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Submission details

I am making this submission as Other

Submission type I am submitting on behalf of my organisation

Organisation making the submission (if applicable) Clarence Cane Growers Association

Your position in the organisation (if applicable) Secretary/Manager

Consent to make submission public I give my consent for this submission to be made public

Share your experience or tell your story

Terms of Reference (optional)

The Inquiry welcomes submissions that address the particular matters identified in its [Terms of Reference](#)

1.5 Recovery from floods Refer to attached submission

Supporting documents or images

Attach files

- [2022 flood submission.pdf](#)



Clarence Canegrowers

Submission to the NSW Independent Flood Inquiry

Addressing point 1.5 Recovery from floods.

Introduction

Following the widespread and at times devastating floods during the 1950s, Federal, State and local councils worked together and invested in significant flood mitigation infrastructure. This involved levees around townships and drainage of the backswamps. The floodplains of the Northern Rivers are characterised by the rivers being bordered by natural levees, which have formed over time by the deposition of flood mud. Behind these levees, the height of the land drops away to what were fresh water swamps, which had poor connectivity to the main stream. After floods, these backswamps would stay inundated for months afterwards (Lucas 2004). These swamps were drained to provide space for the next lot of flood waters and to improve the life of those living on the floodplains. As happened in 2022, about one third of the floods on the Clarence occur within 3 months of a preceding flood (Ford 2012). The speed at which the backswamps can be drained, will in part determine the impact of the current flood, any subsequent flood and the impact of blackwater events.

The importance of an efficient floodplain drainage network for flood mitigation purposes is being challenged by some sectors of the public and government departments. This has resulted in the underfunding of flood mitigation infrastructure and the subsequent deterioration of drainage efficiency. Under a number of headings we will aim to convince the members of the independent inquiry that as significant landowners on the floodplains of the Northern Rivers, canegrowers are interested in seeking a middle line in the efficiency of drainage and environmental outcomes. We believe that the current model for managing this important infrastructure is biased towards environmental outcomes and a separate flood mitigation authority needs to be established to ensure that the needs of all sectors of society are met.

The Dutch Experience

The Dutch have realised that their prior work in trying to contain the Rhine and other rivers has not worked and they are now implementing their “Room for River” concept, where they are shifting levees, removing flood mud off floodplains, deepening side channels etc. We have not levied off our backswamps and have no need to do what the Dutch are doing, as our backswamps, are our “Room for River” alternative. (Note that this is not the case for the constraining levies in Grafton and Lismore.) However, our “Room for River – the backswamps can only function as such if the majority of flood water can be removed from them efficiently.

Legislation

There does not appear to be any direct Flood Mitigation Legislation, but is included under the *Water Management Act 2000*. One clause under Floodplain management in this act states:

(6) (c) *the existing and future risk to human life and property arising from occupation of floodplains must be minimised.*

We interpret this to mean that the current occupants can expect that flood waters are drained quickly so that damage to life and property is minimised.

Fisheries have a role to play in providing permits to allow for maintenance work on floodplain mitigation infrastructure. This is legislated under *The Fisheries Act 1994 Part 7 Protection of aquatic habitats*: This provides for the protection of Mangroves, seagrass and other vegetation declared by regulation (currently includes salt marsh) up to the highest astronomical tide. Fisheries have a mapping portal to show where fish habitat is. This is currently being updated. The current maps often include areas which are not tidal and are inside flood gated drains.

The implementation of the Marine Estate Management Strategy 2018-2028 is beginning to have an impact on the management of flood mitigation infrastructure. This is legislated under *The Marine Estate Management Act 2014* and defines the marine estate (from a terrestrial point of view) as:

- (b) estuaries (being any part of a river whose level is periodically or intermittently affected by coastal tides) up to the highest astronomical tide,
- (c) lakes, lagoons and other partially enclosed bodies of water that are permanently, periodically or intermittently open to the sea,
- (d) coastal wetlands (including saltmarsh, mangroves and seagrass),

Management of Flood Mitigation infrastructure

On the Clarence River, the flood mitigation infrastructure was constructed and maintained by the Clarence River County Council (CRCC). When the four councils that contributed to this organisation merged in 2004, the CRCC was initially absorbed into the new council as a separate division – eventually though this division was disbanded and the role of flood mitigation was housed within council engineering and environmental departments. The reasoning for this was for efficiencies, but in reality was due to declining flood mitigation funding making a separate division unviable. This is acknowledged in the Clarence Valley Council Draft Rural Lands Strategy where Point 16.1 in the Implementation Plan states that “*Continue discussions with the State Government to seek additional funding provision to improve drainage and floodplain maintenance that has been in decline in relative terms over the last 30 years*”. Concurrent with declining flood mitigation funding has been a noticeable shift in emphasis in council on improving environmental outcomes on the floodplains.

The cane industry has sought to work with floodplain environmental managers to improve outcomes for all. The first major area of conflict occurred in the 1980s with an increase in the occurrence of the red spot disease of fish in the river. After it was suggested that poor quality water coming out of flood mitigation drains may be contributing to the occurrence of this disease, the cane industry worked with floodplain managers to improve this water. A number of cane growers were members of the Floodplain Project, which was the steering committee that sought to make these improvements. The main emphasis was to install winches on floodgates, so that there could be an exchange of water into the drains, typically only for a few hours each day at mid tide. This would let some water in, which would drain out at the next low tide. Around about the year 2000, The Healthy Rivers Commission recommended that a Floodplain Partnership be created as a forum for all floodplain stakeholders to meet and agree on actions moving forward. This was chaired by Vince Castle (Chairman of the Clarence Canegrowers) for 10 years and this functioned well in improving environmental outcomes for the floodplain. Even so, during this time it was difficult to obtain funding for flood mitigation infrastructure maintenance. It took over two years to get a major floodgate repaired. During this time, the tea tree backswamp that this floodgate was protecting was inundated with salt water, resulting in the death of the tea trees. Upon Vince’s retirement,

chairmanship of the Floodplain Partnership moved to Craig Copeland, a Fisheries Officer at the time. There were a couple of meetings, but then it just faded away with the last meeting in 2014.

The current driver of floodplain management is the Marine Estate Management Strategy 2018-2028 (MEMS), which although mainly focused on the coast and estuaries along the NSW coast indicate that they should “...undertake a catchment-based approach to implement initiatives to address the cumulative threats identified to major coastal waterways and ensure a coordinated approach to waterway health that benefits the NSW community”. This statement comes from the introduction to the Strategy even though the catchment is not mentioned in the legislation.

The lead agency in implementing this strategy is DPI and the fisheries division is doing the majority of this work. MEMS does not mention flood impacts in their document.

The key area of contention in the drainage network is the final outlet floodgate into the river/stream. Depending on the location up to 7 permits are required from various state government departments to do basic maintenance on these structures. Fisheries have an ongoing MEMS action to streamline this process. We have not been consulted on this process, even though we are one of the main stakeholders concerned with this process.

We are very concerned that Fisheries have the lead role in MEMS, as our experience is that they are seeking to have all drains determined as fish habitat. Once this is determined this will give them control of the management of these drains. As an industry, we were quite happy to work with fisheries during the 1990s and 2000s to allow for water exchange and fish passage into the flood mitigation drainage network as this seemed a win-win for the environment, the fishing industry, our industry and flood mitigation. The balance now is too far in Fisheries favour, which is a major concern to us. As a consequence:

we are asking the Inquiry to consider recommending that all flood mitigation drains and infrastructure be recognised as such and to have an adequate budget and a separate authority with appropriate powers to maintain them.

Blackwater events

Fish kills caused by blackwater events occur after many floods and are a contentious aspect of floodplain management. Whitworth et al. (2013) comment that there is considerable literature regarding the events that lead to hypoxic blackwater development, but very little documented instances of the successful management of blackwater events to minimise harm to the aquatic environment. A recent literature search also failed to find any successful blackwater remediation concepts from the Australian East coast rivers systems. Whitworth et al. (2013) have looked at options to mitigate blackwater events in the Murray-Darling system. They looked at three options 1) dilution of the blackwater stream, 2) mechanical aeration and 3) dilution into large off stream storages. As this is a regulated system, with various branches, stream managers are able to manipulate flows and achieve benefits by stream dilution. Mechanical aeration is an option for a small refuge to help provide a safe haven for aquatic species, but not a catchment wide solution. Dilution into an off-stream storage perhaps happens on the Clarence with Lake Wooloweyah and the Broadwater acting in this role.

Of interest is Whitworth et al.'s (2013) equation which determines how much oxygenated water is required to offset an incoming plume of deoxygenated blackwater. It is our belief that a well maintained drainage network will allow the backswamps to release their water into the main river system when river flows are high and the dilution effect will offset the deleterious effect of the incoming blackwater. Any delay in the release of water from backswamps may change this balance resulting in a blackwater event in the main stream if there is insufficient oxygenated water to counteract the quantity of hypoxic blackwater entering the main stream. Johnson et al (2003) report

that the most adverse time for blackwater is when the last of the water from some backswamps is being released. Canegrowers worked with floodplain managers during the 2000s to identify these areas and to install appropriate structures to minimise these effects. Wong et al. (2011) present a conceptual model to minimise blackwater events by slowing floodplain drainage by retaining water in backswamps. This concept is the current key driver of floodplain management, which has resulted in the neglect of the maintenance of flood mitigation infrastructure.

Canegrowers as an industry are keen to work with floodplain managers to find the correct balance between the use of the drainage network to minimise the impact of floods and the utilisation of appropriate structures to improve environmental outcomes. We do not think that Fisheries are the appropriate partner to control flood mitigation infrastructure and believe that a separate flood management authority with the appropriate powers is required to ensure that the correct balance is found.

Draining the floodplain

In his thesis Lucas (2004), proposes that the major drainage flood mitigation works constructed during the 1960s and 70s were dug too deep resulting in negative environmental outcomes. As discussed earlier, the cane industry and other land owners have worked with the various floodplain managers to rectify this to some degree. The major issue at present is the lack of maintenance at the outlets of the drains. A typical instance is that there is a significant reduction in flow out of the drain due to silting up between the floodgate and the main stream. Those opposed to the drainage network consider that these outcomes are achieving their goals. We think that there is a better way to do this, as this also impedes the removal of flood water from the floodplain. Our preference is to have correctly operating floodgates, to enable the quickest removal of the “top” water – ie flood water and to have other structures along the drains to retain an agreed amount of “bottom” water, which is maintained at an agreed level via tidally operated floodgates.

There is no official data that supports the assertion, from our members, that the lack of maintenance is resulting in slower draining times after floods. One of our members has been recording flood heights at his farm between Palmers Channel and Lake Wooloweyah since the 2001 flood. This data has been presented as the hours after the peak of the flood at Maclean that it takes to drop to 0.8m AHD plotted against the height of the flood peak at Maclean (Fig 1). This represents only one site downstream of Maclean and therefore may not be representative of other sites on the floodplain. There are many factors that contribute to the rate of fall of flood waters, but it was of interest to note that the majority of the data shows a strong linear relationship ($R^2 = 0.94$) of the time the water takes to drop to 0.8m relative to the flood peak in Maclean. However, four of the ten floods do not lie on this line. A possible explanation for these outliers could be: The three in the top right (red markers) were large floods (>3m at Maclean) and are about 50hrs (approx. 2 days) slower in draining compared to the similar height flood from 2001 – when flood mitigation infrastructure was still well maintained by CRCC. Note that last year’s flood (2021) lies on the trend line, which may suggest that the argument is incorrect, or that this delay caused by the lack of maintenance is only occurring in the big floods (ie >3m at Maclean). However, the 2021 flood was unusual as the flooding weather came from the west resulting in lower seas (Yamba max of 2.0m instead of 2.5m in 2022), which allowed for easier draining of the floodplain. The fourth point is from the last flood, which peaked 29 days after the first 2022 flood and may suggest that some aspect of draining from the first flood has slowed the draining of the second flood by about 60 hours (approx. 2 ½ days) later than expected from the trend line.

To conclude, this data may be showing that under some situations, the lack of maintenance may be delaying the removal of flood waters from the floodplain by 2 - 2 ½ days.

Time for flood waters to recede to a height of 0.8m AHD at Palmers Channel from the flood peak at Maclean

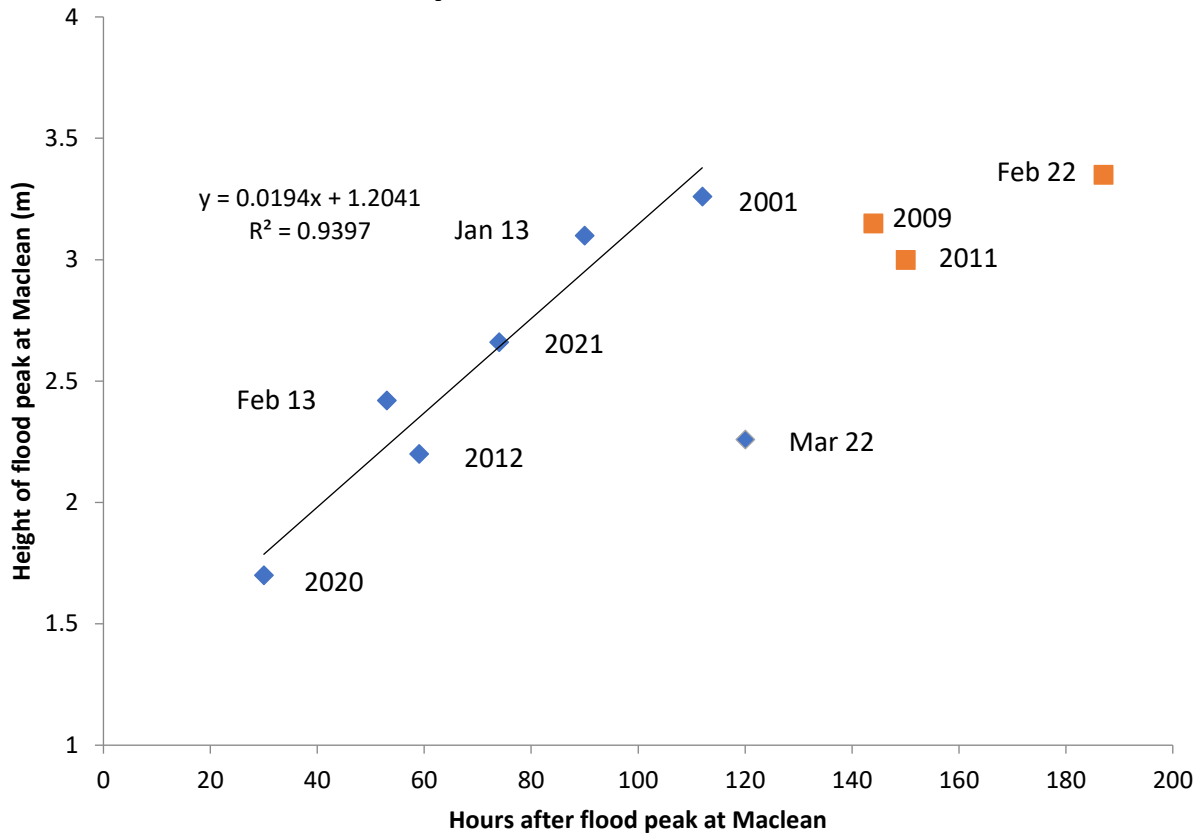


Figure 1 Time for flood waters to recede to a height of 0.8m at Palmers Channel from the flood peak at Maclean

Summary

The cane industry, being a major occupant of the rural lands on the floodplains of the Northern Rivers is seeking recommendations from the inquiry that:

- 1) All flood mitigation drains and infrastructure be recognised as such.
- 2) Create a floodplain mitigation authority that has the budget and powers to maintain the flood mitigation infrastructure
- 3) This floodplain mitigation authority will strive to achieve an equitable balance between environmental outcomes and the efficient drainage of the floodwaters from the floodplain.
- 4) This floodplain mitigation authority to work with all stakeholders to achieve agreed aims.

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