Fitzroy and Capricornia Regional Resilience Strategy

Banana Shire
Shire of Opportunity

Central Highlands Regional Council

Gladstone Regional Council

Livingstone Shire Council

Rockhampton Regional Council

Woorabinda Aboriginal Shire Council

Queensland Government

Document details

Security classification	Public
Date of review of security classification	May 2022
Authority	Queensland Reconstruction Authority
Document status	DRAFT for consultation
Version	1.0
QRA Reference	QRATF/22/444 GD 0685

Interpreter

The Queensland Government is committed to providing accessible services to Queenslanders from all culturally and linguistically diverse backgrounds. If you have difficulty in understanding this report, you can access the Translating and Interpreting Services via www.qld.gov.au/languages or by phoning 13 14 50.

Disclaimer

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained within. To the best of our knowledge, the content was correct at the time of publishing.

Copies

Copies of this publication are available on our website at www.qra.qld.gov.au/regional-resilience-strategies/fitzroy-and-capricornia

Further copies are available upon request to:

Queensland Reconstruction Authority
PO Box 15428
City East QLD 4002
Phone (07) 3740 1700
info@qra.qld.gov.au
www.qra.qld.gov.au

The Fitzroy and Capricornia Regional Resilience Strategy is a partnership between the Queensland Government and Central Queensland Regional Organisation of Councils (Banana Shire, Central Highlands Regional, Gladstone Regional, Livingstone Shire, Rockhampton Regional and Woorabinda Aboriginal Shire).

Council	Website
Banana Shire Council	www.banana.qld.gov.au
Central Highlands Regional Council	www.chrc.qld.gov.au
Gladstone Regional Council	www.gladstone.qld.gov.au
Livingstone Shire Council	www.livingstone.qld.gov.au
Rockhampton Regional Council	www.rockhamptonregion.qld.gov.au
Woorabinda Aboriginal Shire Council	www.woorabinda.qld.gov.au

Cover image: View of Rockhampton from Mount Archer.
Image this page: Beach in Town of 1770. Credit: Shutterstock.
Opp page: Fitzroy Capricornia region. Courtesy QRA.

Foreword

The Fitzroy and Capricornia Regional Resilience Strategy continues to build on Central Queensland's commitment to disaster resilience and disaster risk reduction, prevention and preparation. In a region that is dedicated to continuous improvement of outcomes and improved lifestyle opportunity and prosperity, this Strategy frames our resilience focus now and into the future.

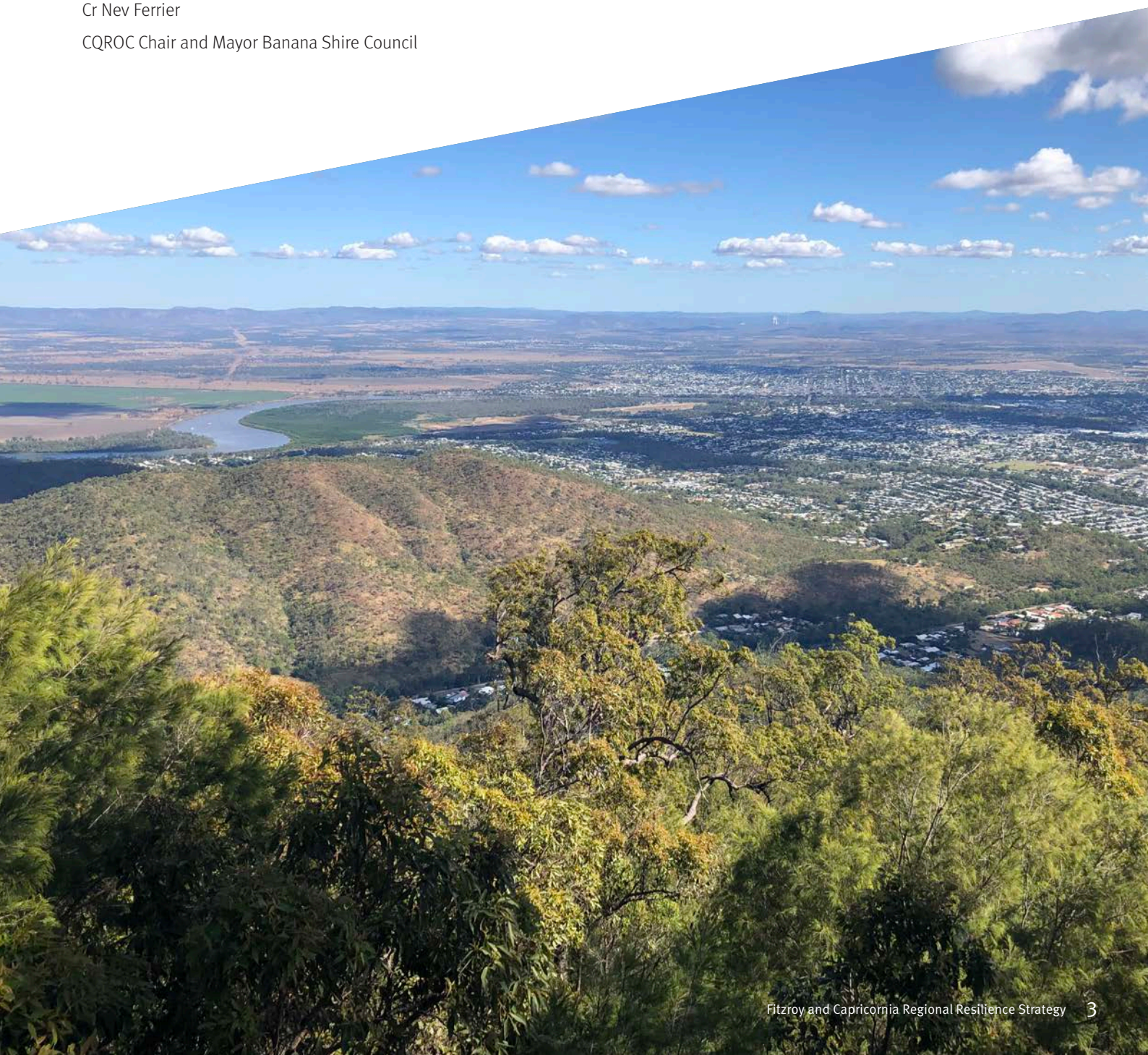
Following the launch of the original Fitzroy Regional Resilience Strategy in 2020, and off the back of a string of disastrous events across our region over the past decade in particular, as a community we understand the need for multiple pathways of effort. Now more than ever, we are being tested by consecutive events of magnitude.

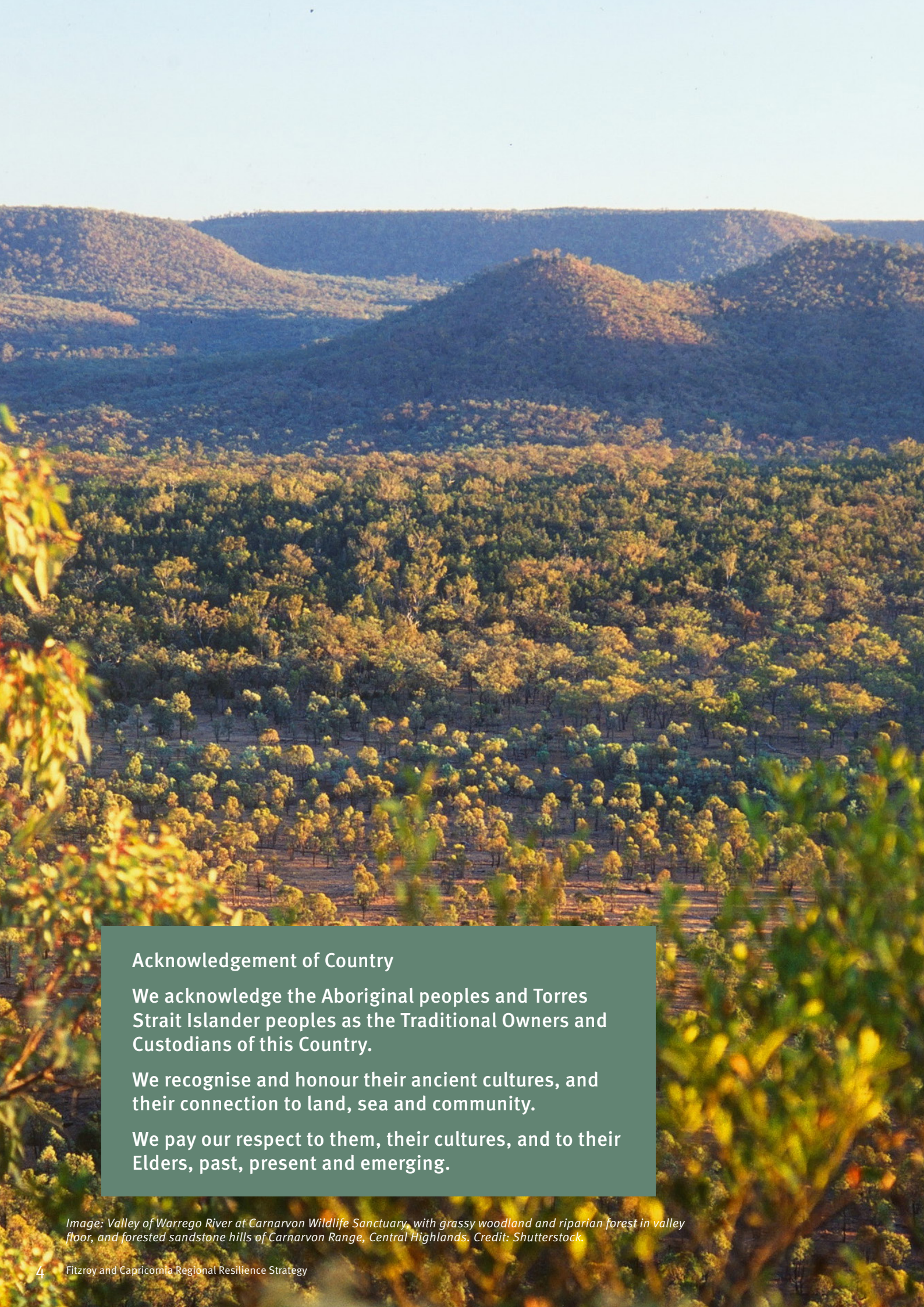
The Fitzroy and Capricornia Regional Resilience Strategy provides our regional blueprint for multi-hazard risk reduction. It sets out our local resilience pathways which together, contribute to enhanced regional resilience outcomes by bringing together the six local governments of:

- Banana Shire Council
- Central Highlands Regional Council
- Gladstone Regional Council
- Livingstone Shire Council
- Rockhampton Regional Council
- Woorabinda Aboriginal Shire Council.

Cr Nev Ferrier

CQROC Chair and Mayor Banana Shire Council





Acknowledgement of Country

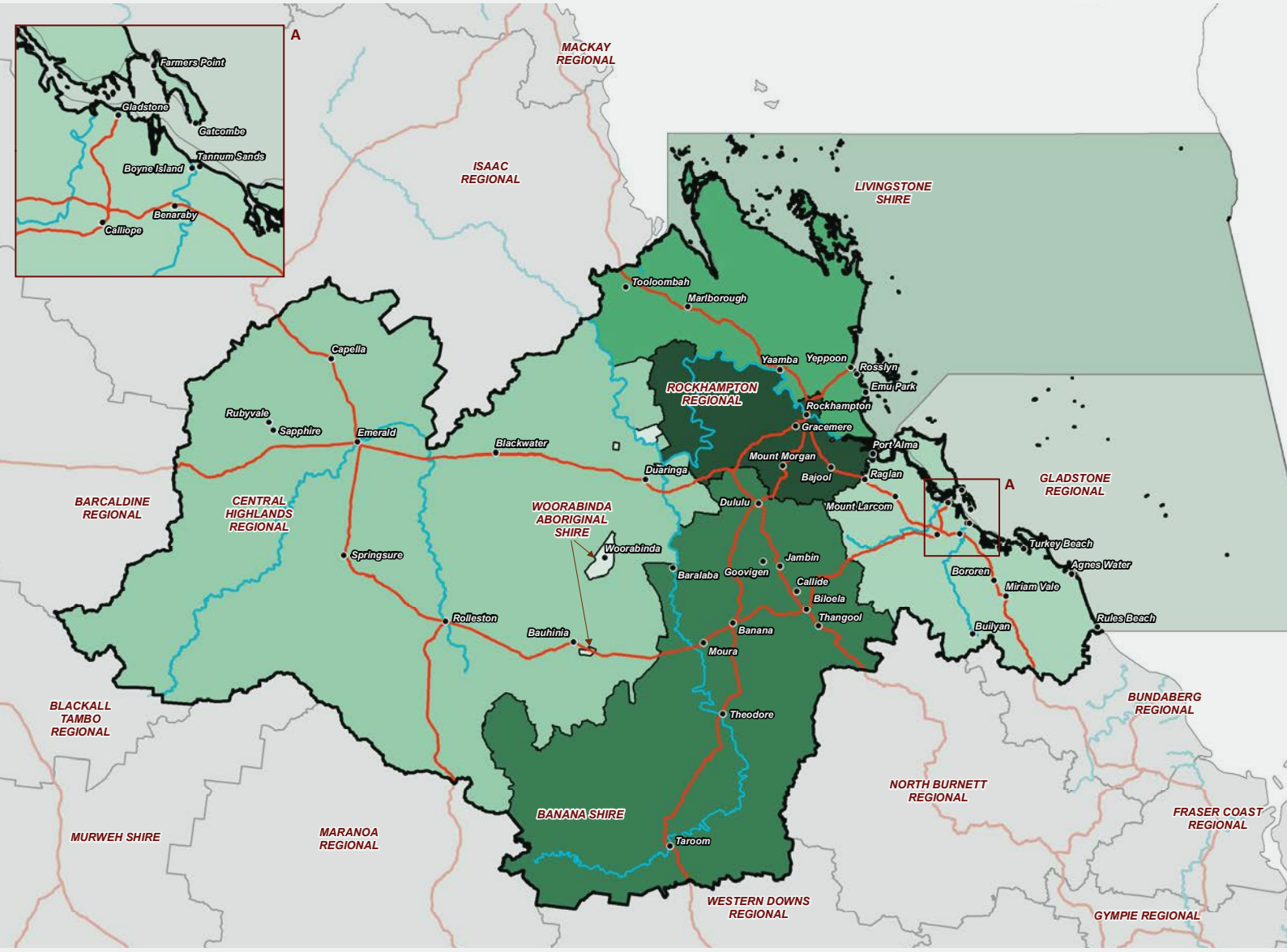
We acknowledge the Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and Custodians of this Country.

We recognise and honour their ancient cultures, and their connection to land, sea and community.

We pay our respect to them, their cultures, and to their Elders, past, present and emerging.

Image: Valley of Warrego River at Carnarvon Wildlife Sanctuary, with grassy woodland and riparian forest in valley floor, and forested sandstone hills of Carnarvon Range, Central Highlands. Credit: Shutterstock.

Fitzroy and Capricornia region



Contents

Image: Railway bridge across the Fitzroy River, Rockhampton. Credit: Shutterstock.

Our vision

The Fitzroy and Capricornia region is no stranger to natural hazards – resilience is the key to our future socio-economic prosperity. From Capella to Kabra, and Taroom to Tannum Sands, we endure repeated events, but we stand up to each test and continue to grow.

We have a unique culture of resilience in Central Queensland, one that is born of the diversity of natural hazards, to which we are routinely exposed. We are a community that pitches in to lend a hand to others. We find ways to work across sectors. We share information, intelligence and resources for the benefit of the greater good.

We are a powerhouse and economic engine for the rest of Queensland, and we take all the steps necessary to bolster the resilience that underpins our capacity to continue to deliver. This includes harnessing and strengthening our own brand of governmental, business, household and individual capability. We work collaboratively toward safeguarding that which is most important to us and our lifestyle.

Limiting disruption to daily life through infrastructure resilience is a key pursuit across the Fitzroy and Capricornia region. We need the right infrastructure in the right places to continue to prosper despite our natural hazard risks.

We are more resilient when we collaborate and work together. We are committed to striving toward continuous improvement, improved community outcomes and reduced effort and time to recover.

Protecting and growing our brand of resilience into the future is among our greatest ambitions.

Image: Sand dunes at Sandy Point, Yeppoon. Credit: Shutterstock.

About the strategy

Resilience is everyone's business. Resilience in the Fitzroy and Capricornia region is dependent on a shared but also collective responsibility model.

This Strategy encourages a role for everyone in the Fitzroy and Capricornia region to rally around and deliver upon a common understanding of regional resilience, reflecting the voice of our locals. It highlights key opportunities to build disaster resilience that are unique to our region.

The end goal for resilience in the Fitzroy and Capricornia region is to shorten and minimise recovery needs to future disaster events, and to enable transformation and adaptation to the range of stresses and shocks we experience.

Council partners

The Fitzroy and Capricornia Regional Resilience Strategy (the Strategy) is a partnership between the Queensland Government and the Central Queensland Regional Organisation of Councils (CQROC) member councils:

- Banana Shire Council
- Central Highlands Regional Council
- Gladstone Regional Council
- Livingstone Shire Council
- Rockhampton Regional Council
- Woorabinda Aboriginal Shire Council

Objectives

The objectives of this Strategy are to:

- identify the region's disaster resilience priorities
- identify actions and initiatives to address resilience needs
- prioritise the identified actions and initiatives
- coordinate and connect priorities to future funding and resourcing opportunities, maximising multi-objective outcomes
- articulate how risk-informed disaster resilience actions and projects meet local needs and align to state and national disaster risk reduction and resilience policy objectives.

Aims

The aims of this Strategy are to:

- tell the unique story of resilience in the Fitzroy and Capricornia region
- bolster what needs to be done to improve disaster resilience in the region
- deliver a clear Regional Resilience Strategy and Local Action Plans to further strengthen disaster resilience for our region.

Fitzroy and Capricornia Regional Resilience Strategy 9

Values guiding our resilience pathway

The Strategy reflects our values in the Fitzroy and Capricornia region, which are unique and make us who we are. There are five underpinning values that guide our resilience pathway.

Collaboration

We work together to not only do things well, but do them right. We share our knowledge, capability and resources for collective benefit and contribute towards a greater good. We seek common approaches to shared challenges. Working together is not always easy and can take longer, but the outcomes are always worthwhile.

Our 'Reef to Red Ridge' identity

The people of the Fitzroy and Capricornia region are our strength. We live in an enviable part of Queensland and are proud of our identity that is underpinned by our diversity of culture, playful spirit and hard work ethic. We are dedicated to community and strongly connected to place. People are what gives our communities a strong social fabric and community resilience.

Recognition of vulnerabilities

Parts of our region and our communities are vulnerable due to the topography of the landscape, our settlement pattern, accessibility, socio-economic or demographic characteristics. We seek to ensure these factors are recognised by services, infrastructure and assistance so we can support all members of our great communities.

Self sufficiency

We are an independent region. We proudly rely on ourselves, our neighbours and communities. We know in some cases that help from emergency services might be some time away, so we take pragmatic, commonsense steps to be prepared and help each other in times of need.

Harnessing Indigenous and local knowledge

Traditional Owners and Indigenous communities across the region maintain a deep physical and spiritual connection with Country. Indigenous and generational landholder knowledge is shared and passed on for the benefit of future generations. This depth of knowledge underpins our ability to know the steps to take to avoid, mitigate and adapt.

Image: Woorabinda. Courtesy Woorabinda LGA.

Strategic alignment

The Queensland Government is committed to strengthening disaster resilience, so our communities are better equipped to deal with the increasing prevalence of natural disasters.

From 2022, every region across Queensland will be part of a locally-led and regionally-coordinated blueprint to strengthen disaster resilience.

The Strategy is a deliverable under the Queensland Strategy for Disaster Resilience (QSDR) and Resilient Queensland - the statewide long-term blueprint supporting Queensland's vision of becoming the most disaster resilient state in Australia.

The Fitzroy and Capricornia Regional Resilience Strategy aligns with the Queensland Strategy for Disaster Resilience and its implementation plan: Resilient Queensland, and with national and international disaster risk reduction and sustainable development agendas articulated by the Sendai Disaster Risk Reduction Framework and the National Disaster Risk Reduction Framework.

This Strategy supports and aligns to the Queensland Disaster Management Arrangements (QDMA) and builds upon the Queensland Emergency Risk Management Framework (QERMF), the Queensland Climate Action Plan (QCAS) and the Climate Risk Management Framework for Queensland Local Government.

Figure 1. The Fitzroy and Capricornia Regional Resilience Strategy disaster resilience policy line of sight to local, regional, state, national and international levels.

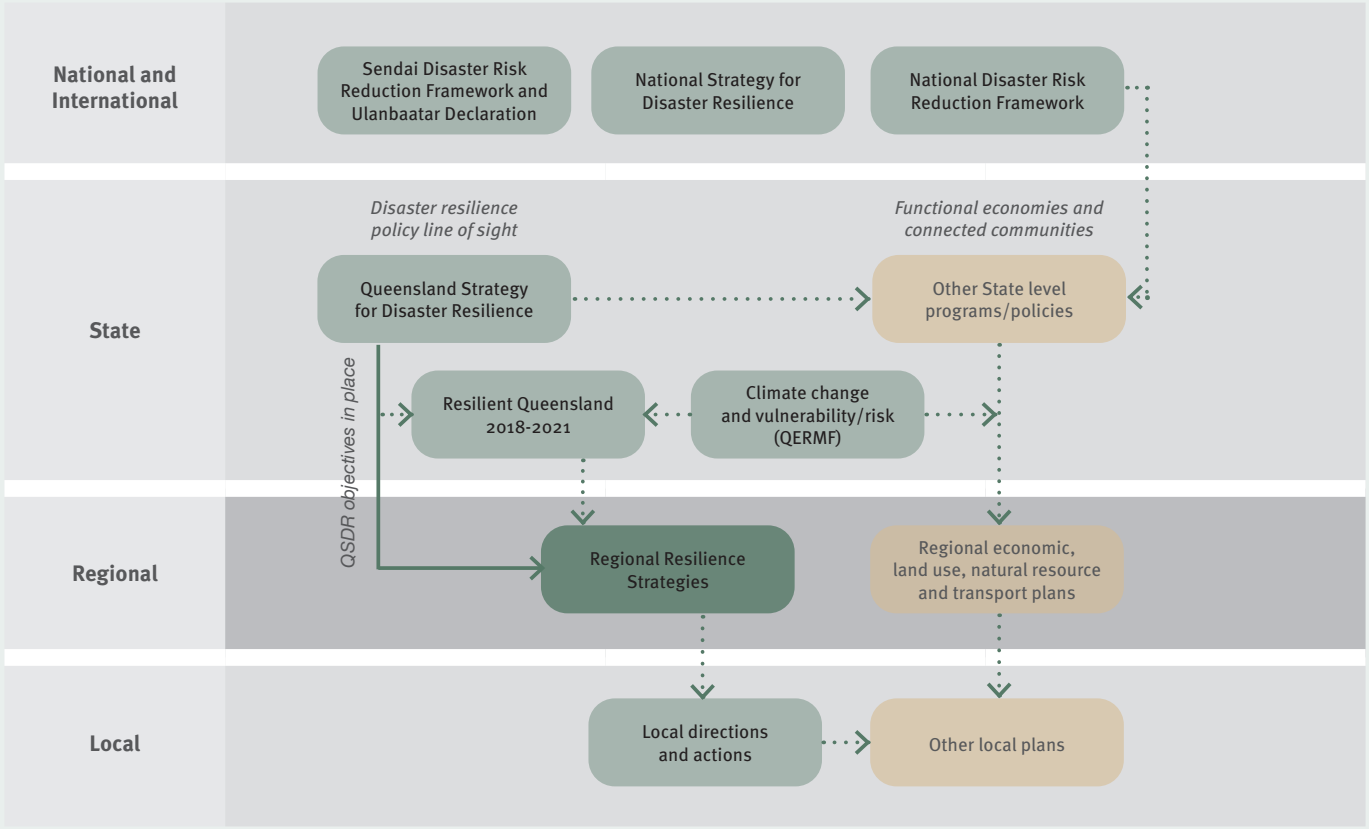


Image: Steel railway bridge, Emerald. Credit: Shutterstock.

Our engagement approach

This strategy has been developed using a locally-led approach. To build resilience means to think and deliver systematically – to deliver what is needed in the places it is needed.

We have applied CSIRO's Resilience Adaptation Pathways Transformation Approach (Q-RAPTA) process is a resilience building approach tailor-made for the Queensland context.

An approach that is locally-led, regionally coordinated and state facilitated has allowed us to draw on local leadership and direction for this Strategy to ensure local needs and priorities of the Fitzroy and Capricornia region are reflected.

This approach means identifying and prioritising regional resilience needs that we can strengthen over time by matching these needs with real funding and resourcing opportunities.

This approach allows for greater collaboration and coordination of resilience efforts across our region, guided by the principles of:

- local leadership
- flexibility and adaptation
- shared responsibility and collaboration
- prioritisation
- resilience becoming business as usual.

Locally-led → **Regionally coordinated** → **State facilitated**

Figure 2. The Resilient Queensland implementation delivery approach (adapted from CSIRO).

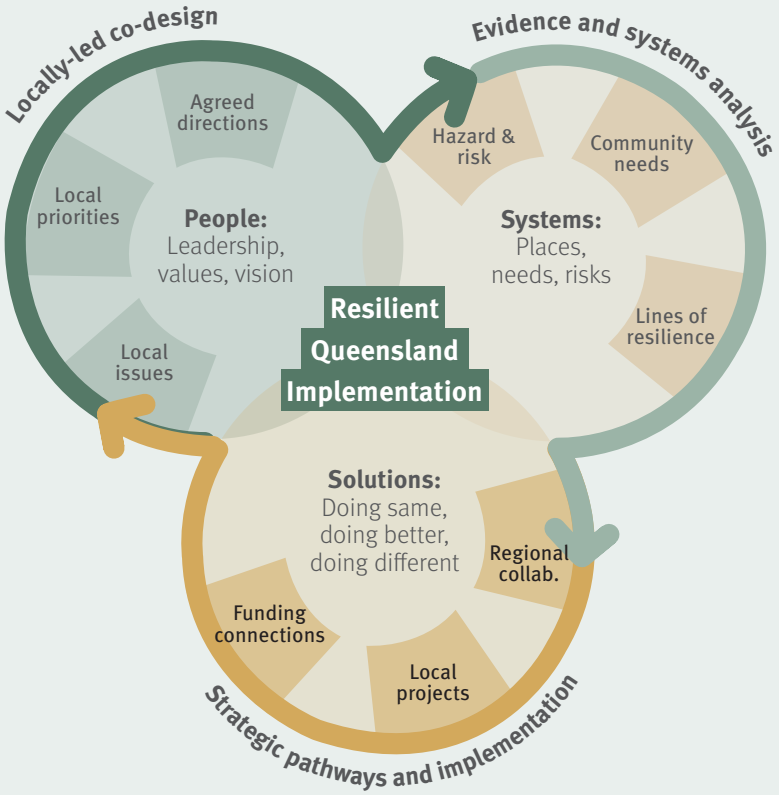


Image: Gladstone. Credit: Shutterstock.

How the strategy has been developed

This Strategy has been co-designed with local representatives and the process has applied the latest in resilience thinking:

- relationship and trust-building engagement
- co-design with locals
- risk-informed
- place-based strategies
- locally-led and regionally coordinated solutions
- integrated multi-objective responses.

The Strategy has a multi-dimensional and cross-disciplinary approach and considers the five elements that contribute to systems-based resilience.

The strategy was developed taking a disaster resilience lens to our economic, social, and environmental systems to ensure the best of disaster management and risk reduction practices can be brought into effect in the Fitzroy and Capricornia region over time.

Engagement with local representatives reflected a deep understanding of local and regional issues to find collective responses to these needs.

This context is matched to an understanding of the exposure and vulnerability of each local government area within the region to a range of hazards informed by the Queensland Emergency Risk Management Framework (QERMF), including:

- cyclone and severe storm (wind and coastal hazards)
- flooding
- bushfire
- heatwave
- severe wind.

Drought is also considered by the Strategy where it has been raised as an issue at the local level.

The impacts of climate change are a key component to long-term resilience and are incorporated, both in terms of relationships with hazards but also by alignment of the Strategy to the Sector Adaptation Plans of the Climate Action Plan and the Qcoast 2100 Coastal Hazard Adaptation Program, the Queensland Climate Resilient Councils (QCRC) program and key strategic infrastructure plans.

Figure 3. The five elements of resilience that contribute to systems-based resilience.

Elements of resilience

The multi-dimensional and cross-disciplinary approach of this Strategy contemplates five elements that contribute to systems-based resilience. These are:

Integration and Alignment

The Strategy reflects previous and existing work at the state, regional and local levels to ensure this work is taken forward, and not 'reinvented', and provides a further mechanism to connect local needs to further funding opportunities at the state and federal levels.

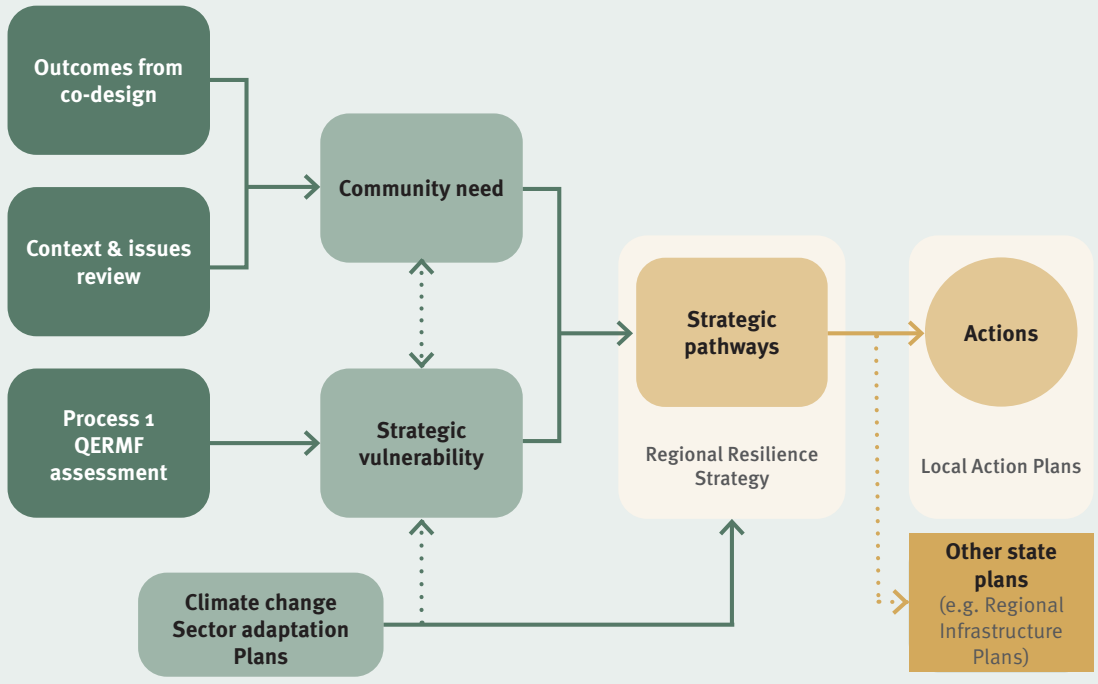
This Strategy culminates in resilience pathways that provide a link between locally-identified actions or projects, funding opportunities, and the state, federal and international policy environment. That way, the need for a particular project or action can be justified by it meeting a regional pathway to resilience that meets one or more objectives of the Queensland Strategy for Disaster Resilience.

This Strategy is supported by Local Action Plans setting out the specific projects and initiatives that are needed to deliver on the aspirations set out by the Strategy. These Local Action Plans are provided to partner councils to implement.

The Strategy aligns with the following risk management, recovery resilience and adaptation planning initiatives, strategies and plans:

- Queensland Resilience, Adaptation Pathways and Transformation Approach project (QRAPTA)
- Queensland Emergency Risk Management Framework (QERMF)
- Queensland Climate Action Plan 2030
- Department of Transport and Main Roads Regional Transport Plans
- Queensland inland road network upgrade (Infrastructure Australia)
- State and local Recovery plans
- Central Queensland Regional Plan
- Central Queensland Sustainability Strategy 2030
- Central Queensland Economic and Infrastructure Framework
- Reef to Red Ridge – The Economic Intersection.

Figure 4. Strategy development process reflects the CSIRO QRAPTA resilience building approach tailor-made for the Queensland context.



Resilience in the Fitzroy and Capricornia region

Our region experiences extremes across multiple hazards. It floods, it burns, the land moves and changes, it can get uncomfortably hot and the wind can howl. Storms can be severe, and cyclones cross the coast here. In addition, our climate is changing and this is presenting a key driver and amplifier of natural hazard risks across out region.

Resilience in the Fitzroy and Capricornia region requires many things. It requires knowledge of one's landscape and how it operates under different weather conditions. It means anticipating how stresses and shocks can affect existing levels of resilience, and how future events and trends will impact our ability to remain resilient.

It also requires a level of agility and flexibility when things happen that we do not expect. What we have leant over recent years and decades is to expect the unexpected, and this helps us to be prepared for a broad spectrum of events.

Resilience in this part of Queensland also means that we adapt to changing circumstances, with a view to making things better for ourselves and for others. It means that we find and learn new ways of doing things that means in the longer term, we are continuously improving our ability to withstand into the future.

Image: Dramatic hexagonal columns of trachyte rock Rosslyn Bay, Yeppoon. Credit: Shutterstock.

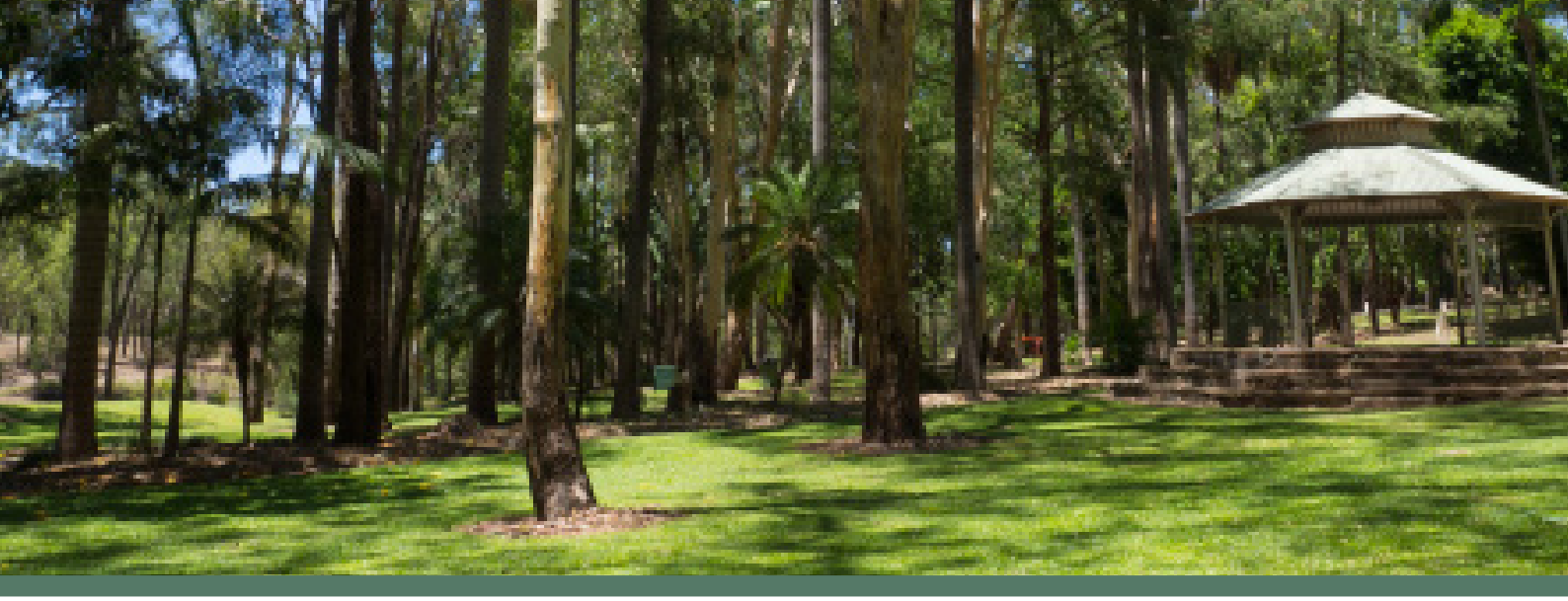
Deeply intwined with our sense of resilience is our commitment to sustainability and desire to adapt to climate change. From regenerative agricultural practices to our burgeoning green hydrogen industry, and through to commercial and household approaches to reducing waste and being energy-smart, our entire community across Central Queensland have a role to play.

Resilience is a term that means different things to different people. The QSDR defines resilience as:

> ***A system or community's ability to rapidly accommodate and recover from the impacts of hazards, restore essential structures and desired functionality, and adapt to new circumstances.***

We know that resilience is not just about being disaster resilient, rather it is a philosophy of how we live our life.

The recurrence or consecutive nature of events in the region, whether it is bushfires, flooding or the impacts associated with the COVID-19 global pandemic, has taken a toll on people, communities and businesses. One of the key challenges for resilience across the region lies in our durability to frequent, repeated and consecutive events, and the ability to recover before something else comes our way. This is becoming a new test, as the climate continues to change, and necessitates a new resilience mindset.



Our resilience needs

Resilience is about looking at people, places and landscapes through the lens of trends, stresses and shocks that are being faced by the region now and into the future. Understanding the trends, stresses and shocks can highlight the resilience needs of the region and the complex interplay between social, economic, built and environmental systems.

Trends

Transformative forces that could change a region:

- Population change
- Emerging markets like hydrogen and renewable energy
- changing market forces for traditional commodities
- ageing population
- sustainable lifestyle practices
- changes in how information is shared
- increased digital enterprise
- regenerative agriculture practices
- climate change
- increasing multiculturalism
- opportunities in remote learning and working.

Stresses

Long term situations or circumstances, weakening the potential of a given system and deepening vulnerability – they may be periodic or chronic:

- periodic and long-term drought
- weed and pest outbreak
- housing availability, diversity, quality and affordability
- supply shortage and supply chain vulnerabilities
- infrastructure end-of-life management
- skilled and non-skilled workforce availability
- reliance upon larger centres for essential services
- limited and potentially vulnerable supply routes
- environmental and landscape health
- COVID-19 pandemic
- rising costs of insurance.

Image: Emerald botanic garden. Credit: Shutterstock.

Shocks

Sudden events with an important and often negative impact on the vulnerability of a system and its parts (such as a flood or bushfire):

- cyclones and severe storms (severe wind and coastal hazards)
- flooding (flash flooding, creek and riverine)
- bushfire and grassfire
- heatwave
- earthquake.

Core resilience needs

- leveraging indigenous knowledge
- enhanced and maintained flood warning infrastructure network
- enhanced information and knowledge sharing platforms and processes
- strategic prioritisation of infrastructure improvements to supply chain networks
- improved facilitating infrastructure or innovation in digital connectivity, water and energy
- enhanced water security
- urban heat design interventions
- community amenities to support social and community resilience
- addressing the vulnerabilities of small, isolated communities
- support for disaster management resources, capability and capacity, including allied networks
- natural resource management and landscape sustainability
- improved insurance outcomes.

Source: Definitions adapted from Guidelines for Resilience Systems Analysis (OECD, 2014).

How resilience is affected by stresses and shocks

Our disaster management system has traditionally dealt very well with the event-based episodic or acute shocks like floods, cyclones or bushfire. However, we need to continue dealing with more of the systemic issues that worsen disaster events when they occur, and place increased burden on our disaster management system.

Investment and effort in building social, economic, infrastructure and environmental resilience helps to reduce the impacts caused by periodic stresses, like drought, and means that communities are better able to cope with episodic events like floods, bushfires or cyclones when they happen.

Figure 5. How resilience is affected by stresses and shocks.

Image: Woorabinda entry top grid. Courtesy Woorabinda LGA.

Rethinking resilience in the Fitzroy and Capricornia region

We acknowledge the need to proactively identify and deliver over time on initiatives that help avoid the stresses and shocks in the first place – ultimately putting us on a more sustainable track for growth and prosperity, and building our resilience to varied impacts of a changing climate.

How we make real and lasting change

To meet our collective challenges, we need to actively take steps to reduce disaster risk and equip our Fitzroy and Capricornia communities to thrive in spite of the stresses and shocks they face. We need to match community need with funding and support to deliver – by refocusing over time from recovery to prevention and preparedness.

Limiting impact or shortening recovery from stresses or shocks

This Strategy focuses on identifying actions that limit impact or shorten recovery from stresses or shocks. These will help communities in the immediate aftermath of an event.

It provides pathways for actions to adapt or transform socio-economic settlements or systems to avoid or resist the impact in the first place. This will help our communities in the Fitzroy and Capricornia to grapple with stresses like climate change, and the lineal settlement pattern.

This way, we can provide a long-term blueprint for how our region can continue to improve its disaster resilience for years to come.

Figure 6. Improving our prosperity through resilience (adapted from Joseph Fiksel).

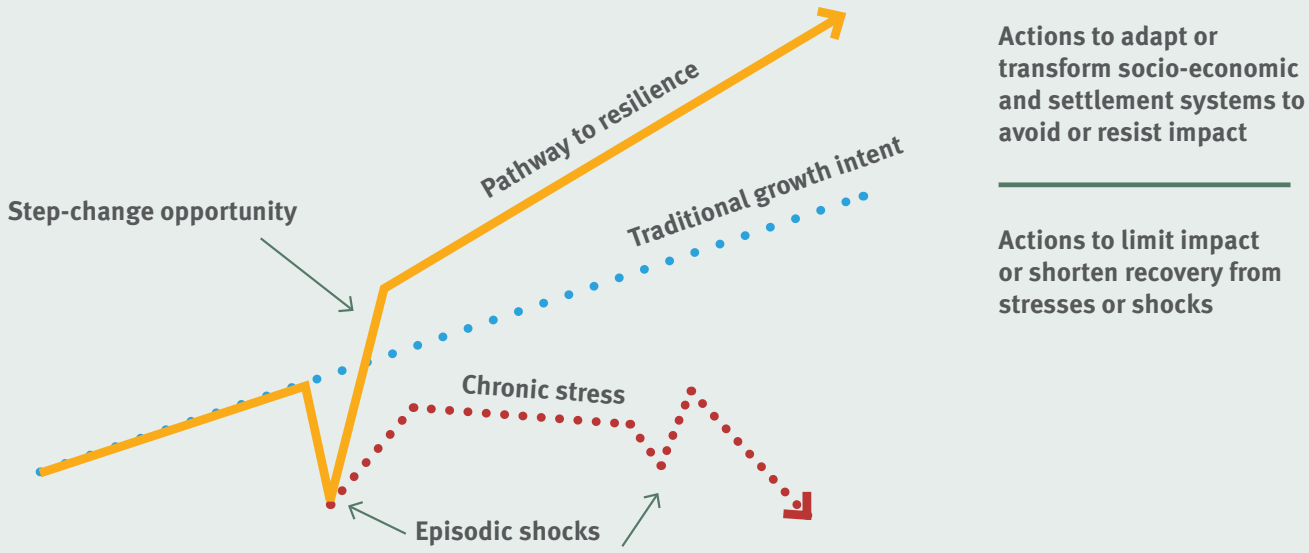
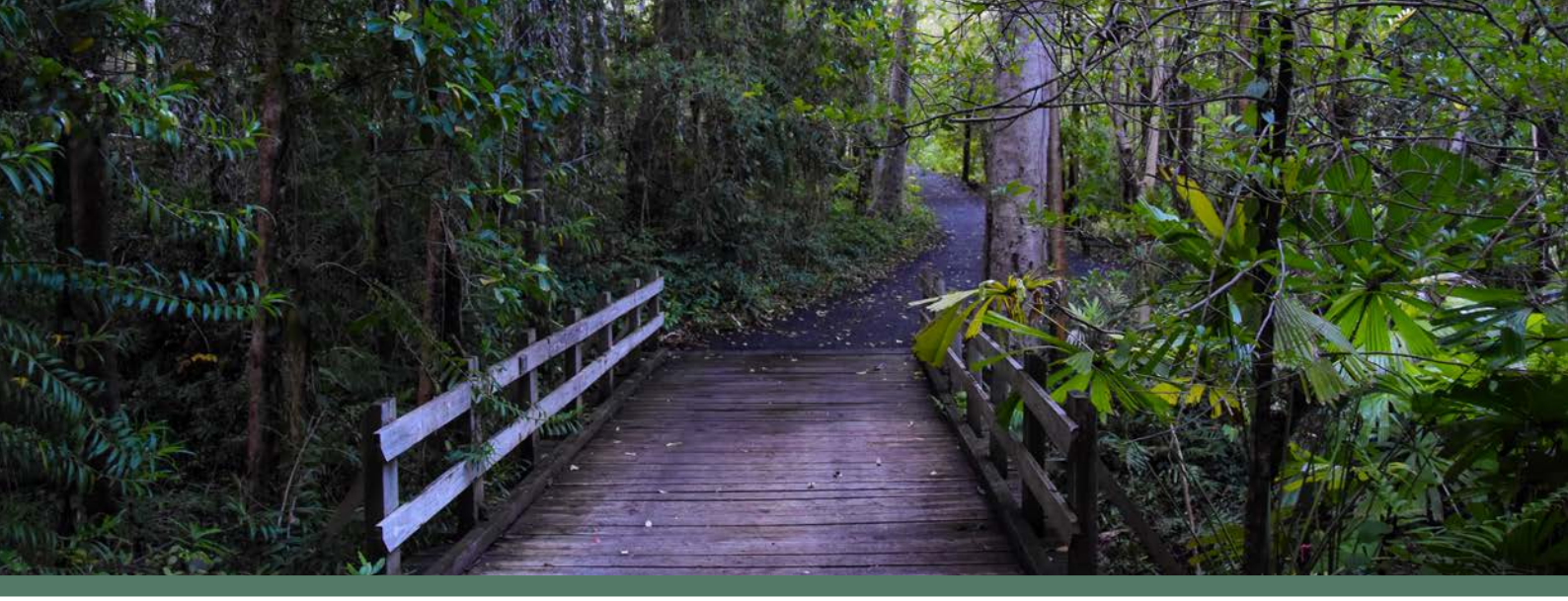


Image: Early sweet grapes farming in Emerald. Credit: Shutterstock.



The changing funding landscape

Under the joint Australian Government-State Disaster Recovery Funding Arrangements 2018 (DRFA), assistance is provided to alleviate the financial burden on states and territories. It also supports the provision of urgent financial assistance to disaster affected communities.

The DRFA replaced the previous Natural Disaster Relief and Recovery Arrangements (NDRRA) on 1 November 2018.

The reforms to the DRFA included, for the first time, a framework to incentivise reconstruction efficiencies to create more funds for resilience and mitigation purposes.

Efforts to realise efficiencies under DRFA are critical to fund resilience and mitigation efforts in the future, and will help change the funding landscape from a focus on reconstruction and recovery to a focus on prevention and preparedness.

We now have a clear forward plan for how we can make lasting change into the future through sustained investment in resilience and mitigation activities. Recent changes in funding arrangements will enable the creation of funds for mitigation and resilience, along with a range of other funding programs (e.g. the Local Government Grants and Subsidies Program, Get Ready Queensland) that support resilience building.

Regional Resilience Strategies will provide the 'long list' of locally-identified actions that can be prioritised against a wide range of possible funding opportunities (including DRFA efficiencies) to build resilience in Queensland communities over time.

Figure 7. Changing the focus from reconstruction to prevention and preparedness.

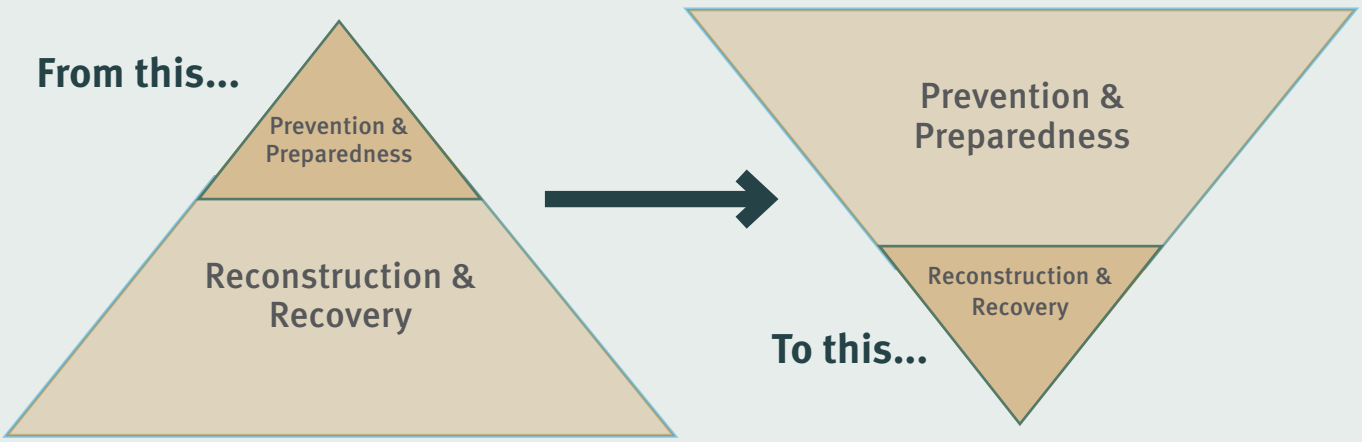
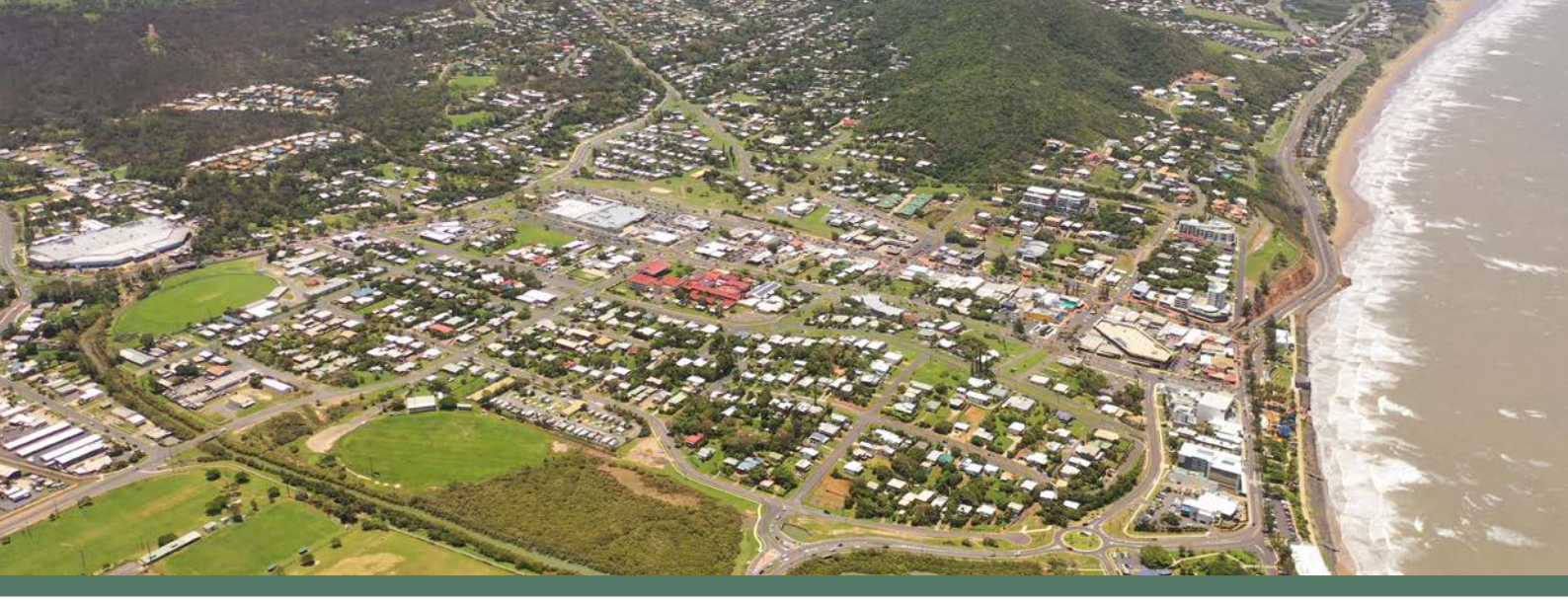


Image: Tondoon Botanic Gardens Gladstone. Credit: Shutterstock.



Evolving from the original Fitzroy Regional Resilience Strategy

The original Fitzroy Regional Resilience Strategy focused on developing a best practice flood warning infrastructure network for the Fitzroy Basin. It was one of a suite of four pilot regional resilience strategies across Queensland released in 2020 to enhance our understanding of the diversity of resilience issues experienced in different areas of Queensland.

The 2020 Fitzroy Regional Resilience Strategy was tailored specifically to the Fitzroy River Basin. It focused on collaboration with flood warning infrastructure asset owners, and how they could work together to enhance the strength of flood warning data, information sharing, and improved situational awareness for decision-makers and communities across the Fitzroy River Basin.

The 2020 Fitzroy Regional Resilience Strategy led to the formation of a new Basin Working Group, headed by the Fitzroy Basin Association. The Basin Working Group brings together the large number of flood warning infrastructure asset owners across the region to share and build knowledge and capacity.

Under the guidance of the original Fitzroy Regional Resilience Strategy, the Fitzroy Basin Working Group works to identify the regional needs for flood warning infrastructure upgrades and improved information in a manner which enhances cost-effectiveness and efficiencies for all levels of government in asset funding.

Since its 2020 release, the original Strategy has delivered a region-wide focus on:

- network governance – adopting a holistic approach to the governance of the flood warning infrastructure network and aligning with best practice
- network efficiency and optimisation – analysis and audit of assets across the network has been completed
- operations and maintenance – improving processes including maintenance specifications and agreements
- asset management – supporting the intelligence drawn from the network during flood events
- flood classifications – aligning improved data and intelligence with community impacts to better inform situational awareness
- flood studies – identification of where updated or additional flood studies are needed across the catchment, in line with identified gaps and risks.

This 2022 Fitzroy and Capricornia Regional Resilience Strategy encapsulates relevant aspects of the 2020 Strategy and combines these with broader multi-hazard considerations. In this regard, it incorporates and absorbs the strategic elements derived from the original strategy, expanding these across multiple hazards.

Image: Aerial views of Yeppoon. Credit: Shutterstock.

Resilience as a pathway to the region's socio-economic prosperity

Significant collaborative effort across the region has been undertaken to implement the 2020 Fitzroy Regional Resilience Strategy and this collaborative effort provides the foundation for continued resilience in our region in the face of natural hazards under changing climate conditions.

The Fitzroy and Capricornia region plays a critical role as a 'powerhouse' of Queensland – both in terms of its economic contribution as well as its literal function in powering the state through its energy production industries.

The impact of natural processes, hazard events and disasters has been glaringly felt across the region over recent years, recent decades and for longer than records have been kept. From floods to bushfires, drought, global pandemics and Category 5 cyclones, the consecutive nature of events is changing. We barely have time to move through recovery processes before another event arrives.

We know that to maintain ongoing socio-economic prosperity across the region and achieve our economic development goals, we must factor disaster resilience into the processes that drive socio-economic growth.

This is a shared and collective responsibility across government, business, community, and individual households.

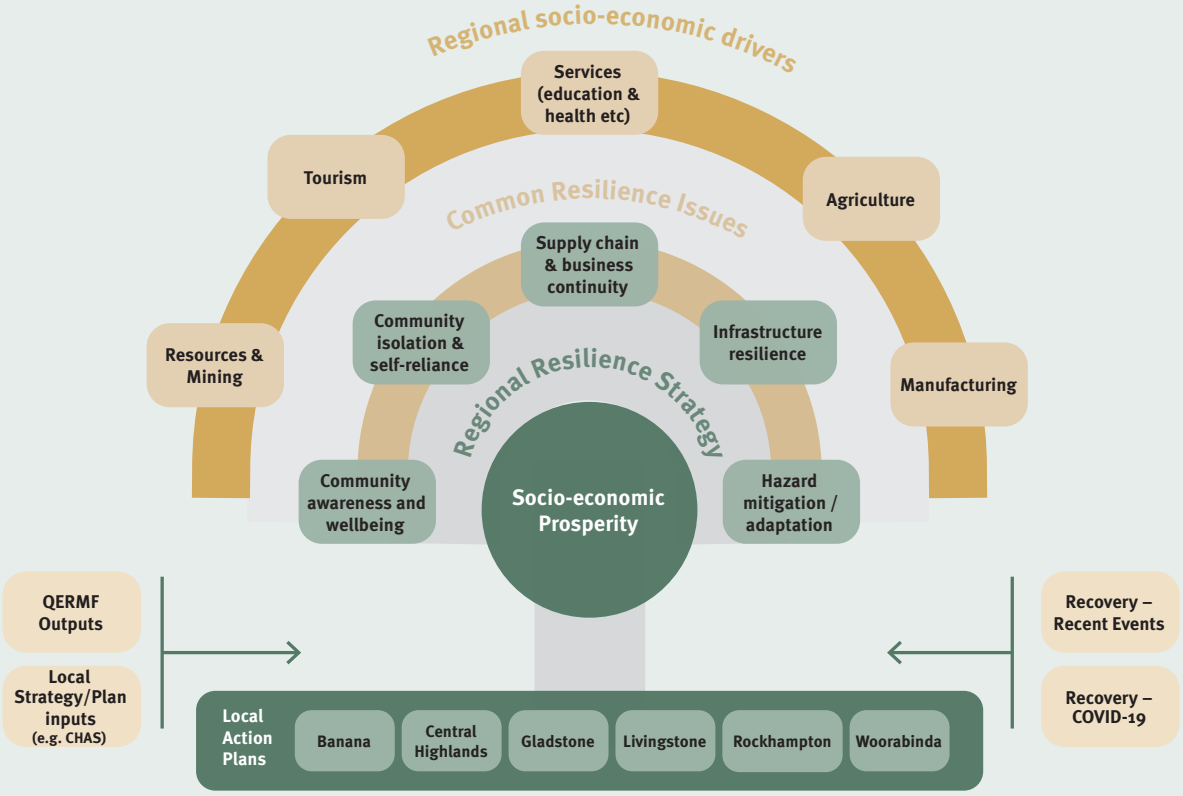
We know that this means more than just planning for business continuity i.e. preparing for a flood or cyclone. It requires integrating risk reduction and resilience principles into decision making processes that sit outside what people traditionally consider to be the disaster management system.

This spans strategic asset management, land use planning, supply chain management, infrastructure design and delivery, environmental management, community and economic development, transport planning, and across industry sectors. It can no longer be the responsibility of first responders to manage disaster impacts.

Key principles for decision making across these sectors include:

- incorporating risk reduction, adaptation, and resilience considerations into financial decisions, asset management / maintenance, and long term financial forecasting
- ensuring investment decisions consider the implications of current and future risk – and limit transferring the impacts of risk onto others
- progressively improving the resilience of our infrastructure networks like road, rail, energy, water, and data – to build in redundancy and maintain critical operation during and following events
- making risk information fully available to all stakeholders
- orienting regional and local land use policy to think of hazards as a core consideration in land suitability – not just a constraint to be overcome Increasing the capacity of individuals, households, small businesses, and other organisations to think and act with risk at front of mind.

Figure 8. Improving our prosperity through resilience (adapted from Joseph Fiksel).



Our region

From the Nogoa River and Carnarvon Gorge in the west, the meandering Dawson River in the south and stunning Keppel Bay Islands in the east, the Fitzroy and Capricornia Region spans the majority of Central Queensland over an area of 117,588 km². Our region comprises six local government areas: Banana; Central Highlands; Gladstone; Livingstone; Rockhampton; and Woorabinda Aboriginal Shire. From the reef to the 'red ridge' of the Great Dividing Range, and anchored by the major regional centres of Rockhampton, Gladstone, Emerald, Yeppoon and Biloela, the region is home to approximately 288,300 people.

The Fitzroy and Capricornia Region takes in a vast number of interconnected townships and communities, with an economy based on grazing, livestock trade, agricultural production, mining, a diversity of service industries and a solid tourism industry. The region is an epicentre for livestock trade, boasting Queensland's largest livestock exchange in Rockhampton, considered the 'beef capital' of Australia. Biloela is home to Queensland's third largest meatworks, and also processes meat for export.

The broader region is characterised by vast areas renown for cattle grazing, scenic landscapes and the resource deposits of the Bowen Basin. The Bowen Basin extends north-south across the entire river catchment from Collinsville to Moura, a length of about 650 kilometres. Mining features strongly in the Isaac and Central Highlands areas, with mines operating in the far north of the region at Hail Creek, Goonyella and Coppabella, further south at Saraji and Middlemount, down to Curragh and Crinum around Blackwater, and the Baralaba and Dawson mines in Banana Shire. The Fitzroy and Capricornia region is home to a number of purpose-built mining towns such as Moranbah, built in 1970, Dysart in 1973 and Middlemount and Tieri in the early 1980s.

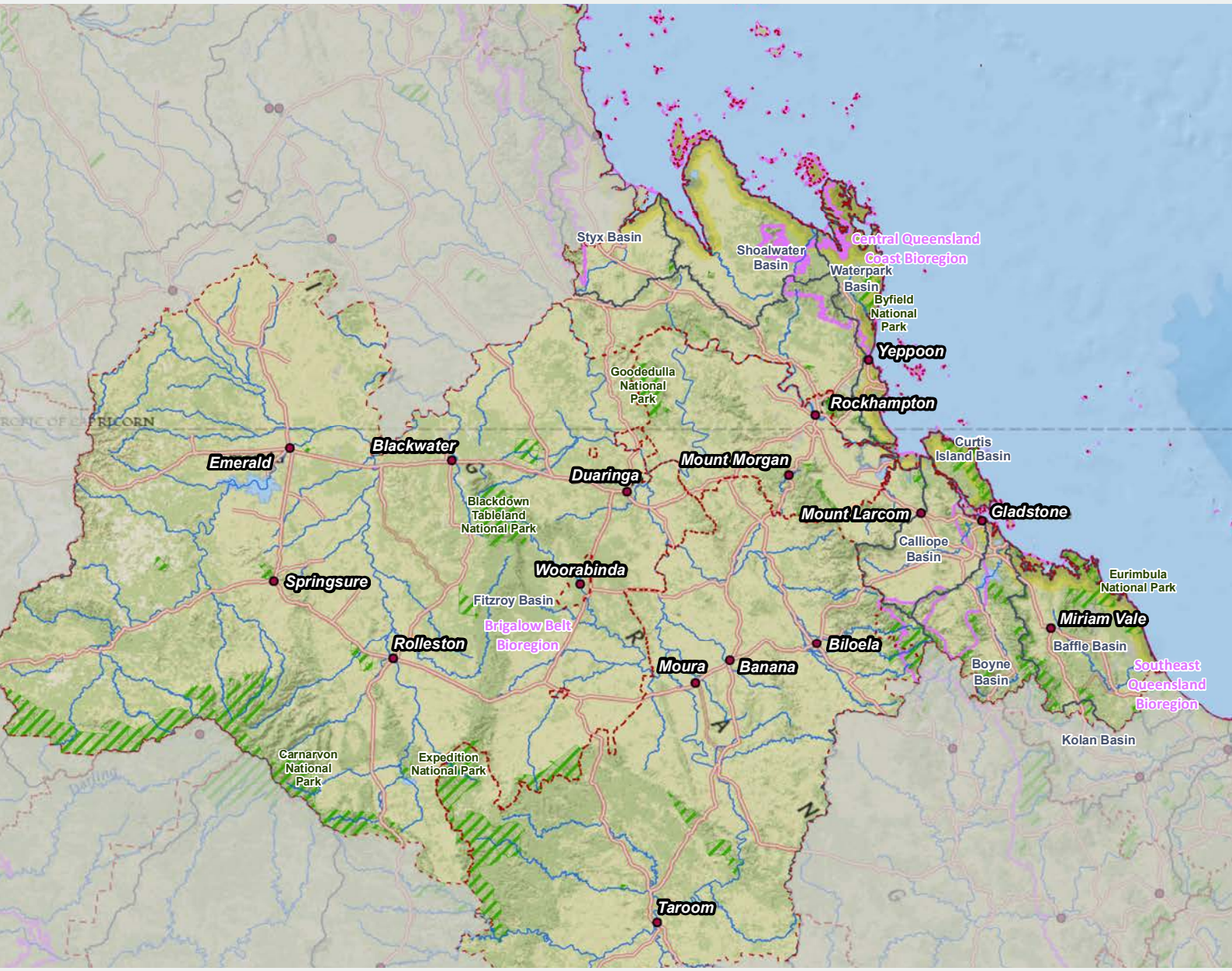
Strategic highways connect the Fitzroy and Capricornia region with the broader Queensland, providing heavy freight transport and tourism routes. From east to west the region is connected by the Capricorn Highway, connecting Rockhampton with Longreach through the townships of Dauringa and Blackwater, and the centre of Emerald. The Dawson Highway also connects Emerald with townships across the Banana Shire and through to Gladstone.

Major north to south routes include the Bruce, Leichhardt, Burnett and Gregory Highways. Railway networks also perform a major role across the region in supporting the transport of minerals, goods and people. These networks include the North Coast Line that traverses Gladstone, Rockhampton and Livingstone local government areas, the Moura Line that connects the mine fields in Banana to Gladstone, the Central Western System that converges at Emerald and the CQ Inland Port, and the Blackwater System that traverses the Central Highlands into Rockhampton before connecting to the North Coast Line.

Whilst the Isaac region forms part of the Fitzroy River catchment, and continues to remain part of the Fitzroy Basin Working Group, Isaac Regional Council also forms part of the separate Mackay, Isaac and Whitsunday Regional Resilience Strategy.

Image: Woorabinda community. Credit: Woorabinda LGA.

Fitzroy and Capricornia landscape features



Banana Shire

Banana Shire is home to over 15,000 people, with Biloela as the central administration centre, named by the Gaangalu People after their totem, the white cockatoo. Biloela is joined by a number of other townships dispersed across the shire which include Thangool, Taroom, Theodore, Banana, Baralaba, Jambin, Goovigen, Moura, Dululu, Wowan and Cracow. The region's natural environments take in pristine gorges, rivers and national parks, such as the Dawson River and Expedition National Park, Kroombit Tops National Park, Lake Murphy and Mt Scoria Conservation Parks, and Isla Gorge.

The Callide power station outside Biloela provides energy for large portions of Queensland, including as far as South East Queensland. Cotton is the main industry of Theodore, that also supports a diverse rural sector. The Dawson Valley area grows approximately 80 per cent of the Shire's cotton and is a regionally significant industry . Beef is the region's dominant agricultural industry and is a substantial contributor to local economies in addition to Queensland's exports.

Central Highlands

Central Highlands is bounded by Isaac to the north, Rockhampton to the east, Banana, Maranoa, Murweh and Blackall-Tambo to the south and Barcaldine to the west. The region comrises the Nogoa, Comet and Mackenzie sub-basins and the scenic Carnarvon Ranges and tablelands high country.

The Central Highlands is rich in agriculture lands and minerals, with a population of over 28,000 people across thirteen unique communities including Arcadia Valley, Bauhinia, Blackwater, Bluff, Capella, Comet, Dingo, Duaringa, Emerald, Rolleston, Sapphire Gemfields, Springsure and Tieri.

The average age of the population of Central Highlands is 33, a relatively young population with a very low unemployment level at around 2 per cent. The Central Highlands is a thriving region abound with natural assets, heritage and cultural values and economic opportunity, which supports its diverse and vibrant community.

The Central Highlands is at the inter-section of several groups who each have a claim as Traditional Custodians of the land within the region.

Gladstone

Gladstone is known as the gateway to the Southern Great Barrier Reef and is the key launch point for southern island access to Heron, Lady Musgrave, North West and Wilson Islands. It is also home to Agnes Water and Town of 1770, Australia's most northerly surf beach. Gladstone is an area of great social, cultural and spiritual importance to the Gooreng Gooreng, Byellee, Gurang and Taribelang Bunda Peoples.

Gladstone is a regionally significant logistical and freight city, where all major regional roads and rail provide access to the Port of Gladstone, considered to be Queensland's largest multi-commodity shipping port. The naturally deep water port is situated within the World Heritage Great Barrier Reef area and caters for cruise ships, as well as supporting a thriving fishing and seafood industry. The Gladstone State Development Area facilitates state-significant industrial activities and is a hub for the region's highly skilled workforce. Further, the economy of Gladstone has begun transitioning to a green economy with the recent announcement of developing a Green Hydrogen Future with projects such as Hydrogen Park Gladstone.

Livingstone Shire

The Darumbal People are the Traditional Custodians of the Capricorn Coast and Rockhampton area, and the Woppaburra People as the Traditional Custodians of what is now known as the Keppel Islands.

Livingstone is nestled along the Capricorn Coast with a growing population of around 36,000 people, situated north-east of Rockhampton. It is renowned for the scenic townships of Yeppoon and Emu Park, productive coastal hinterland and the Keppel Bay Islands, that consist of 18 islands which attract international tourism on the Great Barrier Reef, 13 of which form Keppel Bay Islands National Park. The reefs around the islands boast a coral diversity that matches the Whitsundays with clear water most of the year.

The Shire has a diverse industry that consists of timber production, livestock trade, agricultural cropping, tourism, education and defence with the Shoalwater Bay Military Training area occupying the northern area of the shire.

Rockhampton

The Rockhampton Regional Council, situated 600 kilometres north of Brisbane on the Tropic of Capricorn, is the largest local government in area and population. Rockhampton is one of Queensland largest regional centres, flanking the downstream stretches of the mighty Fitzroy River as it makes its way to the Pacific Ocean. It is a key service and logistics hub for the regional mining and agricultural industries with a population of over 80,000 people.

Surrounding Rockhampton are the communities of Mount Archer, Gracemere, Kabra, Stanwell and Mount Morgan. The Stanwell power station is a highly-automated and efficient facility that provides electricity to large areas of the state. The Rockhampton region is steeped in history, with many historic buildings from the area's gold rush days remaining intact.

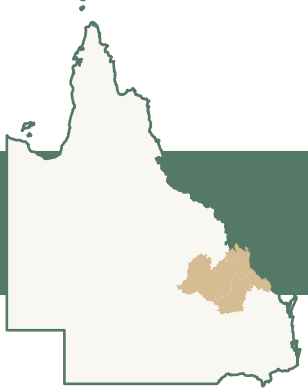
Woorabinda

Woorabinda Aboriginal Shire is situated on the lands of the Wadja and Gungaloo Aboriginal Peoples where approximately 52 clans are represented with a vast number of language groups from across Queensland.

The town of Woorabinda is located 170 kilometres south west of Rockhampton and 65 kilometres south of Dauringa, on the Fitzroy Development Road. The shire has a population of 962 people and is completely bounded by the Central Highlands Regional Council land. Woorabinda was established in 1927 and the community was sustained through stockwork that led to the formation of the Woorabinda Pastoral Company.

The Woorabinda Aboriginal Shire Council was established in 1985, and today the township incorporates a number of services and recreational facilities that serve the local community.

A snapshot of community characteristics



6 local governments

Median age 36.8 years

21.8% under 14 years old

14% over 65 years old

Top three employing industries:

Health care and social assistance (10.5%)

Retail trade (9.6%)

Education and training (9.0%)

5.7% Aboriginal and/or Torres Strait Islander Peoples

41.8% migration rate over last five years

87.2% of private dwellings are separate houses

26.2% of the population is within the most disadvantaged SEIFA quintile

6.4% unemployment rate

Our landscape

With the Great Dividing Range to the west and the Great Barrier Reef to the east, the Fitzroy and Capricornia region is made up of a diverse array of landscapes that comprise towering and dramatic sandstone cliffs of the tablelands, vast rich soil plains to national significant wetlands. Each landscape supports unique native plant and animal communities, some of which are found nowhere else in the world. The main bioregions includes the Brigalow Belt which comprises approximately 93 per cent of the region, followed by the South East Queensland and Central Queensland Coast Bioregions.

Over 6,700 flora and fauna species are found in the Central Queensland region (CQSS 2030).

There are 20 listed wetlands of national significance in the Fitzroy and Capricornia region, including major wetland ecosystems in the Fitzroy Delta. Some of these are also listed under The Ramsar Convention on Wetlands and form part of the Great Barrier Reef World Heritage Area, including Shoalwater and Corio Bays. These wetlands are estimated to support over 791 plant species, 445 different fish species, threatened marine turtles and 226 bird species, including migratory species that are protected under international conservation agreements such as the critically endangered Capricorn yellow chat found only in our region and on the mainland across from The Narrows. Dugongs are also reported to frequent the estuary adjacent to the lowlands close to Port Clinton. Water quality is a primary management issue for the catchment given the importance of local wetlands, the fauna and flora they support and the proximity of the Great Barrier Reef.

The landscape varies across the region from the coastal swamps and wetlands to mature eucalypt woodlands and open forest. Acacia scrub woodlands dominate the inland areas. Grazing is widespread on natural and modified pasture, irrigated cropping and horticulture is undertaken on the richest soils.

Rich, fertile soils are aided by the river systems that traverse the landscape. The Fitzroy Basin comprises 11 major river systems including the Callide, Comet, Connors, Upper and Lower Dawson, Upper and Lower Isaac, Mackenzie, Nogoa and Theresa Creek, forming the Fitzroy River about 100 kilometres west of Rockhampton. To the north and south of the Fitzroy River Delta are a number of coastal river catchments including the Waterpark Creek and Shoalwater coastal creek catchments along the Capricorn Coast in Livingstone as well as the Calliope, Boyne and Baffle catchments in Gladstone.

Hidden in the rugged ranges of Queensland's central highlands, Carnarvon Gorge and the rangelands feature towering sandstone cliffs, vibrantly coloured side gorges, diverse flora and fauna and Aboriginal rock art. Carnarvon forms part of Queensland's Sandstone Wilderness with a string of conservation estates across the south of the region from Theodore to Emerald including Isla Gorge, Nuga Nuga Lakes, Carnarvon National Park, and Blackdown Tablelands to name a few.

The region comprises a number of prominent national parks such as the Keppel Bay Islands National Park, also known by Indigenous names Woppaburra, Wop-Pa and Wapparaburra. Other State Forests and National Parks include Expedition, Blackdown Tableland, Goodedulla and Eurimbula National Parks, and Belington Hut, Dawson Range, Presho and Theodore State Forests which offer residents and visitors alternative experiences across the region's diverse landscapes.

Stock routes across the catchment reflect the importance of the beef industry from Clermont to Emerald, Springsure and Moura and also Taroom to Roma. The landscape offers rich recreational experiences from Fairbairn Dam and Lake Maraboon to fossicking on the public reserves of the Central Highlands gemfields.

Image: Carnarvon National Park. Credit: Shutterstock.

River and creek catchments

The Fitzroy River catchment is a vast area collecting water from extensive inland plains, coastal highlands and the Great Dividing Range. It extends from Nebo in the north to Taroom in the south, and Clermont and Injune in the west.

The Fitzroy Basin major tributaries join together about 100 kilometres west of Rockhampton and the catchment is commonly discussed in terms of its 11 rivers (Callide, Comet, Connors, Fitzroy (lower), Upper and Lower Dawson, Upper and Lower Isaac, Mackenzie, Nogoa and Theresa Creek) or six distinct sub-basins. The northernmost sub-basin takes in the Isaac River, draining the vast Isaac Plains, which is joined by the Connors River from the rainforests of the Connors Range and Blue Mountain. The southern tip of the Isaac sub-basin joins the Mackenzie River at the base of the Broadsound Range.

The westernmost is the Nogoa River sub-basin, which starts at the Great Divide and Drummond Range, flowing down the valley to Fairbairn Dam just west of Emerald. The Theresa Creek catchment joins it from the north and together they flow into the Comet River. Further south and almost parallel to the Nogoa is the Comet River valley and sub-basin, starting as the Brown River. It changes to the Comet at Rolleston and flows north until it meets the Nogoa and forms the Mackenzie, halfway between Emerald and Blackwater.

The Mackenzie sub-basin is in the centre of the broader Fitzroy catchment area and flows north-east from Blackwater to Tartrus where the Isaac joins it, turning south and collecting the waters of Carnarvon Creek along the way. Duaringa is the meeting place of the southern sub-basin of the Dawson River. It flows as the Upper Dawson River from as far as Injune, east and north through Taroom, Theodore and Baralba before joining the Mackenzie at Dauringa to form the Fitzroy. The remaining catchment is the lower Fitzroy which winds its way north through The Gap and Yaamba before heading south east to Keppel Bay and discharging into the Pacific Ocean.

To the north of the Fitzroy Delta within Livingstone Shire are the Waterpark Creek and Shoalwater sub-basins, each comprised of a number of short-run coastal catchments, which can produce dangerous flash flood conditions in parts of the shire.

To the south are the Boyne, Calliope and Baffle catchments within the Gladstone LGA. The Calliope River finds its headwaters in the Calliope Range, flowing east to the coastline where it discharges to the north of Gladstone. The catchment comprises a number of tributaries including Alma, Larcom, and Neil creeks. Hard geologies cover most of the catchment which means much of the rainfall in the catchment runs off into the Calliope which can produce riverine flooding across the floodplain.

The Boyne River adjoins the Calliope catchment to the south, descending the western slopes of the Great Dividing Range, and flowing north-west through the Boyne Valley before turning to flow north-east and entering Lake Awoonga before discharging in Port Curtis.

The Baffle Creek catchment straddles the Gladstone and Bundaberg LGAs and comprises a coastal river system with a patchwork of national parks, conservation parks and state forests.

Image: Gladstone region. Courtesy QRA.

Our climate

Our region has a highly variable climate, characterised by fluctuations between wet and dry periods, and certainly annual wet and dry seasons.

The region's sub-tropical climate is distinguished by hot, moist summers and warm, dry winters. Seasonal temperatures averages vary between the coast and inland areas. Summer averages range between 27°C and 34°C, whilst winter averages range between 21°C and 24°C.

The historical average annual rainfall for the region ranges from 600mm in the west to 900mm in the east. Higher rainfall is received over summer (December through February), however this fluctuates from year to year with natural variables. It is noted that local factors such as topography and vegetation as well as broader weather influences such as the El Niño-Southern Oscillation make the average and seasonal rainfall of the region variable in nature.

The following section highlights the key current climatic attributes of the region.

Tropical cyclones

The Fitzroy and Capricornia region routinely feels the impact of tropical cyclones, including inland areas. Cyclone season generally takes place in the period from November to April, with the highest incidence between December and March.

Tropical cyclones in the region often result in extensive rainfall, dangerous wind impacts and coastal hazards such as storm tide inundation and erosion along the Capricorn Coast and offshore islands.

Notable tropical cyclones and their category upon landfall in the region over recent times include:

- 1972 – Tropical Cyclone Emily (Category 2)
- 1972 – Tropical Cyclone Althea (Category 1)
- 1976 – Tropical Cyclone David (Category 2)
- 1992 – Tropical Cyclone Fran (Category 2)
- 2009 – Tropical Cyclone Hamish (Category 5)
- 2013 – Ex-Tropical Cyclone Oswald (Category 1)
- 2015 – Tropical Cyclone Marcia (Category 5)
- 2017 – Tropical Cyclone Debbie (Category 5).

Fire weather

Bushfire and grassfire is endemic to the landscapes of large areas of the region, often ignited by lightning strike or accidental causes. Good fire also supports healthy landscapes, with many of the region's ecosystem dependent on a level of fire frequency.

Aside from fuel loads, our weather and climate have a significant role in the intensity to which fire may occur, and how easily fuels may burn.

Fire weather is determined by aspects of temperature, low relative humidity, high wind and drought factor. These aspects are considered as part of a framework known as the Forest Fire Danger Index (FFDI) as well as the Grass Fire Danger Index (GFDI). Based on data analysis performed by the Bureau of Meteorology (BoM), from 1950 to 2018, annual accumulated FFDI has increased in the area by 18 per cent. The average annual occurrence of fire weather days exceeding FFDI 50 has increased by 19 per cent since 1950 (BoM, 2019). The annual fire season is also starting earlier and lasting longer, adding an estimated 30 days onto the annual season over the past 70 years. Catastrophic fire conditions (exceeding FFDI 100) was observed during the 2018 Central Queensland Bushfires.

The region experiences different fire weather conditions from east to west. However overall, fire weather conditions are intensifying in the region, heightening the risk of bushfire and grassfire.

Image: Yeppoon Lagoon Sunset. Credit: Shutterstock.

Temperature

Summers in Central Queensland are hot, with average maximum temperatures ranging from 28°C to 32°C. On very hot days, the temperature can exceed 40°C. While annual temperatures have fluctuated year-on-year, the region has experienced a steady increase in temperatures over the past half-century and an increase in days over 35°C. Considering Rockhampton for instance, days above 35°C per year have steadily risen over the past half-century, from an average of 15 days per year in the 1950s to 25 days in the 2010s.

This can lead to heatwave conditions which can have significant impacts on society and the environment in several ways, including human health, agriculture, economy, natural hazards and ecosystems. They are also Australia's most costly disaster in terms of human impact, with severe and extreme heatwaves being attributed to more than half of all disaster-related deaths.

The Bureau of Meteorology identifies heatwave conditions as three days or more of high maximum and minimum temperatures that are unusual for that location. This is considered in relation to the local climate and past weather at the location.

Heatwaves are generally driven by a high pressure system which pushes hot air from the Australian interior towards the region. This pressure in the upper atmosphere stops hot air from rising, causing it to stagnate over a region. Climate phenomena such as periods of El Niño produce changes in heatwave pattern and severity, resulting in significantly more heatwave days and longer and more intense events within northern and eastern Australia.

Most people have adequate capacity to cope with many of the heatwaves experienced in Queensland, as they are low intensity heatwaves. However, less frequent, higher intensity severe heatwaves can be challenging for vulnerable populations and can translate to agricultural, infrastructure, economic and ecosystem impacts.

Drought

Drought events, associated with below average rainfall of varying intensity and duration, have a long history across Central Queensland. These stress events have led to great innovations and successes in adaptation however, droughts can seem unending and can affect our community resilience.

Notable drought events in the region over time have included:

- Federation Drought 1895-1902
- May 1914-March 1915
- January 1965-June 1966
- April 1982-February 1983
- April 2002-January 2003
- April 2017-September 2019.

The latest drought declarations are published at: www.longpaddock.qld.gov.au/drought/drought-declarations/

Future climate trends

Looking forward, our climate is projected to change in a number of ways, with implications for people, our landscapes and the economic activities of the region.

We know that historical climate and natural hazard event trends can no longer be relied on exclusively as an indicator of future climatic trends or disaster events. Climate change is shifting the goal posts for disaster management and resilience.

The Queensland Regional Climate Impact Summaries provide climate change projections to 2030 and 2070. Into the future, the Fitzroy and Capricornia region can expect to experience:

- higher annual average temperatures
- more frequent hot days, particularly in the summer
- fewer frosts
- sea level rise
- warmer and more acidic seas
- more frequent sea level extremities.

These likely changes to the climate of the region will bring with it both opportunities and risks for which we will need to prepare.

Image: Yeppoon sunrise. Credit: Shutterstock.

Case study: Fitzroy Regional Drought Resilience Plan

The Queensland Department of Agriculture and Fisheries has partnered with the Rural Economies Centre of Excellence (RECoE) to lead the consultation to work with regional communities and develop Regional Drought Resilience Plans (RDRPs) to prepare regional communities for and manage future drought risks.

The RDRP program is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government.

The RDRP Program builds on and complements the *Resilient Queensland* work completed by QRA, who supports the design of this program and is a key program stakeholder.

Throughout the consultation and development of the Queensland Strategy for Disaster Resilience and its implementation plan *Resilient Queensland*, drought has often been raised as a serious challenge impacting regions. The RDRP Program provides the opportunity to have a clear focus on drought risk in the context of regional resilience

In its foundational year the Queensland RDRP Program focuses on five pilot regions for the development of RDRPs by June 2022, with learnings to inform the development of RDRPs in other regions in the near future. The Fitzroy is one of these regions.

The plans will identify actions to prepare regional communities for future droughts, with a sharp focus on agricultural sector and allied industries. Engagement and plans will account for the unique profile of each region and will include actions that are regionally relevant.

The RDRPs will provide an evidence base and priority actions that regions can use to compile applications for small grants from the Future Drought Fund and potentially other funding sources.

Image: Beef grazing operation in the Central Highlands region. Credit: Richard Hawkins.

Our challenges and opportunities

Living in lockstep with the functions of the landscape and weather conditions provides us a unique awareness and understanding of the implications of serious weather.

Our challenges and opportunities to continue to bolster our resilience in the face of serious weather, disasters and a changing climate are varied, having regard to aspects of the environment, infrastructure, roads and transport, people and communities, and the region's economy.

Environment

The environmental characteristics of the region generate values and benefits, as well as the potential for adverse impacts. While the river catchments and floodplains are a vital component of the landscape and provide a great source of fertile alluvial soils, flood events can contribute to a range of environmental challenges such as the spread of weeds and pests from upstream flows, erosion of streambanks and sedimentation. Extreme erosion and sediment loss can destabilise land and can lead to potential contamination. Proactive measures to manage these impacts can support the resilience of environmental systems.

Tropical cyclones can also incur a variety of environmental considerations in their aftermath. These powerful weather systems can disrupt or even damage fragile and unique habitats. They can contribute to regional-scale biosecurity challenges through the spread of pests and weeds, while also producing large quantities of vegetation debris, or green waste.

Research commissioned by the Queensland Fire and Emergency Services following Tropical Cyclone Marcia found that increased fuel loading and hazard caused by tropical cyclones can increase fire intensity by more than two-fold. Vegetation debris build-up can also further endanger recovering ecological communities.

A range of opportunities exist in relation to bolstering environmental resilience, including advanced approaches to primary production such as regenerative agriculture, and partnerships which embrace First Nations sustainable practices. The stewardship of healthy Country offers benefits beyond the intrinsic values it contributes to ecosystems and biodiversity, including reduced bush and grassland fuel loads, reduced carbon emissions through improved fire management practices, improved weed and pest outcomes and reduced erosion.

Local governments in the region are members of the Reef Guardian Council's program and have made commitments to support a healthy and resilient Great Barrier Reef. Reducing impacts on the reef is a shared responsibility, with a large proportion of the region's landholders also dedicated to on-farm sustainable agricultural practices to ensure the longevity of the reef for generations to come.

Towns and infrastructure

Our network of towns and built environment stems principally from our agricultural heritage, coastal village culture and mining, industry, and energy expansion. Much of our housing stock predates modern building codes and while the classic 'Queenslander' has experienced many weather events, how we can make our homes and buildings more resilient to flood, cyclones and bushfire (and eliminating asbestos) is certainly advantageous.

The planning and design of our towns can have a large influence on how we experience heatwaves. A commonly used solution to cool towns is street trees. However, in parts of our region, street trees can create other risks during tropical cyclones and severe storms. Along the Capricorn Coast including Rockhampton and Gladstone, alternative solutions could include passive design strategies such as solid shading elements, orientation according to breeze and wind directions and 'cool' walls, floors and roofs.

Work stemming from the original Fitzroy Regional Resilience Strategy has seen our flood warning infrastructure continue to improve, which has expanded to include assets in the Waterpark Creek, Calliope, Boyne and Baffle catchments. This is essential for the sheer number of waterways in the region and the future outlook for more intense and shorter rainfall events or 'microbursts'. Coordinated flood warning infrastructure translates to better information and intelligence, and more options for consideration in decision-making relating to flood hazard for our towns and infrastructure networks on which we rely.

During disasters, redundancy and back up is especially important for energy and telecommunication networks. With a dispersed population, staying connected is paramount. Support from infrastructure providers in recognising challenges in locations where redundancy is limited, and alternatives even less, means we can work together to deliver infrastructure that is fit-for purpose and enduring.

Image: Train platform of Emerald railway station. Credit: Shutterstock.

Roads and transport

Our road, rail, air and stock route networks across the Fitzroy and Capricornia region support high-value product movement and keep Queensland's economy moving.

Transport networks are an essential component of daily life across the region. This extends beyond road networks and includes rail, air, ports and stock routes. Not only do these networks enable us to travel for work and for personal purposes, but they support product, freight, materials and stock movements, and drive tourism, as foundations of our economy. Transport also provides a lifeline in times of emergency, and is critical for strong supply chains and resupply before, during and after disaster events.

Whilst it is not possible to 'flood-proof' the entirety of the road and rail network in an area of vast floodplains such as that of Fitzroy, projects have been underway to minimise closure periods. The Bruce Highway – Yeppen Floodplain Upgrade project is a key example.

In addition to the rail and road network is the nationally-significant Gladstone Port which handles over 30 different products including coal, bauxite, alumina, aluminium, cement and Liquified Natural Gas for a total throughput of more than 100 million tonnes per annum, accounting for approximately 83 per cent of Queensland's nominal overseas merchandise exports.

Experiences with these frequent events, like floods, cyclones and bushfires, is also how we have built our existing levels of resilience over time. However, there are other hazards we also face in this region and whilst their probability may be lower, they are not impossible. Our familiarity with these types of hazards is also lower. We must be careful that we do not inadvertently discount these hazards by focusing our attention and efforts only on higher frequency hazards. These events have been risk assessed by local governments and emergency services, with appropriate measures identified which reflect the nature of these risks.

Earthquakes are a good example of a low probability but potential high consequence hazard. Transport networks can be vulnerable to earthquakes and earth tremors, particularly bridges which often require specialist structural inspection following a nearby earthquake, depending on its scale, before they can be safely reopened. This can result in short periods of isolation or restricted movement until the inspections have been carried out and the safety of the travelling public can be ensured.

Extreme heat can also damage road pavement surfaces, causing sealed surfaces to 'melt' and railway lines to buckle. This type of damage can also occur due to flame contact and radiant heat emitted from intense bushfire events.

Economy

Rockhampton is the location of the junction of major road and rail networks, with proximity to the Bowen Basin and strategic access to the Galilee Basin. Rockhampton is also a key service and logistics hub for the coal industry, providing road, rail and air services. The Bowen Basin in Central Queensland is the nation's largest coal reserve and has 46 operational coal mines extracting more than 200 million tonnes of coal annually. Coal is also found further south as far as Moura. The Callide power station produces about 20 per cent of Queensland's electricity, noting that a significant proportion of Queensland's demand for electricity comes from the Gladstone area

The Isaac economy contributes over 75 per cent of the region's Gross Regional Product of $5.9 billion and consistently generates in excess of $1 billion in royalty payments each year. Agriculture is an important industry with an annual output of $308 million.

Central Highlands is similarly rich in minerals and agriculture, thriving on irrigation sourced from storage on the Nogoa and Comet rivers. The region produces significant amounts of cotton, broadacre crops, fruit, nuts and vegetables. Its niche horticulture producers service the growing international demand for safe and clean premium products. The town of Emerald hosts Ag-Grow, one of the most successful marketing events for businesses seeking to access opportunities throughout the region. The sector contributes nearly a quarter of the state's total exports and is part of Queensland's $13 billion primary industry sector.

Theodore supports a diverse rural sector with its main industry being cotton. Almost 80 per cent of the Shire's cotton is grown in the Dawson Valley Area. The beef industry is the region's dominant agricultural industry and is a significant contributor to local economies as well as Queensland's exports. The region is home to Queensland's largest livestock exchange. Rockhampton is also known as the beef capital of Australia and hosts Australia's national beef expo, Beef Australia, every three years. The Biloela meatworks is the third largest in Queensland and processes meat for export.

Grain production is also a significant contributor to the region's economy.

Image: Semi-trailer transportation on the highway carrying cattle to the sale yards, Rockhampton. Credit: Shutterstock..

Looking to the future, the region's energy sector continues as the power hub of Queensland, including the development of Queensland's first renewable hydrogen production facility at Gladstone. The continued development of infrastructure networks that support emerging industry is a key opportunity.

The Gladstone Region and Banana Shire are also home to the Gladstone and Callide Infrastructure Corridor State Development Areas, established to support state-significant industrial activity, including liquified natural gas. Also in the Banana region is the Surat Basin Infrastructure Corridor State Development Area, a 214 kilometre rail corridor between Wandoan and Banana which will connect the existing Western Railway and Moura Railway systems.

The region forms part of the Central Queensland Renewable Energy Zone, centrally located in a strong part of the network and already home to significant renewable energy resources. The Gladstone Inland Rail development presents further economic development opportunity for the region.

Tourism is a key contributor to the regional economy with growing road travellers. While the bulk of visitor numbers are due to mining and industry uses, there is an abundance of opportunities for leisure visitors. Domestic overnight leisure visitors spend over $500 million in the Fitzroy Region, with tourism accounting for 10.9 per cent of all employment. Key factors in Central Queensland's favour are the stronger domestic drive market, upon which Central Queensland relies for almost 80 per cent of its visitors and the daytrip market which is supported by population growth. Only 10 per cent of visitors to Central Queensland are international.

Among the strengths of the regional economy that benefit economic resilience are high levels of industry diversity, strong transport networks, access to manufacturing facilities, the climate of the region, the cost of living and land availability.

A large part of the economic vibrance of the Fitzroy and Capricornia region is not just industry diversity, but the spectrum of small and medium enterprises, large national and multi-nationals as well as government and Defence. Irrespective of the scale of operation, business continuity planning is essential.

People and communities

The catchment boasts isolated yet well connected and resourceful communities. These communities service vast areas of rural Queensland. With growing tourist numbers, the region is celebrated regularly and its character reflected through the range of events held. People and communities across the vast Fitzroy and Capricornia region are the definition of resilient, incorporating behaviours as part of everyday tasks that consider the rapid onset of natural hazards, as routine. This is particularly evident across the grazing and agricultural communities of the region.

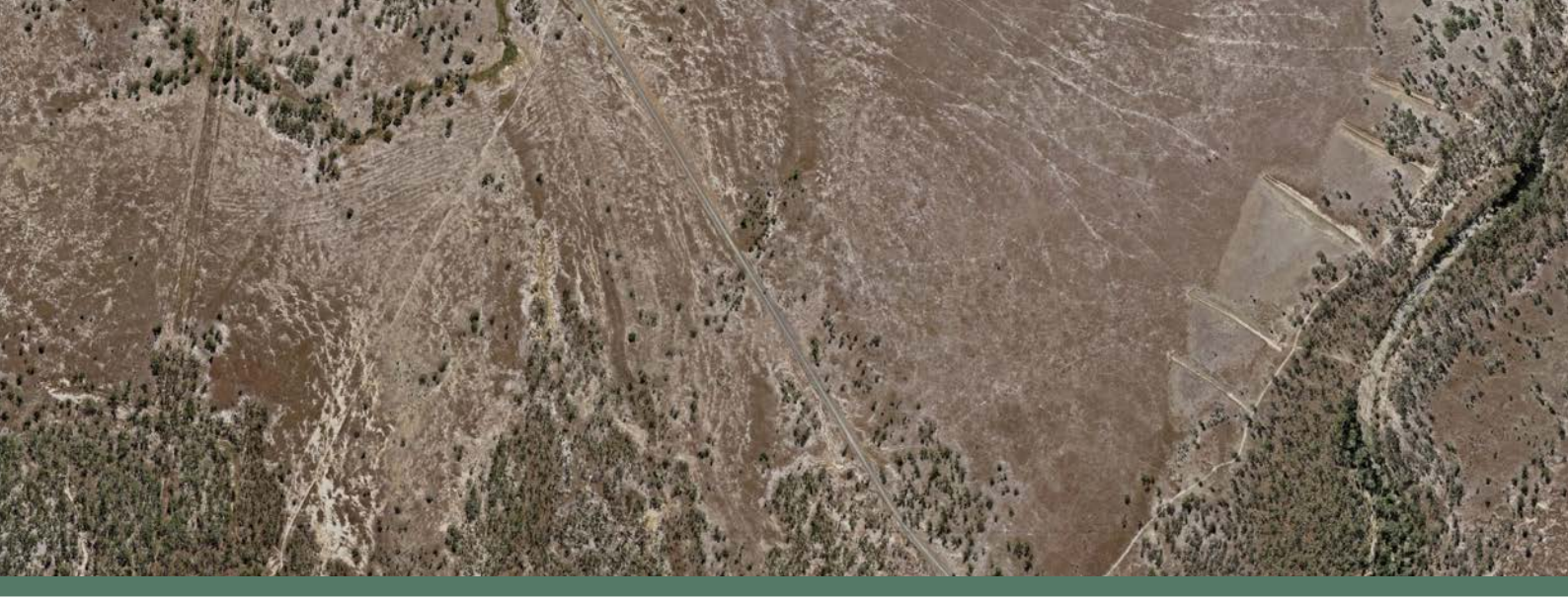
Whether we live in or out of town, being prepared includes not only the steps we can take to prepare ourselves, families, properties and businesses, but also lending a hand to help our neighbours and broader community to prepare.

Our valued community and sporting groups are a key opportunity to provide many hands that make light work as we prepare for each disaster season. Central Queensland boasts some of Queensland's most active and impactful community groups, and these networks come in many forms. Some may be place-based, like our local Country Women's Association or Rotary, and others may be interest groups – even those which are largely online. We still help each other out, in more ways than one and especially for those who are vulnerable. Being connected and lending a hand to serve others usually pays us back in spades when it is our own turn to need some help. It also aids the recovery process, which is often long-term but is made easier by locally-led approaches.

Part of our population profile includes our transient population and in particular, fly-in-fly-out worker populations as well as backpackers who are yet to understand the landscape, how it operates and the hazards of the region in the same way that locals do.

Over the years, and particularly more recent years, our Central Queensland community has faced a lot. Drought, floods, bushfires, cyclones, a global pandemic, and other events which have rocked our local communities. The value we place on 'community' means we can stand up to the adverse conditions that come out way, together.

Image: Beach carnival of trainee surf life savers and nippers with surfboards, swimming and races at Yeppoon. Credit: Shutterstock.



Climate influences

Opportunities to position the region as the climate changes is a key overarching driver for a prosperous economy, communities and environment in Central Queensland.

Climatic challenges include projections of higher temperatures, hotter and more frequent hot days and nights, more intense and frequent fire weather and more intense downpours, with less overall rainfall. Rates of evaporation across the region will increase.

Tropical cyclones are expected to track further south across Queensland than has been the case in the past. The quantity of cyclones each year is not projected to change but their general intensity is forecast to increase which presents potential changes to the cyclone risk exposure of the region.

Sea level is predicted to rise by 0.8 metres or more above present day levels by 2100, bringing with it increased exposure to coastal hazards including those associated with cyclone events.

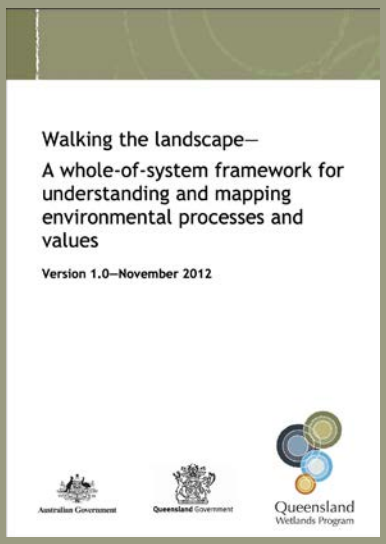
Rainfall is projected to become concentrated, with a higher incidence of high volume, intense events but reduced annual rainfall. More intense episodes could increase agricultural vulnerability in terms of flood inundation, increased potential for erosion and a reduced infiltration effect with lowered pasture growth. Persistent drought between intense rainfall and flood events will rise in likelihood.

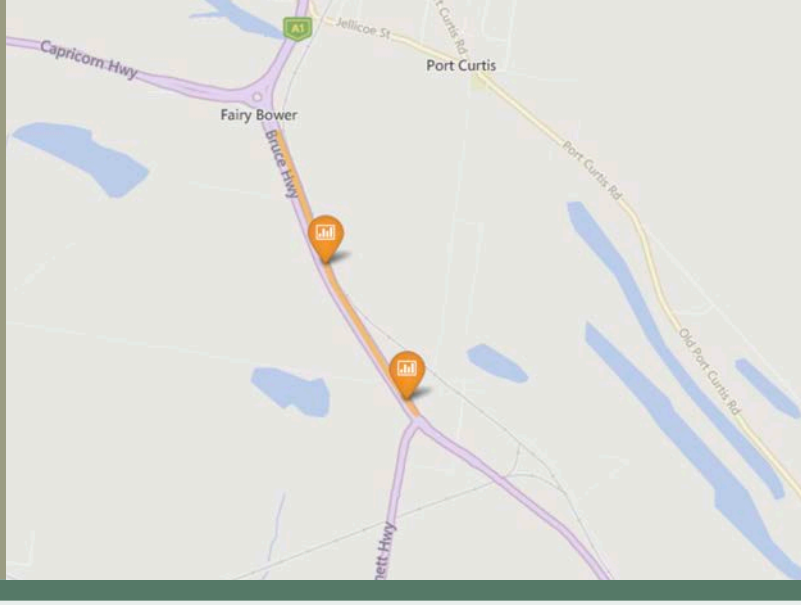
Rises in mean temperatures brings with it an increase in the number of hot days experienced giving the effect of an extended summer. Temperature rises will primarily impact our people, health and lifestyle, with the potential for heatwaves to occur over protracted periods compared with that experienced at present.

The environmental cost of increased temperatures include coral bleaching, reduction of water quality, harm to to coastal ecosystems and reduced recreational values. The region's Brigalow Belt bioregion is vulnerable to increased temperatures with threatened species having their migration patterns disrupted and habitat reduced. From a grazing perspective, increased temperatures may result in the intrusion of feral animals seeking water and food resources.

Over time, we will need to adapt how we live, work and play under changing climatic conditions. Taking steps now, as highlighted by this Strategy, is a key opportunity to consider the various aspects of enhanced resilience to inform how we move forward. In this way, we will place ourselves, our communities, economy and built and natural environments in as best a position as we possibly can to keep options open and inform our decision-making in the face of future uncertainties.

Image:Livingstone Shire. Courtesy QRA.





Case Study: Walking the Landscape

The Strategy is supplemented by a separate body of work led by the Department of Environment and Science, called Walking the Landscape. The Walking the Landscape content for the Lower Fitzroy and Calliope River systems can be viewed via the WetlandInfo website.

The primary aim of Walking the Landscape is to help develop a whole-of-landscape understanding to improve evidence-based decision making for the sustainable management and restoration of ecological systems.

The framework incorporates available knowledge on landscape components (e.g. groundwater dependent ecosystems, lacustrine wetland, riparian vegetation etc.) and processes (hydrological, geological etc.). The framework integrates existing scientific information with local knowledge about how catchments work.

Through this process, the Department of Environment and Science worked with local stakeholders, local and state government and communities to gain a collective understanding of many Queensland catchments from Cape York to South East Queensland.

The process helps answer questions like how the landscape impacts water movement or why groundwater dependent ecosystems occur in certain locations.

The primary aim of the framework is to help develop a whole-of landscape understanding to improve evidence-based decision making for the sustainable management and restoration of ecological systems.

www.wetlandinfo.des.qld.gov.au/wetlands/ecology/processes-systems/water/catchment-stories/

Image: Strategy cover. Courtesy Department of Environment and Science.

Case Study: Bruce Highway - Yeppen Floodplain Upgrade

The Yeppen Floodplain upgrade involved the duplication of the Bruce Highway on an elevated carriageway, 3.5 metres higher than the previous highway. The new elevated crossing commences at the Burnett Highway intersection through to the roundabout at the intersection of the Bruce and Capricorn highways.

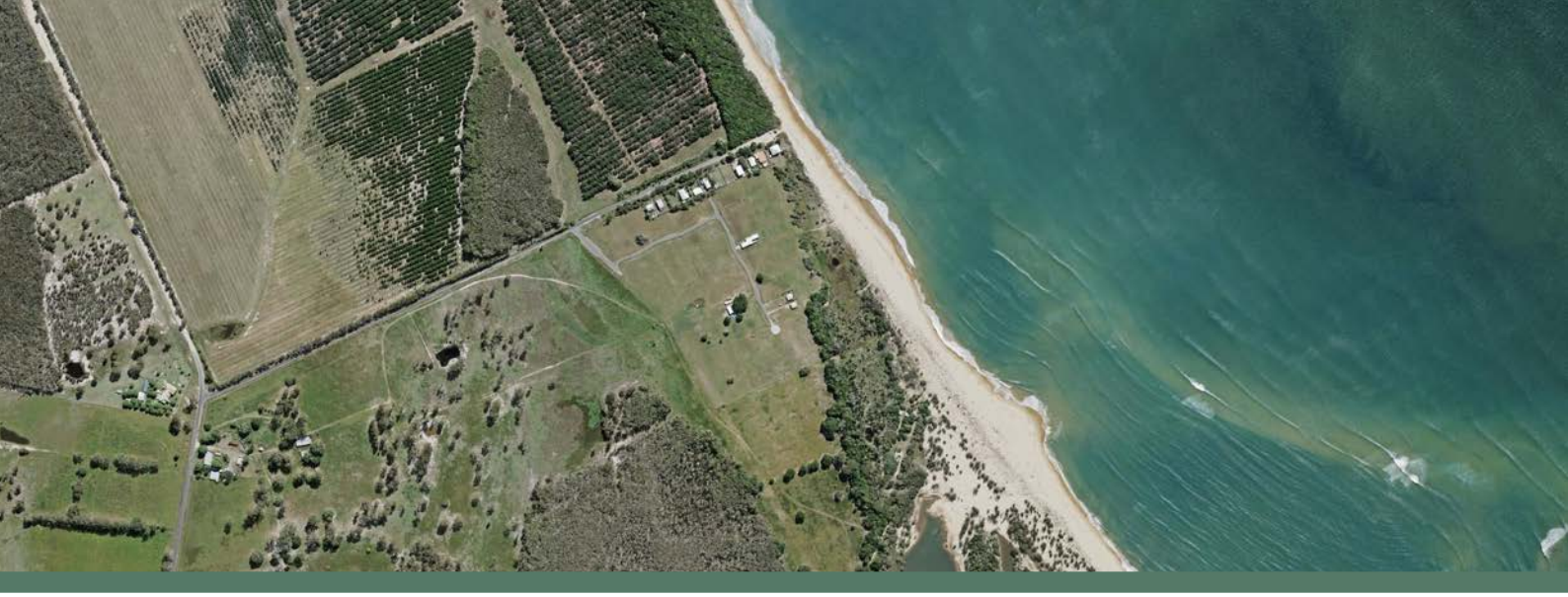
Benefits of the project include:

- improved safety through the separation of north and south-bound traffic
- improved flood immunity in flood events up to a 1% AEP level
- improved efficiency for freight and passenger traffic travelling along the Bruce Highway and to and from Rockhampton
- reduced congestion.

The Australian Government committed up to $118.512 million towards the project in partnership with the Queensland Government and the project was delivered under budget.

Construction commenced in January 2014 and was completed in November 2015.

Image courtesy Department of Infrastructure, Transport, Regional Development and Communications.



Our exposure and risks

Critical to understanding risk are the elements of exposure and vulnerability which exist at both a micro and macro scale, as well as the likelihood of risk. For example, specific infrastructure assets may be exposed and/or vulnerable to natural hazards and as a consequence, activities which depend on these assets may also be vulnerable. From a resilience perspective, it is necessary to consider the risk consequences across a broad spectrum from asset-based analysis through to strategic and systems-based analysis.

The following section provides a high-level overview of the nature of hazard exposure across the Fitzroy and Capricornia region. The following observations are informed, in part, by the QERMF approach across each local government area.

Cyclone, severe storm and coastal hazards

Aside from flood hazard, there remains a high probability of cyclone and severe storm events occurring in the region, with cascading associated coastal hazards.

The region's cyclone exposure is largely associated with systems crossing the coast from the Pacific Ocean, and those which track down the coastline from the north. The energy from a cyclone will generally dissipate upon making landfall, transitioning to a low-pressure system as it moves further inland however, these systems can still result in considerable damage from extreme wind. Areas with the highest level of vulnerability to cyclones are predominately coastal settlements along the Capricorn Coast and including Gladstone, where cyclones are usually at their peak severity prior to making landfall.

While risk is elevated to coastal locations, severe wind remains a risk for the entire region. An example being the impact of Topic Cyclone Marcia which remained a cyclonic-strength system which it reached Biloela in the evening of 20 February 2015, with wind gusts of 85km/hr were recorded. Emerald and communities in Central Highlands have likewise bore the brunt of powerful systems, dumping rain and causing damage from destructive winds.

Vulnerability to cyclones and the ability to withstand the extreme wind associated with these systems is particularly prevalent to the age and condition of building stock particularly situated along the coastline. This includes critical assets such as aged care, schools, telecommunication towers, exchanges, schools, airport facilities, emergency service facilities and public hospitals.

In general terms, homes built before 1985 usually sustain more damage during a cyclone than more recently built homes. For homes constructed after the mid-1980s, they are likely designed and built for the wind speed specific to its particular location.

As well as extreme winds, a tropical cyclone can cause the sea to rise well above the highest tide levels of the year when it comes ashore. These storm surges are caused mainly by strong, onshore winds and reduced atmospheric pressure. Storm surge is potentially the most dangerous hazard associated with a tropical cyclone.

Storm surge is an abnormal rise in sea level over and above the normal (astronomical) tide levels. It can be thought of as the change in the water level due to the presence of a storm. These powerful ocean movements are caused by strong winds piling water up against the coast as a tropical cyclone approaches. Storm tides can swamp low-lying areas, sometimes for kilometres inland. Strong winds at the coast can also create large waves, worsening the impact and giving rise to coastal erosion. Storm surges are at their most dangerous when they arrive at high tide – when the sea is already at its high point. The resulting storm tide can flood inland areas.

Livingstone Shire Council and Gladstone Regional Council have undertaken a detailed coastal hazard adaptation strategies which consider the spectrum of coastal hazards and risks relevant across the coast.

Image: Rules Beach, Gladstone. Courtesy QRA.

Flood hazard

The Fitzroy River has a long and well documented history of flooding dating back to 1859. The highest recorded flood occurred in January 1918 and reached 10.11 metres on the Rockhampton gauge. Rockhampton has exceeded the major flood level three times this decade and in 2011 the Fitzroy River reached 9.20 metres at Rockhampton – still almost a metre below the 1918 levels.

This last decade events affected communities across the catchment in Emerald, Rolleston and Theodore with their largest floods on record. A total of 79 warnings were issued for the Fitzroy River system including the Nogoa River during December 2010 and January 2011. The major event in 2011 was preceded by heavy rainfall throughout the catchment with Emerald township suffering the rise of the Nogoa River as 600mm of rain fell. Over 400mm fell in the Carnarvon ranges between December 26 and 28. Emerald recorded major flooding in December 2010 causing significant inundation to the town. Major flood level (15 metres) was exceeded from December 30 to January 2. An estimated 1000 houses and 95 per cent of properties were inundated.

Emerald flood height records began in 1950 with three major flood peaks in the record. The last major flood was 15.36 metres in January 2008, but previous to that was 15.7 metres in 1950. Flooding peaked at a new record of 16.05 metres on December 31 and remained above 14 metres for five days.

In the 2010-11 Queensland Floods, the entire population of Theodore was evacuated and the urban area inundated as a 1 per cent annual exceedance probability (AEP) event affected the township.

In the Waterpark Creek and Shoalwater catchments of Livingstone, there are a large number of creeks that cause localised flooding, including flash flooding in some instances. Flooding on Ross Creek and Fig Tree Creek in Yeppoon can impact houses and businesses. Flooding occurs regularly in areas such as Byfield, Stony Creek and Stanage Bay, noting Stanage Bay Road is regularly impassable.

In the Gladstone region are the Calliope, Boyne and Baffle catchments. Flood heights in 2013 across the catchments was exceptional, considerably higher than the Major flood level for the Boyne River and reaching 18.10 metres at Essendean Bridge (flood forecast location). The Major flood level at this location is 12.0 metres.

Image: Fitzroy RIver flooding at Rockhampton. Credit: Shutterstock.

Heat and heatwave hazard

Dealing with heat is part of living in our region of Queensland. The interior of our region can experience over 60 days each year above 35°C, while our coastal towns benefit from the sea breeze and cooler temperatures. However, increasing intensity and frequency of heatwaves means all of Fitzroy and Capricornia will experience longer periods of increased temperatures.

Currently, heatwave days are experienced an average of 22 days each year, higher for Banana Shire and Gladstone. This is anticipated to increase under a changing climate of up an average of 35 additional heatwave days across the region each year.

The rise of annual heatwave days may potentially increase stress on the region's economy, social and community services, as well as potentially impact infrastructure networks, if unable to adapt to prolonged periods of increased heat.

Those who are most vulnerable to the effects of hotter and more humid temperatures associated with heatwave days will require considerable attention and care from our community. This includes the aged, the ill and the very young.

Bushfire and grassfire hazard

In November and December 2018, the Central Queensland Bushfires devastated 35 communities across eight LGAs, including most within the Fitzroy and Capricornia region, burning 1.4 million hectares of land and impacting primary producers, agriculture and the environment.

Widespread and protracted heatwave conditions combined with gusty westerly winds created a catastrophic fire danger. In Central Queensland, temperatures in excess of 40°Cs and wind gusts of up to 40 kilometres per hour made for dangerous and unpredictable conditions.

As an example, on 28 November 2018, Rockhampton Airport recorded 'Catastrophic' conditions for approximately three-and-a-half hours, a first for that region and the most prolonged event since the implementation of the Fire Danger Rating System in 2010.

The fires caused significant social disruption with school, road and rail closures and 14,462 residents notified for evacuation across impacted areas.

In total, in the areas affected 17 dwellings were assessed as damaged, with nine destroyed, while 72 sheds or other structures were damaged, of which 27 were destroyed. In addition, 28 vehicles and multiple machinery and equipment across 37 properties were damaged.

The 2019-20 bushfire season in Central Queensland was equally as devastating, with impacts in Livingstone, Gladstone and Rockhampton particularly prominent. Following years of drought and still in recovery from the preceding fire season, bushfire emergencies were again declared in the region, impacting the communities of Lowmede, Mount Maria, Cobraball and surrounding localities, Mount Morgan, Lakes Creek, Mount Archer, Frenchville and Koongal.

In terms of exposure to bushfire and grassfire hazard beyond residential dwellings includes various forms of infrastructure including roads, bridges, railway tracks, airport facilities, schools and telecommunication towers. While these assets are exposed, the threat of economic loss is also a significant risk across the region given the potential loss of cattle grazing pastures, crops, impacts on stock routes, fodder, equipment and sheds.

It is worth considering that cattle grazing does manage the availability of potential fuel to an extent and landholders particularly vulnerable to bushfire will generally have a sound understanding and awareness of their bushfire risk.

In addition to hazard reduction burning, other mitigation measures and environmental activities can contribute to healthy, managed landscapes. These include weed management programs, the implementation of strategic asset protection zones, establishment of firebreaks and the use of regenerative or ecological fire to restore landscapes. Cultural burning practices and Traditional Owner fire management opportunities offer significant benefits for the region and can mitigate the impact of intense fire on wildlife populations.

Earthquake hazard

Earthquakes are a rare event for the region, but tremors have occurred in the past including the 'Great Queensland Quake' which occurred in the Gladstone region off Lady Elliot Island in 1918. This earthquake measured a magnitude of between 5.9 and 6.05 and was felt as far as Mackay, Charleville and south to Grafton.

Newspapers at the time noted severe damage to settlements in Bundaberg, Rockhampton and Gladstone. A recurrence of this event today would likely have catastrophic consequences for the local community, and State-wide economic impacts given the significant contribution of Gladstone to the Queensland economy.

The Fitzroy and Capricornia region stretches across three Seismic Hazard Source zones, including zones 2, 3 and 29. These areas have varying levels of earthquake exposure in accordance with the Queensland State Earthquake Risk Assessment. Zone 2 takes in Livingstone, the northern half of Rockhampton and the northern area of Central Highlands and is identified as subject to a 13 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years.

Zone 3 takes in most of the Gladstone region and the eastern area of Banana Shire and is identified as subject to a 17 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years. A fault line is located off the coast of Gladstone.

Zone 29 takes in the northern area of Gladstone, the southern areas of Rockhampton and Central Highlands, most of Banana Shire and the entirety of Woorabinda and is identified as subject to a 41 per cent probability of a 5.35 magnitude earthquake occurring over the next 100 years.

In terms of exposure, damage to underground assets and above ground infrastructure networks may yield considerable and cascading effects for water availability, sanitation and public health and disease. Mining related activities occurring underground is a key consideration for exposure, as is the age and condition of building stock which may be vulnerable to earth tremors.

Image: Woorabinda. Courtesy Woorabinda LGA.

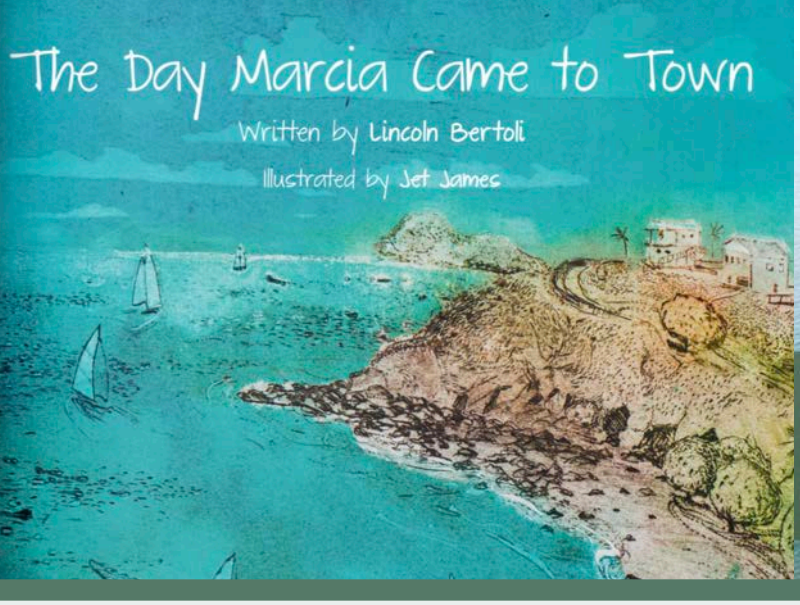


Image: The day Marcia comes to Town cover.

Image: Snapshot from Resilient Ricky video. Courtesy QRA.

Case Study: The day Marcia came to town

The tropical low that eventually became Tropical Cyclone Marcia was first identified and tracked on 15 February 2015, observed on the monsoon trough southeast of Papua New Guinea in the Coral Sea. On 18 February, after several days of drifting eastward with little change, the system turned southwest and began intensifying. The system was officially designated a Category 1 cyclone that evening, subsequently undergoing rapid intensification to a Category 4 in approximately ten hours. By 20 February, Cyclone Marcia had intensified to a Category 5; crossing the Queensland coast at Shoalwater Bay at 8:00am, 90 kilometres north-north-west of Yeppoon.

As Yeppoon marked the first anniversary of Cyclone Marcia, the community launched creative works in response to the disaster. The book was the idea of local Lincoln Bertoli and illustrated by local artist Jet James.

The Day Marcia Came to Town, is written from the perspective of a young boy named Lachlan, whose grandfather tells him the story of the cyclone.

The book was distributed to every child in schools around the region from prep to year four. The distribution to the schools also gave an opportunity for Lincoln to speak to the kids and have some firsthand discussion on the impacts of the event.

The discussion can give greater insight into how people work together and collaborate for the collective good. This discussion was important because working together is a key theme of the book: stick together and help each other.

Case study: Resilient Ricky

Resilient Ricky is Livingstone Shire Council's Disaster Crusader.

Ricky's role is to promote the Get Ready message and to support the community to be prepared and participate in recovery.

Ricky was born from an internal discussion with a variety of Council officers looking for a fun and engaging way to promote the Get Ready message and the Livingstone Shire Council Disaster Dashboard – especially for kids.

This group went on to design the costume in such a way that any willing Council officer can be Ricky!

Resilient Ricky has become a recognisable character in Livingstone and flies into many Council and community activities and events. Ricky interacts with children in a positive way, not focusing on the fear of disasters but focusing on the empowerment of being prepared and informed.

Resilient Ricky has been involved in a number of Get Ready events, school holiday visits, community centre promotions, cinema and billboard advertising, book readings and Council and community festivals and events.

Case study: Rockhampton's Inclusive Risk Assessment

Rockhampton Regional Council has been working with the community to increase awareness of and preparedness for disasters. Rockhampton Regional Council has undertaken a comprehensive emergency management assessment to help with that planning process. The aim was to apply the Queensland Emergency Risk Management Framework (QERMF) to a comprehensive risk assessment of their community.

The QERMF is tool that supports the development and review of Local Disaster Management Plans. It works by identifying and understanding hazards, exposure, and community vulnerability.

One of the key strengths identified through the risk assessment is the networked links which Rockhampton Regional Council has forged since establishing the Disability Inclusive Disaster Risk Reduction (DIDRR) Working Group in 2020.

The working group bought people together who wanted to continue the conversation about DIDRR. The Working Group is a resource to support mutual learning about disaster risks and preparedness planning with people with disability, a group that has traditionally lacked representation as part of emergency management planning.

By learning and working together, the group is strengthening their bonds and building links between people with disability and emergency personnel. The Working Group has shown how grassroots initiatives formed through shared interest can strengthen collaborative action toward DIDRR.

Image: Rockhampton's Disaster Management Dashboard. Courtesy Rockhampton Regional Council.

Case study: Our Coast. Our Future. The Gladstone Region CHAS

The Gladstone Region Coastal Hazard Adaptation Strategy (CHAS): Our Coast Our Future is a long-term strategy to help manage and adapt to the coastal hazard impacts on the coastline and Gladstone's coastal communities. Coastal hazards include erosion of our sandy coastlines and short or long-term seawater inundation of low-lying areas along the coastline.

Gladstone Regional Council was awarded funding through the QCoast2100 program, a Queensland Government and Local Government Association of Queensland's (LGAQ) initiative. The initiative was designed to assist local governments in planning for the potential impacts of coastal hazards associated with climate change.

Throughout the development of the strategy, detailed coastal hazard modelling studies were undertaken as well as a range of engagement conversations with the community to ensure the values and ideas of residents were incorporated into the strategy.

The coastal lifestyle in the Gladstone Region is unique and worth preserving for generations to come. This Strategic Plan enables Gladstone Regional Council and stakeholders, including Traditional Owners, industry and residents, to be better prepared to reduce the impacts of coastal hazards on our communities, environment, cultural values, infrastructure, lifestyle and services, both now and into the future (to 2100).

Image: Our Coast Our Future cover. Courtesy Gladstone Regional Council.

Our pathways to resilience

This Strategy has been formulated through regional engagement and collaboration with the local governments and stakeholders within the region, and calibrated by drawing upon a spectrum of existing resilience efforts across the region, including existing studies, reports, plans and strategies. It also draws upon the strategic observations from the initial assessment of exposure and vulnerability undertaken across the region.

This enables the consideration of both locally identified community needs and risk informed strategic vulnerabilities, which when considered together, can be used to bolster resilience initiatives across the region.

The concept of resilience action can be considered in the context of three opportunities, as highlighted by the strategic pathways:

'Doing same' – some parts of the system may be able to continue successful functioning even with disruption. However, other parts of the system will not endure major disruptions and to 'go back to normal' after disasters is reinforcing existing vulnerabilities.

'Doing better' – some parts of the system may be amenable to incremental changes and adjustments, allowing for improved decisions and actions based on updating knowledge.

'Doing differently' – large parts of the system will not be able to withstand increasing frequency or magnitude of disruption and will require a step change to deliver on goals and things that are valued. System structural changes can be achieved by addressing root causes and re-prioritising.

For the Fitzroy and Capricornia region, the doing same, doing different and doing better model encompasses the following examples:

- Sharing information to build intelligence through collaborative working. This process will help us 'do better' to build skills, capability and capacity over the longer term
- Focusing on opportunities to build resilience for our towns and centres through innovations in land use planning, the flood warning infrastructure network and through to innovative and transformative aspects of design, to cool our towns
- Enhancing the resilience of our transport networks through planned mitigation, a focus on repeat impact hotspots and taking whole-of-systems and multi-modal approaches, providing a continuous pathway to improvement
- Pursuing socio-economic prosperity through continuity planning and economic systems-based approaches which recognise the varied ways in which economic resilience underpins broader community resilience
- Implementing measures that help us to better steward the landscapes we value, are connected to and rely on, as we navigate towards new sustainability goals.

Image: Road through Outback under cloudy sky near Marlborough. Credit: Shutterstock.

Regional strategic pathways

The strategic pathways identified below form a blueprint for coordinated resilience action for the Wet Tropics region. Efforts at the local level are calibrated to work toward the achievement of regional goals. Each strategic pathway is mapped to its corresponding QSDR objective, referenced by the coloured number reference.

Climate adapted prosperity

	Doing different	Doing better	Doing same
Resilient society	**Sharing information and intelligence** 1 Improved data intelligence, monitoring and reporting. Sharing information across sectors to support enhanced evidence-based decision making and situational awareness.	**Collaboration** 2 We value working together, and that if we want to do something right, we need to do it together. We will maximise our success through working collaboratively toward our common goals.	**Supported upskilling** 4 We take our lessons learnt from event recovery and put them into action to continuously build our resilience. Through sharing and collaboration, we will work toward upskilling across communities and across sectors.
Resilient towns and infrastructure	**A FWIN program of action** 4 Maintaining the flood warning infrastructure network through investment, a common asset management plan, action plan and maintenance arrangements to collate data to inform situational awareness and decision-making.	**Connect disaster resilience into land use planning** 3 Develop, transform and grow the region's places and economy in a risk-responsive way.	**Cooling our towns** 3 Explore ways to cool our towns and provide relief from heat and heatwaves with solutions that are fit for our climates and hazard profiles.
Resilient transport	**Building prosperity and redundancy through roads** 2 Increasing safety and developing pathways for betterment is essential for our road network. We take action to implement the resilience objectives of the Regional Transport Plans across the region.	**Mitigating repeated impact hotspots and networks** 3 We collaborate to investigate new options for improved network resilience, having regard to known locations where repeat event impacts highlight potential transport network vulnerability.	**Strategic whole-of-network approaches across transport modes** 4 Bolster supply chains and multi-modal networks to support communities and strengthen regional networks that support employment and the economy.
Resilient economy	**Ensuring baseline business continuity** 1 Embracing business continuity processes within corporate cultures, from small businesses to large industries across the region, as part of daily business operations to continue to support communities.	**Hazard adaptation as a precursor to economic prosperity** 2 Using the pursuit of resilience as a pathway to socio-economic prosperity. Contemplating hazards, risks and disaster as part of economic development.	**A systems-based approach** 4 Adoption of integrated systems-based approaches to the network of factors that underpin economic resilience, and the varied ways in which the economy underpins other aspects of resilience.
Resilient environment	**Sustainable land management approaches** 3 Harnessing and restoring natural functions and collecting data to support evidence-based decision making. We implement sustainable practices and partner with Traditional Owners to care for Country.	**Pre-planning for post-event environmental recovery** 3 Environmental risk following events is considered as part of strategic processes and projects, ahead of event impacts in an effort to deploy proactive measures to mitigate environmental damage.	**Achieving sustainability goals** 4 Working collaboratively to define and implement actions which work towards our individual and collective sustainability goals, and the achievement of carbon neutrality.

Delivering over time

The strategic pathways above provide the broad themes that address the region's identified resilience needs. Staging and focusing the right effort at the right time is also critical to advancing resilience in a sustainable way.

Being able to describe what is needed and when is a key aspect of coordinating whole of government and collective responses to locally identified needs.

The diagram below provides a conceptual roadmap to understand key actions and investment priorities for the region, and when they might be applied, having regard to funding mechanisms and broader delivery programs of investment. It anticipates that stresses and shocks will continue to happen into the future – but it provides the 'trigger points' for key interventions at the relevant points over time (before and event, during, and after) that are needed to help sustain socio-economic growth into the future.

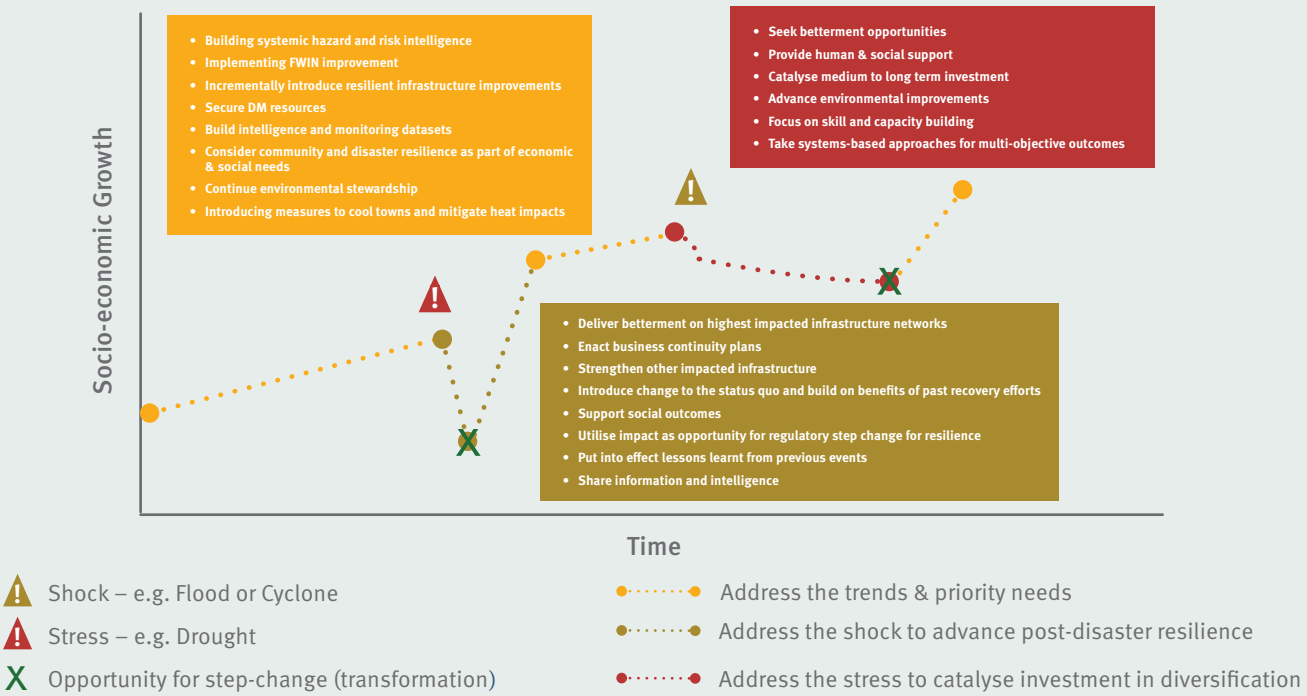
This can be used as a mechanism to understand key recovery and resilience priorities ahead of time, so that when an event occurs, all stakeholders are already aware of the key needs of the region following an event which enables post disaster efforts to be better coordinated and streamlined.

The phased approach, demonstrated by the figure above, acknowledges that resilience is a journey and is punctuated by events that change our circumstances. Sometimes, it is easier to achieve changes to the status quo after an event, when the consequences are in clear memory. As challenging as events are, they also present opportunities for change so that today's lessons can be retained and put to work for future benefit. In other periods, under 'blue sky' conditions, other opportunities also exist to build hazard and risk information datasets, undertake monitoring and plan for uncertain times.

Importantly, this approach means that efforts, projects and activities need not be all done at once. Individual local government circumstances will dictate what is needed and when certain actions are best carried out depending on local priorities and needs at any given time. local priorities and needs at any given time.

Future action and investment priorities and phasing

Figure 7. Improving our prosperity through resilience (adapted from Joseph Fiksel).



Action Planning

A local action plan relative to each local government in the region supports the implementation of this Strategy. The action plan identifies a suite of potential projects, that if implemented, would contribute to improving resilience to natural hazards at both the local and regional level. It is calibrated to provide direction on how to pivot actions as events occur and circumstances change.

Each local government will be the primary driver for implementing the local action plan, however it is acknowledged that not every action identified is the responsibility of the local government, with some actions requiring involvement by state agencies, local stakeholder groups, charities, NRM bodies and community groups. Where this is the case, councils can work with stakeholders to share these actions and projects.

Implementation

Working together to implement the strategy

This strategy will be implemented as a partnership across the local governments of the Central Queensland Regional Organisation of Councils (CQROC). The strategy actions will be driven through local leadership and regional resourcing under the direction of the CQROC, with appropriate support from other coordinating bodies and entities including District Disaster Management Groups (DDMGs), local disaster management committees, recovery and resilience officers, state government agencies, and not-for-profits.

This approach recognises that while actions are best delivered locally, multi-disciplinary regional level support is also required to encourage cross jurisdictional collaboration, provide technical assistance and proactively assist project implementation.

Enduring governance and funding arrangements

This strategy provides an opportunity and support how local governments, and stakeholders work together to achieve common resilience outcomes for the Fitzroy and Capricornia region. It seeks to inform strategic and coordinated approaches to climate-related disaster resilience activities to align funding and action.

Under this model, the strategy acts as the regional 'blueprint' for coordinated and sustained action. An agreed governance arrangement will support the implementation of the strategy and an enduring commitment to championing resilience into the future. Stakeholder-identified key requirements for the successful implementation of this strategy are:

- a broad, multidisciplinary approach to resilience building
- sustaining governance arrangements, funding, and resource capability for implementation of resilience actions over time
- a clear understanding of how resilience arrangements interplay with Queensland Disaster Management Arrangements
- greater collaboration between
- government and non government organisations to optimise resilience service delivery and efficiency
- clarification of the proposed resilience implementation arrangements at state, regional and local levels so that local actions can be programmed and delivered accordingly.

This model is underpinned by a 'role for everyone' in delivery including:

Local leadership

Local governments are encouraged to establish their own multi-disciplinary resilience working groups to transition community and climate-related disaster resilience to front-of-mind in all local government functions. This could be achieved by combining existing recovery group arrangements with an ongoing resilience focus over the calendar year.

Regional coordination

Regional coordination will be driven through the CQROC with a strong link to other existing related governance arrangements such as the relevant DDMGs.

State support

As a locally-led and regionally coordinated strategy, the role of the State is intended to be one of provision of enabling measures such as administration of grant funding programs, delivery of core governmental functions that interface with resilience building, and facilitation/coordination of support that can assist implementation.

Image: Criterion hotel building, Rockhampton.
Back page: The Capricorn caves. Credit: Shutterstock.

www.qra.qld.gov.au/regional-resilience-strategies/Fitzroy-Capricornia