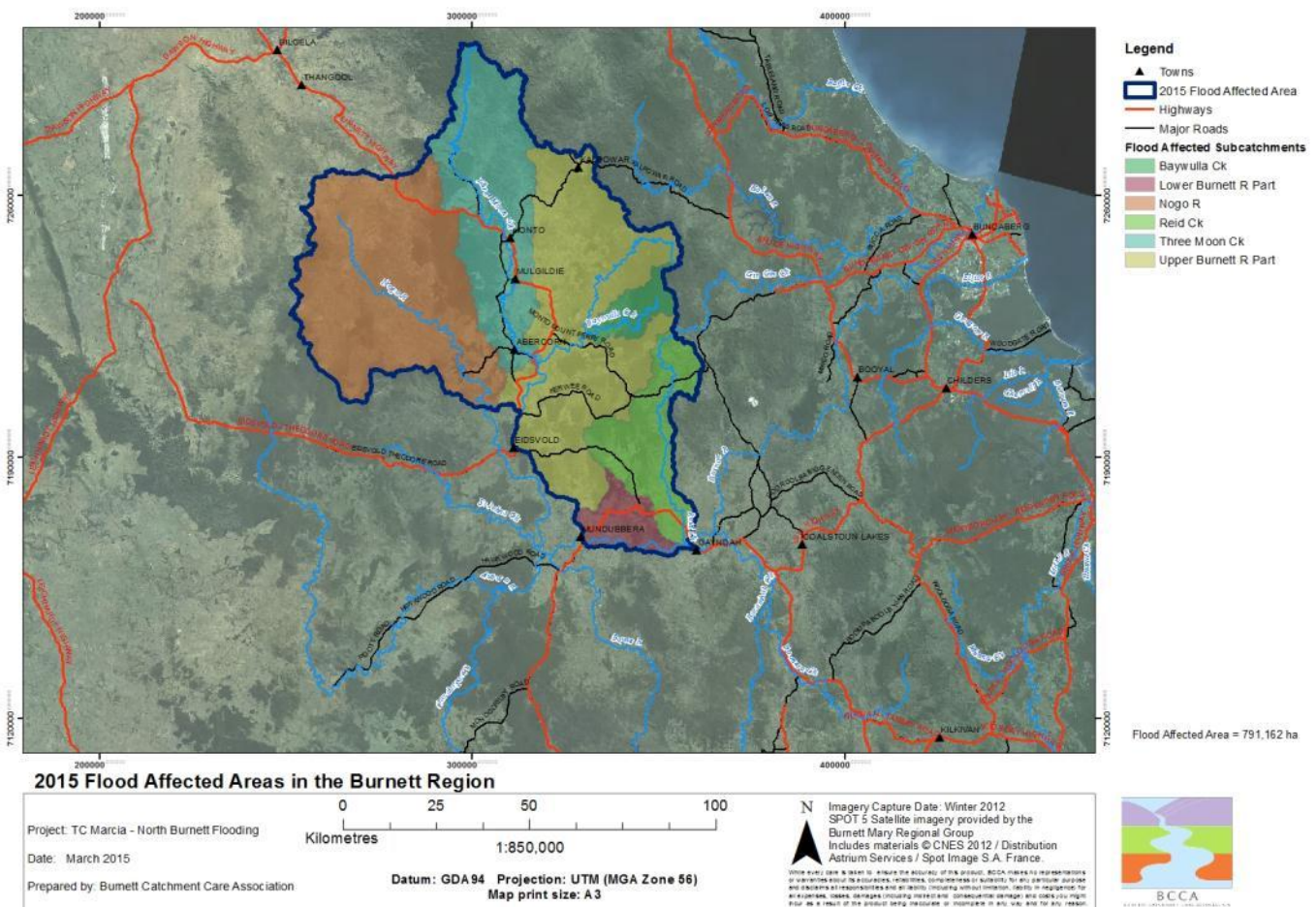


Figure 1: Flood affected subcatchments of the Burnett

The Three Moon Creek catchment has again suffered severe damage. The northern end of the floodplain had a large volume of water from Cania Dam (overflowing the spillway by 2.8m). Some landholders have sustained less damage than the devastating floods of 2013 as the water receded quicker in the north, however, Spring Creek (which flows into the Three Moon north of Moonford) was approximately 1 metre higher than any record, so properties in areas have suffered much higher/worse flooding across their properties. In this area, the flooding caused broken banks again and caused as much damage as 2013.

The general consensus is that the February 2015 flood was on average, 0.75 metres lower than the 2013 flood in the north of the Three Moon Creek Floodplain however, was much faster rising and therefore had higher velocities. At Boolaroo Tops at the head of the Three Moon Creek there was over 250mm in 24 hours, which may not normally cause a significant flood, however, rain intensity has been the problem.

Landholders in the Hurdle Gully Outfall area just south of Monto have advised that Hurdle Gully was at the greatest velocity/volume they have ever experienced, with considerable paddock scouring and deposition across the adjoining paddocks as a result (see photo below).



Airport Drive, Dowlings Flood Damage from Hurdle Gully (hole approx. 2 metres deep). This is a Flood Recovery project that was about to commence, due for completion in May 2015.

Damage Caused and the Cost to the Region

Significant flood damage was sustained across the North Burnett Region.

Hay and machinery sheds which didn't flood in 2013 have flooded in this event damaging stored hay and forage and in other areas were spared.

Irrigation equipment and infrastructure, particularly switchboards, motors and irrigation pipes have been significantly damaged in the irrigation subcatchments of Three Moon Creek and Upper Burnett.

Natural creek levee banks have broken in different parts of the creek then 2013 and some repaired banks have held together well, while others have been damaged again.

Cultivation paddocks appear to have fared better then 2013, however, some areas are showing some significant scouring—particularly where projects have not been completed—where paddocks have been bare so very exposed to damage.

In the lower Burnett River subcatchment and the lower parts of the Reid Creek subcatchment there has been reports of some damage to citrus properties. Our main concern was for our current Flood Recovery Riparian Revegetation projects where by newly planted revegetation on the River banks of citrus properties have been inundated by flood waters to the minor flood level. Fortunately it has appeared that minimal damage was caused to earthworks at these sites.

The other parts of the flood affected area (particularly Nogo River, Baywulla Creek, Upper Burnett and Reid Creek), graziers were most affected by significant flood fencing losses and in some areas creek bank erosion. The other major concern for these graziers is the significant spread of weed seed, particularly parthenium which was exacerbated by the 2013 flooding event and will now be further exacerbated by this flooding event.

Overall, the estimated agricultural damage; particularly for the wider Upper Burnett areas are as follows:

- Mungbean crops—650ha lost = 70% of the total crop and worth \$1.3M
- Sorghum crops—150ha lost = 30% of total crop and worth \$335K
- Lucerne crops— 2,500ha lost = 50% of total crop and worth \$20M annually
- Dairy forage crops—500ha worth \$1M
- Stored fodder (hay and silage)—\$500K
- Irrigation switchboards—100+ switch boards costing \$250K to replace/ repair
- Irrigation motor, pumps, centre pivots and irrigation pipes damaged costing \$1M to repair
- Fencing—200km + lost and damaged costing \$1.6M to repair
- Dams—100 + damaged costing \$500 repair
- Dairy – \$1.4 M, 7 out of 8 dairies severely damaged (QDO data)
- Cultivation paddock scouring and creek bank erosion—1000ha and \$1M
- Crop replanting costs on 3,750 ha equates to \$1.9 M

Damage to Flood Recovery Program (ex-TC Oswald) Projects

Burnett Catchment Care Association has been coordinating the delivery of the Flood Recovery program in the North Burnett Region Council area for the Burnett Mary Regional Group for the last 18 months.

The four main subprograms of Flood Recovery Program; Land Productivity, Floodplain Restoration, Invasive Species Mitigation and Riparian Restoration have all been affected to varying degrees by the flooding event caused by TC Marcia.

Floodplain Restoration and Land Productivity

The target area in the North Burnett for Floodplain Restoration and Land Productivity projects was predominately the highly productive and significantly affected cropping lands of the Three Moon Creek Floodplain. In the past 18 months, approximately \$900K has been spent on landholder projects to restore the floodplain and productivity. That included activities such as laser levelling, paddock scouring repair, creek crossing repair, fencing repair, irrigation infrastructure repair/replacement and natural creek bank levee restoration as well as advice and planning. This funding consisted of over 55 landholder projects from across the floodplain.

During the Flood Recovery activities for the Three Moon Floodplain following ex TC Oswald, considerable floodplain management planning was undertaken with floodplain and soil conservation specialists and impacted landholders. As a result, the Three Moon and Monal Floodplain Management Plan was produced and provided to all the landholders. Flood Recovery funds were directed towards recommendations in this report, such as laser levelling, natural levee bank restoration, crop selection and crop layout changes. A number of projects were funded; however, not all projects were able to be funded due to limitations in funding.

Given, the importance of floodplain management it is imperative that we continue to implement the recommendations in the plan, therefore, recommend activities to assist recover the floodplain following TC Marcia in line with this plan, to mitigate against future events. It is particularly unfortunate that TC Marcia came at such a time where projects weren't complete—it is evident in some areas where laser levelling projects were completed, they have assisted in reducing the impacts in areas across the floodplain. Had there been more time before TC Marcia came and more funding from the ex TC Oswald programs, the damage to some areas could have been considerably less.

It is evident that if we continue to implement the Floodplain Management principles and continue to assist these landholders they will be in a better position should they be faced with another devastating flood. Time was against the Three Moon Floodplain farmers when TC Marcia arrived, with projects not finished or hadn't has time to revegetate and settle. Landholders appreciated the

efforts from 2013 and believe the works have in areas mitigated damage; however, these works need to be extended for a more comprehensive approach.

There has been some positive reports of completed projects been undamaged by these floods, such as natural levee bank repairs and road repairs and some reports of partial damage. Overall however, the floodplain has suffered through fencing damage/loss, large debris deposits, scouring, sand/silt deposition, bank erosion, creek crossing damage and irrigation and electrical system damage.



Creek crossing project finished in late 2014 damaged by TC Marcia flooding event and in need of repair

Many of the funded fencing projects have reported most, if not all, new fencing have been lost. One of the Flood Recovery Projects was completed only days before TC Marcia to have the fencing almost completely destroyed overnight by the Cyclone.

There are seven uncompleted projects from the 2013 Flood Recovery - Floodplain Restoration Program. All these landholders have been severely impacted during this 2015 flooding event. Fencing and laser levelling projects that had only just commenced have been significantly affected in areas. Laser levelling projects have been severely set back due to the exposed paddocks now having significant silt deposition and deep scouring across the paddocks. Therefore, consideration is needed to allow for extensions of these projects past June. These landholders are struggling with the overall property damage which is going to take a long time to recover from and get back in productivity.

A large co-ordinated laser levelling project (see photos below), which was identified as a priority in the Three Moon Floodplain Management Plan, consisting of three properties was in progress just prior to the flooding. Due to trying to meet project deadline time constraints they have had to commence works at this time. At least 10 hectares of the project had been ploughed and levelled which had exposed the paddocks and therefore made them vulnerable to the damage it has

sustained including soil loss and scouring. This project was supported by the wider landholder community and soil conservationists that the long term benefits will be valuable, therefore it would be disappointing and not as effective to not be completed as per the original plan. However, at least 10 hectares of the already completed works has to be re-levelled costing an additional \$20K and would require an extension at least until Sept – Dec 2015.



Damage to paddocks where laser levelling project had commenced in early 2015

Table 1 summarises the different projects that were funding, the extent of damage to the projects, the estimated cost of damage to the Floodplain Restoration and Land Productivity Projects and the estimated additional cost of damage beyond the funded Flood Recovery projects sustained on the floodplain and across the other affected areas.

Table 1: Extent of damage and cost of damage to current Flood Recovery Floodplain Restoration and Land Productivity Projects as well as the cost of damage additional to the projects funded under Flood Recovery

Project	Damage to Project (% affected of projects funded)	Cost of Damage to Projects	Estimated cost of damage additional to the projects funded
Laser levelling—paddock repairs	300ha (~20% of the 1125ha)	\$200,000	\$500,000 (700ha)
Irrigation repairs	350ha (~30% of 1163ha)	\$50,000	\$950,000
Fencing	15km (~75% of 20km)	\$80,000	\$533,000 (100km)
Debris removal	40ha (~50% of 79ha)	\$50,000	\$100,000
Dam repairs	Nil		\$500,000 (100+ dams)
Creek crossing repairs	2 damaged (~50%)	\$40,000	\$100,000 (10 crossings)
Natural levee bank restoration	3 damaged (~50%)	\$40,000	\$280,000 (7+ banks)
Total costs of damage		\$460,000	\$2,963,000

As shown above, funding is required to remedy the projects that have been damaged. In addition, funds are required for the areas outside the projects that have also been severely damaged to improve and regain the agricultural productivity of this Three Moon Floodplain area and other affected areas. This is particularly important as the Australian Government does not activate Category C Natural Disaster assistance for primary producers.

The financial loss to so many of these landholders is beyond comprehension, particularly when so many have just started to find their feet with quality crops that were just ready for harvest, now lost. Having to face three severe flood events on 5 years is going to take its toll mentally, physically and economically on many landholders across the region.

Riparian Restoration

BCCA are coordinating a total of 18 riparian revegetation projects located along the Burnett River in the Mundubbera and Gayndah areas. On-ground works had commenced or had been completed on 12 sites. At the time of inspection following Cyclone Marcia, all 12 projects with works completed or in process were inundated by flood waters to the minor flood level (Zone 1) affecting approximately 1.42 ha of a total of 8 ha of revegetation works. Minimal damage was caused to earthworks at these sites, however BMRG's soil technical officer, Peter Wilson, has advised that extended saturation (caused by lower bank remaining inundated for an extended period) may cause future slumping and sites will require monitoring for the next few weeks in case of future bank slumping.



Riparian Revegetation Project in Mundubbera with earthworks recently completed prior to the flooding.

The full extent of the impact on plants and infrastructure in the lower flood zone is unknown as the areas were still inundated on inspection. However it is expected that the high flow rate, sediment, debris will have a significant impact on new (unestablished) works located in the flooded zone (1.42 ha over 9 sites). In addition, the intense rainfall caused minor erosion (rilling) at 2 sites and plant mortality on the upper bank at least 3 sites due to the young plants being buried, scoured or suffering high heat stress following the event.



Riparian Revegetation Project with zone 1 plants inundated

In order to replace dead plants (as required) and infrastructure located in the flooded zone (Zone 1) estimated costs include:

- Debris removal (crew labour)
- Fencing (crew labour, materials)
- Revegetation (mulch, stakes, cartage, labour)
- Maintenance (watering until establishment, weed control labour and materials)

Table 2 below summarises the cost involved in repairing damage to existing Riparian projects.

Table 2: Activities and cost of repairing damaged Riparian Restoration projects in the Central Burnett

Activity	Description	Quantity	Cost
Debris removal (labour)	Debris removal from flood zone and on fencelines by 2 crew	7 sites @ 2 days per site approx	\$8,691
Fencing repair (contractor)	Repair broken fenceline	350m repaired fenceline @ \$100/m	\$3,500
Grass seed	Green couch \$12/kg applied @ 1.5kgkg/ha and Jap millet for 1.42 ha	2.13 kg seed @ \$12/kg	\$866
Tubestock	Native tubestock 1.42 ha @ 3m distance	1586 tubestock @ \$2 ea	\$3,172
Cartage	Cartage \$18/tray of 50 plants	32 trays	\$576
Stakes	1 stake per plant	1586 stakes @ \$1.5 ea	\$2,379
Mulch	Mulch \$2.50/bale @ 0.5 bale/plant	793 bales	\$1,983
Mulch Cartage	\$200/load 100 bales per load	8 loads	\$1,600
Weed Control	Nufarm Weedmaster 1 Lt/ha @ \$25/L for 1.42 ha x 2 applications	3 L	\$75
Fertiliser	Organic Xtra 100g/stem @ \$23.55/25kg/bag	159kg, 4 bags	\$96
Reveg labour	50 plants /day for 2 crew	32 days for 2 crew	\$19,866
Maintenance labour	Watering and weed control 100 plants /day for 2 crew twice	16 days for 2 crew	\$19,866
Total Cost			\$62,670

Invasive Species Mitigation

Approximately \$70,000 has been allocated to BCCA to enable the funding of chemical to be provided to landholders in the flooded areas of the North Burnett area to combat priority weeds post the 2013 flooding event. The majority of the funds have been directed towards parthenium control in the Upper Burnett and the Biggenden area.

Rain in December 2014 and January 2015 has seen a significant increase in priority weeds and an interest from landholders to partake in the program.

Immediately after TC cyclone Marcia flooding event, a number of landholders, particularly in the Upper Burnett Catchments express their concern with the further spreading of weeds expected from the flooding event.

It is anticipated that at least \$35,000 will be required for additional treatments post TC Marcia.



Parthenium weed prior to flooding

Examples of Flood Damage



Flood Debris and Irrigation Damage



Fencing and paddock damage on Three moon Floodplain- this producer has lost almost 300 acres of mungbeans (estimated total property damage \$600K)



Flooded Lucerne paddock at least 4 m deep – during flooding, Monto



Rotting Lucerne paddock at flood waters recede, Monto



Flooded Hay Shed, Mulgildie



Threemoon Creek and Monal Creek junction flooding the Burnett Hwy, Monto



Sorghum crop damage



Further sorghum crop damage



Scouring in paddocks from Hurdle Gully Outfall



Further scouring in paddocks from Hurdle Gully Outfall