Department of Climate Change, Energy, the Environment and Water

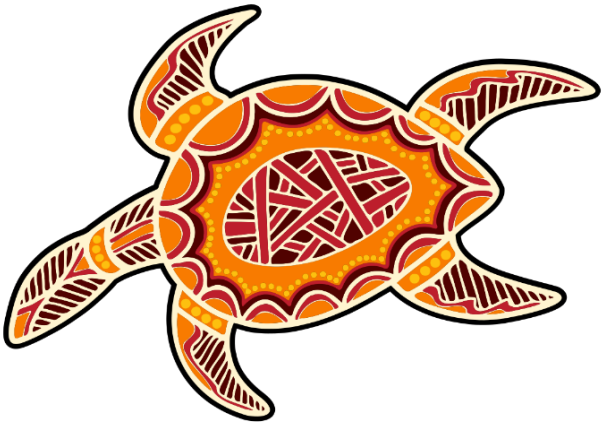
What we heard report

Stage 1 public consultation: Draft Billabong Creek Floodplain Management Plan

March 2025

NSW GOVERNMENT

Acknowledgement of Country



Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Wiradjuri artist and designer Nathan Peckham from Yurana Creative created Guwunggan*.

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Executive summary

The Water Group in the NSW Department of Climate Change, Energy, the Environment and Water (the department) is developing a whole-of-floodplain floodplain management plan (FMP) under the *Water Management Act 2000* (the WM Act) for the Billabong Creek floodplain. This will replace the historical FMP that was originally developed under the *Water Act 1912*.

FMPs are legal instruments made under the WM Act. They set rules for what types of flood works can be constructed on a declared floodplain and where.

The department conducted Stage 1 public consultation from 8 October to 18 November 2024 to seek feedback on key elements that will inform the development of the draft Floodplain Management Plan for the Billabong Creek Floodplain (the draft FMP), including the:

- proposed floodplain boundary
- proposed flood events to be used in hydraulic flood modelling (design floods)
- proposed floodway network, which includes the main floodways, and areas important for the temporary storage of floodwater during the passage of a flood
- flood-dependent and flood-impacted Aboriginal cultural assets and values located within the floodplain
- flood-impacted heritage sites located within the floodplain
- flood-dependent ecological assets that have been identified within the floodplain
- local variances from default rules for flood work applications in different areas of the floodplain.

A report to assist public consultation was published on the department's website to explain the key elements proposed and provide prompts for feedback.

This report details the feedback we received during the Stage 1 public consultation period. Feedback was captured through individual appointments with departmental staff, an online submission form and written submissions. During the consultation period, the department received 100 submissions and saw 91 people attend 52 appointments.

The key issues raised are summarised below and in more detail in Tables 2 to 12. The feedback is informing the development of the full draft FMP, which will be released for public exhibition in April 2025.

Floodplain boundary

- Concerns that the proposed floodplain boundary is too extensive and includes areas that have not previously been included in an FMP, particularly downstream of Jerilderie. A summary of the feedback received and the department's response is provided in Table 2.

Design floods

- Feedback suggested that the department should use the 2012 flood event as the large design flood instead of the 2022 flood, as it would be more consistent with the draft Murrumbidgee Valley FMP and is considered a more typical flood in the Billabong Creek floodplain. A summary of the feedback received is provided in Table 3.

After revisiting the modelling data and spatial information, the department has confirmed that the 2022 flood event is the most appropriate for determining the proposed floodway network. More information about this review is provided in Appendix 2: Design flood selection.

Floodway Network

- Concerns that the proposed inundation extent (areas of ponding) is too extensive and includes areas that have never flooded.
- Feedback suggested that the proposed floodway network would be more accurate if the department used the 2012 flood event as the large design flood instead of the 2022 flood event.

A summary of the feedback received is provided in Table 4. In response, the department has refined the proposed floodway network in multiple locations. These refinements are shown in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.

Identified Aboriginal cultural assets and values on the floodplain

- Landholders are generally unaware of any Aboriginal cultural assets on the floodplain or their properties.
- The Aboriginal Heritage Information Management System (AHIMS) has not captured all of the Aboriginal cultural assets on the floodplain.

A summary of the feedback received and the department's response is provided in Table 5.

Identified Heritage sites on the floodplain

- Several identified heritage sites, particularly those in urban areas, would benefit from protection from flooding.

A summary of the feedback received and the department's response is provided in Table 6.

Identified flood-dependent ecological assets and values on the floodplain

- Generally, the identified ecological assets are accurate from localised perspectives. However, some identified ecological assets were labelled incorrectly or are not flood-dependent.

A summary of the feedback received and the department's response is provided in Table 7.

Localised variances to rules

- Critical works such as access roads, farm tracks, supply channels and infrastructure protection works should be permitted within floodways, with support for specifications to limit potential flooding impacts.
- Existing works should be permitted within floodways and the broader floodplain.
- Stakeholders are concerned that existing works that have been in the landscape for a long time will require approval and may need to be removed as part of the implementation of the draft FMP.
- A range of height thresholds for standard and primary access roads were suggested, from 0 cm to 100 cm.
- One size fits all approach to the height limitations of access roads is not appropriate.

A summary of the feedback received and the department's response is provided in Table 8, Table 9 and Table 10.

About this report

This report provides an overview of community and stakeholder feedback on the key elements of the draft FMP, received during the consultation period 8 October to 25 November 2024.

The purpose of this report is to outline where changes are being considered or will be made in response to the feedback received. It also aims to assure community and stakeholders that we have heard the points of clarification, concerns and issues they raised in their feedback. Responses have been provided where feedback has not been adopted.

This report consists of:

- an overview of the engagement process and participation by stakeholders
- a summary of what we heard on the key elements proposed and our responses to the feedback received
- other feedback received that is out of scope of the draft FMP (detailed in Appendix 1)
- our response to concerns about the selected design floods used in the draft FMP (Appendix 2)
- refinements made to the proposed floodway network (Appendix 3) and identified flood-dependent ecological assets (Appendix 4) in response to the feedback received.

Further opportunities to comment on the draft FMP will be provided during Stage 2 public exhibition in April 2025.

Introduction

Background

The purpose of Stage 1 public consultation was to provide an early opportunity for community feedback on key elements that will inform the development of the draft FMP before formal public exhibition in 2025. This included:

- confirming and verifying information that will be used in the draft FMP at a property scale
- enabling the department to respond to stakeholder feedback and, where appropriate, make changes to the key elements prior to developing the draft FMP.

The department was seeking feedback on the proposed floodway network and flood-dependent assets to identify and confirm areas of the floodplain that require protection. FMPs protect these areas by restricting the types of flood works that can be constructed. This allows floodwater to move freely to and from a river, or to environmental and cultural assets that rely on it.

FMPs are required under the WM Act to consider the risk to life and property from the effects of flooding. The identification and confirmation of the proposed floodway network informs this consideration. The construction of a flood work in an area which has fast-flowing floodwater (floodways) can significantly increase the risk to life and property; both on the landholding where the flood work is constructed and on neighbouring properties. The draft FMP will limit the types and size of flood works constructed in floodways to minimise the risk to life and property.

To ensure community and stakeholders had an opportunity to have their say, the department held a series of in-person and online appointments throughout the consultation period. An overview of these activities and the key issues raised during consultation is outlined below.

Engagement overview

Stage 1 public consultation on the draft FMP commenced on 8 October and closed on 18 November 2024. To assist the public in understanding the key elements proposed and how to make a submission, we published several resources on a dedicated web page, including:

- a Report to assist Stage 1 public consultation
- a pre-recorded presentation
- an interactive spatial map displaying the:
  - proposed floodplain boundary
  - proposed floodway network
  - identified ecological assets
- details of where engagement activities were taking place and how to register.

Individual appointments with departmental staff were held in-person in Jerilderie (22 October), Moulamein (23 October) and Wanganella (24 October), as well as online (multiple dates) and over the phone (multiple dates).

To promote the consultation, we:

- posted letters to landholders within the mapped floodways (deep, fast-flowing floodwaters)[1]
- ran print, social and digital advertisements
- sent emails to registered landholders, peak bodies, and the department's Water e-newsletter subscribers.

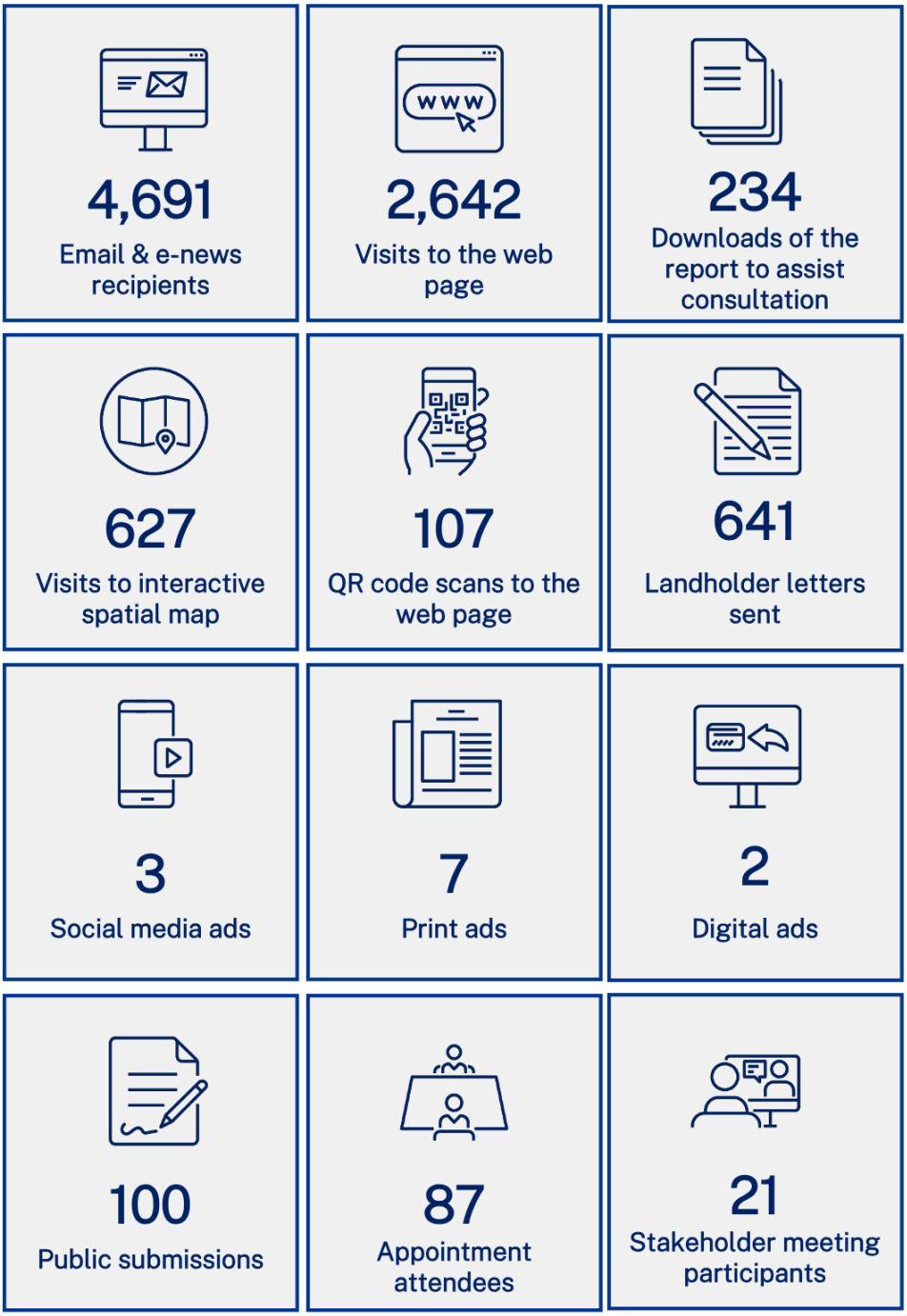
To ensure broad and equitable engagement, we extended invitations to individuals who participated in the information sessions held in June 2023 which aimed to collect flooding information, and to representative groups for:

- Traditional Owners and Aboriginal communities
- irrigators and other peak water users
- environmental interests
- business interests
- Australian Government, NSW Government and other state government agencies
- regional councils.

[1] Letters were targeted using postal address information from NSW Land Registry Services. This was the best available information to the department at the time. We acknowledge that not every landholder may have received a letter. To stay up to date with all current engagements within the department, please subscribe to our email distribution list.

A summary of the engagement statistics is provided in Figure 1.

Figure 1: Engagement activities at a glance



Who we spoke to

During the consultation period, we spoke with 108 individuals through a variety of channels including individual face-to-face appointments, online appointments, phone calls and stakeholder group meetings. Appointments were primarily with individual landholders, irrigator groups and local councils. We also spoke with Aboriginal communities as part of targeted First Nations meetings and provided briefings to two members of parliament. See Table 1 for an overview of engagement attendance.

Table 1: Overview of engagement attendance from 24 July to 25 November 2024

Date	Engagement platform	Participants
24 July 2024 & 16 August 2024	Meeting with the Deniliquin Local Aboriginal Land Council and community to confirm identified Aboriginal cultural values on the floodplain	5
27 August 2024	Meeting with the Yarkuwa Indigenous Knowledge Centre to confirm identified Aboriginal cultural values on the floodplain	1
17 October 2024	Online briefing with Mr Justin Clancy MP, Member for Albury	2
18 October 2024	Online briefing with Mrs Helen Dalton MP, Member for Murray	2
21 October 2024	Individual online/phone appointments	9
22 October 2024	Online meeting with the Yanco Creek and Tributaries Advisory Council	2
22 October 2024	Individual appointments at Jerilderie	39
23 October 2024	Individual appointments at Moulamein	7
24 October 2024	Individual appointments at Wanganella	5
28 October 2024	Individual online/phone appointments	5
29 October 2024	Individual online/phone appointments	11
4 November 2024	Follow up online meeting with Yanco Creek and Tributaries Advisory Council	2
20 November 2024	Follow-up group meeting with the NSW Irrigators' Council and member organisations (online)	8
On request	Additional online/phone appointments	19
24 July to 25 November 2024	**Total number of participants engaged during the consultation period**	**108***
24 July onwards	**Formal submissions received**	**100**

*Note: the department spoke with some individual stakeholders on more than one occasion. For this reason, the total number of participants engaged during the consultation period is not a sum of the number of engagements in Table 1.

What we heard

This section provides a summary of the feedback received on the key elements presented in the Report to assist Stage 1 public consultation. This feedback includes submissions received, and questions and comments made in individual appointments with departmental staff.

Proposed floodplain boundary

The proposed Billabong Creek floodplain boundary, shown in Figure 1 in the Report to assist public consultation, was mapped to capture the areas that are low-lying, adjacent to a river or creek, and are generally inundated during large flood events while considering flood works that may influence the way floodwater moves across the landscape.

The public were asked to make comments on the proposed floodplain boundary, in particular at a property scale. Table 2 outlines a summary of the feedback received.

Table 2: Summary of feedback received on the proposed Billabong Creek floodplain boundary

Feedback	Departmental response
The proposed floodplain boundary is significantly larger and extends into areas that have not previously been covered by an FMP. Landholders are concerned about: • a considerable increase in work, stress and expense relating to the need for a flood work approval • potential negative impacts on farming operations • unnecessary red-tape • negative impact on land values.	In NSW all flood works as defined by the WM Act require a flood work approval, regardless of whether an FMP applies to the area. The proposed Billabong Creek floodplain has been mapped to capture the areas that are inundated during large flood events at a valley-scale while considering existing flood works that may influence the way floodwater moves across the landscape. The draft FMP will standardise the assessment process for flood work applications. It also means that applications will be assessed appropriately to determine whether the flood work/s will have an acceptable impact on neighbouring properties and the surrounding floodplain environment. This is consistent with the requirements of the WM Act. The proposed floodplain boundary will connect to neighbouring floodplains in the Murrumbidgee and NSW Murray. This allows for assessment and approval processes to better account for the cumulative impacts produced by floodplain development, and aids in improving the flow of water throughout key areas of the NSW southern Murray–Darling Basin.

Feedback	Departmental response
The boundary is too extensive and includes areas that don't flood, including areas of high ground.	Isolated areas of higher elevation such as sand hills are included within the proposed floodplain boundary. While these areas do not form part of the floodway network, they are categorised as being flood fringe. These areas will be considered in the same way to areas that are protected from flooding by approved flood works.
Low-lying areas are included in the boundary that do not connect to or are an extended distance from waterways.	The proposed floodplain boundary has been mapped using hydraulic modelling results for large historical events and consideration of: • inundation data within the catchment • the extent of the historical FMP • water source boundaries, as established in water sharing plans • local government areas • major roads and railway lines. Areas within the floodplain boundary that are not mapped as being part of the floodway network are categorised as flood fringe. Structures in these areas may still be considered flood works as defined by the WM Act and may require a flood work approval. The flood fringe will be subject to the least restrictive rules in the draft FMP and will allow for floodplain development to occur in a coordinated manner while minimising negative impacts to neighbouring properties and the environment. The proposed rules and assessment criteria for flood work applications will be released for comment as part of Stage 2 public exhibition of the draft FMP.
The floodplain boundary should be expanded east of Urana. Illegal drains are affecting flows and ecological assets within the proposed floodplain. Concerns about flood works just outside of the boundary not being adequately assessed, which may cause localised flooding impacts.	This area was investigated, and a decision was made to not refine the boundary as the area was determined to be outside of the extent of the large design flood. However, the department will seek further feedback during Stage 2 public exhibition on the use of drains (as a type of flood work) to divert floodwater in the floodplain and whether rules need to be included in the draft FMP.

Feedback	Departmental response
	Refinements to the proposed floodplain may also be considered following Stage 2 public exhibition. All flood works as defined by the WM Act require a flood work approval, regardless of whether an FMP applies to the area. Technical guidance on the assessment of flood work applications in areas without an in-force FMP is available on the department's website (under Supporting Documents). This means that any flood work applications upstream of the floodplain boundary will be assessed appropriately to determine whether the flood work/s will have an acceptable impact on flow connectivity and third parties.
The proposed floodplain boundary is generally ok on the eastern side where there is no change to the current boundary. However, further to the northeast it could be expanded to include more of Urangeline Creek.	This area was investigated, and a decision was made to not refine the boundary as the area was determined to be outside of the extent of the large design flood. Technical guidance on the assessment of flood work applications in areas without an in-force FMP is available on the department's website (under Supporting Documents). This means that any flood work applications upstream of the floodplain boundary will be assessed appropriately to determine whether the flood work/s will have an acceptable impact on flow connectivity and third parties.
Lake Urana should be included in the Billabong Creek FMP rather than the Murrumbidgee FMP. Lake Urana receives initial flows from Murrumbidgee River flood water, with flows from Billabong Creek entering last.	Agreed. Lake Urana is within the existing localised FMP boundary and designated floodplain so has been included in the proposed floodplain boundary for the new draft Billabong FMP. Inflows into Lake Urana are primarily from Urangeline Creek and breakout flows from Billabong Creek. Flows from Lake Urana then rejoin Billabong Creek upstream of Jerilderie. There is a general reduction in Billabong Creek's downstream peak flood flows due to the storages on the floodplain, including Lake Urana.

Feedback	Departmental response
It is not fair that the floodplain is more than 14 km wide on our side of the creek in the area between Conargo and Wanganella, yet for our neighbours to the east it is much narrower, even though we are on the same creek.	The extent of the floodplain is defined by the topography and behaviour of floodwater. Flooding is rarely equally spread across opposing banks of a creek or river channel. The boundary is primarily defined by hydraulic modelling and review of satellite imagery showing the extent of inundation in historic flooding. Areas within the floodplain boundary that are not mapped as being part of the floodway network are categorised as flood fringe. Structures in these areas may still be considered flood works as defined by the WM Act and may require a flood work approval. The flood fringe will be subject to the least restrictive rules in the draft FMP and will allow for floodplain development to occur in a coordinated manner while minimising negative impacts to neighbouring properties and the environment.
The proposed boundary should be expanded to include the catchments of Coreen Creek and the Wangamong Creek west of Daysdale. These flows greatly add to the impacts of flooding within the system.	Significant parts of these catchments are within the proposed floodplain boundary. For areas located upstream, hydrologic models were developed to estimate contributing inflows from upstream of these catchments entering the Billabong Creek floodplain. While some parts of these creeks' catchments are not within the proposed floodplain boundary, their inflows were included in the hydraulic model. More information about the hydrologic and hydraulic modelling is available in Appendix 1 of the Report to assist Stage 1 public consultation.
Floodplain boundary should be pulled back to Wangamong Creek.	The proposed floodplain boundary has been mapped to capture the areas that are inundated during large flood events. The existing designated floodplain was expanded on the southern side of Wangamong Creek as it was confirmed to be within the extent of the large design flood.
The proposed floodplain boundary is generally acceptable.	Noted.

Feedback	Departmental response
Supportive that the proposed floodplain boundary will connect with the floodplain boundaries currently being developed for the NSW Murray and Murrumbidgee Valley FMPs. By addressing connectivity between plans, it should allow native fish species to move up from the Edward River into the Billabong Creek system to spawn, seek shelter and locate food. Ideally such connectivity will mean fish passage will be achieved along the entire Billabong and Colombo/Yanco creek system to provide connectivity between catchments.	Noted.

Proposed design floods

The following proposed design floods were used to model and map the proposed floodway network:

- Whole floodplain: large design flood of October to December 2022: 2.9% AEP[2] at the Billabong Creek at Conargo (Puckawidgee) gauge (410017)
- Upstream of Jerilderie: large design flood of October to November 2010: 3.3% AEP at the Billabong Creek at Walbundrie gauge (410091)
- Downstream of Jerilderie: small design flood of October to November 2010: 26% AEP at the Billabong Creek at Conargo (Puckawidgee) gauge (410017)
- Upstream of Jerilderie: small design flood of March 2011: 17% AEP at the Billabong Creek at Walbundrie gauge (410091).

We asked the public for comments on the proposed design and if it aligned with their experience of past flood events. Table 3 outlines a summary of the feedback received and the department's responses.

In written submissions and individual appointments, most stakeholders objected to the use of the 2022 flood event for the large design flood event, deeming it to be a catastrophic flood that is not typical of large floods in the area. This feedback was mostly amongst stakeholders downstream of Jerilderie, and around Conago and Wanganella where properties have not previously been included in a FMP. There is a preference for the 2012 flood event to be used as the large design flood.

Table 3: Summary of feedback received on the proposed design floods

Feedback	Departmental response
Why are you using the 2022 flood event as the large flood design event? The 2022 flood event would be a 1 in 100-year flood. The 2012 flood would be more appropriate as a typical large flood for this area of the floodplain and is more likely to occur.	The department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network, as: • it meets the majority of the criteria for a large design flood event • the 2012 flood event only meets one of the criteria for a large design flood event • spatial analysis of the 2012 flood event shows that the floodway network was underrepresented in key areas of the floodplain, compared to the 2022 flood event • analysis of historical flood events showed that the 2022 flood event was more similar

[2]Annual exceedance probability (AEP) is the chance of a flood of a given or larger size occurring in any given year, usually expressed as a percentage (%) or a likelihood of 1 flood in x years. For example, a flood with an AEP of 5% means there is a 5% chance that a flood of the same size or larger will occur in any given year.

Feedback	Departmental response
	to the 1974 flood event which was the large design flood used in the existing localised FMP • the 2022 flood event is consistent with the AEP[2] of other large design floods used in the development of FMPs under the WM Act. • the 2022 flood event is the most recent large flood that is within the living memory of the local community and there is a significant amount of information available for calibration and validation of the hydraulic modelling • it is likely that there will be more flooding in the future of a similar or larger magnitude than the 2022 flood. More information about this review is provided in Appendix 2: Design flood selection. To mitigate the impact of the draft FMP the department is proposing to include unique rules for existing flood works within the proposed floodways and inundation extent. The rules in the draft FMP will be released for comment during Stage 2 public exhibition in April 2025.
The Billabong FMP boundary at the Yanco Creek is immediately downstream of the Murrumbidgee FMP, yet two different large design floods were used to model the floodway network in the two FMPs. Murrumbidgee FMP used the March 2012 flood which was 2% AEP at the Narrandera gauge (410005). Billabong FMP used December 2022 flood which was 2.9% AEP at the Conargo (Puckawidgee) gauge (410017). We strongly reject the use of the 2022 flood for the Billabong FMP. The 2012 flood would be closer to the AEP (2%) used in the Murrumbidgee FMP and would be more appropriate and acceptable.	Flood behaviour in the lower reaches of Yanco Creek and Billabong Creek was different to the Murrumbidgee valley floodplain during the 2012 and 2022 flood events. As described above, the department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the larger 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network. More information about this review is provided in Appendix 2: Design flood selection. To mitigate the impact of the draft FMP the department is proposing to include unique rules for existing flood works within the proposed floodways and inundation extent. The rules in the draft FMP will be released for comment during Stage 2 public exhibition in April 2025.

Feedback	Departmental response
It seems unfair that you are using a much larger design flood for the Billabong FMP than was used upstream in Murrumbidgee FMP, especially as new stricter rules and regulations of types of works permitted in floodways are going to be introduced at the same time.	See response above.
Object to the use of the 2022 flood as it was an extremely unusual event and not typical of normal floods because of: • an increase in localised rainfall • a large amount irrigation in West Corurgan and Murray Irrigation, resulting in irrigation water on top of the natural flows • Wangamong Creek, Berrigan escape channel and Billabong Creek all peaked at the same time.	See response above.
The 2010 or 2016 flood events were more typical of floods downstream of Yanco. The 2022 was higher than the 2010 and 2016 according to my flood marker points.	See response above.
I think the 2012 flood is more representative of a large flood than the 2022 flood as the gauge at Jerilderie was lower in 2022 than 2012.	See response above.
There are also areas that are down as floodways but are through sandhills, or only ran in the 2022 flood and 1974 flood. It is unacceptable to have floodways nominated that only run every 50 years or so.	The existing localised FMP used the 1974 flood event as one of the large design floods. As described above, the department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the larger 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network. More information about this review is provided in Appendix 2: Design flood selection.
2022 was extreme. The 2011 and 2010 floods were more of an average flood.	The October 2010 flood event was selected as an additional large design flood for the upper Billabong Creek area as it is the largest flood on record for that area of the floodplain. In the lower Billabong Creek area, downstream of Jerilderie, the October to November 2010

Feedback	Departmental response
	flood event was selected as the small design flood to ensure that critical flow paths were identified in the floodway network. Similarly, the March 2011 flood event was selected as the small design flood for the upper Billabong Creek area to ensure that critical flow paths were identified.
The 2022 flood had more intense local rainfall, which was not the worst flood. The 2012 flood was a build-up following the 2011 flood.	As described above, the department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the larger 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network. More information about this review is provided in Appendix 2: Design flood selection.
Using the 2010 flood as the large design flood would be logical.	The October 2010 flood event was selected as one of the large design floods for the upper Billabong Creek area, upstream of Jerilderie. Downstream of Jerilderie, the October 2010 flood event was selected as the small design flood to ensure that critical flow paths were identified in the floodway network.
The proposed floodway network is incorrect in many areas as it covers areas that didn't flood in 2022. The 2012 flood should be used instead for modelling and mapping the floodway network.	The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. This results in some areas being shown as inundated due to the presence of an unapproved flood work preventing floodwater from moving into the area. The feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made.

Feedback	Departmental response
	An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
I have no objections to using the 2022 flood as a model. However, some of the floodways marked did not run water during this flood.	See above response.
The design floods do not consider land management practices. The creek has much more capacity to carry water in its banks since the willows in the area were removed.	Noted. The hydraulic models used to delineate the floodway network have several parameters that need to be calibrated to correctly represent how floodway behaves across the floodplain. These parameters include: • Topographic information, using a range of datasets acquired from available bathymetry, river cross-sectional surveys and Light Detection and Ranging (LiDAR) laser surveying • Land use and vegetation layers were used to inform the "roughness" of the ground surface. As part of the model calibration process parameters like roughness are modified if the results do not align with observed information such as gauge data and satellite imagery. More information about the hydraulic model data and parameters is available in the Report to assist Stage 1 public consultation (see section 4.1.2 Hydraulic modelling).
The 2016 had a great impact on the Corren and Wangamong Creek systems, as well as the years proposed.	Noted. As described above, the department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the larger 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network. More information about this review is provided in Appendix 2: Design flood selection.
2012 was the bigger flood in Urana, 2010 the bigger flood for Jerilderie, 2022 for Conargo with the Wangamong and Billabong converging	See response above. The October 2010 flood event was selected as an additional large design flood in the upper

Feedback	Departmental response
and then Wanganella. 2010 flood at Yanco was almost the same as the 1974 flood. The 2012 flood in the Yanco converged differently to the Billabong. Flood study on the Murray showed flooding at Murwaila due to the weir and changes in geomorphology at Berrigan.	Billabong Creek area as it is the largest flood on record for that area.
Lake Urana was already at full capacity during the 2022 floods which exacerbated the flooding.	Agreed. Lake Urana and other water storages across the Billabong Creek floodplain play a crucial role in reducing peak flood flows downstream along Billabong Creek during extreme flood events. However, in prolonged floods with heavy rainfall, such as those in 1974 and 2022, Lake Urana nearly reached full capacity in the early months of flooding. Once full, the lake may spill into Cocketgedong Creek, exacerbating flooding in certain areas of the floodplain.
Floods are also variable, with previous events having the outfall drain push floodwater back up into the Billabong Creek. North/south roads are contributors to ponding during big rainfall events, with inadequate culverts to allow for the passage of floodwater.	Noted. It is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the floodplain. The department will raise this feedback with the relevant local councils and other government agencies.
The modelling appears to accept the existing man-made structures to prevent flooding to properties to the east of Jerilderie.	The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. Feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.

Feedback	Departmental response
If the 2022 flood is used as the large design flood, then it is expected that the model and mapping should reflect a combination of the two floods not just a stacked or the 'doomsday' approach that has currently been taken.	As described above, the department has undertaken a review of historical flood events in the Billabong Creek floodplain and has confirmed that the larger 2022 flood event is the most appropriate for the purposes of delineating the extent of the proposed floodway network. More information about this review is provided in Appendix 2. Additional flood events were also selected to confirm the floodway network and assist in the identification of critical flow paths.
The 2022 flood very large but was appropriate for this part of the landscape with the influence of the Wangamong Creek and flows from the Berrigan Channel and Finely Escape coming in from the south.	Noted.
2012 flood was huge. It sparked the drainage works and unapproved works in the area.	Noted. As part of developing the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. The department is currently working through next steps. If you have concerns regarding unapproved works, you can make a report to NRAR: www.nrar.nsw.gov.au/report-suspicious-water-activities You can also contact NRAR on 1800 633 362 during business hours or via email nrar.enquiries@nrar.nsw.gov.au The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. Feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made.

Feedback	Departmental response
	An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
When comparing photos of the 1973 floods with 2010 and 2012 floods, it is visible that some landholders have completely changed the function of the floodplain.	Noted. As described above, as part of developing the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. As part of this process, the department will work through the next steps to determine what action is required to bring unapproved flood works into compliance.
Volume and flow rates reduce the further downstream water travels from its source, which naturally reduces floodplain inundation. This natural flow pattern has not been replicated in the mapping. The land at Moulamein falls roughly 300 mm to 1,600 m westwards.	Noted. The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. Feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
The 2022 and 2010 floods were similar in size. There was a lot of water out on the floodplain during these floods.	In the upper Billabong Creek area of the proposed floodplain, the 2022 and 2010 flood events have been selected as the large design floods. The October 2010 flood event is the largest flood on record for this area of the floodplain.
2016 was a different flood event as it was wet and stayed wet. 2010, 2011 and 2022 were spring floods with a lot of run off. Floods were higher and more damaging in more recent years.	Noted. The selection of the large design flood event is important for the identification of the floodways that have the deepest and fastest flowing floodwater and pose the greatest risk to life and property. Consequently, the large design

Feedback	Departmental response
	flood will be associated with community experiences of more damaging floodwaters.
The proposed mapping is generally consistent with the endorsed Conargo Floodplain Risk Management Plan and Study 2010 which identifies the high-risk flood impacted areas of the Conargo township, which supports the design flood of 2022 generally.	Noted.

Proposed floodway network

The proposed floodway network is comprised of **floodways** (approximately 4% of the floodplain) and the **inundation extent** (ponding areas) (approximately 22% of the floodplain). The proposed floodway network is shown in Figure 2 in the Report to assist Stage 1 public consultation.

We asked stakeholders if the proposed floodways and inundation extent aligned with their experience of past flood events. Table 4 shows the summary of feedback received and the department's responses.

Table 4: Summary of feedback received on the proposed floodway network

Feedback	Departmental response
The proposed floodway network includes flooding of the town of Urana. I request an urban area boundary to be put in place around Urana to protect buildings of historical significance.	The proposed floodway network has been refined around the town of Urana. These refinements are shown on Figure 5 and 6 in Appendix 3. In urban areas, local councils are responsible for managing flood prone land in line with the NSW Flood Prone Land Policy. FMPs acknowledge the role councils play in managing flood risk in these areas and are developed to exist as a complementary process. FMPs establish rules which provide clarity about where flood works may be constructed on the floodplain, ensuring that flooding impacts are avoided or minimised on neighbouring properties and the surrounding floodplain environment. This includes the consideration of potential flooding impacts on urban areas.
There are areas of proposed floodway in the Jerilderie and Conargo townships that do not flood, including during the 2022 flood and as	In urban areas, local councils are responsible for managing flood prone land in line with the NSW Flood Prone Land Policy. FMPs

Feedback	Departmental response
such should be removed from the floodway mapping and flood inundation zone.	acknowledge the role councils play in managing flood risk in these areas and are developed to exist as a complementary process. The proposed floodway network has been amended to be consistent with the flood risk management plans and studies for Jerilderie and Conargo. These refinements are shown on Figures 7 and 8 in Appendix 3.
This map has grossly exceeded the floodways around the Jerilderie and Conargo area. It does not represent the 2022 flood.	See response above.
The proposed mapping is generally consistent with the endorsed Conargo Floodplain Risk Management Plan and Study 2010 which identifies the high-risk flood impacted areas of the Conargo township, which supports the design flood of 2022 generally.	Noted.
Localised, property-scale feedback on the floodways or inundation extent (or both) was provided via a map, based on past experience of flooding in the area. General reasoning included: • irrigation infrastructure / tail water return drain listed as inundation extent • areas marked as inundation extent have never flooded • floodways marked as crossing elevated land • infrastructure upgrades that increased flooding • inundation extent did not flood from creek flooding, but from the high rainfall event.	The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. This results in some areas being shown as inundated due to the presence of an unapproved flood work preventing floodwater from moving into the area. The feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.

Feedback	Departmental response
Urana and Rand sit directly on the Billabong Creek, receiving flows from Coreen. Coreen breaks off Billabong and flows into Daysdale. Once full, Lake Urana can't discharge which cause east to west creeks to slow and flow backwards at times. Wangamong Creek starts east of Sanger. Banks and channels around Jerilderie and Berrigan, and there is a 2.5m high bank at "Tombstone" that pushes water into Urana.	Noted. Lake Urana and other water storages across the Billabong Creek floodplain play a crucial role in reducing peak flood flows downstream along Billabong Creek during extreme flood events. However, in prolonged floods with heavy rainfall, such as those in 1974 and 2022, Lake Urana nearly reached full capacity in the early months of flooding. Once full, the lake may spill into to Cocketgedong Creek, exacerbating flooding in certain areas of the floodplain.
Does the floodway network represent future floods or historical floods?	The proposed floodway network is based on historical flood events. Hydraulic models were developed to simulate the movement of floodwater through the landscape during large and small design floods. A design flood is usually based on recorded historical events that are preferably within the living memory of a community. For the draft FMP, the 2022 flood event was used as the large design flood for the entire floodplain, as well as the 2010 flood event upstream of Jerilderie. Data from smaller flood events is also used to calibrate the hydraulic models.
There is no differentiation between rainfall runoff/overland flow and floodwater in the mapping which has resulted in the inundation extent being excessive.	With respect to local rainfall, and runoff from the Colleambally area, the department acknowledges that these were significant contributors to the 2022 flood event. Local rainfall-runoff is less of a consideration in the hydraulic modelling used to map the floodway network, which relies more on large inflows upstream and the major tributary systems. More information about this issue is provided in Appendix 2: Design flood selection. To mitigate the impact of the draft FMP the department is proposing to include unique rules for existing flood works within the proposed floodways and inundation extent. The rules in the draft FMP will be released for comment during Stage 2 public exhibition in April 2025.

Feedback	Departmental response
There are areas marked as inundation extent that do not connect to the creek or flow from the creek or are isolated low-lying areas.	The proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. This results in some areas being shown as inundated due to the presence of an unapproved flood work preventing floodwater from moving into the area. The feedback received has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
There are areas included in the inundation extent that are high ground including sand hills.	Isolated areas of higher elevation such as sand hills are included within the proposed floodplain boundary but will generally be mapped as being outside of the proposed floodway network. As described above, feedback received during Stage 1 public consultation has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
There is no floodway on the Cocketgedong Road to allow flood water to go north into the Cocketgedong Creek.	Noted. It is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the

Feedback	Departmental response
	floodplain. The department will raise this feedback with the relevant local council and other government agencies within NSW.
Tombstone and Eight Mile causeways (south of Urana) would be giving incorrect data as the Toombstone causeway has carried majority of the water and Eight Mile Creek has next to zero due to floodwater diversion. This has been noted with WaterNSW and NRAR for a long period of time and has not been rectified.	As described above, proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. This results in some areas being shown as inundated due to the presence of an unapproved flood work preventing floodwater from moving into the area. The department is currently working through next steps. Feedback received during Stage 1 public consultation has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. In general, the proposed floodway network in this area matches the flood flow paths and inundation extent shown on the available high resolution satellite imagery. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
The Tombstones and 8-Mile causeways used to take the floodwater equally, but because of floodplain development floodwater now backs up around Lake Uranagong and our local roads were under water for 2-3 weeks in 2022. There needs to be a fresh look at the flooding issues in this area.	Noted. See response above.
Eight Mile floodway, Tombstone floodway, Hydewell floodway and, in the right circumstances, the floodway from Lake	Noted. See response above.

Feedback	Departmental response
Uranagong, all need to be taking the pressure of moving the floodwater.	
The reported river levels at Jeriliderie are incorrect and do not record Correen Creek, Wangamong Creek and Turn Back Jimmy Creek.	The inflows of Correen Creek, Wangamong Creek and Turn Back Jimmy Creek are included in the hydraulic modelling. The model results show a good peak water level match to the recorded water level at the Jeriliderie gauge. However, as described above, the proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. These results in some areas being shown as inundated due to the presence of an unapproved flood work preventing floodwater from moving into the area. As part of this process, the department will work through the next steps to determine what action is required to bring unapproved flood works into compliance. Feedback received during Stage 1 public consultation has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
Floodway does not match with river network showing on satellite image.	In response to this feedback, the department has reviewed the floodway across the proposed floodplain area against satellite imagery and realigned where needed. These refinements are shown on Figures 5 to 10 in Appendix 3.
The floodway looks accurate on the mapping.	Noted.

Feedback	Departmental response
The inundation extent is excessive downstream of Jerilderie due to irrigation organisations (West Corurgan, Murray Irrigation and Coleambally Irrigation) draining water into the creek systems during the 2022 flood event, subsequently increasing flows. The inundation extent should be reduced to reflect the inundation that would have occurred naturally.	Noted. Local rainfall-runoff is less of a consideration in the hydraulic modelling used to map the floodway network, which relies more on large inflows upstream and the major tributary systems.
There are issues with localised flooding caused by council roads and bridges (culverts not big enough or not maintained).	Noted. It is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the floodplain. The department will raise this feedback with the relevant local councils and other government agencies.
There are works on our property that were developed approximately 30 years ago as part of Murray Irrigation which have not been considered in the mapping. There are also rice banks on my property are marked as inundation extent, but it was just wet in 2022 from irrigation water.	Noted. The department has become aware that not all flood work structures authorised under the Irrigation Corporatisation Act 1994 converted across to flood work approvals under the Water Management Act 2000 and is currently working to rectify this. Any flood work structure built by an Irrigation Corporations that was not explicitly authorised under the Irrigation Corporatisation Act 1994 or the Water Act 1912 will need to make application for a food work approval. The floodway network is subject to change and further refinements may be made following Stage 2 public exhibition.
The floodway that flows down the Mahonga Road and goes to Lake Uranagong is approximately 500 metres wide and it closes to approximately 150 metres. That is not enough space for the water to continue moving.	As described above, the proposed floodways and inundation extent at some locations may differ from that experienced during flood events as they include a process for the consideration of unapproved flood works, as shown in in Figure 8 in the Report to assist Stage 1 public consultation. In many instances, unapproved flood works will not be considered in the development of the floodway network. This results in some areas being shown as inundated due to the presence of an unapproved flood work preventing

Feedback	Departmental response
	floodwater from moving into the area. The department is currently working through the next steps for unapproved works. Feedback received during Stage 1 public consultation has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. Where proposed refinements related to unapproved flood works, no change was made. An updated interactive spatial map will be published as part of Stage 2 public consultation of the draft FMP.
Can you present a comparison of the floodway network with the 2012 flood event which is more typical of a large flood?	More information about the design flood selection and the proposed floodway network is provided in .
There are existing flood works on neighbouring properties that are preventing floodwater to move freely through the floodplain.	Noted. In NSW, all flood works that meet the definition of a flood work under the WM Act require a flood work approval unless an exemption applies. As part of developing the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. The department is currently working through next steps. If you have concerns regarding unapproved works, you can make a report to NRAR: nrar.nsw.gov.au/report-suspicious-water-activities. You can also contact NRAR on 1800 633 362 during business hours or via email nrar.enquiries@nrar.nsw.gov.au.
In the course of a natural flood, river height, volume and low rates decrease the further downstream water travels from its source. This naturally reduces floodplain inundation. This natural flow pattern has not been replicated in the mapping.	Noted. As described above, the proposed floodways and inundation extent at some locations may differ from that experienced during flood events as the presented floodways are showing natural flow paths during large flood events in the absence of unapproved flood works.

Feedback	Departmental response
There are large irrigation schemes and infrastructure introduced in the 1960s that have transformed the landscape and natural flow paths. The removal of this infrastructure is completely untenable and would severely impact and destructive to the township of Jerilderie and the local and surrounding economies.	FMPs do not set requirements for the removal of flood works. Instead, the draft FMP will set rules for the assessment and determination of applications for flood work approvals. These rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP.
There is an irrigation channel which crosses the creek and severely affects water movement. It has inadequate pipes underneath it to allow floodwater through. Further downstream Murray Irrigation has constructed a boundary fence on a raised bank which may hold water flow.	Noted. As part of developing the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. The department is currently working through next steps. If you have concerns regarding unapproved works, you can make a report to NRAR: nrar.nsw.gov.au/report-suspicious-water-activities. You can also contact NRAR on 1800 633 362 during business hours or via email nrar.enquiries@nrar.nsw.gov.au. In relation to major water infrastructure owned and operated by irrigation corporations, the department has become aware that not all flood work structures authorised under the Irrigation Corporatisation Act 1994 converted across to flood work approvals under the Water Management Act 2000 and is currently working to rectify this. Any flood work structure built by an Irrigation Corporations that was not explicitly authorised under the Irrigation Corporatisation Act 1994 or the Water Act 1912 will need to make application for a food work approval.
The mapped floodway and inundation extent is generally correct.	Noted.
It is unacceptable to have floodways nominated that only run every 50 years or so.	Noted. The proposed floodway network identifies high risk floodways that, even if only partially blocked, would cause significant changes in the movement of floodwater across the floodplain

Feedback	Departmental response
	and pose the greatest risk to life and property during times of flood. This is consistent with the requirements of the WM Act.
The inclusion of the lower Forest Creek into the floodway west of the Cobb Hwy is inaccurate. The lower Forest Creek no longer receives water due to the Water for Rivers program which ceased flows at the Warriston Weir, unless an environmental water order is placed to fill Wanganella Swamp.	As described above, the proposed floodways and inundation extent at some locations may differ from that experienced during flood events as the presented floodways are showing natural flow paths during large flood events in the absence of unapproved flood works. Review of the modelling results and high-resolution satellite imagery indicated that floodwater was present in Lower Forest Creek during the 2022 flood event.
The bed of the Forest Creek is over a metre higher than the bed of the Billabong Creek and the banks of the Billabong Creek in some areas are 4 metres high. The volume of water required for over bank flows is considerable, therefore it is unrealistic to expect large inundation of land adjacent to the Billabong Creek, along the entirety of the creek system.	The Billabong and Forest Creeks bed elevations were included in the hydraulic modelling. The inundation extent is based on the model results during the 2022 large flood event considering natural flow paths. Review of the modelling results and high-resolution satellite imagery indicated that floodwater was present in Lower Forest Creek during the 2022 flood event.
The flow west of the Cobb Hwy (if any), would be sporadic and only in times of extreme rainfall. As such this area should be mapped as inundation extent rather than a floodway.	The proposed floodway network identifies high risk floodways that, even if only partially blocked, would cause significant changes in the movement of floodwater across the floodplain and pose the greatest risk to life and property during times of flood. It is expected that many of these areas outside of the main creek may be dry or have low flows most of the time.
Council would anticipate the Department seek advice and ground-truth the potential areas identified within the floodway and inundation areas from the residents and business owners impacted by the historical events, supported by local knowledge.	The department is grateful for all feedback received during consultation. As a valley scale plan, the localised expertise provided during consultation is essential for developing and refining the draft FMP. The department completed a listening tour in 2023 to obtain information of local flooding experiences and knowledge. A What we heard report is available on the department's website. The feedback received during Stage 1 public consultation has been reviewed against the

Feedback	Departmental response
	hydraulic model results and high-resolution satellite imagery captured around the peak of the historical large design flood events. This has resulted in multiple refinements being made to the proposed floodway network. These refinements are shown on Figures 5 to 10 in Appendix 3. An updated interactive spatial map will be published as part of Stage 2 public exhibition of the draft FMP. Stage 2 public exhibition will provide additional opportunities for community feedback.

Identified flood-dependent and flood-impacted Aboriginal cultural assets and values

The Aboriginal cultural assets and values located within the Billabong Creek floodplain and currently registered on the Aboriginal Heritage Information Management System (AHIMS) is shown in Figure 3 in the Report to assist Stage 1 public consultation. This information was presented to demonstrate the abundance of Aboriginal cultural sites throughout the Billabong Creek floodplain.

We asked the public if any other Aboriginal cultural assets or values on the floodplain should be considered. Table 5 shows a summary of the feedback received and the department's responses.

Table 5: Summary of feedback received on the identified flood-dependent and flood-impacted Aboriginal cultural assets and values

Feedback	Departmental response
Not all Aboriginal cultural assets and values are listed in AHIMS.	To ensure that Aboriginal cultural assets and values are protected from the impacts associated with flood works, the department has been explaining and promoting the use of AHIMS as part of consultation with Aboriginal communities. Heritage NSW will continue to provide support to individual communities where required to add objects or places to AHIMS. For further information, please visit the Environment and Heritage website. You can also seek assistance by contacting heritageinbox@environment.nsw.gov.au or phone (02) 9873 8500.
There may be Aboriginal cultural assets on my property that could benefit from having protection under the FMP.	If an Aboriginal cultural asset is found in NSW it should be recorded in AHIMS. The best way to record an Aboriginal cultural asset is to download the AHIMS mobile app. The app was developed to make site recording easy, consistent, and more accurate. For further information, please visit the Environment and Heritage website.
There are 28 identified assets on our property. These assets were identified by Murray Local Land Services around 2012/2013.	Noted. We will follow-up with the department's AHIMS team to ensure that these identified assets are recorded in AHIMS.
There are no identified Aboriginal cultural sites mapped on our area of the floodplain.	Noted.

Feedback	Departmental response
Lake Urana includes 4 corners of different tribes.	Noted.
Unaware of any Aboriginal cultural sites on our property.	Noted.
Some Aboriginal cultural sites were shown in our area on AHIMS map.	Noted. When an application for a flood work approval, is being assessed, a search of AHIMS must be completed. The location and construction of any work or use area, including a flood work, must prevent any impact on areas of cultural significance. For more information about how to search AHIMS visit the Environment and Heritage website.
I have worked on properties in a 72km range of Jerilderie for 42 years and have never seen an Aboriginal cultural asset or value on any property.	Noted.
No localised map was presented for comment.	The Aboriginal cultural assets and values currently registered on the AHIMS are shown in Figure 3 of the Report to assist public consultation. This information is provided to demonstrate the abundance of Aboriginal cultural sites at a valley scale. An interactive map was not provided due to the sensitive nature of the sites.
No concerns with the AHIMS sites.	Noted.

Identified heritage sites

The heritage sites located within the Billabong Creek floodplain and currently listed on the State Heritage Register are shown in Figure 4 in the Report to assist Stage 1 public consultation. This information was presented to demonstrate the range of heritage sites throughout the Billabong Creek floodplain.

We asked the public if any other heritage sites on the floodplain should be considered. The summary of the feedback received and associated departmental response is shown in Table 6.

Table 6: Summary of feedback received on heritage sites

Feedback	Departmental response
There is no identified heritage sites recorded in this area.	Noted.
Our property is a local heritage site, with significant heritage buildings and is part of a Biodiversity Conservation Trust covenant to protect rare and endangered native vegetation. There are significant Aboriginal cultural values within the conservation areas. Given it is a specific site, there might be a need for local variances from the default rules for flood works.	Noted. The draft FMP will provide a pathway for the approval of new and existing flood works that are for the purpose of protecting heritage sites that may be vulnerable to the effects of flooding. For example, an embankment or levee to protect a heritage listed site. The draft FMP will also include rules that are designed to minimise or avoid flooding impacts on neighbouring properties, as well as a requirement to maintain flood flows to flood-dependent ecological assets.
There are additional heritage sites on the floodplain that are not listed on the NSW Heritage Register, but they are highly significant. While some of these buildings are located on higher ground, some are vulnerable to flooding impacts and should be protected.	See response above. Even if a historical homestead or other building is not listed on the NSW Heritage register, the draft FMP will provide a pathway for the approval of infrastructure protection works that are for the purpose of protecting high value infrastructure from the effects of flooding. For example, an embankment or levee to protect homes or sheds.
Request an urban area boundary be created around the town of Urana to reduce the risk of flooding heritage sites. A levee bank could be constructed to protect the town of Urana.	This feedback will be passed on to the local council. In urban areas, local councils are responsible for managing flood prone land in line with the NSW Flood Prone Land Policy. FMPs acknowledge the role councils play in managing flood risk in these areas and are developed to exist as a complementary process.

Identified flood-dependent ecological assets

The following types of ecological assets were identified within the Billabong Creek floodplain:

- wetlands: semi-permanent wetlands (non-woody) and floodplain wetlands (flood-dependent shrubland wetlands)
- other floodplain ecosystems: flood-dependent forest/woodland (wetlands) and flood-dependent woodland.

The identified flood-dependent ecological assets are shown in Figure 5 in the Report to assist Stage 1 public consultation.

We asked stakeholders if they agree with the types of assets identified and if there are any other ecological assets on the floodplain that should be considered. Table 7 shows the summary of feedback received and the department's responses.

Table 7: Summary of feedback received on identified flood-dependent ecological assets

Feedback	Departmental response
Ecological assets generally look correct at a property scale.	Noted.
Some ecological assets are no longer visible and should not be considered flood-dependent ecological assets. For example, mapped areas of native vegetation in developed or cultivated areas, isolated paddock trees that are watered by local rainfall. Localised, property-scale feedback on the mapped ecological assets was provided via a map.	The feedback received has resulted in multiple refinements being made to the identified ecological assets in multiple areas. These refinements are shown in Appendix 4 and include the removal of: • ecological assets that are no longer visible within developed or cultivated areas • isolated trees in areas that have previously been cleared • gardens associated with dwellings and outbuildings. An updated interactive spatial map will be published as part of Stage 2 public exhibition of the draft FMP.
Some areas mapped as wetlands have been destroyed due to poor land and water management. Other woody wetlands have changed and there are more invasive weeds.	Often ecological assets have changed through time and can be incorrectly identified. These issues are addressed through comparison to latest high-resolution satellite and aerial imagery, flood modelling results, and cadastral and other ecological spatial data. The feedback received has resulted in refinements being made to the identified ecological assets in multiple areas. These refinements are shown in Appendix 4.

Feedback	Departmental response
	While some wetlands or habitat for flood-dependent fauna has been degraded, these areas can still serve an important ecological function in the floodplain and require protection from future changes in flood behaviour.
The ecological assets marked in yellow on the map appear to represent the ecological areas supported by inundation. We don't agree with this approach – the inundated area should not be the default ecological asset area.	Noted. The identified flood-dependent ecological assets will often align with the proposed floodways and inundation extent. This is because the approach typically involves areas identifying flood-dependent vegetation which requires some degree of inundation to maintain its ecological viability. The draft FMP will distinguish between ecological assets outside the floodway network and ecological assets within the floodway network. Areas that have no flood-dependent vegetation or other ecological significance (for example, developed land) are generally excluded from the ecological asset layer. In response to feedback received refinements have been made to the identified ecological asset mapping in multiple areas. These refinements are shown in Appendix 4.
The plant community type of some of the identified ecological assets have been categorised incorrectly. For example, Red Gum Forest is actually Black Box woodland or floodplain wetland is actually Old Man Saltbush country.	Noted. Both River Red Gum and Black Box plant community types are categorised as flood-dependent ecosystems for the purposes of the draft FMP. An updated interactive spatial map will be published as part of Stage 2 public exhibition of the draft FMP.
It looks like a desktop review rather than any ground truthing.	A variety of wetland mapping and information sources have been used to identify the flood-dependent ecological assets. The department is limited in conducting on ground field surveys at the scale required for whole-of-valley FMPs. Often wetlands and other floodplain ecosystems have also changed through time and can be incorrectly identified. These issues

Feedback	Departmental response
	are addressed through comparison to latest high-resolution satellite and aerial imagery, flood modelling results, and cadastral and other ecological spatial data. The department is committed to using the best available information in the development of the draft FMP. When newer ecological asset data becomes available in the short-term, this will be considered in the development of the draft FMP and further community feedback will be sought during Stage 2 public exhibition. More information about the ecological asset identification and categorisation is available in the Report to assist Stage 1 public consultation.
The colours used to define 'floodplain wetland' and 'semi-permanent wetlands' are too similar, particularly when overlayed on satellite imagery.	Noted. We take this feedback on board in preparation for Stage 2 public exhibition. An updated interactive spatial map will be published as part of Stage 2 public exhibition of the draft FMP.
Critical aquatic and semi-aquatic wildlife should also be considered in the mapping of ecological assets.	The identification of the flood-dependent ecological assets within the Billabong Creek floodplain includes consideration of key habitat features for water-dependent fauna including areas of native fish passage, observed waterbird breeding habitat sites and drought refugia. The proposed floodway network aims to provide for the adequate passage of floodwater to these areas to maintain their ecological value. More information about the ecological asset identification and categorisation is available in the Report to assist Stage 1 public consultation.
Several fenced areas are managed by Local Land Services agreements as environmental assets. One of these sites has watering infrastructure that enables use of an environmental water entitlement to replenish the ecological values in dry times when approved by the Commonwealth Water Entitlement Holder.	Noted. The draft FMP will include rules to protect flood flows to flood-dependent ecological assets. This means that an application for a flood work on a neighbouring or nearby property will have to consider potential changes in flood behaviour that could disconnect the ecological asset from the floodwater it depends on to survive.

Feedback	Departmental response
I am unclear as to what ecological sites and assets are referred to. Please make this clear to all before the commencement of Stage 2 public exhibition. In face-to-face meetings with department staff this topic was not covered.	Noted. Information about the identified flood-dependent ecological assets and categorisation is available in section 3.4 and Appendix 3 of the Report to assist Stage 1 public consultation. An updated interactive spatial map will be published as part of Stage 2 public exhibition of the draft FMP and we will welcome additional community feedback on the identified ecological assets. There was significant interest in Stage 1 public consultation in the Billabong Creek floodplain which presented time constraints in some face-to-face meetings. We have planned for additional consultation sessions for Stage 2 public exhibition to ensure we have enough time available for individual appointments.
Canegrass and Lignum grew up after the 2010 and 2011 floods which could block the floodway.	Noted. The FMP will only deal with applications for flood work approvals on the floodplain. The Land Management Framework regulates native vegetation management on private rural land. More information about the Land Management Biodiversity Framework in NSW is available on the Local Land Services website. The hydraulic models used to delineate the floodway network have several parameters that need to be calibrated to correctly represent how floodway behaves across the floodplain. As part of the model calibration process parameters like the “roughness” of the ground are modified if the results do not align with observed information such as gauge data and satellite imagery. More information about the hydraulic model data and parameters is available in the Report to assist Stage 1 public consultation (see section 4.1.2 Hydraulic modelling).

Localised variances to some rules for flood work applications

The types of flood works proposed to be permitted within a floodway are detailed in Table 1 in the Report to assist Stage 1 public consultation. Further, feedback was sought on the maximum height to be applied to standard and primary access roads with 10 cm being the lower end of the threshold and 50 cm being the upper end of the threshold.

We asked the public if other essential works types should be considered for approval in floodways and what an appropriate height would be for a standard or primary access road. Table 8 provides a summary of the feedback received and the department's response.

Table 8: Summary of feedback received on proposed flood works permitted in a floodway

Feedback	Departmental response
There should be height limitations for all flood works within floodways.	The proposed rules in the draft FMP will include specifications for flood works within floodways, including height limitations, where relevant, to allow for the adequate passage of floodwater. The proposed rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP.
All flood works should have appropriately sized culverts, or flood paths through roads regardless of their height.	The proposed rules in the draft FMP will require the installation of causeways for access roads constructed within a floodway to allow for the adequate passage of floodwater. This requirement may also apply in other areas of the floodplain depending on where and how the floodwater moves.
Access roads should be permitted as long as there are pipes/culverts or causeways.	See response above.
Causeways are preferred over pipes and culverts that always get blocked, particularly on local roads.	See response above.
All levee banks need to be licenced. Roads can act as levees and must have culverts that are able to let water through at a predeterminate size.	See response above. In NSW all flood works require a flood work approval under the WM Act, unless an exemption applies. The proposed rules in the draft FMP will require the installation of causeways for access roads constructed within a floodway to allow for the adequate passage of floodwater. This requirement may also apply in other areas of the floodplain depending on where and how the floodwater moves.

Feedback	Departmental response
	With regard to public roads, it is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the floodplain. The department will raise this feedback with the relevant local councils and other government agencies.
No works should be permitted unless they have approvals. An approval process brings transparency, accountability and integrity to the system, all of which I think are absent at the moment.	In NSW all flood works require a flood work approval under the WM Act, unless exempt, regardless of whether a floodplain management plan is in place. The FMP will provide clarity about where flood works may be constructed on the floodplain and will streamline the approval process for new and amended flood works. This coordinated approach aims to minimise future changes to flooding behaviour, increase awareness of the risk to life and property from the effects of flooding; and to contribute to improved environmental health of the floodplain.
We are against all flood work types being constructed as they cause the floodwater to impact other properties.	The types of flood works proposed to be permitted within floodways balance the need to protect life, infrastructure, or stock, with the potential impact they may have on the flow and distribution of floodwater.
No flood works should be permitted on the floodplain that cause floodwaters to build up or change the flow of floodwaters.	See response above.
Floods are a normal part of farming operations in the area, We don't support the use of levee banks.	Under the WM Act, the draft FMP must consider the risk to life and property during times of flood. Levee banks that are designed to protect high value infrastructure such as homes, sheds and stock, are proposed to be permitted within a floodway. Outside of a floodway, levees may be constructed to protect crops, subject to meeting the relevant proposed rules and assessment criteria in the draft FMP.

Feedback	Departmental response
	The intent of the rules and assessment criteria is to minimise impacts on neighbouring properties and the downstream environment. The proposed rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP.
Access roads, supply channels and farm tracks are critical and existing roads and tracks should be allowed to be maintained at their existing height.	Access roads, supply channels and infrastructure protection works, designed to protect high value infrastructure such as homes and sheds, are proposed to be permitted within floodways. Outside of a floodway, some works may be exempt from requiring a flood work approval, including ring embankments around homes and low-level earthworks such as farm tracks. Please see Exemptions to flood work approvals fact sheet on WaterNSW's website for further information.
Landholders require access in an emergency and the flexibility to manage these areas.	See response above.
Infrastructure such as supply channels and dams must be permitted to provide water for stock, otherwise there will be very severe animal welfare consequences.	Supply channels and stock refuges are proposed to be permitted within floodways. Outside of a floodway, the *type* of flood works will not be restricted. Works such as water storage dams will be permitted in addition to supply channels, subject to meeting the relevant proposed rules and assessment criteria in the draft FMP. The proposed rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP.
Existing works that are in a floodway must be permitted and remain intact, including access roads, farm tracks, crossings and bridges.	In NSW, all flood works require a flood work approval under the WM Act, unless exempt, regardless of whether a floodplain management plan is in place. The draft FMP will not set requirements for the removal of existing flood works. The department recognises that existing flood works provide many benefits in terms of access and the protection they provide to life and property in times of flood. The draft FMP will

Feedback	Departmental response
	include pathways for the approval of existing flood works that do not have an approval. Landholders are encouraged to speak to WaterNSW about the status of any existing works. For more information, please contact WaterNSW on 1300 662 077 or customer.helpdesk@waternsw.com.au
Existing infrastructure should be allowed to be retained to allow for the continuation of a longstanding, productive and environmentally sensitive business.	See response above.
Will the FMP require existing flood works to be removed?	See response above.
Existing works that have been in the landscape for a long time should not need to get a flood work approval. Particularly, channel banks, irrigation layouts and roads within the inundation extent and flood fringe. We strongly object to the huge cost and inconvenience, without compensation, when we know the works we have are not causing flooding problems with our neighbours.	In NSW all flood works require a flood work approval under the WM Act, unless exempt, regardless of whether a floodplain management plan is in place. The draft FMP will provide a streamlined approach to the assessment and determination of applications for flood work approvals and will include pathways for the approval of existing flood works that do not have an approval. In response to the feedback received, the department proposes to include unique rules for existing flood works within floodways and the inundation extent. The draft rules will be released for comment during Stage 2 public exhibition.
Currently we have a licensed levee system but this doesn't seem to be mentioned in the list of flood work types permitted.	The draft FMP will set rules for applications for flood work approvals. It will not apply to existing approved flood works unless they are modified, and the modification requires an amendment to an existing flood work approval. The development of the floodway network includes consideration of existing approved flood works in the landscape, which are accounted for in the hydraulic models.

Feedback	Departmental response
The flood fringe should be the least restrictive zone with flexibility for landholders to manage these areas. It is acknowledged that the inundation extent (flood storage) would attract permitted work types with conditions and assessment criteria.	Noted. In NSW all flood works require a flood work approval under the WM Act, unless an exemption applies. The draft FMP will provide a streamlined approach to the assessment and determination of applications for flood work approvals and will include pathways for the approval of existing flood works that do not have an approval. In the draft FMP the rules and assessment criteria for flood work approvals will be the least restrictive in the flood fringe, which includes areas outside of the floodways and inundation extent.
We support the need for major works such as water storage dams, significant levee and water diversion banks, to be approved before construction. However, structures such as water delivery channels, drains, land forming works, access roads must be “grandfathered” to be approved if they have not already been approved.	See response above.
Any existing infrastructure that is in a floodway and was permitted under the old Billabong Creek FMP should be permitted and remain intact, such as access roads, farm tracks and bridges.	See response above.
In the flood fringe: • farmers need to be able to manage and work these zones • farm tracks and irrigation supply channels are essential for the running of our farm.	See response above. In addition, some low risk works including farm tracks outside of floodways may be exempt from requiring a flood work approval.
Many irrigation channels along the Billabong Creek are above ground, with higher channel banks. These channels need to be included in the list.	The draft FMP will provide a pathway for the approval of existing above ground supply channels within floodways. The rules in the draft FMP will not apply to an *existing approved* supply channel unless a modification to the channel is proposed.

Feedback	Departmental response
	Proposals for new supply channels that are within, or cross floodways will be required to be below the natural surface level. Under the WM Act, the draft FMP must consider the risk to life and property during times of flood. The construction of a flood work, such an above ground supply channel, can significantly increase the risk to life and property; both on the landholding where the flood work is constructed and on neighbouring properties. The types of flood works proposed to be permitted within floodways balance the need to protect life, infrastructure, or stock, with the potential impact they may have on the flow and distribution of floodwater.
Need at least a 50cm height limit for channels to operate.	See response above.
Above ground channels in the area have pipes to allow the floodway to get through. Murray Irrigation ensured the pipes were there for the flows to get through.	Noted. The proposed rules in the draft FMP will include specifications for supply channels within floodways, including the construction of structures such as syphons, where relevant, to allow for the adequate passage of floodwater. The draft FMP will provide a pathway for the approval of existing above ground supply channels within floodways.
I agree with the proposed types of flood works that may be considered for approval. However, the requirements for approvals should apply to the whole floodplain, in particular the inundation extent and not just the floodways. Laser levelling, check banks, pumps and pipes should not be approved if the purpose is to avoid providing temporary pondage during large floods or which will interfere with the natural passage of floodwater. For properties within or next to floodways, this may create increased risks to life and property. In my case, neighbouring landowners have carried out works that cause greater inundation.	Noted. FMPs restrict the types of flood works that can be constructed within a floodway to ensure that floodwater can move freely to or from a river or to assets that rely on it. For areas outside floodways, the proposed rules and assessment criteria will allow for floodplain development to occur in a coordinated manner while minimising negative impacts to neighbouring properties and flood-dependent assets. Flood works also have a cumulative impact on the floodplain landscape over time. The proposed rules and assessment criteria are intended to balance the need to protect life and

Feedback	Departmental response
	property with the need to facilitate the orderly passage of floodwater through the floodplain. The proposed rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP
Works associated with 'electricity generating works' (including supporting infrastructure such as access and transmission and temporary construction facilities) should be permitted in floodways.	Major projects which are state significant development or state significant infrastructure are exempt from requiring a flood work approval. The draft FMP only applies to applications for flood work approvals under the WM Act. However, state significant development or state significant infrastructure will be required to address potential flooding impacts as part of the assessment process.
Concern that works which sustain life and farm operations won't be permitted in the FMP and that crossings and water supply channels will be required to be removed.	The draft FMP will provide pathways for the approval of existing flood works in floodways that are critical for access during times of flood and to ensure that landholders can access water rights from water sources. FMPs set rules for the assessment and determination of applications for flood work approvals. They do not set requirements for the removal of flood works. Works within 40m of a riverbank, such as crossings, may be considered controlled activities under the WM Act. You can use the waterfront land e-tool on the department's website to determine if your development is on waterfront land and requires a controlled activity approval from the department.
There are several historical stock waterholes in Wangamong Creek that were constructed before we purchased the property. They are not built up so would not affect flood flows. We removed an earth bank from one of them as water was backing up prior to this. Need to allow for existing flood works like this in the floodways.	Noted. The department is currently reviewing all feedback received to determine if any additional types of existing flood works should be permitted within a floodway.
Allowing someone to build a bank around their house is ok, but I would like to be notified if my	Noted.

Feedback	Departmental response
neighbours built a levee bank as it would significantly impact my property with the amount of floodwater that comes through this part of the creek.	Infrastructure protection works that are for the purpose of protecting homes and sheds during times of flood are proposed to be permitted within a floodway in the draft FMP. However, other levee banks will not be permitted within a floodway as they may significantly increase the risk to life and property; both on the landholding where the flood work is constructed and on neighbouring properties.
If all banks on the floodplain had height limits from ground level, then the water would find its natural path and there would be no point putting banks through depressions which has happened in the upstream Billabong Creek.	Noted. FMPs restrict the type of flood work that can be constructed within a floodway to ensure that floodwater can move freely to or from a river or to assets that rely on it. For areas outside floodways, the proposed rules and assessment criteria will allow for floodplain development to occur in a coordinated manner while minimising negative impacts to neighbouring properties and flood-dependent assets. Flood works also have a cumulative impact on the floodplain landscape over time. The proposed rules and assessment criteria are intended to balance the need to protect life and property with the need to facilitate the orderly passage of floodwater through the floodplain. The proposed rules and assessment criteria will be released for comment as part of Stage 2 public exhibition of the draft FMP.
Within Conargo and the surrounding areas, the mapping identifies Council's, and private infrastructure within the floodway and inundation areas. Some of this infrastructure is critical and essential for the community and supports the wider district, such as the Rural Fire Services shed, which is mapped within the proposed floodway. Lawfully erected structures (with development consent, flood works approval/s or otherwise exempt) should be permitted to be retained within floodways and the inundation extent.	In urban areas, local councils are responsible for managing flood prone land in line with the NSW Flood Prone Land Policy. FMPs acknowledge the role councils play in managing flood risk in these areas and are developed to exist as a complementary process. The draft FMP will not set requirements for the removal of existing flood works. The department recognises that existing flood works provide many benefits in terms of access and the protection they provide to life and property in times of flood. The draft FMP will include pathways for the approval of existing

Feedback	Departmental response
	flood works that do not have an approval (where an exemption does not apply).

We asked stakeholders what the maximum height of a standard access road would be, with 10cm being the lower threshold and 50cm being the upper threshold. Table 9 shows the summary of feedback received and the department's responses.

Table 9: Summary of feedback received on standard access road heights (10 cm to 50 cm)

Feedback	Departmental response
There must be a case-by-case approach to the access road heights. There should be flexibility for access road height to be managed individually.	Applying a maximum height to standard access roads within a floodway balances the need to ensure access during times of flood with the potential impact it may have on the flow and distribution of floodwater. There are some specific aspects of the draft FMP rule set that can be tailored to account for local conditions and needs. This includes the maximum height of standard access roads.
Greater than 50cm as a maximum height above the natural surface would be acceptable. Heights less than 50cm may not be sufficient in some flood situations.	Noted. The department is currently reviewing all feedback received to determine an appropriate maximum height for primary access roads.
A maximum height of 100cm is required for animal husbandry.	See response above.
New standard access roads should be permitted to be 50 to 100cm above the natural surface level.	See response above.
Recommend access road height up to 50cm is allowed.	See response above.
Recommend access road height up to 30cm is allowed.	See response above.
Access road height of at least 20cm is essential.	See response above.
Access road height of 50cm is too high.	See response above.
Ground level is appropriate.	See response above.

Feedback	Departmental response
Farmers must be able to traverse their land to conduct animal husbandry procedures for the health and wellbeing of our animals.	Noted. Applying a maximum height to access roads within a floodway balances the need to ensure access during times of flood with the potential impact it may have on the flow and distribution of floodwater Outside of floodways, some activities considered low risk, such as farm tracks below 150 mm, are exempt from requiring a flood work approval. Stock refuges, for the purpose of protecting stock during times of flood are also proposed to be permitted within floodways.
The access roads need to have amble pipe works, culverts or causeways to allow for consistent flow and to avoid floodwaters backing up.	The proposed rules in the draft FMP will require the installation of causeways for access roads constructed within a floodway to allow for the adequate passage of floodwater. This requirement may also apply in other areas of the floodplain depending on where and how the floodwater moves.
10cm in the light blue area is not enough in the event of a large local rain event. 50cm seems fair if they have culverts.	Noted. The maximum height of standard access roads will only apply to floodways, which are shown as the *dark blue* areas on the proposed floodway network map. Outside of a floodway, in the light blue areas that represent the inundation extent, the height of an access road will not be specified in the draft FMP. Rather, applications for flood work approvals in this area of the floodplain will be assessed against a suite of assessment criteria to ensure that potential flooding impacts on neighbouring properties and the downstream environment are avoided or minimised. The draft FMP will also provide a pathway for the approval of existing access roads that are located within a floodway.
Roads used for project that are State Significant Developments are not considered in the definition of access roads or primary access roads.	Major projects which are state significant development or state significant infrastructure are exempt from requiring a flood work approval. The draft FMP only applies to

Feedback	Departmental response
	applications for flood work approvals under the WM Act. However, state significant development or state significant infrastructure will be required to address potential flooding impacts as part of the assessment process.
Access roads and farm tracks are critical. Need to allow for existing roads and tracks to be maintained at their existing height.	In NSW, all flood works require a flood work approval under the WM Act, unless exempt, regardless of whether a floodplain management plan is in place. The draft FMP will not set requirements for the removal of existing flood works. The department recognises that existing flood works provide many benefits in terms of access and the protection they provide to life and property in times of flood. The draft FMP will include pathways for the approval of existing flood works that do not have an approval.
Existing standard roads should be "grandfathered" as approved.	See response above.

We asked stakeholders what the maximum height of a primary access road should be, with 10cm being the lower threshold and 50cm being the upper threshold. Table 10 shows the summary of feedback received and the department's responses.

Table 10: Summary of feedback received on primary access road heights (10 cm to 50 cm)

Feedback	Departmental response
This rule doesn't allow for individual cases and there must be an allowance/waiver for primary access road height variability on a case-by-case basis.	Applying a maximum height to primary access roads within floodways balances the need to ensure access during times of flood with the potential impact it may have on the flow and distribution of floodwater. There are some specific aspects of the draft FMP rule set that can be tailored to account for local conditions and needs. This includes the maximum height of standard access roads.
High enough to operate safely without causing major hydraulic effect on the floods.	Noted. The department is currently reviewing all feedback received to determine an appropriate maximum height for primary access roads.

Feedback	Departmental response
Farmers must be able to traverse their land to conduct animal husbandry procedures for the health and wellbeing of our animals.	Noted. Applying a maximum height to access roads within a floodway balances the need to ensure access during times of flood with the potential impact it may have on the flow and distribution of floodwater. Outside of floodways, some activities considered low risk, such as farm tracks below 150 mm, are exempt from requiring a flood work approval. Stock refuges, for the purpose of protecting stock during times of flood are also proposed to be permitted within floodways.
50 cm is appropriate, provided that there is adequate cross drainage in the form of a bridge, culvert or spoon drain to allow for the flood of floodwater on its intended path.	Noted. The department is currently reviewing all feedback received to determine an appropriate maximum height for primary access roads. The proposed rules in the draft FMP will require the installation of causeways for access roads constructed within a floodway to allow for the adequate passage of floodwater. This requirement may also apply in other areas of the floodplain depending on where and how the floodwater moves.
10 to 50 because it is primarily access it must be allowed.	See response above.
At least 50cm is essential.	See response above.
New primary access roads should be permitted to be 50 to 100 cm above the natural surface level. Existing primary access roads should be approved without hydraulic assessment.	Noted. The department recognises that existing flood works provide many benefits in terms of access and the protection they provide to life and property in times of flood. The draft FMP will include a pathway for the approval of existing access roads within a floodway. Landholders are encouraged to speak to WaterNSW about the status of any existing works.

Feedback	Departmental response
	For more information, please contact WaterNSW on 1300 662 077 or customer.helpdesk@waternsw.com.au
There needs to be an ample pipe and culverts under the access roads to allow for consistent flow, so the water does not build up.	The proposed rules in the draft FMP will require the installation of causeways for access roads constructed within a floodway to allow for the adequate passage of floodwater. This requirement may also apply in other areas of the floodplain depending on where and how the floodwater moves.
10 cm in the light blue area is not enough in the event of a large local rain event 50cm seems fair to important assets as long as they have culverts.	Noted. The maximum height of primary access roads will only apply to floodways, which are shown as the *dark blue* areas on the proposed floodway network map. Outside of a floodway, in the light blue areas that represent the inundation extent, the height of an access road will not be specified in the draft FMP. Rather, applications for flood work approvals in this area of the floodplain will be assessed against a suite of assessment criteria to ensure that potential flooding impacts on neighbouring properties and the downstream environment are avoided or minimised. The draft FMP will also provide a pathway for the approval of existing access roads that are located within a floodway.
Consideration should be given to the maximum height for roads to be as high as possible for State Significant Developments.	Major projects which are state significant development or state significant infrastructure are exempt from requiring a flood work approval. The draft FMP only applies to applications for flood work approvals under the WM Act. However, state significant development or state significant infrastructure will be required to address potential flooding impacts as part of the assessment process. Please see Exemptions to flood work approvals fact sheet on WaterNSW's website for further information.

Feedback	Departmental response
The bridge to our main residence, shed and sheep yards allows a road train (at maximum) to carefully cross. We would like to have the ability to extend the bridge for larger machinery.	Under the WM Act, works on waterfront land (the land on each side within 40 metres of a riverbank) may be considered controlled activities and are not dealt with in FMPs. You can use the Waterfront land e-tool on the department's website to determine if a proposed development is on waterfront land and if it requires a controlled activity approval.

General feedback

As part of Stage 1 public consultation, stakeholders were able to provide general feedback or any other comments. Some of the general feedback is outside the scope of the draft FMP and is summarised in Appendix 1: Broader issues. Table 11 shows the general feedback that relates to the draft FMP and the department's responses.

Table 11: Summary of general feedback provided by stakeholders

Feedback	Departmental response
The submission process is in the middle of winter crop harvest which means we are spending considerable time in the office reading, collating & giving feedback instead of harvesting. It would have been great to have more time to contact the department and to consider the future implications before submitting a response.	Noted. Where possible, the department will give stakeholders as much time as possible to comment on future consultation materials related to all of the southern Murray–Darling Basin FMPs. Stage 2 public exhibition will provide additional opportunities for community feedback.
We are concerned that our recommendations won't be listened to or taken onboard. Who gets the say, the people who base decisions off maps, or people who live here?	The department is grateful for all feedback received during consultation. As a valley scale plan, the localised expertise provided during consultation is essential for developing and refining the draft FMP. Consultation on the draft FMP is an ongoing process, and we will continue to communicate with the community and stakeholders during Stage 2 public exhibition in mid-2025. The department has also met with representative groups, such as the Yanco Creek and Tributaries Advisory Council, and will continue to do this as part of Stage 2 public exhibition.

Feedback	Departmental response
	The draft FMP will be reviewed at key stages by an interagency working group. This group includes representatives from the NSW Department of Primary Industries (agriculture and fisheries interests), the department's Water Group (water and First Nations interests) and the department's Conservation Programs, Heritage and Regulation Group (environmental interests). Approval from the Minister for Water and concurrence from the Minister for the Environment is required before the draft FMP is given legal status.
Departmental staff should have knowledge of the floodplain management history in the area.	The process to prepare an FMP under the WM Act involves key early steps to understand flood behaviour in the floodplain including: • reviewing the existing and previous planning arrangements including previous guidelines and flood studies [3,4,5] • reviewing other relevant reports and studies such as local council flood risk management plans and flood studies • gathering data and historical flooding information, such as flood imagery, topographical information and flow data from streamflow gauges. The department also completed a listening tour in 2023 to obtain information of local flooding experiences and knowledge. A What we heard report is available on the department's website. Feedback received from the local community during Stage 1 public consultation will be used to inform the development of the draft FMP.
Please get real scientists to look into this plan. This is a horribly thought-out design that will	See response above.

[3]NSW Water Resources Commission (1980) *Guidelines for Billabong Creek Flood Plain Development Walbundrie to Urana*

[4]Bewsher Consulting Pty Ltd (2004) *Billabong Creek Floodplain Management Study (Phase B Report)* prepared for the NSW Department of Infrastructure, Planning and Natural Resources.

[5]Bewsher Consulting Pty Ltd (2002) *Billabong Creek Floodplain Management Plan (Phase A Data Review and Flood Behaviour*, prepared for the NSW Department of Land and Water Conservation.

Feedback	Departmental response
severely impact farming practices and cause financial impacts to farmers.	
Additional locations for one-on-one appointments should be provided in Conargo and east of Jerilderie, such as including Urana, Walbundrie or Rand.	We have taken this feedback on board and have planned additional locations for Stage 2 public exhibition.
There were not enough one-on-one appointments available in-person and some landholders missed out.	See response above.
This program, along with other water related programs consulting simultaneously, are causing mental health concerns among landholders who are already affected by drought and floods, huge increases in water charges and changes to state and federal laws and rules. Landholders are concerned about viability of running the farm.	Noted. We will proactively work with our communications and engagement teams to ensure that consultation periods are better aligned in the future to avoid or minimise the need for landholders and peak stakeholder groups to prepare multiple submissions at once.
There are numerous programs consulting with the public at the same time which takes too much time, money and resources to spend preparing submissions.	See response above. We also encourage interested landholders to book a one-on-one appointment with departmental staff where we can assist in preparing feedback maps and a submission.
Public, town-hall style meetings are preferred over one-on-one style meetings.	The department engages with the community in a variety of ways to obtain as much feedback as possible to inform the development of the draft plan. The department has found the one-on-one meetings to be very constructive in receiving local community feedback and hearing a broad range of local floodplain management issues. The department has also attended group meetings with representative groups, such as the Yanco Creek and Tributaries Advisory Council, and will continue to do this as part of Stage 2 public exhibition.
I was not informed the FMP was being developed. I found out by word of mouth.	The department distributes information about engagement activities for FMPs in a number of different ways to reach as many people as possible in the most efficient way. To promote this public consultation, we:

Feedback	Departmental response
	• posted letters to landholders within the mapped floodways • ran print, social and digital advertisements • sent emails to registered landholders, peak bodies, and the department's Water e-newsletter subscribers. To stay informed about FMPs and other engagement opportunities, please subscribe to receive email updates from the Water Group, including our e-newsletter.
Billabong Creek is currently in good health. Landholders in the area are mindful of what is best for the creek and land. Further rules around land management are unnecessary.	Other feedback during Stage 1 public consultation indicates that flooding issues in the Billabong Creek floodplain are exacerbated by individual landholders constructing flood works without an approval. The FMP will build on the existing floodplain management planning arrangements and will provide clarity about what flood works can be built and where. This ensures that local landholders don't inadvertently cause flooding impacts on their neighbours or the environment.
We are happy with the implementation of the FMP in the area as it may help neighbours to work together to reduce impacts of flooding.	Noted.
Confusion with around the intent of the FMP and potential overlaps with Reconnecting River Country Program, in the form of feedback such as: • my house will be flooded if this goes ahead • my dwelling will be flooded which will reduce the value of the property.	The draft FMP will set rules for what types of flood works can be constructed and where on the floodplain. It does not deal with the take of water or environmental flows. However, the department is currently developing the Reconnecting River Country Program, which is focused on removing constraints to enable more flexible use of water for the environment. A series of proposed environmental flow limit options have been presented through inundation mapping. These options are separate to the floodway network shown in the draft FMP and are below the minor flood level across most of the program area. This inundation mapping can be found on the department's website.

Feedback	Departmental response
	A fact sheet with further information and frequently asked questions about the floodplain management plans and the Reconnecting River Country Program has been published on the department's website and provides clarity about the two programs.
Floods are a normal part of farming operations in the area. We are happy for floodwaters to flow across our cultivated areas as the floodways are only activated during large floods.	Noted.
Local roads such as Federation Way or Pretty Pine Road are causing flooding problems. There needs to be adequate drainage (siphons, culverts and causeways) to allow floodwater to reach the full extent of floodplain and flood runners.	It is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the floodplain. The department will raise this feedback with the relevant local councils and other government agencies.
Irrigation infrastructure such as channels cross floodways and do not have the adequate siphons to allow floodwaters to flow through which is causing localised flooding issues.	FMPs aim to maintain the unimpeded flow of floodwater while balancing the need to protect life and property during times of flood. Where existing floodplain development is approved, refinements have been made to the proposed floodway network to reflect this development. As part of developing the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. The department is currently working through next steps. If you have concerns regarding unapproved works, you can make a report to NRAR: nrar.nsw.gov.au/report-suspicious-water-activities You can also contact NRAR on 1800 633 362 during business hours or via email nrar.enquiries@nrar.nsw.gov.au The department has become aware that not all flood work structures authorised under the Irrigation Corporatisation Act 1994 converted across to flood work approvals under the Water Management Act 2000 and is currently working to rectify this. Any flood work structure built by

Feedback	Departmental response
	an Irrigation Corporations that was not explicitly authorised under the Irrigation Corporatisation Act 1994 or the Water Act 1912 will need to make application for a food work approval.
Our neighbour has constructed flood works that redirect flood water to our property, affecting our farming operations.	See response above.
There is a large dam constructed very close to the creek. We are worried about the impact of flooding in the local area if this were to breakout.	See response above.
Some banks are not legal and are changing the way the floodwater moves.	See response above.
Development east of Jerilderie towards Oaklands contributes to the high flood levels of the Wangamong Creek, which is amplified by changing land use from pasture to cropping. Increased private levee banks to the north side of the Billabong where Wangamong runs in, restrict flows out into the natural floodplain and subsequently push water out to the south side of the Billabong, elevating flood levels on our property. Modern technology has enabled those properties in the flood fringe to dramatically reduce flooding on their properties, increasing flooding further down the system despite being categorised as flood protected areas.	Flood work approvals ensure that the construction or use of a flood work does not negatively affect water sources and their dependent ecosystems, or other water users; and minimises the existing and future risk to human life and property. Areas within the floodplain boundary that are not mapped as being part of the floodway network are categorised as flood fringe. Structures in these areas may still be considered flood works as defined by the WM Act and may require a flood work approval. The draft FMP will allow for floodplain development to occur in a coordinated manner while minimising negative impacts to neighbouring properties and the environment.
The Tombstone and Eight Mile floodways should carry equal amount of floodwater, however the Tombstone floodway caries majority of the floodwater and Eight Mile carries minimal floodwater. WaterNSW and NRAR have been notified of this, but it has not been rectified.	As described above as part of the development of the hydraulic models, the department mapped all structures on the floodplain and categorised those that may be unapproved. The department is currently working through next steps. If you have concerns regarding unapproved works, you can make a report to NRAR: nrar.nsw.gov.au/report-suspicious-water-activities.

Feedback	Departmental response
	You can also contact NRAR on 1800 633 362 during business hours or via email nrar.enquiries@nrar.nsw.gov.au
The mismanagement of banks along the Tombstone and Eight Mile floodways causes a choke to back water up into Lake Uranagong and Bidgeemia, which causes access issues for several months.	See response above.
The Eight Mile floodway needs to be realigned to follow the natural depression west of the culvert on Federation Way. All floodways need to carry their share of water; if this doesn't happen, the floodplain management principles have not been followed. A neighbouring levee with a box culvert must be open to allow for the drainage of local water but can be blocked off during a flood. The neighbour has been abusing that aspect of his licence and I have put in 3 complaints to NRAR. They should not be allowed to keep abusing their levee licence which needs reviewing.	See response above.
There are a few floodways we would like to see flowing again with flows shared 50/50 between neighbours.	See response above.
Development of the floodplain has enhanced the flow of water off the country.	Noted. FMPs aim to maintain the unimpeded flow of floodwater while balancing the need to protect life and property during times of flood. The draft FMP will provide assessment and approval processes to better account for the cumulative impacts produced by floodplain development.
We need to keep wetlands getting flows.	Agree. The draft FMP will provide the framework for coordinating flood work development to minimise future changes to flooding behaviour; improving the environmental health of floodplains and increasing awareness of risk to life and property from the effects of flooding.

Feedback	Departmental response
We are concerned about the need to get a flood work approval for existing works, including the cost for the application. We have existing works approvals for other water infrastructure, so this seems like an unnecessary step. New or proposed works should be treated differently to existing works. Will the cost for WaterNSW applications be recovered via water users?	In NSW, all flood works require a flood work approval under the WM Act unless an exemption applies. The draft FMP will include proposed rules that relate to flood works that were constructed in a floodway prior to the draft FMP commencing. The cost of application fees is set by WaterNSW and is borne by the applicant. They are not set by the Independent Pricing and Regulatory Tribunal (IPART). The cost of hydraulic modelling and other technical studies is determined by the market (consultants). Landholders are encouraged to speak to WaterNSW about the status of any existing works. For more information, please contact WaterNSW on 1300 662 077 or customer.helpdesk@waternsw.com.au
There are several fenced conservation areas where the fences collect debris which caused flows to break out during the 2022 flood.	Noted. The hydraulic models used to delineate the floodway network have several parameters that need to be calibrated to correctly represent how floodway behaves across the floodplain. As part of the model calibration process parameters like the “roughness” of the ground are modified if the results do not align with observed information such as gauge data and satellite imagery. More information about the hydraulic model data and parameters is available in the Report to assist Stage 1 public consultation (see section 4.1.2 Hydraulic modelling).
Dead trees, mostly from trees that grew after the 1956 floods, are causing blockages in the creek. While snags are important for fish, it needs to be balanced with flooding impacts caused by these chokes.	Noted. The FMP will only set rules for what type of flood works can be constructed and where throughout the floodplain. However, the department will pass this feedback on to other relevant government agencies

Feedback	Departmental response
The ecological sites layer was not working when accessing the website remotely. However, landholders who met with the team were able to view these sites. This must be available for response in the Stage 2 public exhibition period.	Detailed instructions on how to access various layers on the interactive spatial map will be made available during Stage 2 public exhibition.
Will the plan cause Billabong Creek to stop flowing?	No. The FMP will only set rules for what type of flood works can be constructed and where throughout the floodplain.
We are keen for the FMP to allow the continued viability of a best practice operation which delivers benefits to the community, the environment and stock.	Noted. FMPs provide the framework for coordinating flood work development to minimise future changes to flooding behaviour, improving the environmental health of floodplains and increasing awareness of risk to life and property from the effects of flooding. FMPs provide clarity about where flood works may be constructed on the floodplain and streamline the approval process for new and amended flood works.
The township of Urana should be mapped as an urban area, as it includes heritage sites that are vulnerable to the effects of flooding.	Noted. The allocation of management zones in the draft FMP will include urban areas, where flood risk management is primarily the responsibility of the local council.
An embankment is required around the town of Urana to protect the urban area, including heritage properties, from flooding.	See response above. The department will pass this feedback on to the local council.
The draft FMP would impose unnecessary hardship on landholders and agricultural businesses, due to: • longstanding agricultural uses being disrupted, threatening livelihoods • the FMP lacking practical benefit for landholders • inaccurate mapping based on outdated or inflated data	Noted. In NSW, all flood works require a flood work approval under the WM Act, regardless of whether there is an FMP in place. FMPs provide the framework for coordinating flood work development to minimise future changes to flooding behaviour, improving the environmental health of floodplains and increasing awareness of risk to life and property from the effects of flooding.

Feedback	Departmental response
• townships being part of the floodway network when they didn't flood. Unjustified economic impact on local communities through restricted land use and increase cost of land management.	FMPs provide clarity about where flood works may be constructed on the floodplain and streamline the approval process for new and amended flood works. The floodplain management planning approach has been revised in response to changes to the legislative and policy framework that governs water management in NSW. The floodplain management planning approach has been updated to satisfy the provisions of the WM Act, including dealing with the risk to life and property from flooding.
Using a flood that has benefit to the riparian and localised floodplains is supported. An FMP that will protect targeted environmental areas but still allow a productive agricultural industry to not only survive but thrive is supported.	Noted.
The draft FMP describes 'flood works' as structures that alter the flow of water to/from a river or alter the movement of floodwater during a flood. We would like to see further definition around 'flood works' to better understand what works may be considered to be included or may be considered exempt.	The meaning of 'flood work' is defined in the Dictionary of the WM Act. Some examples of flood works include, but are not limited to: • access roads • supply channels • levee banks • embankments • banks and other earth works used to protect homes, sheds and livestock during flood events. Please see Exemptions to flood work approvals fact sheet on WaterNSW's website for further information.

Next steps

The feedback outlined in this report is informing the development of the draft FMP. The department will refine the proposed key elements where it is indicated in our responses that a change will occur. Feedback that is not factored into the draft FMP will be communicated in future documents.

Consultation on the draft FMP is an ongoing process, and we will continue to communicate with the community and stakeholders. Public exhibition of the draft FMP is scheduled for April 2025. We will share project updates on our website at: water.nsw.gov.au/billabong-creek

Appendices

This section provides a summary of the feedback received on the key elements presented in the Report to assist Stage 1 public consultation. This feedback includes submissions received, and questions and comments made in appointments with departmental staff.

Appendix 1: Broader issues

The issues summarised in Table 12 are out of scope for the development of the draft FMP. However, they are provided for information and context.

Table 12: Summary of broader issues raised during Stage 1 public consultation

Feedback	Departmental response
There was a huge impact of floods in this area for some homes and no help was given apart from the local community.	Noted. FMPs cannot provide a comprehensive response to flooding. However, the department will raise this feedback with the relevant emergency management agencies.
The 2022 flood response from SES was dismal but RFS were great.	See response above.
The levee built in 1974 that protects Conargo from flooding has not been maintained and was breached in the 2022 flood. The levee needs to be repaired, extended and raised. Advised the council but nothing has been done.	In urban areas, local councils are responsible for managing flood prone land in line with the NSW Flood Prone Land Policy. FMPs acknowledge the role councils play in managing flood risk in these areas and are developed to exist as a complementary process. The department will raise this feedback with the relevant local council.
Culverts that cross the Cobb Highway up near Cooper's Swamp need to be cleaned out regularly, not just after a flood. Plus clearing out blue bush which grows up in low points and blocks flows.	See response above.
The bridge at Carrathool Road is impeding flows.	See response above.
A landholder pumps waste irrigation water into Billabong Creek, despite it being contaminated with chemicals. This shouldn't be allowed.	Pollution of beaches, estuaries, tidal lakes, rivers, creeks, streams and lakes should be reported to local councils.

Feedback	Departmental response
	For more information, visit the NSW Environmental Protection Agency's (EPA) website.
Over-flooding of vegetation will cause negative environmental outcomes, such as increased mosquitoes and related diseases, weed infestations, biosecurity issues and an increase in feral animals (pigs).	Noted. The FMP does not deal with environmental water flows. However, your comment may be related to the environmental flows proposed under the Reconnecting River Country Program. It is important to note that these proposed environmental flows are generally below the minor flood level. Further information on this program can be found at Reconnecting River Country Program.
Wangawong Creek is an ungauged catchment. There needs to be more gauges so that it can be monitored to assist with management.	Noted. The department will consider Wangamong Creek for possible future investment in the hydrometric network. More information about the most recent additions to the hydrometric network and the NSW Government's work in this space is available on the department's website.
There are a limited number of gauges and none for Urana or Rand.	Noted. As described above, additional hydrometric gauging stations in the Billabong Creek floodplain may be considered as part of future investment in the hydrometric network.
What are you doing about TransGrid raising the road heights which will impact the direction of floodwater?	It is important that road construction and maintenance is undertaken in a manner that ensures flood flow connectivity throughout the floodplain. Major projects which are state significant development or state significant infrastructure are exempt from requiring a flood work approval. The draft FMP only applies to applications for flood work approvals under the WM Act. However, state significant development or state significant infrastructure will be required to address potential flooding impacts as part of the assessment process.

Feedback	Departmental response
The 2022 flood caused enormous animal husbandry issues for stock and native species due to the putrid flood water that carried dead animals and weeds along the waterways.	Noted. FMPs cannot provide a comprehensive response to flooding. However, the department will raise this feedback with the relevant emergency management agencies.
I am concerned about the lost lucerne crops due to weed infestation which weren't there prior to the 2022 floods. We've been unable to have stock in the area, resulting in a considerable expense to our business.	Noted. As described above, the FMP cannot provide a comprehensive response to flooding. It will only set the rules for flood works on the floodplain. Local Land Services is responsible for providing support to manage pests, weeds, and diseases.
Local rules should be considered to facilitate connectivity between upstream and downstream for fish movement.	A key objective of the draft FMP will be to maintain flood connectivity to flood-dependent ecological assets. This means that flood works should not block the floodways that allow native fish species to move between upstream and downstream habitats as well as adjacent riparian and floodplain areas.
The draft Plan does not make it clear how major projects would be assessed.	Major projects which are state significant development or state significant infrastructure are exempt from requiring a flood work approval. The draft FMP only applies to applications for flood work approvals under the WM Act. However, state significant development or state significant infrastructure will be required to address potential flooding impacts as part of the assessment process.
I have informed multiple agencies including WaterNSW, NRAR and local council about illegal water diversion onto my property resulting in loss of income and have not received an outcome.	NRAR has received a significant number of complaints about unapproved flood works during and following the 2022 flood events. As part of the development and implementation of the FMPs, the department will work through the next steps to bring priority unapproved flood works into compliance.
The 2022 floods around Jerilderie were worse due to the height of the Algudgerie Weir. The weir forms a fixed crest, resulting in higher water levels all year round in the Billabong which backs up the Wangamong Creek. Silt has	Noted. The Algudgerie Weir is managed by a private water trust and will generally be overtopped by large flood events.

Feedback	Departmental response
built-up and Cumbungi is growing in the whole area. Wangamong Creek would normally be dry. In 2022 the area of flood affected farmland was greater than ever before.	More information about the maintenance and management of water infrastructure as part of private water trusts is available on the department's website.
Algudgerie weir should be reduced by 6 inches due to the impacts.	See response above.

Appendix 2: Design flood selection

In response to the feedback received on the selected design floods, the department has completed a review of the relevant data and information to determine the appropriateness of the 2022 and 2012 flood events for the purpose of delineating the proposed floodway network for the Billabong Creek floodplain.

Importance of the large design flood

When modelling and mapping a floodway network with adequate hydraulic capacity and continuity to effectively convey floodwaters, an appropriately large flood event must be selected. This is known as the large design flood.

The selection of a flood event that is too small may lead to:

- floodways (high-risk areas of fast flowing floodwater) not adequately identified in the floodplain
- an increased risk that the determining authority for flood work approvals (WaterNSW for most landholders and the department for its customers) will not have enough information to adequately determine whether proposed flood works will have an acceptable flooding impact on neighbouring properties and the surrounding floodplain environment. This assessment is critical in floodways, where even if only a partial blockage would cause significant changes in the movement of floodwater across the floodplain. For areas in the inundation extent, it is important that flood works are constructed in a coordinated manner so that they so that they do not block inundation, which in turn could dramatically increase the depth and speed of floodwater in the floodways.
- an increased risk that flood works are approved and constructed that may cause unacceptable flooding impacts and pose potentially significant risks to life and property and the environment.

Under the WM Act, the draft FMP must consider the risk to life and property from the effects of flooding.

Spatial review of the proposed floodway network

The hydraulic modelling results and satellite imagery from the 2012 flood event were reviewed and compared to the proposed floodway network based on the 2022 flood event. The focus of the review was to determine whether the 2012 event was representative of the key floodways identified within in the floodway network.

This analysis showed that the 2012 flood event underrepresents key floodways in a number of locations in the lower Billabong Creek area of the floodplain. Examples are shown in Figure 2 and Figure 3 for Two Mile Creek and Carroonboon Creek respectively. The darker blue area in the figure indicates the proposed floodways using the 2022 flood event while the light blue shows the inundation extent using the 2012 flood event. The difference demonstrates that the 2012 flood event does not reach the threshold for inclusion as floodways (depth and velocity product) but the thresholds were met in the 2022 flood event.

The analysis also showed that below Jerilderie, 25 key floodways that are similar to these examples (as well as many other smaller, shorter floodways) are represented in the 2022 flood event but not in the 2012 flood event. If these floodways were not included in the floodway network, there is potential for the approval of inappropriate development in these areas, leading to unacceptable

flooding impacts on neighbouring properties or changes to flood flow connectivity to ecological and cultural assets.

Figure 2: Key floodways within Two-Mile Creek that were not activated during the 2012 flood event

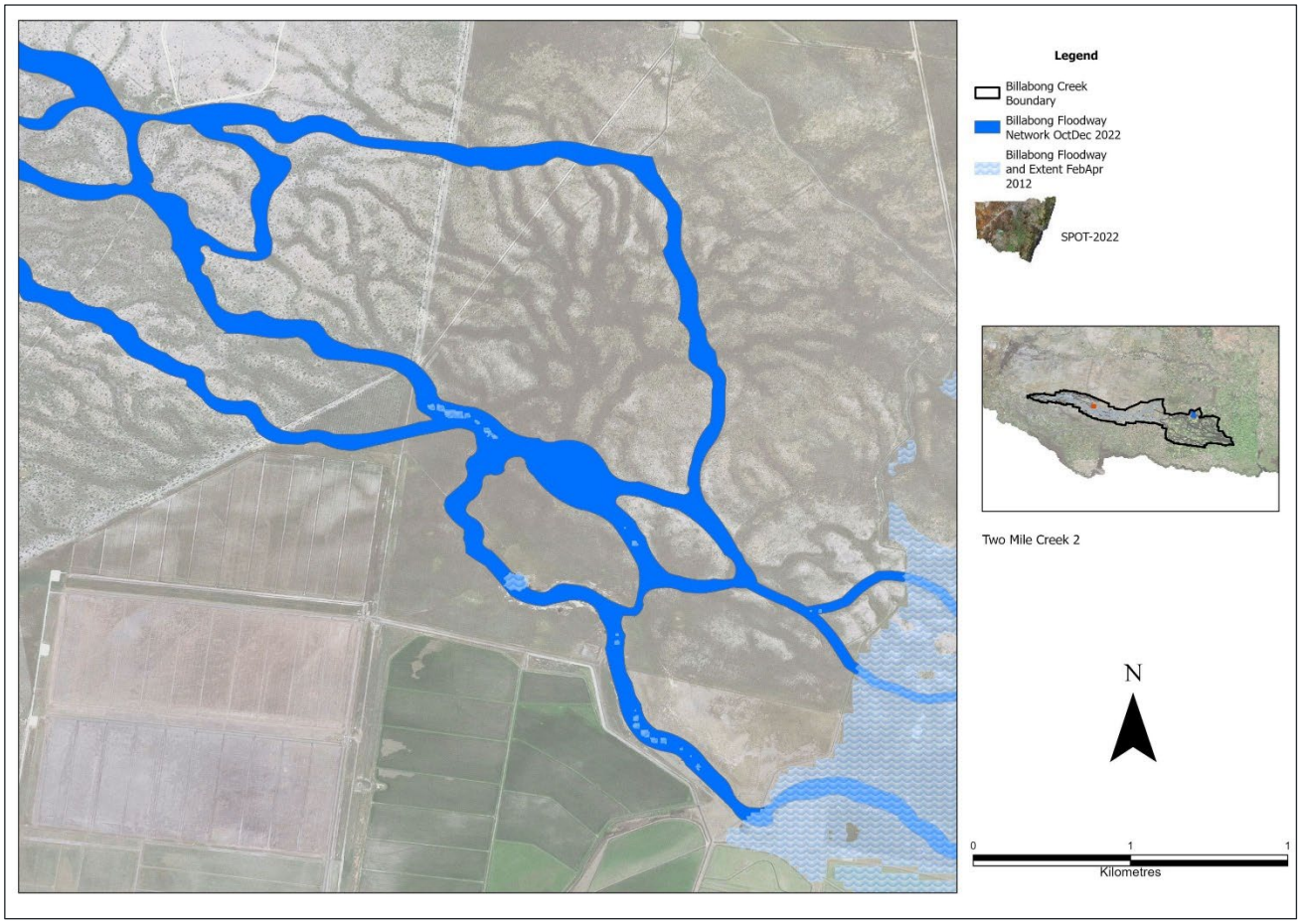
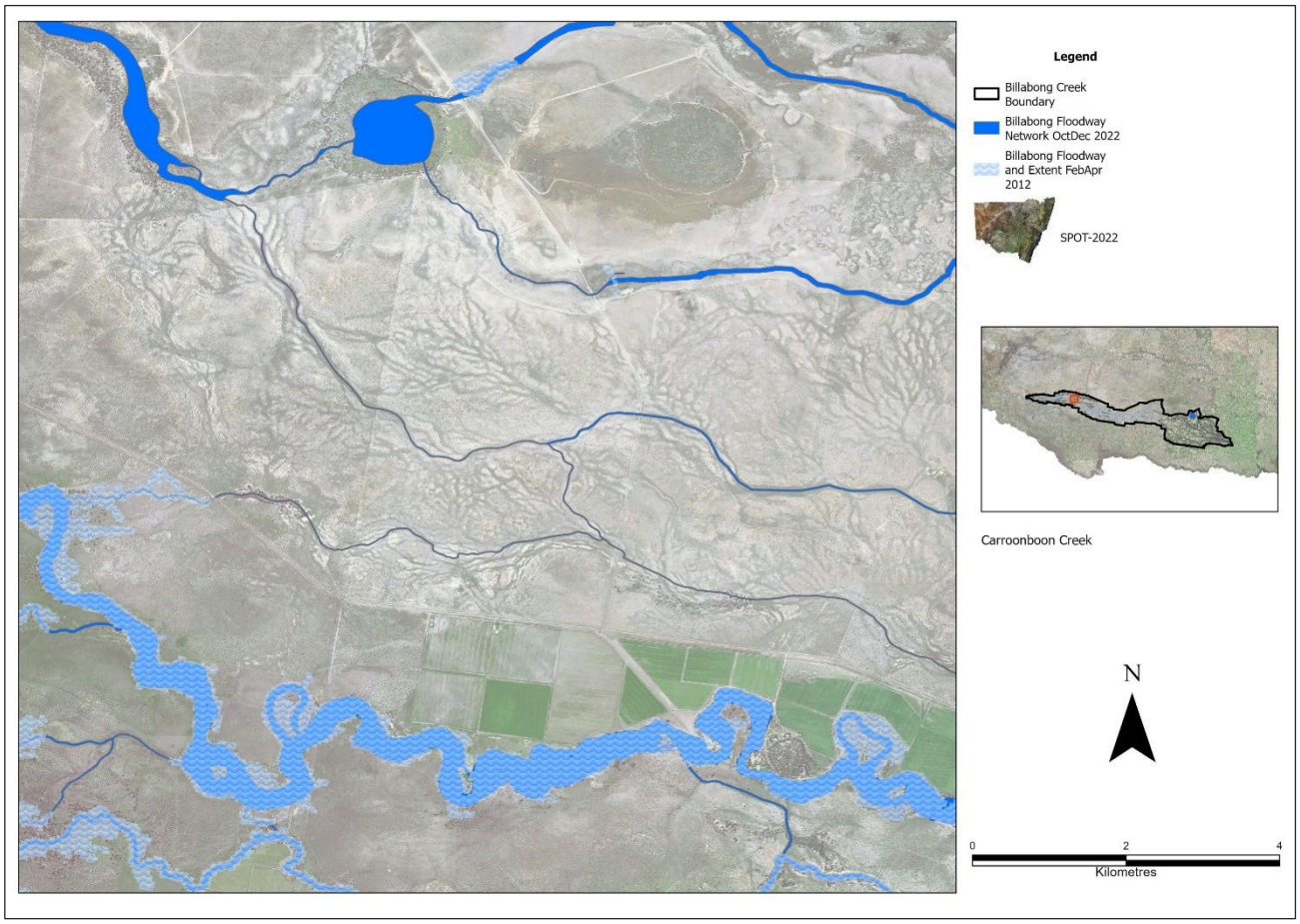


Figure 3: Key floodways within Carroonboon Creek that were not activated during the 2012 flood event



Review of historical flood event probabilities

As part of the selection of design flood events, historic floods are assessed and their probability of occurrence in any given year across the floodplain is investigated. This is typically demonstrated through a flood frequency analysis which is a standard assessment undertaken to determine the relative sizes of floods in terms of Annual Exceedance Probability (AEP)[6].

AEP is the probability of an event occurring or being exceeded within any given year. It is expressed as a percentage which is the inverse of the previously used Average Recurrence Interval (ARI). For example, a 5% AEP event is analogous to a 1 in 20 Year ARI and a 1% AEP event is analogous to a 1 in 100 Year ARI. The AEP terminology is mandated by Engineers Australia[7].

A large design flood should have an AEP of 5% or less[5]. The FMPs developed in the northern Murray-Darling Basin used large design floods ranging from 1%-5% AEP. By comparison, flood risk management planning in urban areas uses a larger design flood of 1% AEP with a further 0.5 m

[6] Department of Industry and Planning and Environment (2020) *Rural floodplain management plans: technical manual for plans developed under the Water Management Act 2000*

[7] Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) (2019) Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia

freeboard added to account for uncertainty[8]. Ultimately, this means that the rules in the draft FMP will be somewhat more flexible for landholders in the rural areas of the floodplain when it comes to floodplain development, as opposed to the requirements for development within urban areas that are managed by local councils (but where the risk to life and property is also higher due to higher density development).

Floods can be highly variable. Due to differences in peak flood levels duration of floods throughout a floodplain, a flood event used as a large design flood in one catchment may not be applicable to another catchment. To assess the suitability of a flood event, the AEP is determined at hydrometric gauges throughout a floodplain.

Table 13 and Table 14 show the AEP (%) at gauges throughout the Billabong Creek floodplain and for comparison, gauges throughout the Murrumbidgee Valley Floodplain for both the 2012 and 2022 flood events. The tables show that the 2022 flood event is more suitable for the Billabong Creek floodplain, with an AEP of 5% or less at 3 of the 4 gauges, compared to the 2012 flood event where only 1 of the 4 gauges has an AEP of 5% or less. Conversely, in the proposed Murrumbidgee valley floodplain, the 2012 flood event is more suitable, with 5 of the 6 gauges meeting an AEP of 5% or less compared to the 2022 flood event where 4 of the 6 gauges have an AEP of 5% or less.

Table 13: Comparison of the estimated equivalent AEP for the 2012 and 2022 flood events in the proposed Billabong Creek floodplain

Gauge location	Estimated equivalent AEP for the 2012 flood event (%)	Estimated equivalent AEP for the 2022 flood event (%)
Billabong Creek at Walbundrie (410091)	6.3	7.7
Billabong Creek at Jerilderie (410016)	20	5*
Billabong Creek at Conargo (Puckawidgee) (410017)	5*	2.9*
Billabong Creek at Wanganella (41010810)	7.8	3.1*

Table 14: Comparison of the estimated equivalent AEP for the 2012 and 2022 flood events in the proposed Murrumbidgee valley floodplain

Gauge location	Estimated equivalent AEP for the 2012 flood event (%)	Estimated equivalent AEP for the 2022 flood event (%)
Yanco Creek at Offtake (410007)	1.5*	4.2*
Yanco Creek at Morundah (410015)	5.6	2.9*
Murrumbidgee River at Wagga Wagga (410001)	2.5*	11
Murrumbidgee River at Narrandera (410005)	2.1*	5.9

[8] Australian Institute for Disaster Resilience (AIDR) (2017) *Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia*. Australian Institute for Disaster Resilience

Gauge location	Estimated equivalent AEP for the 2012 flood event (%)	Estimated equivalent AEP for the 2022 flood event (%)
Murrumbidgee River at Darlington Point (410021)	1.4*	2.9*
Murrumbidgee River downstream Hay Weir (410136)	4.4*	2.2*

*Green values in the table indicate that the estimated equivalent AEP is within the appropriate range for a large design flood. Whereas red values (all other values) indicate that the estimated equivalent AEP is outside of the range for a large design flood.

Comparison to the existing localised FMP

When developing an FMP, consideration should be given to the existing or previous floodplain management planning arrangements, including the design floods used in existing localised FMPs. The existing Billabong Creek FMP 2006 used the 1974 and 1983 flood events as the large design flood. Comparison of the 1974, 2012 and 2022 flood events in Figure 4 shows that:

- The peak of the 2022 flood event (red line) was smaller than the 1974 flood event (blue line) and had a comparable duration (i.e. number of days average daily flow was over 6,000 (ML/day)
- The 2012 flood event (green line) had the lowest peak flood level and had significantly shorter duration with no flows over 6,000ML/day recorded at Jerilderie.

This data shows that the 2022 flood event was hydrologically more similar to the 1974 flood event than the 2012 flood event while still being considerably smaller in peak flow and volume than the 1974 flood event.

The use of the 1974 as the design flood for the draft FMP was not possible due to a lack of data on the topography, the level of floodplain development and flood data (for example, flow data and flood imagery) required to set up and calibrate a two-dimensional hydraulic model.

Figure 4: Historical flood flows in a 150-day period for peak floods at the Billabong Creek at Conargo gauge (410017)

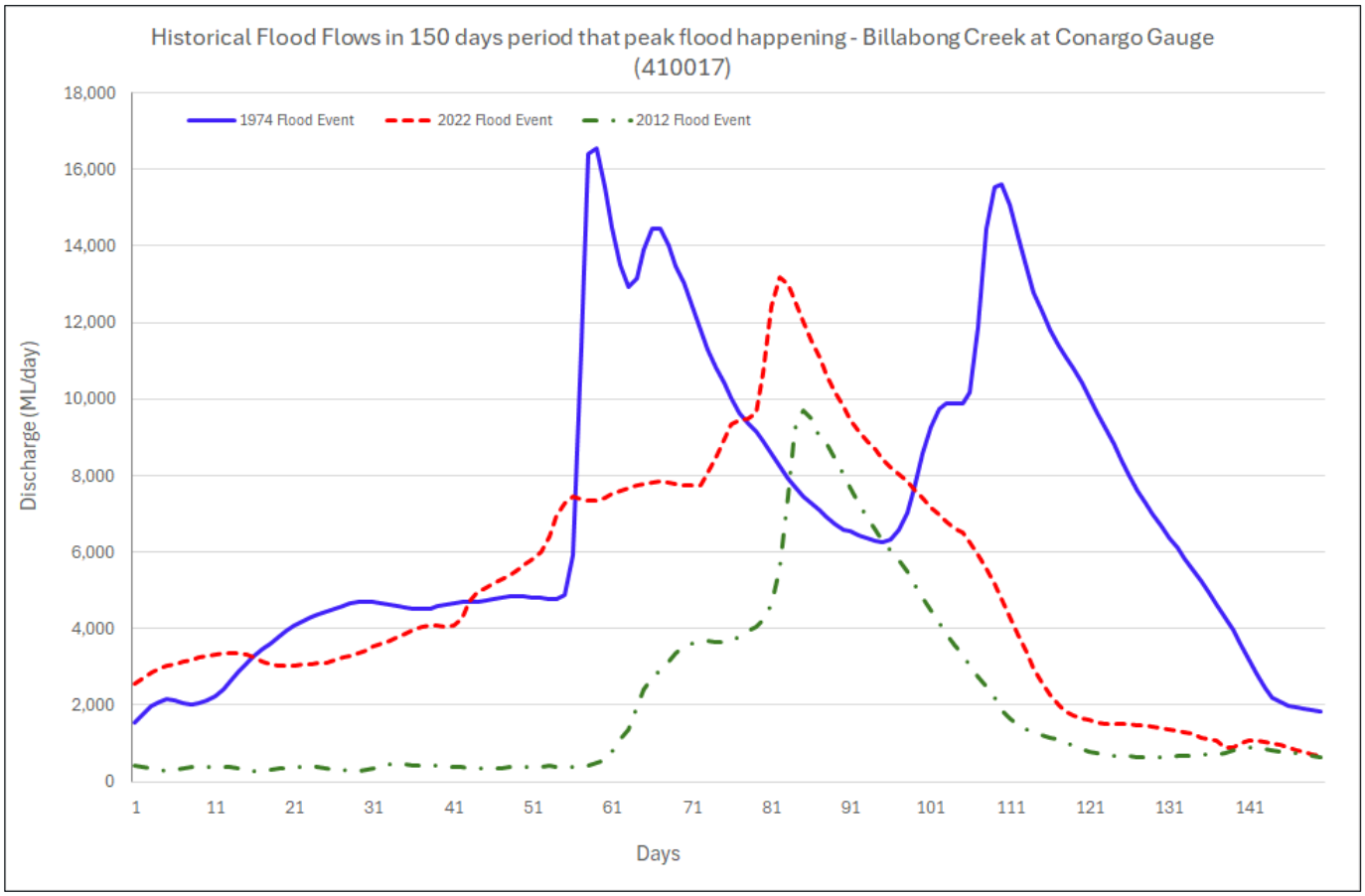


Table 15: Number of days average daily flow was over 6,000 (ML/day) Peak flow (ML/day) and Estimated Equivalent AEP (%) at Billabong Creek for 1974, 2012 and 2022 flood events

Item	Flood event	Billabong Creek at Conargo (410017)	Billabong Creek at Jerilderie (410016)
Number of days average daily flow was over 6,000 ML/day (day)	1974	76	78
	2012	14	0
	2022	55	48
Peak Flow (ML/day)	1974	16,545	9,152
	2012	9,709	4,060
	2022	13,182	7,294
Estimated Equivalent AEP (%)	1974	1.3	2.2
	2012	5	20
	2022	2.9	5

Runoff from the Colleambally catchment and local rainfall

One of the issues raised during consultation was the large depth of local rainfall and runoff volume that flowed into the Billabong Creek floodplain from the Colleambally catchment. There is a lack of rainfall data available in the catchment, particularly sub-daily rainfall data and analysis, which was limited to daily rainfall stations. Table 16 shows that the 2022 flood event had the highest rainfall depths and overall intensity, with the next biggest rainfall occurring in 2011.

A rainfall frequency analysis was undertaken to determine the AEP. However, this analysis accuracy is limited due to the relatively short (< 10 year) record, and the only available sub-daily gauges are located in the upper Billabong Creek catchment. These events suggested that the 24-hour rainfall total would be approximately a 10% AEP (41000279).

The 2022 flood event had the highest rainfall depths during recent floods and review of satellite imagery shows that the Colleambally runoff was considerable. However, analysis of the limited available data suggests that the rainfall was still within the expectations of a moderate sized flood and is likely to occur again in the future.

Further to this, while the hydraulic modelling does include estimates of the runoff from Colleambally, it does not include "local rainfall" which would be falling on the floodplain itself, which may mean an under-representation of inundation extents where that local rainfall is sufficient to generate overland flow.

Table 16: Analysis of rainfall during flood periods at Colleambally (74249)

Event	Rainfall Depth (mm)	Period (Days)	Average Intensity (mm/hr)
1974	290	248	0.05
1983	126	81	0.06
2008	36	56	0.03
2010	242	98	0.10
2011	331	106	0.13
2012	186	89	0.09
2016	221	123	0.08
2022	445	123	0.15

Summary of the data review

The Technical manual for FMPs developed under the *Water Management Act 2000*[9] provides guidelines for selecting an appropriate large design flood. A summary of the 'large design flood' criteria is provided in Table 17.

The data review indicates that:

[9] Department of Industry and Planning and Environment (2020) *Rural floodplain management plans: technical manual for plans developed under the Water Management Act 2000*

- the 2022 flood event meets the majority of the criteria for a large design flood event
- the 2012 flood event only meets one of the criteria for a large design flood event
- spatial analysis shows that the 2012 flood event does not identify floodways in key areas of the floodplain, compared to the 2022 flood event
- analysis of historical flood events showed that the 2022 flood event was more similar to the 1974 flood event which was the large design flood used in the existing localised FMP
- the 2022 flood event is consistent with the annual exceedance probability (AEP) of other large design floods used in the development of existing rural FMPs under the WM Act
- the 2022 flood event is the most recent large flood that is within the living memory of the local community and there is a significant amount of information available for calibration and validation of the hydraulic modelling.

At least two flood events in the last 70 years in the Billabong Creek floodplain have been larger than the 2022 flood, including the 1956 and 1974 events which had 66% and 27% higher peak flows than the 2022 at Conargo respectively. Whilst acknowledging the devasting impact of the 2022 floods across all of the southern inland floodplains, it is likely that there will be more flooding in the future of a similar or larger magnitude than the 2022 flood. As such, the precautionary principle suggests that the 2022 flood event is more appropriate than the 2012 flood event for determining the extent of the proposed floodway network in the Billabong Creek floodplain.

In response to the feedback received, the department is also considering steps to mitigate the impact of the draft FMP by including unique rules for existing flood works within the proposed floodways and the inundation extent. The draft rules will be released for comment during Stage 2 public exhibition in April 2025.

Table 17: Summary of large design flood criteria for 1974, 2012 and 2022 flood events

Design flood criteria	1974 flood event	2012 flood event	2022 flood event
Most recent large flood	✗	✗	✓
Representative of large flood in valley	✓	✗	✓
Significant information available for the event	✗	✓	✓
Previously used and widely accepted as the design flood	✓	✗	✗
AEP less than 5% at most gauges	✓	✗	✓

Design flood criteria	1974 flood event	2012 flood event	2022 flood event
Comments	• Used in the existing localised FMP	• Used in Murrumbidgee Creek FMP • Exceeded 5% AEP at most gauges and is too small for the recommended range for a large design flood • Known floodways are not activated during the flood event	• Meets the majority of criteria for a large design flood • Known floodways are activated during the flood event

Appendix 3: Refined floodway network maps

The following maps (Figures 5 to 10) provide an overview of refinements to the proposed floodway network in response to stakeholder feedback. Red areas show where part of the proposed floodway have been removed in response to feedback. Pink areas show where part of the inundation extent have been removed in response to feedback. The updated proposed floodway network is shown in bright blue (floodways) and pale blue (inundation extent) and will be available in an interactive spatial map as part of Stage 2 public exhibition.

Figure 5: Refinements made to the proposed floodway network in the upper Billabong Creek area around Walbundrie, Oaklands and Urana

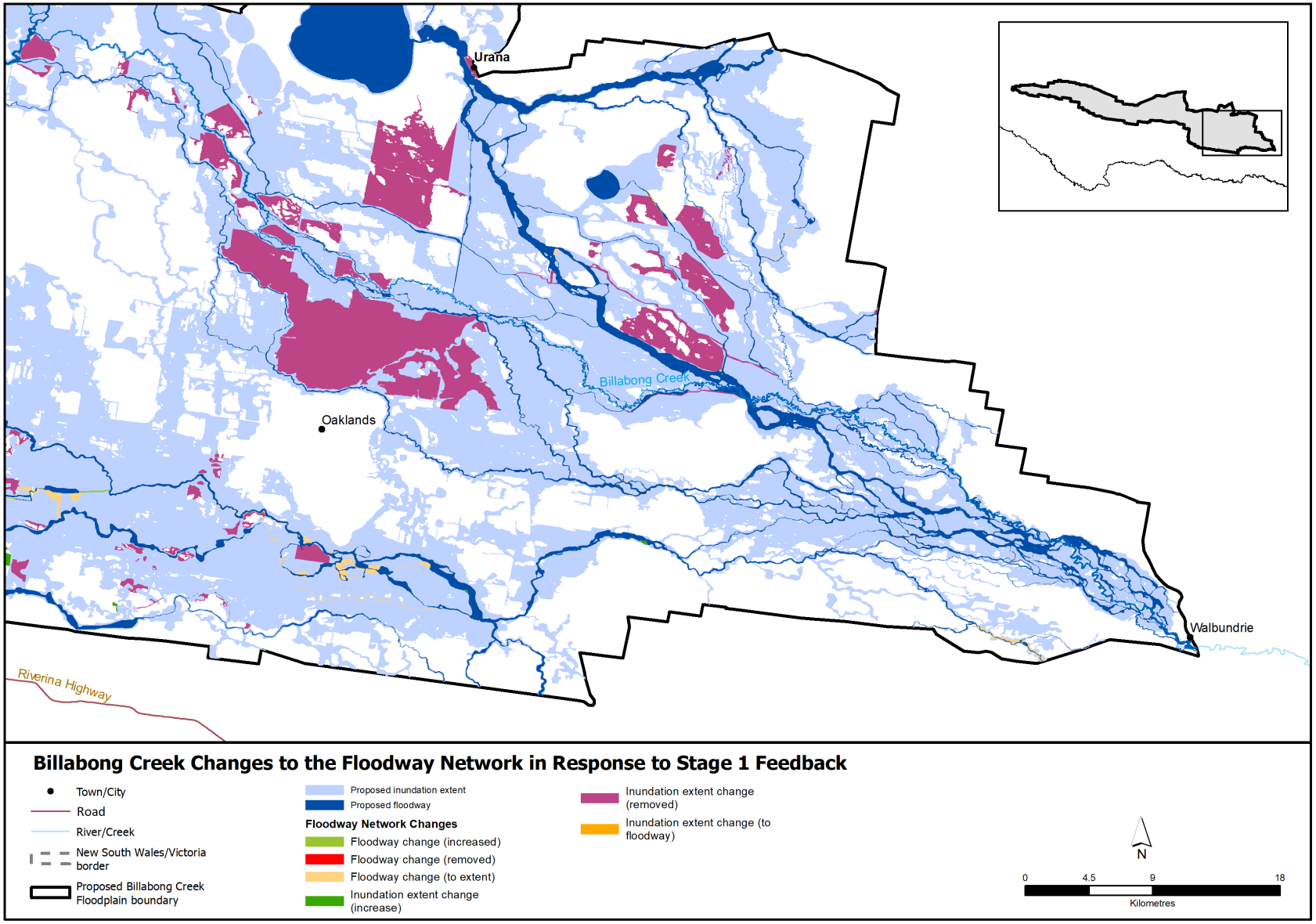


Figure 6: Refinements made to the proposed floodway network in the upper Billabong Creek area between Oaklands and Jerilderie

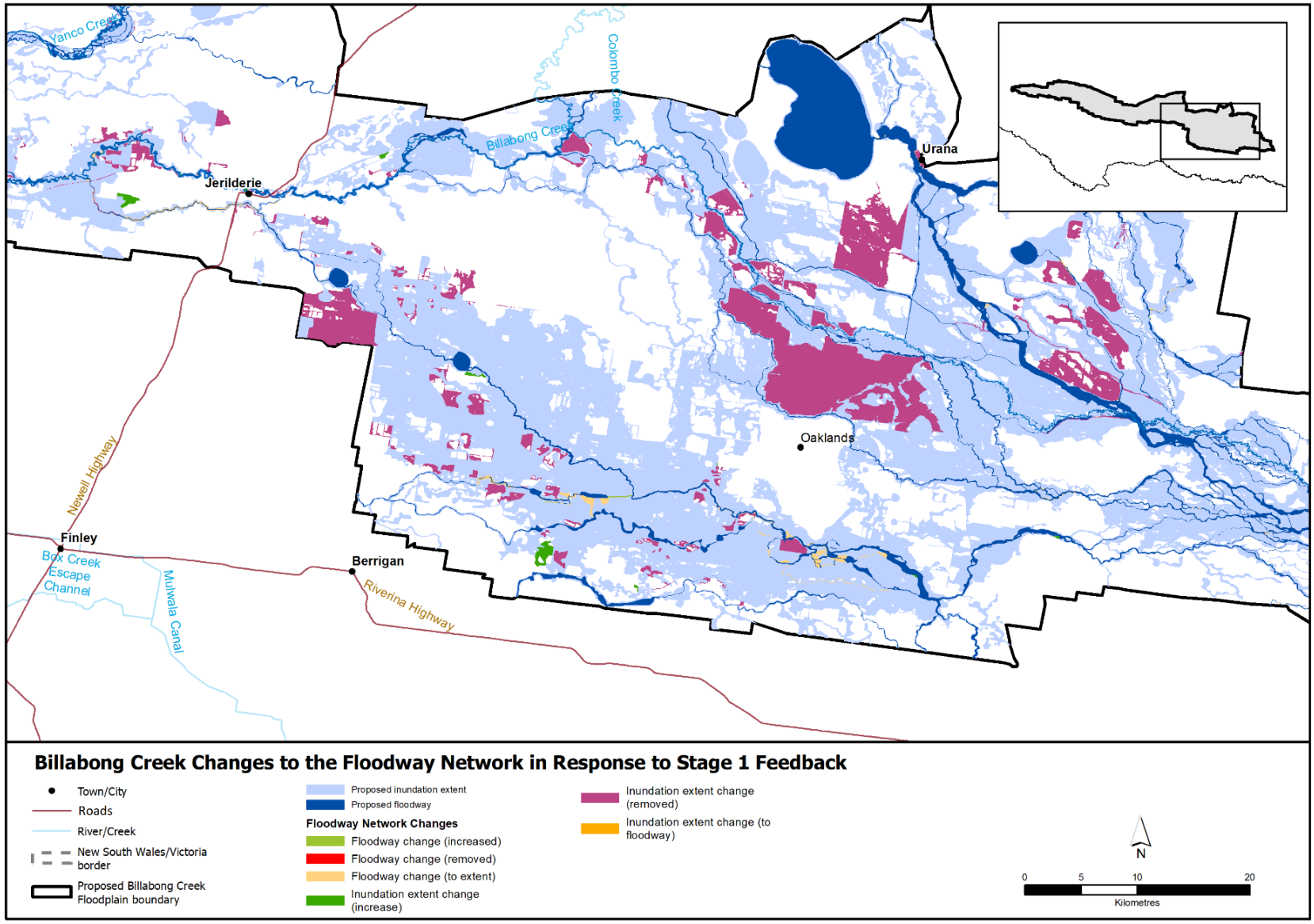


Figure 7: Refinements made to the proposed floodway network around Jerilderie

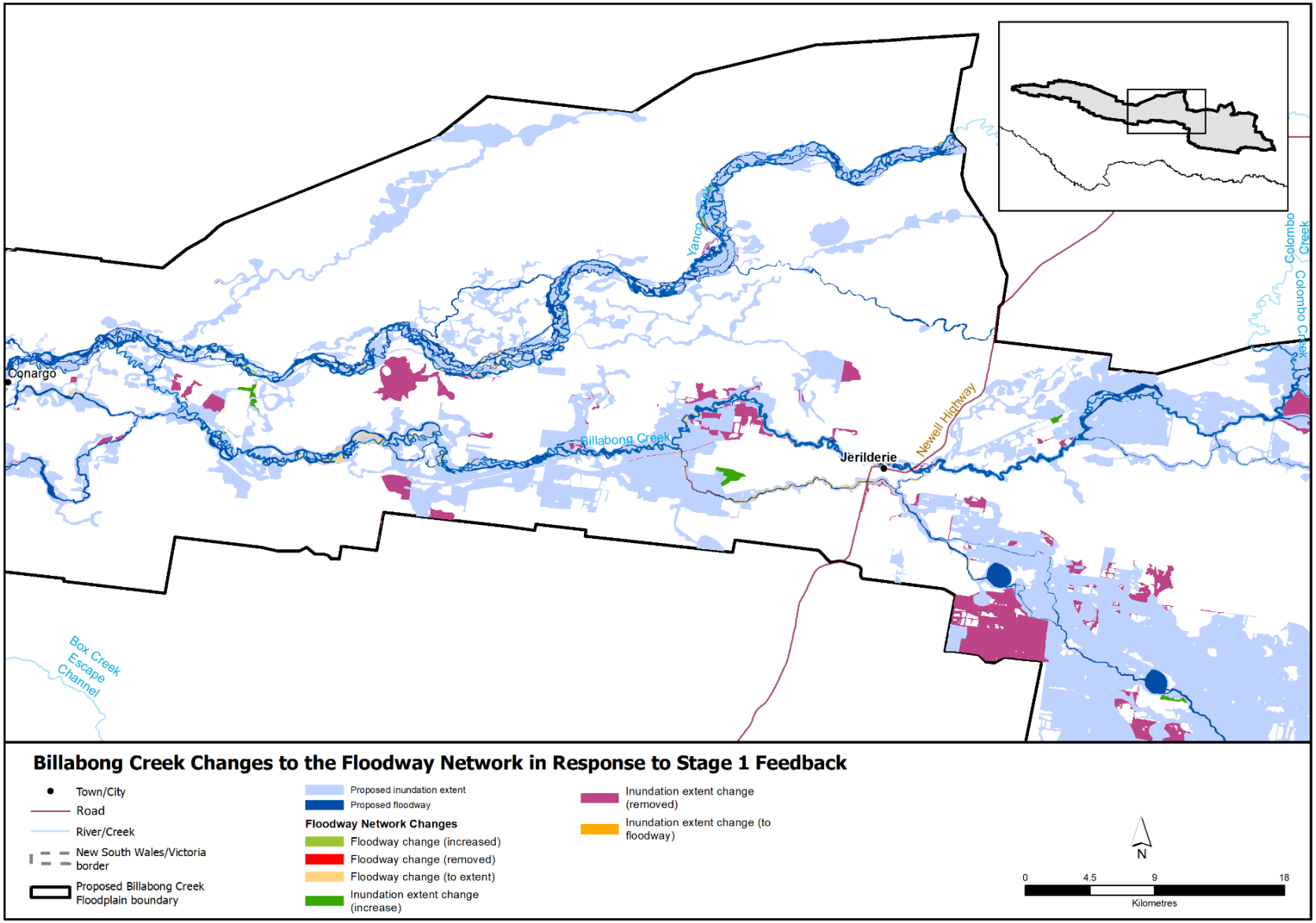


Figure 8: Refinements made to the proposed floodway network around Conargo

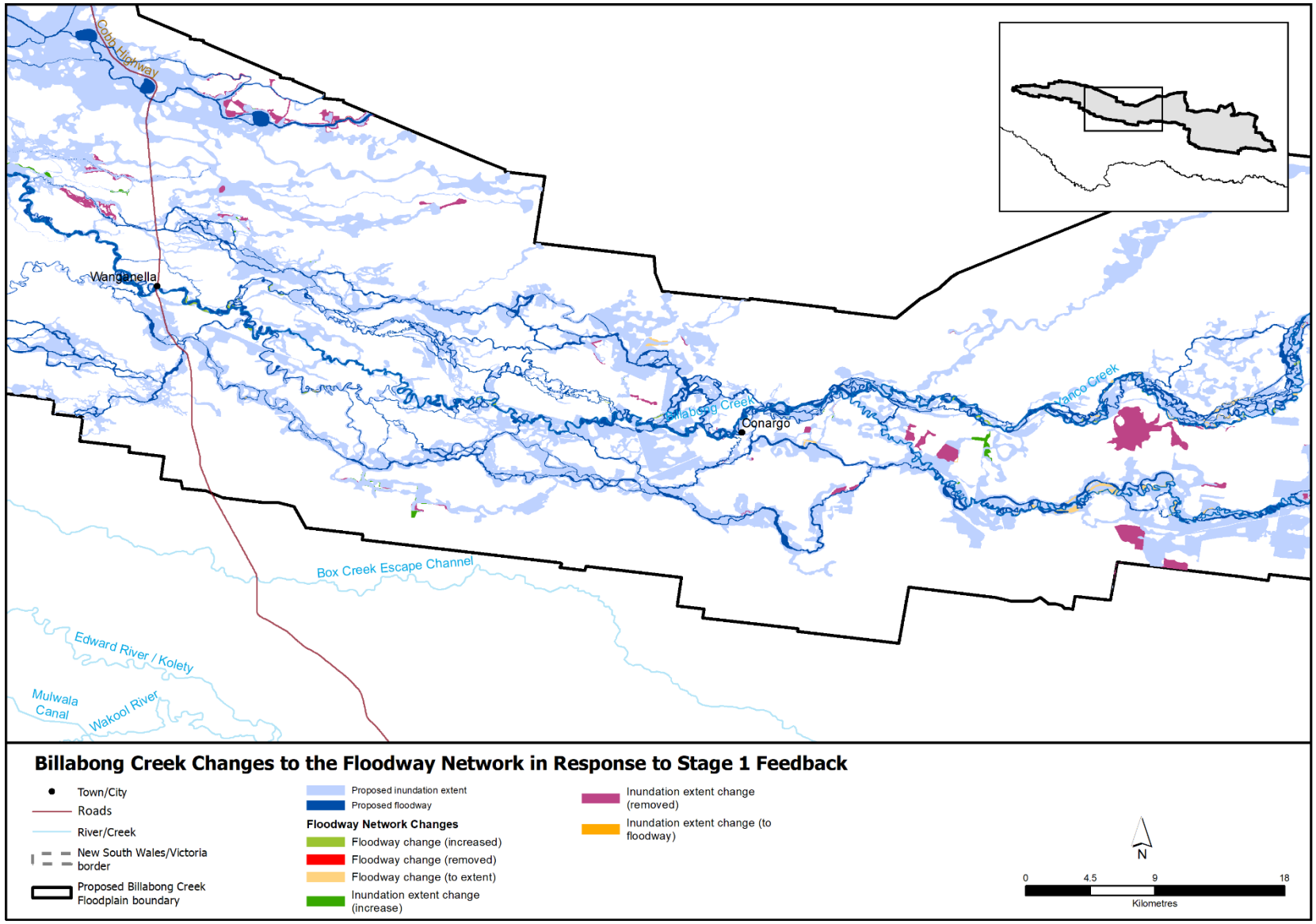


Figure 9: Refinements made to the proposed floodway network around Wanganella

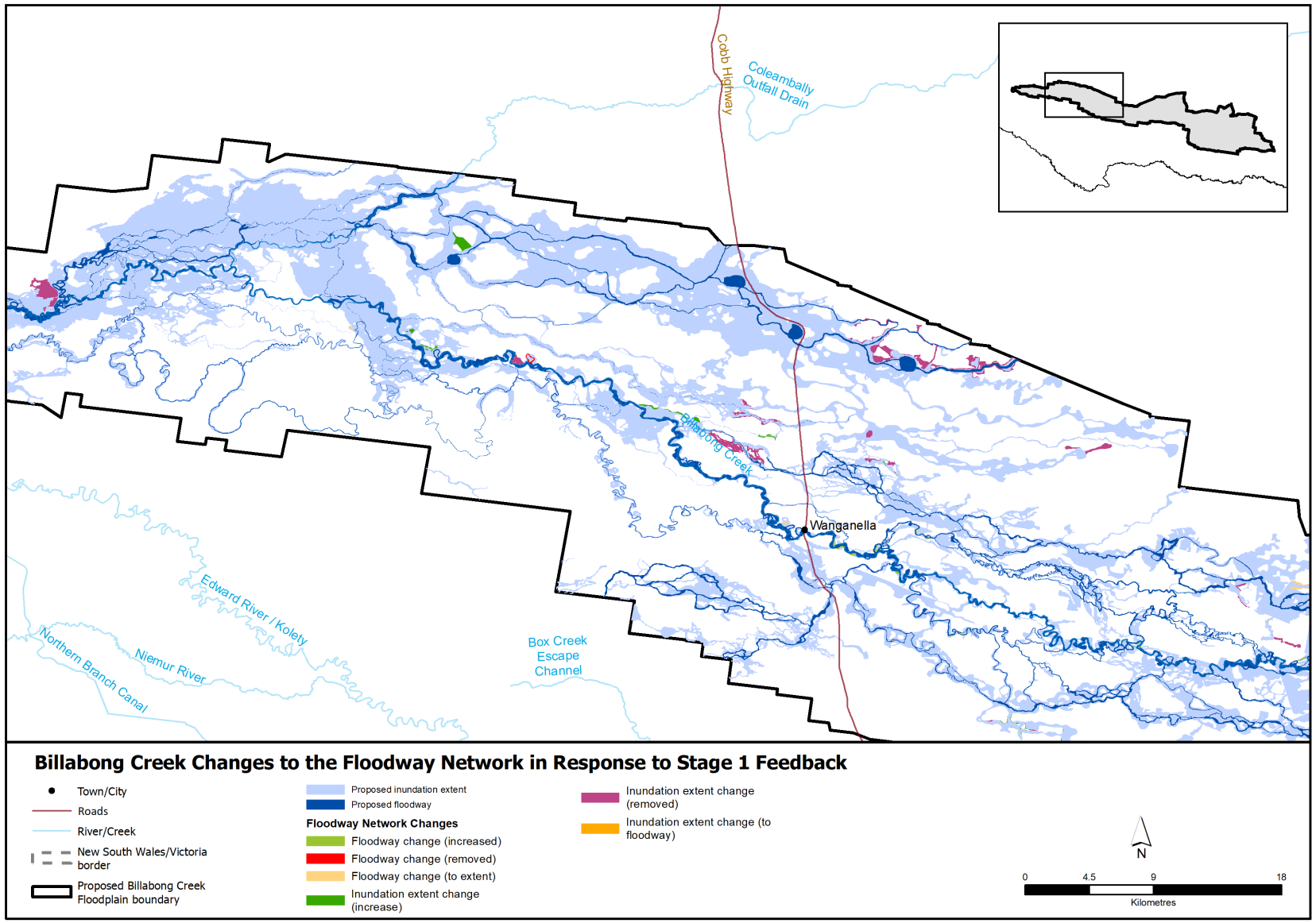
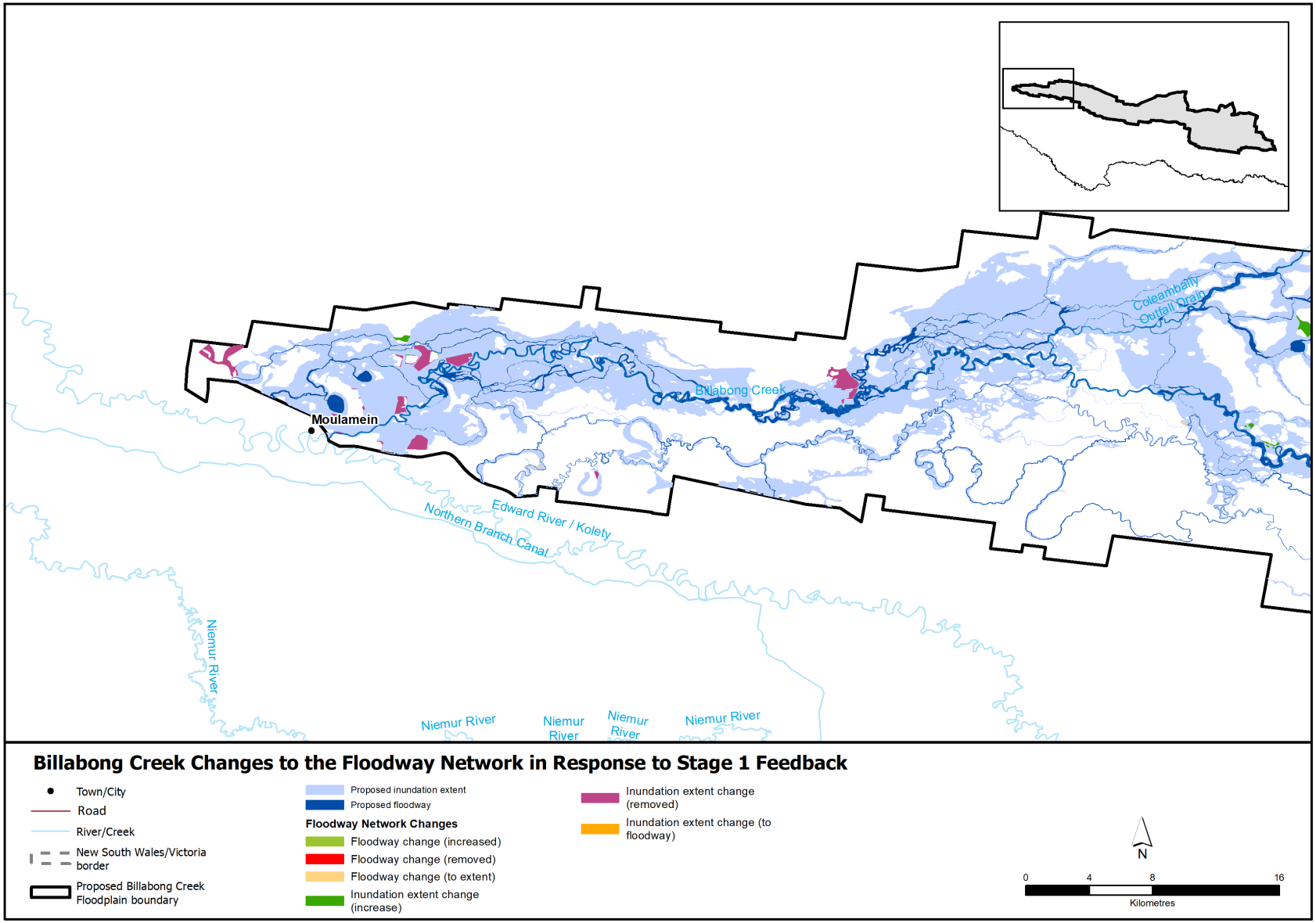


Figure 10: Refinements made to the proposed floodway network around Moulamein



Appendix 4: Refined ecological asset maps

The following maps (Figures 11 to 16) provide an overview of refinements made to the identified flood-dependent ecological assets in response to stakeholder feedback. Red areas show where areas of wetland have been removed in response to feedback. Orange areas show other floodplain ecosystems that have been removed in response to feedback. The updated flood-dependent ecological assets are shown in blue (wetlands) and green (other floodplain ecosystems).

Further refinements may be undertaken prior to Stage 2 public exhibition. An updated interactive spatial map will be published during Stage 2 public exhibition.

Figure 11: Refinements made to the identified ecological assets map near Oaklands

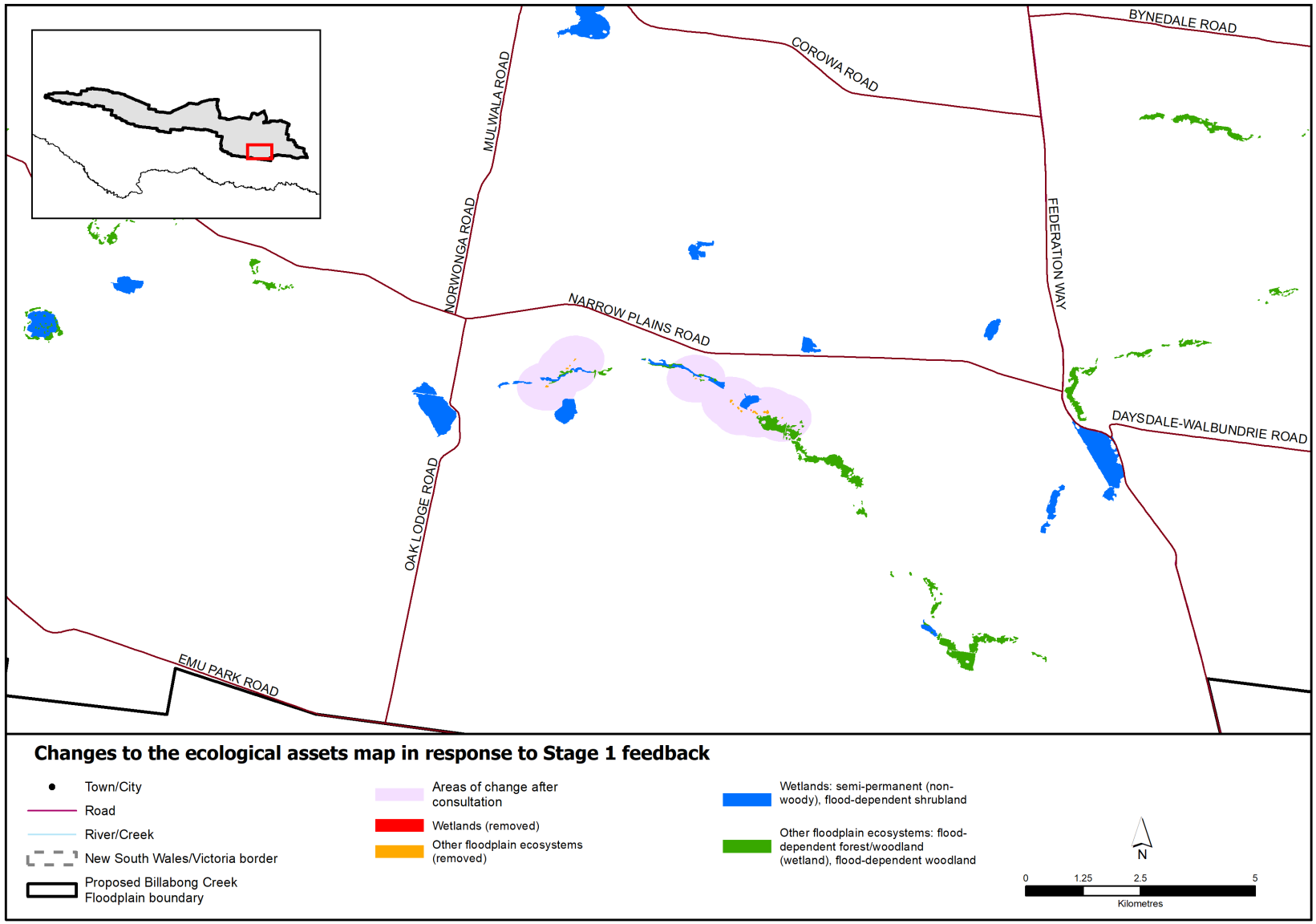


Figure 12: Refinements made to the identified ecological assets map around Jerilderie

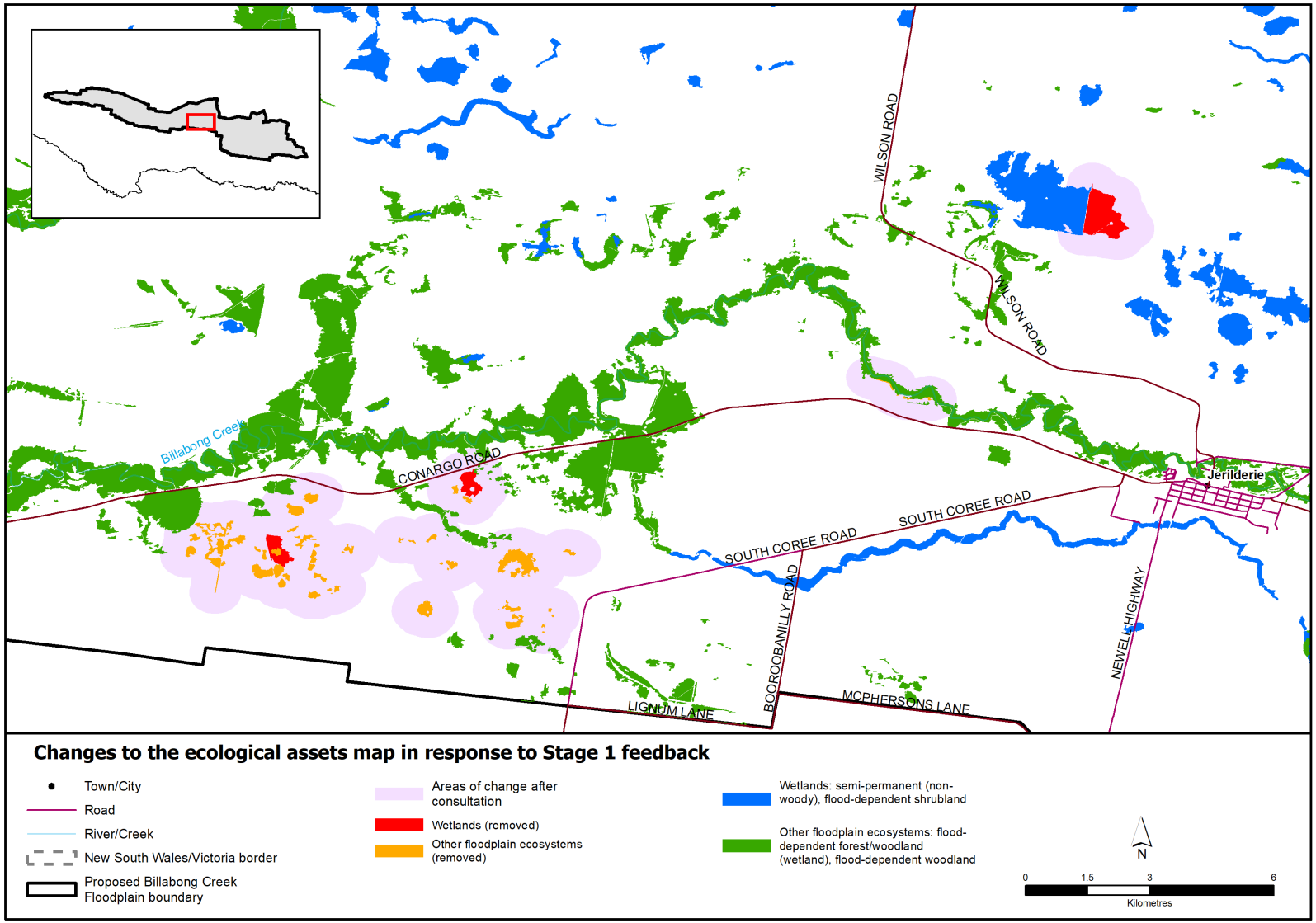


Figure 13: Refinements made to the identified ecological assets map around Conargo

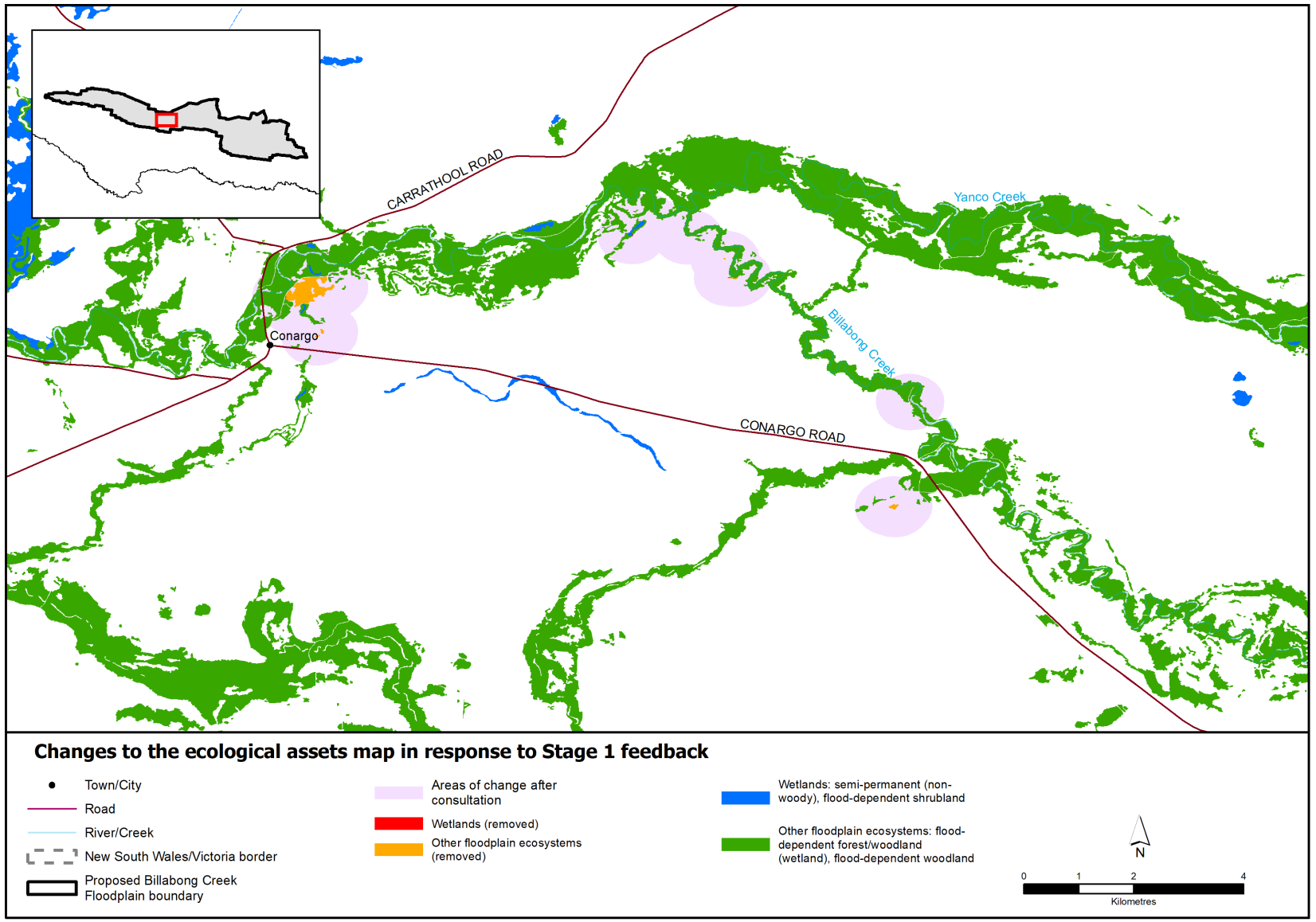


Figure 14: Refinements made to the identified ecological assets map around Wanganella

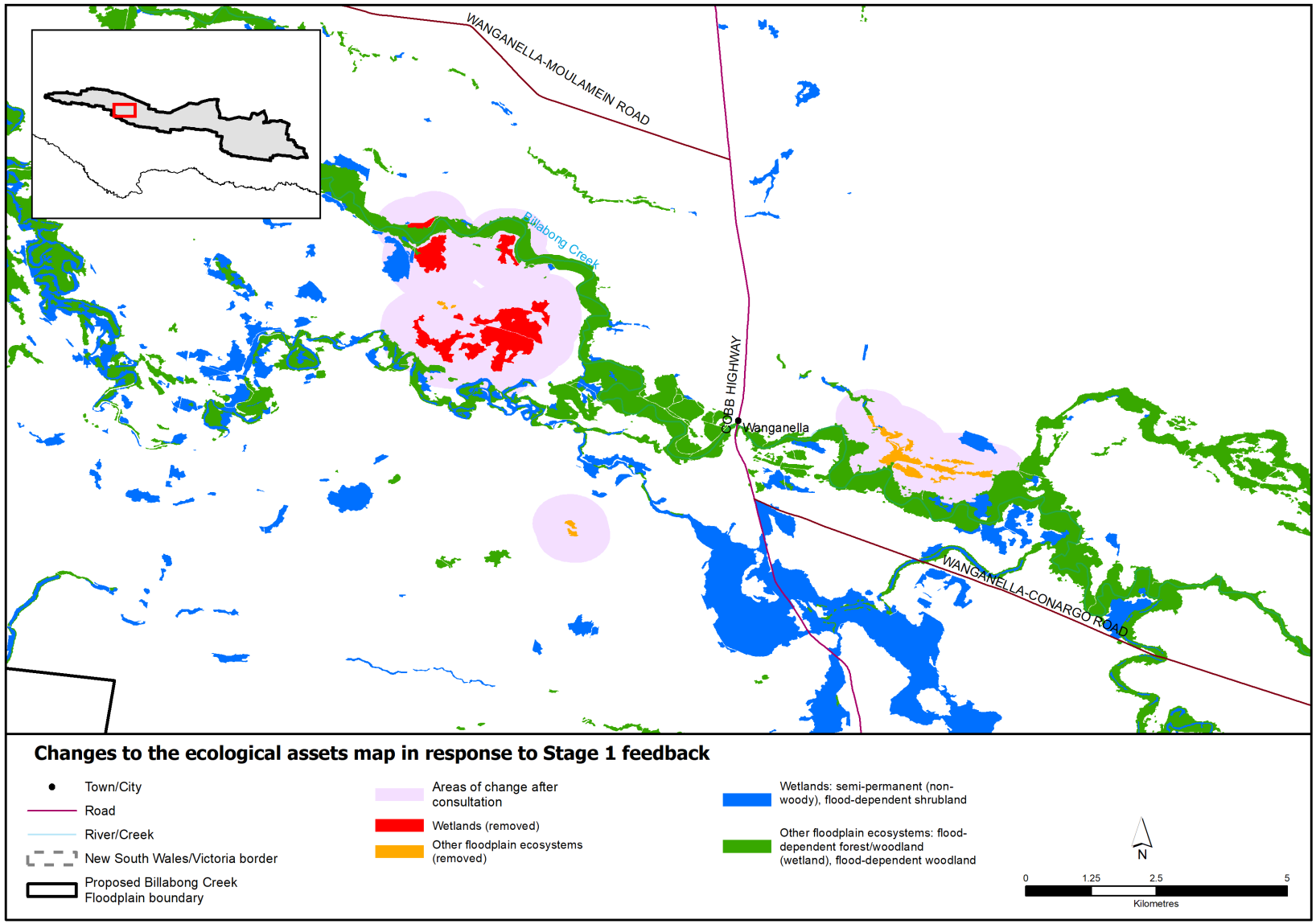


Figure 15: Refinements made to the identified ecological assets map between Wanganella and Moulamein

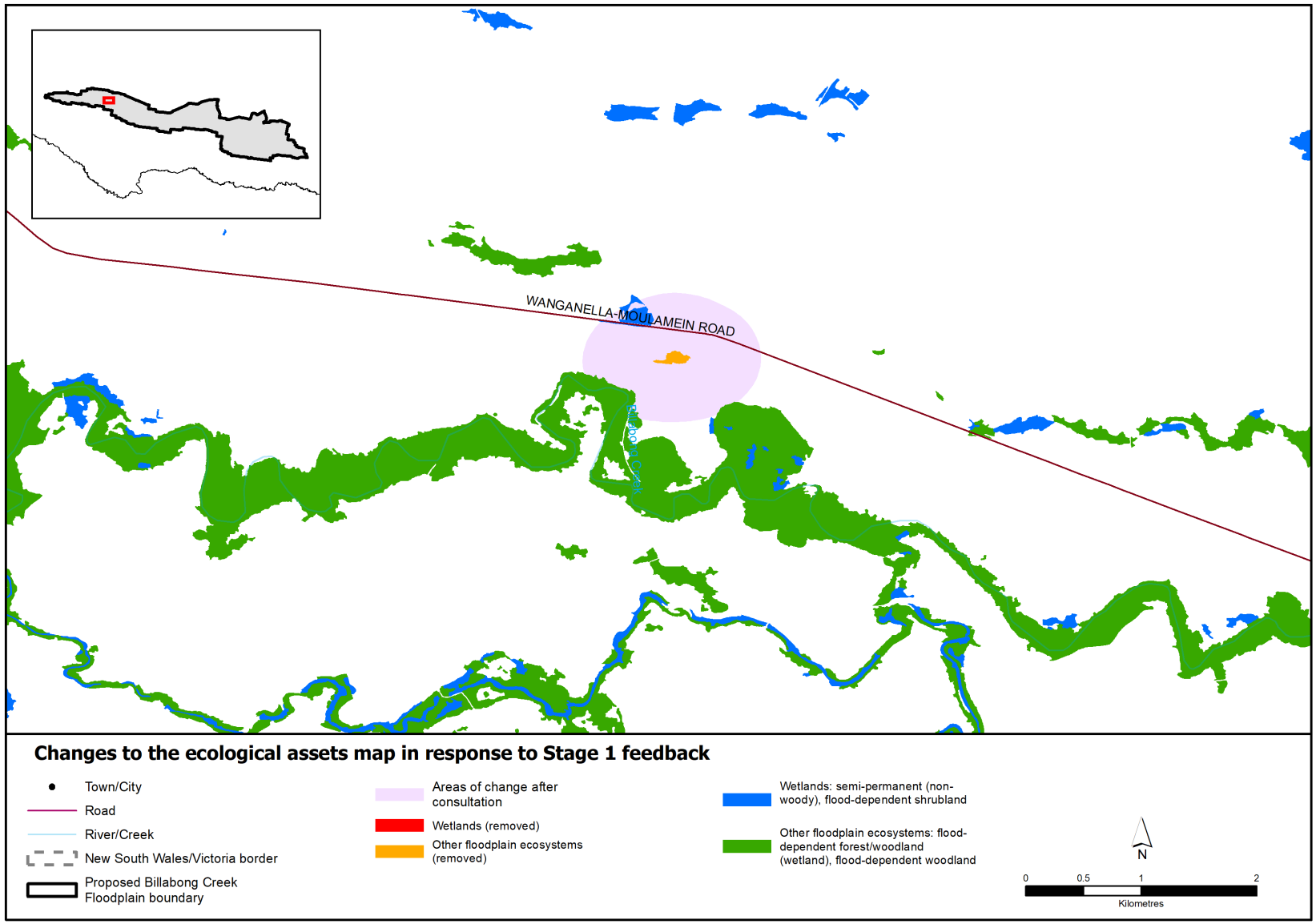


Figure 16: Refinements made to the identified ecological assets map near Moulamein