



NSW Flood Inquiry Submission

22/06/2022

Satellite image taken March 7th (6 days after peak)

Contact:

I give my express consent to the Inquiry to publish my submission on an anonymous basis.

Your story

We are fortunate to live and work on Bundjalung Country in the beautiful Bungawalbin Valley. Bungawalbin is a huge catchment with a vast 'Nationally Important' wetland system, leading to the second highest level of Biodiversity in Australia.

Our property is protected by an earthen levee that was constructed in 1945. We have never had water inside the house or the shed, nor have the recorded flood levels been anywhere close. That was until 28 February 2022.

The levee protects our property as well as the regions of Bungawalbin, Swan Bay, Woodburn and New Italy. In its 70+ year history, it has never needed any major repairs or maintenance works done to it until the Pacific Hwy upgrade was completed in 2017, which effectively created a dam, increasing flood height and pressure.

Floods are a very normal and regular occurrence here in Bungawalbin, and we have systems in place to mitigate them including plans, food stockpiles, high ground and boats. It is usually a nice time for our community. Although we are isolated, we are safe, and neighbours take the opportunity to meet up.

The February 28th and April 1st Floods were another story. The words unprecedented and apocalyptic are tossed around but you truly can't imagine

the devastation until you've experienced it. Our normal maximum flood height ever recorded here was 5.245m. This reached over 7.8m – a 50% increase.

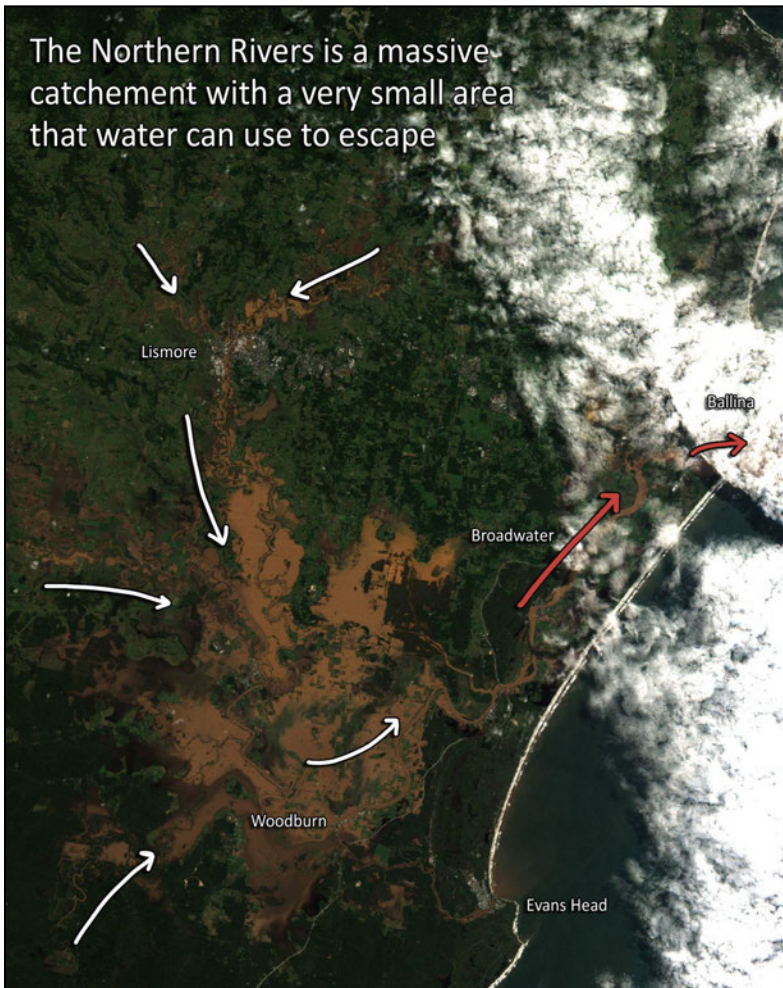
We are a very organised and self-sufficient family. We did everything we could with the information we had, even preparing for a possibly record breaking flood. But it still wasn't nearly enough.

After 3 weeks the waters receded and the road was finally accessible for a couple of days. Then we were hit again with the 2nd highest flood ever recorded. Anything we had out to be cleaned and dried in the sun, had to be secured back inside so it wouldn't float away.

Since then, every day is spent cleaning, sorting, salvaging, or doing what we can to get help for our rural community.

We *still* cannot get back to work.

1.1 Causes and contributing factors



A major issue in the Richmond River catchment is the way the flood water is restricted from draining into the ocean. There are a few exacerbators of this, both recent and historical.

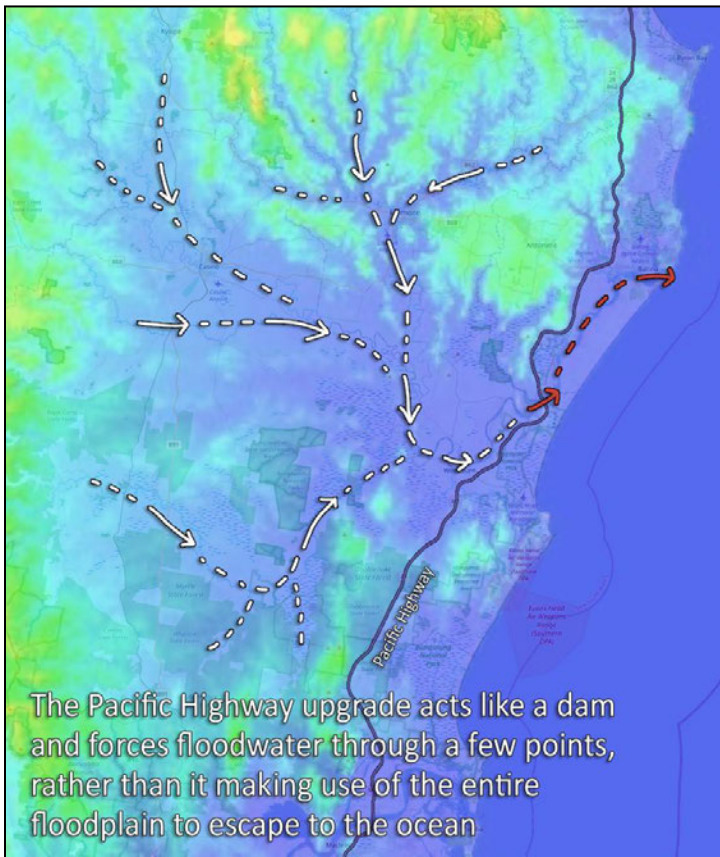
Figure 1: Northern Rivers Catchment during flood

1.1 A: Pacific Highway Upgrade

When the Pacific Highway from Ballina to Woodburn was upgraded, the new road was built on a raised earthen mound, against extensive professional advice. This mound has effectively created a dam, stretching across the floodplain that usually allows floodwater to escape the Richmond catchment into the ocean.



Figure 2: Aerial image of highway acting as dam



The Pacific Highway upgrade acts like a dam and forces floodwater through a few points, rather than it making use of the entire floodplain to escape to the ocean

Figure 3: Topographic illustration of highway damming floodplain

In 2005 when the community consultation office was set up in Woodburn by the Department of Roads, numerous people submitted modelling, advice, local knowledge and important indigenous experience. Among these contributors were the SES and CSIRO.

They advised that the design would create a dam, increasing flood levels, volume and velocity. When the final highway plans were decided on, the designers based them on insufficient flood data and did not consider the upper floodplains, nor undertake flood studies of the extensive Lower Richmond and Bungawalbin catchments.

The new highway was originally supposed to be built on pylons to allow clear space underneath, thus avoiding disruption of the flood plains. Due to the marshy ground, they had to drill foundations too deep and cost was prohibitive. They changed the design to use a cheaper, raised mound construction instead, effectively creating a dam wall. As a compromise, it was supposed to have 200 metre long culverts to still allow sufficient drainage. To cut costs, culvert length was later downgraded again to just 66 metres.

During the flood we asked the SES and RFS to check if these (already insufficient) culverts were blocked by debris, exacerbating the problem.

The highway upgrade included 49 kilometres of road located within one of Australia's largest and complex floodplains. Before the highway upgrade, water would flow out gently across that stretch into the ocean. Now it can only exit via the river at broadwater bridge and a small canal at Tuckombil.

7.6.5 Flood mitigation works required for route options

Potential impact upon the existing flood plain conditions due to the proposed route options is mitigated by providing flood mitigation structures (culverts, bridges, and viaducts) to meet the objectives in section 7.6.2, above.

Table 7-48 below summarises the major flood mitigation structures (bridges and viaducts) by assumed route corridor.

Table 7-48 Major flood mitigation structures by corridor

Assumed Corridor	Major flood mitigation structures
Corridor A	<ul style="list-style-type: none">• 800m Bridge across Richmond River• 650m Bridge across Broadwater• 100m Viaduct/bridge North of Richmond River crossing• 1,380m Viaduct South of Broadwater• 350m Bridge across Tuckombil Canal
Corridor A1	Similar to Corridor A above
Corridor A2	<ul style="list-style-type: none">• 720m Bridge across Richmond River• 450m Bridge across Broadwater• 1,380m Viaduct South of Broadwater• 350m Bridge across Tuckombil Canal

Figure 4: Summary of Pacific Highway upgrade drainage points

The Hydrology reports into the design indicated *“There are some localised alterations to the timing of the rise of flood levels, mostly upstream (west) of the project around Woodburn. Peak flood levels at this location would also be up to 50 millimetres higher as a result of the project.”* However this only extended west a short section and did not take into consideration the Bungawalbin catchment.

“Flooding in the area is dominated by the three major inflows of the Richmond River, Wilsons River and Bungawalbin Creek. These systems and their catchments are considered to be quite different in nature and result in different flooding problems. Richmond River Flood Mapping Study Inaccuracies are largely attributed to the poor availability of recorded rainfall and streamflow data from the southern half of the catchment, in particular, the Bungawalbin”

(Richmond River Flood Mapping Study Volume 1 Final Report. R.B16784.002.02 Volume 1. March 2010)

Hydrology reports were negligently made, and models were purposely designed to show an acceptable level of flood height increase.

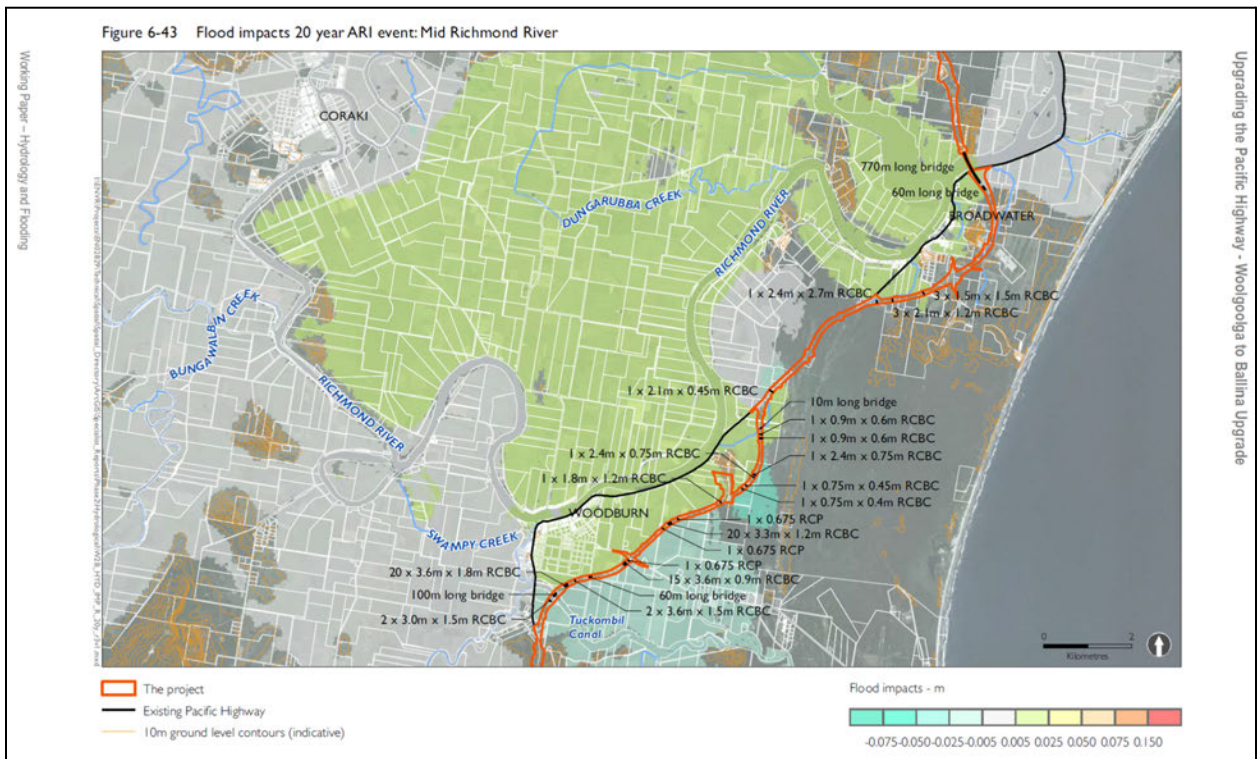


Figure 5: Projected flood impacts caused by Pacific Highway upgrade. Note the lack of data regarding the larger Bungawalbin catchment.

For example, the 1771m² Bungawalbin catchment was not and could not have been considered sufficiently when undertaking the hydrology report for the highway upgrade plans.

Another interaction of the river system which is usually overlooked is the way flood water from the Wilsons and Richmond Rivers backs up into Bungawalbin Catchment.

1.1 B: Replacing fabridam with concrete

In addition to the highway restricting floodwater flow, the council have replaced the fabridam at tuckombil canal with a permanent concrete weir

“Tuckombil Canal and Barrage – the Tuckombil Canal was originally excavated in 1895 between Rocky Mouth Creek and the Evans River. The canal was intended to provide flood relief to the Mid-Richmond area, allowing floodwaters to drain to the ocean via the Evans River. The original construction of the canal had a flagstone causeway slightly above high tide level, to prevent tidal exchange. In 1965, the canal was excavated to its current form. An inflatable fabridam was located at the upstream end. During normal operation, the fabridam remained inflated, thus preventing tidal exchange. The dam was deflated during floods, to maximise the drainage potential of the canal. Following numerous replacements, the fabridam was replaced in 2001 by a temporary fixed concrete weir at 0.94m AHD”

(Richmond River Flood Mapping Study Volume 1 Final Report. R.B16784.002.02 Volume 1. March 2010)

This flow restriction puts significant load on the Richmond river at Broadwater and causes massive amounts of water to collect in the catchment area, greatly increasing flood heights.

1.1 C: Flow Restrictions

Flood levels 2+ metres above the all time record would not have been possible without the restriction of flow caused by blockages like the fabridam, highway upgrade and other road upgrades like the Woodburn to Coraki road.

These problems became clearly apparent in 2017, when enough of the HWY was completed that it began to make a significant difference.

In addition to drastically and immediately increasing the amount of drainage under the highway, government must consider extra mitigation infrastructure. This may take the form of canals being excavated from the Richmond River around the Broadwater area going directly to the ocean. This would allow some floodwater to bypass Ballina and escape, meaning that the whole catchment area and floodplain can drain faster, lowering flood heights and the time period that communities are isolated.



Figure 6: Possible flood water drainage canals at broadwater

Another potential canal stretches from the Wilson's River near Tuckurimba to Tucki canal. This project would reduce the long distance water from Lismore has to travel to the ocean, potentially saving the lower parts of the city

including the CBD. If some kind of infrastructure isn't built to increase drainage away from the town, a massive number of houses and businesses must be moved, incurring astronomical costs. The government has no option but to fix Lismore's flooding issue, as it is the hub for the entire area. If the city isn't saved, sustaining the Richmond Valley's \$1 billion of GDP will be impossible.

Detailed modelling must be done on a number of projects like this to assess the costs and benefits. Whilst ensuring all of the catchments and lower flood plains are taken into consideration.

1.1 D: Lack of detailed flood modelling in wider catchment area

It is well known that flood modelling in the Richmond catchment area is insufficient. The community has lobbied for decades to obtain funding for a full study, which would allow a region with frequent flood issues the information to solve or mitigate some of its problems.

Additionally, on numerous occasions over the years, the community have requested from Richmond Valley council, Rous County Council, Manly Hydraulics and BOM for additional river height and flood gauges be installed in the area's extensive waterways, as recommended by many previous flood studies in the area.

"Inaccuracies are largely attributed to the poor availability of recorded rainfall and streamflow data from the southern half of the catchment, in particular, the Bungawalbin"

(Richmond River Flood Mapping Study Volume 1 Final Report. R.B16784.002.02 Volume 1. March 2010)

This is an issue routinely neglected by government and council. There is a particularly insufficient number of rain and flood gauges for the bungawalbin catchment, and the Neileys Lagoon flood gauge which is the only data

collection point for a stretch of river roughly 40km long is still offline after the March 1st flood. This deprives residents of a vital flood monitoring tool.

Pre-flood I, and many others, advised numerous agencies of our concerns. I was at Richmond Valley Council only 2 weeks prior where I mentioned it again. I spoke extensively to ex-Councillor Jill Lyons, who was very keen to help. Councillors Debbie McGillan and Patrick Deegan visited me at Bungawalbin where I also brought it to their attention. All preceding the March flood.

1.1 E: Climate Change

The science is eminently clear, these rain events will continue to get worse. Any money invested in mitigation now will be well and truly profitable in the long term and is critical to the survival of not just the entire northern rivers area but the country as a whole.

1.2 Preparation and planning

1.2 A: Lack of investment in infrastructure

There is a chronic lack of investment in Australian infrastructure. This includes things like emergency services, climate change mitigation, roads and local Australian industry. In normal times the country can still function, but stressors like extreme weather can make the shortcomings of our infrastructure clear.

1.2 B: SES preparedness

The SES shed in Woodburn was flooded in this event. This is quite frankly ridiculous. Existing flood modelling already showed that these record breaking levels were possible in a 1 in 500 year event. **Emergency services must be *safe from and prepared for the disasters they exist to help with***. Additionally, in this event SES members needed to ask the community for petrol because they had run out. The SES **must** keep a stockpile of the goods and equipment that would be necessary for disasters like this. Things like fuel, food, communications equipment and medical supplies. It is blindingly clear throughout history that money is better spent investing in disaster preparedness than recovery.

Further, SES volunteers should be a back up only. Full time, paid, trained and prepared emergency service members must be employed.

1.2 C: Bungawalbin Creek Levee

The Levee bank along the Bungawalbin River has survived maintenance free for around 70 years. It was initially damaged in 2017, likely because of increased water volume and pressure caused by the pacific highway upgrade

(dam). The council was advised of the needed measures to fix it and proceeded to disregard the advice. These measures include simple things such as fabric matting and topsoil covering the levee surface to promote grass growth, which protects the bank from erosion. When fixing the levee, not enough money was spent to fix it properly and proper design was ignored. Thus, it has been damaged and needed emergency repairs again multiple times since, resulting in *massively* increased cost.

The levee banks exist to protect the community from minor to moderate floods, and in the case of major floods, they allow residents extra time to evacuate and prepare, before roads are submerged. Neglecting the maintenance and investment in flood infrastructure like this puts hundreds of properties and lives directly in danger.

1.2 D: No Warning

Residents received little to no warning that this flood could be record breaking. BOM rain estimates were **far** too low. Privately contacting the SES, we were advised that up to 300mm of rain was possible, based on information they had just received from Control. This was significantly higher than anything in public BOM forecasts. Regardless, the actual rainfall in Bungawalbin was 714mm, double what even the SES was expecting.

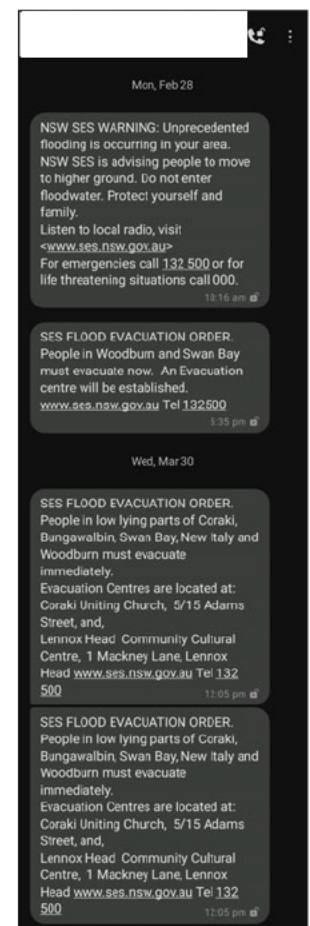
There must be an issue either in the BOM's public communication or in their forecasts.

BOM, Manly Hydraulics, Richmond Valley Council and Rous County Council were all asked to install additional rain and river gauges, for the Bungawalbin catchment, on numerous occasions. They were advised to do so in the 2010 Flood Study conducted by BMT Global. If recommendations were followed, these too would have provided much needed warning.

For whatever reason, evacuation orders were given well after major flood height was reached, when it was too late to leave. There was little to no indication beforehand of the severity of the flooding. BOM flood warnings said that major flooding was possible, but almost everyone builds above the record heights of 1954 so even major flooding has no effect on most houses. If there was any warning that records could be broken by more than 2 metres (50% above normal), there would have been a drastically different response by residents which could have saved lives and possessions that were needlessly lost. All of the flood water from Lismore and above ends up in the lower regions of Coraki, Bungawalbin, Woodburn and Broadwater. We could have been warned this water was coming. This seems to either be a failure by Bureau of Meteorology and Richmond River flood models, or more likely a failure of communicating the severity of the event/disaster.

Timeline of public warnings

- Sunday 27th February
 - Midday - River Reached moderate level and road was inundated
 - Midnight - River reached Major flood Level
- Monday 28th February
 - 10:16am Received a “get to higher ground” warning text from SES. The road was already well under metres of water.
 - 5:35pm Evacuation notice issued for Swan Bay and Woodburn. No mention of Bungawalbin. Bungawalbin had already exceeded the maximum ever recorded.
- Wednesday 30th March
 - 12:05pm Bungawabyn received evacuation notice. 3 full days after evacuation was impossible.



If we were given the correct information, as soon as it was available, lives would have been saved, people could have got their livestock and vehicles to higher ground, and personal property could have been saved. Without a doubt, this is one of the biggest complaints by people in rural areas.

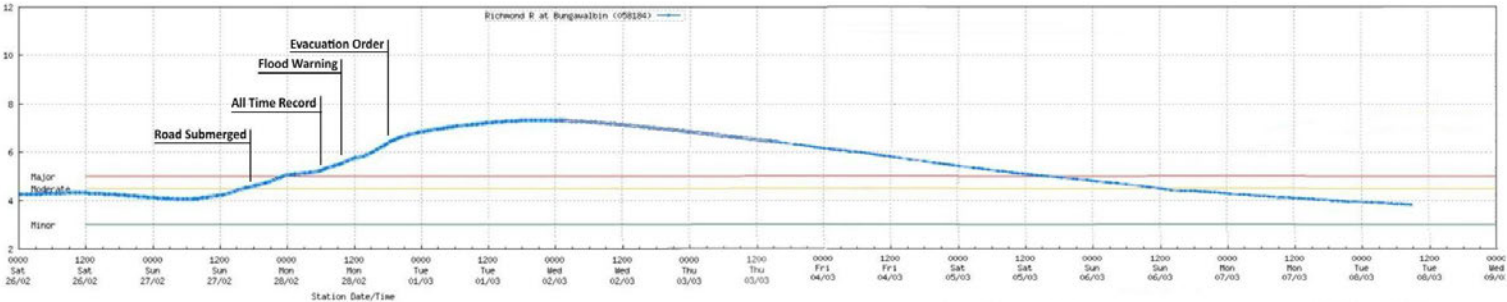


Figure 7: Bungawalbin River flood height compared with timeline of SES warnings

The graph above clearly illustrates that SES warnings were **criminally insufficient**.

1.3 Response to floods

1.3 A: SES

There was a distinct lack of communication and organisation in the SES response.

Evacuation orders for Woodburn were rescinded during the peak of the April 1st flood, with no consultation of SES members on the ground. This is utterly unacceptable. There is no situation where evacuated residents can come back to their house when the flood water hasn't even dropped, and to rescind an evacuation without consulting anyone in the affected area is criminally negligent.

Local knowledge is essential to SES response. Local controllers must have the ability to consider holistic information, not rely purely on the BOM, which is often wrong.

Considering the frequency of natural disasters in Australia, there is a severe lack of training and equipment with services like the RFS and SES. For example, the SES are forced to use boats unsuited for rescues in floodwater. The boats they use are more akin to construction barges, with flat wide hulls that can overturn easily in fast flowing floodwater. They also lack the training needed to recognise this discrepancy. The SES needs flood boats that are safe to drive in rivers that can quite easily become white water rapids in flood conditions.

We witnessed first hand that volunteers were unconsciously incompetent. They attended our property 5 days after the flood peak to check on us and other Residents in our region. We advised them that, in our experience, the barge style boat they were in was not suitable for use further upstream where there are many obstacles and very fast flowing water. They informed us it was a 'flood boat' and they were trained. We tried to explain why it wasn't suitable, but they headed off anyway. Later they returned, with the boat

damaged. They tried for 4 days to get further upstream and ended up having to take a helicopter. They truly believed they knew what they were doing, because they had been trained. They had been trained with the wrong information.

1.3 B: ARMY

For whatever reason, the Army arrived too late, and left too early, well before even the initial cleanup was finished. In addition, the first few groups of soldiers that came did not provide any significant help to locals, due to lack of skills, preparedness and organisation. This is evidenced by the many social media posts complaining that soldiers were only there for photo opportunities.

The defence personnel that were sent to help seemed to be under trained, most likely new soldiers without experience. This was a major issue, because one of the biggest needs in the immediate cleanup were skilled workers like engineers, mechanics and electricians. These were vital to get services like running water, gas, electricity, farm machinery and transportation working again. It would also have been very helpful if they could have brought tools with them for residents to use.

1.3 C: Resilience NSW

The SES were unable to help with the damage to the Bungawalbin levee as they did not have the infrastructure or resources and advised us that the army had also left the area. I contacted Resilience NSW. The operator told me to 'get my husband to help put a tarp on the levee erosion'. Despite me explaining, they were unable to understand why that suggestion was nonsensical. It was an absolute waste of time and money and has increased the stress levels of

everyone having to deal with them. Placing untrained and incompetent personnel as the main point of access in an emergency is ridiculous.

I went into the Coraki hub and requested they check on everyone in Bungawalbin, going driveway to driveway, as many people were still stranded out here without vehicles or communication, weeks after the event. That had still not happened 2 months after the flood.

1.3 D: Community

Too much red tape, volunteers were told by the government to stand down once the army had arrived, despite the fact that many rural residents were still in desperate need of assistance. Volunteers were forced to ignore government organisers and continued to provide vital assistance to those in need.

Fire Rescue attended our property and asked how to help. One of them had electrical training which alone would have been more helpful than 20 untrained volunteers, however he wasn't permitted by his superiors to assist us in that capacity and instead wasted his time standing around.

Now, 3 months on, there is no hands-on help from Government or community volunteers.

1.3 E: Communication

Communication was a big problem.

In rural areas, most residents have a UHF (CB) Radio. This allows for emergency communications when phone service is unavailable in disasters. Once the power and phones went out, we utilised our UHF radios, and were able to keep in contact with our neighbours. We took our spares, via boat, to neighbours that didn't have one. We put a large sign on the roof of our

building saying “UHF 10”. This enabled helicopters doing welfare checks to radio and check on us.

The Australian Army and SES uses encrypted radio which cannot interact with civilian models. This is completely understandable except in a case where the army has to coordinate with civilians, either in a natural disaster like this or in a war fought on Australian soil. The Army **must** keep a stockpile of UHF unencrypted radios for communication with civilians in emergencies.

Furthermore, everyone in rural areas should have UHF radios, and for new homes being built, it should be a requirement.

In the modern day, internet connection is now also vital, and one of the only ways to check data like weather reports and emergency warnings. Setting up satellite internet stations in communities, that can be turned on in an emergency, is essential. We were forced to climb the roof and use family and friends as intermediaries to get any kind of information, as we were only able to get short text messages in and out for weeks.

1.4 Transition from incident response to recovery

Residents in Bungawalbin were still isolated 6 weeks after the first flood. We were still in the middle of an emergency situation when the Army left.

Different areas came out of the emergency at different times, and this should have been reflected in the response.

1.5 Recovery from floods

1.5 A: Financial Aid

The \$1000 Disaster Assistance payment was relatively easy to apply and receive. Conversely, the wages assistance provided to those who could not work due to the flood was very difficult. We were required to provide paperwork that had been destroyed in the floods, including such things as property valuations. Even now, many people are still without phone, printers, internet, power, computer access and transport.

We were told we had to go to Service NSW to apply for assistance. My husband and I got our flooded car going after 3 days of mechanical work, travelled the 40km to Service NSW, where the car broke down in the middle of the street. It was incredibly dangerous, but the only option we had. When I asked if we could include our adult son I was advised he had to be there in person. We only had 2 seats in the car, which we shouldn't have been driving anyway. I offered to video call him, so they could check that he is a real person, but there was no leeway.

There has been no common sense from the Government.

We applied for the \$50k small business grant to purchase a new vehicle. Sent in a receipt and they said they would only grant \$39k, as that is what they considered the vehicle we were replacing was worth. They did not take into consideration that there were 80,000 insured vehicles lost in this event, as well as thousands of uninsured plus all the new cars in yards. They did not take into consideration it was the only vehicle available to purchase in the short term.

1.5 B: Army Engineering Corp

It was a 'slap in the face' to the Northern Rivers when the Australian Army held Humanitarian Response Training with Indonesia and the US in Darwin,

during May. The aim of the program was to “give the soldiers some real training value”.

They should have been in the Northern Rivers – on the job training – helping thousands of people.

The Department of Defence has the capability and logistics to significantly help. Please send the engineering Corps out. House by House. They have carpenters, electricians and builders. Everything we need. They are trained to set up towns. They can get people back in their homes quickly and without fuss. This is a real, practical, timely solution.

1.5 C: Rural v. Town

Rural areas are in a very different situation to towns. We have to stay on our properties, if possible, to tend to farms, livestock and animals.

Many buildings cannot be seen from the road or river.

Many residents have still been unable to get into a town to access assistance.

Consideration was not given to the needs of rural areas not on ‘mains’ power, or providing transport options for them to get in to an assistance point.

The large centres like Lismore, and smaller towns like Coraki, had a lot of media exposure, and Government assistance. The rural areas have been completely forgotten about. I had to go to a council meeting to plead with Council not to forget about us in the rural areas, 6 weeks after the first flood. In response, they realised they should have a Rural Advisory board for the recovery, in addition to the town ones. This has now been implemented in our area.

1.5 D: No stock or tradesmen

There is no stock. Our shopping and industrial precinct, Lismore, has been destroyed. There is some indication that woolworths may be opening in August. No idea when Bunnings will be open. We have to go further to Ballina, which is now overwhelmed because they have to supply for the greater Lismore region too.

Many tradies, couriers etc, all lost their homes and tools too.

1.5 E: Environment

Bungawalbin's wetlands and river systems are essential to Australia's ecosystem. I have written to Council, Local Land Services, State Ministers and Federal Ministers, asking them to restore the wetlands as a matter of priority.

River Health is catastrophic. I have requested this be tended to. There is no reason it cannot happen concurrently with the township restorations, as it requires different skillsets and trades.

I have been told that it is **not** being considered.

1.6 Any other matters

We are now receiving electricity bills based on an average, during the flood, not taking into consideration the days without power.

And on top of this 12 week relentless nightmare, I am still working with/encouraging council to rebuild the levee which is now in a total state of destruction. When following up, I was told it would take 3 years to fix this critical piece of flood mitigation infrastructure.

Many insured people may have access to insurance even though there is no flood cover, because of where the rain came from. However Hydrology reports are very expensive and hard to organise. Further, local knowledge is not being considered. For example one insurer employed hydrologist asked a Woodburn resident which way the river flows. The river is tidal. Hydrology reports can differ between neighbours, depending on the insurance company they use. The Government needs to assist residents with this.

A recent study found *“The adverse effects of stressors during the recovery process (secondary stressors) can sometimes be just as severe as the initial trauma...The secondary stressor of [grants/loans]/insurance dispute had stronger associations with ongoing distress and depression than the initial flood exposure”*

“After disasters such as flooding, restoration of the built environment, finances and social cohesion can take considerable time and effort. During this time, flood-affected people are especially vulnerable to “secondary stressors”

(McKenzie, J.W.; Longman, J.M.; Bailie, R.; Braddon, M.; Morgan, G.G.; Jegasothy, E.; Bennett-Levy, J. Insurance Issues as Secondary Stressors Following Flooding in Rural Australia—A Mixed Methods Study.)

Summary

1. Pacific Highway upgrade created a dam - *this needs to be fixed IMMEDIATELY.*
2. SES/BOM Warnings were wrong and insufficient.
3. Volunteers were pushed away.
4. Abolish Resilience NSW or employ trained, competent, personnel.
5. 3 months on, recovery is slow. Army engineering corps needs to come in. No sign of housing solutions for rural areas.
6. Bungawalbin Levee still needs emergency repairs.
7. SES and ARMY were not sufficiently trained & equipped.
8. Financial assistance needed.
9. Government needs to step in with insurance companies.
10. Restoration of the environment has to be a concurrent priority.