



Brisbane River Strategic Floodplain Management Plan overview



Australian Government



Dedicated to a better Brisbane



REGIONAL COUNCIL



Queensland
Government

Our shared vision



Working together to strengthen the flood resilience of our communities, our economy, our infrastructure and our environment.

In 2017, local communities were asked about their top priorities for managing flood risk in the Brisbane River floodplain, which were identified as follows:

1. improving community safety
2. reducing the cost of floods
3. avoiding adverse impacts on other communities.

These priorities align with our shared vision.

Brisbane River Catchment Flood Studies

Living with flooding is a part of life in the Brisbane River Catchment. While we can't prevent flooding from occurring, we can take steps to strengthen our resilience to floods.

The floods experienced across Queensland in 2010-11 demonstrated the impact flooding can have on our community. The events reinforced floods don't respect local boundaries. Regional and multi-disciplinary approaches are necessary to better coordinate our efforts to manage flood risk.

The Brisbane River Catchment Flood Studies is a partnership between the Queensland Government, Seqwater, Brisbane City Council, Ipswich City Council, Somerset Regional Council and Lockyer Valley Regional Council.

The Flood Study was released in May 2017 and is the largest ever undertaken in Australia. The Flood Study reinforces that no two floods are the same and supports a greater understanding of flood behaviour

that considers a range of factors including location of rainfall, ground conditions, sea levels and dam water levels.

The Flood Study informed the development of the *Brisbane River Strategic Floodplain Management Plan* (Strategic Plan) to better understand current and future flood risks and identify regionally consistent approaches to strengthen flood resilience across the Brisbane River floodplain. The Strategic Plan builds on extensive work undertaken since 2011 to better manage flood risk in the catchment. This work will continue to develop through the implementation of the Strategic Plan actions and the development and implementation of subsequent Local Floodplain Management Plans.

This document provides an overview of the Strategic Plan. It outlines our understanding of flood risk in the Brisbane River floodplain and key areas of focus that will help strengthen our resilience to floods now and in the future.

Brisbane River Catchment Flood Studies – key deliverables

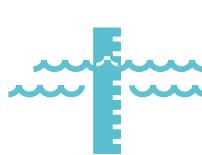
1. Data collection



170 years of Historical data



Rainfall records



Flood gauge records

3. Hydraulic assessment

Computer modelling identified a range of flood levels, depths, and verified against historical floods – 1974, 1996, 1999, 2011 and 2013

50,000 Fast model simulations

2000 Detailed simulations



4. Joint probability assessment

Investigating 11,340 combinations that influence floods



Rainfall patterns

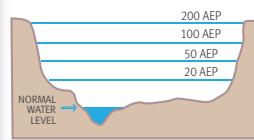
Dam levels

Tides

5. Flood Study data

The most comprehensive study of its kind in Australia

11 flood events ranging from highly likely to highly unlikely



7. Strategic Plan outputs

1000 page technical evidence report

52 recommended actions

Land use planning guideline

Flood resilient building guide

Structural options for further consideration



6. Strategic floodplain technical evidence report

134,000 property level surveys

40,000 hours of computer modelling

300 structural mitigation options considered

Feedback from 1000 residents



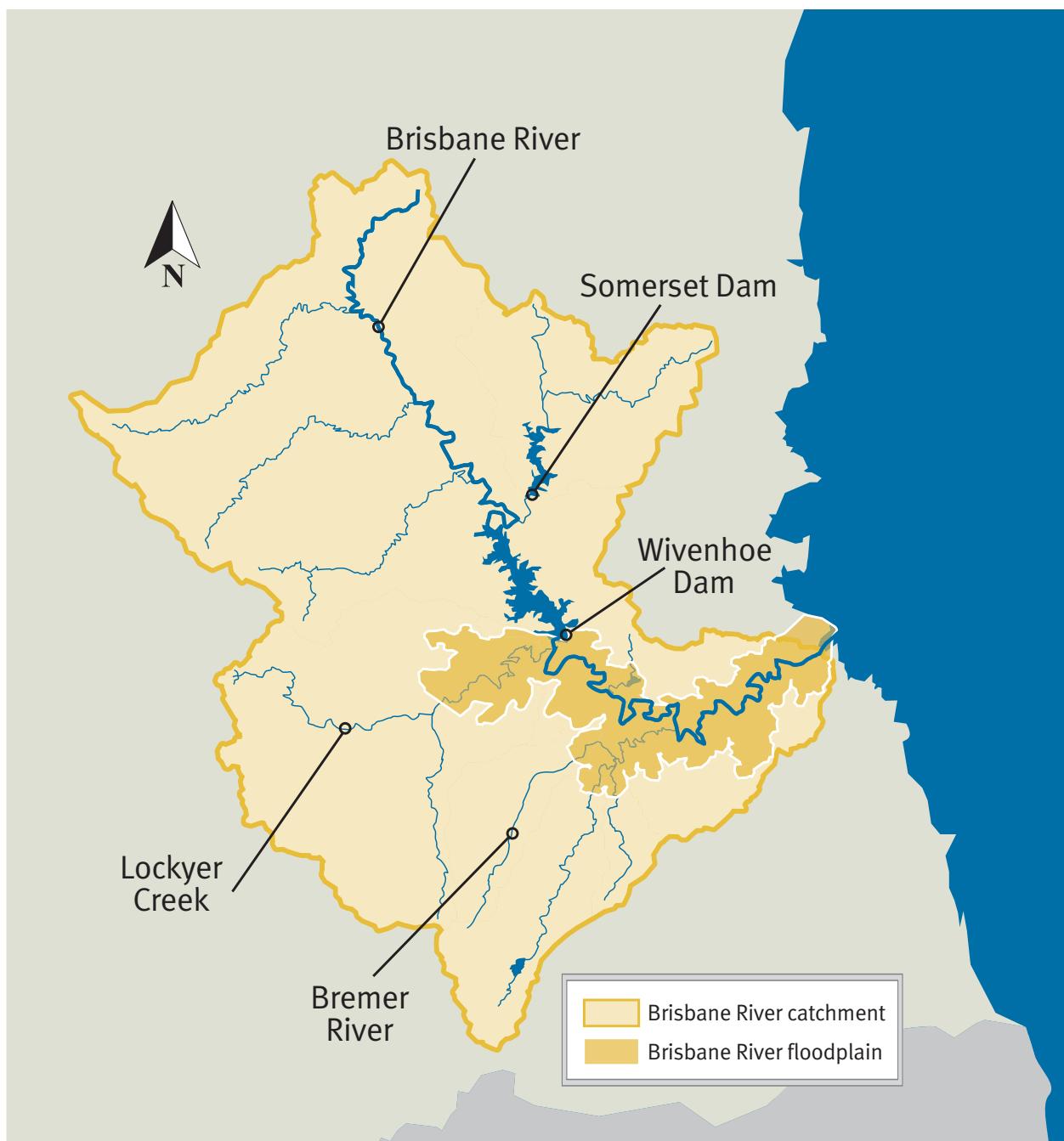
8. Next steps Delivery of Strategic Plan actions



About the Brisbane River Catchment

Key features of the Brisbane River Catchment:

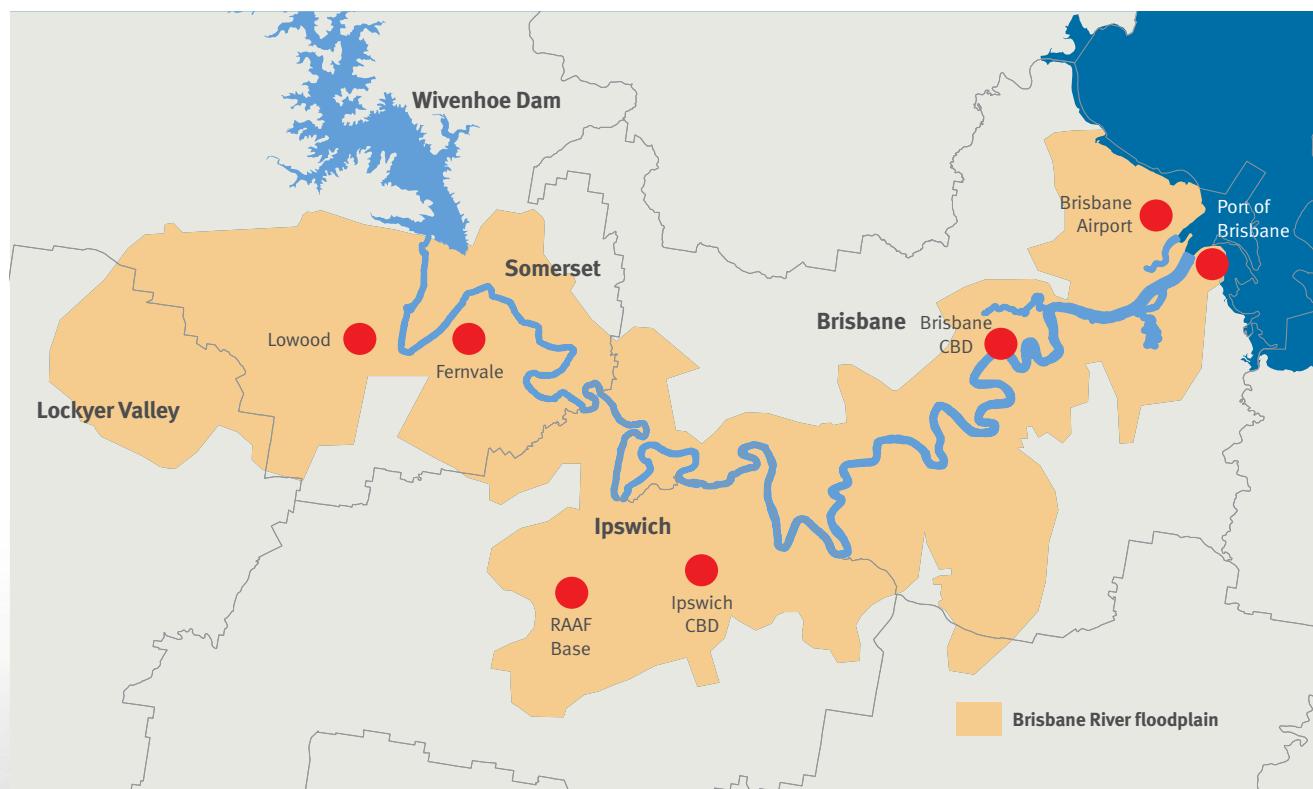
- 13,570 km² in size
- home to the largest river in South East Queensland
- approximately half of the catchment drains into the Wivenhoe and Somerset Dams, providing the primary source of water supply for communities located downstream in the Brisbane River floodplain
- the catchment is capable of generating large volumes of floodwater. Just 1mm of rainfall runoff across the whole catchment is sufficient to fill over 5000 Olympic-size swimming pools.



About the Brisbane River floodplain

Key features of the Brisbane River floodplain:

- four local governments
- estimated to have the largest number of buildings of any floodplain in Australia, with approximately 134,000 buildings and a population of 280,000 (as at 2017)
- two central business districts and two major centres
- a major international port and airport
- Royal Australian Air Force (RAAF) Base.

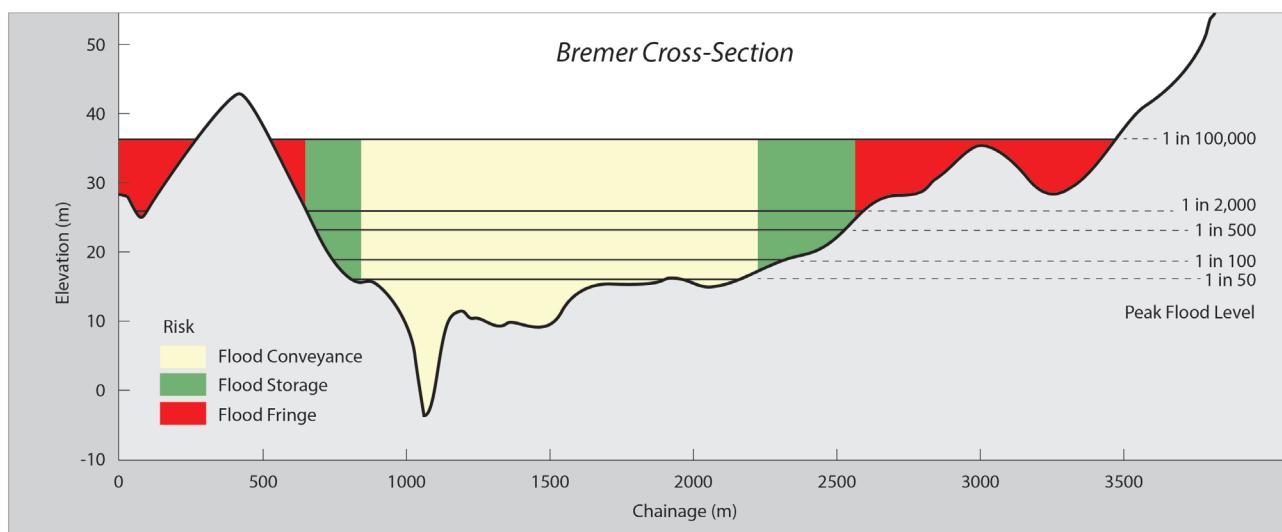


About the Brisbane River

The Brisbane River valley was carved out of bedrock over millions of years as waters drained from the catchment out to Moreton Bay. This river valley is relatively narrow with steep sides in some places, and a generally flat base that has been infilled by sediment washing off the catchment over millennia.

The Brisbane River valley is quite narrow and deep. When flooding occurs, it quickly fills the lowest-lying parts of the floodplain. During larger floods, the spread of water is constrained by the narrow width and steep edges of the floodplain. This means that as floods get bigger, the waters rise upwards rather than dispersing sideways.

Example river cross section showing the physical characteristics of the Brisbane River floodplain



Floodwaters in the Brisbane River can potentially be quite deep and fast flowing during larger floods.

Brisbane River Strategic Floodplain Management Plan

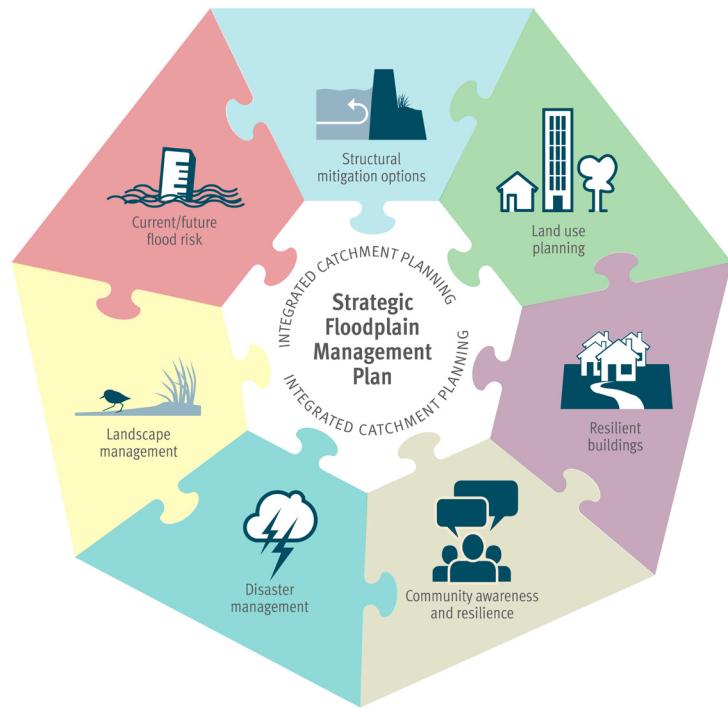
The Strategic Plan provides guidance for a range of professionals involved in managing the Brisbane River floodplain.

The Strategic Plan outlines our shared understanding of current and future flood risk from the Brisbane River and identifies a suite of actions that build on existing processes to strengthen the resilience of our communities, settlements, environment and economy.

The Strategic Plan was developed through an integrated catchment planning approach, which involved collaboration with a range of disciplines from engineers and planners, to community engagement and disaster management specialists.

Key outputs from the Strategic Plan include:

- a comprehensive assessment of the economic costs of flooding, now and into the future
- common data for the region that will inform a consistent approach to managing the floodplain
- a flood resilient building guide will help reduce the impact and cost of future floods on residential buildings
- identification of structural mitigation options that will undergo further feasibility testing by the Queensland Government, four local governments and Seqwater.
- an implementation plan containing 52 resilience actions to be delivered by the Queensland and local governments.



The full list of outcomes and recommendations are detailed in the *Brisbane River Strategic Floodplain Management Plan*, which is available at www.qra.qld.gov.au/BRCS



Working together to strengthen our flood resilience

Applying a resilience lens to decision making will ensure future decisions build flood resilience by helping to minimise damage and disruption to our community, environment, economy and settlements when floods do occur.

The Strategic Plan will guide a more collaborative approach to managing current and future flood risk across the floodplain.

Understanding our flood risk



Current and future flood risk

The Flood Study identified the likelihood of different sized floods occurring in the Brisbane River floodplain, ranging from small and frequent floods to very large and rare floods. The Strategic Plan builds on this information to identify the impact of different sized floods on our community, natural environment, economy and the urban environment.

The Strategic Plan assessed current and future flood risk, including parts of the floodplain that are particularly vulnerable to flood as well as how development, population growth and changes to our climate may affect flood behaviour in the future.

There is still much uncertainty regarding conditions of the Brisbane River floodplain over the long-term. However, sensitivity testing exploring how potential future changes would impact flood behaviour reveal that parts of the floodplain are sensitive to land filling practices associated with development, and that increased rainfall caused by changes to our climate has the potential to significantly increase flood risk. The Strategic Plan provides guidance for identifying, evaluating and assessing flood risk to ensure decisions made in one part of the floodplain consider potential impacts to other areas.

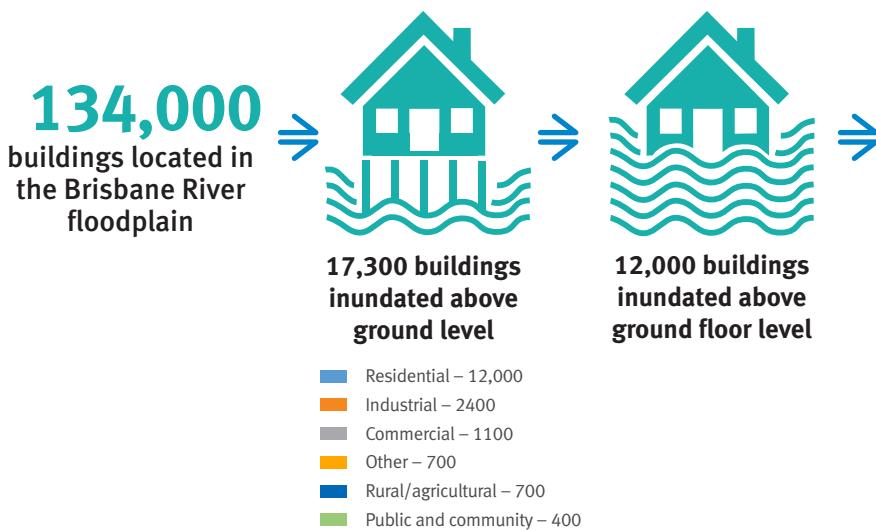
Impact of floods

Disasters have been shown to cause intangible (social) costs equal to or greater than the tangible (physical) costs. Tangible costs include replacement of property, goods and infrastructure. They also includes loss of production or revenue, loss of wages and additional accommodation or living expenses incurred due to floods. Intangible costs can be associated with increased levels of emotional stress and physical illness including loss of life.

Annual Exceedance Probability (AEP) is the term used to describe the probability of a flood of the nominated size or larger occurring in any given year. For example, a 1% AEP flood describes an event that has a 1 in 100 chance of being equalled or exceeded in any given year.

The following diagram shows the economic impact of a 1 in 100 (1%) AEP flood, which has a 55 per cent chance of occurring at least once over an 80-year period.

Economic impact of floods of a 1% (1 in a 100) AEP flood



Expected tangible costs = \$5.2B total	
Residential	\$1.3B
Other Infrastructure	\$0.6B
Non-Residential	\$2.2B
Utilities	\$0.1B
Transport	\$0.7B
Clean-up	\$0.2B

Strategic Floodplain Management Plan



Disaster management

Disaster management requires a combination of advance planning and real-time decision making that is reliant on a sound understanding of:

- flood behaviour and the nature of communities at risk of flooding
- the potential for flooding to be more severe than previously experienced.

Disaster management is most effective when tailored to local conditions, risks and communities. However, when floods become too large to be managed locally, additional support may be provided at the district, state or national level.

Understanding the risk of flood inundation and isolation is critical for emergency response organisations to ensure appropriate resources can be provided to areas deemed most at risk, and to assist with evacuation as necessary.

Information gathered from the Flood Study and the Strategic Plan has been collated into a shared computer system that will provide emergency responders with the following critical information during a flood:

- roads likely to become inundated that would impact evacuation routes
- critical infrastructure that is at risk, and where it is located
- areas at risk of isolation.

All four local governments in the Brisbane River floodplain now have access to the same information source for understanding the impact of floods in real time. The information from this shared system will help local governments to quickly determine potential consequences of a flood on the community, based on flood forecasts by the Bureau of Meteorology. This information will enable disaster management responses to be more effectively coordinated across the region during a flood.



Land use planning

Leading practice in floodplain management adopts a risk-based approach to land use planning that understands flood risk and assigns land uses appropriate to that level of risk. This involves considering a range of flood likelihoods in the planning process, from small and frequent floods up to the most extreme and unlikely flood.

Understanding future risk is critical to the planning process. The Strategic Plan identifies that flood risk may be impacted in the future by urban development and consequences of climate change, which can now be factored into decision making processes for land use and building design.

New regional-scale data acquired through the Strategic Plan will be used to inform flood risk assessments. This will enable both current and future risks to be considered for future developments, and ensure changes to one part of the floodplain do not negatively impact flood risk elsewhere.

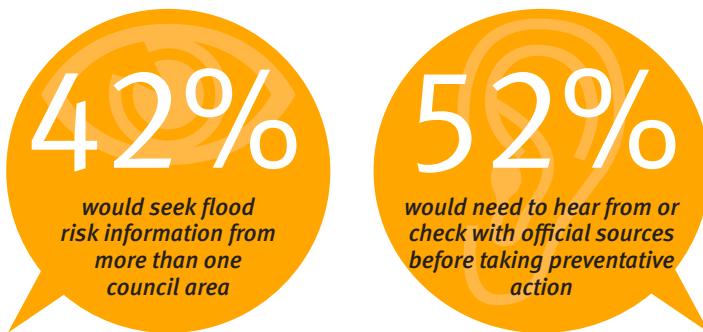
A consistent approach to land use planning across the four local government boundaries will support common flood management outcomes and ensure that land use and new development is 'risk appropriate' regardless of where it occurs across the floodplain.

Strategic Floodplain Management Plan



Community resilience

Community awareness, understanding and response is the foundation for community resilience. In 2017, consultation was undertaken with more than 1000 residents across the Brisbane River floodplain, providing insights into community behaviours and attitudes toward flood risk.



Community input has helped identify opportunities for even greater collaboration across government to support clear and consistent information being available before, during and after a flood.

The State and local governments will work together to develop regionally consistent flood-risk information for people living and working in different parts of the floodplain. This includes greater consistency in the following:

- online flood awareness mapping
- property-scale flood information
- community information.

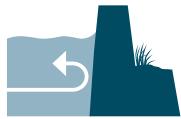


Resilient buildings

The *Flood Resilient Building Guidance for Queensland Homes* has been developed to guide the use of flood resilient design and building materials in the floodplain to minimise damage to properties. Reducing the physical damage to property and possessions will enable people to return to their homes and workplaces sooner following a flood.

The building guide has been produced for engineers, homeowners, architects, builders and certifiers about increasing the flood resilience of new and renovated residential properties. The guide is available at www.qra.qld.gov.au/BRCS

Strategic Floodplain Management Plan



Structural mitigation

Flood mitigation infrastructure can help to reduce flood risks where appropriate and economically viable.

A range of structural options have been considered including levees, detention basins, flood gates, dams, dredging and landscape management.

Structural mitigation options likely to have a regional scale impact on flooding were considered as part of the Strategic Plan. This included options with cross-council boundary benefits or that could significantly reduce the regional economic impacts of floods.

Potential structural mitigation options were sourced from almost 300 options submitted through the Queensland Floods Commission of Inquiry as well options previously identified by the Queensland Government and the four local governments. The recommended regional-scale structural options are referenced in the Strategic Plan.

Landscape management

Sustainable management of the natural and built landscape provides environmental, social and economic benefits to the community. Flooding can contribute to the rural economy through the replenishment of groundwater aquifers and the deposition of nutrients into floodplains used for primary production.

Modelling undertaken as part of the Strategic Plan indicates that landscape management has the potential to provide some reduction in water levels for smaller more frequent floods, as well as improve ecosystem health and habitat, reduced salinity and soil erosion, and increased groundwater recharge. However, further work is required to better understand what is involved, the impacts on the hydrological cycle and how best to undertake landscape management in the catchment.

The Strategic Plan acknowledges the benefits of landscape management to improve flood resilience and recommends it be considered as part of the suite of resilience actions undertaken to manage flood risk.

Next steps

State and local governments will continue to work together to achieve the recommendations set out in the *Brisbane River Strategic Floodplain Management Plan*. Local Floodplain Management Plans will be delivered as the fourth and final phase of the Brisbane River Catchment Flood Studies. The local plans will build on the Strategic Plan to establish more detailed floodplain management approaches within each Local Government Area.



More information

-  view the Brisbane River Strategic Floodplain Management Plan at www.qra.qld.gov.au/BRCS
-  for information about the development of Local Floodplain Management Plans, contact your local council.