

**From:** [NSW Government](#)  
**To:** [Flood Inquiry](#)  
**Subject:** Floods Inquiry  
**Date:** Sunday, 8 May 2022 3:19:10 PM  
**Attachments:** [000000 Wilson Richmond Flood Proposal 22-05-08 C.pdf](#)

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## Your details

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<b>Title</b>	Mr
<b>First name</b>	John
<b>Last name</b>	IBBOTSON
<b>Email</b>	
<b>Postcode</b>	2460

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## Submission details

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<b>I am making this submission as</b>	A member of the general public
<b>Submission type</b>	I am making a personal submission
<b>Organisation making the submission (if applicable)</b>	ALT
<b>Your position in the organisation (if applicable)</b>	ALT
<b>Consent to make submission public</b>	I give my consent for this submission to be made public

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## Share your experience or tell your story

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**Your story**

In early April I sent you a preliminary version of how I consider the flood situation in the Richmond catchment could be improved. It has had considerable changes (improvements!) since then. They are in the attached pdf. Are you also looking at the flood situation in the Clarence catchment? I have been hitting my head on the (green) wall for ten years. I have an "extensive" document on the Clarence too. Please advise if you want me to forwards it to you. Thank you. John Ibbotson

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**Terms of Reference (optional)**

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

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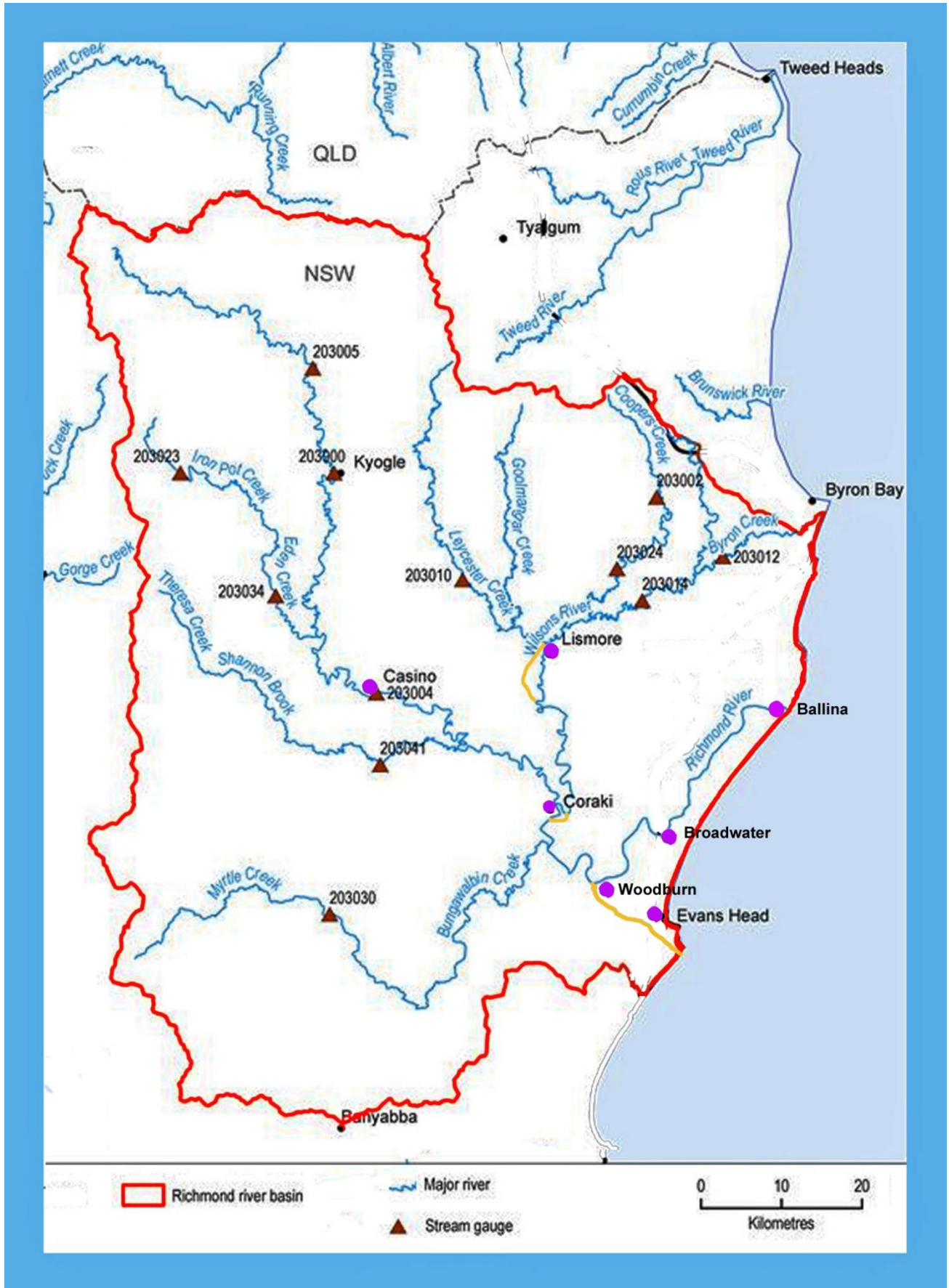
**Supporting documents or images**

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**Attach files**

- [000000 Wilson Richmond Flood Proposal 22-05-08 C.pdf](#)
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Minimising the Impact of Floods in the Richmond River Catchment Communities



# Lismore's Land Use Management Strategy (LLUMS)

## CHANGING COURSE

### 1: Introduction:

Part of this document is a proposal that I have distributed over the last few weeks (Early April). Its approach is quite different from the goals set out in the new LLUMS document.

The following are corrections, and additional points using current information.

The council has released a discussion paper (LLUMS), that presents some broad brushstrokes for how Lismore could build back better. The aim of the review is to agree on a strategic direction for growth and rebuilding in Lismore and to ensure that in the long-term, there is a suitable supply of land available for new and existing businesses and a suitable supply of flood-free residential land.

It has established an excellent procedure for allowing interested parties to comment on their proposals, with an option to make other suggestions. The main strategic objectives identified for consideration were:

- One North and South Lismore land swap
- Two Protection of the CBD (Raising Levee)
- Three Expansion of Goonellabah Industrial Precinct
- Four Commercial and/or mixed-use development at the golf course in East Lismore
- Five New medium density areas
- Six Affordable housing
- Seven Review of infrastructure delivery program
- Eight Other Suggestions from interested parties

A little detail on the above:

- A planned retreat of the most-high flood risk areas of North and South Lismore. Council will advocate for a State and Federal Government funded land swap arrangement to allow residents to move to higher ground but remain close to existing social networks and jobs.
- Protection of the CBD and land on the eastern side of the Wilsons River through flood mitigation measures.
- Investigations into expanding the industrial precinct at Goonellabah.
- Preliminary design and feasibility work to establish whether a new commercial or mixed-use precinct could be located on the golf course land at East Lismore.
- New medium density zoning and increased height controls for strategically located flood-free sites.
- Ensuring affordable housing is included as part of Lismore's growth by introducing an Affordable Housing Contributions Scheme (AHCS) for all land identified for future residential rezoning or a change in LEP controls to allow for greater density. An AHCS is a mechanism in the Environmental Planning and Assessment Act that allows Council to collect developer contributions for the purpose of providing new affordable housing.
- Review of the Infrastructure Delivery program to identify how we can fast-track infrastructure to new land releases outside of flood affected areas.

Feedback is encouraged until Friday, June 10, 2022. This can be done online, making a written submission by emailing [https://mailto:council@lismore.nsw.gov.au](mailto:council@lismore.nsw.gov.au) or writing to [PO Box 23A, Lismore NSW 2480](#) with a subject titled 'Land Use Management Strategy Review'

The council will host two public forums where the community can learn more about the review. They will be held on May 23 and May 25. Bookings to attend can be made by emailing [https://mailto:navanka.fletcher@lismore.nsw.gov.au](mailto:navanka.fletcher@lismore.nsw.gov.au) , or online using

<https://calendly.com/lismorece/review-of-lismore-s-land-use-management-strategy-public-forum>.

**Aside:** What Lismore is planning is being compared to what happened in Grantham in Qld, which used a similar approach in 2011. But with Lismore, which is 150 times larger to Grantham makes it like comparing pumpkins to pomegranates. Not only that but Grantham was a dismal failure. In the 2006 census it had a population of 370. In the 2011 census after the flood, it was 176. Nor did it bounce back as in 2016 its

## Minimizing Floods in the Richmond River's Catchment

population was 184. Now it doesn't even seem to have a figure in the 2021 census. Hardly a result to identify with. Also, Grantham might not have had any alternative options, whereas the "Richmond" communities do.

### Strategic Options:

After reviewing the LLUMS document I felt that items one to seven were appropriate for an expanding Lismore, but they didn't adequately address solving the current flooding problem. They would be disruptive, expensive, time consuming and create all kinds of angst within the community.

None even looked at reducing the volume of water, which would inundate the township. This only left option eight to suggest something, which would doable in a short period of time, without disrupting the status quo.

So is there another solution? There is.

***It starts with saying that the solution, should be something which benefits all the flood prone communities in the Richmond Catchment, not just one of them.***

In Lismore, except for raising the downtown levee, mitigation is not mentioned. In fact, there is an implication that "The floods have won, we'll move out of their way".

But is this the end game? It isn't. Based on the definition of Flood Mitigation, it is more than building levees: "The objective of flood mitigation is to

A: *Build levees for events up to their designed capacity;*

B: *Exclude floodwaters from areas under threat;*

C: *Reduce flood levels, velocities or flows;*

They are a common and proven means of reducing damage to properties under the threat from flooding."

### The Richmond Catchment:

Based on the geography of the catchment the major way to reduce/stop the flooding is kind of a combination of "B" and "C". It can be achieved with three diversion canals.

I: It would divert the Leycester Creek, about 2.5km upstream from its junction with the Wilson River into a canal which would result its water re-entering the Wilson 8-10km further downstream.

II: It would divert the Wilson River, about 3.0 km upstream from its junction with the Richmond River into a canal which would result its water re-entering the Richmond 3-5km downstream from Coraki.

III: It would allow for **some of the water** from the Richmond River, just upstream from Woodburn, into a canal (or a combination of the Evans River and a canal), which would result in the water flowing into the sea south of the Goanna Headland, which is 5km south of Evans Head.

### Would this work?

For **Lismore**: Taking the worst-case scenario where both Leycester Creek and the Wilson River were both flooding, diverting the Leycester, would reduce the volume of water ending up in the down town Lismore by a guesstimated 40% +/- . It would also reduce the turbulence that occurs when the two streams meet.

For **Coraki**: Taking the worst-case scenario where the Richmond and Wilson Rivers were both flooding, diverting the Wilson, would reduce the volume of water ending up in Coraki by a guesstimated 50% +/- . It too would also reduce the turbulence that occurs when the two streams meet.

For **Woodburn, Broadwater** and maybe **Ballina**: The volume of water diverted from the Richmond to the sea would be variable. It would be whatever is determined appropriate or necessary.

Although the above are I believe reasonable estimates, the first step would be to have the Northern Rivers Reconstruction Corporation (NRRC), contract a Water engineering/surveying organisation, based on their expertise and tools to review the proposal, to provide accurate information and recommendations. This would then be used to make decisions, that are more reliable.

This is outlined in the following document.



## Minimizing Floods in the Richmond River's Catchment

From: John Ibbotson

NSW 2460

08-05-2022

### 1. Background:

Not long ago I started looking at the Lismore, and to some extent the Coraki flood disaster, and what was an achievable way to minimise future floods in these communities.

I wrote a (draft) report suggesting an alternative way of achieving this and sent it to Janelle Saffin to see if she felt it was appropriate to continue. She responded positively and suggested I send it to

**The NSW Independent Flood Inquiry**, (I've done this –and they they will be sent this update.

(Submissions can be made by **email**: [inquiry@floodinginquiry.nsw.gov.au](mailto:inquiry@floodinginquiry.nsw.gov.au)

**By Post**: NSW Independent Flood Inquiry, GPO Box 5341, Sydney NSW 2001

**Or in person**: at Service NSW Service Centre (The Lismore Centre is currently located at Southern Cross University Block V) or at public consultation sessions which will be advertised in advance.)

Since then, The NSW government has established a new corporate body to lead the long-term reconstruction of flood impacted areas in the Northern Rivers.

**The Northern Rivers Reconstruction Corporation (NRRC)**, which came into effect from 01-05-22.

The corporation under CEO David Witherdin, will be active for up to five years to ensure flood impacted areas are built to be more resilient for future generations. The NRRC operates as a 'front door to government' for all reconstruction and development activities in the Northern Rivers LGAs: Ballina, Byron, Clarence Valley, Lismore, Richmond Valley, Tweed, and Kyogle. It will set and implement reconstruction priorities in the region, and to work with government agencies and departments to deliver those priorities quickly.

In their preamble they mention 23 activities, they will be involved with. Interestingly, they apply to fixing up what has previously happened, *but nothing on preventing similar damage occurring many times into the future.*

As they only came into existence on 1/5/22, they don't have a specific address yet.

And there is a Lismore Council Plan:

***Lismore Floodplain Risk Management 2014 Plan along with its 2017 Revisions.***

#### **The Approach of the above three groups:**

In reviewing the general approach of the above three groups based on their comments to date, appears that their objectives are to:

Show the residents of these areas that they are doing something,

Repair the damage caused by the latest floods,

Move essential services to high ground,

Move some sections of the community, such as the industrial area to a different location,

Co-opt existing facilities such as the golf course to be used for something entirely different,

Help residents in flood prone areas, who want to relocate to move to flood proof areas. These would be developed within Lismore, but include available allotments in adjoining communities.

## 2: Fix instead of Patch:

The following is an alternative view on a way to *minimize the impact of floods* along the Wilson-Richmond River systems. In all the searching I've done this option never seems to have been considered. Amazing.

There are two main items that need to be addressed:

**A: "Communities in the Wilson-Richmond catchments always need to be prepared for a major flood, because any flood, anytime could be major."**

**B: "That with many floods the volume of water entering riverside communities, no matter what is done to keep them at bay, exceeds the ability of current or proposed mitigation procedures to handle it."**

Unlike Adaminaby or Tallangatta, moving or modifying these communities is not an appropriate option. The options being considered are based on moving the water or facilities around within the flooded area. These options seem to be more like the rearranging the deck chairs on the Titanic or putting residents into lifeboats and sending them elsewhere.

These options do not bode well for the tranquillity and long-term benefits of the communities.

So, is there a feasible, practical and affordable option? There is.

**If the town can't be moved or floodproofed then if contour possible, move the river, or divert some of its water.**

### C: A Diversion Summary:

#### I: Lismore:

The Wilson River and Leycester Creek come together in the middle of downtown Lismore. If both are carrying floodable volumes of water flooding is inevitable.

The solution to minimise flooding, is to divert Leycester Creek about 2.5km upstream from its end into an 8km canal which enters the Wilson River at South Gundurimba.

#### II: Coraki:

The Wilson River makes a dogleg, which means it terminates into the Richmond River in the middle of downtown Coraki. A 3km diversion could redirect the Wilson into the Richmond downstream from Coraki.

The diversion if applicable, may need to be longer to minimise back flow into Coraki.

#### III: Woodburn - Evans Head, Broadwater, Ballina:

What needs to be done here is the most interesting of the three diversions both geographically, construction-wise, environmentally and politically.

Firstly, it should be kept in mind that the Richmond River at Woodburn and the whole of the Evans "River" are estuarine, so tides are a flooding factor, just as they are at Lismore and Coraki, but inevitably more so.

The aim of a partial diversion of the Richmond River at Woodburn is to reduce the volume of flooding water heading downstream through Woodburn, Broadwater and Ballina.

This can be achieved by diverting water from Woodburn to the sea.

The options to achieve this would be to:

Put an adjustable weir at the end of Rocky Mountain Creek where it enters the Richmond.

Widen the Creek and if necessary, the Tuckombil Canal.

If necessary, widen/straighten the Evens "River" down to the "island" at the outskirts of. Evans Head.

## Minimizing Floods in the Richmond River's Catchment

Put another adjustable weir at this point, which allows water to be sent down a diversion canal, which enters the sea, south of Goanna Headland. (South of the headland is preferable, but would need National Parks approval.)

If it was decided not to use the river, a canal would be needed from Tuckombil Canal to Goanna Headland.

Either way it would need to be a large canal, as by the time the Richmond reaches the coast, there would need to be a significant volume of water (including any from the Bungawalbin Creek), to keep the Richmond River, below, or at a significant lower flood level.

Probably either solution would work, but gaining a community consensus could be difficult.

And to reiterate: *Whether people want to acknowledge it or not The Evens River is 99% estuary. Ditto for whatever canal was built, which could be considered a maritime bonus.*

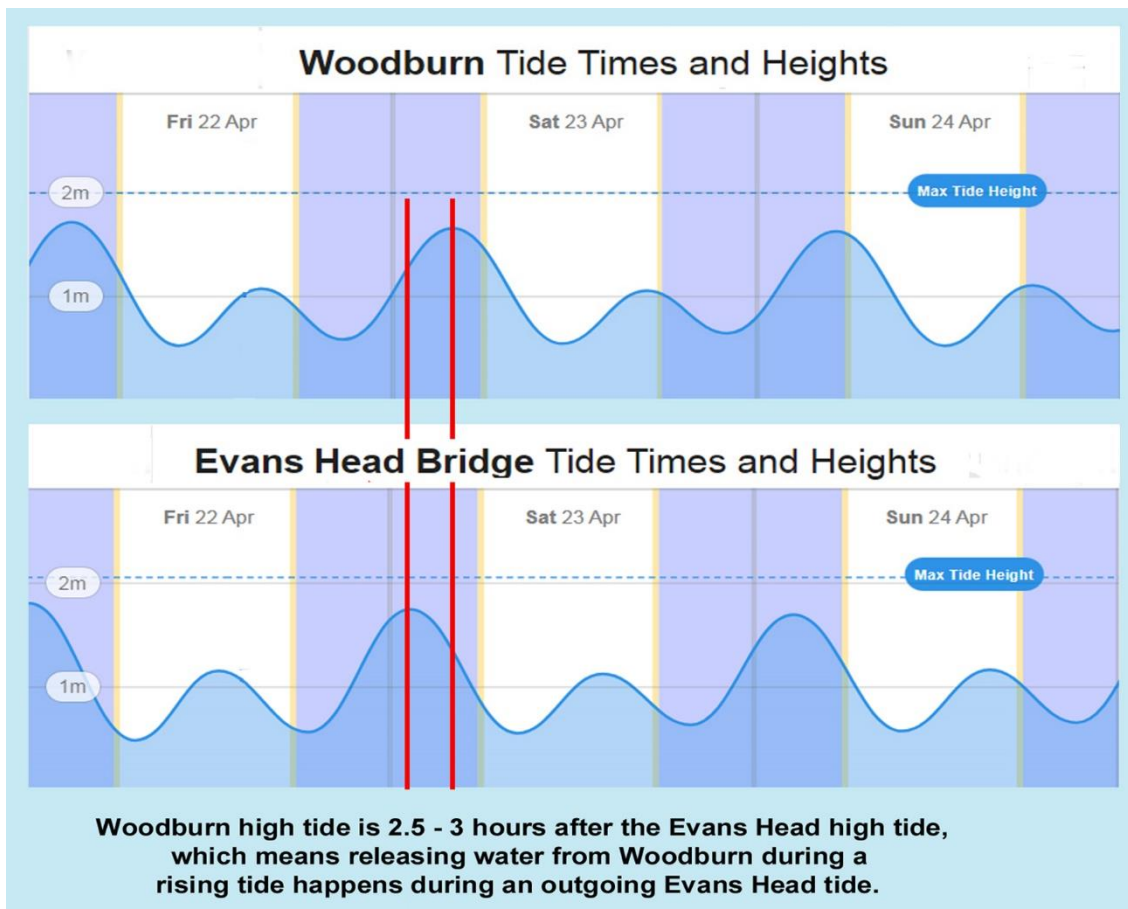
### IV: Where to from Here?

As this solution doesn't seem to have been previously addressed an evaluation of it needs to start at square one. The current groups being assembled also need to review, from this point of view, the future of the Richmond River. There needs to be:

A water/hydraulics group appointed to do a detailed concept evaluation of what would be needed to achieve a meaningful result.

Survey the *local communities* to establish if they would be in favour of this, if it was way to *reduce the impact* of the floods, with less changes to their current communities.

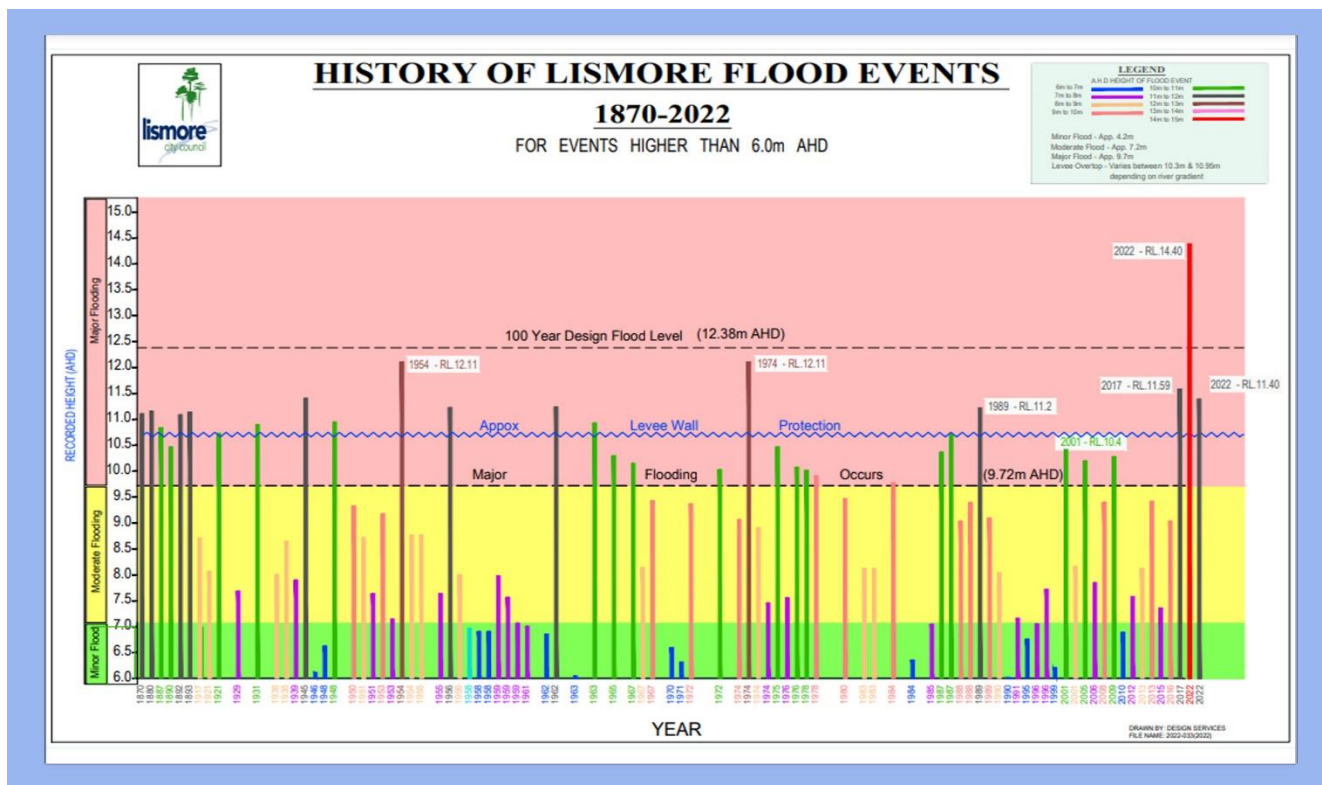
Issue a report by the end of September, 2022.



An interesting timing plus for the Woodburn diversion:



### 3: Minimising the Impact of Floods in Lismore and Coraki



#### I: A short history of Lismore and its Floods:

“Lismore was first settled by red cedar cutters and farmers looking for high quality fertile land. All transport was by boat, using the river system as a major trade route to the sea.

Ships could not travel upstream much further than the junction of Leycester Creek and the Wilsons River. This junction was also suitable for the ships to turn around.

Lismore grew rapidly around the river trade, timber and agricultural industries, becoming one of the major North Coast towns. In the 1890s the railway linked the river and rail systems, further confirming Lismore’s status as a regional centre. The importance of the river diminished as road transport improved after WWII. By this time Lismore was a major city, established adjacent to the Wilsons River.

While the location of Lismore is ideal as a service and trading centre for produce and freight, *floods come very quickly and consequently have a major impact.*

During heavy rain, rainfall from the high surrounding hills comes down the steep creeks and rivers meeting at Lismore, then slowing down and spreading across the floodplain before moving out to sea.

In 1954 and 1974 Lismore experienced very severe flooding, creating major problems for the community.

Following the 1974 flood, the government of the day commissioned a number of studies to consider ways to overcome Lismore’s flood problems.

The then government assisted with the purchase of land at Goonellabah to create a new commercial area and new planning schemes to limit growth in floodplain zones. A voluntary purchase scheme aimed at assisting people to move out of the seriously affected flood zones was also introduced. The study concluded by stating that it would be very difficult to construct a levee system for Lismore.

Following the 1989 flood the concept of a levee to protect the CBD was again investigated. After examining the hydraulic effects of more than 20 possible levee schemes, it became clear that it was both practical and financially feasible to construct a limited levee system around South and Central Lismore.”

*In 1999 a government-funded scheme to protect the CBD and South Lismore from a 1-in-10-year flood event was approved. This proposal would mean that most of the smaller floods would not enter the central area of Lismore and substantially improve the time available for the evacuation of residents and the business community during larger floods.*

## Minimizing Floods in the Richmond River's Catchment

In 2005 levees were constructed, which would protect limited parts of the city, particularly the city centre, but not all the time. *Of the 30 major floods, 17 would have, or were above the new levee, including 3 in the last 5 years. In other words, even the city centre would be subject to some of the major floods.*

In 2014 the Lismore City Council produced a very comprehensive document "The Lismore Floodplain Risk Management Plan 2014" on how to respond to a flood when it occurs. *It was based on the assumption that floods were going to continue and how to handle them.*

In March 2017, the Lismore flood levee was overtopped for the first time, causing one of the most damaging floods in living memory in terms of material and community destruction. *(There have since been 2 more floods as bad or worse, in 21 and 22.)*

Following the flood, Lismore City Council launched its Flood Ready project, to develop a comprehensive, community-wide action plan for natural disasters. Working with emergency services, local agencies and community groups, the *Lismore Flood Ready* plan provides a clear framework on how to be prepared and resilient before, during and after a natural disaster."

Why a 2014 Plan followed by a 2017 one? The later, although based on the 2014 report, brought the process into the real time internet world.

## II: The Geographical Aspects:

### Terrain:

A caldera is a large bowl like depression formed when a volcano erupts and collapses. They usually have rivulets, which flow into creeks, which in turn flow into an exit river.

Lismore is located at the exit of a 40km+/- diameter caldera. And being estuarine it was port for ocean going vessels. The ultimate place to build a city!

### Flooding:

Lismore's catchment includes the catchment of the Wilsons River upstream of Lismore (550sq kms), and the water from the tidal pool, including Leycester Creek (850sq kms), giving a total of 1,400sqkms. This is small part of the Richmond's 7,000sqkm and tiny compared to the Clarence's 22,000sq kms. As a result. rain can fall over the whole catchment at the same time, and it all rushes down to Lismore in a short time. And during a deluge that is a lot of water.

A minor flood is 4.2m, a moderate is 7.2m and a major is 9.7m and above. But unlike the Clarence, where flood levels at Grafton can be predicted days ahead, in Lismore it can go from minor to major "overnight".

People keep talking about a major flood being a 1/100 or even 1/1,000-year event. Unfortunately, saying this is quite misleading as it creates the impression that the next BIG one won't occur for many years. In reality a major flood can occur on successive years or even multiple times in one year.

Repeating: There are two main items that need to be addressed:

#### **1: "Lismore needs to prepare for a major flood, because any flood, anytime could be major."**

On the lighter side: If you want to bet on when the next major flood will be: "Roll a ten-sided (pentagonal trapezohedron) dice with the sides numbered 0 to 9, four times. Add up the four numbers and divide them by 4 rounded." Your answer will be 0 to 9 and it will have a realistic chance of being correct.

#### **2: "That with many floods the volume of water entering Lismore, no matter what is done, exceeds the ability of regular mitigation procedures to handle it."**

Unlike Adaminaby or Tallangatta, moving the town is not a realistic option.

So, is there a feasible, practical and affordable option?

There is.

**If the town can't be moved, then move the river (or in Lismore the creek).**

## Minimizing Floods in the Richmond River's Catchment

### III: Overcoming Lismore's Floods:

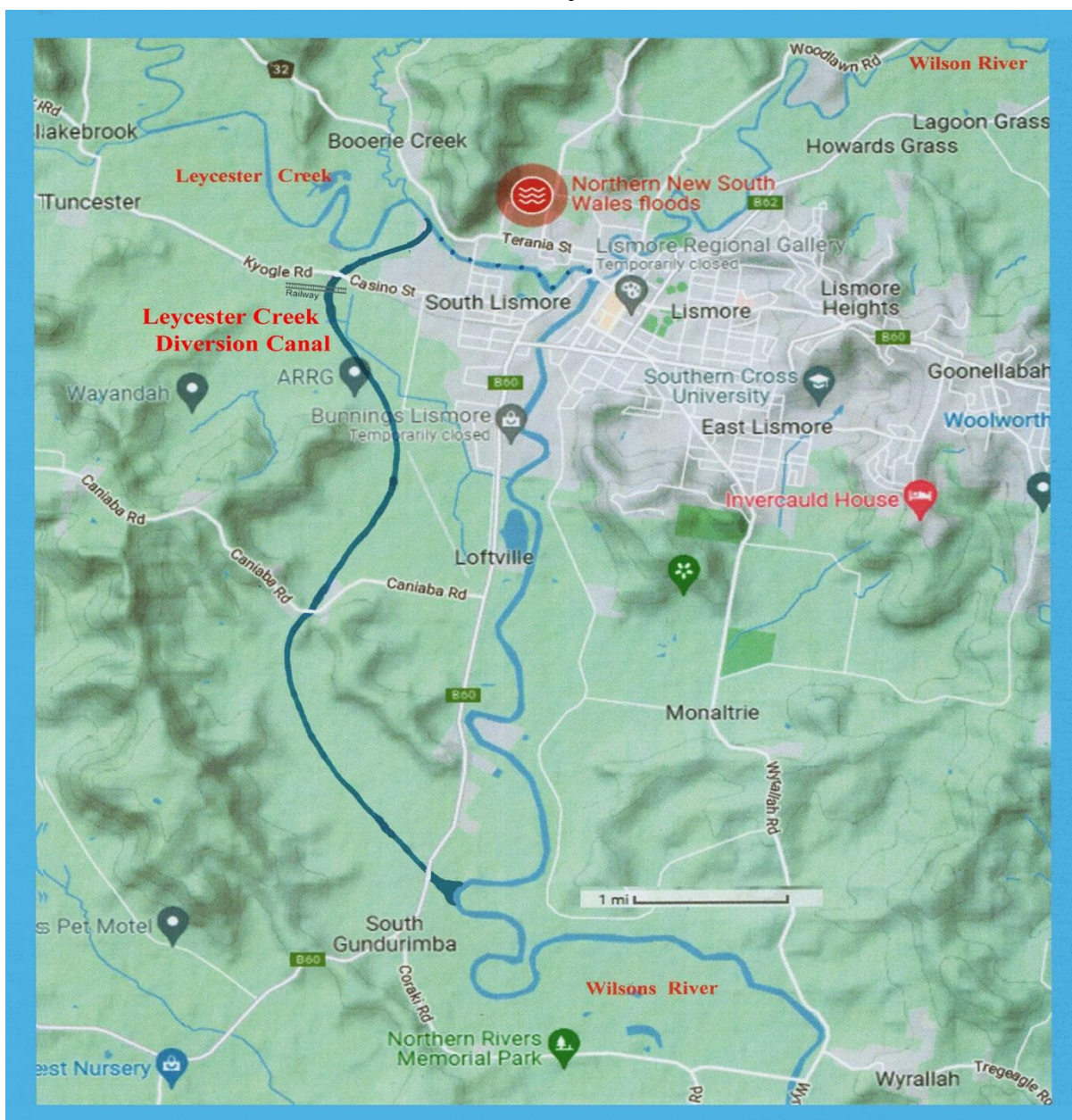
Based on the last 150 years (as shown in the earlier chart), there have been 30 major floods (1 every 5 years), as well as 36 moderate floods. If all floods are counted it is at least a flood every other year. And under the current flood mitigation plans, flooding will continue to occur on a regular, but random basis.

#### A: The Diversion:

The only viable way to flood proof Lismore is to remove some of the water from entering the city. This would involve diverting Leicester Creek from merging with the Wilson River in the middle of town.

About 2.5km upstream from its junction with the Wilson and after the junction with Booerie Creek make a new south bound 8km water course diverting Leicester Creek which:

- Goes under the Kyogle road,
- Goes under the Railway tracks
- Collects the water from Hollingworth/Yeurabar Creeks,
- Runs along the east side of the ARRG parallel to the runway,
- Goes under the Caniaba, Northcott, Johnson Roads and the Bruxner Highway,
- Flows into the Wilson River at South Gundurimba just north of Coraki Road.



The Leicester Creek Diversion Canal



## Minimizing Floods in the Richmond River's Catchment

### B: Some Other Considerations:

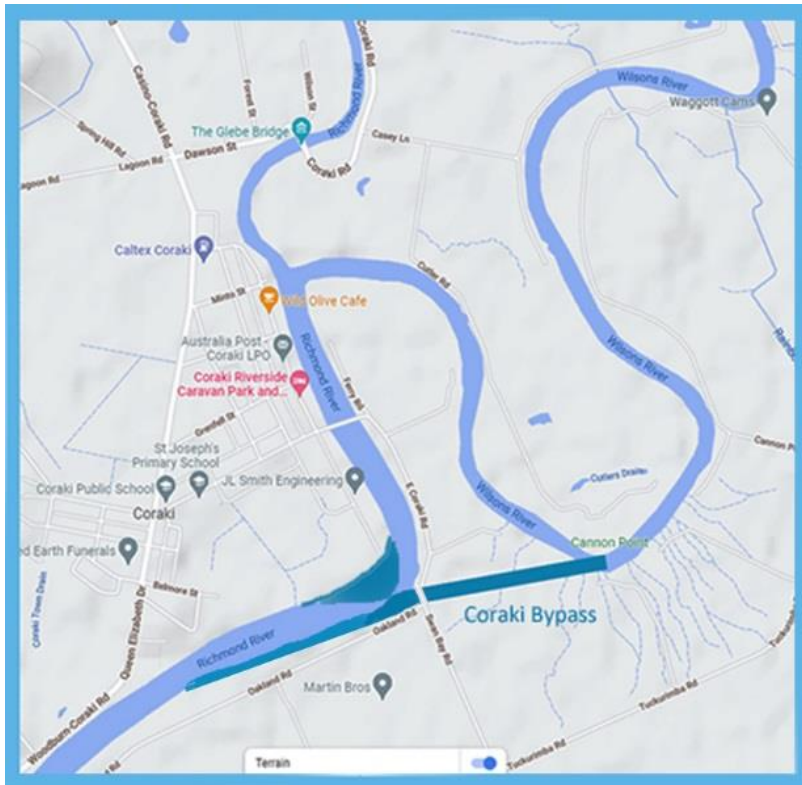
The 2.5km unused portion of the Leycester Creek could become a peoples' lake.

At the old junction provide the ability to divert Wilson River water into the lake.

It would also be possible to provide the capability at flood times, for water to be channelled from the Wilson River back along the now unused end of Leycester Creek, and into the diversion canal.

Where the diversion enters the Wilson River, fan it out so the water merges in at an acute angle (not 90°), to minimise the turbulence.

### IV: Coraki:



Currently the Wilson River enters the Richmond in the centre of Coraki.

It would be quite feasible to divert the Wilson River near Canon Point into a short diversion canal, which would result in the Wilson River entering the Richmond at to the junction of Oakland, Swan Bay and East Coraki Roads.

It would also be necessary to remove a number of choke points in the Richmond, possibly as far downstream as Bungawalbin Creek so as to reduce the backup in the Richmond

### V: Woodburn, Broadwater & Ballina:

“Evans Head is the only town within the Evans River catchment and much of the town is high enough not be directly affected by flood events on the Evans River.”

It also needs to be kept that way. “River” is a bit of a misnomer because the Evans River is “99%”

estuarine, so normally would only flood during unusually high tides. The only fresh water currently entering it is a bit of rain.

Adding large volumes of flood water entering Evans Head would not be acceptable. Hence flood waters would need to be diverted to the sea before reaching Evans Head.

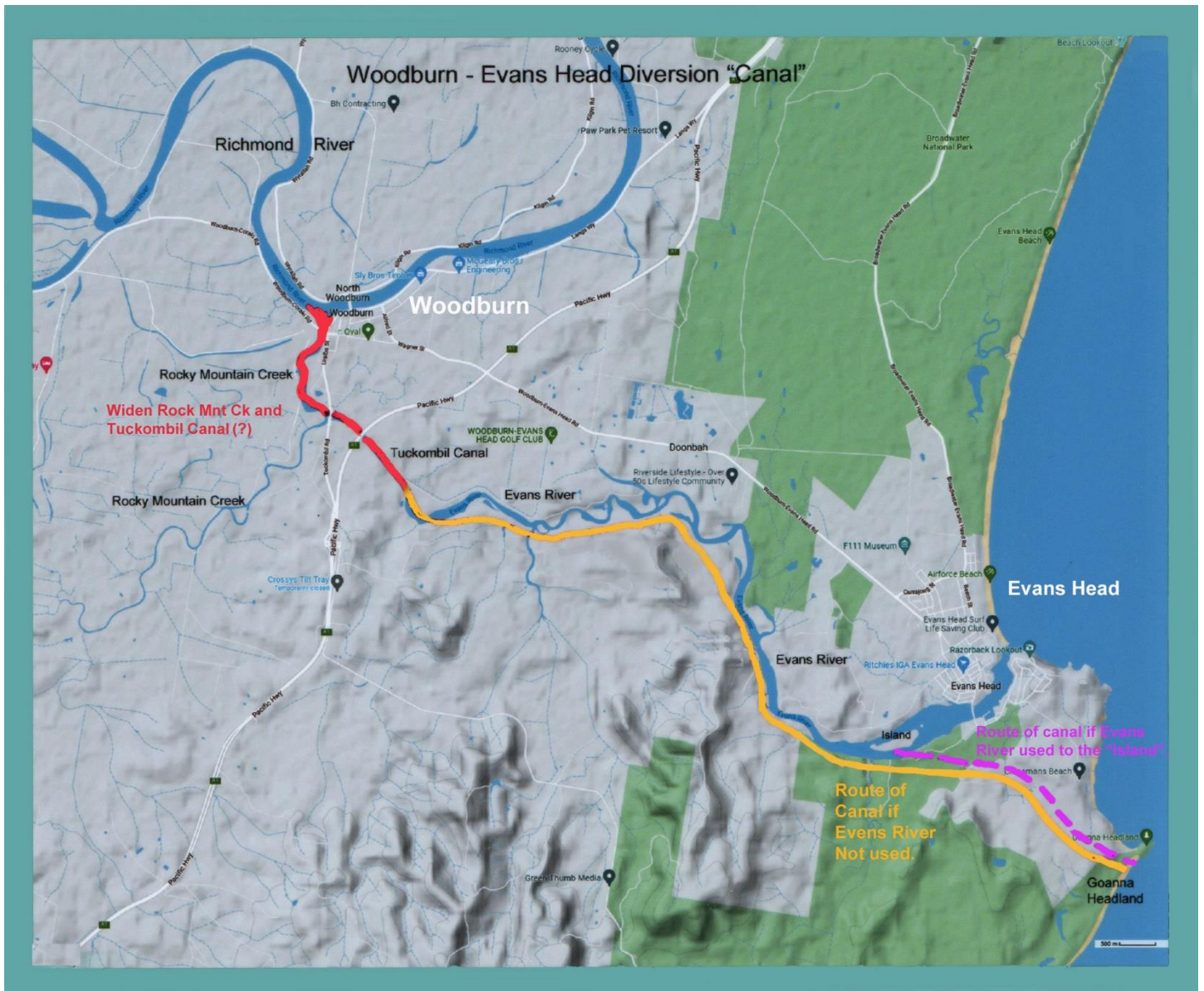
There are two options for diverting floods to the sea although both require an adjustable weir at the junction of the Richmond River and the widening of the Rocky Mountain Creek and possibly the Tuckombill Canal.

**One:** Starting at the end of the Tuckombil Canal use the existing river, although it would probably need to be widened. So that Evans Head was not inundated with flood water, there would be a barrier to divert the flood water into a diversion canal at the “island” (see map). This canal would go to the southern side of Goanna Headland.

**Two:** This would require the construction a separate canal, from the end of the Tuckombil Canal directly to Goanna Head.

Depending on the size of the Richmond-to-sea-diversion, would determine how much flooding could be prevented.

## Minimizing Floods in the Richmond River's Catchment



### 4: Conclusion:

Effectively the diversions at Lismore and Coraki would reduce most of the flooding in those communities. It may not eliminate all floods but their severity would be significantly minimised. Time would tell.

It is the same for Woodburn, Broadwater & Ballina. The level of flooding would be dependent on the size of the diversion to the sea at Woodburn.

It gets down to whether the governments are really serious about doing something to flood proof, or at least minimise the impact of flooding in this flood prone catchment.

The above could be the basis for a more detailed evaluation by water engineers or hydrologists of what could be achieved.

As for the cost it would be minimal compared to the cumulative cost of reoccurring floods, the resulting damage and most importantly the elimination of the human misery they cause.

**The first steps are to have experts evaluate the plan and to survey the *local communities* to establish if they would be in favour of this, as a way to *reduce the impact* of the floods.**



**5: Appendices: A selection of background Information:**

**Appendix I “Long Lost forgotten rain bombs –  
The BOM yells “unprecedented, while ignoring 120 years of history**

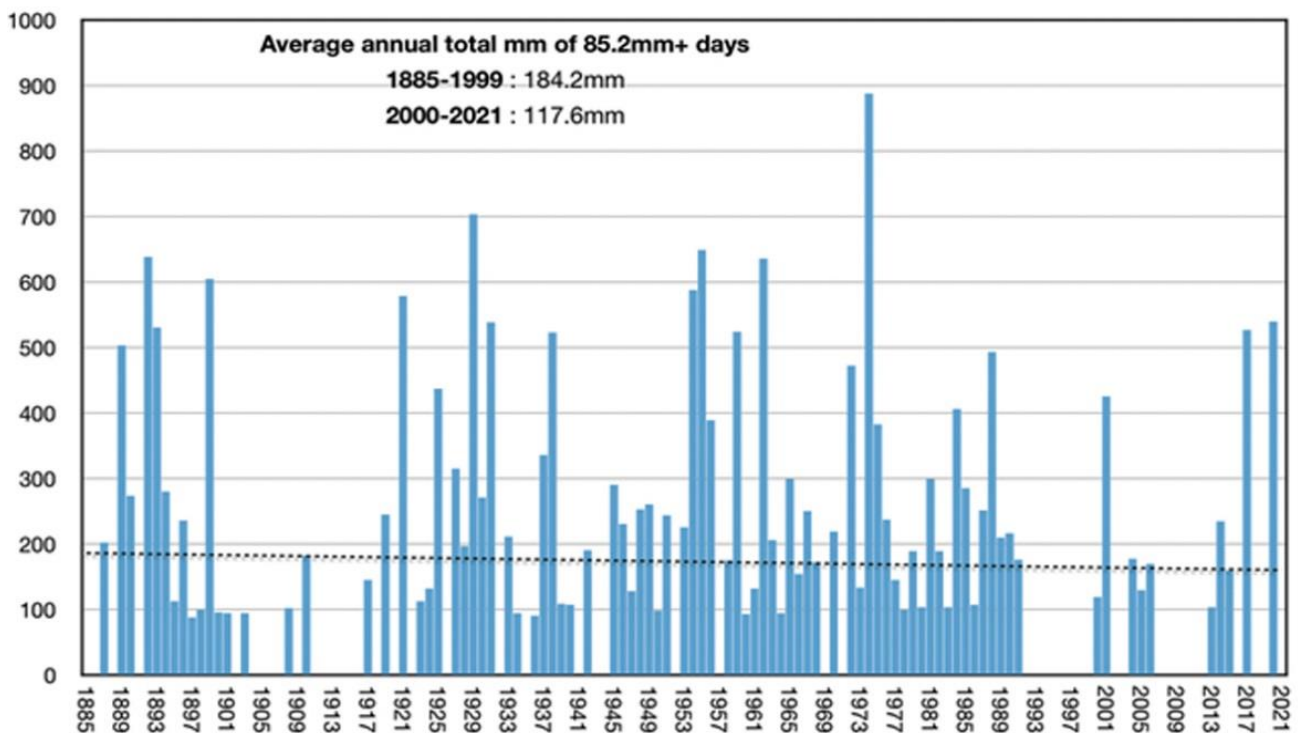
If Climate Change was a real threat, the Bureau of Meteorology might even look at their own historic records. When Jennifer Marohasy and Chris Gillham did just that, they found that as bad as the current situation is, it’s happened before:

- The wettest *day* in Lismore was in February **1954**.
- The wettest *year* for Lismore was **1893**.
- There was no increase in intensity or frequency of extreme wet days at Lismore, or the towns around it.

Now if the BOM looks at this with a supercomputer, they might find an effect from CO2. But if the BOM just used a calendar, like I did, they might find the latest floods started the week after rolled across Australia. Maybe that matters?

No one needed a supercomputer to read a rain gauge in 1885, and we have excellent long data. Imagine how handy that might be if the BoM wanted to understand, say, Australian flood cycles? There are 137 years of rainfall records in Lismore from 1885 to now, *but the BOM said we set a new record for Lismore based on Lismore airport where records started as long ago as... 2002*.

Annual total millimetre volume of rainfall days above 99th percentile (85.2mm) at Lismore 58037 and 58214, 1885-2021



**Here’s what big rain looks like in Lismore”**

Graph by <https://jennifermarohasy.com/2022/03/the-disaster-at-lismore-some-rainfall-statistics/>

Article Courtesy of Jo Nova 04-04-2022

## Appendix II: Flood Behaviour in Lismore

This appendix clearly outlines, why the junction of the Wilson River and Leycester Creek, make the diversion of the creek a much more appropriate venture to undertake.

### “2.2 Flood Behaviour in Lismore.

A number of factors are responsible for flooding in Lismore. Its latitude and proximity to the coast make it liable to the effects of extreme weather mechanisms, via tropical cyclones from January to April, and east coast lows from April to July.

The catchment above Lismore is fan-shaped and the valleys and streams are steep providing a relatively quick transfer of rainfall to runoff. The whole of the runoff from the 1,400km<sup>2</sup> catchment squeezes through a narrow section of floodplain at Lismore, which is located at the confluence of Wilsons River and Leycester Creek.

The floodplain lies at approximately 9.5m AHD with significantly lower levels near Lismore Park in Central Lismore.

At the confluence, *the Leycester Creek floodplain is approximately 2 to 2.5m higher than the Wilsons River floodplain*. This causes the upper section of the Wilsons River to act as a natural detention basin. During the very early rising stages of a flood it is not uncommon for floodwaters from Leycester Creek to back up into the Wilsons River, and once the storage is filled the flow reverses and discharges into the lower, southerly section of the Wilsons River.

The prospects for mitigating the effects of flooding are complicated by the city being centred around the confluence of Leycester Creek and Wilsons River, either of which may dominate in a flood event. The April 1989 flood was an example of a 1 in 100-year ARI flood occurring in Leycester Creek with only a minor flood occurring in the Wilsons River. This flood highlights the importance of understanding the variability of rainfall across the Leycester Creek and Wilsons River sub-catchments and the impacts this has across different areas in Lismore, especially from a flood warning and evacuation planning perspective.

In particular, flood warning should not just focus on the rowing club gauge height alone as the evacuation trigger. In 1989 South Lismore was flooded sooner and more severely than the gauge had indicated.

Flood behaviour is further influenced by more localised features such as Hollingworth Creek and the railway lines. Hollingworth Creek was a major floodway before European settlement. Due to the construction of the railway embankment in the 1880s and the South Lismore levee in the 1970s, it now functions more as a drain until the levee overtops when it once again becomes a major floodway.

Local flooding problems in past floods, for example, in 1954, led to the construction of viaducts through the railway land to allow water to flow southwards. Browns Creek Pump Station At Levee Spillway Lismore Floodplain Risk Management Plan 2014 11 Reference should be made to Appendices 2 and 3 for details on flood history and flood behaviour.



**Appendix III: Lismore Flood Risk Management Project** J. Encalada reporter Lismore 8-11-2020

The COUNCIL will publish digital animations to explain the recent disaster and how different draft options may impact the city. There is no single magic solution to make Lismore floodproof, and the options offered to the community will have different consequences, according to the digital modelling done by experts, which will be available to the community as animations next week.

Lismore City Council will publish animations showing how the 2017 floods happened and what the impact of some options raised could be on the city, once the Lismore Flood Risk Management Project draft goes on exhibition. Six flood-mitigating ideas have been included in a new LFRMP 2020 draft report.

The options are:

- Option 1 - CBD levee raise to provide one-in-20-year flood protection.
- Option 2 - South Lismore levee raise to provide one-in-20-year flood protection.
- Option 3 - Excavate to increase Wilsons River conveyance at 387 Keen St.
- Option 4 - Removal of Kyogle Rd railway embankment and viaduct.
- Option 5 - Increase conveyance at key hydraulic controls at Bruxner Highway, Caniaba Rd and Krauss Ave.
- Option 6 - Combined option, reflective of implementing Options 1 to 5.

Lismore City Council's Strategic Planning Co-ordinator, Paula Newman, said the options offered will not make Lismore completely floodproof.

"The option to raise the levee for a one-in-20-year flood would keep the Lismore CBD dry, however, you can't say that for the whole of Lismore," she said.

"The model said the levee has a negative impact on North Lismore, and I think South Lismore as well.

"When you develop flood plans, one of the important things is that you need a package of measures, especially for a place like Lismore

"Also, the option to excavate the Wilsons River bends to increase its conveyance, provide an additional time for evacuation (...) it does not provide any extra physical protection per se."

The study examined a number of scenarios and offered preferred options but included a proviso that it had to **protect the city for the "least expenditure of public monies"**.

*(The acceptable cost should be based on the cost of not doing it. (JI))*

The following are the list of **strategic objectives** that are up for consideration in April 2022 which are significantly different from the November 8, 2020 list!!

April 2022: The council has released a discussion paper that presents some broad brushstrokes for how Lismore could build back better. Some of the strategic objectives identified for consideration include:

- |                 |   |
|-----------------|---|
| Objective One   | North and South Lismore land swap.  |
| Objective Two   | Protection of the CBD (Raising Levee).                                      |
| Objective Three | Expansion of Goonellabah Industrial Precinct.                               |
| Objective Four  | Commercial and/or mixed-use development at the golf course in East Lismore. |
| Objective Five  | New medium density areas.   |
| Objective Six   | Affordable housing.   |
| Objective Seven | Review of infrastructure delivery program.                                  |
| Objective Eight | Other Suggestions from interested parties.                                  |

**An amazing difference of Options/Objectives in 18 months!**

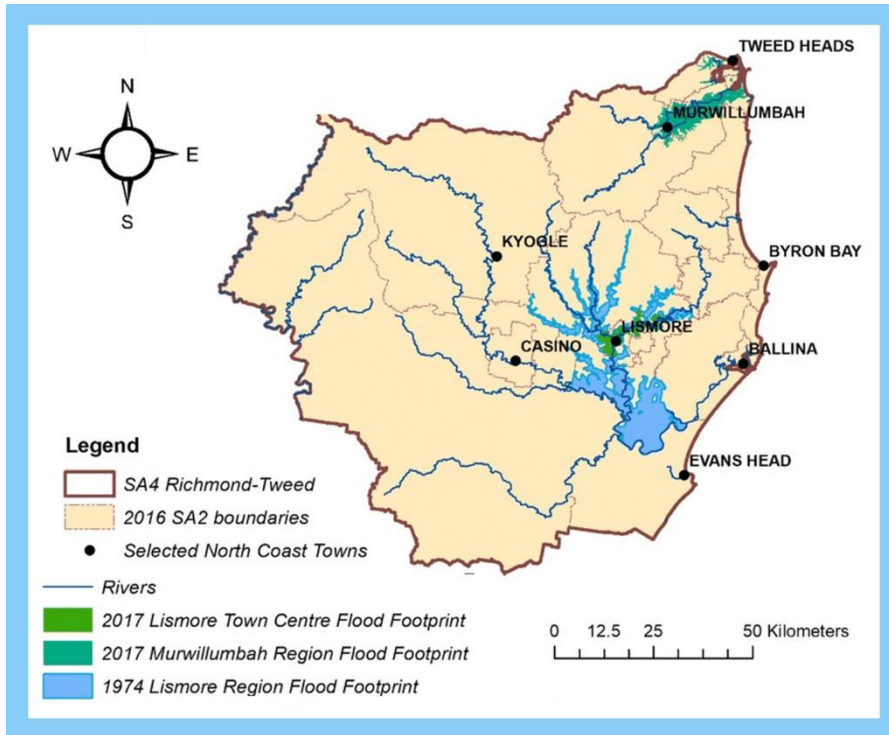
**Flood Insurance:**

Another point to contemplate: Without minimizing the size of the floods, which are can occur, then the escalating insurance costs (providing insurance is even available) will remain over the current flood prone areas.

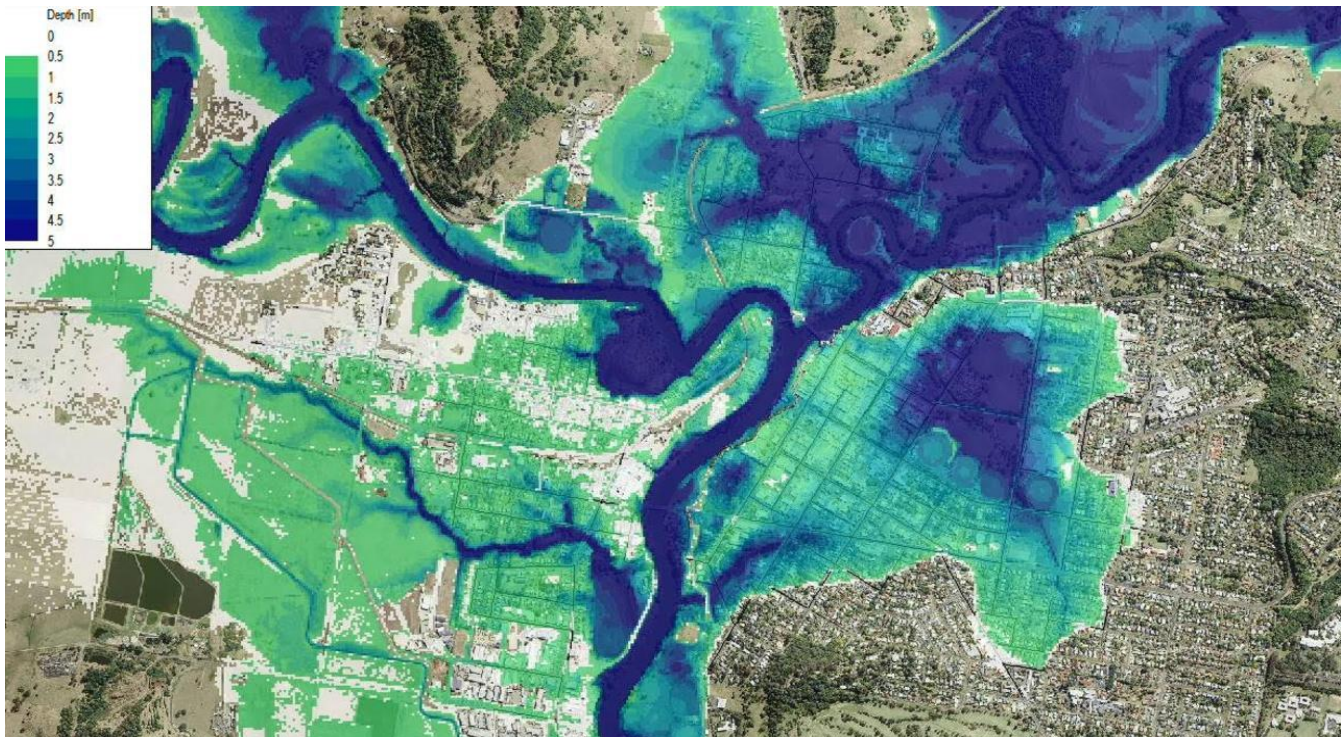
With reducing the size of floods, then flood prone areas in the communities "should" diminish.



## Minimizing Floods in the Richmond River's Catchment



This graphic shows how much more extensive the 1974 flood than the 2017 flood. Pity there isn't a suitable one (I could find), for 2022. The proposed diversion canals will not eliminate all flooding, but will significantly minimize what occurs in the currently flooded townships.



This graphic appears to emphasize how the Leicester Creek entering the Wilson River, causes the Wilson River to back up. Part of this could be due that at the point of entry, the creek is about 2.5m higher than the river. That is the Wilson River hits a wet wall.

## Appendix IV: All-in approach to rebuild flood prone Northern Rivers

A new body has been announced to lead the long-term reconstruction effort of flood impacted areas across the Northern Rivers. Here is how it will work.

### [Catherine Piltz](#) Article from [The Northern Star 19-04-22](#)

The NSW government has launched a new body to lead the long-term reconstruction of flood impacted areas across northern New South Wales. The Premier says the *Northern Rivers Reconstruction Corporation* will be active for three to five years to ensure the areas impacted by the floods are built back stronger than before the disaster.

The NSW government has established a new corporate body to lead the long-term reconstruction of flood impacted areas in the Northern Rivers.

The Northern Rivers Reconstruction Corporation (NRRC) will sit within the Department of Regional NSW and report to the Deputy Premier and will formally come into effect from May 1.

The NRRC will operate as a 'front door to government' for all reconstruction and development activities in the Northern Rivers.

It will set and implement reconstruction priorities and work with government agencies and departments to deliver those priorities quickly.

Premier Dominic Perrottet said the corporation will be active for up to five years to ensure flood impacted areas are built more resilient for future generations.

"We will support the people of [flood impacted communities](#) across the Northern Rivers, every step of the way," Mr Perrottet said.

Leading the new corporation is David Witherdin, previous CEO of Local Lands Services and current head of the Public Works Advisory and the Soil Conservation Service.

"It's an honour to be appointed to this role," Mr Witherdin said.

Working with those from the [Northern Rivers communities](#) will be crucial, he said.

"We want to get that co-ordination, that scale, across the region," he said.

NRRC's mission will be to co-ordinate planning, rebuilding and construction work of essential services, infrastructure and housing across multiple government agencies to help the Northern Rivers communities rebuild their homes and lives.

An advisory board consisting of people such as local members of parliament and mayors, as well as leaders in the community, will ensure local expertise and knowledge is central.

"The key about this corporation is we will be able to move quickly on things," Mr Witherdin said.

**The catalyst for a lot of the action will be the findings from the flood inquiry report due in late June.**

"This corporation will provide us with the architecture to really quickly move through things in terms of that planning framework, looking at engineering controls," he said.

"Ensuring that in terms of building standards, that we build back better so that we're more resilient in the future."

Member for Lismore, Janelle Saffin, said she has been calling for a reconstruction commission to have one single body do the work that's required.

"I get asked a lot whether the Premier is listening as he is Liberal, I'm Labor and I can tell you, the premier is listening to our community," Ms Saffin said.

Some local community members feared the NRRC would take control away from local hands, but the Premier stressed the key component of these corporations are local advisory bodies.

"These are about local communities providing advice in to government, into the corporation, to make sure we build back in ways that protect our communities into the future, and that's the local input we're looking to get here," Mr Perrottet said.



## Minimizing Floods in the Richmond River's Catchment

“There are different issues in different communities with different needs and so having this corporation in place, looking after the seven local government areas, will do so in a way that brings that local input in.

“I want to make sure this body is able to cut through government bureaucracy and get the job done, and that’s why you set up corporations like this,” Mr Perrottet said.

*The corporation will oversee the recovery work in the local government areas of Ballina, Byron Bay, Lismore, Clarence Valley, Kyogle, Tweed and Richmond Valley.*

- *prioritising and sequencing projects*
- *coordinating procurement and financial planning*
- *industry capacity and engagement*
- *planning and land acquisition*
- *local government liaison*
- *betterment identification*

More specifically, the NRRC:

- identifies, assesses, develops and makes recommendations on projects and programs that can help rebuild Lismore and other ***flood impacted Northern Rivers communities quickly and for the long-term***
- works with councils to identify, prioritise and support projects that can rejuvenate communities within the Northern Rivers area, with a particular emphasis on housing and supporting social infrastructure
- works with the Department of Planning and Environment to fast-track planning and environmental approvals to make it easier for people living in the Northern Rivers to rebuild their homes and get back to their normal lives as quickly as possible
- works with business to attract and retain investment in the region, with a particular focus on job creation and long-term economic growth
- funds the delivery of enabling infrastructure to develop long-term, resilient and economically sustainable communities. This includes new or upgraded roads, water, power, digital connectivity and social infrastructure
- *acts on and implements recommendations from the Independent Flood Inquiry and the Parliamentary Inquiry into the Northern Rivers Floods as directed by the government.*

### **Comment:**

**And when there is an equivalent flood in the future (as there inevitably will be), how much of the “restoration”, which is to be implemented will survive that flood, and the next one, and...???**

**Maybe it’s time to think outside the bucket.**

If you have questions, or would like to discuss this approach outlined in this report further, please let me know.



John Ibbotson

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08-05-2022